FENOC

FirstEnergy Nuclear Operating Company

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May 11, 2007
L-07-066

ATTN: Document Control Desk
U. S. Nuclear Regulatory Commission
Washington, DC 20555-0001

Subject: **Beaver Valley Power Station, Unit No. 2**
Docket No. 50-412, License No. NPF-73
Proposed Alternatives and Relief Requests Associated With The Inservice Testing Program Ten-Year Update

FirstEnergy Nuclear Operating Company (FENOC) requests approval of proposed alternatives and relief requests associated with the third ten-year interval update (Issue 3, Revision 0) of the Beaver Valley Power Station (BVPS) Unit No. 2 Inservice Testing Program for Pumps and Valves (IST Program).

The subject requests are included as integral parts of the enclosed BVPS Unit No. 2 IST Program, Issue 3, Revision 0, which has been updated to the American Society of Mechanical Engineers Operations and Maintenance (OM) Code 2001 Edition, "Code for Operation and Maintenance of Nuclear Power Plants," with OM Code Addenda through OMb-2003. Portions of the IST Program other than the subject 10 CFR 50.55a requests, as well as plant drawings, are enclosed for information only.

The proposed alternatives and relief requests are submitted in accordance with 10 CFR 50.55a. Nine (9) requests are associated with pump testing requirements, and one (1) request is associated with valve test requirements. The attached list of 10 CFR 50.55a requests identifies the request number, applicable code paragraph, requests that are similar to those approved for the second ten-year interval IST Program, and the location in the enclosed IST Program document where the details of the requests are presented.

Requests identified as PRR1, PRR2, PRR7, PRR8, and PRR9 for the BVPS Unit No. 2 IST Program are similar to BVPS Unit No. 1 requests identified as PRR1, PRR2, PRR7, PRR8, and PRR13 respectively, as submitted for approval by FENOC letter number L-07-049, dated March 21, 2007. Concurrent review of these requests is recommended.

A047

The third ten-year inservice testing interval for BVPS Unit No. 2 commences on November 18, 2007. Therefore, FENOC requests NRC approval of the proposed alternatives and relief requests prior to November 18, 2007.

There are no regulatory commitments contained in this letter. If there are any questions or if additional information is required, please contact Mr. Henry L. Hegrat, Supervisor, FENOC Fleet Licensing at 330-374-3114.

Sincerely,

James H. Lash

Attachment:
List of 10 CFR 50.55a Requests

Enclosures:
Beaver Valley Power Station, Unit No. 2, Inservice Testing (IST) Program for Pumps and Valves
Plant Drawings

c: Ms. N. S. Morgan, NRR Project Manager
Mr. P. C. Cataldo, NRC Senior Resident Inspector
Mr. S. J. Collins, NRC Region I Administrator
Mr. D. J. Allard, Director BRP/DEP
Mr. L. E. Ryan (BRP/DEP)

ATTACHMENT TO LETTER L-07-066

LIST OF 10 CFR 50.55a REQUESTS

Request Number	Applicable Code Paragraph	Similar to Approved Request[1]	Enclosure Page Number[4]
PRR1	10 CFR 50.55a(a)(3)(i), Proposed Alternative	Similar	49
PRR2	10 CFR 50.55a(a)(3)(i), Proposed Alternative	Similar	52
PRR3	10 CFR 50.55a(f)(5)(iii), Proposed Alternative	Similar	56
PRR4	10 CFR 50.55a(f)(5)(iii), Proposed Alternative	Revised[2]	59
PRR5	10 CFR 50.55a(a)(3)(ii), Proposed Alternative	Similar	62
PRR6	10 CFR 50.55a(a)(3)(i), Proposed Alternative	Similar	64
PRR7	10 CFR 50.55a(f)(5)(iii), Proposed Alternative	Similar	66
PRR8	10 CFR 50.55a(a)(3)(i), Proposed Alternative	Revised[3]	68
PRR9	10 CFR 50.55a(a)(3)(ii), Proposed Alternative	New	73
VRR1	10 CFR 50.55a(a)(3)(i), Proposed Alternative	New	317

Notes:

1. Requests are identified as “Similar” or “Revised” with respect to the requests approved for the Beaver Valley Power Station (BVPS) Unit No. 2 second ten-year interval IST Program. Other requests are identified as “New.” The requests propose alternatives to American Society of Mechanical Engineers Operations and Maintenance Code (2001 Edition) requirements.
2. Request PRR4 is similar to the request approved for the BVPS Unit No. 2 second ten-year interval, but was revised to allow the use of a winter or summer pump curve for the service water pumps depending on the river water temperature at the time of the test. The winter and summer pump curves are used to address seasonal changes in pump performance (from changes in thermal expansion of internal components) due to temperature change.
3. Request PRR8 is similar to the request approved for the BVPS Unit No. 2 second ten-year interval, but was also applied to pumps for which vibration readings less than 0.05 inches per second are obtained subsequent to repair and replacement, or for comprehensive pump testing.
4. Pump requests (PRR) are provided in Section III, and the valve request (VRR) is provided in Section IX of the enclosed IST Program.

Beaver Valley Power Station

Unit 2

Inservice Testing (IST) Program For Pumps And Valves

Issue 3, Revision 0

Preparer [signature]	Date: 4/13/07
IQR Joann H. West	Date: 4-16-07
Carl Batton for D.C. Reeves Technical Services Engineering Review	Date: 4/17/07
Operations Approval R D Bologna	Date: 4-18-07

This 10-year interval update was made using the ASME OM Code-2001 Edition with Addenda through OMb-2003.

Beaver Valley Power Station

Unit 2

Inservice Testing (IST) Program for Pumps and Valves

Issue 3, Revision 0

Effective Date of Procedure: 11/18/07

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SECTION I: PUMP TESTING REQUIREMENTS

Title 10, Part 50.55a of the Code of Federal Regulations, Paragraph (f)(4)(ii) requires that 10-year IST Programs comply with the latest NRC approved edition and addenda of the Code incorporated by reference in Paragraph (b), 12 months prior to the start of the 120-month inspection interval. The third 10-year inservice testing interval for Beaver Valley Power Station (BVPS) Unit 2 commences on November 18, 2007. The use of any later edition and addenda of the ASME OM Code is allowed if it has been incorporated in Paragraph (b)(2) of 10 CFR 50.55a, or if approved by the NRC as an acceptable alternative.

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

- American Society of Mechanical Engineers (ASME) OM Code-2001 Edition, Code for Operation and Maintenance of Nuclear Plants, with Addenda through OMb-2003.
- Generic Letter No. 89-04, "Guidance on Developing Acceptable Inservice Testing Programs".
- NUREG-1482, Revision 1, "Guidelines for Inservice Testing at Nuclear Power Plants".
- Technical Specification 5.5.4, "Inservice Testing Program

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 safe shutdown condition, maintaining the safe shutdown condition, or mitigating the consequences of an accident, at BVPS, Unit 2. BVPS-2 is licensed for a safe shutdown of cold shutdown.

Exclusions

The following are excluded from the requirements of Subsection ISTB:

- Drivers, except where the pump and driver form an integral unit and the pump bearings are in the driver.
- Pumps that are supplied with emergency power solely for operating convenience.
- Skid-mounted pumps that are tested as part of the major component and are justified by BVPS-2 to be adequately tested. Skid-Mounted Pumps are pumps which are integral to or support operation of a parent pump or major component. NUREG-1482, Rev.1, Section 3.4, "Skid-mounted Components and Component Subassemblies" provides further discussion pertaining to skid-mounted components.

NOTE:	Transitioning to the applicable edition of the ASME OM Code for the IST Third 10-Year Interval requires the Grouping of pumps according to function as well as adopting the Comprehensive Pump Test. The pump Groupings, instrument accuracy requirements, test parameters and acceptance criteria for tests parameters are detailed in the following.

When a Group A test is required a Comprehensive test may be substituted. When a Group B test is required a Group A test or Comprehensive test may be substituted. A preservice test may be substituted for any inservice test.

Group A Pumps

The ASME OM Code defines Group A pumps as those pumps that are operated continuously or routinely during normal operation, cold shutdown, or refueling operations. BVPS considers the following Unit 2 pumps as being categorized as Group A as well as justification for grouping. Justification does not necessarily consider all safety related functions.

- **Charging / High Head Safety Injection Pumps, [2CHS*P21A, 21B, 21C]** – The Charging Pumps support the Reactor Coolant System (RCS) during all normal modes of plant operation. The functions performed include, but are not limited to, the following: maintenance of seal water injection flow to the Reactor Coolant Pumps (RCPs); control of RCS inventory; supplying pressurizer auxiliary spray and reducing the radioactivity level in the reactor coolant. The pumps also serve as the High Head Safety Injection (HHSI) Pumps for emergency cool cooling during post accident conditions.

- **Boric Acid Transfer Pumps, [2CHS*P22A, 22B]** – The Boric Acid Transfer Pumps provide a solution of soluble boric acid for reactor coolant makeup. These pumps also provide boric acid for emergency boration.

- **Residual Heat Removal Pumps, [2RHS*P21A, 21B]** – The primary function of the Residual Heat Removal (RHR) Pumps is to remove heat energy from the core and the RCS during plant cool down.

- **Component Cooling Water Pumps, [2CCP*P21A, 21B, 21C]** - The Component Cooling Water Pumps operate continuously during normal plant operation to supply cooling water to reactor plant components and non-essential heat loads as well as cooling water to the RCP motor bearings and thermal barrier. Their safety related function is to provide cooling water for RHR System support.

- **Service Water Pumps [2SWS*P21A, 21B, 21C]** - The Service Water Pumps operate continuously during normal plant operation to provide cooling water for heat removal from power plant auxiliary subsystems. During post accident conditions they provide the heat sink to the following components: at least two recirculation spray coolers, one charging pump lube oil cooler, one control room air-conditioning refrigerant condenser or one control room air-conditioning unit, one emergency diesel generator cooling system heat exchanger, and one safeguards area air-conditioning unit.

Group B Pumps

The ASME OM Code defines Group B pumps as those pumps in standby systems that are not operated routinely except for testing. BVPS-2 considers the following pumps as being categorized as Group B as well as justification for grouping.

- **Low Head Safety Injection Pumps, [2SIS*P21A, 21B] -** The Low Head Safety Injection Pumps are not utilized during any plant operating evolution. The pumps remain in standby during all operating Modes. The pumps are required to operate primarily during a large break loss-of-coolant accident (LOCA), in addition to other design basis accidents (DBA), in order to provide low head safety injection and recirculation flow to the RCS, and for long term shutdown cooling during post-LOCA conditions.

- **Quench Spray Pumps, [2QSS*P21A, 21B]** - The Quench Spray Pumps are not utilized during any plant operating evolution. The pumps remain in standby during all operating modes. The pumps are required to operate only during a loss-of-coolant accident (LOCA) for containment heat removal and pressure suppression. The Quench Spray System also serves in removing fission products released into the containment atmosphere during a LOCA by the admission of sodium hydroxide to the spray stream.

- **Chemical Injection Pumps, [2QSS*P24A, 24B]** - The Chemical Injection Pumps are not utilized during any plant operating evolution. The pumps remain in standby during all operating modes. The pumps are required to operate only during a loss-of-coolant accident (LOCA) to provide sodium hydroxide to the Quench Spray System in order to provide iodine removal from the containment atmosphere and to maintain containment sump pH levels.

- **Recirculation Spray Pumps, [2RSS*P21A, 21B, 21C, 21D]** - The Recirculation Spray Pumps are not utilized during any plant operating evolution. The pumps remain in standby during all operating modes. The pumps are required to operate only during a loss-of-coolant accident (LOCA) for long term containment heat removal and pressure suppression after sufficient inventory has collected in the containment sump to support pump operation. The C and D Recirculation Spray Pumps also have the capability of providing sump inventory to the suction supply of the High Head Safety Injection Pumps when RWST level is low.

- **Turbine Driven Auxiliary Feedwater Pump, [2FWE*P22].** - The Turbine Driven Auxiliary Feedwater Pump is not utilized during any plant operating evolution. The pump remains in standby during all operating modes and is required to operate only in the event of a main turbine trip with a total loss of all electrical power (Station Blackout) in order to provide emergency makeup to the Steam Generators during loss of normal feedwater.

- **Motor Driven Auxiliary Feedwater Pumps, [2FWE*P23A, 23B]** - The Motor Driven Auxiliary Feedwater Pumps may be utilized during startup from refueling outages to fill the steam generators and to maintain steam generator level prior to initiation of normal feedwater. However, restart is not dependent upon operation of the Motor Driven Auxiliary Feedwater Pumps since the Steam Generator Startup Feedwater Pump [2FWS-P24] may be used to perform this non-safety related function. With the possible exception of the above, the Motor Driven Auxiliary Feedwater Pumps remain in standby during all operating modes. The pumps also serve as an emergency source of feedwater supply to the steam generators during a loss of normal feedwater, loss of offsite power, secondary side pipe ruptures, or cool down following a steam generator tube rupture.

- **DG Fuel Oil Transfer Pumps, [2EGF*P21A, 21B, 21C, 21D]** - The Fuel Oil Transfer Pumps are not utilized during any plant operating evolution. The pumps remain in standby during all operating Modes. The pumps are required to operate only during emergency diesel generator operation to replenish day tank inventory.

Instrument Accuracy Requirements

Instrument accuracy shall be within the limits specified in Table ISTB-3500-1, as reflected below. If a parameter is determined by analytical methods instead of measurement, then the determination shall meet the parameter accuracy requirement of Table ISTB-3500-1. For individual analog instruments, the required accuracy is percent of full scale. For digital instruments, the required accuracy is over the calibrated range. For a combination of instruments, the required accuracy is loop accuracy. Table ISTB-3500-1 below reflects the required instrument accuracies for both the Group A test and Group B test as well Comprehensive testing applicable to Group A and Group B pumps and Preservice tests.

The full-scale of each analog instrument shall be not greater than three times the reference value. Per Code Case OMN-6, Alternate Rules for Digital Instruments, digital instruments shall be selected such that the reference value does not exceed 90% of the calibrated range of the instrument. This Code Case is unconditionally approved for use by US NRC Regulatory Guide 1.192, Operation and Maintenance Code Case Acceptability, ASME OM Code.

Table ISTB-3500-1

Required Instrument Accuracy (%)

Quantity	Group A and Group B Tests, %	Comprehensive and Preservice Tests, %
Pressure	± 2	± 1/2
Flow Rate	± 2	± 2
Speed	± 2	± 2
Vibration	± 5	± 5
Differential Pressure	± 2	± 1/2

Instrument accuracy is defined as the allowable inaccuracy of an instrument loop based on the square root of the sum of the square of the inaccuracies of each instrument in the loop when considered separately. Alternatively, the allowable inaccuracy of the instrument loop may be based on the output for a known input into the instrument loop.

Instrument loop is defined as two or more instruments working together to provide a single output (e.g., a vibration probe and its associated signal conditioning and readout devices, transmitter and indicator, etc.). Per ASME OM Code Interpretation 04-07, pump suction and discharge pressure instruments are not considered an instrument loop when used in conjunction to determine differential pressure.

Test Parameters

The requirements of the Code and the guidance provided by NUREG-1482, Rev. 1 will be followed at all times unless specific relief has been granted by the NRC. A Group A or Group B inservice test, run quarterly, as applicable, and a Comprehensive inservice test, run biennially, to measure or observe the test quantities listed in Table ISTB-3000-1, below, is required for all pumps in the IST Program.

Pursuant to ISTB-3550, "Flow Rate"; When measuring flow rate, a rate or quantity meter shall be 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. Internal recirculated flow is not required to be measured. External recirculated flow is not required to be measured if it is not practical to isolate, has a fixed resistance, and has been evaluated by BVPS-2 to not have a substantial effect on the results of the test.

TABLE ISTB-3000-1

INSERVICE TEST PARAMETERS

Quantity	Preservice Test	Group A Test	Group B Test	Comprehensive Test	Remarks
Speed: N	X	X	X	X	If variable speed
Differential Pressure: ΔP	X	X	X (Note 1)	X	Centrifugal pumps, including vertical line shaft pumps
Discharge Pressure: P	X	X	X	X	Positive displacement pumps
Flow Rate: Q	X	X	X (Note 1)	X	- - - -
Vibration: Velocity, V_v	X	X		X	Peak

NOTE:

(1) For positive displacement pumps, flow rate shall be measured or determined. For all other pumps, differential pressure or flow rate shall be measured or determined.

Test Duration

(a) For the Group A test and the Comprehensive test, after pump conditions are as stable as the system permits, each pump shall be run at least 2 minutes. At the end of this time at least one measurement or determination of each of the required quantities shall be made and recorded.

(b) For the group B test, after pump conditions are stable, at least one measurement or determination of the required quantity shall be made and recorded.

Reference Values

(a) Initial reference values shall be determined from the results of testing meeting the requirements of ISTB-3100, Preservice Testing, or from the results of the first inservice test.

(b) New or additional reference values shall be established as required by ISTB-3310, ISTB-3320, or ISTB-6200(c).

(c) Reference values shall be established only when the pump is known to be operating acceptably.

(d) Reference values shall be established at a point(s) of operation (reference point) readily duplicated during subsequent tests.

(e) Reference values shall be established in a region(s) of relatively stable pump flow.

(1) Reference values shall be established within ±20% of pump design flow rate (i.e., the flow rate at the design point or the accident analysis flow, with operation at the best efficiency point (BEP) desired provided all are greater than or equal to the maximum accident analysis flow) for the Comprehensive pump test.

(2) Reference values shall be established within ±20% of pump design flow for the Group A and Group B tests, if practicable. If not practicable, the reference point flow shall be established at the highest practical flow rate.

(f) All subsequent test results shall be compared to these initial reference values or to new reference values established per ISTB-3310, ISTB-3320, or ISTB-6200(c).

(g) Related conditions that can significantly influence the measurement or determination of the reference value shall be analyzed in accordance with ISTB-6400.

Centrifugal Pump Test Acceptance Criteria

The allowable ranges for centrifugal pump test parameters are specified in Table ISTB-5100-1 and are reflected below. It should be noted that the hydraulic acceptance criteria defining Acceptable Range and Required Action Range for the quarterly Group A and Group B tests are less stringent than the acceptance range imposed on the hydraulic test parameters associated with the biennial Comprehensive test. In addition, an Alert Range is imposed on the hydraulic parameters for centrifugal pumps during the Comprehensive test.

Table ISTB-5100-1

Centrifugal Pump Test Acceptance Criteria

Test Type	Pump Speed	Test Parameter	Acceptable Range	Alert Range	Required Action Range Low	Required Action Range High
Group A[1,2]	N/A	Q	0.90 to 1.10 Q_r	None	< 0.90 Q_r	> 1.10 Q_r
	N/A	ΔP	0.90 to 1.10 ΔP_r	None	< 0.90 ΔP_r	> 1.10 ΔP_r
	≥600	V_v or V_d	≤ 2.5V_r	> 2.5V_r to 6 V_r or >0.325 to 0.7 in/sec	None	>6V_r or >0.7 in/sec
Group B	N/A	Q	0.90 to 1.10 Q_r	None	< 0.90 Q_r	> 1.10 Q_r
	N/A	ΔP	0.90 to 1.10 ΔP_r	None	< 0.90 ΔP_r	> 1.10 ΔP_r
Comprehensive[1,2]	N/A	Q	0.94 to 1.03 Q_r	0.90 to <0.94 Q_r	< 0.90 Q_r	> 1.03 Q_r
	N/A	ΔP	0.93 to 1.03 ΔP_r	0.90 to <0.93 ΔP_r	< 0.90 ΔP_r	> 1.03 ΔP_r
	≥600	V_v or V_d	≤ 2.5V_r	> 2.5V_r to 6 V_r or >0.325 to 0.7 in/sec	None	>6Vr or >0.7 in/sec

NOTES: The subscript *r* denotes reference value, the subscript *v* denotes vibration velocity reference value, and the subscript *d* denotes displacement.

(1) Vibration parameter per Table ISTB-3000-1. V_r is vibration reference value in the selected units.

(2) Refer to Fig. ISTB-5200-1 to establish displacement limits for pumps with speeds ≥600 rpm.

All deviations from the reference values shall be compared with the ranges of Table ISTB-5100-1 and corrective action taken as specified in ISTB-6200, as reflected in the Corrective Action section following pump test acceptance criteria.

NOTE: The vibration measurements shall be compared to both the relative and absolute criteria shown in the alert and required action ranges of Table-ISTB-5100-1. For example, if vibration exceeds either 6V_r, or 0.7 in./sec, the pump is in the required action range.

Vertical Line Shaft Centrifugal Pump Test Acceptance Criteria

The allowable ranges for vertical line shaft centrifugal pump test parameters are specified in Table ISTB-5200-1 and are reflected below. It should be noted that the hydraulic acceptance criteria defining Acceptable Range and Required Action Range for the quarterly Group A and Group B tests are less stringent than the acceptance range imposed on the hydraulic test parameters associated with the biennial Comprehensive test.

A vertical line shaft pump is defined as a vertically suspended pump, where the pump driver and the pumping element are connected by a line shaft within an enclosing column which contains the pump bearings, making pump bearing vibration measurements impracticable.

Table ISTB-5200-1

Vertical Line Shaft and Centrifugal Pumps Test Acceptance Criteria

Test Type	Pump Speed	Test Parameter	Acceptable Range	Alert Range	Required Action Range	
					Low	High
Group A[1,2]	N/A	Q	0.95 to 1.10 Q_r	0.93 to <0.95 Q_r	< 0.93 Q_r	> 1.10 Q_r
	N/A	ΔP	0.95 to 1.10 ΔP_r	0.93 to <0.95 ΔP_r	< 0.93 ΔP_r	> 1.10 ΔP_r
	≥600	V_v or V_d	≤ 2.5V_r	> 2.5V_r to 6 V_r or >0.325 to 0.7 in/sec	None	>6V_r or >0.7 in/sec
Group B	N/A	Q	0.90 to 1.10 Q_r	None	< 0.90 Q_r	> 1.10 Q_r
	N/A	ΔP	0.90 to 1.10 ΔP_r	None	< 0.90 ΔP_r	> 1.10 ΔP_r
Comprehensive[1,2]	N/A	Q	0.95 to 1.03 Q_r	0.93 to <0.95 Q_r	< 0.93 Q_r	> 1.03 Q_r
	N/A	ΔP	0.95 to 1.03 ΔP_r	0.93 to <0.95 ΔP_r	< 0.93 ΔP_r	> 1.03 ΔP_r
	≥600	V_v or V_d	≤ 2.5V_r	> 2.5Vr to 6 V_r or >0.325 to 0.7 in/sec	None	>6V_r o >0.7 in/sec

NOTES: The subscript *r* denotes reference value, the subscript *v* denotes vibration velocity reference value, and the subscript *d* denotes displacement.

(1) Vibration parameter per Table ISTB-3000-1. V_r is vibration reference value in the selected units.

(2) Refer to Fig. ISTB-5200-1 to establish displacement limits for pumps with speeds ≥600 rpm.

All deviations from the reference values shall be compared with the ranges of Table ISTB-5200-1 and corrective action taken as specified in ISTB-6200, as reflected in the Corrective Action section following pump test acceptance criteria.

NOTE: The vibration measurements shall be compared to both the relative and absolute criteria shown in the alert and required action ranges of Table-ISTB-5200-1. For example, if vibration exceeds either 6V_r, or 0.7 in./sec, the pump is in the required action range.

Positive Displacement Pump Test Acceptance Criteria

The allowable ranges for positive displacement parameters are specified in Table ISTB-5300-1 and Table ISTB-5300-2, and are reflected below. It should be noted that the hydraulic acceptance criteria defining Acceptable Range and Required Action Range for the quarterly Group A and Group B tests are less stringent than the acceptance range imposed on the hydraulic test parameters associated with the biennial Comprehensive test.

Table ISTB-5300-1

Positive Displacement Pump (Except Reciprocating) Test Acceptance Criteria

Test Type	Pump Speed	Test Parameter	Acceptable Range	Alert Range	Required Action Range Low	Required Action Range High
Group A[1,2]	N/A	Q	0.95 to 1.10 Q_r	0.93 to <0.95 Q_r	< 0.93 Q_r	> 1.10 Q_r
	N/A	P	0.93 to 1.10 P_r	0.90 to <0.93 P_r	< 0.90 P_r	> 1.10 P_r
	≥600	V_v or V_d	≤ 2.5V_r	> 2.5Vr to 6 V_r or >0.325 to 0.7 in/sec	None	>6V_r or >0.7 in/sec
Group B	N/A	Q	0.90 to 1.10 Q_r	None	< 0.90 Q_r	> 1.10 Q_r
Comprehensive[1,2]	N/A	Q	0.95 to 1.03 Q_r	0.93 to <0.95 Q_r	< 0.93 Q_r	> 1.03 Q_r
	N/A	P	0.93 to 1.03 P_r	0.90 to <0.93 P_r	< 0.90 P_r	> 1.03 P_r
	≥600	V_v or V_d	≤ 2.5V_r	> 2.5Vr to 6 V_r or >0.325 to 0.7 in/sec	None	>6V_r or >0.7 in/sec

NOTES: The subscript *r* denotes reference value, the subscript *v* denotes vibration velocity reference value, and the subscript *d* denotes displacement.

(1) Vibration parameter per Table ISTB-3000-1. V_r is vibration reference value in the selected units.

(2) Refer to Fig. ISTB-5200-1 to establish displacement limits for pumps with speeds ≥600 rpm.

Table ISTB-5300-2

Reciprocating Positive Displacement Pump Test Acceptance Criteria

Test Type	Pump Speed	Test Parameter	Acceptable Range	Alert Range	Required Action Range Low	Required Action Range High
Group A	N/A	Q	0.95 to 1.10 Q_r	0.93 to <0.95 Qr	< 0.93 Q_r	> 1.10 Q_r
	N/A	P	0.93 to 1.10 P_r	0.90 to <0.93 Pr	< 0.90 P_r	> 1.10 P_r
	N/A	V_v or V_d	≤ 2.5V_r	> 2.5V_r to 6 V_r	None	>6V_r
Group B	N/A	Q	0.90 to 1.10 Q_r	None	< 0.90 Q_r	> 1.10 Q_r
Comprehensive	N/A	Q	0.95 to 1.03 Q_r	0.93 to <0.95 Q_r	< 0.93 Q_r	> 1.03 Q_r
	N/A	P	0.93 to 1.03 P_r	0.90 to <0.93 P_r	< 0.90 P_r	> 1.03 P_r
	N/A	V_v or V_d	≤ 2.5V_r	> 2.5V_r to 6 V_r	None	>6V_r

NOTES: The subscript *r* denotes reference value, the subscript *v* denotes vibration velocity reference value, and the subscript *d* denotes displacement.

All deviations from the reference values shall be compared with the ranges of Table ISTB 5300-1 or Table ISTB-5300-2, as applicable, and corrective action taken as specified in ISTB-6200, as reflected in the Corrective Action section following pump test acceptance criteria.

NOTE: The vibration measurements shall be compared to both the relative and absolute criteria shown in the alert and required action ranges of Table-ISTB-5300-1. For example, if vibration exceeds either $6V_r$, or 0.7 in./sec, the pump is in the required action range.

<u>**Corrective Action**</u>

(a) **Alert Range [ISTB 6200(a)]**. If the measured test parameter values fall within the alert range of Table ISTB-5100-1, Table ISTB-5200-1, Table ISTB-5300-1 or Table ISTB-5300-2, as applicable, the frequency of testing specified in paragraph ISTB-3400 shall be doubled until the cause of the deviation is determined and the condition corrected.

(b) **Action Range [ISTB 6200(b)]**. If the measured test parameter values fall within the required action range of Table ISTB-5100-1, Table ISTB-5200-1, Table ISTB-5300-1 or Table ISTB-5300-2, as applicable, the pump shall be declared inoperable until either the cause of the deviation has been determined and the condition corrected, or an analysis of the pump is performed and new reference values are established in accordance with paragraph ISTB-6200(c). The analysis of the pump's condition with respect to system operability and Technical Specifications shall also be made as follows:

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

(2) 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 required action statements shall be followed.

(3) Nothing in the ASME OM Code shall be construed to supersede the requirements of any technical specification.

(c) **New Reference Values [ISTB 6200(c)]**. In cases where the pump's test parameters are within either the alert or required action ranges of Table ISTB-5100-1, Table ISTB-5200-1, Table ISTB-5300-1 or Table ISTB-5300-2, as applicable, and the pump's continued use at the changed values is supported by an analysis, a new set of reference values may be established. The analysis shall include verification of the pump's operational readiness. The analysis shall include both a pump level and a 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.

When a test shows measured parameter values that fall outside of the acceptable range of Table ISTB-5100-1, Table ISTB-5200-1, Table ISTB-5300-1 or Table ISTB-5300-2, as applicable, that have resulted from an identified systematic error, such as improper system lineup or inaccurate instrumentation, the test shall be rerun after correcting the error.

If the reference value of a particular parameter being measured or determined can be significantly influenced by other related conditions, then these conditions shall be analyzed and documented in the record of tests.

Reference Pump Curves

Utilization of a pump curve in the BVPS-2 IST Program for performing testing and establishing acceptance criteria is considered acceptable since the guidelines provided by NUREG-1482, Rev.1, Section 5.2 relating to the use of a pump curve shall be followed:

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

(b) 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 ISTB-3510. The instrument accuracy requirements specified in Table ISTB-3500-1 for Comprehensive and Preservice tests shall apply when developing a pump curve.

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

(d) 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.

(e) 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.

(f) 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.

(g) 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.

Records and Reports

Records of the results of inservice tests and corrective actions as required by ISTB-9000 are maintained in computerized or in tabular form. Pump performance characteristics will be examined for trends.

Pump Definitions

Operational Readiness - The ability of a component to perform its intended function when required.

Plant Operation - The conditions of startup, operation at power, hot standby, and reactor cool down, as defined by the plant Technical Specifications.

Reference Point - A point of operation at which reference values are established and inservice test parameters are measured for comparison with applicable acceptance criteria.

Reference Values - One or more values of test parameters measured or determined when the equipment is known to be operating acceptably.

Safe Shutdown - The operating Mode a plant must achieve subsequent to a design basis accident as reflected in the plant safety analysis. BVPS-2 is licensed as cold shutdown being safe shutdown.

Trending - A comparison of current data to previous data obtained under similar conditions for the same equipment.

NOTE: The following three sections of this document are the "Pump Outline Tables", "Pump Relief Requests", and "Pump Minimum Operating Point (MOP) Curves" sections.

<u>Pump Outline Tables</u>

The "Pump Outline Tables" are a listing of all the pumps in the IST Program, their testing requirements, and their specific pump relief request reference numbers. The pumps are arranged according to system and pump number. The following abbreviations and designations are used on the Pump Outline Tables and throughout the IST Program for pumps:

N - Speed

P - Discharge Pressure

ΔP - Differential Pressure

Q - Flow rate

V - Vibration

2BVT - Unit 2 Beaver Valley Test

2OST - Unit 2 Operating Surveillance Test

CMP - Corrective Maintenance Procedure

CPT - Comprehensive Pump Test

Q - Quarterly Test Frequency

CSD - Cold Shutdown Frequency

R - Refueling Test Frequency

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

PRR - Pump Relief Request

X - Meets or exceeds OM Code ISTB requirements

NA - Not Applicable

Pump Relief Requests

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 are 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.

Pump Minimum Operating Point (MOP) Curves

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 OUTLINE TABLES

<table>
<tr><td colspan="5">BVPS-2 IST
PUMP OUTLINE TABLE</td></tr>
<tr><td>Pump Name:
21A Charging Pump</td><td>Pump Number:
2CHS*P21A</td><td>Code Class:
2</td><td colspan="2">System:
7-Chemical and Volume Control</td></tr>
<tr><td colspan="3" rowspan="2">Function: To support the RCS during all normal modes of plant operation which includes, but is not limited to, the following: maintenance of seal water injection flow to the RCPs; control of RCS inventory; supplying pressurizer auxiliary spray and reducing the radioactivity level in the reactor coolant. The pump also serves as the High Head Safety Injection Pump for emergency cool cooling during post accident conditions.</td><td>Type:
Centrifugal</td><td>Dwg. OM No.:
7-1A</td></tr>
<tr><td>Group:
A</td><td>Dwg. Coord.:
C-4</td></tr>
<tr><td colspan="5">Remarks: Pump is tested quarterly (Group A test) on recirculation flow with the VCT via the normal charging header while at power or via the VCT or RWST when shutdown. It can also be tested via the miniflow recirc path with the RWST when shutdown. Comprehensive test is performed during refueling outages at full flow to the RCS during HHSI full flow testing (design point is 150 gpm, accident analysis flow per Calc. 10080-N-794 (Rev.1, Add.2) is 472.4 gpm (required discharge check valve flow)). Also see PRR1 and PRR2, PRR8.</td></tr>
</table>

Parameter (Group A)	**2OST- (Frequency)**	**Req'd**	**Group A Test 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].
Q	7.4 (Q)	X	Summation of flow rates from Flow Indicators [2CHS-FI122A, 124A, 127A, 130A, 160], Control Room, and [2CHS-FI170], local.
V	7.4 (Q)	X	Portable monitoring equipment using velocity units.

Parameter (CPT)	**2OST- (Frequency)**	**Req'd**	**Comprehensive Test Comments**
N	NA	NA	Constant speed induction motor.
ΔP	11.14B (R)	X	Calculated using Pump Discharge Pressure Indicator [2CHS-PI151B] (local) and a temporary suction pressure test gauge, local.
Q	11.14B (R)	X	Summation of flow rates from Flow Indicators [2SIS-FI975, 976, 977], local.
V	11.14B (R)	X	Portable monitoring equipment using velocity units.

BVPS-2 IST
PUMP OUTLINE TABLE

Pump Name: 21B Charging Pump	**Pump Number:** 2CHS*P21B	**Code Class:** 2	**System:** 7-Chemical and Volume Control	
Function: To support the RCS during all normal modes of plant operation which includes, but is not limited to, the following: maintenance of seal water injection flow to the RCPs; control of RCS inventory; supplying pressurizer auxiliary spray and reducing the radioactivity level in the reactor coolant. The pump also serves as the High Head Safety Injection Pump for emergency cool cooling during post accident conditions..			**Type:** Centrifugal **Group:** A	**Dwg. OM No.:** 7-1A **Dwg. Coord.:** D-4
Remarks: Pump is tested quarterly (Group A test) on recirculation flow with the VCT via the normal charging header while at power or via the VCT or RWST when shutdown. It can also be tested via the miniflow recirc path with the RWST when shutdown. Comprehensive test is performed during refueling outages at full flow to the RCS during HHSI full flow testing (design point is 150 gpm, accident analysis flow per Calc. 10080-N-794 (Rev.1, Add.2) is 472.4 gpm (required discharge check valve flow)). Also see PRR1 and PRR2, PRR8.				

Parameter (Group A)	**2OST- (Frequency)**	**Req'd**	**Group A Test 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].
Q	7.5 (Q)	X	Summation of flow rates from Flow Indicators [2CHS-FI122A, 124A, 127A, 130A, 160], Control Room, and [2CHS-FI170], local.
V	7.5 (Q)	X	Portable monitoring equipment using velocity units.

Parameter (CPT)	**2OST- (Frequency)**	**Req'd**	**Comprehensive Test Comments**
N	NA	NA	Constant speed induction motor.
ΔP	11.14B (R)	X	Calculated using Pump Discharge Pressure Indicator [2CHS-PI152B] (local) and a temporary suction pressure test gauge, local.
Q	11.14B (R)	X	Summation of flow rates from Flow Indicators [2SIS-FI981, 982, 983], local.
V	11.14B (R)	X	Portable monitoring equipment using velocity units.

BVPS-2 IST

PUMP OUTLINE TABLE

Pump Name:	**Pump Number:**	**Code Class:**	**System:**
21C Charging Pump	2CHS*P21C	2	7-Chemical and Volume Control

	Type:	**Dwg. OM No.:**
Function: To support the RCS during all normal modes of plant operation which includes, but is not limited to, the following: maintenance of seal water injection flow to the RCPs; control of RCS inventory; supplying pressurizer auxiliary spray and reducing the radioactivity level in the reactor coolant. The pump also serves as the High Head Safety Injection Pump for emergency cool cooling during post accident conditions.	Centrifugal	7-1A
	Group:	**Dwg. Coord.:**
	A	E-4

Remarks: Pump is tested quarterly (Group A test) on recirculation flow with the VCT via the normal charging header while at power or via the VCT or RWST when shutdown. It can also be tested via the miniflow recirc path with the RWST when shutdown. Comprehensive test is performed during refueling outages at full flow to the RCS during HHSI full flow testing (design point is 150 gpm, accident analysis flow per Calc. 10080-N-794 (Rev.1, Add.2) is 472.4 gpm (required discharge check valve flow)). Also see PRR1, PRR2, and PRR8.

Parameter (Group A)	2OST- (Frequency)	Req'd	Group A Test 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].
Q	7.6 (Q)	X	Summation of flow rates from Flow Indicators [2CHS-FI122A, 124A, 127A, 130A, 160], Control Room, and [2CHS-FI170], local.
V	7.6 (Q)	X	Portable monitoring equipment using velocity units.

Parameter (CPT)	2OST- (Frequency)	Req'd	Comprehensive Test Comments
N	NA	NA	Constant speed induction motor.
ΔP	11.14B (R)	X	Calculated using Pump Discharge Pressure Indicator [2CHS-PI153B] (local) and a temporary suction pressure test gauge, local.
Q	11.14B (R)	X	Summation of flow rates from Flow Indicators [2SIS-FI971, 972, 973], local.
V	11.14B (R)	X	Portable monitoring equipment using velocity units.

BVPS-2 IST PUMP OUTLINE TABLE				
Pump Name: 22A Boric Acid Transfer Pump	**Pump Number:** 2CHS*P22A	**Code Class:** 3	**System:** 7-Chemical and Volume Control	
Function: To provide a solution of soluble boric acid for reactor coolant makeup. The pump also provides boric acid for emergency boration.			**Type:** Centrifugal	**Dwg. OM No.:** 7-2
			Group: A	**Dwg. Coord.:** C-2
Remarks: Pump is tested quarterly (Group A test) at full flow by recirculating the Boric Acid Tank. The biennial Comprehensive test utilizes the same flow path (design point is 75 gpm, accident analysis flow per EM109114 is 71 gpm (required discharge check valve flow)). Also see PRR1, PRR2, and PRR8.				

Parameter (Group A)	2OST- (Frequency)	Req'd	Group A Test 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.

Parameter (CPT)	2OST- (Frequency)	Req'd	Comprehensive Test Comments
N	NA	NA	Constant speed induction motor.
ΔP	7.1 (2YR)	X	Calculated using Pump Discharge Pressure Indicator [2CHS-PI105] (local) and a temporary suction pressure test gauge, local.
Q	7.1 (2YR)	X	Flow Indicator [2CHS-FI123A(B)], local.
V	7.1 (2YR)	X	Portable monitoring equipment using velocity units.

BVPS-2 IST PUMP OUTLINE TABLE				
Pump Name: 22B Boric Acid Transfer Pump	**Pump Number:** 2CHS*P22B	**Code Class:** 3	**System:** 7-Chemical and Volume Control	
Function: To provide a solution of soluble boric acid for reactor coolant makeup. The pump also provides boric acid for emergency boration.			**Type:** Centrifugal	**Dwg. OM No.:** 7-2
			Group: A	**Dwg. Coord.:** F-2
Remarks: Pump is tested quarterly (Group A test) at full flow by recirculating the Boric Acid Tank. The biennial Comprehensive test utilizes the same flow path (design point is 75 gpm, accident analysis flow per EM109114 is 71 gpm (required discharge check valve flow)). Also see PRR1, PRR2, and PRR8.				

Parameter (Group A)	2OST-(Frequency)	Req'd	Group A Test 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.

Parameter (CPT)	2OST-(Frequency)	Req'd	Comprehensive Test Comments
N	NA	NA	Constant speed induction motor.
ΔP	7.2 (2YR)	X	Calculated using Pump Discharge Pressure Indicator [2CHS-PI110] (local) and a temporary suction pressure test gauge, local.
Q	7.2 (2YR)	X	Flow Indicator [2CHS-FI123B(A)], local.
V	7.2 (2YR)	X	Portable monitoring equipment using velocity units.

BVPS-2 IST PUMP OUTLINE TABLE				
Pump Name: 21A Residual Heat Removal Pump	**Pump Number:** 2RHS*P21A	**Code Class:** 2	**System:** 10-Residual Heat Removal	
Function: To remove heat energy from the core and the RCS during plant cool down.			**Type:** Vertically-Mounted Centrifugal	**Dwg. OM No.:** 10-1
			Group: A	**Dwg. Coord.:** B-3
Remarks: Per PRR7, the pump is tested during cold shutdowns and refueling outages at full flow by recirculating the RCS (design point is 4000 gpm, accident analysis flow per Calc. BV2-SET-024 and EM 113379 is 4000 gpm (MOP)). During cold shutdowns and extended outages, the Group A test will occur at least once every 92 days. The Comprehensive test will be performed in lieu of the Group A test at least once during refueling outages. Also see PRR1 and PRR8.				

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

Parameter (CPT)	2OST-(Frequency)	Req'd	Comprehensive Test Comments
N	NA	NA	Constant speed induction motor.
ΔP	10.1 (R)	X	Calculated using a temporary discharge pressure test gauge (local) and a temporary suction pressure test gauge (local).
Q	10.1 (R)	X	Summation of flow rates from Flow Indicators [2RHS-FI607A], [2RHS-FI605A], and [2CHS-FI150], Control Room.
V	10.1 (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 TABLE				
Pump Name: 21B Residual Heat Removal Pump	**Pump Number:** 2RHS*P21B	**Code Class:** 2	**System:** 10-Residual Heat Removal	
Function: To remove heat energy from the core and the RCS during plant cool down.			**Type:** Vertically-Mounted Centrifugal	**Dwg. OM No.:** 10-1
			Group: A	**Dwg. Coord.:** E-3
Remarks: Per PRR7, the pump is tested during cold shutdowns and refueling outages at full flow by recirculating the RCS (design point is 4000 gpm, accident analysis flow per Calc. BV2-SET-024 and EM 113379 is 4000 gpm (MOP)). During cold shutdowns and extended outages, the Group A test will occur at least once every 92 days. The Comprehensive test will be performed in lieu of the Group A test at least once during refueling outages. Also see PRR1.				

Parameter (Group A)	2OST- (Frequency)	Req'd	Group A Test Comments
N	NA	NA	Constant speed induction motor.
ΔP	10.2 (CSD)	X	Calculated using Pump Discharge Pressure Indicator [2RHS-PI602B] and Pump Suction Pressure Indicator [2RHS-PI603B], Control Room.
Q	10.2 (CSD)	X	Summation of flow rates from Flow Indicators [2RHS-FI607B], [2RHS-FI605B], and [2CHS-FI150], Control Room.
V	10.2 (CSD)	X	Portable monitoring equipment using velocity units.

Parameter (CPT)	2OST- (Frequency)	Req'd	Comprehensive Test Comments
N	NA	NA	Constant speed induction motor.
ΔP	10.2 ®	X	Calculated using a temporary discharge pressure test gauge (local) and a temporary suction pressure test gauge (local).
Q	10.2 (R)	X	Summation of flow rates from Flow Indicators [2RHS-FI607B], [2RHS-FI605B], and [2CHS-FI150], Control Room.
V	10.2 ®	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 TABLE**				
Pump Name: 21A Low Head Safety Injection Pump	**Pump Number:** 2SIS*P21A	**Code Class:** 2	**System:** 11-Safety Injection	
Function: To operate primarily during a large break LOCA, in addition to other design basis accidents, in order to provide low head safety injection and recirculation flow to the RCS, and for long term shutdown cooling during post-LOCA conditions. The pump is not utilized during any plant operating evolution and remains in standby during all operating Modes.			**Type:** Centrifugal **Group:** B	**Dwg. OM No.:** 11-1 **Dwg. Coord.:** E-2
Remarks: Pump is tested quarterly (Group B test) on recirculation flow with the RWST. Comprehensive test is performed during refueling outages at full flow to the RCS (design point is 3000 gpm, accident analysis flow per Calc. PS-C-104 is 3615 gpm (required discharge check valve flow)). Also see PRR1 and PRR2.				

Parameter (Group B)	2OST-(Frequency)	Req'd	Group B Test 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].
Q	11.1 (Q)	X	Flow indicator [2SIS-FIS970A], local.
V	NA	NA	Not required during the quarterly Group B test.

Parameter (CPT)	2OST-(Frequency)	Req'd	Comprehensive Test Comments
N	NA	NA	Constant speed induction motor.
ΔP	11.14A ®	X	Calculated using Pump Discharge Pressure Indicator [2SIS-PI943] (local) and a temporary suction pressure test gauge, local.
Q	11.14A ®	X	Flow indicator [2SIS-FI945], Control Room.
V	11.14A ®	X	Portable monitoring equipment using velocity units.

BVPS-2 IST
PUMP OUTLINE TABLE

Pump Name:	**Pump Number:**	**Code Class:**	**System:**
21B Low Head Safety Injection Pump	2SIS*P21B	2	11-Safety Injection

Function: To operate primarily during a large break LOCA, in addition to other design basis accidents, in order to provide low head safety injection and recirculation flow to the RCS, and for long term shutdown cooling during post-LOCA conditions. The pump is not utilized during any plant operating evolution and remains in standby during all operating Modes.	**Type**: Centrifugal	**Dwg. OM No.:** 11-1
	Group: B	**Dwg. Coord.:** G-2

Remarks: Pump is tested quarterly (Group B test) on recirculation flow with the RWST. Comprehensive test is performed during refueling outages at full flow to the RCS (design point is 3000 gpm, accident analysis flow per Calc. PS-C-104 is 3615 gpm (required discharge check valve flow)). Also see PRR1 and PRR2.

Parameter (Group B)	2OST-(Frequency)	Req'd	Group B Test 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].
Q	11.2 (Q)	X	Flow indicator [2SIS-FIS970B], local.
V	NA	NA	Not required during the quarterly Group B test.

Parameter (CPT)	2OST-(Frequency)	Req'd	Comprehensive Test Comments
N	NA	NA	Constant speed induction motor.
ΔP	11.14A ®	X	Calculated using Pump Discharge Pressure Indicator [2SIS-PI944] (local) and a temporary suction pressure test gauge, local.
Q	11.14A ®	X	Flow indicator [2SIS-FI946], Control Room.
V	11.14A ®	X	Portable monitoring equipment using velocity units.

BVPS-2 IST

PUMP OUTLINE TABLE

Pump Name: 21A Quench Spray Pump	**Pump Number:** 2QSS*P21A	**Code Class:** 2	**System:** 13-Containment Depressurization	
Function: To operate only during a loss-of-coolant accident (LOCA) for containment heat removal and pressure suppression, in addition to removing fission products released into the containment atmosphere during a LOCA by the admission of sodium hydroxide to the spray stream. The pump is not utilized during any plant operating evolution and remains in standby during all operating modes.			**Type**: Centrifugal	**Dwg. OM No.:** 13-2
			Group: B	**Dwg. Coord.:** A-9
Remarks: Pump is tested quarterly (Group B test) at full flow by recirculating the RWST. This same flow path is utilized during the performance of the Comprehensive test once every 2 years (design point is 3000 gpm, accident analysis flow per Calc. 12241-US(B)-193-1 is 3000 gpm (MOP)). Also see PRR1.				

Parameter (Group B)	2OST- (Frequency)	Req'd	Group B Test 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	NA	NA	Not required during the quarterly Group B test.

Parameter (CPT)	2OST- (Frequency)	Req'd	Comprehensive Test Comments
N	NA	NA	Constant speed induction motor.
ΔP	13.1 (2YR)	X	Calculated using a temporary discharge pressure test gauge (local) and a temporary suction pressure test gauge (local).
Q	13.1 (2YR)	X	Flow Indicator [2QSS-FIS101A or 102A], local.
V	13.1 (2YR)	X	Portable monitoring equipment using velocity units.

BVPS-2 IST **PUMP OUTLINE TABLE**				
Pump Name: 21B Quench Spray Pump	**Pump Number:** 2QSS*P21B	**Code Class:** 2	**System:** 13-Containment Depressurization	
Function: To operate only during a loss-of-coolant accident (LOCA) for containment heat removal and pressure suppression, in addition to removing fission products released into the containment atmosphere during a LOCA by the admission of sodium hydroxide to the spray stream. The pump is not utilized during any plant operating evolution and remains in standby during all operating modes.			**Type**: Centrifugal **Group:** B	**Dwg. OM No.:** 13-2 **Dwg. Coord.:** G-9
Remarks: Pump is tested quarterly (Group B test) at full flow by recirculating the RWST. This same flow path is utilized during the performance of the Comprehensive test once every 2 years (design point is 3000 gpm, accident analysis flow per Calc. 12241-US(B)-193-1 is 3000 gpm (MOP)). Also see PRR1.				

Parameter (Group B)	2OST-(Frequency)	Req'd	Group B Test 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	NA	NA	Not required during the quarterly Group B test.

Parameter (CPT)	2OST-(Frequency)	Req'd	Comprehensive Test Comments
N	NA	NA	Constant speed induction motor.
ΔP	13.2 (2YR)	X	Calculated using a temporary discharge pressure test gauge (local) and a temporary suction pressure test gauge (local).
Q	13.2 (2YR)	X	Flow Indicator [2QSS-FIS101B or 102B], local.
V	13.2 (2YR)	X	Portable monitoring equipment using velocity units.

BVPS-2 IST

PUMP OUTLINE TABLE

Pump Name:	**Pump Number:**	**Code Class:**	**System:**	
24A Chemical Injection Pump	2QSS*P24A	2	13-Containment Depressurization	
Function: To operate only during a loss-of-coolant accident (LOCA) to provide sodium hydroxide to the Quench Spray System in order to provide iodine removal from the containment atmosphere and to maintain containment sump pH levels. The pump is not utilized during any plant operating evolution and remains in standby during all operating modes.			**Type:** Rotary Positive Displacement	**Dwg. OM No.:** 13-2
			Group: B	**Dwg. Coord.:** C-6
Remarks: Pump is tested quarterly (Group B test) at full flow by recirculating the RWST. This same flow path is utilized during the performance of the Comprehensive test once every 2 years (design point is 55 gpm, accident analysis flow per Calc. 12241-US(B)-124-2 and Calc. 12241-211-N-532-0 is 45 gpm (MOP)). Also see PRR1 and PRR8.				

Parameter (Group B)	2OST-(Frequency)	Req'd	Group B Test Comments
N	NA	NA	Constant speed induction motor.
P	NA	NA	Not required during the quarterly Group B test.
Q	13.10A (Q)	X	Flow Indicator [2QSS-FIS105A], local.
V	NA	NA	Not required during the quarterly Group B test.

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

BVPS-2 IST

PUMP OUTLINE TABLE

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

Function:	**Type:**	**Dwg. OM No.:**
To operate only during a loss-of-coolant accident (LOCA) to provide sodium hydroxide to the Quench Spray System in order to provide iodine removal from the containment atmosphere and to maintain containment sump pH levels. The pump is not utilized during any plant operating evolution and remains in standby during all operating modes.	Rotary Positive Displacement	13-2
	Group:	**Dwg. Coord.:**
	B	E-6

Remarks: Pump is tested quarterly (Group B test) at full flow by recirculating the RWST. This same flow path is utilized during the performance of the Comprehensive test once every 2 years (design point is 55 gpm, accident analysis flow per Calc. 12241-US(B)-124-2 and Calc. 12241-211-N-532-0 is 45 gpm (MOP)). Also see PRR1.

Parameter (Group B)	2OST- (Frequency)	Req'd	Group B Test Comments
N	NA	NA	Constant speed induction motor.
P	NA	NA	Not required during the quarterly Group B test.
Q	13.10B (Q)	X	Flow Indicator [2QSS-FIS105B], local.
V	NA	NA	Not required during the quarterly Group B test.

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

BVPS-2 IST PUMP OUTLINE TABLE				
Pump Name: 21A Recirculation Spray Pump	**Pump Number:** 2RSS*P21A	**Code Class:** 2	**System:** 13-Containment Depressurization	
Function: To operate only during a loss-of-coolant accident (LOCA) for long term containment heat removal and pressure suppression after sufficient inventory has collected in the containment sump to support pump operation. The pump is not utilized during any plant operating evolution and remains in standby during all operating modes.			**Type:** Vertical Line Shaft	**Dwg. OM No.:** 13-1
			Group: B	**Dwg. Coord.:** F-3
Remarks: Per ISTB-3430, "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. This pump is normally tested during refueling outages by filling a temporary dike built around the containment sump area and circulating water through a test loop at full flow (design point is 3500 gpm, accident analysis flow per Calc. 12241-US(B)-190-2 is 3500 gpm (MOP)). In all cases, the Comprehensive test will be performed in lieu of the Group B test at refueling. Also see PRR1.				

Parameter (Group B)	2OST-(Frequency)	Req'd	Group B Test Comments
N	NA	NA	Constant speed induction motor.
ΔP	NA	NA	Comprehensive test will be performed in lieu of the Group B test.
Q	NA	NA	Comprehensive test will be performed in lieu of the Group B test.
V	NA	NA	Not required during the quarterly Group B test.

Parameter (CPT)	2OST-(Frequency)	Req'd	Comprehensive Test Comments
N	NA	NA	Constant speed induction motor.
ΔP	2BVT 1.13.5 (R)	X	Calculated using a temporary discharge pressure test gauge (local) and the calculated suction pressure using the level in the dike as measured by a ruler (local), in accordance with Section 5.5.3 of NUREG-1482, Rev.1.
Q	2BVT 1.13.5 (R)	X	Flow Indicator [2RSS-FI157A], Control Room.
V	2BVT 1.13.5 (R)	X	Portable monitoring equipment using velocity units.

BVPS-2 IST
PUMP OUTLINE TABLE

Pump Name:	**Pump Number:**	**Code Class:**	**System:**	
21B Recirculation Spray Pump	2RSS*P21B	2	13-Containment Depressurization	
Function: To operate only during a loss-of-coolant accident (LOCA) for long term containment heat removal and pressure suppression after sufficient inventory has collected in the containment sump to support pump operation. The pump is not utilized during any plant operating evolution and remains in standby during all operating modes.			**Type:** Vertical Line Shaft	**Dwg. OM No.:** 13-1
			Group: B	**Dwg. Coord.:** E-8
Remarks: Per ISTB-3430, "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. This pump is normally tested during refueling outages by filling a temporary dike built around the containment sump area and circulating water through a test loop at full flow (design point is 3500 gpm, accident analysis flow per Calc. 12241-US(B)-190-2 is 3500 gpm (MOP)). In all cases, the Comprehensive test will be performed in lieu of the Group B test at refueling. Also see PRR1.				

Parameter (Group B)	2OST- (Frequency)	Req'd	Group B Test Comments
N	NA	NA	Constant speed induction motor.
ΔP	NA	NA	Comprehensive test will be performed in lieu of the Group B test.
Q	NA	NA	Comprehensive test will be performed in lieu of the Group B test.
V	NA	NA	Not required during the quarterly Group B test.

Parameter (CPT)	2OST- (Frequency)	Req'd	Comprehensive Test Comments
N	NA	NA	Constant speed induction motor.
ΔP	2BVT 1.13.5 (R)	X	Calculated using a temporary discharge pressure test gauge (local) and the calculated suction pressure using the level in the dike as measured by a ruler (local), in accordance with Section 5.5.3 of NUREG-1482, Rev.1.
Q	2BVT 1.13.5 (R)	X	Flow Indicator [2RSS-FI157B], Control Room.
V	2BVT 1.13.5 (R)	X	Portable monitoring equipment using velocity units.

BVPS-2 IST
PUMP OUTLINE TABLE

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

Function: To operate only during a loss-of-coolant accident (LOCA) for long term containment heat removal and pressure suppression after sufficient inventory has collected in the containment sump to support pump operation. The pump is also required to provide sump inventory to the suction supply of the HHSI Pumps when the RWST level is low. The pump is not utilized during any plant operating evolution and remains in standby during all operating modes.	**Type:** Vertical Line Shaft	**Dwg. OM No.:** 13-1
	Group: B	**Dwg. Coord.:** E-5

Remarks: Per ISTB-3430, "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. This pump is normally tested during refueling outages by filling a temporary dike built around the containment sump area and circulating water through a test loop at full flow (design point is 3500 gpm, accident analysis flow per Calc. 12241-US(B)-190-2 is 3500 gpm (MOP)). In all cases, the Comprehensive test will be performed in lieu of the Group B test at refueling. Also see PRR1.

Parameter (Group B)	2OST- (Frequency)	Req'd	Group B Test Comments
N	NA	NA	Constant speed induction motor.
ΔP	NA	NA	Comprehensive test will be performed in lieu of the Group B test.
Q	NA	NA	Comprehensive test will be performed in lieu of the Group B test.
V	NA	NA	Not required during the quarterly Group B test.

Parameter (CPT)	2OST- (Frequency)	Req'd	Comprehensive Test Comments
N	NA	NA	Constant speed induction motor.
ΔP	2BVT 1.13.5 (R)	X	Calculated using a temporary discharge pressure test gauge (local) and the calculated suction pressure using the level in the dike as measured by a ruler (local), in accordance with Section 5.5.3 of NUREG-1482, Rev.1.
Q	2BVT 1.13.5 (R)	X	Flow Indicator [2RSS-FI157C], Control Room.
V	2BVT 1.13.5 (R)	X	Portable monitoring equipment using velocity units.

BVPS-2 IST PUMP OUTLINE TABLE				
Pump Name: 21D Recirculation Spray Pump	**Pump Number:** 2RSS*P21D	**Code Class:** 2	**System:** 13-Containment Depressurization	
Function: To operate only during a loss-of-coolant accident (LOCA) for long term containment heat removal and pressure suppression after sufficient inventory has collected in the containment sump to support pump operation. The pump is also required to provide sump inventory to the suction supply of the HHSI Pumps when the RWST level is low. The pump is not utilized during any plant operating evolution and remains in standby during all operating modes.			**Type:** Vertical Line Shaft **Group:** B	**Dwg. OM No.:** 13-1 **Dwg. Coord.:** E-6
Remarks: Per ISTB-3430, "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. This pump is normally tested during refueling outages by filling a temporary dike built around the containment sump area and circulating water through a test loop at full flow (design point is 3500 gpm, accident analysis flow per Calc. 12241-US(B)-190-2 is 3500 gpm (MOP)). In all cases, the Comprehensive test will be performed in lieu of the Group B test at refueling. Also see PRR1.				

Parameter (Group B)	2OST-(Frequency)	Req'd	Group B Test Comments
N	NA	NA	Constant speed induction motor.
ΔP	NA	NA	Comprehensive test will be performed in lieu of the Group B test.
Q	NA	NA	Comprehensive test will be performed in lieu of the Group B test.
V	NA	NA	Not required during the quarterly Group B test.

Parameter (CPT)	2OST-(Frequency)	Req'd	Comprehensive Test Comments
N	NA	NA	Constant speed induction motor.
ΔP	2BVT 1.13.5 (R)	X	Calculated using a temporary discharge pressure test gauge (local) and the calculated suction pressure using the level in the dike as measured by a ruler (local), in accordance with Section 5.5.3 of NUREG-1482, Rev.1.
Q	2BVT 1.13.5 (R)	X	Flow Indicator [2RSS-FI157D], Control Room.
V	2BVT 1.13.5 (R)	X	Portable monitoring equipment using velocity units.

BVPS-2 IST **PUMP OUTLINE TABLE**				
Pump Name: 21A Component Cooling Water Pump	**Pump Number:** 2CCP*P21A	**Code Class:** 3	**System:** 15-Primary Component Cooling Water	
Function: To operate continuously during normal plant operation to supply cooling water to reactor plant components and non-essential heat loads as well as cooling water to the RCP motor bearings and thermal barrier. Its safety related function is to provide cooling water for RHR system support.			**Type:** Centrifugal	**Dwg. OM No.:** 15-1
			Group: A	**Dwg. Coord.:** B-4
Remarks: Pump is tested quarterly (Group A test) through various CCP supplied heat exchangers using a pump curve per PRR3. Comprehensive test is performed during refueling outages when additional flow can be directed through the RHR heat exchanger and throttled to full flow conditions (design point is 6000 gpm, accident analysis flow per Calc. 10080-N-740 is 6000 gpm (MOP)). Also see PRR1 and PRR2				

Parameter (Group A)	**2OST-(Frequency)**	**Req'd**	**Group A Test 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.

Parameter (CPT)	**2OST-(Frequency)**	**Req'd**	**Comprehensive Test Comments**
N	NA	NA	Constant speed induction motor.
ΔP	15.1 or 15.5 (R)	X	Calculated using a temporary discharge pressure test gauge (local) and a temporary suction pressure test gauge, local.
Q	15.1 or 15.5 (R)	X	Flow Indicator [2CCP-FI117A1], Control Room.
V	15.1 or 15.5 (R)	X	Portable monitoring equipment using velocity units.

BVPS-2 IST
PUMP OUTLINE TABLE

Pump Name:	**Pump Number:**	**Code Class:**	**System:**	
21B Component Cooling Water Pump	2CCP*P21B	3	15-Primary Component Cooling Water	
Function: To operate continuously during normal plant operation to supply cooling water to reactor plant components and non-essential heat loads as well as cooling water to the RCP motor bearings and thermal barrier. Its safety related function is to provide cooling water for RHR system support.			**Type:** Centrifugal **Group:** A	**Dwg. OM No.:** 15-1 **Dwg. Coord.:** F-4
Remarks: Pump is tested quarterly (Group A test) through various CCP supplied heat exchangers using a pump curve per PRR3. Comprehensive test is performed during refueling outages when additional flow can be directed through the RHR heat exchanger and throttled to full flow conditions (design point is 6000 gpm, accident analysis flow per Calc. 10080-N-740 is 6000 gpm (MOP)). Also see PRR1 and PRR2.				

Parameter (Group A)	2OST- (Frequency)	Req'd	Group A Test 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.

Parameter (CPT)	2OST- (Frequency)	Req'd	Comprehensive Test Comments
N	NA	NA	Constant speed induction motor.
ΔP	15.2 or 15.5 (R)	X	Calculated using a temporary discharge pressure test gauge (local) and a temporary suction pressure test gauge, local.
Q	15.2 or 15.5 (R)	X	Summation of flow rates from Flow Indicators [2CCP-FI117B1], Control Room, [2CCP-FI103] and [2CCP-FI102], local.
V	15.2 or 15.5 (R)	X	Portable monitoring equipment using velocity units.

BVPS-2 IST

PUMP OUTLINE TABLE

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

Function:	**Type:**	**Dwg. OM No.:**
To operate continuously during normal plant operation to supply cooling water to reactor plant components and non-essential heat loads as well as cooling water to the RCP motor bearings and thermal barrier. Its safety related function is to provide cooling water for RHR system support.	Centrifugal	15-1
	Group: A	**Dwg. Coord.:** D-4

Remarks: Pump is tested quarterly (Group A test) through various CCP supplied heat exchangers using a pump curve per PRR3. Comprehensive test is performed during refueling outages when additional flow can be directed through the RHR heat exchanger and throttled to full flow conditions (design point is 6000 gpm, accident analysis flow per Calc. 10080-N-740 is 6000 gpm (MOP)). Also see PRR1 and PRR2.

Parameter (Group A)	2OST- (Frequency)	Req'd	Group A Test 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.

Parameter (CPT)	2OST- (Frequency)	Req'd	Comprehensive Test Comments
N	NA	NA	Constant speed induction motor.
ΔP	15.3 or 15.5 (R)	X	Calculated using a temporary discharge pressure test gauge (local) and a temporary suction pressure test gauge, local.
Q	15.3 or 15.5 (R)	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 or 15.5 (R)	X	Portable monitoring equipment using velocity units.

BVPS-2 IST PUMP OUTLINE TABLE				
Pump Name: Turbine Driven Auxiliary Feedwater Pump	**Pump Number:** 2FWE*P22	**Code Class:** 3	**System:** 24-Auxiliary Feedwater	
Function: To provide emergency makeup to the Steam Generators during loss of normal feedwater following a main turbine trip with a total loss of all electrical power (Station Blackout). The pump is not utilized during any plant operating evolution and remains in standby during all operating modes.			**Type:** Centrifugal **Group:** B	**Dwg. OM No.:** 24-3 **Dwg. Coord.:** E-4
Remarks: Pump is tested quarterly (Group B test), on a staggered test basis with the other AFW Pumps, on recirculation flow with the PPDWST and at full flow (Comprehensive test) from the PPDWST to the Steam Generators when in Mode 3 during shutdown for refueling or during startup from refueling outages (design point is 700 gpm, accident analysis flow per Calc. 10080-N-684-0 is 521.5 gpm (MOP)). Also see PRR1.				

Parameter (Group B)	2OST-(Frequency)	Req'd	Group B Test Comments
N	24.4 (Q)	X	No installed rpm indication. Use portable monitoring equipment – Stroboscope, with speed recorded to within ±1% of the reference point per ISTB-5122(a).
ΔP	24.4 (Q)	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.
V	NA	NA	Not required during the quarterly Group B test.

Parameter (CPT)	2OST-(Frequency)	Req'd	Comprehensive Test Comments
N	24.4A (R)	X	No installed rpm indication. Use portable monitoring equipment - Stroboscope, with speed recorded to within ±1% of the reference point per ISTB-5123(a).
ΔP	24.4A (R)	X	Calculated using Pump Discharge Pressure Indicator [2FWE-PI155] and Pump Suction Pressure Indicator [2FWE-PI156], local.
Q	24.4A (R)	X	Summation of flow to Steam Generators through Flow Indicators [2FWE-FI100A, B and C] (Control Room).
V	24.4A (R)	X	Portable monitoring equipment using velocity units.

BVPS-2 IST PUMP OUTLINE TABLE				
Pump Name: 23A Motor Driven Auxiliary Feedwater Pump	**Pump Number:** 2FWE*P23A	**Code Class:** 3	**System:** 24-Auxiliary Feedwater	
Function: To serve as an emergency source of feedwater supply to the Steam Generators during a loss of normal feedwater, loss of offsite power, secondary side pipe ruptures, or cool down following a steam generator tube rupture. The pump is not normally utilized during any plant operating evolution and normally remains in standby during all operating modes.			**Type:** Centrifugal **Group:** B	**Dwg. OM No.:** 24-3 **Dwg. Coord.:** F-4
Remarks: Pump is tested quarterly (Group B), on a staggered test basis with the other AFW Pumps, on recirculation flow with the PPDWST and at full flow (Comprehensive test) from the PPDWST to the Steam Generators during refueling outages (design point is 350 gpm, accident analysis flow per Calc. 10080-N-684-0 is 319 gpm (MOP)). Also see PRR1, PRR2 and PRR8.				

Parameter (Group B)	2OST-(Frequency)	Req'd	Group B Test 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.
Q	24.2 (Q)	X	Flow Indicator [2FWE-FI155A], local.
V	NA	NA	Not required during the quarterly Group B test.

Parameter (CPT)	2OST-(Frequency)	Req'd	Comprehensive Test Comments
N	NA	NA	Constant speed induction motor.
ΔP	24.6A (R)	X	Calculated using Pump Discharge Pressure Indicator [2FWE-PI155A] and Pump Suction Pressure Indicator [2FWE-PI156A], local.
Q	24.6A (R)	X (PRR2)	Summation of flow to Steam Generators through Flow Indicators [2FWE-FI100A, B and C] (Control Room). See PRR2 for range and accuracy of pump flow indicators [2FWE-FI100A, B and C].
V	24.6A (R)	X	Portable monitoring equipment using velocity units.

BVPS-2 IST

PUMP OUTLINE TABLE

Pump Name:	**Pump Number:**	**Code Class:**	**System:**	
23B Motor Driven Auxiliary Feedwater Pump	2FWE*P23B	3	24-Auxiliary Feedwater	
Function: To serve as an emergency source of feedwater supply to the Steam Generators during a loss of normal feedwater, loss of offsite power, secondary side pipe ruptures, or cool down following a steam generator tube rupture. The pump is not normally utilized during any plant operating evolution and normally remains in standby during all operating modes.			**Type:** Centrifugal **Group:** B	**Dwg. OM No.:** 24-3 **Dwg. Coord.:** G-4
Remarks: Pump is tested quarterly (on a staggered test basis with the other AFW Pumps) on recirculation flow with the PPDWST and at full flow (Comprehensive test) from the PPDWST to the Steam Generators during refueling outages (design point is 350 gpm, accident analysis flow per Calc. 10080-N-684-0 is 319 gpm (MOP)). Also see PRR1 and PRR2.				

Parameter (Group B)	**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.
Q	24.3 (Q)	X	Flow Indicator [2FWE-FI155B], local.
V	NA	NA	Not required during the quarterly Group B test.

Parameter (CPT)	**2OST-(Frequency)**	**Req'd**	**Comprehensive Test Comments**
N	NA	NA	Constant speed induction motor.
ΔP	24.6B (R)	X	Calculated using Pump Discharge Pressure Indicator [2FWE-PI155B] and Pump Suction Pressure Indicator [2FWE-PI156B], local.
Q	24.6B (R)	X (PRR2)	Summation of flow to Steam Generators through Flow Indicators [2FWE-FI100A, B and C] (Control Room). See PRR2 for range and accuracy of pump flow indicators [2FWE-FI100A, B and C].
V	24.6B (R)	X	Portable monitoring equipment using velocity units.

<table>
<tr><th colspan="5">BVPS-2 IST
PUMP OUTLINE TABLE</th></tr>
<tr><td>Pump Name:
21A Service Water Pump</td><td>Pump Number:
2SWS*P21A</td><td>Code Class:
3</td><td colspan="2">System:
30-Service Water</td></tr>
<tr><td colspan="3" rowspan="2">Function: To operate continuously during normal plant operation to provide cooling water for heat removal from power plant auxiliary subsystems. During post accident conditions it provides the heat sink to the following components: at least two recirculation spray coolers, one charging pump lube oil cooler, one control room air-conditioning refrigerant condenser or one control room air-conditioning unit, one emergency diesel generator cooling system heat exchanger, and one safeguards area air-conditioning unit.</td><td>Type:
Vertical Line Shaft</td><td>Dwg. OM No.:
30-1</td></tr>
<tr><td>Group:
A</td><td>Dwg. Coord.:
C-2</td></tr>
<tr><td colspan="5">Remarks: Pump is tested quarterly (Group A test) through various SWS supplied heat exchangers using a pump curve per PRR4. This same flow path is utilized during the performance of the Comprehensive test once every 2 years (design point is 14700 gpm, accident analysis flow per Calc. 10080-N-726-0 is 12720 gpm (MOP)). Also see PRR1, PRR5 and PRR9.</td></tr>
</table>

Parameter (Group A)	2OST- (Frequency)	Req'd	Group A Test Comments
N	NA	NA	Constant speed induction motor.
ΔP	30.2 (Q)	X	Calculated using Pump Discharge Pressure Indicator [2SWS-PI101A] and the calculated suction pressure using river water elevation from Ohio River Level Recorder [LR-1CW-101], local, as permitted by NUREG-1482, Rev. 1, 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.

Parameter (CPT)	2OST- (Frequency)	Req'd	Comprehensive Test Comments
N	NA	NA	Constant speed induction motor.
ΔP	30.2 (2YR)	X (PRR9)	Calculated using Pump Discharge Pressure Indicator [2SWS-PI101A] and the calculated suction pressure using river water elevation from Ohio River Level Recorder [LR-1CW-101], local. Refer to PRR9.
Q	30.2 (2YR)	X	Flow Indicator [2SWS-FIT100], local.
V	30.2 (2YR)	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.

<table>
<tr><td colspan="5">BVPS-2 IST
PUMP OUTLINE TABLE</td></tr>
<tr><td>Pump Name:
21B Service Water Pump</td><td>Pump Number:
2SWS*P21B</td><td>Code Class:
3</td><td colspan="2">System:
30-Service Water</td></tr>
<tr><td colspan="3" rowspan="2">Function: To operate continuously during normal plant operation to provide cooling water for heat removal from power plant auxiliary subsystems. During post accident conditions it provides the heat sink to the following components: at least two recirculation spray coolers, one charging pump lube oil cooler, one control room air-conditioning refrigerant condenser or one control room air-conditioning unit, one emergency diesel generator cooling system heat exchanger, and one safeguards area air-conditioning unit.</td><td>Type:
Vertical Line Shaft</td><td>Dwg. OM No.:
30-1</td></tr>
<tr><td>Group:
A</td><td>Dwg. Coord.:
D-2</td></tr>
<tr><td colspan="5">Remarks: Pump is tested quarterly (Group A test) through various SWS supplied heat exchangers using a pump curve per PRR4. This same flow path is utilized during the performance of the Comprehensive test once every 2 years (design point is 14700 gpm, accident analysis flow per Calc. 10080-N-726-0 is 12720 gpm (MOP)). Also see PRR1, PRR5, PRR8 and PRR9.</td></tr>
</table>

Parameter (Group A)	**2OST-(Frequency)**	**Req'd**	**Group A Test Comments**
N	NA	NA	Constant speed induction motor.
ΔP	30.3 (Q)	X	Calculated using Pump Discharge Pressure Indicator [2SWS-PI101B] and the calculated suction pressure using river water elevation from Ohio River Level Recorder [LR-1CW-101], local, as permitted by NUREG-1482, Rev. 1, 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.

Parameter (CPT)	**2OST-(Frequency)**	**Req'd**	**Comprehensive Test Comments**
N	NA	NA	Constant speed induction motor.
ΔP	30.3 (2YR)	X (PRR9)	Calculated using Pump Discharge Pressure Indicator [2SWS-PI101B] and the calculated suction pressure using river water elevation from Ohio River Level Recorder [LR-1CW-101], local. Refer to PRR9.
Q	30.3 (2YR)	X	Flow Indicator [2SWS-FIT100], local.
V	30.3 (2YR)	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 TABLE

Pump Name:	**Pump Number:**	**Code Class:**	**System:**	
21C Service Water Pump	2SWS*P21C	3	30-Service Water	
Function: To operate continuously during normal plant operation to provide cooling water for heat removal from power plant auxiliary subsystems. During post accident conditions it provides the heat sink to the following components: at least two recirculation spray coolers, one charging pump lube oil cooler, one control room air-conditioning refrigerant condenser or one control room air-conditioning unit, one emergency diesel generator cooling system heat exchanger, and one safeguards area air-conditioning unit.			**Type:** Vertical Line Shaft **Group:** A	**Dwg. OM No.:** 30-1 **Dwg. Coord.:** G-2
Remarks: Pump is tested quarterly (Group A test) through various SWS supplied heat exchangers using a pump curve per PRR4. This same flow path is utilized during the performance of the Comprehensive test once every 2 years (design point is 14700 gpm, accident analysis flow per Calc. 10080-N-726-0 is 12720 gpm (MOP)). Also see PRR1, PRR5 and PRR9.				

Parameter (Group A)	2OST- (Frequency)	Req'd	Group A Test Comments
N	NA	NA	Constant speed induction motor.
ΔP	30.6A or 6B (Q)	X	Calculated using Pump Discharge Pressure Indicator [2SWS-PI101C] and the calculated suction pressure using river water elevation from Ohio River Level Recorder [LR-1CW-101], local, as permitted by NUREG-1482, Rev. 1, Section 5.5.3, "Use of Tank or Bay Level to Calculate Differential Pressure".
Q	30.6A or 6B (Q)	X	Flow Indicator [2SWS-FIT100(S)], local.
V	30.6A or 6B (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.

Parameter (CPT)	2OST- (Frequency)	Req'd	Comprehensive Test Comments
N	NA	NA	Constant speed induction motor.
ΔP	30.6A or 6B (2YR)	X (PRR9)	Calculated using Pump Discharge Pressure Indicator [2SWS-PI101C] and the calculated suction pressure using river water elevation from Ohio River Level Recorder [LR-1CW-101], local. Refer to PRR9.
Q	30. 6A or 6B (2YR)	X	Flow Indicator [2SWS-FIT100(S)], local.
V	30. 6A or 6B (2YR)	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 TABLE**				
Pump Name: 21A Fuel Oil Transfer Pump	**Pump Number:** 2EGF*P21A	**Code Class:** 3	**System:** 36-Diesel Fuel Oil	
Function: To operate only during emergency diesel generator operation to replenish day tank inventory. The pump is not utilized during any plant operating evolution and remains in standby during all operating Modes.			**Type:** Vertical Line Shaft	**Dwg. OM No.:** 36-1
			Group: B	**Dwg. Coord.:** F-3
Remarks: Pump is normally tested bi-monthly (Group B test) at full flow from the fuel oil storage tank to the day tank. This same flow path is utilized during the performance of the Comprehensive test once every 2 years (design point is 40 gpm, accident analysis flow per Calc. 12241-MT-224 (Rev.2) is 15.8 gpm (MOP)). Also see PRR1, PRR2, PRR6 and PRR8.				

Parameter (Group B)	2OST- (Frequency)	Req'd	Group B Test Comments
N	NA	NA	Constant speed induction motor.
ΔP	36.1 (Q)	X (PRR2)	Calculated using Pump Discharge Pressure Indicator [2EGF-PI201A] (local) and the calculated suction pressure using Fuel Oil Storage Tank level from [2EGF-LIS201A], local, as permitted by NUREG-1482, Rev.1,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 flow rate per PRR6.
V	NA	NA	Not required during the quarterly Group B test..

Parameter (CPT)	2OST- (Frequency)	Req'd	Comprehensive Test Comments
N	NA	NA	Constant speed induction motor.
ΔP	36.1 (2YR)	X	Calculated using a temporary discharge pressure test gauge, local, and the calculated suction pressure using Fuel Oil Storage Tank level from [2EGF-LIS201A], local, as permitted by NUREG-1482, Rev.1, Section 5.5.3, "Use of Tank or Bay Level to Calculate Differential Pressure."
Q	36.1 (2YR)	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 flow rate per PRR6.
V	36.1 (2YR)	X	Portable monitoring equipment using velocity units.

BVPS-2 IST

PUMP OUTLINE TABLE

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

Function:	**Type:**	**Dwg. OM No.:**
To operate only during emergency diesel generator operation to replenish day tank inventory. The pump is not utilized during any plant operating evolution and remains in standby during all operating Modes.	Vertical Line Shaft	36-1
	Group:	**Dwg. Coord.:**
	B	E-3

Remarks: Pump is normally tested bi-monthly (Group B test) at full flow from the fuel oil storage tank to the day tank. The same test configuration is used during the performance of the biennial Comprehensive test (design point is 40 gpm, accident analysis flow per Calc. 12241-MT-224 (Rev.2) is 15.8 gpm (MOP)). Also see PRR1, PRR2, PRR6 and PRR8.

Parameter (Group B)	2OST- (Frequency)	Req'd	Group B Test Comments
N	NA	NA	Constant speed induction motor.
ΔP	36.1 (Q)	X (PRR2)	Calculated using Pump Discharge Pressure Indicator [2EGF-PI201B] (local) and the calculated suction pressure using Fuel Oil Storage Tank level from [2EGF-LIS201A], local, as permitted by NUREG-1482, Rev.1,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 flow rate per PRR6.
V	NA	NA	Not required during the quarterly Group B test..

Parameter (CPT)	2OST- (Frequency)	Req'd	Comprehensive Test Comments
N	NA	NA	Constant speed induction motor.
ΔP	36.1 (2YR)	X	Calculated using a temporary discharge pressure test gauge, local, and the calculated suction pressure using Fuel Oil Storage Tank level from [2EGF-LIS201A], local, as permitted by NUREG-1482, Rev.1, Section 5.5.3, "Use of Tank or Bay Level to Calculate Differential Pressure."
Q	36.1 (2YR)	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 flow rate per PRR6.
V	36.1 (2YR)	X	Portable monitoring equipment using velocity units.

BVPS-2 IST

PUMP OUTLINE TABLE

Pump Name:	**Pump Number:**	**Code Class:**	**System:**	
21C Fuel Oil Transfer Pump	2EGF*P21C	3	36-Diesel Fuel Oil	
Function: To operate only during emergency diesel generator operation to replenish day tank inventory. The pump is not utilized during any plant operating evolution and remains in standby during all operating Modes.			**Type:** Vertical Line Shaft	**Dwg. OM No.:** 36-1
			Group: B	**Dwg. Coord.:** F-8
Remarks: Pump is normally tested bi-monthly (Group B test) at full flow from the fuel oil storage tank to the day tank. The same test configuration is used during the performance of the biennial Comprehensive test (design point is 40 gpm, accident analysis flow per Calc. 12241-MT-224 (Rev.2) is 15.8 gpm (MOP)). Also see PRR1, PRR2, PRR6 and PRR8.				

Parameter (Group B)	2OST-(Frequency)	Req'd	Group B Test Comments
N	NA	NA	Constant speed induction motor.
ΔP	36.2 (Q)	X (PRR2)	Calculated using Pump Discharge Pressure Indicator [2EGF-PI201C] (local) and the calculated suction pressure using Fuel Oil Storage Tank level from [2EGF-LIS201B], local, as permitted by NUREG-1482, Rev.1,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 flow rate per PRR6.
V	NA	NA	Not required during the quarterly Group B test..

Parameter (CPT)	2OST-(Frequency)	Req'd	Comprehensive Test Comments
N	NA	NA	Constant speed induction motor.
ΔP	36.2 (2YR)	X	Calculated using a temporary discharge pressure test gauge, local, and the calculated suction pressure using Fuel Oil Storage Tank level from [2EGF-LIS201B], local, as permitted by NUREG-1482, Rev.1, Section 5.5.3, "Use of Tank or Bay Level to Calculate Differential Pressure."
Q	36.2 (2YR)	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 flow rate per PRR6.
V	36.2 (2YR)	X	Portable monitoring equipment using velocity units.

BVPS-2 IST PUMP OUTLINE TABLE				
Pump Name: 21D Fuel Oil Transfer Pump	**Pump Number:** 2EGF*P21D	**Code Class:** 3	**System:** 36-Diesel Fuel Oil	
Function: To operate only during emergency diesel generator operation to replenish day tank inventory. The pump is not utilized during any plant operating evolution and remains in standby during all operating Modes.			**Type:** Vertical Line Shaft	**Dwg. OM No.:** 36-1
			Group: B	**Dwg. Coord.:** E-8
Remarks: Pump is normally tested bi-monthly (Group B test) at full flow from the fuel oil storage tank to the day tank. The same test configuration is used during the performance of the biennial Comprehensive test (design point is 40 gpm, accident analysis flow per Calc. 12241-MT-224 (Rev.2) is 15.8 gpm (MOP)). Also see PRR1, PRR2, PRR6 and PRR8.				

Parameter (Group B)	**2OST- (Frequency)**	**Req'd**	**Group B Test Comments**
N	NA	NA	Constant speed induction motor.
ΔP	36.2 (Q)	X (PRR2)	Calculated using Pump Discharge Pressure Indicator [2EGF-PI201D] (local) and the calculated suction pressure using Fuel Oil Storage Tank level from [2EGF-LIS201B], local, as permitted by NUREG-1482, Rev.1,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 flow rate per PRR6.
V	NA	NA	Not required during the quarterly Group B test..

Parameter (CPT)	**2OST- (Frequency)**	**Req'd**	**Comprehensive Test Comments**
N	NA	NA	Constant speed induction motor.
ΔP	36.2 (2YR)	X	Calculated using a temporary discharge pressure test gauge, local, and the calculated suction pressure using Fuel Oil Storage Tank level from [2EGF-LIS201B], local, as permitted by NUREG-1482, Rev.1, Section 5.5.3, "Use of Tank or Bay Level to Calculate Differential Pressure."
Q	36.2 (2YR)	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 flow rate per PRR6.
V	36.2 (2YR)	X	Portable monitoring equipment using velocity units.

SECTION III: PUMP RELIEF REQUESTS

PUMP RELIEF REQUEST 1

Proposed Alternative In Accordance with 10CFR50.55a(a)(3)(i)

On the basis that the proposed alternative provides an acceptable level of quality and safety.

ASME Code Component(s) Affected: The Code Class 2 and 3 pumps listed in the Pump Outline Tables included in Section II of the IST Program, (Issue 3, Rev. 0)

Component/System Function: As listed in the Pump Outline Tables included in Section II of the IST Program (Issue 3, Rev. 0) for all the Code Class 2 and 3 pumps.

Applicable Code Edition and Addenda: ASME OM Code-2001 Edition, with Addenda through OMb-2003.

Applicable Code Requirement(s): ISTB-6200, "Corrective Action", Paragraph ISTB-6200(a), "Alert Range", states, "If the measured test parameter values fall within the alert range of Table ISTB-5100-1, Table ISTB-5200-1, ISTB-5300-1, or ISTB-5300-2, as applicable, the frequency of testing specified in ISTB-3400 shall be doubled until the cause of the deviation is determined and the condition is corrected."

Reason for Request: ASME OM Code paragraph ISTB-6200(c), "New Reference Values", states, "In cases where the pump's test parameters are within either the alert or required action ranges of Table ISTB-5100-1, Table ISTB-5200-1, ISTB-5300-1, or ISTB-5300-2, as applicable, and the pump's continued use at the changed values is supported by analysis, a new set of reference values may be established. This analysis shall include verification of the pumps operational readiness. The analysis shall include both a pump level and system 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 the analysis shall be documented in the record of tests."

The reason for testing a pump on a doubled frequency, per ISTB-6200(a), when test parameters fall in the alert range is to obtain additional information so that the condition of the pump may be determined. Additional information may already exist to support an analysis demonstrating pump operational readiness and its continued use at the parameters acquired during the test in lieu of placing the pump on a doubled frequency as required by ISTB-6200(a). Additionally, for pumps that can only be tested during shutdowns, compliance to ISTB-6200(a) would require a plant shutdown to facilitate testing at a doubled frequency. Therefore, the proposed alternative is requested because placing a pump on a doubled test frequency as required by ISTB-6200(a) may be unnecessary based on analysis of available information per ISTB-6200(c), and could unnecessarily require a plant shutdown to facilitate testing.

PUMP RELIEF REQUEST 1

Proposed Alternative and Basis for Use: (Cont.)

In lieu of the double frequency test requirements specified in ISTB-6200(a) an evaluation and analysis shall be performed per the guidelines provided in ISTB-6200(c). FENOC proposes to use the provisions of ISTB-6200(c), for measured parameters associated with all pumps in the IST Program. All available data acquired during previous inservice tests, in addition to spectral vibration data will be evaluated each time a pump enters the alert range. As part of the BVPS Unit No. 2 Predictive Maintenance Program, spectral analysis may be used to assist in determining the mechanical condition of a pump. 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. Also, a significant amount of historical trended data associated with hydraulic parameters exists which could be used to support an analysis demonstrating pump operational readiness and its continued use at the parameters acquired during the test.

If the evaluation, per the guidelines specified in ISTB-6200(c), supports an analysis which demonstrates pump operational readiness and continued use then the frequency of testing will not be doubled. However, a condition report will be initiated when the pump parameter enters the alert range to document the evaluation and analysis, determine the cause of the deviation, and to track the condition of the pump. If the results of the evaluation and analysis are inconclusive or do not demonstrate pump operational readiness then the test frequency shall be doubled until the cause of the deviation is determined and the condition corrected. Testing at a doubled frequency will be scheduled immediately following the "Alert Range" condition of the pump and will not be removed from the schedule until an evaluation and analysis has been performed that provides verification of pump operational readiness or the pump returns to acceptable operation. When applying this proposed alternative and the requirements of ISTB-6200(c), to avoid stair-stepping to failure, a new set of reference values may only be obtained once prior to performing corrective maintenance. For pumps that can only be tested during shutdowns, testing will be performed at the next available opportunity if the results of the evaluation and analysis are inconclusive or do not demonstrate operational readiness. The plant will not shutdown to facilitate testing at a doubled frequency. This proposed alternative will minimize the potential of testing a pump at a doubled frequency when its operational readiness and continued use are supported by conclusive analyses.

Using the provisions of this relief request as an alternative to the requirements of ISTB-6200(a) will ensure pump operational readiness and provides an acceptable level of quality and safety.

Duration of Proposed Alternative:

The proposed alternative identified in this relief request shall be utilized during the Third Ten-Year Inservice Test Interval.

PUMP RELIEF REQUEST 1

Precedents:

A similar request was approved for the Beaver Valley Power Station, Unit No. 2 Second Ten-Year Inservice Test Interval. The NRC letter authorizing the similar alternative is referenced below.

Beaver Valley Power Station, Unit No. 2, Docket No. 50-412, Safety Evaluation of Relief Request PRR1 for the Second Ten-Year Interval for Pumps and Valves Inservice Testing Program, Dated November 18, 1997 (TAC No. M98909)

References:

ISTB-6200, "Corrective Action"

Table ISTB-5100-1, "Centrifugal Pump Test Acceptance Criteria"

Table ISTB-5200-1, "Vertical Line Shaft and Centrifugal Pumps Test Acceptance Criteria"

Table ISTB-5300-1, "Positive Displacement Pump (Except Reciprocating) Test Acceptance Criteria"

Table ISTB-5300-2, "Reciprocating Positive Displacement Pump Test Acceptance Criteria"

PUMP RELIEF REQUEST 2

Proposed Alternative In Accordance with 10CFR50.55a(a)(3)(i)

On the basis that the proposed alternative provides an acceptable level of quality and safety.

ASME Code Component(s) Affected: Various Code Class 2 and 3 pumps in the Inservice Test (IST) Program. See the attached Table for affected Code Class 2 and 3 pumps in the IST Program.

Component/System Function: As listed in the Pump Outline Tables included in Section II of the IST Program (Issue 3, Rev. 0) for the Code Class 2 and 3 pumps affected in the attached table.

Applicable Code Edition and Addenda: ASME OM Code-2001 Edition, with Addenda through OMb-2003.

Applicable Code Requirement(s): ISTB-3510(b)(1), "Range", states, "The full-scale for each analog instrument shall not be greater than three times the reference value."

Reason for Request: The pumps listed on the attached table use instruments which do not meet the requirements of ISTB-3510(b)(1), however, the accuracy of the instruments used is more conservative than the requirements of ISTB-3510(a), "Accuracy" and Table ISTB-3500-1 "Required Instrument Accuracy" for Group A and Group B tests and Comprehensive tests. 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 ISTB-3510(b)(1) and Table ISTB-3500-1.

Proposed Alternative and Basis for Use: 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 ISTB-3510. NUREG-1482, Rev.1, Section 5.5.1, "Range and Accuracy of Analog Instruments", states; When the range of a permanently installed analog instrument is greater than three times the reference value, but the accuracy of the instrument is more conservative than that required by the Code, the staff may grant relief when the combination of the range and accuracy yields a reading that is as at least equivalent to that achieved using instruments that meet the Code requirements (i.e., up to ±6 percent for Group A and B tests, and ±1.5 percent for pressure and differential pressure instruments for Preservice and Comprehensive tests). The instruments identified on the attached Table satisfy the guidance provided in NUREG-1482, Rev.1, Section 5.5.1. Additional basis for use and the applicable test type are also provided with the attached Table.

Using the provisions of this relief request as an alternative to the requirements of ISTB-3510(b)(1) provides an acceptable level of quality and safety since their use yields a reading that is as at least equivalent to that achieved using instruments that meet the Code requirements as described in NUREG-1482, Rev.1, Section 5.5.1.

PUMP RELIEF REQUEST 2

Duration of Proposed Alternatives:	The proposed alternative identified in this relief request shall be utilized during the Third Ten-Year Inservice Test Interval.
Precedents:	A similar request was approved for the Beaver Valley Power Station, Unit No. 2 Second Ten-Year Inservice Test Interval. The NRC letter authorizing the similar alternative is referenced below. Beaver Valley Power Station, Unit No. 2, Docket No. 50-412, Safety Evaluation of Relief Request PRR2 for the Second Ten-Year Interval for Pumps and Valves Inservice Testing Program, Dated November 18, 1997 (TAC No. M98909)
References:	ISTB-3510 "Data Collection – General" NUREG-1482, Rev.1, Section 5.5.1 "Range and Accuracy of Analog Instruments"

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.	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 approximately 20 to 25% of the range or approximately30 to 40 psig. With a calibrated accuracy of 0.5%, this results in a reading more accurate than Code requirements. The use of these pressure instruments is applicable to Group A tests only since the combination of range and accuracy yields a reading of ±2.6 percent which is less than the ±6 percent required by the Code for the Group A test. During Comprehensive testing, temporary pressure instrumentation will be used having a calibrated accuracy of at least ±0.5 percent of full scale with a sufficient range to satisfy the ±1.5 percent required by the Code for the Comprehensive test.
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 approximately 10-15% of the range or approximately 3 to 5 psig. With a calibrated accuracy of 0.5%, this results in a reading more accurate than Code requirements. The use of these pressure instruments is applicable to Group A tests only since the combination of range and accuracy yields a reading of approximately ±3.0 percent to ±5.0 percent which is less than the ±6 percent required by the Code for the Group A test. During Comprehensive testing, temporary pressure instrumentation will be used having a calibrated accuracy of at lease ±0.5 percent of full scale with sufficient range to satisfy the ±1.5 percent required by the Code for the Comprehensive test.
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.	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 approximately 20% of the range or 32 psig. With a calibrated accuracy is 0.5%, this results in a reading more accurate than Code requirements. The use of these pressure instruments is applicable to Group B tests only since the combination of range and accuracy yields a reading of approx. ±2.5 percent which is less than the ±6 percent required by the Code for the Group B test. During Comprehensive testing, temporary pressure instrumentation will be used having a calibrated accuracy of at lease ±0.5 percent of full scale with sufficient range to satisfy the ±1.5 percent required by the Code for the Comprehensive test.

PUMP RELIEF REQUEST 2

IST PUMP INSTRUMENTATION			
Pump ID#	**Instrument ID#**	**Condition Requiring Relief**	**Basis for Relief/Alternate Test**
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 requested by Pump Relief Request No. 3. The suction pressures vary between 27-32% of the range or 16 to 19 psig. With a calibrated accuracy of 0.5%, this results in a reading more accurate than Code requirements.. The use of these pressure instruments is applicable to Group A tests only since the combination of range and accuracy yields a reading of approx. ± 1.57 to ± 1.87 percent which is less than the ±6 percent required by the Code for the Group A test. During Comprehensive testing, temporary pressure instrumentation will be used having a calibrated accuracy of at lease ±0.5 percent of full scale with sufficient range to satisfy the ±1.5 percent required by the Code for the Comprehensive test. In an instance where the combination of range and accuracy yields a reading of ±1.5 percent, as required for the Comprehensive test, temporary test pressure gauges may not be installed.
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 9.5 and 10.5 psig, slightly below 1/3 of the range. With a calibrated accuracy of 1.0%, this results in a reading more accurate than Code requirements. The use of these pressure instruments is applicable to Group B tests only since the combination of range and accuracy yields a reading of approx. ±2.85 percent to ±3.15 percent which is less than the ±6 percent required by the Code for the Group B test. During Comprehensive testing, temporary pressure instrumentation will be used having a calibrated accuracy of at lease ±0.5 percent of full scale with sufficient range to satisfy the ±1.5 percent required by the Code for the Comprehensive test.
2FWE*P23A 2FWE*P23B	2FWE-FI100A 2FWE-FI100B 2FWE-FI100C	The range of the gauges is greater than three times the reference flow for the Motor-Driven AFW Pumps.	These flow indicators are in the three lines to the S/Gs from the AFW Pumps. The flow indicators are sized to measure accident flow from the Turbine-Driven AFW Pump as well as the Motor-Driven Pumps, with a range of 0-400 gpm. The reference value for the Motor-Driven Pumps, full-flow test is approx. 115 gpm, 28.5% of the range. The calibration accuracy of the flow meters is 1.5%, which would yield a reading more accurate than Code requirements. These flow instruments will be used during both the Group B tests and Comprehensive tests since the combination of range and accuracy yields a reading of ±5.21 percent which is less than the ±6 percent required by Code.

PUMP RELIEF REQUEST 3

Proposed Alternative In Accordance with 10CFR50.55a(f)(5)(iii)

On the basis that compliance with the ASME Code requirement is impractical.

ASME Code Component(s) Affected:

2CCP*P21A, Component Cooling Water Pump (Class 3)

2CCP*P21B, Component Cooling Water Pump (Class 3)

2CCP*P21C, Component Cooling Water Pump (Class 3)

Component/System Function:

The Component Cooling Water Pumps circulate cooling water through various reactor plant components during normal operation, and through the Residual Heat Removal (RHR) Heat Exchangers following an accident in order to achieve and maintain the plant in a cold shutdown condition. Component Cooling Water flow is also provided to the RHR pumps' seal water coolers to support long term pump operation.

Applicable Code Edition and Addenda:

ASME OM Code-2001, with Addenda through OMb-2003.

Applicable Code Requirement(s):

ISTB-5121, "Group A Test Procedure", states: "Group A tests shall be conducted with the pump operating at a specific reference point." ISTB-5121(b) states: "The resistance of the system shall be varied until the flow rate equals the reference point. The differential pressure shall then be determined and compared to its reference value. Alternatively, the flow rate can be varied until the differential pressure equals the reference point and the flow rate shall be determined and compared to the reference flow rate value."

ISTB-5123, "Comprehensive Test Procedure", states: "Comprehensive tests shall be conducted with the pump operating at a specific reference point." ISTB-5123(b) states: "For centrifugal pumps the resistance of the system shall be varied until the flow rate equals the reference point. The differential pressure shall then be determined and compared to its reference value. Alternatively, the flow rate can be varied until the differential pressure equals the reference point and the flow rate shall be determined and compared to the reference flow rate value."

Reason for Request:

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.

PUMP RELIEF REQUEST 3

Reason for Request: (Cont.)

In order to increase flow to a reference value during cold winter months, the throttled manual valves at the discharge of the RHR Heat Exchangers would require additional throttling in the open direction. These valves are located in the reactor containment building, which would require personnel to make a containment entry to facilitate valve manipulation. Since the radiation levels and air temperature inside containment are higher than normal during power operation, this would involve higher radiological dose rates and heat stress risk to plant personnel. This presents a working environment for station personnel that is not considered practicable for surveillance testing on a routine basis on-line. Surveillance testing that requires reactor containment entry is performed at refueling.

In order to throttle flow to a reference value during warm summer months, a manual valve at the discharge of the pumps would need to be used since the RHR Heat Exchanger discharge 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 heat up of the Reactor Coolant Pumps to near required manual pump trip set points 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.

Proposed Alternative and Basis for Use:

A pump curve (developed per the guidelines provided in NUREG-1482, Rev.1, Section 5.2.2, " Reference Curves") will be used to compare flow rate with developed pump head at the flow conditions dictated by plant seasonal heat load requirements per 2OST-15.1, 2OST-15.2 and 2OST-15.3 (Primary Component Cooling Water Pump Tests) during each quarterly Group A test and per 2OST-15.1, 2OST-15.2 and 2OST-15.3 (Primary Component Cooling Water Pump Tests) or 2OST-15.5 (Primary Component Cooling Water Pump Refueling Test) during the biennial Comprehensive test. Since normal flow varies, 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.

ISTB-3320, "Establishment of 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. The proposed alternative to use a pump curve provides a reasonable alternative in trending pump performance and degradation to that required by the Code. Flow will be permitted to vary as system conditions require. Differential pressure will be calculated and converted to a developed head for the ranges included in Table ISTB-5100-1.

Using the provisions of this relief request as an alternative to the requirements of ISTB-5121(b) and ISTB-5123(b) provides a reasonable alternative to the Code requirements and assurance that the pumps are operationally ready.

PUMP RELIEF REQUEST 3

Duration of Proposed Alternative: The proposed alternative identified in this relief request shall be utilized during the Third Ten-Year Inservice Test Interval.

Precedents: Similar requests were approved for the Beaver Valley Power Station, Unit No. 2 Second Ten-Year Inservice Test Interval. NRC letters authorizing the similar alternatives are referenced below.

Beaver Valley Power Station, Unit No. 2, Docket No. 50-412, Safety Evaluation of Relief Request PRR3 for the Second Ten-Year Interval for Pumps and Valves Inservice Testing Program, Dated November 18, 1997 (TAC No. M98909).

Beaver Valley Power Station, Unit No. 2, Docket No. 50-412, Safety Evaluation of Inservice Testing (IST) Relief Requests PRR3 and PRR7 for Second Ten-Year Interval IST, Dated February 24, 2006 (TAC No. MC5901, MC5902, and MC5903).

References:

ISTB-5121, “Group A Test Procedure”

ISTB-5123, “Comprehensive Test Procedure”

ISTB-3320, "Establishment of Additional Set of Reference Values"

NUREG-1482, Rev.1, Section 5.2.2, " Reference Curves”

PUMP RELIEF REQUEST 4

Proposed Alternative in Accordance with 10CFR50.55a(f)(5)(iii)

On the basis that compliance with the ASME Code requirement is impractical.

ASME Code Component(s) Affected:

2SWS*P21A, Service Water Pump (Class 3)

2SWS*P21B, Service Water Pump (Class 3

2SWS*P21C, Service Water Pump (Class 3)

Component/System Function:

The Service Water Pumps operate continuously during normal plant operation to provide cooling water for heat removal from power plant auxiliary subsystems. During post accident conditions they provide the heat sink to the following components: at least two recirculation spray coolers, one charging pump lube oil cooler, one control room air-conditioning refrigerant condenser or one control room air-conditioning unit, one emergency diesel generator cooling system heat exchanger, and one safeguards area air-conditioning unit.

Applicable Code Edition and Addenda:

ASME OM Code-2001, with Addenda through OMb-2003.

Applicable Code Requirement(s):

ISTB-5121, "Group A Test Procedure", states: "Group A tests shall be conducted with the pump operating at a specific reference point." ISTB-5121(b) states: "The resistance of the system shall be varied until the flow rate equals the reference point. The differential pressure shall then be determined and compared to its reference value. Alternatively, the flow rate can be varied until the differential pressure equals the reference point and the flow rate shall be determined and compared to the reference flow rate value."

ISTB-5123, "Comprehensive Test Procedure", states: "Comprehensive tests shall be conducted with the pump operating at a specific reference point." ISTB-5123(b) states: "For centrifugal pumps the resistance of the system shall be varied until the flow rate equals the reference point. The differential pressure shall then be determined and compared to its reference value. Alternatively, the flow rate can be varied until the differential pressure equals the reference point and the flow rate shall be determined and compared to the reference flow rate value."

Reason for Request:

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 flow rate 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

PUMP RELIEF REQUEST 4

Reason for Request: (Cont.)

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.

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 the following 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 that can cause reactor containment temperature to exceed the technical specification limit.

Proposed Alternative and Basis for Use:

A pump curve (developed per the guidelines provided in NUREG-1482, Rev.1, Section 5.2.2, " Reference Curves") will be used to compare flow rate with developed pump head at the flow conditions dictated by plant seasonal heat load requirements per 2OST-30.2, 2OST-30.3 and 2OST-30.6A or 6B (Service Water Pump Tests) during each quarterly Group A test and biennial Comprehensive test. Since normal flow varies, 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.

ISTB-3320, "Establishment of 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, required to use a pump curve, which provides a reasonable alternative in trending pump performance and degradation to that required by the Code. Flow will be permitted to vary as system conditions require. Differential pressure will be calculated and converted to a developed head for the ranges included in Table ISTB-5100-1.

During the winter and summer months the appropriate pump curve shall be used accordingly using the provisions of this relief request as an alternative to the requirements of ISTB-5121(b) and ISTB-5123(b) and will provide a reasonable alternative to the Code requirements and assurance that the pumps are operationally ready.

PUMP RELIEF REQUEST 4

Duration of Proposed Alternative: The proposed alternative identified in this relief request shall be utilized during the Third Ten-Year Inservice Test Interval.

Precedents: Request PRR4 is similar to the request approved for the Beaver Valley Power Station Unit No. 2 Second Ten-Year Inservice Test Interval, but was revised to allow the use of a winter or summer pump curve for the service water pumps depending on the river water temperature at the time of the test. The winter and summer pump curves are used to address changes in pump performance (from changes in thermal expansion of internal components) due to changes from warm (summer) to cold (winter) river water temperatures. The NRC letter authorizing the similar alternative is referenced below.

Beaver Valley Power Station, Unit No. 2, Docket No. 50-412, Safety Evaluation of Relief Request PRR4 for the Second Ten-Year Interval for Pumps and Valves Inservice Testing Program, Dated November 18, 1997 (TAC No. M98909)

References:

ISTB-5121, “Group A Test Procedure”

ISTB-5123, “Comprehensive Test Procedure”

ISTB-3320, "Establishment of Additional Set of Reference Values"

NUREG-1482, Rev.1, Section 5.2.2, " Reference Curves”

PUMP RELIEF REQUEST 5

Proposed Alternative in Accordance with 10CFR50.55a(a)(3)(ii)

On the basis that compliance with the ASME Code results in Hardship or Unusual Difficulty without a Compensating Increase in the Level of Quality or Safety.

ASME Code Component(s) Affected:

2SWS*P21A, Service Water Pump (Class 3)

2SWS*P21B, Service Water Pump (Class 3

2SWS*P21C, Service Water Pump (Class 3)

Component/System Function:

The Service Water Pumps operate continuously during normal plant operation to provide cooling water for heat removal from power plant auxiliary subsystems. During post accident conditions they provide the heat sink to the following components: at least two recirculation spray coolers, one charging pump lube oil cooler, one control room air-conditioning refrigerant condenser or one control room air-conditioning unit, one emergency diesel generator cooling system heat exchanger, and one safeguards area air-conditioning unit.

Applicable Code Edition and Addenda:

ASME OM Code-2001, with Addenda through OMb-2003.

Applicable Code Requirement(s):

ISTB-3540(b), "Vibration", states: "On vertical line shaft pumps, measurements shall be taken on the upper motor-bearing housing in three approximately orthogonal directions, one of which is the axial direction."

Reason for Request:

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.

Proposed Alternative and Basis for Use:

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) during each quarterly Group A test and biennial Comprehensive test per 2OST-30.2, 2OST-30.3 and 2OST-30.6A or 6B (Service Water Pump Tests).

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.

PUMP RELIEF REQUEST 5

Proposed Alternative and Basis for Use: (Cont.)

It would be a hardship without a compensating increase in safety to modify these pumps to measure axial vibration on the upper motor bearing housing given that the proposed alternative will be taking vibration measurements in three orthogonal directions at the lower motor bearing housing, and two orthogonal directions, which are non-axial, at the upper motor bearing housing. The proposed locations for taking vibration measurements should not be subject to dampening effects of non-rigid structural contact that could mask potential degradation. In recognition of inherent deficiencies in the vibration testing for vertical line shaft pumps, hydraulic performance requirements are more stringent for vertical line shaft pumps than for horizontal centrifugal pumps. Therefore, the proposed alternative locations for taking vibration measurements would provide reasonable assurance of operational readiness.

Using the provisions of this relief request as an alternative to the requirements of ISTB-3450(b) will ensure pump operational readiness and provides an acceptable level of quality and safety.

Duration of Proposed Alternatives:

The proposed alternative identified in this relief request shall be utilized during the Third Ten-Year Inservice Test Interval.

Precedents:

A similar request was approved for the Beaver Valley Power Station, Unit No. 2 Second Ten-Year Inservice Test Interval. The NRC letter authorizing the similar alternative is referenced below.

Beaver Valley Power Station, Unit No. 2, Docket No. 50-412, Safety Evaluation of Relief Request PRR5 for the Second Ten-Year Interval for Pumps and Valves Inservice Testing Program, Dated November 18, 1997, (TAC No. M98909)

References:

ISTB-3540(b), "Vibration"

PUMP RELIEF REQUEST 6

Proposed Alternative In Accordance with 10CFR50.55a(a)(3)(i)

On the basis that the proposed alternative provides an acceptable level of quality and safety.

ASME Code Component(s) Affected:

2EGF*P21A, Diesel Fuel Oil Transfer Pump, (Class 3)

2EGF*P21B, Diesel Fuel Oil Transfer Pump, (Class 3)

2EGF*P21C, Diesel Fuel Oil Transfer Pump, (Class 3)

2EGF*P21D, Diesel Fuel Oil Transfer Pump, (Class 3)

Component/System Function:

The Emergency Diesel Generator Fuel Oil Transfer Pumps 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.

Applicable Code Edition and Addenda:

ASME OM Code-2001, with Addenda through OMb-2003.

Applicable Code Requirement(s):

ISTB-3550, "Flow Rate", states: "When measuring flow rate, a rate or quantity meter shall be 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."

Reason for Request:

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 Table ISTB-3500-1, "Required Instrument Accuracy".

Proposed Alternative and Basis for Use:

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 during both the Group B tests and Comprehensive tests per 2OST-36.1 and 2OST-36.2 (Emergency Diesel Generator and Fuel Oil Transfer Pump Tests).

This proposed alternative is consistent with the guidelines provided in NUREG-1482, Rev.1, Section 5.5.2. Calculating flow rate by a level change in the day tank should be considered acceptable since the level of accuracy required by Table ISTB-3500-1 is satisfied and the method provides reasonable assurance of pump operational readiness.

Using the provisions of this relief request as an alternative to the requirements of ISTB-3550 provides an acceptable level of quality and safety since the alternative provides reasonable assurance of pump operational readiness and the accuracy requirement for measuring flow, as specified in Table ISTB-3500-1 is satisfied.

PUMP RELIEF REQUEST 6

Duration of Proposed Alternatives: The proposed alternative identified in this relief request shall be utilized during the Third Ten-Year Inservice Test Interval.

Precedents: A similar request was approved for the Beaver Valley Power Station, Unit No. 2 Second Ten-Year Inservice Test Interval. The NRC letter authorizing the similar alternative is referenced below.

Beaver Valley Power Station, Unit No. 2, Docket No. 50-412, Safety Evaluation of Relief Request PRR6 for the Second Ten-Year Interval for Pumps and Valves Inservice Testing Program, Dated September 4, 1997, (TAC No. M98909)

References: ISTB-3550, “Flow Rate”

Table ISTB-3500-1, “Required Instrument Accuracy”

NUREG-1482, Rev.1, Section 5.5.2, “Use of Tank Level to Calculate Flow Rate for Positive Displacement Pumps.”

PUMP RELIEF REQUEST 7

Proposed Alternative In Accordance with 10CFR50.55a(f)(5)(iii)

On the basis that compliance with the ASME Code requirement is impractical for BVPS-1.

ASME Code Component(s) Affected:	2RHS*P21A, Residual Heat Removal Pump, (Class 2) 2RHS*P21B, Residual Heat Removal Pump, (Class 2)
Component/System Function:	The Residual Heat Removal (RHR) Pumps provide long-term removal of decay heat from the reactor core and sensible heat from the Reactor Coolant System (RCS) in order to achieve and maintain the plant in a cold shutdown condition.
Applicable Code Edition and Addenda:	ASME OM Code-2001, with Addenda through OMb-2003.
Applicable Code Requirement(s):	ISTB-3400, "Frequency of Inservice Tests", states: "An inservice test shall be run on each pump as specified in Table ISTB-3400-1." Table ISTB-3400-1, "Inservice Test Frequency", requires Group A pumps to be tested on a quarterly frequency.

Reason for Request:

The Residual Heat Removal (RHR) Pumps are in a standby condition during power operation, and are not required to be in service until the Reactor Coolant System (RCS) temperature is less than or equal to 350 degrees Fahrenheit and RCS pressure is less than or equal to 360 pounds per square inch gauge (psig). Therefore, they are not exposed to operational wear except when the RCS is at low temperature and pressure and the RHR System is in operation for normal shutdown cooling.

The RHR Pumps have a design pressure of 600 psig. They take suction from the RCS, pass flow through the RHR Heat Exchangers, and then discharge back to the RCS. The RHR System is considered to be a low pressure system that could be damaged if exposed to the normal operating RCS pressure of approximately 2235 psig. In order to prevent this, the RHR Inlet and Return Isolation Valves are interlocked with an output signal from the RCS pressure transmitters, which prevent the valves from being opened when the RCS pressure exceeds 360 psig. In addition, these valves are also maintained shut with their breakers de-energized and administratively controlled (caution tagged). Therefore, testing of the RHR Pumps during normal operation is not practicable since there are no alternate supply sources and aligning the RCS to the suction of the RHR pumps, during operation at power, would result in damage to piping and components due to overpressurization. Major plant and system modifications would be needed to allow quarterly Group A testing of the RHR pumps according to ASME OM Code requirements.

In addition, although overpressure precludes testing of the RHR pumps, they are also located inside containment. Testing at power, subsequent to system modification, would require test personnel to make a containment entry in order to monitor pump operation. Since radiation levels and air

PUMP RELIEF REQUEST 7

Reason for Request: (Cont.)	temperature inside containment are higher than normal during power operation, this would involve higher radiological dose rates and heat stress risk to plant personnel. This presents a working environment for station personnel that is not considered practicable for quarterly surveillance testing on a routine basis while on-line. Based on the above, compliance with the ASME OM Code test frequency requirement for Group A pump tests is impractical. Testing is only possible during a surveillance interval frequency of cold shutdown and refueling unless major plant and system modifications are made.
Proposed Alternative and Basis for Use:	These pumps will be tested during cold shutdowns and refueling outages, not more often than once every 92 days, per 2OST-10.1 and 2OST-10.2 (Residual Heat Removal Pumps Performance Tests). For a cold shutdown or refueling outage that extends longer than 3 months, the pumps will be tested every 3 months in accordance with Table ISTB-3400-1. In the instance of an extended outage, a Group A test may be performed, otherwise; a Comprehensive test will be performed each refueling outage. This proposed alternative is necessary to prevent the potential for piping and component damage as a result of overpressurization. Using the provisions of this relief request as an alternative to the frequency requirements of Table ISTB-3400-1 provides a reasonable alternative to the Code requirements and assurance that the pumps are operationally ready.
Duration of Proposed Alternatives:	The proposed alternative identified in this relief request shall be utilized during the Third Ten-Year Inservice Test Interval.
Precedents:	Similar requests were approved for the Beaver Valley Power Station, Unit No. 2 Second Ten-Year Inservice Test Interval. NRC letters authorizing the similar alternatives are referenced below. Beaver Valley Power Station, Unit No. 2, Docket No. 50-412, Safety Evaluation of Inservice Test (IST) Relief Request PRR-7 for the Second Ten-Year IST Interval, Dated July 2, 2004, (TAC MC2318) Beaver Valley Power Station, Unit No. 2, Docket No. 50-412, Safety Evaluation of Inservice Test (IST) Relief Request PRR7 for the Second Ten-Year IST Interval, Dated February 24, 2006, (TAC No. MC5901, MC5902, and MC5903).
References:	ISTB-3400, “Frequency of Inservice Tests” Table ISTB-3400-1, "Inservice Test Frequency"

PUMP RELIEF REQUEST 8

Proposed Alternative In Accordance with 10CFR50.55a(a)(3)(i)

On the basis that the proposed alternative provides an acceptable level of quality and safety.

ASME Code Component(s) Affected:

2CHS*P21A, Charging Pump, (Class 3)
2CHS*P21B, Charging Pump, (Class 3)
2CHS*P21C, Charging Pump, (Class 3)
2CHS*P22A, Boric Acid Transfer Pump, (Class 3)
2CHS*P22B, Boric Acid Transfer Pump, (Class 3)
2RHS*P21A, Residual Heat Removal Pump, (Class 2)
2QSS*P24A, Chemical Injection Pump, (Class 2)
2FWE*P23A, Motor-Driven Auxiliary Feedwater Pump, (Class 3)
2FWE*P23B, Motor-Driven Auxiliary Feedwater Pump, (Class 3)
2SWS*P21B, Service Water Pump, (Class 3)
2EGF*P21A, Fuel Oil Transfer Pump, (Class 3)
2EGF*P21B, Fuel Oil Transfer Pump, (Class 3)
2EGF*P21C, Fuel Oil Transfer Pump, (Class 3)
2EGF*P21D, Fuel Oil Transfer Pump, (Class 3)

This Request for Relief may also be applied to any pump in the Inservice Test (IST) Program scope should a vibration reading of <0.05 in/sec be obtained as a new reference value subsequent to repair or replacement and for pumps that demonstrate a vibration reading of <0.05 in/sec for new comprehensive pump tests.

Component/System Function:

As listed in the Pump Outline Tables included in Section II of the IST Program (Issue 3, Rev. 0) for the pumps listed above.

Applicable Code Edition and Addenda:

ASME OM Code-2001, with Addenda through OMb-2003.

Applicable Code Requirement(s):

ISTB-3300, "Reference Values"

ISTB-3300(a), states: "Initial reference values shall be determined from the results of testing meeting the requirements of ISTB-3100, "Preservice Testing", or from the results of the first inservice test."

ISTB-3300(d), states: "Reference values shall be established at a point(s) of operation (reference point) readily duplicated during subsequent tests."

ISTB-3300(f), states: "All subsequent test results shall be compared to these initial reference values or to new reference values established in accordance with ISTB-3310, ISTB-3320, or ISTB-6200(c)."

ISTB-5120, "Inservice Testing" (Centrifugal Pumps, Except Vertical Line Shaft Centrifugal Pumps)

PUMP RELIEF REQUEST 8

Applicable Code Requirement(s): (Cont.)

ISTB-5121(e) and ISTB-5123(e), "Group A Test and Comprehensive Test Procedure", states: "All deviations from the reference values shall be compared with the ranges of Table ISTB-5100-1 and corrective action taken as specified in ISTB-6200. Vibration measurements shall be compared to both the relative and absolute criteria shown in the alert and required action ranges of Table-ISTB-5100-1. For example, if vibration exceeds either $6V_r$, or 0.7 in/sec, the pump is in the required action range."

ISTB-5220, "Inservice Testing" (Vertical Line Shaft Centrifugal Pumps)

ISTB-5221(e) and ISTB-5223(e), "Group A Test and Comprehensive Test Procedure", states: "All deviations from the reference values shall be compared with the ranges of Table ISTB-5200-1 and corrective action taken as specified in ISTB-6200. Vibration measurements shall be compared to both the relative and absolute criteria shown in the alert and required action ranges of Table-ISTB-5200-1. For example, if vibration exceeds either $6V_r$, or 0.7 in/sec, the pump is in the required action range."

ISTB-5320, "Inservice Testing" (Positive Displacement Pumps, Except Reciprocating)

ISTB-5321(e) and ISTB-5323(e), "Group A Test and Comprehensive Test Procedure", states: "All deviations from the reference values shall be compared with the ranges of Table ISTB-5300-1 and corrective action taken as specified in ISTB-6200. Vibration measurements shall be compared to both the relative and absolute criteria shown in the alert and required action ranges of Table-ISTB-5200-1. For example, if vibration exceeds either $6V_r$, or 0.7 in/sec, the pump is in the required action range."

Note: BVPS Unit No. 2 has no reciprocating positive displacement pumps in the Inservice Test Program.

Reason for Request:

The above pumps in the BVPS Unit No. 2 Inservice Test Program have at least one vibration reference value (V_r) that is currently less than 0.05 in/sec. A small value for V_r produces a small acceptable range for pump operation. The ASME OM Code Acceptable Range limit for pump vibrations from Table ISTB-5100-1, Table ISTB-5200-1, and Table ISTB-5300-1 for both the Group A test and Comprehensive test is $\leq 2.5\ V_r$. Based on a small acceptable range, a smooth running pump could be subject to unnecessary corrective action if it exceeds this limit. ISTB-6200(a), "Corrective Action – Alert Range", states; If the measured test parameter values fall within the alert range of Table ISTB-5100-1, Table ISTB-5200-1, or Table ISTB-5300-1, as applicable, the frequency of testing specified in ISTB-3400 shall be doubled until the cause of the deviation is determined and the condition is corrected.

PUMP RELIEF REQUEST 8

Reason for Request: (Cont.)

For very small reference values for vibrations, flow variations, hydraulic noise and instrument error can be a significant portion of the reading and affect the repeatability of subsequent measurements. Also, experience gathered by the BVPS Predictive Maintenance (PdM) Group has shown that changes in vibration levels in the range of 0.05 in/sec do not normally indicate significant degradation in pump performance.

In order to avoid unnecessary corrective actions, a minimum value for V_r of 0.05 in/sec is proposed. This minimum value would be applied to individual vibration locations for those pumps with reference vibration values less than 0.05 in/sec. Therefore, the smallest ASME OM Code Acceptable Range limit for any IST pump vibration measurement location would be no lower than 2.5 times V_r, or 0.125 in/sec, which is within the "fair" range of the "General Machinery Vibration Severity Chart" provided by IRD Mechanalysis, Inc. Likewise, the smallest ASME OM Code Alert Range limit for any IST Pump vibration measurement location for which the pump would be inoperable would be no lower than 6 times V_r, or 0.300 in/sec.

ASME XI, Table IWP-3100-2, "Allowable Ranges of Test Quantities", specifies a vibration Acceptable Range limit of 1.0 mil for a displacement reference value ≤ 0.5 mils. In velocity units, a displacement reference value of 0.5 mils is equivalent to 0.047 in/sec for an 1800 rpm pump and 0.094 in/sec for a 3600 rpm pump.

The effective minimum reference value proposed (0.05 in/sec) for smooth-running pumps is roughly equal to the ASME XI IWP reference value for an 1800 rpm pump and more conservative than the reference value for a 3600 rpm pump. Without this relief, the ASME XI Acceptable Range limit for some extremely smooth running pumps is reduced by as much as a factor of 10.

In addition to the requirements of ISTB for inservice testing, the pumps in the Beaver Valley Power Station (BVPS) Unit No. 2 Inservice Test Program are also included in the BVPS PdM Program. The BVPS PdM Program currently employs predictive monitoring techniques such as: vibration monitoring and analysis beyond that required by ISTB, bearing temperature trending, oil sampling and analysis, and/or thermography analysis as applicable.

If the measured parameters are outside the normal operating range or are determined by analysis to be trending toward an unacceptable degraded state, appropriate actions are taken that may include: initiation of a Condition Report (CR), increased monitoring to establish a rate of change, review of component specific information to identify the cause of the condition, and removal of the pump from service to perform maintenance.

PUMP RELIEF REQUEST 8

Reason for Request: (Cont.)

It should be noted that pumps in the Inservice Test Program will remain in the BVPS PdM Program even if certain pumps have very low vibration readings and are considered to be smooth running pumps.

Proposed Alternative and Basis for Use:

In lieu of applying the vibration acceptance criteria ranges specified in Table ISTB-5100-1, Table ISTB-5200-1, or Table ISTB-5300-1, as applicable, smooth running pumps with a measured reference value below 0.05 in/sec for a particular vibration measurement location will have subsequent test results for that location compared to an Acceptable Range limit of 0.125 in/sec and an Alert Range limit of 0.300 in/sec (based on a minimum reference value 0.05 in/sec). These proposed ranges shall be applied to vibration test results during both Group A tests and Comprehensive tests.

In addition to the Code requirements, all pumps in the BVPS Unit No. 2 Inservice Test Program are included in and will remain in the BVPS PdM Program regardless of their smooth running status.

Using the provisions of this relief request as an alternative to the specific requirements of ISTB identified above will provide adequate indication of pump performance and continue to provide an acceptable level of quality and safety without unnecessarily imposing corrective action since changes in vibration levels in the range of 0.05 in/sec do not normally indicate significant degradation in pump performance.

Using the provisions of this relief request as an alternative to the vibration acceptance criteria ranges specified in Table ISTB-5100-1, Table ISTB-5200-1, or Table ISTB-5300-1 provides an acceptable level of quality and safety since the alternative provides reasonable assurance of pump operational readiness and the ability to detect pump degradation.

Duration of Proposed Alternatives:

The proposed alternative identified in this relief request shall be utilized during the Third Ten-Year Inservice Test Interval.

Precedents:

Request PRR8 is similar to the request approved for the Beaver Valley Power Station Unit No. 2 Second Ten-Year IST Interval, but was also applied to IST Program pumps for which vibration readings less than 0.05 inches per second are obtained subsequent to repair and replacement, or for comprehensive pump testing. The NRC letter authorizing the similar alternative is referenced below.

Beaver Valley Power Station, Unit No. 2, Docket No. 50-412, Safety Evaluation of Inservice Test (IST) Pump Relief Request PRR-8 for the Second Ten-Year IST Interval, Dated December 27, 2004, (TAC No. MC3241)

PUMP RELIEF REQUEST 8

References:

ISTB-3300, "Reference Values"

ISTB-5120, "Inservice Testing", (Centrifugal Pumps, Except Vertical Line Shaft Centrifugal Pumps)

Table ISTB-5100-1, "Centrifugal Pump Test Acceptance Criteria"

ISTB-5220, "Inservice Testing", (Vertical Line Shaft Centrifugal Pumps)

Table ISTB-5200-1, "Vertical Line Shaft and Centrifugal Pumps Test Acceptance Criteria"

ISTB-5320, "Inservice Testing", (Positive Displacement Pumps, Except Reciprocating)

Table ISTB-5300-1, "Positive Displacement Pump (Except Reciprocating) Test Acceptance Criteria"

NUREG-1482, Rev.1, Section 5.4, "Monitoring Pump Vibration in Accordance with ISTB"

ASME XI, Table IWP-3100-2, "Allowable Ranges of Test Quantities"

General Machinery Vibration Severity Chart provided by IRD Mechanalysis, Inc.

PUMP RELIEF REQUEST 9

Proposed Alternative In Accordance with 10CFR50.55a(a)(3)(ii)

On the basis that compliance with the Code requirement would result in hardship and unusual difficulty without a compensating increase in the level of quality and safety.

ASME Code Component(s) Affected:

2SWS*P21A, Service Water Pump (Class 3)

2SWS*P21B, Service Water Pump (Class 3)

2SWS*P21C, Service Water Pump (Class 3)

Component/System Function:

The Service Water Pumps operate continuously during normal plant operation to provide cooling water for heat removal from power plant auxiliary subsystems. During post accident conditions they provide the heat sink to the following components: at least two recirculation spray coolers, one charging pump lube oil cooler, one control room air-conditioning refrigerant condenser or one control room air-conditioning unit, one emergency diesel generator cooling system heat exchanger, and one safeguards area air-conditioning unit.

Applicable Code Edition and Addenda:

ASME OM Code-2001, with Addenda through OMb-2003.

Applicable Code Requirement(s):

ISTB-3510(a), "Data Collection; General Accuracy", states: "Instrument accuracy shall be within the limits of Table ISTB-3500-1. If the parameter is determined by analytical methods instead of measurement, then the determination shall meet the parameter accuracy requirement of Table ISTB-3500-1. For individual analog instruments, the required accuracy is percent of full scale. For digital instruments, the required accuracy is over the calibrated range. For a combination of instruments, the required accuracy is loop accuracy."

Table ISTC-3500-1, "Required Instrument Accuracy"' requires pressure instruments to be calibrated to at least 0.5 percent when used during the Comprehensive Pump test.

Reason for Request:

The Beaver Valley Power Station Unit No. 2 Service Water Pumps are vertical line-shaft pumps that receive their suction from a pit that communicates with the Ohio river. Differential pressure is calculated using local Pump Discharge Pressure Indicators [2SWS-PI101A, B and C] and the calculated suction pressure using river water elevation from Ohio River Level Recorder [LR-1CW-101] (local). The transmitter associated with level recorder [LR-1CW-101] is calibrated to 1.5 percent of full scale and the recorder is calibrated to 1.0 percent of full scale resulting in a loop accuracy of 1.8 percent of full scale. The overall loop accuracy exceeds the maximum 0.5 percent required by Table ISTC-3510-1 when performing a Comprehensive or Preservice test. Replacing level recorder [LR-1CW-101] with level indication calibrated to 0.5 percent is considered a hardship or unusual difficulty without a compensating increase in the level quality or safety since the installed instrument accuracy is adequate to determine pump operational readiness.

PUMP RELIEF REQUEST 9

Reason for Request: (Cont.)

Typical Ohio River elevation is between 665 and 667 feet resulting in a small variance between calculated suction pressure when determined by the calculational method provided by the procedure. However, it should be noted that during the spring, river elevations may be higher due to rain. This condition is evaluated with the test results to ensure operational readiness of the pumps.

Proposed Alternative and Basis for Use:

Existing level instrumentation will be used when determining differential pressure during Comprehensive and Preservice testing, with a calibrated loop accuracy of 1.80 percent full scale, in lieu of replacing existing instrumentation to satisfy the 0.5 percent accuracy requirement for pressure instrumentation, as specified in Table ISTC-3500-1. Since suction pressure is typically a small value, it has minimal impact on pump differential pressure.

Other activities are implemented at BVPS Unit No. 2, in addition to those required by the ASME OM Code, which enhances the ability to detect pump degradation. As part of the BVPS Unit No. 2 Predictive Maintenance Program, spectral analysis is also used to determine the mechanical condition of a pump. 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. Additionally, as part of the BVPS Unit No. 2 Preventive Maintenance Program, the pump motors are inspected, lubricated, and tested every 144 weeks. The pump and motor are completely overhauled every 516 weeks. Motor overhaul includes sending it to the vendor. This frequency is based on the expected condition of the pumps as a result of historical overhauls and was established to allow overhaul prior to the point of degradation resulting in questionable operational readiness.

Using the provisions of this relief request as an alternative to the accuracy requirements of Table ISTB-3500-1, when performing Comprehensive or Preservice tests, provides an acceptable level of quality and safety.

Duration of Proposed Alternatives:

The proposed alternative identified in this relief request shall be utilized during the Third Ten-Year Inservice Test Interval.

Precedents:

None

References:

ISTB-3510-1(a), “Data Collection; General Accuracy”

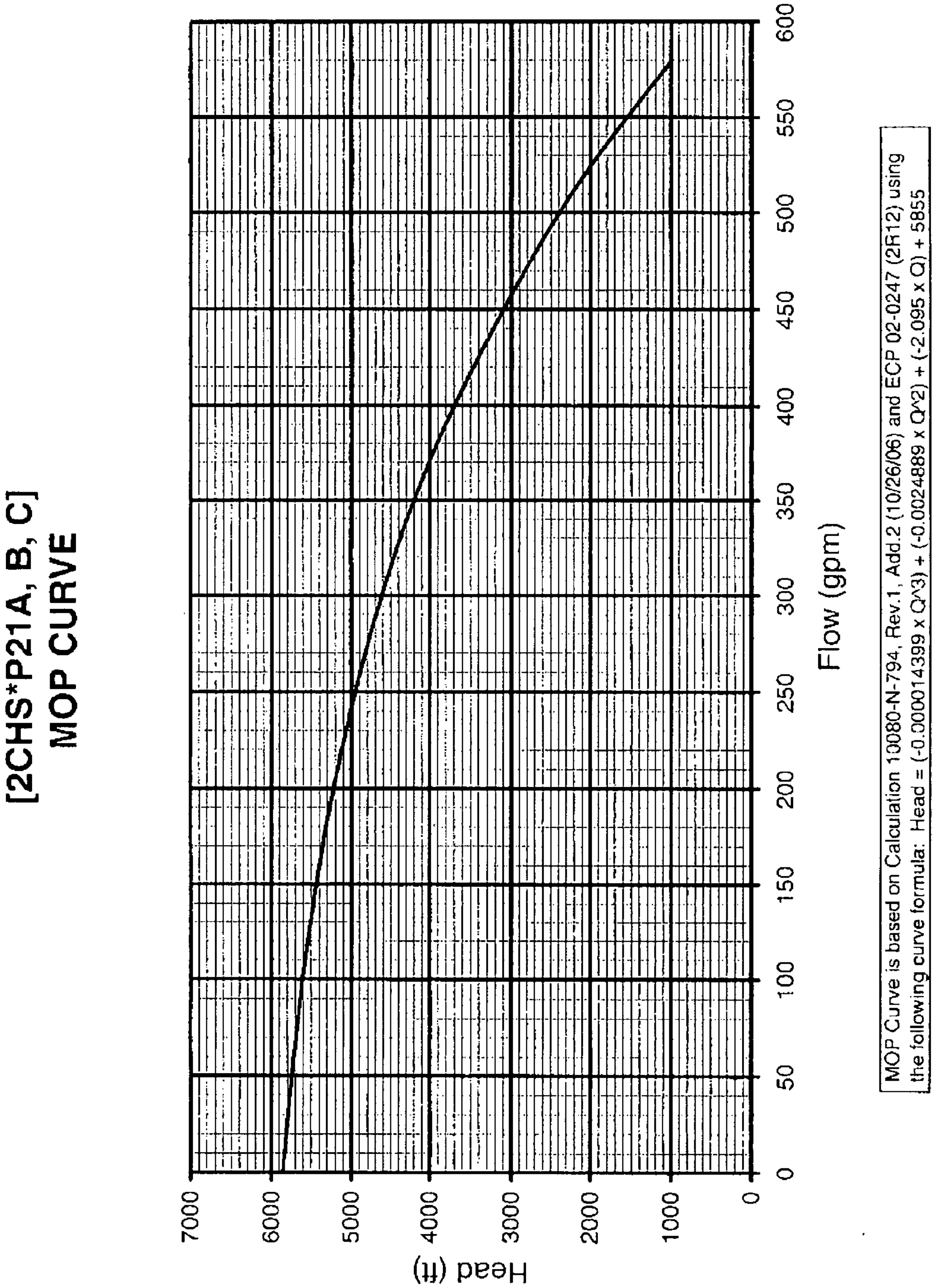
Table ISTB-3500-1, “Required Instrument Accuracy”

NUREG-1482, Rev.1, Section 5.5.3, “Use of Tank or Bay Level to Calculate Differential Pressure”.

SECTION IV: PUMP MINIMUM OPERATING POINT (MOP) CURVES

Pump Name: Charging/High Head Safety Injection Pumps

Pump Number: 2CHS*P21A
2CHS*P21B
2CHS*P21C

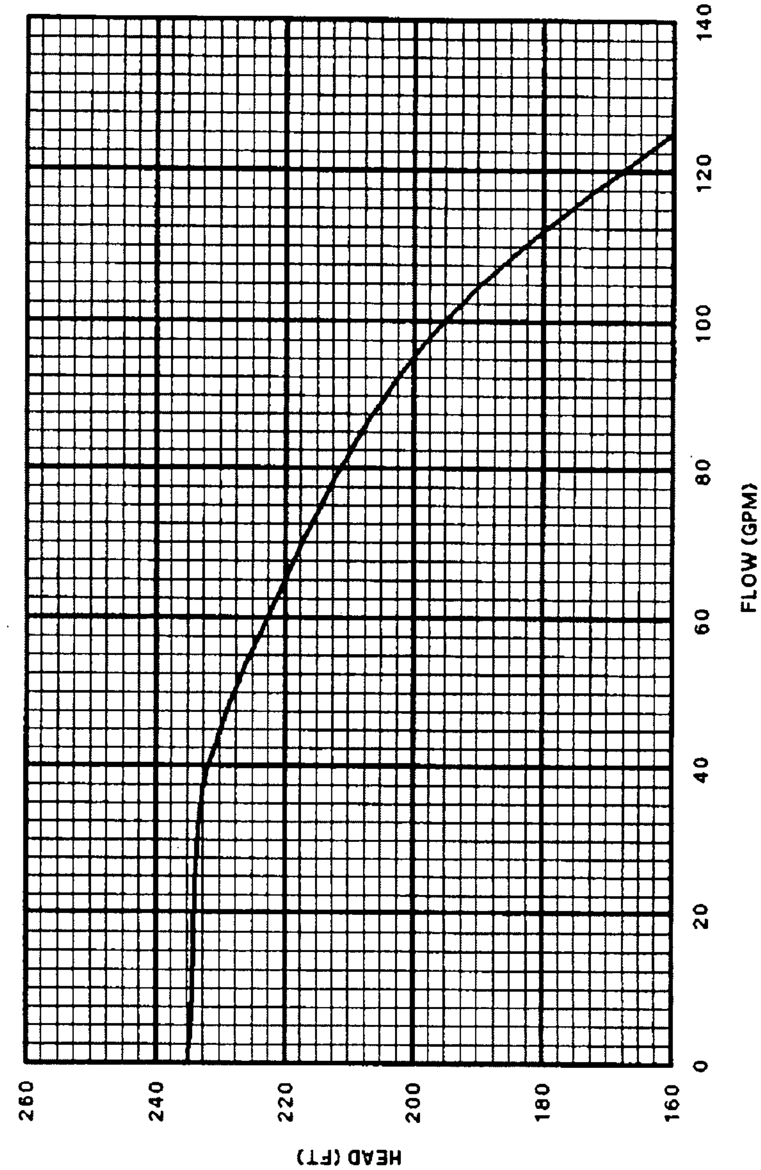


Pump Name: 22A Boric Acid Transfer Pump **Pump Number:** 2CHS*P22A

2CHS*P22A
MOP CURVE

MOP CURVE DATA POINTS:

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



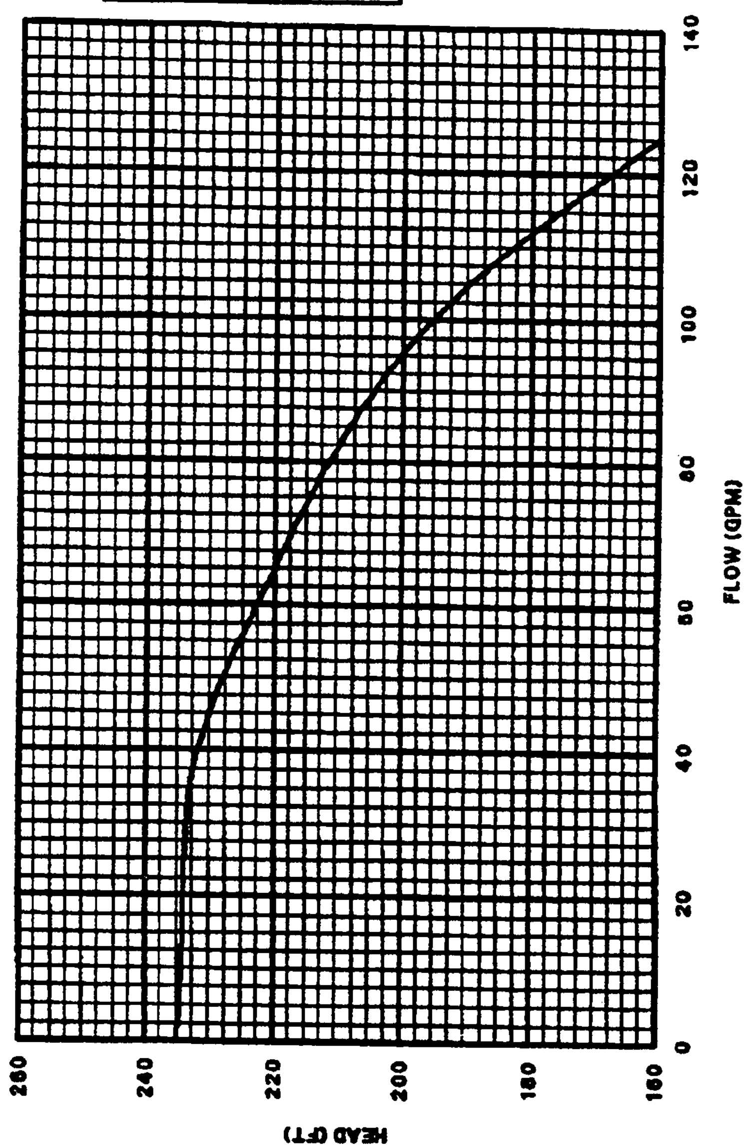
SUPPLIED BY WESTINGHOUSE PER
LETTER NO. BV2-SET-024 (2/3/87).

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

2CHS*P22B
MOP CURVE

MOP CURVE DATA POINTS:

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



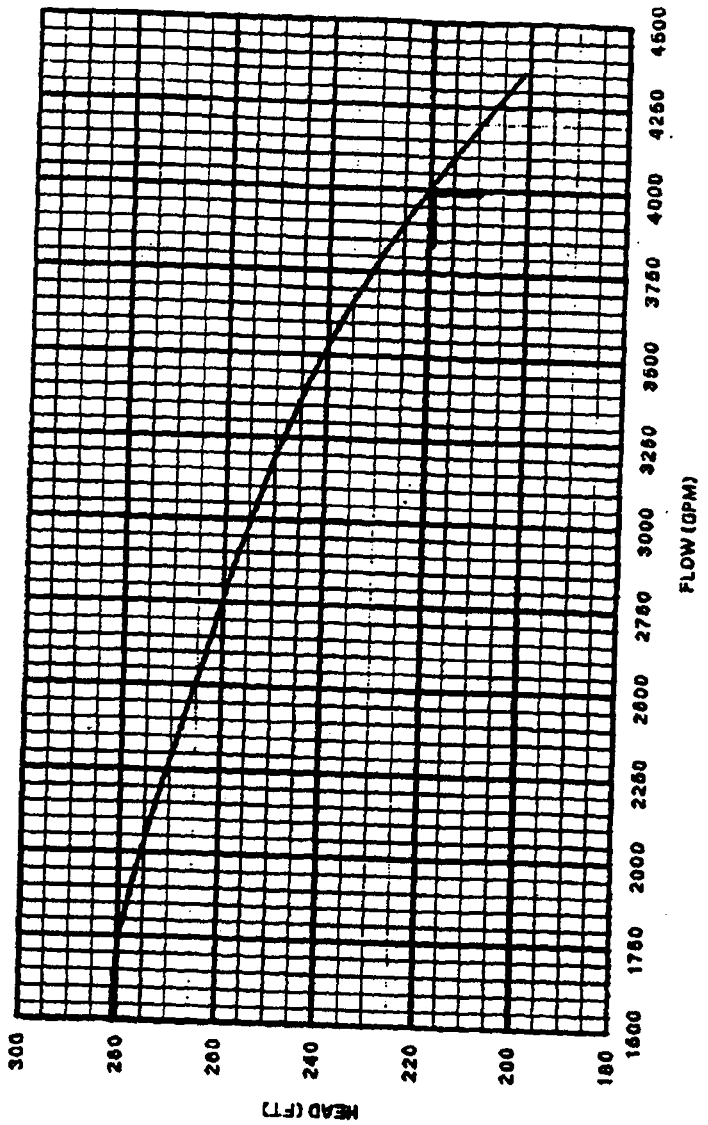
SUPPLIED BY WESTINGHOUSE PER
LETTER NO. BV2-SET-024 (2/3/87).

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

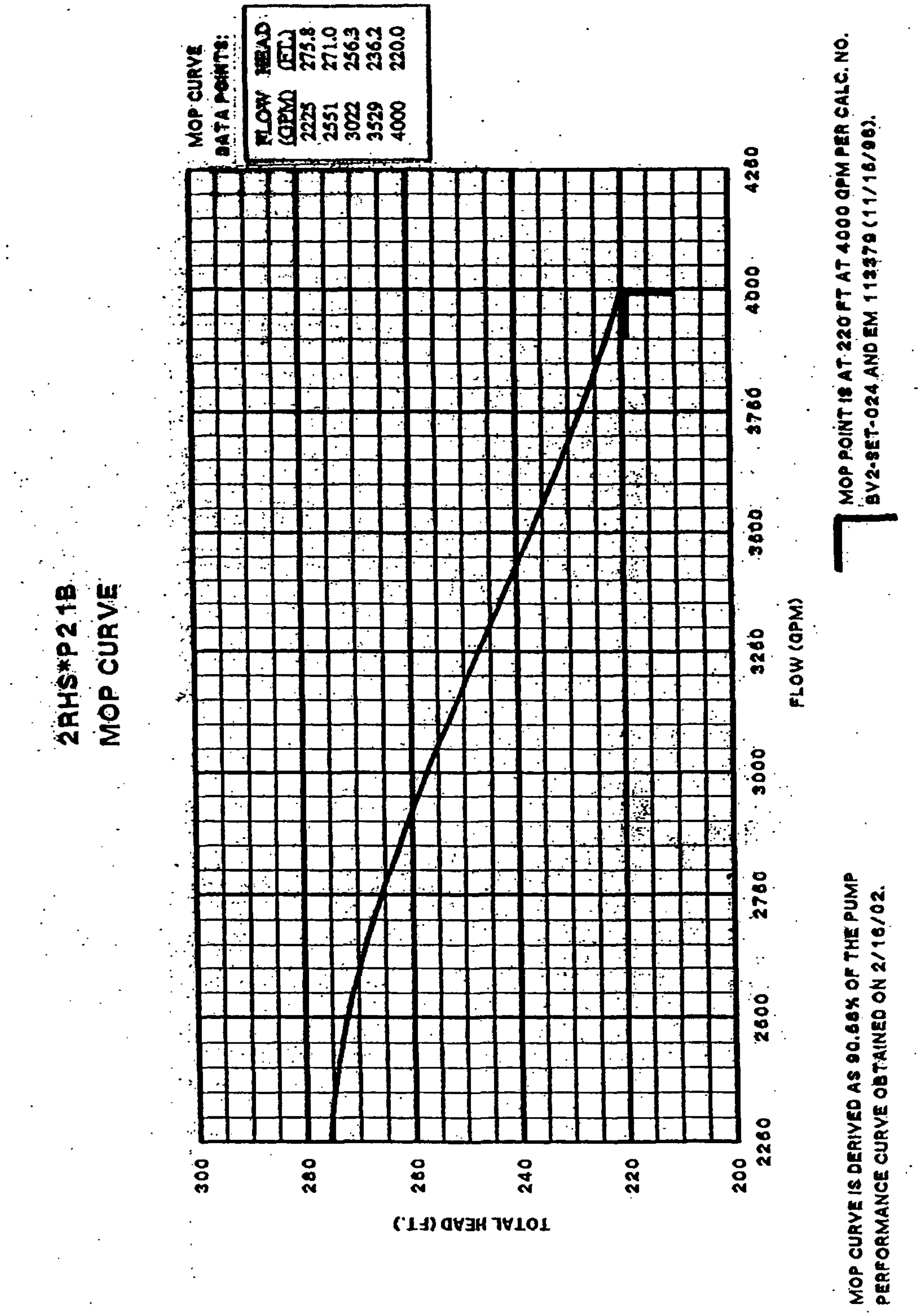


MOP POINT IS AT 220 FT AT 4000 GPM PER CALC. NO. 8V2-SET-024 AND EM 113379 (11/16/98).

MOP CURVE IS DERIVED AS 96.72% OF THE PUMP PERFORMANCE CURVE OBTAINED ON 11/16/98.

Pump Name: 21B Residual Heat Removal Pump

Pump Number: 2RHS*P21B

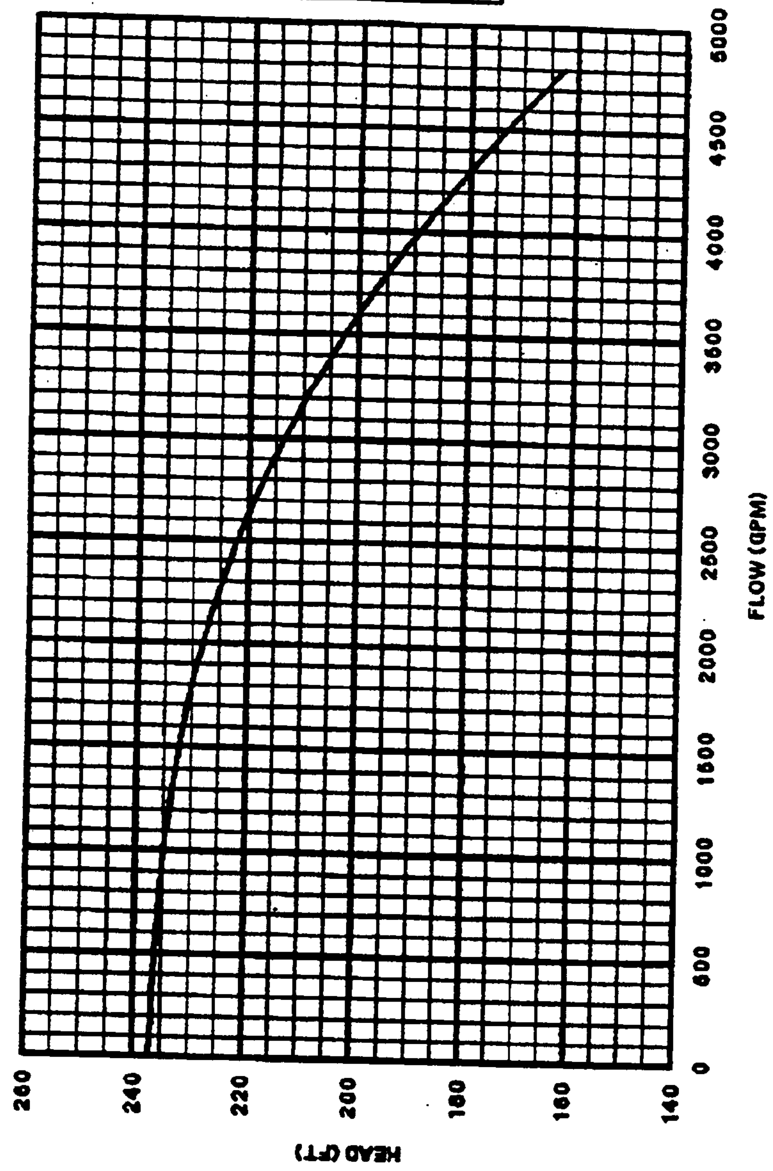


Pump Name: 21A Low Head Safety Injection Pump **Pump Number:** 2SIS*P21A

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).

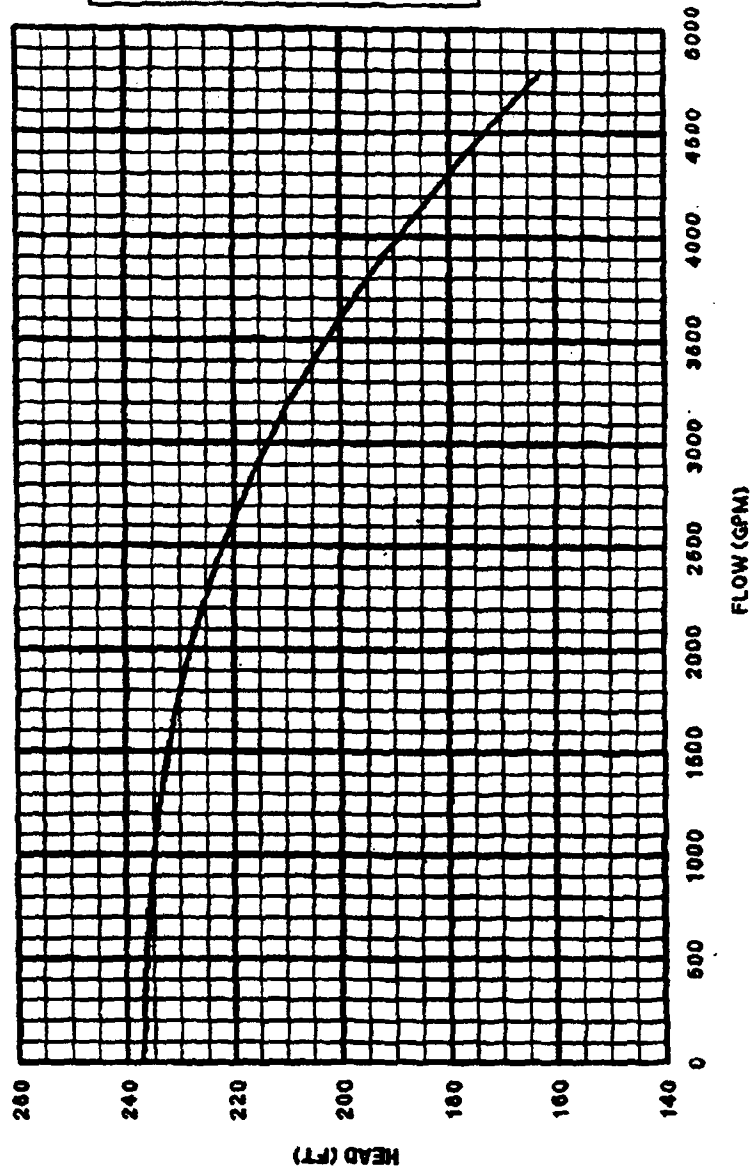
Pump Name: 21B Low Head Safety Injection Pump

Pump Number: 2SIS*P21B

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

2SIS*P21B
MOP CURVE



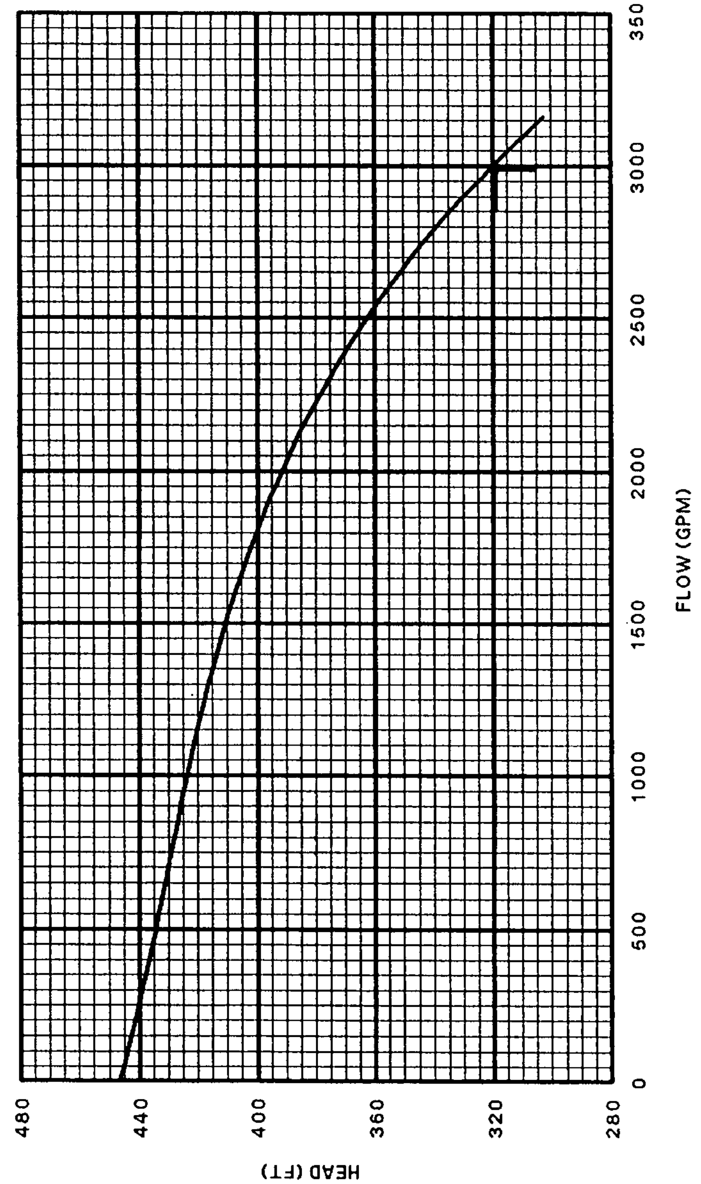
SUPPLIED BY WESTINGHOUSE PER CALCULATION NO. PS-C-104 (6/10/93).

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

2QSS*P21A MOP CURVE

MOP CURVE DATA POINTS:

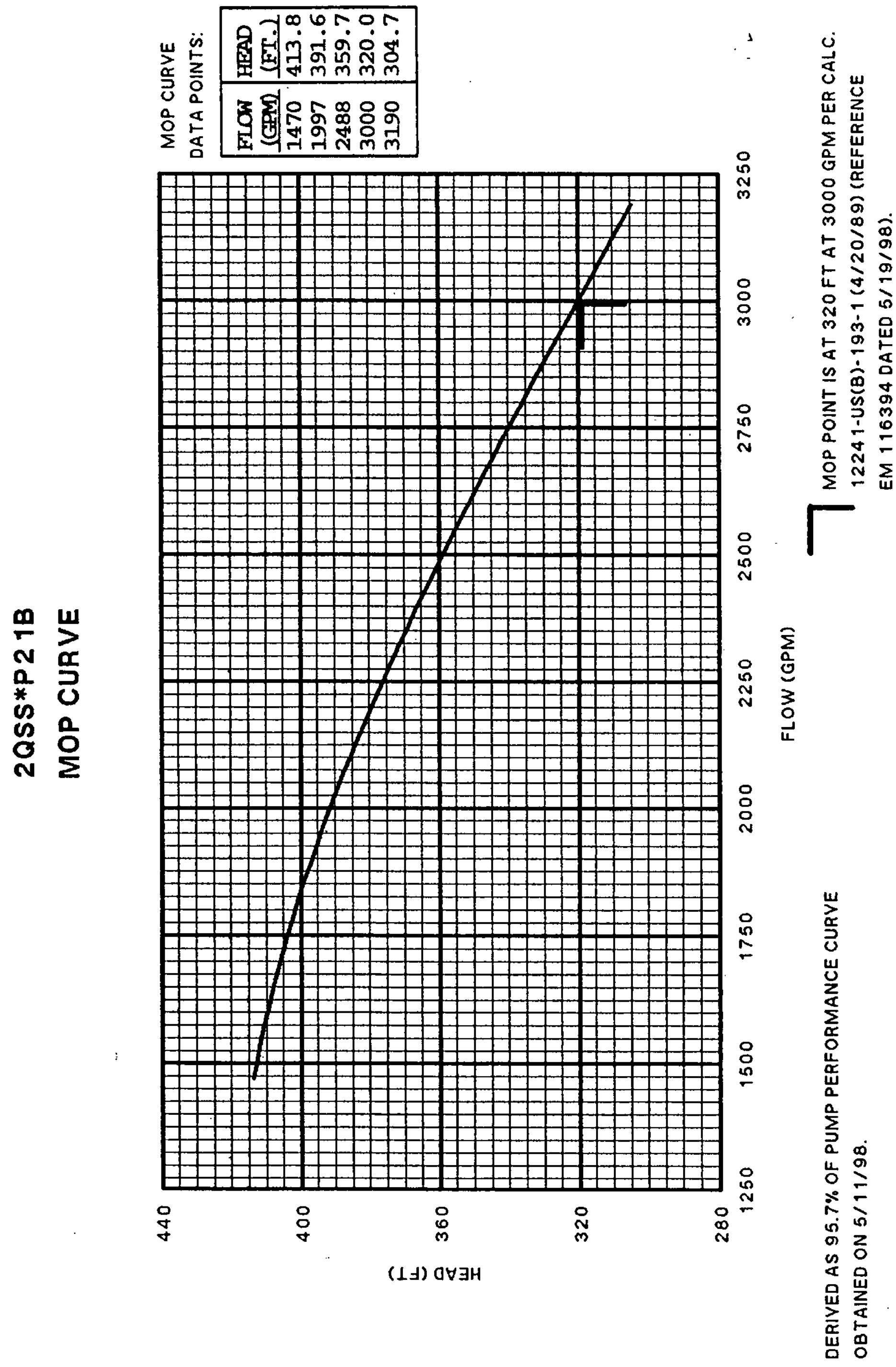
FLOW (GPM)	HEAD (FT.)
0	446.6
430	436.0
860	426.9
1290	416.7
1720	403.3
2150	384.1
2580	356.8
3000	320.0
3160	302.9



MOP POINT IS AT 320 FT AT 3000 GPM PER CALC.
12241-US(B)-193-1 (4/20/89)

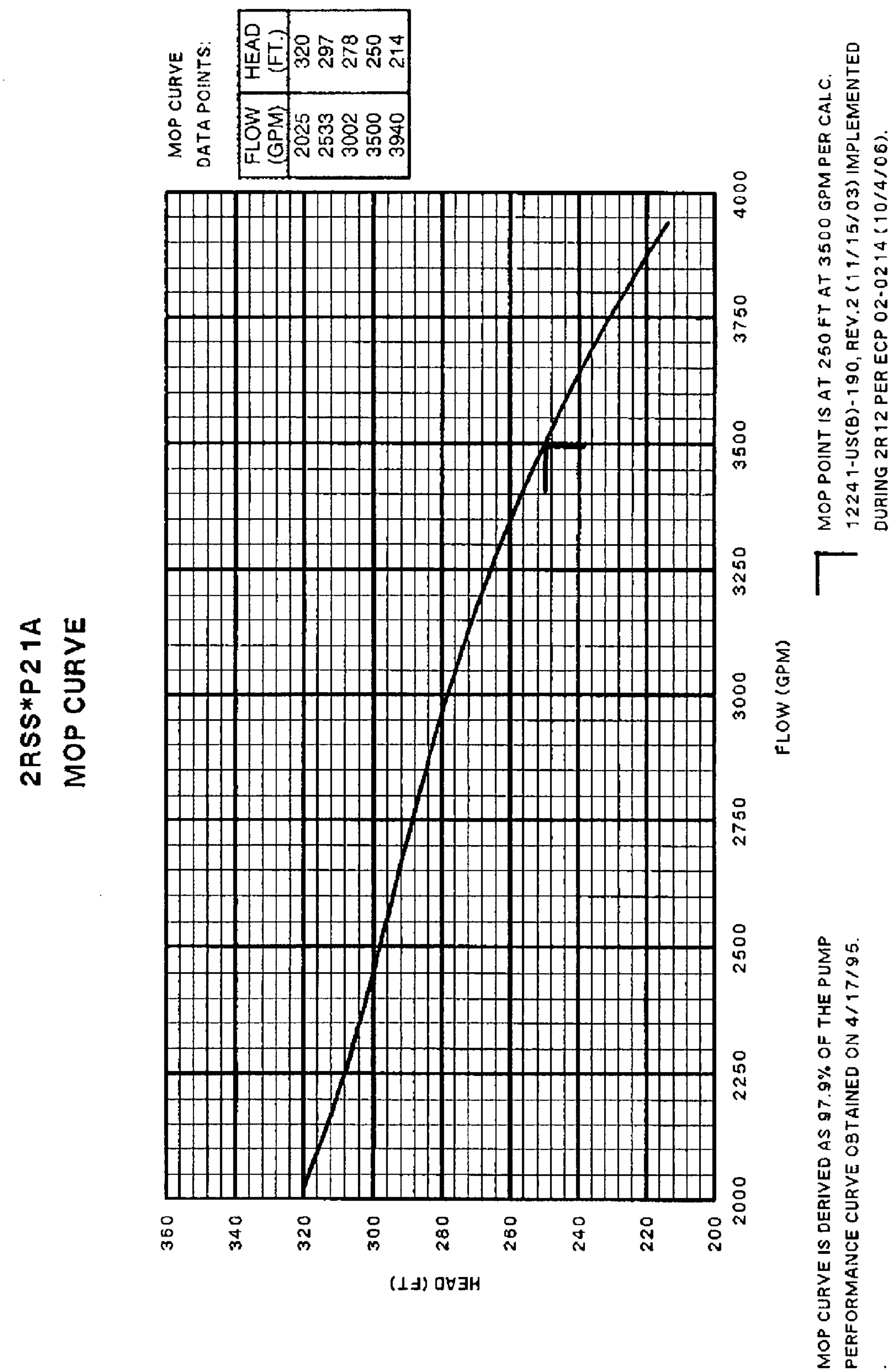
DERIVED AS 95.36% OF PUMP PERFORMANCE CURVE
OBTAINED ON 3/12/87.

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

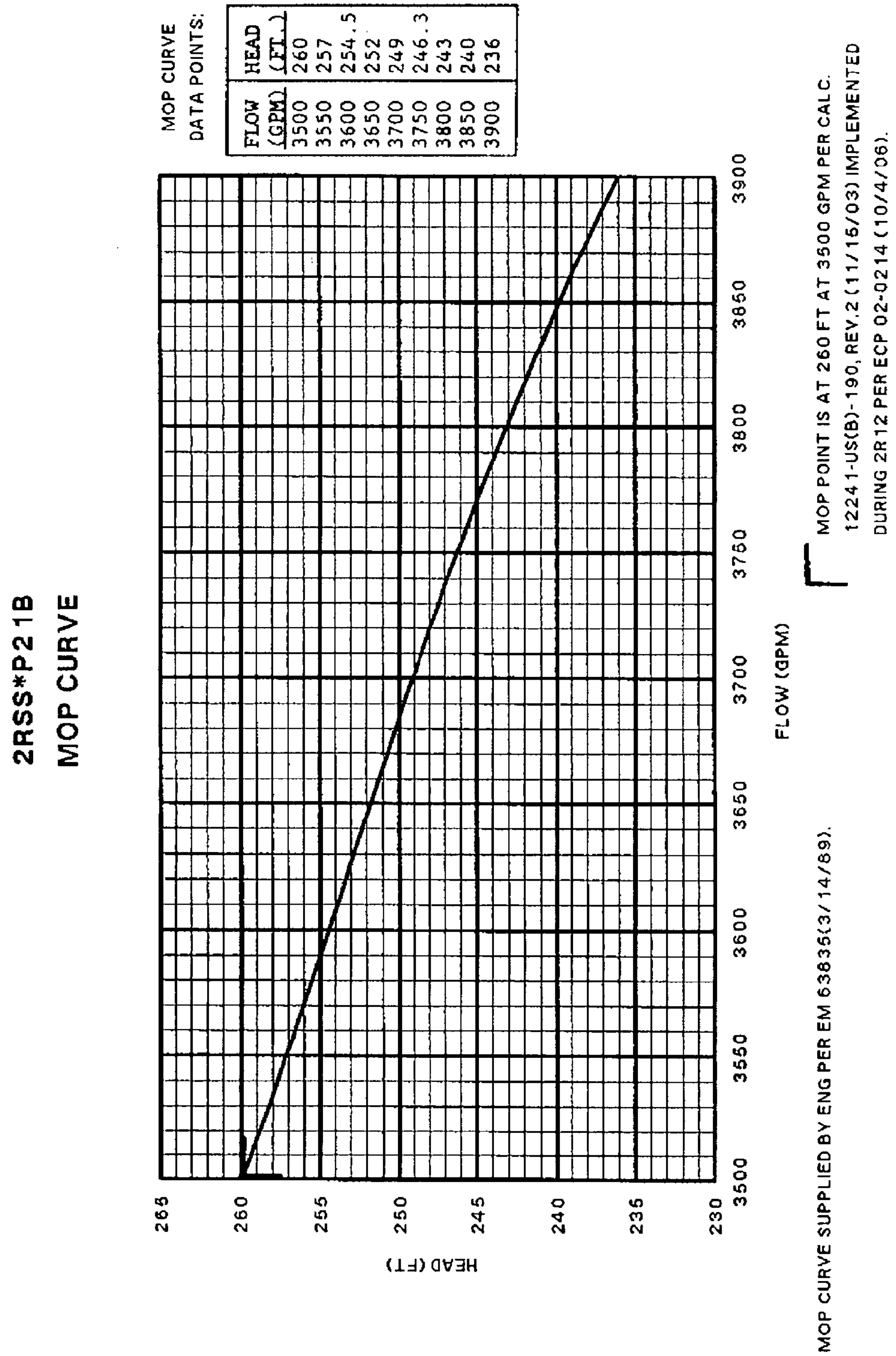


FLOW (GPM)	HEAD (FT.)
1470	413.8
1997	391.6
2488	359.7
3000	320.0
3190	304.7

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



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



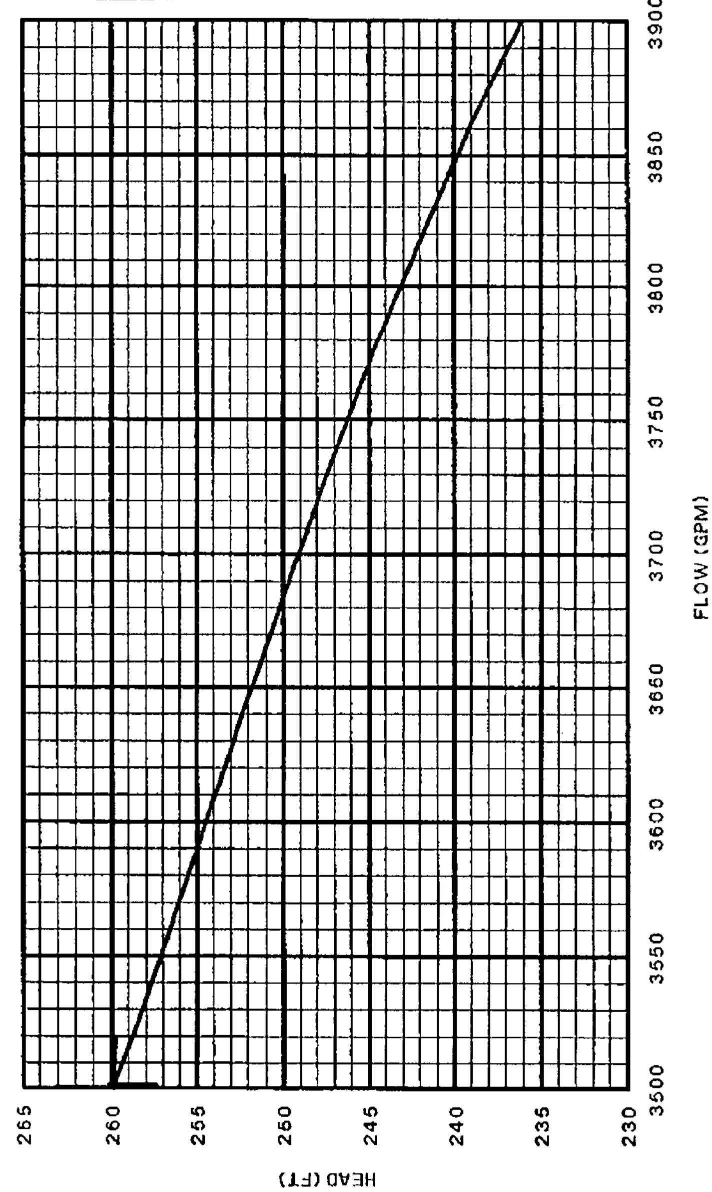
FLOW (GPM)	HEAD (FT.)
3500	260
3550	257
3600	254.5
3650	252
3700	249
3750	246.3
3800	243
3850	240
3900	236

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 POINT IS AT 260 GPM AT 3500 GPM PER CALC. 12241-US(B)-190, REV.2 (11/15/03) IMPLEMENTED DURING 2R12 PER ECP 02-0214 (10/4/06).

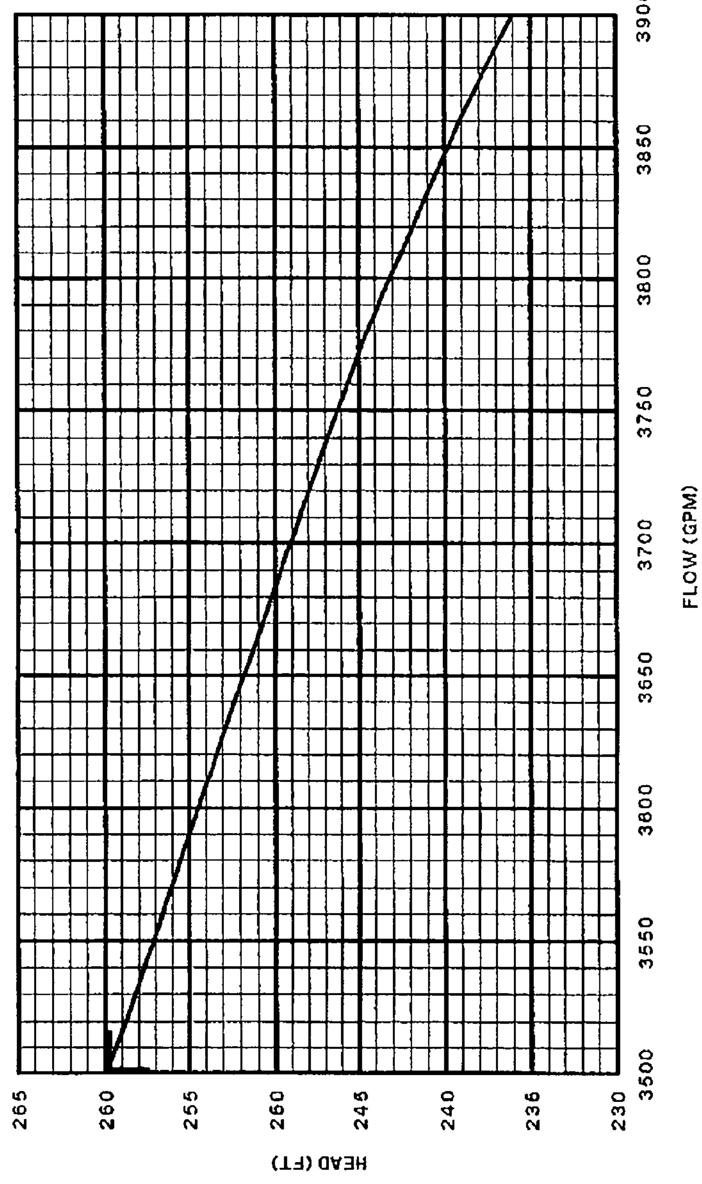
MOP CURVE WAS SUPPLIED BY ENGINEERING PER EM 63835 (3/14/89).

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 POINT IS AT 260 FT AT 3500 GPM PER CALC. 12241-US(B)-190, REV.2 (11/15/03) IMPLEMENTED DURING 2R12 PER ECP 02-0214 (10/4/06).

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

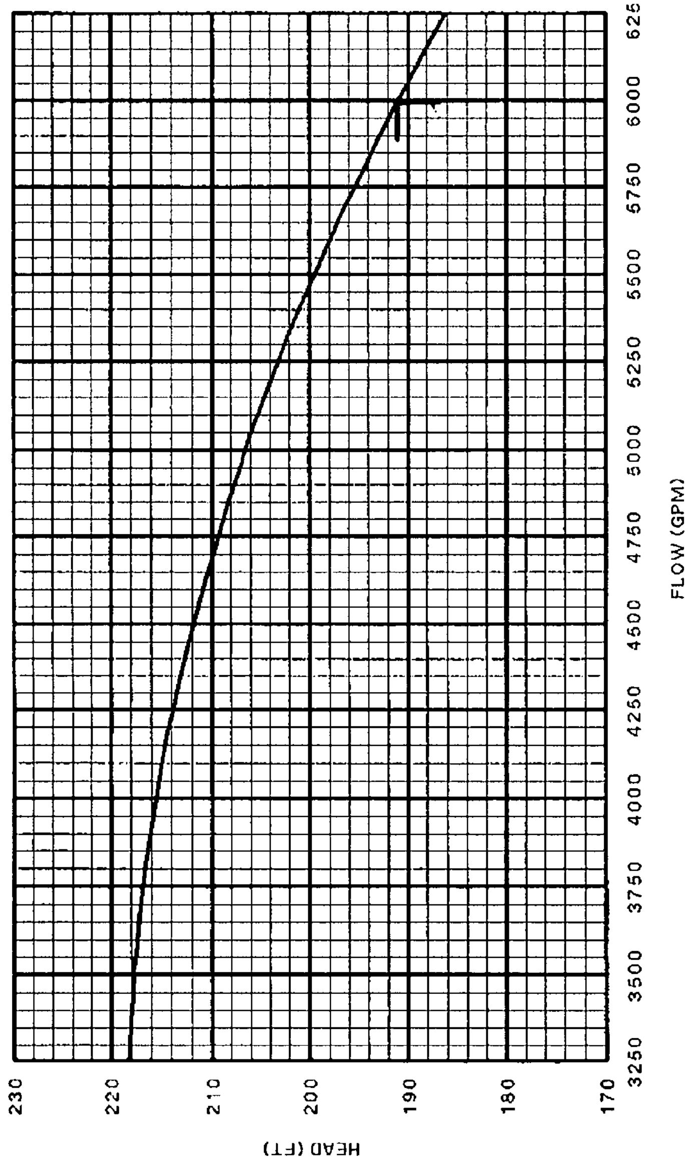
Pump Name: 21A Component Cooling Water Pump **Pump Number:** 2CCP*P21A

2CCP*P21A

MOP CURVE

MOP CURVE DATA POINTS:

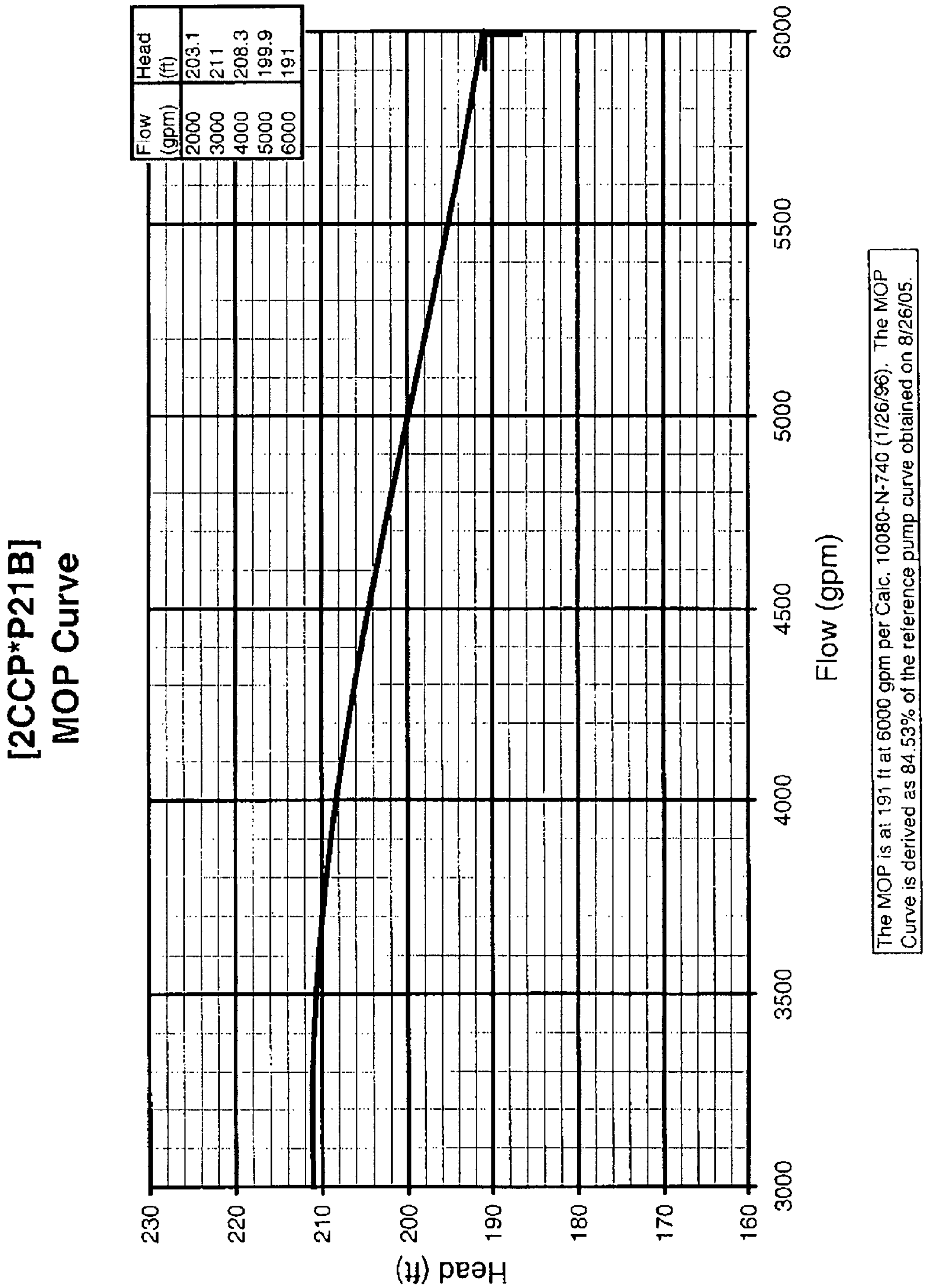
FLOW (GPM)	HEAD (FT.)
2840	218.1
4334	213.3
4857	208.2
5230	203.5
6000	191.0
6500	180.8



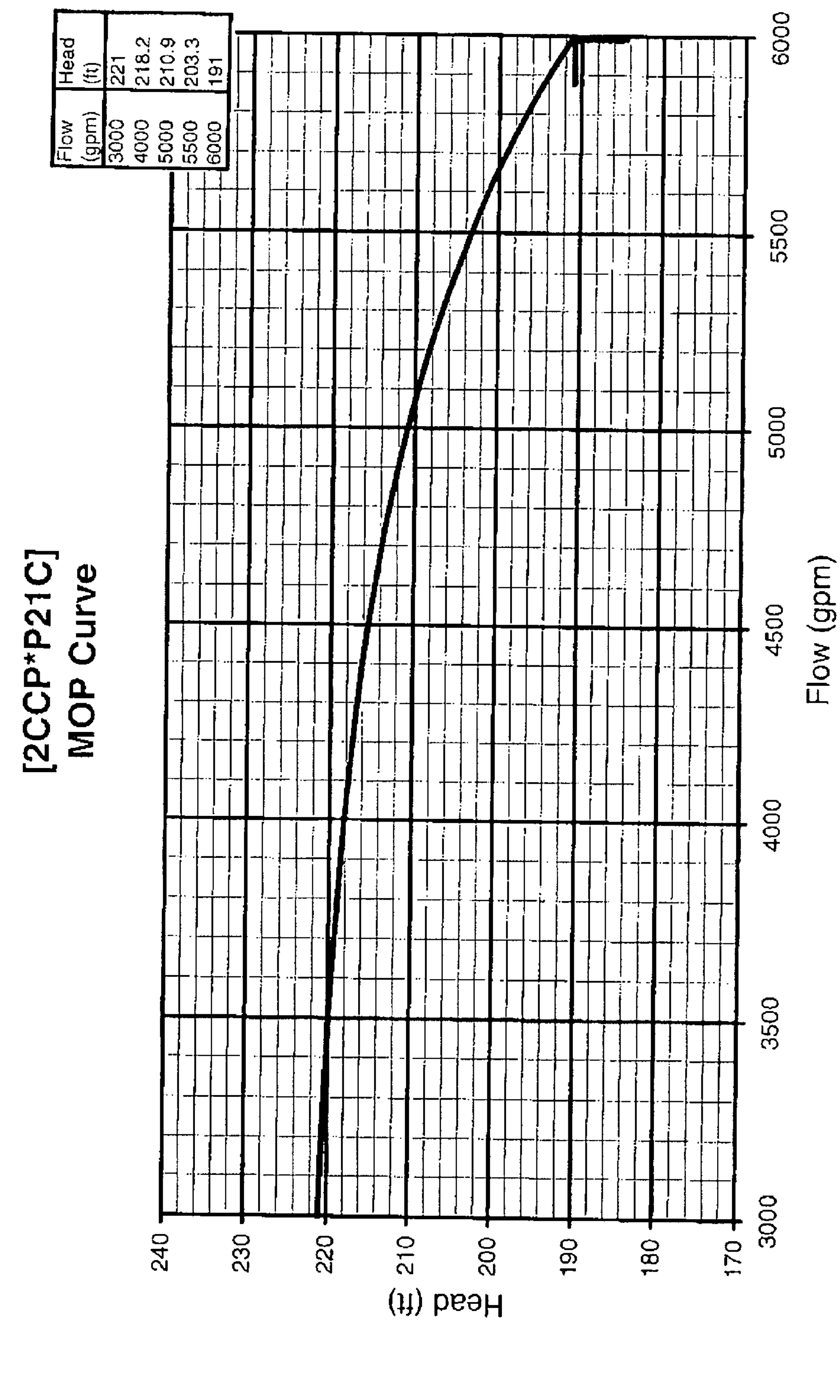
MOP POINT IS AT 191 FT AT 6000 GPM PER CALC. 10080-N-740 (1/26/96).

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

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



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



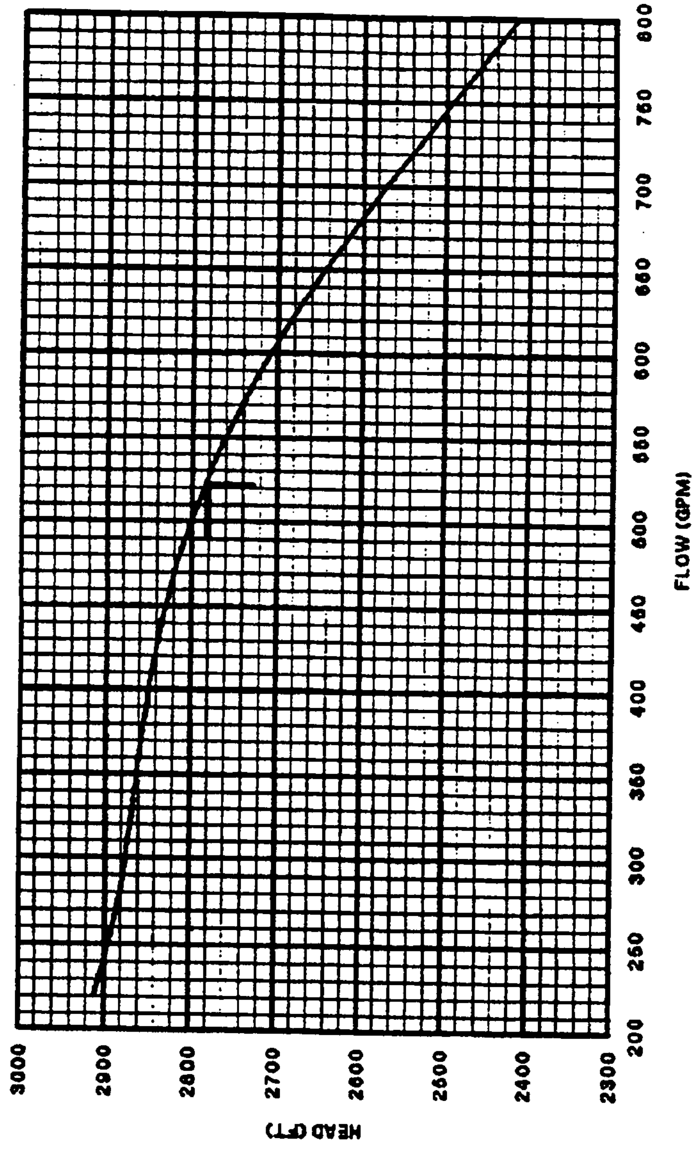
The MOP is at 191 ft at 6000 gpm per Calc. 10080-N-740 (1/26/96). The MOP Curve is derived as 90.30% of the reference pump curve obtained on 4/4/04.

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 521.6 GPM PER CALCULATION 10080-N-664, REV.0 (8/17/93).

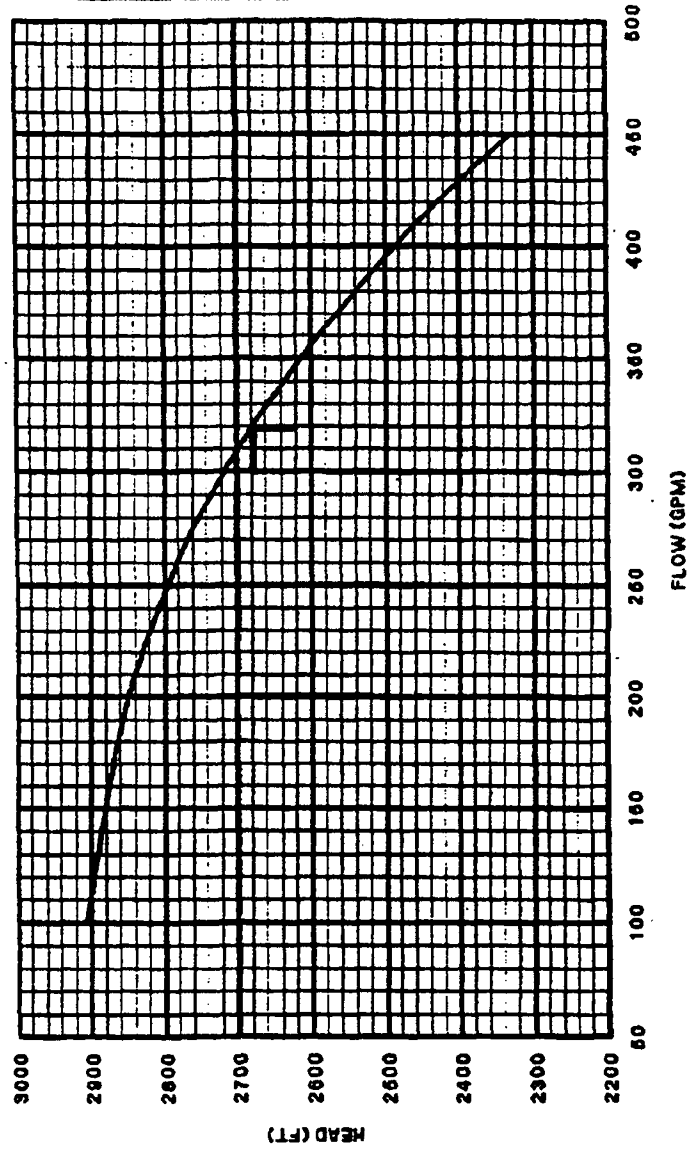
DERIVED AS 94.82% OF THE PUMP PERFORMANCE CURVE OBTAINED ON 5/7/92 (REF: EM 106208 (9/30/93)).

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-884, REV.0 (8/17/93).

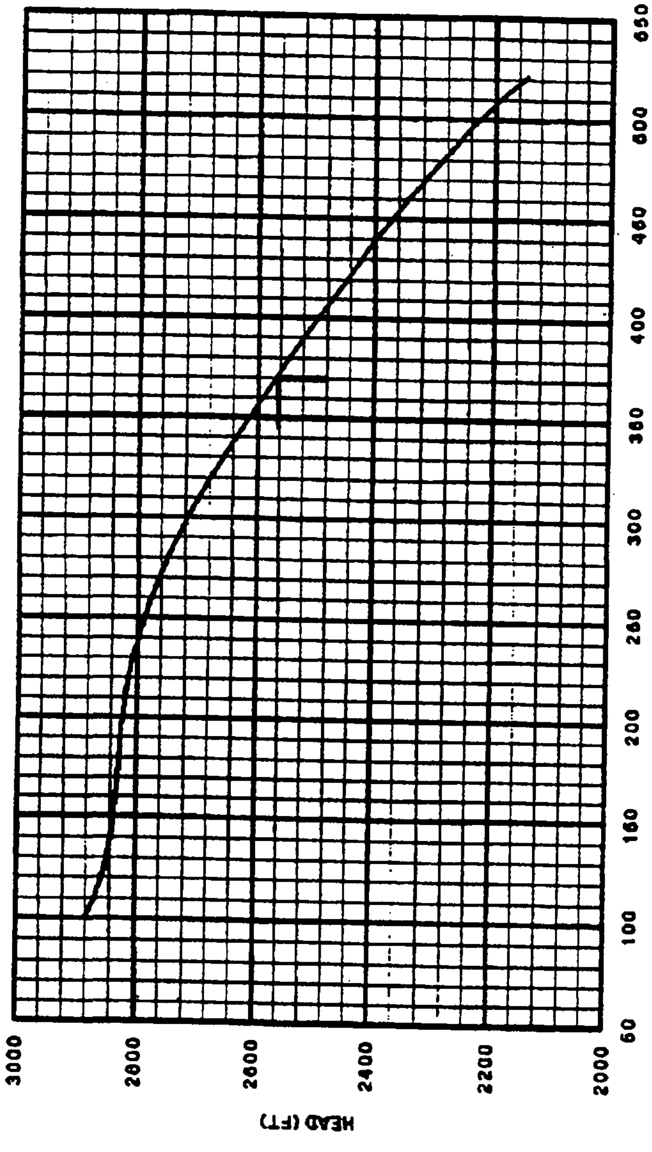
DRIVED AS 95.84% OF THE PUMP PERFORMANCE CURVE OBTAINED ON 6/2/92 (REF: EM 106206 (9/30/93)).

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

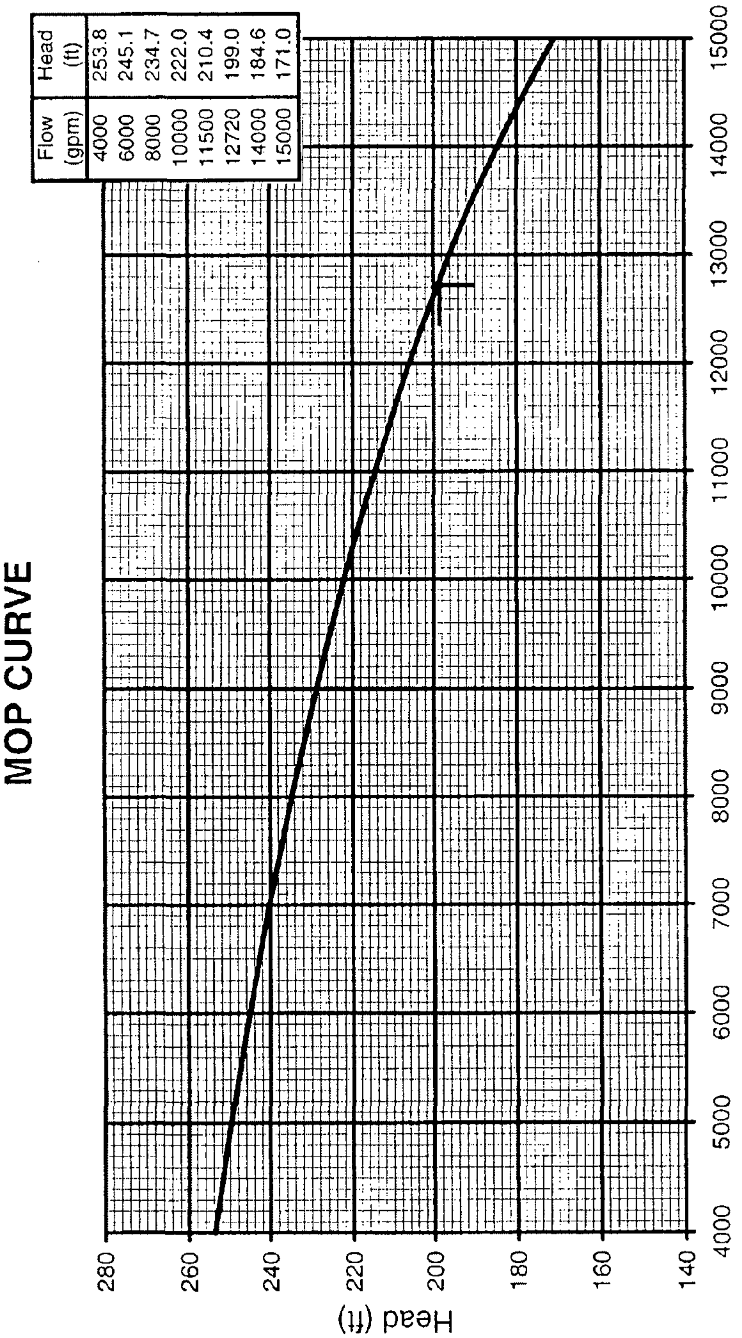


MOP POINT IS AT 2680 FT AT 319 GPM PER CALCULATION 10080-N-684, REV.0 (8/17/93).

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



Flow (gpm)	Head (ft)
4000	253.8
6000	245.1
8000	234.7
10000	222.0
11500	210.4
12720	199.0
14000	184.6
15000	171.0

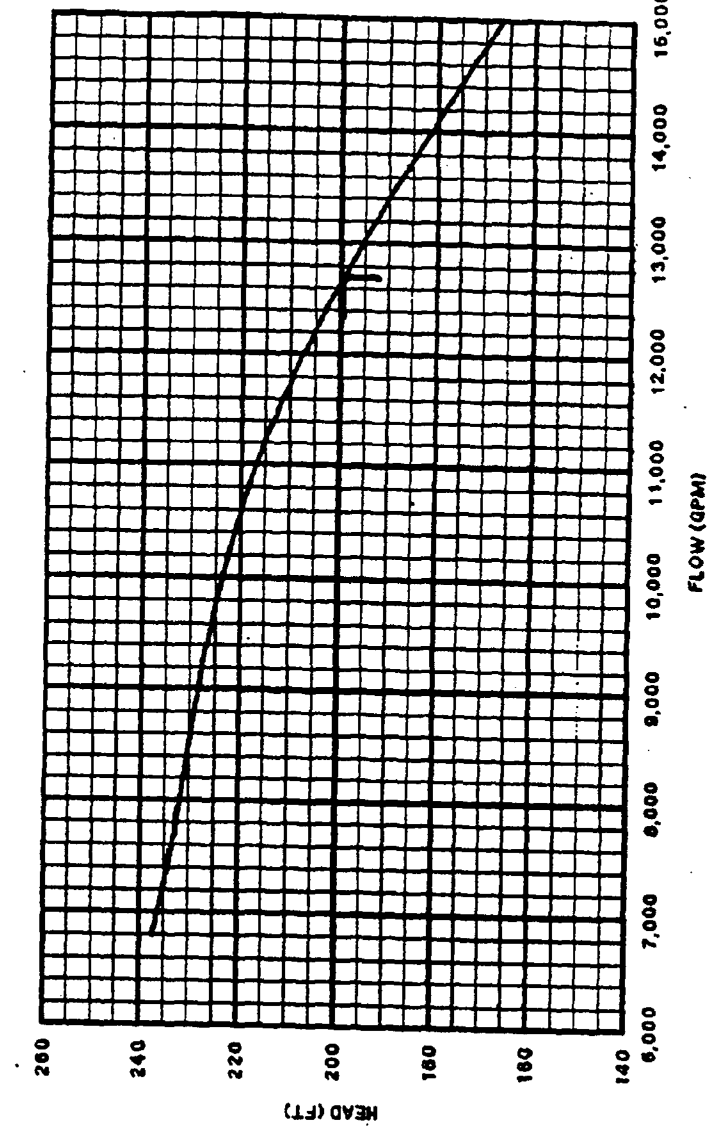
The MOP is at 199 ft at 12720 gpm per Calc. 10080-N-726-0 (7/25/95). The MOP curve is derived as 83.26% of the Manufacturer's Pump Curve.

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

2SWS*P21B
MOP CURVE

MOP CURVE DATA POINTS:

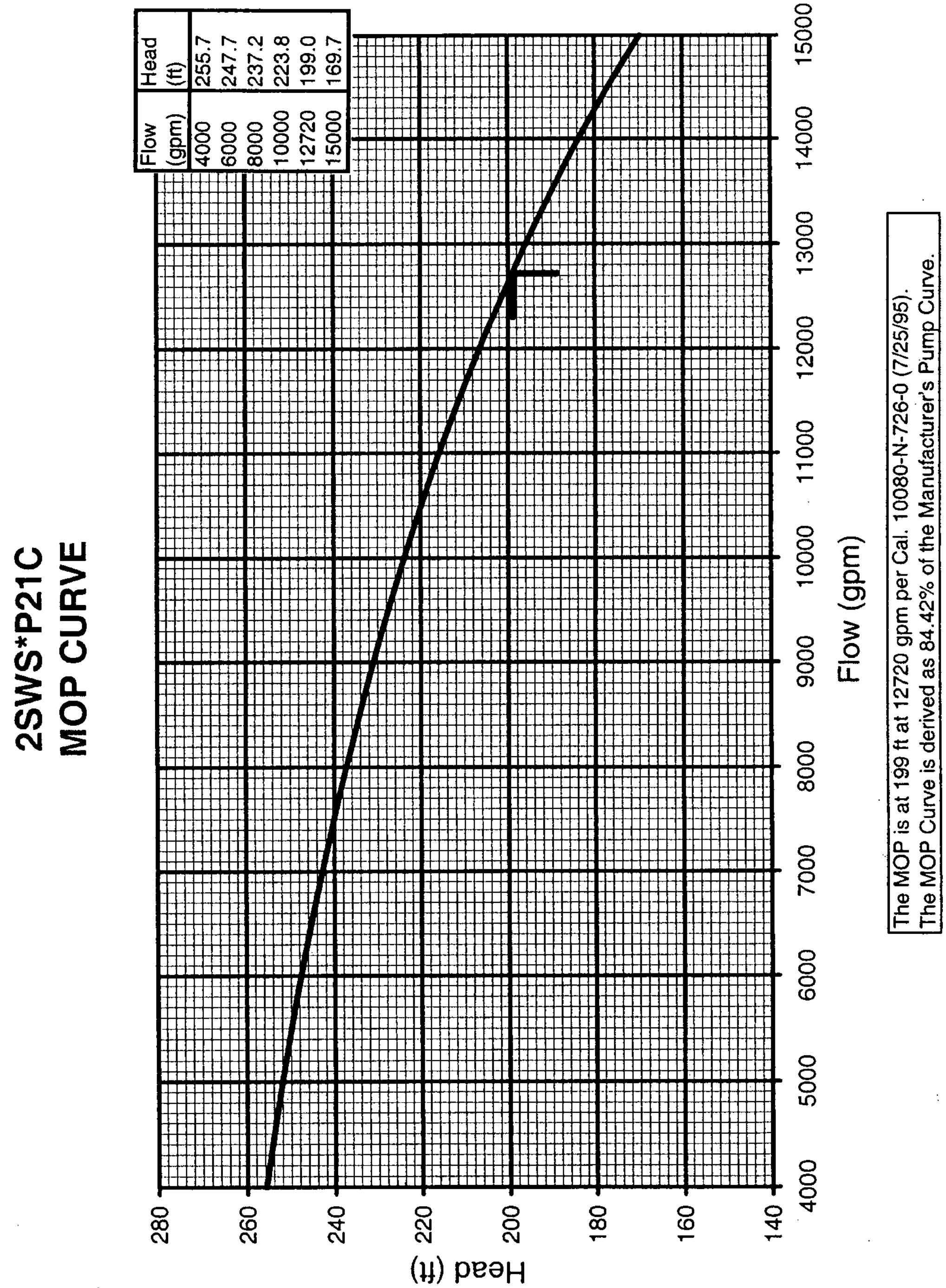
FLOW (GPM)	HEAD (FT.)
6793	237.4
8950	228.5
10914	217.6
12879	197.0
14843	169.0



MOP POINT IS AT 199 FT AT 12720 GPM PER CALCULATION #10080-N-726-0 (7/26/96)

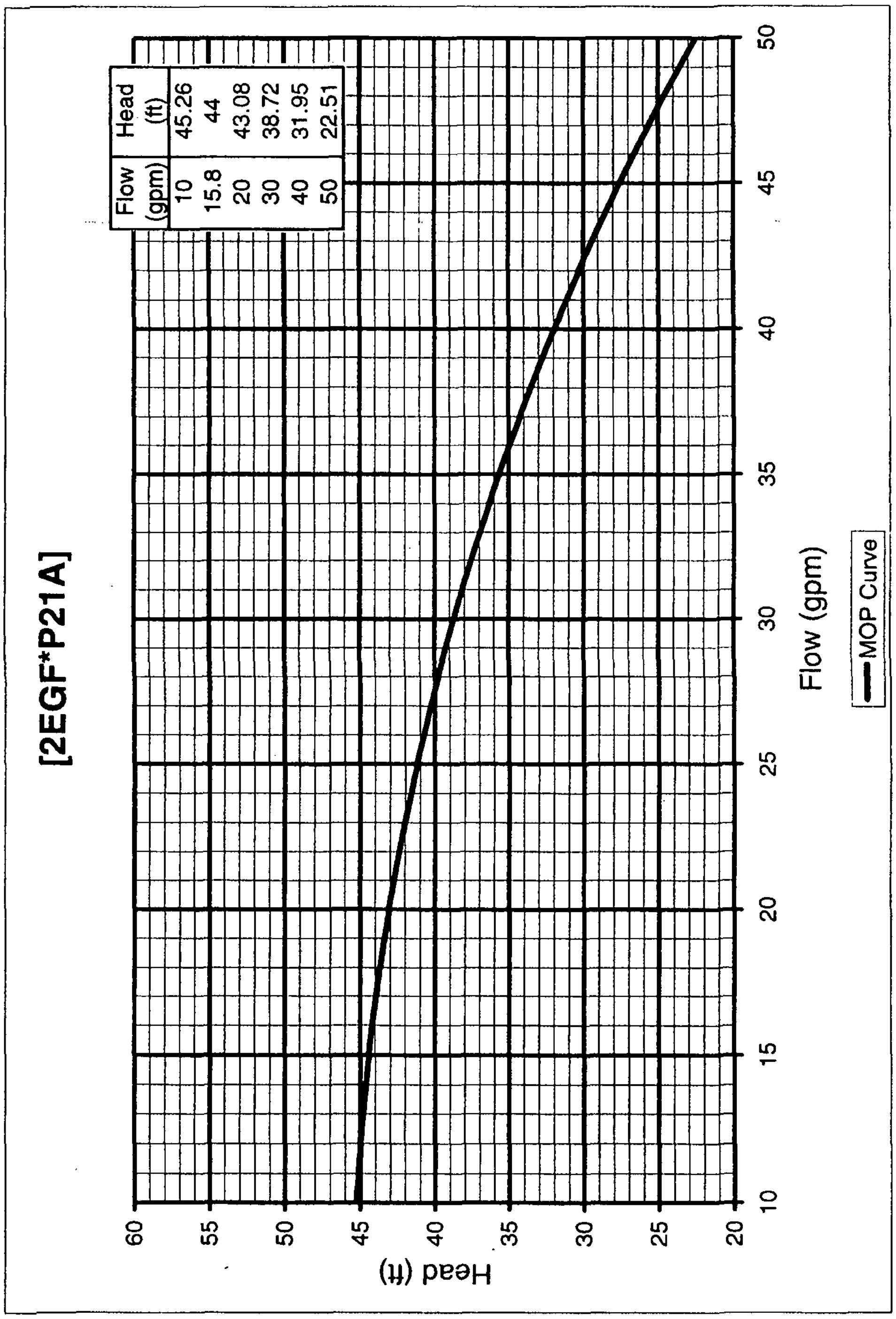
DERIVED AS 81.23% OF PUMP THE PERFORMANCE CURVE OBTAINED ON 6/18/92.

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



Flow (gpm)	Head (ft)
4000	255.7
6000	247.7
8000	237.2
10000	223.8
12720	199.0
15000	169.7

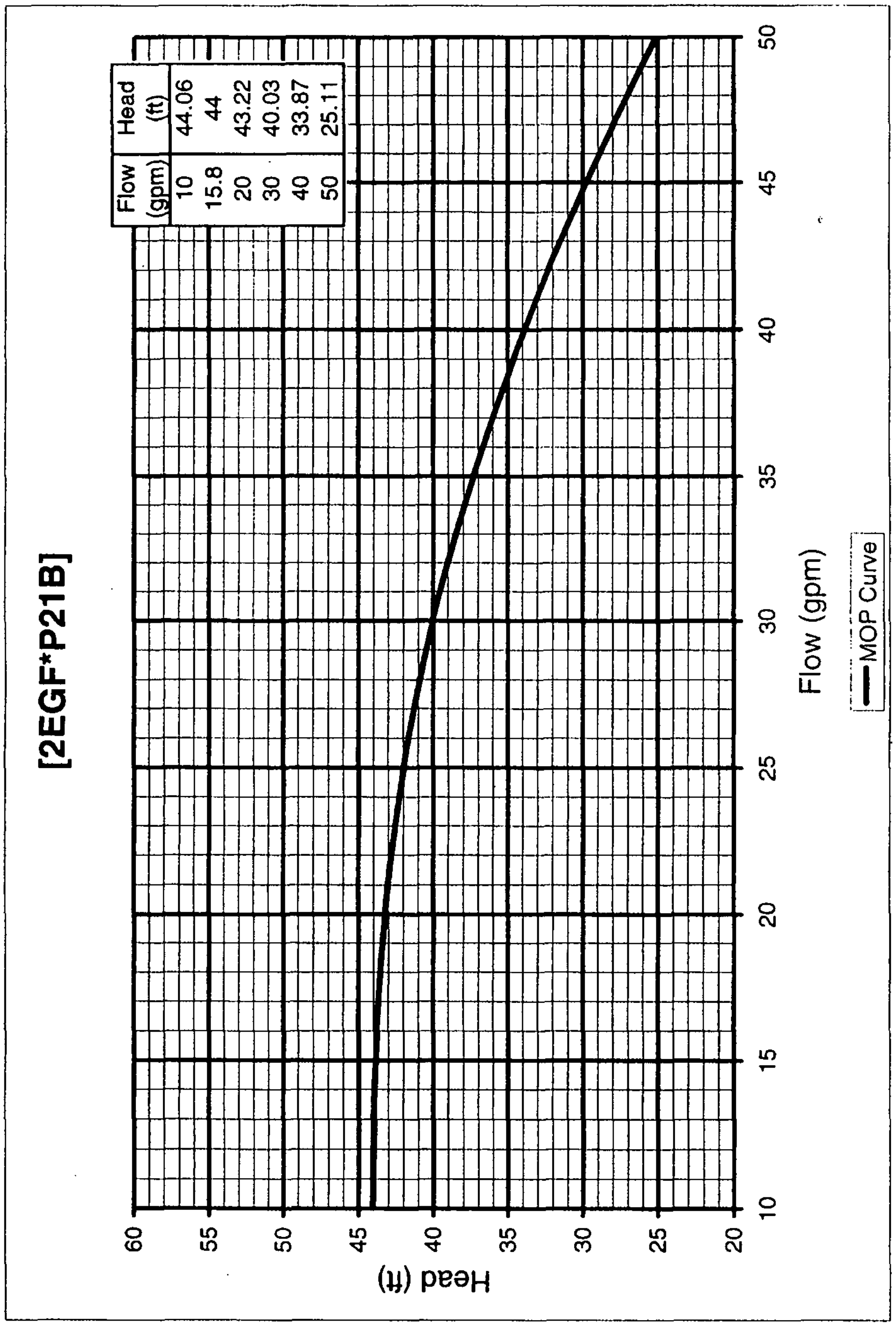
Pump Name: 21A Fuel Oil Transfer Pump **Pump Number:** 2EGF*P21A



Flow (gpm)	Head (ft)
10	45.26
15.8	44
20	43.08
30	38.72
40	31.95
50	22.51

MOP Point is at 44 ft at 15.8 gpm per Calc. 12241-MT-224 (Rev.2, 5/2/03).
MOP Curve is based on Calc. 12241-MT-224 (Rev.2) and ECP-03-0248.

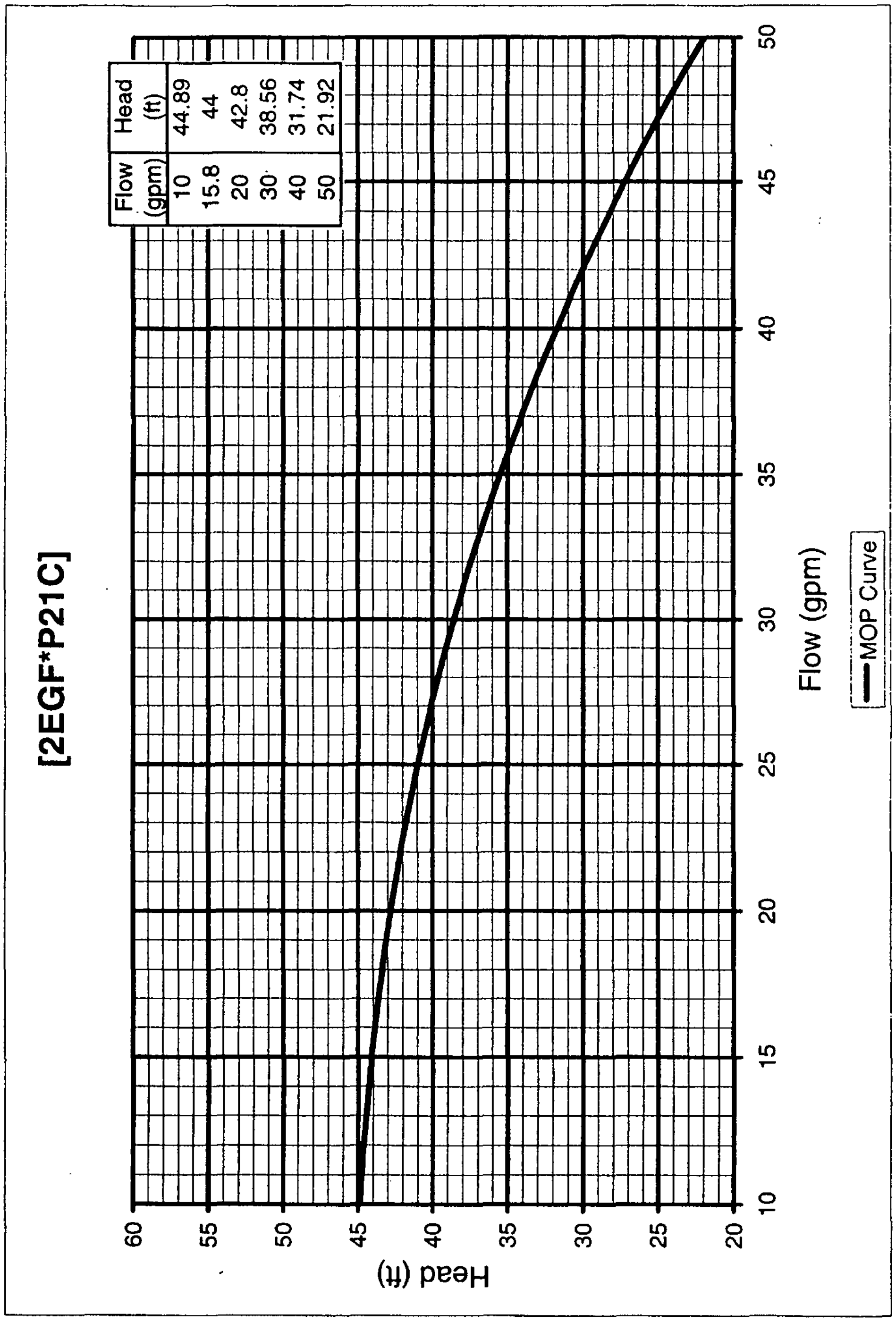
Pump Name: 21B Fuel Oil Transfer Pump **Pump Number:** 2EGF*P21B



Flow (gpm)	Head (ft)
10	44.06
15.8	44
20	43.22
30	40.03
40	33.87
50	25.11

MOP Point is at 44 ft at 15.8 gpm per Calc. 12241-MT-224 (Rev.2, 5/2/03).
MOP Curve is based on Calc. 12241-MT-224 (Rev.2) and ECP-03-0248.

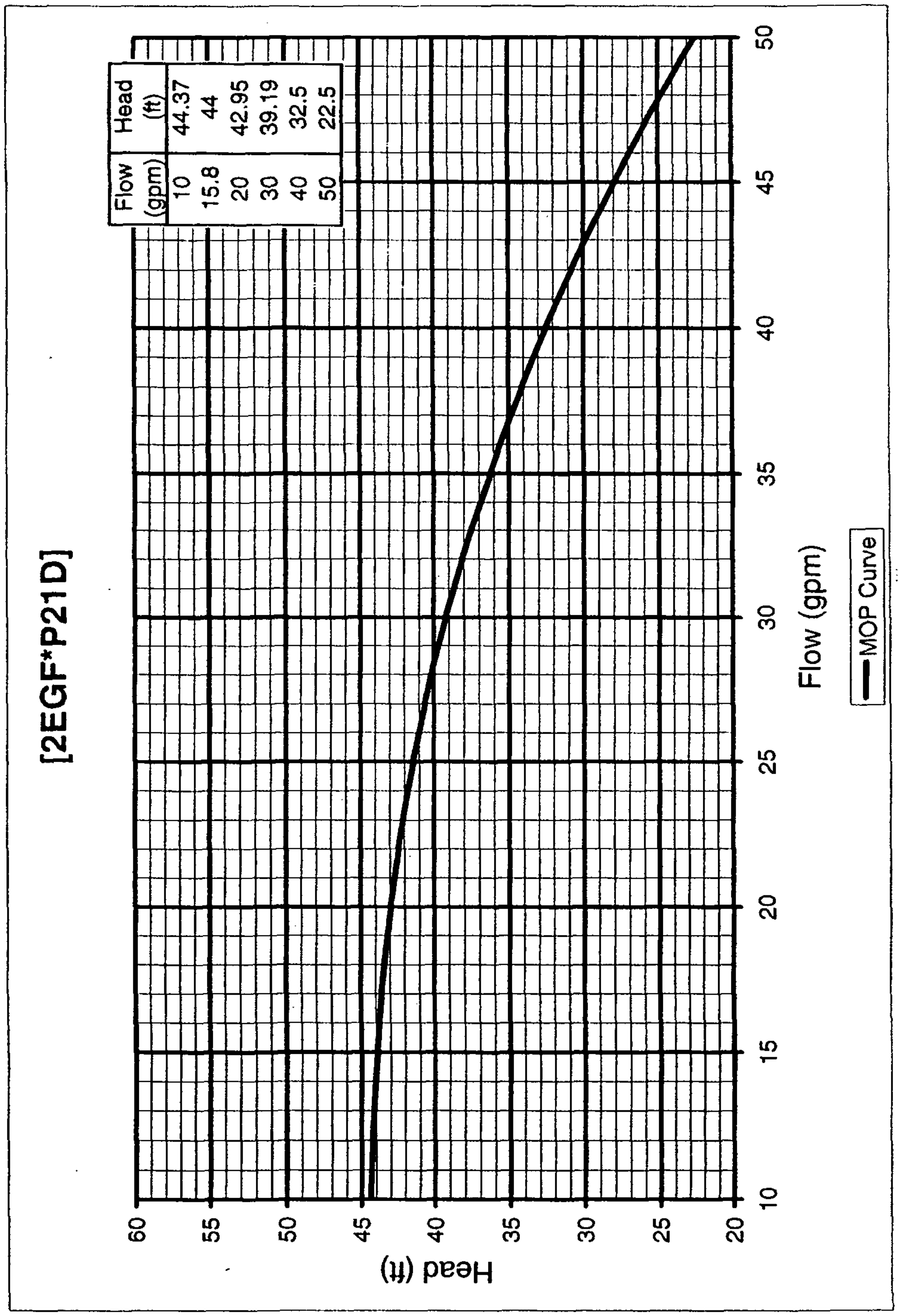
Pump Name: 21C Fuel Oil Transfer Pump **Pump Number:** 2EGF*P21C



Flow (gpm)	Head (ft)
10	44.89
15.8	44
20	42.8
30	38.56
40	31.74
50	21.92

MOP Point is at 44 ft at 15.8 gpm per Calc. 12241-MT-224 (Rev.2, 5/2/03).
MOP Curve is based on Calc. 12241-MT-224 (Rev.2) and ECP-03-0248.

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



MOP Point is at 44 ft at 15.8 gpm per Calc. 12241-MT-224 (Rev.2, 5/2/03).
MOP Curve is based on Calc. 12241-MT-224 (Rev.2) and ECP-03-0248.

SECTION V: 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) OM Code-2001 Edition, Code for Operation and Maintenance of Nuclear Plants, with Addenda through OMb-2003
- Generic Letter No. 89-04, "Guidance on Developing Acceptable Inservice Testing Programs"
- NUREG-1482, Revision 1. "Guidelines for Inservice Testing at Nuclear Power Plants"
- Technical Specification 5.5.4, “Inservice Testing Program”
- Implementation of ASME OM Code Case OMN-1 shall be in accordance with Corrective Maintenance Procedure (CMP) 1/2-CMP-E-75-021 for rising stem MOVs and 1/2CMP-75-Quarrter Turn-1E for butterfly and ball valves. (See Valve Relief Request No. 1, VRR1)
- Implementation of ASME OM Code Case OMN-12 shall be in accordance with Maintenance Instruction (MI) 1/2MI-75-Ultracheck A-1I for all AOVs.

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 safe shutdown condition, in maintaining the safe 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 one or more of the three aforementioned functions at BVPS-2. BVPS-2 is licensed for a safe shutdown of cold shutdown.

Category A and B Valves

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. Power-operated relief valves shall be tested once per fuel cycle per ISCT-3510. 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.

Stroke Time Limits and Testing Requirements for Category A and B Valves

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 an acceptable range and/or 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.

NOTE:	As an alternative to the requirements of paragraph ISTC-5120 of the ASME OM Code-2001 Edition through OMb-2003 Addenda, Code Case OMN-1 "Alternative Rules for Preservice and Inservice Testing of Certain Electric Motor-Operated Valve Assemblies in LWR Power Plants" provides an alternative to MOV stroke time testing requirements.

BVPS-2 shall adopt the alternative test requirements specified in ASME OM Code Case OMN-1 in lieu of stroke timing certain motor operated valves (MOVs) in accordance with the requirements specified in paragraph ISTC-5120 and position indication testing in accordance with the requirements specified in paragraph ISTC-3700. The BVPS MOV Program satisfies the criteria specified in ASME OM Code Case OMN-1 and the conditional acceptance specified in Reg. Guide 1.192, "Operation and Maintenance Code Case Acceptability, ASME OM Code". Paragraph 3.6 of OMN-1 requires MOVs to be full stroke exercised (not timed) to the position(s) required to fulfill their function(s) on an interval not to exceed one year or one refueling cycle (which ever is longer). Full stroke exercising is based on the practicality of exercising during power operation, cold shutdown, or refueling. Justification for extended full stroke exercising of ASME OM Code Case OMN-1 scoped MOVs beyond a quarterly frequency are provided in Sections VII and VIII of the BVPS-2 IST Program. Further guidance regarding the use of ASME OM Code Case OMN-1 is provided in NUREG-1482, Revision 1, Section 4.2.5, "Alternatives to Stoke-Time Testing". Refer to Valve Relief Request VRR1 and 1/2-ADM-2049, "MOV Administration Program" for further discussion regarding the implementation of Code Case OMN-1.

Implementation of ASME OM Code Case OMN-1 for diagnostic testing and stroke timing of MOVs at increased test intervals shall be performed using Corrective Maintenance Procedure (CMP) 1/2-CMP-E-75-021 for rising stem MOVs and 1/2CMP-75-Quarter Turn-1E for butterfly and ball valves.

2. All other power-operated valves (AOV, HYV, SOV, etc.) 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.

NOTE:	As an alternative to the requirements of paragraph ISTC-5130 and ISTC-5140 of the ASME OM Code-2001 Edition through OMb-2003 Addenda, Code Case OMN-12 "Alternative Requirements for Inservice Testing Using Risk Insights for Pneumatically and Hydraulically-Operated Valve Assemblies in LWR Power Plants" provides an alternative to AOV and HOV stroke time testing requirements.

BVPS-2 shall adopt the alternative test requirements specified in ASME OM Code Case OMN-12 in lieu of stroke timing certain air operated valves (AOVs) and hydraulic operated valves (HOVs) in accordance with the requirements specified in paragraphs ISTC-5130 and ISTC-5140 and position indication testing in accordance with the requirements specified in paragraph ISTC-3700. The BVPS AOV Program satisfies the criteria specified in ASME OM Code Case OMN-12 and the conditional acceptance specified in Reg. Guide 1.192, "Operation and Maintenance Code Case Acceptability, ASME OM Code". Paragraphs 4.2.3 and 5.5 of OMN-12 require AOVs and HOVs to be exercised through one full stroke (open and closed) once during each fuel cycle of operation based on the practicality of exercising during power operation, cold shutdown, or refueling. Justification for extended full stroke exercising of ASME OM Code Case OMN-12 scoped AOVs and HOVs beyond a quarterly frequency are provided in Sections VII and VIII of the BVPS-2 IST Program. Further guidance regarding the use of ASME OM Code Case OMN-12 is provided in NUREG-1482, Revision 1, Section 4.2.5, "Alternatives to Stoke-Time Testing". Since Code Case OMN-12 is approved for use with ASME OM Code-2001 Edition per Reg. Guide 1.192, request for relief to use this Code Case is not necessary. Refer to 1/2-ADM-2029, "Air Operated Valve Program" for further discussion regarding the implementation of ASME OM Code Case OMN-12.

Implementation of ASME OM Code Case OMN-12 shall be in accordance with Maintenance Instruction (MI) 1/2MI-75-Ultracheck A-1I for all AOVs.

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 limiting value of full-stroke time is based on the following:

   a. The Technical Specification or License Requirements Manual value.

   b. Containment isolation or 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.

A limiting value of full-stroke time is the calculated maximum allowable valve stroke time limit established to assure that corrective action is taken on a degraded valve before it reaches the point where there is a high probability of failure to perform its safety function if called upon. If a design, Technical Specification, UFSAR, or accident analysis limit exists which is more limiting, then it shall be used as the limiting value of full-stroke time in lieu of the calculated value.

5. Since valves included in OMN-1 are not required to follow the stroke time requirements of ISTC-5120, stroke timing to the position(s) required to fulfill their function(s) will only be performed during diagnostic testing. The stroke times during diagnostic testing will only be compared to a reference value and a limiting value of full-stroke time for trending purposes. Acceptable Range limits specified in ISTC-5122 are not required to be used.

6. Since valves included in OMN-12 are not required to follow the stroke time requirements of ISTC-5130 and ISTC-5140, stroke timing will only be performed during diagnostic testing. The stroke times during diagnostic testing will only be compared to a reference value and a limiting value of full-stroke time for trending purposes. Acceptable Range limits specified in ISTC-5132 and ISTC-5142 are not required to be used.

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 (except where extended per OMN-1 or OMN-12) 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.

Fail-Safe Testing for Category A and B Valves

Fail-safe valves are valves equipped with fail-safe actuators that are required to move to a position to fulfill the intended safety function upon a loss of actuating power (typically instrument air and/or electrical control power). 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 Actions for Category A and B Valves

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 OM Code 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 required 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 required action statements shall be followed.

   c. Nothing in the ASME OM Code shall be construed to supersede the requirements of any technical specification.

2. Valves with measured stroke times which do not meet the acceptance criteria specified in Paragraphs ISTC-5122 (MOVs), ISTC-5132 (AOVs), ISTC-5142 (HOVs), ISTC-5152 (SOVs), or ISTC-5114 (PORVs) (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, 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, 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.

Manual Valves

Although ISTC-3540 permits manual valves to be full-stroke exercised at least once every 5 years, pursuant to 10 CFR 50.55a(b)(3)(vi), manual valves within the IST program scope that perform an active safety function shall be exercised through a complete cycle at least once every 2 years. Exercise testing shall be considered acceptable if valve stem travel exhibits unrestricted movement with no abnormal resistance or binding through one complete cycle. Where practical, process parameters may be utilized to verify obturator movement. However, where process parameters are utilized to verify obturator movement

it is not necessary to be performed simultaneous to manual exercising. This testing methodology is consistent with the discussion provided in NUREG-1482, Rev.1, Section 4.4.4. If a valve fails to exhibit the required change of obturator position, the valve shall immediately declared inoperable.

The use of a valve persuader (cheater) for additional mechanical advantage will not invalidate the test, as it is recognized that larger valves may exhibit increased packing friction and/or increased friction associated with the disk to seat interface. In addition, a valve persuader may be used for personnel safety depending on a valve's service application (i.e. main steam).

Leak Testing

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, are leak rate tested at the frequency specified in Option B of 10CFR50, Appendix J. For other than containment isolation valves with a leakage requirement based on other functions, shall be tested in accordance with ISTC-3630. Example of these other functions are RCS pressure isolation valves, certain owner defined system functions such as inventory preservation, system protection, or flooding protection. 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.

Category C Valves

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.

Safety and Relief Valves

ASME Class 1, 2 and 3 safety and relief valves are tested in accordance with ASME OM Code Appendix I, "Inservice Testing of Pressure Relief Devices in Light-Water Reactor Nuclear Power Plants." 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 system category (i.e., same manufacturer, type (size, model), system application and service media) 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 system category included in the BVPS-2 IST Program tested within any 48 months. A test is defined as a seat tightness test and a set pressure test. 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. Following the as found seat tightness test, a set pressure test shall be performed. If any safety or relief valve fails its 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 system category. If any of the additional valve(s) fail, then all remaining valves in the same system category shall be set pressure tested. A failure is defined as when the as found set pressure (first test actuation) exceeds the greater of either the ±tolerance limit of the Owner-established set pressure acceptance criteria or ±3% of the valve nameplate set pressure. Any safety or relief valve which exceeds its set pressure or leakage test acceptance criteria shall be evaluated for cause and effect then 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. Set point 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. Class 1 thermal relief valves shall be tested in accordance with the requirements of paragraph I-1320 of Appendix I. Class 2 and 3 thermal relief valves shall be tested or replaced every 10 years in accordance with the requirements of paragraph I-1390 of Appendix I. A thermal relief valve is defined as a pressure relief device whose only overpressure protection function is to protect isolated components, systems, or portions of systems from fluid expansion caused by changes in fluid temperature.

Check Valves

NOTE:	In transitioning to ASME OM Code-2001 through OMb-2003 Addenda, each check valve will require exercising to both the open and closed positions regardless of their safety function. Additionally, periodic partial stroke exercising is no longer a Code requirement.

Category C check valves shall be exercised nominally every 3 months, except as provided by ISTC-3522 and ISTC-5221. During operation at power, each check valve shall be exercised or examined in a manner that verifies obturator travel by using the methods in ISTC-5221. Each check valve exercise test shall include an open and closed test. Open and closed tests need only be performed at an interval when it is practicable to perform both tests. Test order (e.g. whether the open test precedes the closed test) shall be determined by BVPS. Open and close tests are not required to be performed at the same time if they are both performed within the same interval.

NOTE:	Bi-directional testing in the non-safety related direction can be performed anytime during the fuel cycle. If testing cannot be performed during operation at power, a Valve Cold Shutdown Justification (VCSJ) or Valve Refueling Outage Justification (VROJ) is not required to support the deferral of testing.

If exercising is not practicable during operation at power, it shall be performed during cold shutdowns. If exercising is not practicable during operation at power and cold shutdowns, it shall be performed during refueling outages. Valves exercised at shutdowns shall be exercised during each shutdown, except as specified in ISTC-3522(e). Such exercise is not required if the interval since the previous exercise is less than 3 months. During extended shutdowns, valves that are required to perform their intended function shall be exercised every 3 months, if practicable. Per ISTC-3522(e), valve exercising shall commence within 48 hours of achieving cold shutdown and continue until all testing is complete or the plant is ready to return to operation at power. For extended outages, testing need not be commenced in 48 hours if all valves required to be tested during cold shutdown will be tested before or as part of plant startup. However, it is not the intent of Subsection ISTC-3522(e) to keep the plant in cold shutdown to complete cold shutdown testing. All valve testing required to be performed during a refueling outage shall be completed before returning the plant to operation at power.

Valves that operate in the course of plant operation at a frequency that would satisfy the exercising requirements of ISTC need not be additionally exercised, provided that the observations otherwise required for testing are made and analyzed during such operation and recorded in the plant record at intervals no greater than specified in ISTC-3510.

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 before placing the system in an operable status, the valves shall be exercised and the schedule followed in accordance with requirements of ISTC.

Per ISTC-5221, check valve obturator movement shall be verified as follows:

Check Valve Flow Exercising

During exercise testing with flow, the necessary obturator movement shall be demonstrated by performing both an open and a close test. [ISTC-5221(a)]

1. Check valves that have a safety function in both the open and close directions shall be exercised by initiating flow and observing that the obturator has traveled to either the full open position or the position required to perform its intended function(s) and verify that on cessation or reversal of flow, the obturator has traveled to its seat.

2. Check valves that have a safety function in only the open direction shall be exercised by initiating flow and observing that the obturator has traveled to either the full open position or the position required to perform its intended function(s) and verify closure.

3. Check valves that have a safety function in only the close direction shall be exercised by initiating flow and observing that the obturator has traveled at least to the partially open position (normal or expected system flow), and verify that on cessation of reversal of flow, the obturator has traveled to the seat.

Observations shall be made by observing a direct indicator (e.g. position indicating device) or other positive means (e.g. changes in system pressure, flow rate, level, temperature, seat leakage testing, or non-intrusive testing results).

Check Valve Mechanical Exercising

If a mechanical exerciser is used to exercise a valve, the force or torque required to move the obturator and fulfill its safety function(s) shall meet the acceptance criteria specified by BVPS-2 [ISTC-5221(b)]. If practicable, the force or torque required to move the obturator and fulfill any non-safety function should be evaluated to detect abnormality or erratic action for corrective action. The following shall be considered when determining acceptance criteria for mechanical exercising:

1. Exercise test(s) shall detect a missing obturator, sticking (closed or open), binding (throughout obturator movement), and the loss of any weight(s). Both an open and close test may not be required.
2. Acceptance criteria shall consider the specific design, application, and historical performance. (A reference opening torque ±50% was used in the previous 10-year interval per OM-10, Paragraph 4.3.2.4(b).)
3. If impracticable to detect a missing obturator or the loss or movement of any weight(s) using a mechanical exerciser, other positive means may be used (e.g., seat leakage tests and visual observations to detect obturator loss and the loss or movement of external weight(s), respectively).

Check Valve Sample Disassembly and Inspection

Per ISTC-5221(c); If the test methods in ISTC-5221(a) (flow exercising) and ISTC-5221(b)

(mechanical exercising) are impractical for certain check valves, or if sufficient flow cannot be achieved or verified, a sample disassembly and inspection program shall be used to verify obturator movement. If maintenance is performed on one of these valves that could affect its performance, the post-maintenance testing shall be conducted in accordance with ISTC-5221(c)(4).

Check valves that will be disassembled and inspected shall be grouped by similar design, application, and service condition and require a periodic examination of one valve from group each refueling outage. The details and bases of the sampling program shall be documented and recorded in the test plan. The following shall be considered when implementing a sample disassembly and inspection program:

4. Grouping of check valves for the sample disassembly and inspection program shall be technically justified and shall consider, as a minimum, valve manufacturer, design, service, size, materials of construction, and orientation. [ISTC-5221(c)(1)]

   Maintenance and modification history should be considered in the grouping process. Valve groupings should also consider potential flow instabilities, required degree of disassembly, and the need for tolerance or critical dimension checks.

5. During the disassembly process, the full stroke motion of the obturator shall be verified. Full stroke motion of the obturator shall be verified immediately prior to completing reassembly. Check valves that have their obturator disturbed before full stroke motion is verified shall be examined to determine if a condition exists that could prevent full opening or reclosure of the obturator. Examples of valves that could have their obturators disturbed prior to verifying full stroke motion include; spring loaded check valves or check valves with the obturator supported from the bonnet. [ISTC-5221(c)(2)]

6. At least one valve from each group shall be disassembled and inspected each refueling outage; and all valves in the group be disassembled and inspected at least once every 8 years. [ISTC-5221(c)(3)]

7. Before return to service, valves that were disassembled for examination or that received maintenance that could affect their performance, shall be exercised full- or part-stroke, if practicable, with flow in accordance with ISTC-3520. Those valves shall also be tested for other requirements (e.g., closure verification or leak rate testing) before returning them to service. [ISTC-5221(c)(4)]

Check Valve Condition Monitoring

As an alternative to the requirements of paragraphs ISTC-3510, ISTC-3520, ISTC-3530, ISTC-3550, and ISTC-5221, BVPS-1 may establish a Check Valve Condition Monitoring (CVCM) Program per ISTC-5222. The purpose of this program is to both (a) improve check valve performance and to (b) optimize testing, examination, and preventive maintenance activities in order to maintain the continued acceptable performance of a select group of check valves. BVPS-1 may implement this program on a valve or a group of similar valves basis.

Examples of candidates for (a) improved valve performance are check valves that:

- have an unusually high failure rate during inservice testing or operations
- cannot be exercised under normal operating conditions or during shutdown
- exhibit unusual, abnormal, or unexpected behavior during exercising or operation
- the Owner elects to monitor for improved valve performance

Examples of candidates for (b) optimization of testing, examination, and preventive maintenance activities are check valves with documented acceptable performance that:

- have had their performance improved under the Check Valve Condition Monitoring Program
- cannot be exercised or are not readily exercised during normal operating conditions or during shutdowns
- can only be disassembled and examined
- the Owner elects to optimize all the associated activities of the valve or valve group in a consolidated program.

The program shall be implemented in accordance with Appendix II, "Check Valve Condition Monitoring Program", of OMb-2003 Addenda, a site administrative procedure (1/2-ADM-2118, "Check Valve Condition Monitoring Program"), and site implementing procedures which perform the specified tests identified in the individual Check Valve Condition Monitoring (CVCM) Program Plans.

If the Appendix II CVCM Program for a valve or group of valves is discontinued, then the requirements of ISTC-3510, ISTC-3520, ISTC-3530, ISTC-3550, and ISTC-5221 shall be implemented.

Corrective Actions for Category C Check Valves

If a check valve fails to exhibit the required change of disk position by any testing method above, 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 required 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 required action statements shall be followed.
3. Corrective action (i.e., Order) shall be initiated immediately for the check valve's repair or replacement.
4. Nothing in the ASME OM Code shall be construed to supersede the requirements of any technical specification.
5. Check valves in a sample disassembly program that are not capable of full-stroke movement (i.e., due to binding) or have failed or have unacceptably degraded valve internals, shall have the cause of the failure analyzed and the condition corrected. Other check valves in the sample group that may also be affected by this failure mechanism shall be examined or tested during the same refueling outage to determine the condition of internal components and their ability to function.

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

Category D Valves

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.

Valve Inservice Test Requirements

All the inservice testing requirements for each different category of valve in the IST Program are summarized in Table ISTC-3500-1. This table lists the paragraphs of the ASME OM Code that apply to each different type of valve.

Table ISTC-3500-1

Valve Inservice Test Requirements

Category	Valve Function	Leakage Test Proc/ Frequency	Exercise Test Proc/ Frequency	Special Test Procedure[1]	Position Indication Verification and Frequency
A	Active	ISTC-3600	ISTC-3510	None	ISTC-3700
A	Passive	ISTC-3600	None	None	ISTC-3700
B	Active	None	ISTC-3510	None	ISTC-3700
B	Passive	None	None	None	ISTC-3700
C[3] (Safety/Relief)	Active	[Notes (2),(3)]	ISTC-5230 ISTC-5240	None	ISTC-3700
C[4] (Check)	Active	[Notes (3)]	ISTC-3510	None	ISTC-3700
D	Active	[Notes (3)]	None	ISTC-5250 ISTC-5260	None

Notes:

(1) Note additional requirements for fail-safe valves, ISTC-3560.

(2) Leak test as required for Appendix I

(3) When more than one distinguishing category characteristic is applicable, all requirements for each of the individual categories are applicable, although the duplication or repetition of common testing requirements is not necessary.

(4) If a "check" valve used for a pressure relief device is capacity certified, then it shall be classified as a pressure or vacuum relief device. If a check valve used to limit pressure is not capacity certified, then it shall be classified as a check valve.

Active valves are valves which are required to change obturator position to accomplish a specific function for accident mitigation or achieving/maintaining safe shutdown. Active may also refer to a particular valve position with respect to safety function.

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 Tables except where leakage testing or remote position verification is required.

Certain exemptions from the valve testing requirements of the ASME OM Code defined by Paragraph ISTC-1200 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.

5. Skid-mounted valves are excluded from Subsection ISTC, provided they are tested as part of the major component and are justified by BVPS to be adequately tested. Further discussion pertaining to skid-mounted valves and component subassemblies is provided in NUREG-1482, Rev.1, Sections 3.4 and 4.1.10. Skid-mounted valves are valves which are integral to or that support operation of major components, even though these pumps and valves may not be located on the skid. In general, these valves are supplied by the manufacturer of the major component. Examples include: steam admission and trip throttle valves for turbines, and solenoid operated pilot valves used to control air operated valves.

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 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.

Records and Reports

Records of the results of inservice tests and corrective actions as required by ISTC-9000 are maintained in computerized or in tabular form. Stroke times of valves will be reviewed for developing trends.

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

Valve Tables

The "Valve Tables" section is a table listing of all the valves in the IST Program, their system code class and category, whether they are active or passive, their size, valve type, actuator type, drawing number and coordinates, normal, safety and fail-safe positions, required test and frequency, specific cold shutdown justifications, refueling outage justifications and/or relief request reference numbers, test procedure numbers and remarks.

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 ISTC-1300.

3. Whether the valve is Active or Passive will be identified in accordance with the guidelines in ISTA-2000.

4. The type of valve (i.e., globe, gate, butterfly, ball, check, safety, relief, etc.) will be specified. From the valve ID number given, the type of valve actuator can be determined from the following abbreviations:

   AOV - Air Operated Valve
   FCV - Flow Control Valve
   HCV - Hand Control Valve
   HYV - Hydraulic Operated 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)

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

6. The normal, safety and fail-safe positions will be listed using the following abbreviations:

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

   The normal position applies to operation at power and in most cases will be the normal system arrangement (NSA) position listed in the applicable Operating Manual. The safety position is the position the valve is required to be in to fulfill its safety function. The fail-safe position is the position the valve is required to be in to fulfill its intended safety function upon a loss of actuating power.

7. The required test will be listed using the following abbreviations:

ST-O	Stroke Time Open in Safety Direction
ST-S	Stroke Time Shut in Safety Direction
FS-O	Fail-Safe Test in Open Safety Direction
FS-S	Fail-Safe Test in Shut Safety Direction
ET	Exercise Test (Full Stroke Cycle – Open and Shut) of OMN-1 or OMN-12 Valves
DIAG-ST-O	OMN-1 or OMN-12 Diagnostic Test Open in Safety Direction
DIAG-ST-S	OMN-1 or OMN-12 Diagnostic Test Shut in Safety Direction
CV-O	Stroke Check Valve Open in Safety Direction
CV-S	Stroke Check Valve Shut in Safety Direction
CV-S-LT	Stroke Check Valve Shut by Leak Test in Safety Direction
CV-ME	Stroke Check Valve Open and Shut using a Mechanical Exerciser on the External Weight Arm
CV-BDT-O	Stroke Check Valve Open in non-Safety Direction

CV-BDT-S	Stroke Check Valve Shut in non-Safety Direction
CV-DIS	Disassemble & Inspect Check Valve in Both (Open and Shut) Directions
PMT	Post-Maintenance Test Following Disassembly and Inspection of a Check Valve
MAN	Full-Stroke Manual Valve in Both (Open and Shut) Directions
MAN-O	Full-Stroke Manual Valve Open
MAN-S	Full Stroke Manual Valve Shut
LM	Leakage Monitoring
LT	Leak Test
LTJ	Leak Test (10CFR50 Appendix J, Option B / Type-C)
SPT	Set point Test
RPV	Remote Position Verification (Required every 2 years or at the frequency requirements of OMN-1 and OMN-12. Some valves may require RPV every 18 months per Tech Spec 3.3.3.3(16)).

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

9. The required frequency, specific test procedure number, and any remarks 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
M	Monthly Frequency
Q	Quarterly Frequency
CSD	Cold Shutdown Frequency
R	Refueling Frequency
SP	Special Frequency
MO	Required every __ months
YR	Required every __ years
RFO	Required every __ refueling outages
NSO	During "Normal System Operation" (continuously, intermittently, but at a minimum of once each cycle when the valve operates during the course of plant operation per ISCT-3550)
CVCM	At the frequency specified by the Check Valve Condition Monitoring (CVCM) Program Plan
OMN-1	MOV testing requirements per ASME OM Code Case OMN-1
OMN-12	AOV testing requirements per ASME OM Code Case OMN-12

Valve Cold Shutdown Justifications

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. Since the radiation levels and air temperatures inside containment are higher than normal during power operation, this would involve higher radiological dose rates and heat stress risk to plant personnel. This presents a working environment for station personnel that is not considered practicable for quarterly surveillance testing on a routine basis while on-line. Therefore, surveillance testing that requires a reactor containment entry will be performed at cold shutdown and refueling. Per ISTC-3521(g) and

ISTC-3522(e), 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.

Valve Refueling Outage Justifications

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.

Valve Relief Requests

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 VI: VALVE TABLES

Beaver Valley Power Station Unit 2 IST Program

VALVE TABLE

SYSTEM NAME: Reactor Coolant **SYSTEM NUMBER:** 06

Valve ID / Name	Class	Cat.	Active / Passive	Size (in.)	Valve Type	Actuator Type	Drawing & Coord	Position Normal	Position Safety	Position Fail-Safe	Required Test	Frequency	Code Dev.	Procedure	Remarks
2RCS*68	2	A/C	Active	2.5	Check		6-2 (E-2)	S	S		LTJ	SP		2BVT 1.47.5	
PZR. RLF. TK NITROGEN SUPPLY CHECK											CV-S	R	VROJ - 01	2OST-1.10	By observation of external weight arm to close
											CV-BDT-O	NSO		2OM-52.4.R.2.F	During station S/D
2RCS*72	2	A/C	Active	3	Check		6-2 (F-2)	S	S		LTJ	SP		2BVT 1.47.5	
PZR. RLF. TK SPRAY LINE CHECK											CV-S	R	VROJ - 02	2OST-1.10	By observation of external weight arm to close
											CV-BDT-O	NSO		2OM-52.4.R.2.F	During station S/D
2RCS*AOV101	2	A	Active	0.75	Diaphragm	AOV	6-2 (E-1)	S	S	S	LTJ	SP		2BVT 1.47.5	
PZR. RLF. TK NITROGEN ISOLATION											FS-S	Q		2OST-47.3J	
											ST-S	Q		2OST-47.3J	
											RPV	2YR/18MO		2OST-47.3J	18 months per Tech Specs
2RCS*AOV519	2	A	Active	3	Diaphragm	AOV	6-2 (F-1)	S	S	S	LTJ	SP		2BVT 1.47.5	
PRI. WTR. TO PZR. RLF. TK & SEAL VENT POTS											FS-S	Q		2OST-47.3J	
											ST-S	Q		2OST-47.3J	
											RPV	2YR/18MO		2OST-47.3J	18 months per Tech Specs
2RCS*HCV250A	2	B	Active	1	Globe	HCV	6-2 (G-6)	S	O/S	S	FS-S	CSD or R	VROJ - 03	2OST-6.9	
REACTOR VESSEL VENT PIPING TRAIN A											ST-O	CSD or R	VROJ - 03	2OST-6.9	
											ST-S	CSD or R	VROJ - 03	2OST-6.9	
											RPV	2YR		2OST-6.9	
2RCS*HCV250B	2	B	Active	1	Globe	HCV	6-2 (G-6)	S	O/S	S	FS-S	CSD or R	VROJ - 03	2OST-6.9	
REACTOR VESSEL VENT PIPING TRAIN B											ST-O	CSD or R	VROJ - 03	2OST-6.9	
											ST-S	CSD or R	VROJ - 03	2OST-6.9	
											RPV	2YR		2OST-6.9	
2RCS*MOV535	1	B	Active	1	Gate	MOV	6-1 (F-2)	O	O/S		ET	Q		2OST-6.6	Per OMN-1
(2RCS*PCV455C) ISOLATION											DIAG-ST-O	3RFO		1/2-CMP-E-75-021	Per OMN-1
											DIAG-ST-S	3RFO		1/2-CMP-E-75-021	Per OMN-1
											RPV	3RFO		1/2-CMP-E-75-021	Per OMN-1

Beaver Valley Power Station Unit 2 IST Program

VALVE TABLE

SYSTEM NAME: Reactor Coolant **SYSTEM NUMBER:** 06

Valve ID / Name	Class	Cat.	Active / Passive	Size (in.)	Valve Type	Actuator Type	Drawing & Coord	Position Normal	Position Safety	Position Fail-Safe	Required Test	Frequency	Code Dev.	Procedure	Remarks
2RCS*MOV536	1	B	Active	1	Gate	MOV	6-1 (E-2)	O	O/S		ET	CSD or R		2OST-6.6	Per OMN-1
(2RCS*PCV456) ISOLATION											DIAG-ST-O	3RFO		1/2-CMP-E-75-021	Per OMN-1
											DIAG-ST-S	3RFO		1/2-CMP-E-75-021	Per OMN-1
											RPV	3RFO		1/2-CMP-E-75-021	Per OMN-1
2RCS*MOV537	1	B	Active	1	Gate	MOV	6-1 (F-2)	O	O/S		ET	CSD or R		2OST-6.6	Per OMN-1
(2RCS*PCV455D) ISOLATION											DIAG-ST-O	3RFO		1/2-CMP-E-75-021	Per OMN-1
											DIAG-ST-S	3RFO		1/2-CMP-E-75-021	Per OMN-1
											RPV	3RFO		1/2-CMP-E-75-021	Per OMN-1
2RCS*PCV455C	1	B	Active	3	Globe	PCV	6-1 (F-1)	A	O/S	S	FS-S	R		2OST-6.8	
PZR. POWER RELIEF											ST-O	R		2OST-6.8	
											ST-S	R		2OST-6.8	
											RPV	2YR		2OST-6.8	
2RCS*PCV455D	1	B	Active	3	Globe	PCV	6-1 (F-1)	A	O/S	S	FS-S	R		2OST-6.8	
PZR. POWER RELIEF											ST-O	R		2OST-6.8	
											ST-S	R		2OST-6.8	
											RPV	2YR		2OST-6.8	
2RCS*PCV456	1	B	Active	3	Globe	PCV	6-1 (E-1)	A	O/S	S	FS-S	R		2OST-6.8	
PZR. POWER RELIEF											ST-O	R		2OST-6.8	
											ST-S	R		2OST-6.8	
											RPV	2YR		2OST-6.8	
2RCS*RV100	2	A/C	Active	0.75x1	Relief	RV	6-2 (G-2)	S	O/S		LTJ	SP		2BVT 1.47.5	
PRI. WTR. TO PZR. RLF. TK THERMAL RELIEF											SPT	10YR		2BVT 1.60.5	
2RCS*RV551A	1	C	Active	6x6	Safety	RV	6-1 (D-3)	S	O/S		SPT	5YR		2BVT 1.60.5	
PRESSURIZER SAFETY															
2RCS*RV551B	1	C	Active	6x6	Safety	RV	6-1 (D-3)	S	O/S		SPT	5YR		2BVT 1.60.5	
PRESSURIZER SAFETY															
2RCS*RV551C	1	C	Active	6x6	Safety	RV	6-1 (D-4)	S	O/S		SPT	5YR		2BVT 1.60.5	
PRESSURIZER SAFETY															

Beaver Valley Power Station Unit 2 IST Program

VALVE TABLE

SYSTEM NAME: Reactor Coolant **SYSTEM NUMBER:** 06

Valve ID / Name	Class	Cat.	Active / Passive	Size (in.)	Valve Type	Actuator Type	Drawing & Coord	Position Normal	Position Safety	Position Fail-Safe	Required Test	Frequency	Code Dev.	Procedure	Remarks
2RCS*SOV200A	1	B	Active	1	Globe	SOV	6-2 (E-6)	S	O/S	S	FS-S	CSD or R	VROJ - 03	2OST-6.9	
REACTOR VESSEL VENT PIPING UPSTREAM ISOLATION TRAIN A											ST-O	CSD or R	VROJ - 03	2OST-6.9	
											ST-S	CSD or R	VROJ - 03	2OST-6.9	
											RPV	2YR		2OST-6.9	
2RCS*SOV200B	1	B	Active	1	Globe	SOV	6-2 (F-6)	S	O/S	S	FS-S	CSD or R	VROJ - 03	2OST-6.9	
REACTOR VESSEL VENT PIPING UPSTREAM ISOLATION TRAIN B											ST-O	CSD or R	VROJ - 03	2OST-6.9	
											ST-S	CSD or R	VROJ - 03	2OST-6.9	
											RPV	2YR		2OST-6.9	
2RCS*SOV201A	1	B	Active	1	Globe	SOV	6-2 (E-6)	S	O/S	S	FS-S	CSD or R	VROJ - 03	2OST-6.9	
REACTOR VESSEL VENT PIPING DOWNSTREAM ISOLATION TRAIN A											ST-O	CSD or R	VROJ - 03	2OST-6.9	
											ST-S	CSD or R	VROJ - 03	2OST-6.9	
											RPV	2YR		2OST-6.9	
2RCS*SOV201B	1	B	Active	1	Globe	SOV	6-2 (F-6)	S	O/S	S	FS-S	CSD or R	VROJ - 03	2OST-6.9	
REACTOR VESSEL VENT PIPING DOWNSTREAM ISOLATION TRAIN B											ST-O	CSD or R	VROJ - 03	2OST-6.9	
											ST-S	CSD or R	VROJ - 03	2OST-6.9	
											RPV	2YR		2OST-6.9	

Beaver Valley Power Station Unit 2 IST Program

VALVE TABLE

SYSTEM NAME: Chemical and Volume Control (Charging & HHSI) **SYSTEM NUMBER:** 07

Valve ID / Name	Class	Cat.	Active / Passive	Size (in.)	Valve Type	Actuator Type	Drawing & Coord	Position Normal	Position Safety	Position Fail-Safe	Required Test	Frequency	Code Dev.	Procedure	Remarks
2CHS*136	2	C	Active	2	Check		7-2 (F-8)	S	O		CV-BDT-S	CVCM		2BVT 1.47.11	Per CVCM Program
BORIC ACID TO CHG PP SUCT CHECK											CV-O	CSD	VCSJ - 01	2OST-7.13	
2CHS*141	2	C	Active	2	Check		7-2 (F-9)	S	O		CV-BDT-S	CVCM		2BVT 1.47.11	Per CVCM Program
EMER BORATION CHECK											CV-O	CSD	VCSJ - 01	2OST-7.13	
2CHS*152	2	C	Active	2	Check		7-1A (E-3)	O/S	O		CV-BDT-S	Q		2OST-7.5	
CHG PP 21A MINI-FLOW CHECK											CV-BDT-S	Q		2OST-7.6	
											CV-O	Q		2OST-7.4	
2CHS*153	2	C	Active	2	Check		7-1A (C-3)	O/S	O		CV-BDT-S	Q		2OST-7.4	
CHG PP 21B MINI-FLOW CHECK											CV-BDT-S	Q		2OST-7.6	
											CV-O	Q		2OST-7.5	
2CHS*154	2	C	Active	2	Check		7-1A (D-3)	O/S	O		CV-BDT-S	Q		2OST-7.5	
CHG PP 21C MINI-FLOW CHECK											CV-BDT-S	Q		2OST-7.4	
											CV-O	Q		2OST-7.6	
2CHS*22	2	C	Active	3	Check		7-1A (E-3)	O/S	O/S		CV-O	R	VROJ - 04	2OST-11.14B	
CHG PP 21A DISCH CHECK											CV-S	R	VROJ - 04	2OST-11.14B	
											CV-S	Q		2OST-7.6	
											CV-S	Q		2OST-7.5	
2CHS*23	2	C	Active	3	Check		7-1A (C-3)	O/S	O/S		CV-O	R	VROJ - 04	2OST-11.14B	
CHG PP 21B DISCH CHECK											CV-S	R	VROJ - 04	2OST-11.14B	
											CV-S	Q		2OST-7.6	
											CV-S	Q		2OST-7.4	
2CHS*24	2	C	Active	3	Check		7-1A (D-3)	O/S	O/S		CV-O	R	VROJ - 04	2OST-11.14B	
CHG PP 21C DISCH CHECK											CV-S	R	VROJ - 04	2OST-11.14B	
											CV-S	Q		2OST-7.5	
											CV-S	Q		2OST-7.4	

Beaver Valley Power Station Unit 2 IST Program

VALVE TABLE

SYSTEM NAME: Chemical and Volume Control (Charging & HHSI) **SYSTEM NUMBER:** 07

Valve ID / Name	Class	Cat.	Active / Passive	Size (in.)	Valve Type	Actuator Type	Drawing & Coord	Position Normal	Position Safety	Position Fail-Safe	Required Test	Frequency	Code Dev.	Procedure	Remarks
2CHS*31 CHARGING HEADER ISOL CHECK	2	A/C	Active	3	Check		7-1A (C-1)	O	O/S		CV-S	R	VROJ - 05	2BVT 1.47.11	By observation of external weight arm to close
											CV-O	Q		2OST-7.6	
											CV-O	Q		2OST-7.4	
											CV-O	Q		2OST-7.5	
											LT	2YR		2BVT 1.47.11	
2CHS*472 LOOP FILL CNMT ISOL CHECK	2	A/C	Passive	2.5	Check		7-1A (G-3)	S	S		LT	2YR		2BVT 1.47.11	
2CHS*473 SEAL STR RETURN CNMT ISOL CHECK	2	A/C	Active	2.5	Check		7-3 (E-8)	S	O/S		LTJ	SP		2BVT 1.47.5	
											CV-ME	CSD or R	VROJ - 13	2OST-1.10	
2CHS*474 RCP 21A SEAL SUPPLY CONTAINMENT CHECK	2	A/C	Active	2.5	Check		7-3 (B-4)	O	S		CV-S	R	VROJ - 14	2BVT 1.47.11	By observation of external weight arm to close
											CV-BDT-O	NSO		ISTC-3550	During operation of RCP
											LT	2YR		2BVT 1.47.11	
2CHS*475 RCP 21C SEAL SUPPLY CONTAINMENT CHECK	2	A/C	Active	2.5	Check		7-3 (G-4)	O	S		CV-S	R	VROJ - 14	2BVT 1.47.11	By observation of external weight arm to close
											CV-BDT-O	NSO		ISTC-3550	During operation of RCP
											LT	2YR		2BVT 1.47.11	
2CHS*476 RCP 21B SEAL SUPPLY CONTAINMENT CHECK	2	A/C	Active	2.5	Check		7-3 (D-4)	O	S		CV-S	R	VROJ - 14	2BVT 1.47.11	By observation of external weight arm to close
											CV-BDT-O	NSO		ISTC-3550	During operation of RCP
											LT	2YR		2BVT 1.47.11	
2CHS*75 BORIC ACID PP 22A DISCH CHECK	3	C	Active	2	Check		7-2 (B-3)	O/S	O		CV-O	Q		2OST-7.1	
											CV-BDT-S	18MO		2OST-7.2	Once each cycle
2CHS*76 BORIC ACID PP 22B DISCH CHECK	3	C	Active	2	Check		7-2 (F-3)	O/S	O		CV-O	Q		2OST-7.2	
											CV-BDT-S	18MO		2OST-7.1	Once each cycle

Beaver Valley Power Station Unit 2 IST Program

VALVE TABLE

SYSTEM NAME: Chemical and Volume Control (Charging & HHSI) **SYSTEM NUMBER:** 07

Valve ID / Name	Class	Cat.	Active / Passive	Size (in.)	Valve Type	Actuator Type	Drawing & Coord	Position Normal	Position Safety	Position Fail-Safe	Required Test	Frequency	Code Dev.	Procedure	Remarks
2CHS*84	3	C	Active	2	Check		7-2 (E-7)	O	O		CV-BDT-S	CVCM		2OST-7.TBD	Per CVCM Program
BLENDER TO VCT CHECK											CV-O	CSD	VCSJ - 01	2OST-7.13	
2CHS*870	1	C	Active	3	Check		7-1A (B-1)	O	O		CV-O	Q		2OST-7.6	
NORM CHARGING UPSTREAM CHECK VALVE TO RCS											CV-O	Q		2OST-7.4	
											CV-O	Q		2OST-7.5	
											CV-BDT-S	CVCM		2OST-11.16	Per CVCM Program [with 2CHS*871] per ISTC-5223
2CHS*871	1	C	Active	3	Check		7-1A (B-2)	O	O		CV-O	Q		2OST-7.6	
NORM CHARGING DOWNSTREAM CHECK VALVE TO RCS											CV-O	Q		2OST-7.4	
											CV-O	Q		2OST-7.5	
											CV-BDT-S	CVCM		2OST-11.16	Per CVCM Program [with 2CHS*870] per ISTC-5223
2CHS*AOV200A	2	A	Active	2	Globe	AOV	7-1A (A-6)	S	S	S	LTJ	SP		2BVT 1.47.5	
LETDOWN ORIFICE 21 ISOLATION (45 GPM)											FS-S	Q		2OST-47.3L	
											ST-S	Q		2OST-47.3L	
											RPV	2YR/18MO		2OST-47.3R	18 months per Tech Specs
2CHS*AOV200B	2	A	Active	2	Globe	AOV	7-1A (A-7)	O	S	S	LTJ	SP		2BVT 1.47.5	
LETDOWN ORIFICE 23 ISOLATION (60 GPM)											FS-S	Q		2OST-47.3L	
											ST-S	Q		2OST-47.3L	
											RPV	2YR/18MO		2OST-47.3R	18 months per Tech Specs
2CHS*AOV200C	2	A	Active	2	Globe	AOV	7-1A (A-8)	S	S	S	LTJ	SP		2BVT 1.47.5	
LETDOWN ORIFICE 22 ISOLATION (60 GPM)											FS-S	Q		2OST-47.3L	
											ST-S	Q		2OST-47.3L	
											RPV	2YR/18MO		2OST-47.3R	18 months per Tech Specs
2CHS*AOV204	2	A	Active	2	Globe	AOV	7-1A (A-10)	O	S	S	LTJ	SP		2BVT 1.47.5	
NON-REGEN HEAT EXCHANGER LETDOWN INLET VALVE											FS-S	CSD or R	VROJ - 07	2OST-1.10	
											ST-S	CSD or R	VROJ - 07	2OST-1.10	
											RPV	2YR/18MO		2OST-1.10	18 months per Tech Specs

Beaver Valley Power Station Unit 2 IST Program

VALVE TABLE

SYSTEM NAME: Chemical and Volume Control (Charging & HHSI) **SYSTEM NUMBER:** 07

Valve ID / Name	Class	Cat.	Active / Passive	Size (in.)	Valve Type	Actuator Type	Drawing & Coord	Position Normal	Position Safety	Position Fail-Safe	Required Test	Frequency	Code Dev.	Procedure	Remarks
2CHS*FCV113A	3	B	Active	2	Globe	FCV	7-2 (E-7)	A	O	O	FS-O	Q		2OST-47.3L	
BORIC ACID TO BORIC AICD BLENDER											ST-O	Q		2OST-47.3L	
											RPV	2YR		2OST-47.3L	
2CHS*FCV114A	3	B	Active	2	Globe	FCV	7-2 (E-8)	A	S	S	FS-S	Q		2OST-47.3L	
PRIMARY GRADE WATER TO BORIC ACID BLENDER											ST-S	Q		2OST-47.3L	
											RPV	2YR		2OST-47.3L	
2CHS*FCV160	2	A	Passive	2	Globe	FCV	7-1A (G-3)	S	S	S	LT	2YR		2BVT 1.47.11	
REACTOR COOLANT LOOP FILL HDR FLOW CONTROL VALVE											RPV	2YR		2OST-47.3L	
2CHS*HCV142	2	A	Active	2	Globe	HCV	7-1A (A-9)	S	S	S	LTJ	SP		2BVT 1.47.5	
RHS LETDOWN FLOW CONTROL											ST-S	Q		2OST-47.3L	
											FS-S	CSD	VCSJ - 02	2OST-1.10	
											RPV	2YR		2OST-47.3R	
2CHS*LCV115B	2	A	Active	8	Gate	MOV	7-1A (E-5)	S	O/S		ET	Q		2OST-47.3L	Per OMN-1
CHARGING PUMP SUCTION FROM RWST											DIAG-ST-O	3RFO		1/2-CMP-E-75-021	Per OMN-1
											DIAG-ST-S	3RFO		1/2-CMP-E-75-021	Per OMN-1
											RPV	3RFO		1/2-CMP-E-75-021	Per OMN-1
											LT	2YR		2BVT 1.47.11	
2CHS*LCV115C	2	B	Active	4	Gate	MOV	7-1A (F-5)	O	S		ET	CSD or R	VROJ - 06	2OST-1.10	Per OMN-1
CHARGING PUMP SUCTION FROM VOLUME CONTROL TANK											DIAG-ST-S	3RFO		1/2-CMP-E-75-021	Per OMN-1
											RPV	3RFO		1/2-CMP-E-75-021	Per OMN-1
2CHS*LCV115D	2	A	Active	8	Gate	MOV	7-1A (C-5)	S	O/S		ET	Q		2OST-47.3O	Per OMN-1
CHARGING PUMP SUCTION FROM RWST											DIAG-ST-O	3RFO		1/2-CMP-E-75-021	Per OMN-1
											DIAG-ST-S	3RFO		1/2-CMP-E-75-021	Per OMN-1
											RPV	3RFO		1/2-CMP-E-75-021	Per OMN-1
											LT	2YR		2BVT 1.47.11	
2CHS*LCV115E	2	B	Active	4	Gate	MOV	7-1A (F-5)	O	S		ET	CSD or R	VROJ - 06	2OST-1.10	Per OMN-1
CHARGING PUMP SUCTION FROM VOLUME CONTROL TANK											DIAG-ST-S	3RFO		1/2-CMP-E-75-021	Per OMN-1
											RPV	3RFO		1/2-CMP-E-75-021	Per OMN-1

Beaver Valley Power Station Unit 2 IST Program

VALVE TABLE

SYSTEM NAME: Chemical and Volume Control (Charging & HHSI) **SYSTEM NUMBER:** 07

Valve ID / Name	Class	Cat.	Active / Passive	Size (in.)	Valve Type	Actuator Type	Drawing & Coord	Position Normal	Position Safety	Position Fail-Safe	Required Test	Frequency	Code Dev.	Procedure	Remarks
2CHS*LCV460A	1	B	Active	2	Globe	LCV	7-1A (A-1)	O	S	S	FS-S	CSD or R	VROJ - 12	2OST-1.10	
REGENERATIVE HEAT EXCHANGER LETDOWN INLET VALVE											RPV	CSD or R		2OST-1.10	
											ST-S	CSD or R	VROJ - 12	2OST-1.10	
2CHS*LCV460B	1	B	Active	2	Globe	LCV	7-1A (A-2)	O	S	S	FS-S	CSD or R	VROJ - 12	2OST-1.10	
REGENERATIVE HEAT EXCHANGER LETDOWN INLET VALVE											RPV	CSD or R		2OST-1.10	
											ST-S	CSD or R	VROJ - 12	2OST-1.10	
2CHS*MOV289	2	A	Active	3	Gate	MOV	7-1A (D-1)	O	S		ET	CSD or R	VROJ - 08	2OST-1.10	Per OMN-1
NORMAL CHARGING HDR ISOLATION VALVE											DIAG-ST-S	6RFO		1/2-CMP-E-75-021	Per OMN-1
											RPV	6RFO		1/2-CMP-E-75-021	Per OMN-1
											LT	2YR		2BVT 1.47.11	
2CHS*MOV308A	2	A	Active	2	Globe	MOV	7-3 (B-3)	O	S		ET	CSD or R	VROJ - 09	2OST-1.10	Per OMN-1
RCP 21A SEAL WATER INJECTION ISOLATION VALVE											DIAG-ST-S	6RFO		1/2-CMP-E-75-021	Per OMN-1
											RPV	6RFO		1/2-CMP-E-75-021	Per OMN-1
											LT	2YR		2BVT 1.47.11	
2CHS*MOV308B	2	A	Active	2	Globe	MOV	7-3 (D-3)	O	S		ET	CSD or R	VROJ - 09	2OST-1.10	Per OMN-1
RCP 21B SEAL WATER INJECTION ISOLATION VALVE											DIAG-ST-S	6RFO		1/2-CMP-E-75-021	Per OMN-1
											RPV	6RFO		1/2-CMP-E-75-021	Per OMN-1
											LT	2YR		2BVT 1.47.11	
2CHS*MOV308C	2	A	Active	2	Globe	MOV	7-3 (G-3)	O	S		ET	CSD or R	VROJ - 09	2OST-1.10	Per OMN-1
RCP 21C SEAL WATER INJECTION ISOLATION VALVE											DIAG-ST-S	6RFO		1/2-CMP-E-75-021	Per OMN-1
											RPV	6RFO		1/2-CMP-E-75-021	Per OMN-1
											LT	2YR		2BVT 1.47.11	
2CHS*MOV310	2	B	Active	3	Gate	MOV	7-1A (B-2)	O	S		ET	CSD or R	VROJ - 10	2OST-1.10	Per OMN-1
REGEN HX NORMAL CHARGING DISCHARGE VALVE											DIAG-ST-S	6RFO		1/2-CMP-E-75-021	Per OMN-1
											RPV	6RFO		1/2-CMP-E-75-021	Per OMN-1
2CHS*MOV350	2	B	Active	2	Globe	MOV	7-2 (F-8)	S	O		ET	Q		2OST-47.3O	Per OMN-1
EMERGENCY BORATE VLV											DIAG-ST-O	6RFO		1/2-CMP-E-75-021	Per OMN-1
											RPV	6RFO		1/2-CMP-E-75-021	Per OMN-1

Beaver Valley Power Station Unit 2 IST Program

VALVE TABLE

SYSTEM NAME: Chemical and Volume Control (Charging & HHSI) **SYSTEM NUMBER:** 07

Valve ID / Name	Class	Cat.	Active / Passive	Size (in.)	Valve Type	Actuator Type	Drawing & Coord	Position Normal	Position Safety	Position Fail-Safe	Required Test	Frequency	Code Dev.	Procedure	Remarks
2CHS*MOV378	2	A	Active	3	Gate	MOV	7-3 (E-8)	O	S		LTJ	SP		2BVT 1.47.5	
REACTOR COOLANT PUMPS SEAL WATER RETURN ISOLATION											ET	CSD or R	VROJ - 11	2OST-1.10	Per OMN-1
											RPV	6RFO/18MO		2OST-1.10	18 months per Tech Specs
											DIAG-ST-S	6RFO		1/2-CMP-E-75-021	Per OMN-1
2CHS*MOV381	2	A	Active	3	Gate	MOV	7-3 (F-8)	O	S		LTJ	SP		2BVT 1.47.5	
SEAL WATER RETURN CONTAINMENT ISOLATION VALVE											ET	CSD or R	VROJ - 11	2OST-1.10	Per OMN-1
											RPV	6RFO/18MO		2OST-1.10	18 months per Tech Specs
											DIAG-ST-S	6RFO		1/2-CMP-E-75-021	Per OMN-1
2CHS*MOV8130A	2	B	Active	8	Gate	MOV	7-1A (D-5)	LO	S		ET	CSD or R	VROJ - 15	2OST-1.10	Per OMN-1
CHARGING PUMP SUCTION ISOLATION VALVE											DIAG-ST-S	6RFO		1/2-CMP-E-75-021	Per OMN-1
											RPV	6RFO		1/2-CMP-E-75-021	Per OMN-1
2CHS*MOV8130B	2	B	Active	8	Gate	MOV	7-1A (D-5)	LO	S		ET	CSD or R	VROJ - 15	2OST-1.10	Per OMN-1
CHARGING PUMP SUCTION ISOLATION VALVE											DIAG-ST-S	6RFO		1/2-CMP-E-75-021	Per OMN-1
											RPV	6RFO		1/2-CMP-E-75-021	Per OMN-1
2CHS*MOV8131A	2	B	Active	8	Gate	MOV	7-1A (D-5)	LO	S		ET	CSD or R	VROJ - 15	2OST-1.10	Per OMN-1
CHARGING PUMP SUCTION ISOLATION VALVE											DIAG-ST-S	6RFO		1/2-CMP-E-75-021	Per OMN-1
											RPV	6RFO		1/2-CMP-E-75-021	Per OMN-1
2CHS*MOV8131B	2	B	Active	8	Gate	MOV	7-1A (C-5)	LO	S		ET	CSD or R	VROJ - 15	2OST-1.10	Per OMN-1
CHARGING PUMP SUCTION ISOLATION VALVE											DIAG-ST-S	6RFO		1/2-CMP-E-75-021	Per OMN-1
											RPV	6RFO		1/2-CMP-E-75-021	Per OMN-1
2CHS*MOV8132A	2	B	Active	4	Gate	MOV	7-1A (D-2)	LO	S		ET	CSD or R	VROJ - 15	2OST-1.10	Per OMN-1
CHARGING PUMP DISCHARGE ISOLATION VALVE											DIAG-ST-S	6RFO		1/2-CMP-E-75-021	Per OMN-1
											RPV	6RFO		1/2-CMP-E-75-021	Per OMN-1
2CHS*MOV8132B	2	B	Active	4	Gate	MOV	7-1A (D-2)	LO	S		ET	CSD or R	VROJ - 15	2OST-1.10	Per OMN-1
CHARGING PUMP DISCHARGE ISOLATION VALVE											DIAG-ST-S	6RFO		1/2-CMP-E-75-021	Per OMN-1
											RPV	6RFO		1/2-CMP-E-75-021	Per OMN-1

Beaver Valley Power Station Unit 2 IST Program

VALVE TABLE

SYSTEM NAME: Chemical and Volume Control (Charging & HHSI) **SYSTEM NUMBER:** 07

Valve ID / Name	Class	Cat.	Active / Passive	Size (in.)	Valve Type	Actuator Type	Drawing & Coord	Position Normal	Position Safety	Position Fail-Safe	Required Test	Frequency	Code Dev.	Procedure	Remarks
2CHS*MOV8133A	2	B	Active	4	Gate	MOV	7-1A (C-2)	LO	S		ET	CSD or R	VROJ - 15	2OST-1.10	Per OMN-1
CHARGING PUMP DISCHARGE ISOLATION VALVE											DIAG-ST-S	6RFO		1/2-CMP-E-75-021	Per OMN-1
											RPV	6RFO		1/2-CMP-E-75-021	Per OMN-1
2CHS*MOV8133B	2	B	Active	4	Gate	MOV	7-1A (C-2)	LO	S		ET	CSD or R	VROJ - 15	2OST-1.10	Per OMN-1
CHARGING PUMP DISCHARGE ISOLATION VALVE											DIAG-ST-S	6RFO		1/2-CMP-E-75-021	Per OMN-1
											RPV	6RFO		1/2-CMP-E-75-021	Per OMN-1
2CHS*RV160	2	C	Active	0.75x1	Relief	RV	7-1A (G-2)	S	O/S		SPT	10YR		2BVT 1.60.5	
LOOP FILL HDR RELIEF															
2CHS*RV203	2	A/C	Active	2x3	Relief	RV	7-1A (A-8)	S	O/S		LTJ	SP		2BVT 1.47.5	
LETDOWN RELIEF											SPT	10YR		2BVT 1.60.5	
2CHS*RV260A	2	C	Active	0.75x1	Relief	RV	7-3 (B-4)	S	O/S		SPT	10YR		2BVT 1.60.5	
RCP 21A SEAL WTR PENETRATION RELIEF															
2CHS*RV260B	2	C	Active	0.75x1	Relief	RV	7-3 (E-3)	S	O/S		SPT	10YR		2BVT 1.60.5	
RCP 21B SEAL WTR PENETRATION RELIEF															
2CHS*RV260C	2	C	Active	0.75x1	Relief	RV	7-3 (G-4)	S	O/S		SPT	10YR		2BVT 1.60.5	
RCP 21C SEAL WTR PENETRATION RELIEF															
2CHS*RV382A	2	C	Active	2x3	Relief	RV	7-3 (C-8)	S	O/S		SPT	10YR		2BVT 1.60.5	
SEAL RETURN HDR RELIEF															
2CHS*RV382B	2	C	Active	2x3	Relief	RV	7-3 (E-10)	S	O/S		SPT	10YR		2BVT 1.60.5	
SEAL WATER HEAT EXCHANGER RELIEF															
2CHS*RV8144	2	C	Active	0.75x1	Relief	RV	7-1A (C-1)	S	O/S		SPT	10YR		2BVT 1.60.5	
REGEN HX CHARGING RELIEF															
2CHS*SOV206	2	B	Active	1	Globe	SOV	7-2 (E-8)	S	O	O	FS-O	Q		2OST-47.3L	
ALTERNATE EMERGENCY BORATE VALVE											ST-O	Q		2OST-47.3L	
											RPV	2YR		2OST-7.13	

Beaver Valley Power Station Unit 2 IST Program

VALVE TABLE

SYSTEM NAME: Reactor Plant Vents & Drains **SYSTEM NUMBER:** 09

Valve ID / Name	Class	Cat.	Active / Passive	Size (in.)	Valve Type	Actuator Type	Drawing & Coord	Position Normal	Position Safety	Position Fail-Safe	Required Test	Frequency	Code Dev.	Procedure	Remarks
2DAS*AOV100A	2	A	Active	2	Globe	AOV	9-1 (F-4)	S	S	S	LTJ	SP		2BVT 1.47.5	
CNMT SUMP PMPS INSIDE CNMT DISCHARGE ISOLATION											FS-S	Q		2OST-47.3M	
											ST-S	Q		2OST-47.3M	
											RPV	2YR/18MO		2OST-47.3R	18 months per Tech Specs
2DAS*AOV100B	2	A	Active	2	Globe	AOV	9-1 (F-2)	O	S	S	LTJ	SP		2BVT 1.47.5	
CNMT SUMP PMPS OUTSIDE CNMT DISHARGE ISOLATION											FS-S	Q		2OST-47.3G	
											ST-S	Q		2OST-47.3G	
											RPV	2YR/18MO		2OST-47.3G	18 months per Tech Specs
2DAS*RV110	2	A/C	Active	1.5x2.5	Relief	RV	9-1 (F-3)	S	O/S		LTJ	SP		2BVT 1.47.5	
REACTOR CNMT SUMP PMPS (P204A&B) DISCH RELIEF											SPT	10YR		2BVT 1.60.5	
2DGS*AOV108A	2	A	Active	2	Globe	AOV	9-1 (F-10)	S	S	S	LTJ	SP		2BVT 1.47.5	
PRIMARY DRAINS TFR TK PMPS INSIDE CNMT DISCHARGE ISOL											FS-S	Q		2OST-47.3M	
											ST-S	Q		2OST-47.3M	
											RPV	2YR/18MO		2OST-47.3R	18 months per Tech Specs
2DGS*AOV108B	2	A	Active	2	Globe	AOV	9-1 (E-10)	O	S	S	LTJ	SP		2BVT 1.47.5	
PRIMARY DRAINS TFR TK PMPS OUTSIDE CNMT DISCHARGE ISOL											FS-S	Q		2OST-47.3G	
											ST-S	Q		2OST-47.3G	
											RPV	2YR/18MO		2OST-47.3G	18 months per Tech Specs
2DGS*RV115	2	A/C	Active	1.5x2.5	Relief	RV	9-1 (E-9)	S	O/S		LTJ	SP		2BVT 1.47.5	
PRIMARY DRAINS TFR PMPS (P21A&B) DISCH THERMAL RLF											SPT	10YR		2BVT 1.60.5	
2VRS*AOV109A1	2	A	Active	1.5	Globe	AOV	9-1 (C-9)	O	S	S	LTJ	SP		2BVT 1.47.5	
PRZR RLF/PRI DRNS TFR TANKS OUTSIDE CNMT VENTS ISOLATION											FS-S	Q		2OST-47.3M	
											ST-S	Q		2OST-47.3M	
											RPV	2YR/18MO		2OST-47.3M	18 months per Tech Specs

Beaver Valley Power Station Unit 2 IST Program

VALVE TABLE

SYSTEM NAME: Reactor Plant Vents & Drains SYSTEM NUMBER: 09

Valve ID / Name	Class	Cat.	Active / Passive	Size (in.)	Valve Type	Actuator Type	Drawing & Coord	Position Normal	Position Safety	Position Fail-Safe	Required Test	Frequency	Code Dev.	Procedure	Remarks
2VRS*AOV109A2	2	A	Active	1.5	Globe	AOV	9-1 (C-9)	O	S	S	LTJ	SP		2BVT 1.47.5	
PRZR RLF/PRI DRAINS TFR TANKS INSIDE CNMT VENTS ISO											FS-S	Q		2OST-47.3G	
											ST-S	Q		2OST-47.3G	
											RPV	2YR/18MO		2OST-47.3S	18 months per Tech Specs

Beaver Valley Power Station Unit 2 IST Program

VALVE TABLE

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

Valve ID / Name	Class	Cat.	Active / Passive	Size (in.)	Valve Type	Actuator Type	Drawing & Coord	Position Normal	Position Safety	Position Fail-Safe	Required Test	Frequency	Code Dev.	Procedure	Remarks
2RHS*107	2	A	Passive	6	Globe		10-1 (D-7)	LS	S		LTJ	SP		2BVT 1.47.5	
RWST INNER CNTMNT ISOLATION															
2RHS*15	2	A	Passive	6	Globe		10-1 (D-8)	LS	S		LTJ	SP		2BVT 1.47.5	
RWST OUTER CNTMNT. ISOLATION															
2RHS*3	2	C	Active	10	Check		10-1 (B-3)	S	O/S		CV-O	CSD	VCSJ - 03	2OST-10.1	
RHS TRAIN A PP DISCHARGE CHECK											CV-S	CSD	VCSJ - 03	2OST-10.3	
2RHS*4	2	C	Active	10	Check		10-1 (E-3)	S	O/S		CV-O	CSD	VCSJ - 03	2OST-10.2	
RHS TRAIN B PP DISCHARGE CHECK											CV-S	CSD	VCSJ - 03	2OST-10.4	
2RHS*FCV605A	2	B	Active	8	Butterfly	FCV	10-1 (C-5)	T	S	S	ET	CSD	VCSJ - 04	2OST-10.3	Per OMN-12
RHS TRAIN A HX BYPASS FLOW CONTROL											FS-S	CSD	VCSJ - 04	2OST-10.3	Per OMN-12
											DIAG-ST-S	2RFO		1/2MI-75-Ultracheck A-1I	Per OMN-12
											RPV	2RFO		1/2MI-75-Ultracheck A-1I	Per OMN-12
2RHS*FCV605B	2	B	Active	8	Butterfly	FCV	10-1 (F-5)	T	S	S	ET	CSD	VCSJ - 04	2OST-10.4	Per OMN-12
RHS TRAIN B HX BYPASS FLOW CONTROL											FS-S	CSD	VCSJ - 04	2OST-10.4	Per OMN-12
											DIAG-ST-S	2RFO		1/2MI-75-Ultracheck A-1I	Per OMN-12
											RPV	2RFO		1/2MI-75-Ultracheck A-1I	Per OMN-12
2RHS*HCV758A	2	B	Active	10	Butterfly	HCV	10-1 (D-5)	T	O	O	ET	CSD or R	VCSJ - 06	2OST-10.3	Per OMN-12
RHS TRAIN A HX OUTLET FLOW CONTROL											FS-O	CSD or R	VCSJ - 06	2OST-10.3	Per OMN-12
											DIAG-ST-O	2RFO		1/2MI-75-Ultracheck A-1I	Per OMN-12
											RPV	2RFO		1/2MI-75-Ultracheck A-1I	Per OMN-12
2RHS*HCV758B	2	B	Active	10	Butterfly	HCV	10-1 (F-5)	T	O	O	ET	CSD or R	VCSJ - 06	2OST-10.4	Per OMN-12
RHS TRAIN B HX OUTLET FLOW CONTROL											FS-O	CSD or R	VCSJ - 06	2OST-10.4	Per OMN-12
											DIAG-ST-O	2RFO		1/2MI-75-Ultracheck A-1I	Per OMN-12
											RPV	2RFO		1/2MI-75-Ultracheck A-1I	Per OMN-12

Beaver Valley Power Station Unit 2 IST Program

VALVE TABLE

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

Valve ID / Name	Class	Cat.	Active / Passive	Size (in.)	Valve Type	Actuator Type	Drawing & Coord	Position Normal	Position Safety	Position Fail-Safe	Required Test	Frequency	Code Dev.	Procedure	Remarks
2RHS*MOV701A	1	A	Active	12	Gate	MOV	10-1 (C-1)	S	O/S		ET	CSD	VCSJ - 05	2OST-10.3	Per OMN-1
RHS TRAIN A SUPPLY ISOLATION											DIAG-ST-O	6RFO		1/2-CMP-E-75-021	Per OMN-1
											DIAG-ST-S	6RFO		1/2-CMP-E-75-021	Per OMN-1
											RPV	6RFO		1/2-CMP-E-75-021	Per OMN-1
											LT	2YR/18MO		2OST-10.5	18 MO per Tech Specs
2RHS*MOV701B	1	A	Active	12	Gate	MOV	10-1 (E-1)	S	O/S		ET	CSD	VCSJ - 05	2OST-10.4	Per OMN-1
RHS TRAIN B SUPPLY ISOLATION											DIAG-ST-O	6RFO		1/2-CMP-E-75-021	Per OMN-1
											DIAG-ST-S	6RFO		1/2-CMP-E-75-021	Per OMN-1
											RPV	6RFO		1/2-CMP-E-75-021	Per OMN-1
											LT	2YR/18MO		2OST-10.5	18 MO per Tech Specs
2RHS*MOV702A	1	A	Active	12	Gate	MOV	10-1 (D-1)	S	O/S		ET	CSD	VCSJ - 05	2OST-10.3	Per OMN-1
RHS TRAIN A SUPPLY ISOLATION											DIAG-ST-O	6RFO		1/2-CMP-E-75-021	Per OMN-1
											DIAG-ST-S	6RFO		1/2-CMP-E-75-021	Per OMN-1
											RPV	6RFO		1/2-CMP-E-75-021	Per OMN-1
											LT	2YR/18MO		2OST-10.5	18 MO per Tech Specs
2RHS*MOV702B	1	A	Active	12	Gate	MOV	10-1 (D-1)	S	O/S		ET	CSD	VCSJ - 05	2OST-10.4	Per OMN-1
RHS TRAIN B SUPPLY ISOLATION											DIAG-ST-O	6RFO		1/2-CMP-E-75-021	Per OMN-1
											DIAG-ST-S	6RFO		1/2-CMP-E-75-021	Per OMN-1
											RPV	6RFO		1/2-CMP-E-75-021	Per OMN-1
											LT	2YR/18MO		2OST-10.5	18 MO per Tech Specs
2RHS*MOV720A	1	A	Active	10	Gate	MOV	10-1 (C-8)	S	O/S		LM	NSO		2OM-54.3	Continuously Monitored by 2OM-54.3, Station Log L5-120 per ISTC-3550.
RHS TRAIN RETURN TO B LOOP ISOLATION											ET	CSD	VCSJ - 05	2OST-10.3	Per OMN-1
											DIAG-ST-O	6RFO		1/2-CMP-E-75-021	Per OMN-1
											DIAG-ST-S	6RFO		1/2-CMP-E-75-021	Per OMN-1
											RPV	6RFO		1/2-CMP-E-75-021	Per OMN-1

Beaver Valley Power Station Unit 2 IST Program

VALVE TABLE

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

Valve ID / Name	Class	Cat.	Active / Passive	Size (in.)	Valve Type	Actuator Type	Drawing & Coord	Position Normal	Position Safety	Position Fail-Safe	Required Test	Frequency	Code Dev.	Procedure	Remarks
2RHS*MOV720B RHS TRAIN RETURN TO C LOOP ISOLATION	1	A	Active	10	Gate	MOV	10-1 (F-8)	S	O/S		LM	NSO		2OM-54.3	Continuously Monitored by 2OM-54.3, Station Log L5-120 per ISTC-3550.
											ET	CSD	VCSJ - 05	2OST-10.4	Per OMN-1
											DIAG-ST-O	6RFO		1/2-CMP-E-75-021	Per OMN-1
											DIAG-ST-S	6RFO		1/2-CMP-E-75-021	Per OMN-1
											RPV	6RFO		1/2-CMP-E-75-021	Per OMN-1
2RHS*MOV750A RHS TRAIN A LETDOWN ISOLATION	2	B	Passive	2	Globe	MOV	10-1 (D-5)	S	S		RPV	2YR		2OST-10.3	
2RHS*MOV750B RHS TRAIN B LETDOWN ISOLATION	2	B	Passive	2	Globe	MOV	10-1 (E-5)	S	S		RPV	2YR		2OST-10.4	
2RHS*RV100 X-24 RELIEF VALVE	2	A/C	Active	0.75x1	Relief	RV	10-1 (D-8)	S	O/S		LTJ	SP		2BVT 1.47.5	
											SPT	10YR		2BVT 1.60.5	
2RHS*RV721A RHS TRAIN A SUPPLY RELIEF	2	C	Active	3x4	Relief	RV	10-1 (C-1)	S	O/S		SPT	10YR		2BVT 1.60.5	
2RHS*RV721B RHS TRAIN B SUPPLY RELIEF	2	C	Active	3x4	Relief	RV	10-1 (E-1)	S	O/S		SPT	10YR		2BVT 1.60.5	

Beaver Valley Power Station Unit 2 IST Program

VALVE TABLE

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

Valve ID / Name	Class	Cat.	Active / Passive	Size (in.)	Valve Type	Actuator Type	Drawing & Coord	Position Normal	Position Safety	Position Fail-Safe	Required Test	Frequency	Code Dev.	Procedure	Remarks
2GNS*AOV101-1	2	A	Active	1	Globe	AOV	11-2 (B-3)	O	S	S	LTJ	SP		2BVT 1.47.5	
SI ACCUMULATORS N2 MAKEUP OUTSIDE CNMT ISOL VLV											FS-S	Q		2OST-47.3H	
											ST-S	Q		2OST-47.3H	
											RPV	2YR/18MO		2OST-1.10	18 months per Tech Specs
2GNS*AOV101-2	2	A	Active	1	Globe	AOV	11-2 (C-3)	O	S	S	LTJ	SP		2BVT 1.47.5	
SI ACCUMULATORS N2 MAKEUP INSIDE CNMT ISOL VALVE											FS-S	Q		2OST-47.3J	
											ST-S	Q		2OST-47.3J	
											RPV	2/YR18MO		2OST-1.10	18 months per Tech Specs
2GNS*SOV853A	2	B	Passive	1	Globe	SOV	11-2 (C-4)	S	S	S	RPV	2YR		2OST-1.10	
SI ACCUMULATOR TK21B NITROGEN MAKEUP															
2GNS*SOV853B	2	B	Passive	1	Globe	SOV	11-2 (C-6)	S	S	S	RPV	2YR		2OST-1.10	
SI ACCUMULATOR TK21B NITROGEN MAKEUP															
2GNS*SOV853C	2	B	Passive	1	Globe	SOV	11-2 (C-9)	S	S	S	RPV	2YR		2OST-1.10	
SI ACCUMULATOR TK21C NITROGEN MAKEUP															
2GNS*SOV853D	2	B	Passive	1	Globe	SOV	11-2 (C-4)	S	S	S	RPV	2YR		2OST-1.10	
BYPASS N2 SUPPLY TO ACCUMULATOR (2SIS*TK21A)															
2GNS*SOV853E	2	B	Passive	1	Globe	SOV	11-2 (D-6)	S	S	S	RPV	2YR		2OST-1.10	
BYPASS N2 SUPPLY TO ACCUMULATOR (2SIS*TK21B)															
2GNS*SOV853F	2	B	Passive	1	Globe	SOV	11-2 (D-9)	S	S	S	RPV	2YR		2OST-1.10	
BYPASS N2 SUPPLY TO ACCUMULATOR (2SIS*TK21C)															
2GNS*SOV854A	2	B	Passive	1	Globe	SOV	11-2 (C-2)	S	S	S	RPV	2YR		2OST-1.10	
N2 HEADER VENT ISOLATION															
2GNS*SOV854B	2	B	Passive	1	Globe	SOV	11-2 (D-2)	S	S	S	RPV	2YR		2OST-1.10	
N2 HEADER VENT ISOLATION															

Beaver Valley Power Station Unit 2 IST Program

VALVE TABLE

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

Valve ID / Name	Class	Cat.	Active / Passive	Size (in.)	Valve Type	Actuator Type	Drawing & Coord	Position Normal	Position Safety	Position Fail-Safe	Required Test	Frequency	Code Dev.	Procedure	Remarks
2SIS*107	1	A/C	Active	6	Check		11-1 (G-9)	S	O/S		CV-S-LT	R	VROJ - 20	2OST-11.16	
LOW HEAD SI CHECK TO LOOP 21A COLD LEG											CV-O	CVCM	VROJ - 20	2OST-11.14A	Per CVCM Program
											LT	2YR/18M/CSD		2OST-11.16	CSD or 18 MO per Tech Specs
2SIS*108	1	A/C	Active	6	Check		11-1 (E-9)	S	O/S		CV-S-LT	R	VROJ - 20	2OST-11.16	
LOW HEAD SI CHECK TO LOOP 21B COLD LEG											CV-O	CVCM	VROJ - 20	2OST-11.14A	Per CVCM Program
											LT	2YR/18M/CSD		2OST-11.16	CSD or 18 MO per Tech Specs
2SIS*109	1	A/C	Active	6	Check		11-1 (F-9)	S	O/S		CV-S-LT	R	VROJ - 20	2OST-11.16	
LOW HEAD SI CHECK TO LOOP 21C COLD LEG											CV-O	CVCM	VROJ - 20	2OST-11.14A	Per CVCM Program
											LT	2YR/18M/CSD		2OST-11.16	CSD or 18 MO per Tech Specs
2SIS*122	1	C	Active	2	Check		11-1 (A-7)	S	O		CV-O	R	VROJ - 21	2OST-11.14B	
HIGH HEAD SI CHECK TO LOOP 21B HOT LEG											CV-BDT-S	CVCM		2OST-11.16	Per CVCM Program
2SIS*123	1	C	Active	2	Check		11-1 (A-7)	S	O		CV-O	R	VROJ - 21	2OST-11.14B	
HIGH HEAD SI CHECK TO LOOP 21C HOT LEG											CV-BDT-S	CVCM		2OST-11.16	Per CVCM Program
2SIS*124	1	C	Active	2	Check		11-1 (A-7)	S	O		CV-O	R	VROJ - 21	2OST-11.14B	
HIGH HEAD SI CHECK TO LOOP 21A HOT LEG											CV-BDT-S	CVCM		2OST-11.14B	Per CVCM Program
2SIS*125	1	C	Active	2	Check		11-1 (B-7)	S	O		CV-O	R	VROJ - 21	2OST-11.14B	
HIGH HEAD SI CHECK TO LOOP 21A HOT LEG											CV-BDT-S	CVCM		2OST-11.14B	Per CVCM Program
2SIS*126	1	C	Active	2	Check		11-1 (B-7)	S	O		CV-O	R	VROJ - 21	2OST-11.14B	
HIGH HEAD SI CHECK TO LOOP 21C HOT LEG											CV-BDT-S	CVCM		2OST-11.16	Per CVCM Program
2SIS*127	1	C	Active	2	Check		11-1 (B-7)	S	O		CV-O	R	VROJ - 21	2OST-11.14B	
HIGH HEAD SI CHECK TO LOOP 21B HOT LEG											CV-BDT-S	CVCM		2OST-11.16	Per CVCM Program
2SIS*128	1	A/C	Active	6	Check		11-1 (B-9)	S	O/S		CV-S-LT	R	VROJ - 22	2OST-11.16	
LOW HEAD SI CHECK TO LOOP 21B HOT LEG											CV-O	CVCM	VROJ - 22	2OST-11.14A	Per CVCM Program
											LT	2YR/18M/CSD		2OST-11.16	18 MO per Tech Specs

Beaver Valley Power Station Unit 2 IST Program

VALVE TABLE

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

Valve ID / Name	Class	Cat.	Active / Passive	Size (in.)	Valve Type	Actuator Type	Drawing & Coord	Position Normal	Position Safety	Position Fail-Safe	Required Test	Frequency	Code Dev.	Procedure	Remarks
2SIS*129	1	A/C	Active	6	Check		11-1 (B-9)	S	O/S		CV-S-LT	R	VROJ - 22	2OST-11.16	
LOW HEAD SI CHECK TO LOOP 21C HOT LEG											CV-O	CVCM	VROJ - 22	2OST-11.14A	Per CVCM Program
											LT	2YR/18M/CSD		2OST-11.16	18 MO per Tech Specs
2SIS*130	2	A/C	Active	10	Check		11-1 (F-9)	S	O/S		CV-O	R	VROJ - 23	2OST-11.14A	
LHSI PP COMBINED DISCH CHECK TO LOOPS 21B & 21C HOT LEGS											CV-S	R	VROJ - 23	2OST-11.14A	
											LT	2YR/18MO		2OST-11.16	18 MO per Tech Specs
2SIS*132	2	A/C	Active	10	Check		11-1 (G-9)	S	O/S		CV-O	R	VROJ - 24	2OST-11.14A	
LHSI PUMP 21B DISCH CHECK TO COLD LEGS											CV-S	R	VROJ - 24	2OST-11.14A	
											LT	2YR/18M/CSD		2OST-11.16	CSD or 18 MO per Tech Specs
2SIS*133	2	A/C	Active	10	Check		11-1 (E-9)	S	O/S		CV-O	R	VROJ - 24	2OST-11.14A	
LHSI PUMP 21A DISCH CHECK TO COLD LEGS											CV-S	R	VROJ - 24	2OST-11.14A	
											LT	2YR/18M/CSD		2OST-11.16	CSD or 18 MO per Tech Specs
2SIS*134	1	C	Active	2	Check		11-1 (C-9)	S	O		CV-O	R	VROJ - 25	2OST-11.14B	
HIGH HEAD SI CHECK TO LOOP 21B COLD LEG											CV-BDT-S	CVCM		2OST-11.16	Per CVCM Program
2SIS*135	1	C	Active	2	Check		11-1 (D-9)	S	O		CV-O	R	VROJ - 25	2OST-11.14B	
HIGH HEAD SI CHECK TO LOOP 21C COLD LEG											CV-BDT-S	CVCM		2OST-11.16	Per CVCM Program
2SIS*136	1	C	Active	2	Check		11-1 (D-9)	S	O		CV-O	R	VROJ - 25	2OST-11.14B	
HIGH HEAD SI CHECK TO LOOP 21A COLD LEG											CV-BDT-S	CVCM		2OST-11.16	Per CVCM Program
2SIS*137	1	C	Active	2	Check		11-1 (C-9)	S	O		CV-O	R	VROJ - 25	2OST-11.14B	
HHSI CHECK TO LOOP 21C COLD LEG											CV-BDT-S	CVCM		2OST-11.16	Per CVCM Program
2SIS*138	1	C	Active	2	Check		11-1 (C-9)	S	O		CV-O	R	VROJ - 25	2OST-11.14B	
HHSI CHECK TO LOOP 21B COLD LEG											CV-BDT-S	CVCM		2OST-11.16	Per CVCM Program
2SIS*139	1	C	Active	2	Check		11-1 (C-9)	S	O		CV-O	R	VROJ - 25	2OST-11.14B	
HHSI CHECK TO LOOP 21A COLD LEG											CV-BDT-S	CVCM		2OST-11.16	Per CVCM Program

Beaver Valley Power Station Unit 2 IST Program

VALVE TABLE

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

Valve ID / Name	Class	Cat.	Active / Passive	Size (in.)	Valve Type	Actuator Type	Drawing & Coord	Position Normal	Position Safety	Position Fail-Safe	Required Test	Frequency	Code Dev.	Procedure	Remarks
2SIS*141	1	A/C	Active	12	Check		6-1 (E-6)	S	O/S		CV-S-LT	R	VROJ - 26	2OST-11.4	
SI ACCUM TANK 21C CHECK TO LOOP C COLD LEG											CV-O	CVCM	VROJ - 26	2OST-11.15	Per CVCM Program
											LT	2YR/18M/CSD		2OST-11.4	CSD or 18 MO per Tech Specs
2SIS*142	1	A/C	Active	12	Check		11-2 (F-9)	S	O/S		CV-S-LT	R	VROJ - 26	2OST-11.5	
LOOP 21C SI ACCUMULATOR TANK 21C CHECK											CV-O	CVCM	VROJ - 26	2BVT 1.11.3	Per CVCM Program
											LT	2YR/18MO		2OST-11.5	18 MO per Tech Specs
2SIS*145	1	A/C	Active	12	Check		6-1 (D-6)	S	O/S		CV-S-LT	R	VROJ - 26	2OST-11.4	
SI ACCUM TANK 21B CHECK TO LOOP B COLD LEG											CV-O	CVCM	VROJ - 26	2BVT 1.11.3	Per CVCM Program
											LT	2YR/18M/CSD		2OST-11.4	CSD or 18 MO per Tech Specs
2SIS*147	1	A/C	Active	12	Check		11-2 (F-7)	S	O/S		CV-S-LT	R	VROJ - 26	2OST-11.5	
LOOP 21B SI ACCUM TK 21B CHECK											CV-O	CVCM	VROJ - 26	2BVT 1.11.3	Per CVCM Program
											LT	2YR/18MO		2OST-11.5	18 MO per Tech Specs
2SIS*148	1	A/C	Active	12	Check		11-2 (F-4)	S	O/S		CV-S-LT	R	VROJ - 26	2OST-11.5	
LOOP 21A SI ACCUMULATOR TANK 21A CHECK											CV-O	CVCM	VROJ - 26	2BVT 1.11.3	Per CVCM Program
											LT	2YR/18MO		2OST-11.5	18 MO per Tech Specs
2SIS*151	1	A/C	Active	12	Check		6-1 (D-5)	S	O/S		CV-S-LT	R	VROJ - 26	2OST-11.4	
SI ACCUM TANK 21A CHECK TO LOOP A COLD LEG											CV-O	CVCM	VROJ - 26	2BVT 1.11.3	Per CVCM Program
											LT	2YR/18MO		2OST-11.4	18 MO per Tech Specs
2SIS*27	2	A/C	Active	8	Check		11-1 (F-1)	S	O/S		CV-O	R	VROJ - 17	2OST-11.14B	
CHECK VALVE TO HHSI PUMPS FROM RWST											CV-S-LT	R	VROJ - 17	2BVT 1.47.11	
											LT	2YR		2BVT 1.47.11	
2SIS*41	2	A	Passive	1	Globe		11-2 (C-2)	LS	S		LTJ	SP		2BVT 1.47.5	
COMBINED SUPPLY LINE ISOL TO ACCUM															

Beaver Valley Power Station Unit 2 IST Program

VALVE TABLE

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

Valve ID / Name	Class	Cat.	Active / Passive	Size (in.)	Valve Type	Actuator Type	Drawing & Coord	Position Normal	Position Safety	Position Fail-Safe	Required Test	Frequency	Code Dev.	Procedure	Remarks
2SIS*42	2	A/C	Active	2.5	Check		11-2 (D-2)	S	S		LTJ	SP		2BVT 1.47.5	
COMBINED SUPPLY CHECK VALVE TO ACCUMULATOR											CV-S	R	VROJ - 18	2OST-1.10	By observation of external weight arm to close.
											CV-BDT-O	NSO		2OM-11.4.D	During makeup to SI Accumulator.
2SIS*46	2	C	Active	10	Check		11-1 (G-5)	S	O		CV-ME	CSD	VCSJ - 07	2OST-1.10	
RECIRC PUMP DISCHARGE LINE TO LHSI DISCHARGE CHECK															
2SIS*47	2	C	Active	10	Check		11-1 (E-5)	S	O		CV-ME	CSD	VCSJ - 07	2OST-1.10	
RECIRC PUMP DISCHARGE LINE TO LHSI DISCHARGE CHECK															
2SIS*545	1	C	Active	6	Check		11-1 (A-9)	S	O		CV-BDT-S	CVCM		2OST-11.16	Per CVCM Program
SI CHECK TO LOOP 21B HOT LEG											CV-O	CVCM	VROJ - 27	2OST-11.14A	Per CVCM Program
2SIS*546	1	C	Active	6	Check		11-1 (A-9)	S	O		CV-BDT-S	CVCM		2OST-11.16	Per CVCM Program
SI CHECK TO LOOP 21C HOT LEG											CV-O	CVCM	VROJ - 27	2OST-11.14A	Per CVCM Program
2SIS*547	1	C	Active	6	Check		11-1 (A-9)	S	O		CV-BDT-S	CVCM		2OST-11.16	Per CVCM Program
SI CHECK TO LOOP 21A HOT LEG											CV-O	CVCM	VROJ - 28	2OST-11.14B	Per CVCM Program
2SIS*548	1	C	Active	6	Check		11-1 (A-10)	S	O		CV-BDT-S	CVCM		2OST-11.16	Per CVCM Program
SI CHECK TO LOOP 21A COLD LEG											CV-O	CVCM	VROJ - 29	2OST-11.14A	Per CVCM Program
2SIS*550	1	C	Active	6	Check		11-1 (A-10)	S	O		CV-BDT-S	CVCM		2OST-11.16	Per CVCM Program
SI CHECK TO LOOP 21B COLD LEG											CV-O	CVCM	VROJ - 29	2OST-11.14A	Per CVCM Program
2SIS*552	1	C	Active	6	Check		11-1 (A-10)	S	O		CV-BDT-S	CVCM		2OST-11.16	Per CVCM Program
SI CHECK TO LOOP 21C COLD LEG											CV-O	CVCM	VROJ - 29	2OST-11.14A	Per CVCM Program
2SIS*6	2	A/C	Active	10	Check		11-1 (E-4)	S	O/S		CV-O	R	VROJ - 16	2OST-11.14A	
LHSI PUMP (A) DISCHARGE CHECK											CV-S	Q		2OST-11.2	
											LT	2YR		2BVT 1.47.11	
2SIS*7	2	A/C	Active	10	Check		11-1 (G-4)	S	O/S		CV-O	R	VROJ - 16	2OST-11.14A	
LHSI PUMP (B) DISCHARGE CHECK											CV-S	Q		2OST-11.1	
											LT	2YR		2BVT 1.47.11	

Beaver Valley Power Station Unit 2 IST Program

VALVE TABLE

SYSTEM NAME: Safety Injection — SYSTEM NUMBER: 11

Valve ID / Name	Class	Cat.	Active / Passive	Size (in.)	Valve Type	Actuator Type	Drawing & Coord	Position Normal	Position Safety	Position Fail-Safe	Required Test	Frequency	Code Dev.	Procedure	Remarks
2SIS*83	2	A/C	Active	3	Check		11-1 (A-4)	S	O/S		CV-O	R	VROJ - 19	2OST-11.14B	
HHSI LINE CHECK VALVE TO RCS HOT LEGS											CV-S	R	VROJ - 19	2OST-11.14B	
											LT	2YR		2BVT 1.47.11	
2SIS*84	2	A/C	Active	3	Check		11-1 (B-4)	S	O/S		CV-O	R	VROJ - 19	2OST-11.14B	
HHSI LINE CHECK VALVE TO RCS HOT LEGS											CV-S	R	VROJ - 19	2OST-11.14B	
											LT	2YR		2BVT 1.47.11	
2SIS*894	2	C	Active	4	Check		11-1 (E-3)	S	O/S		CV-O	Q		2OST-11.1	
LHSI PUMP (2SIS*P21A) MIN FLOW RECIRC CHECK											CV-S	Q		2OST-11.2	
2SIS*895	2	C	Active	4	Check		11-1 (G-4)	S	O/S		CV-O	Q		2OST-11.2	
LHSI PUMP (2SIS*P21B) MIN FLOW RECIRC CHECK											CV-S	Q		2OST-11.1	
2SIS*94	2	A/C	Active	3	Check		11-1 (D-6)	S	O/S		CV-O	R	VROJ - 19	2OST-11.14B	
HHSI LINE CHECK VALVE TO RCS COLD LEGS											CV-S	R	VROJ - 19	2OST-11.14B	
											LT	2YR		2BVT 1.47.11	
2SIS*95	2	A/C	Active	3	Check		11-1 (C-6)	S	O/S		CV-O	R	VROJ - 19	2OST-11.14B	
HHSI LINE CHECK VALVE TO RCS COLD LEGS											CV-S	R	VROJ - 19	2OST-11.14B	
											LT	2YR		2BVT 1.47.11	
2SIS*AOV850A	2	B	Passive	0.75	Globe	AOV	11-2 (F-3)	S	S	S	RPV	2YR		2OST-11.4	
SI ACCUMULATOR TK21A LEAK TEST LINE ISOLATION															
2SIS*AOV850B	2	B	Passive	0.75	Globe	AOV	11-2 (F-3)	S	S	S	RPV	2YR		2OST-11.5	
SI ACCUMULATOR TK21A LEAK TEST LINE ISOLATION															
2SIS*AOV850C	2	B	Passive	0.75	Globe	AOV	11-2 (F-6)	S	S	S	RPV	2YR		2OST-11.4	
SI ACCUMULATOR TK21B LEAK TEST LINE ISOLATION															
2SIS*AOV850D	2	B	Passive	0.75	Globe	AOV	11-2 (F-6)	S	S	S	RPV	2YR		2OST-11.5	
SI ACCUMULATOR TK 21B LEAK TEST LINE ISOLATION															
2SIS*AOV850E	2	B	Passive	0.75	Globe	AOV	11-2 (F-8)	S	S	S	RPV	2YR		2OST-11.4	
SI ACCUMULATOR TK21C LEAK TEST LINE ISOLATION															

Beaver Valley Power Station Unit 2 IST Program

VALVE TABLE

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

Valve ID / Name	Class	Cat.	Active / Passive	Size (in.)	Valve Type	Actuator Type	Drawing & Coord	Position Normal	Position Safety	Position Fail-Safe	Required Test	Frequency	Code Dev.	Procedure	Remarks
2SIS*AOV850F	2	B	Passive	0.75	Globe	AOV	11-2 (F-8)	S	S	S	RPV	2YR		2OST-11.5	
SI ACCUMULATOR TK21C LEAK TEST LINE ISOLATION															
2SIS*AOV889	2	A	Active	0.75	Globe	AOV	11-2 (F-1)	S	S	S	LTJ	SP		2BVT 1.47.5	
SI ACCUMULATOR TEST LINE ISOLATION											FS-S	Q		2OST-47.3M	
											ST-S	Q		2OST-47.3M	
											RPV	2YR/18MO		2OST-47.3M	18 months per Tech Specs
2SIS*HCV868A	2	B	Active	1	Globe	HCV	11-1 (D-5)	S	O/S	S	FS-S	CSD	VCSJ - 09	2OST-1.10	
HHSI DISCHARGE TO COLD LEG INJECTION											ST-O	CSD	VCSJ - 09	2OST-1.10	
											ST-S	CSD	VCSJ - 09	2OST-1.10	
											RPV	2YR		2OST-1.10	
2SIS*HCV868B	2	B	Active	1	Globe	HCV	11-1 (B-3)	S	O/S	S	FS-S	CSD	VCSJ - 09	2OST-1.10	
HHSI DISCHARGE TO COLD LEG INJECTION											ST-O	CSD	VCSJ - 09	2OST-1.10	
											ST-S	CSD	VCSJ - 09	2OST-1.10	
											RPV	2YR		2OST-1.10	
2SIS*MOV836	2	A	Active	3	Gate	MOV	11-1 (D-5)	S	O/S		ET	R	VROJ - 30	2OST-1.10	Per OMN-1
HIGH HEAD TO COLD LEG INJECTION ISOLATION											DIAG-ST-O	6RFO		1/2-CMP-E-75-021	Per OMN-1
											DIAG-ST-S	6RFO		1/2-CMP-E-75-021	Per OMN-1
											RPV	6RFO		1/2-CMP-E-75-021	Per OMN-1
											LT	2YR		2BVT 1.47.11	
2SIS*MOV840	2	A	Active	1	Globe	MOV	11-1 (D-6)	S	O/S		DIAG-ST-O	6RFO		1/2-CMP-E-75-021	Per OMN-1
HIGH HEAD TO COLD LEG INJECTION ISOLATION											DIAG-ST-S	6RFO		1/2-CMP-E-75-021	Per OMN-1
											RPV	6RFO		1/2-CMP-E-75-021	Per OMN-1
											LT	2YR		2BVT 1.47.11	
											ET	18MO or R		2OST-47.3M	Per OMN-1
2SIS*MOV841	2	B	Active	3	Gate	MOV	11-1 (B-2)	O	S		ET	Q		2OST-47.3M	Per OMN-1
HIGH HEAD TO COLD LEG INJECTION ISOLATION											DIAG-ST-S	6RFO		1/2-CMP-E-75-021	Per OMN-1
											RPV	6RFO		1/2-CMP-E-75-021	Per OMN-1

Beaver Valley Power Station Unit 2 IST Program

VALVE TABLE

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

Valve ID / Name	Class	Cat.	Active / Passive	Size (in.)	Valve Type	Actuator Type	Drawing & Coord	Position Normal	Position Safety	Position Fail-Safe	Required Test	Frequency	Code Dev.	Procedure	Remarks
2SIS*MOV842	2	A	Active	2	Globe	MOV	11-2 (F-2)	S	S		LTJ	SP		2BVT 1.47.5	
SI ACCUM TEST LINE ISOLATION VALVE TO RWST											RPV	6RFO/18MO		2OST-47.3S	18 months per Tech Specs
											DIAG-ST-S	6RFO		1/2-CMP-E-75-021	Per OMN-1
											ET	18MO or R		2OST-47.3O	Per OMN-1
2SIS*MOV851A	2	B	Passive	2	Globe	MOV	11-2 (E-3)	S	S		RPV	2YR		2OST-1.10	
SI ACCUMULATOR TK21A WATER MAKEUP ISOLATION															
2SIS*MOV851B	2	B	Passive	2	Globe	MOV	11-2 (E-5)	S	S		RPV	2YR		2OST-1.10	
SI ACCUMULATOR TK21B WATER MAKEUP ISOLATION															
2SIS*MOV851C	2	B	Passive	2	Globe	MOV	11-2 (E-8)	S	S		RPV	2YR		2OST-1.10	
SI ACCUMULATOR TK21C WATER MAKEUP ISOLATION															
2SIS*MOV852A	2	B	Passive	2	Globe	MOV	11-2 (F-4)	S	S		RPV	2YR		2OST-1.10	
SI ACCUMULATOR TK21A DISCH TO PRI DRAINS TFR TK21															
2SIS*MOV852B	2	B	Passive	2	Globe	MOV	11-2 (F-7)	S	S		RPV	2YR		2OST-1.10	
SI ACCUMULATOR TK21B DISCH TO PRI DRAINS TFR TK21															
2SIS*MOV852C	2	B	Passive	2	Globe	MOV	11-2 (F-10)	S	S		RPV	2YR		2OST-1.10	
SI ACCUMULATOR TK21C DISCH TO PRI DRAINS TFR TK21															
2SIS*MOV863A	2	B	Active	8	Gate	MOV	11-1 (E-7)	S	O		ET	Q		2OST-47.3M	Per OMN-1
LHSI PUMP 2A DISCH TO HHSI PUMPS ISOLATION											DIAG-ST-O	6RFO		1/2-CMP-E-75-021	Per OMN-1
											RPV	6RFO		1/2-CMP-E-75-021	Per OMN-1
2SIS*MOV863B	2	B	Active	8	Gate	MOV	11-1 (F-6)	S	O		ET	Q		2OST-47.3O	Per OMN-1
LHSI PUMP 2B DISCH TO HHSI PUMPS ISOLATION											DIAG-ST-O	6RFO		1/2-CMP-E-75-021	Per OMN-1
											RPV	6RFO		1/2-CMP-E-75-021	Per OMN-1
2SIS*MOV865A	2	B	Active	12	Gate	MOV	11-2 (F-4)	O	O/S		ST-S	CSD	VCSJ - 08	2OST-1.10	Passive Open. May also be ST-S in 2OM-52.4.R.1.F during station S/D.
SI ACCUMULATOR TK21A DISCH STOP											RPV	2YR		2OST-1.10	

Beaver Valley Power Station Unit 2 IST Program

VALVE TABLE

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

Valve ID / Name	Class	Cat.	Active / Passive	Size (in.)	Valve Type	Actuator Type	Drawing & Coord	Position Normal	Position Safety	Position Fail-Safe	Required Test	Frequency	Code Dev.	Procedure	Remarks
2SIS*MOV865B	2	B	Active	12	Gate	MOV	11-2 (F-7)	O	O/S		ST-S	CSD	VCSJ - 08	2OST-1.10	Passive Open. May also be ST-S in 2OM-52.4.R.1.F during station S/D.
SI ACCUMULATOR TK21B DISCH STOP											RPV	2YR		2OST-1.10	
2SIS*MOV865C	2	B	Active	12	Gate	MOV	11-2 (F-9)	O	O/S		ST-S	CSD	VCSJ - 08	2OST-1.10	Passive Open. May also be ST-S in 2OM-52.4.R.1.F during station S/D.
SI ACCUMULATOR TK21C DISCH STOP											RPV	2YR		2OST-1.10	
2SIS*MOV867A	2	B	Active	3	Gate	MOV	11-1 (B-2)	S	O		ET	Q		2OST-47.3M	Per OMN-1
HHSI PUMPS ISOLATION TO COLD LEG INJECTION											DIAG-ST-O	2RFO		1/2-CMP-E-75-021	Per OMN-1
											RPV	2RFO		1/2-CMP-E-75-021	Per OMN-1
2SIS*MOV867B	2	B	Active	3	Gate	MOV	11-1 (C-2)	S	O		ET	Q		2OST-47.3O	Per OMN-1
HHSI PUMPS ISOLATION TO COLD LEG INJECTION											DIAG-ST-O	3RFO		1/2-CMP-E-75-021	Per OMN-1
											RPV	3RFO		1/2-CMP-E-75-021	Per OMN-1
2SIS*MOV867C	2	A	Active	3	Gate	MOV	11-1 (C-5)	S	O/S		ET	Q		2OST-47.3M	Per OMN-1
HHSI PUMPS ISOLATION TO COLD LEG INJECTION											LT	2YR		2BVT 1.47.11	
											DIAG-ST-O	2RFO		1/2-CMP-E-75-021	Per OMN-1
											DIAG-ST-S	2RFO		1/2-CMP-E-75-021	Per OMN-1
											RPV	2RFO		1/2-CMP-E-75-021	Per OMN-1
2SIS*MOV867D	2	A	Active	3	Gate	MOV	11-1 (C-4)	S	O/S		ET	Q		2OST-47.3O	Per OMN-1
HHSI PUMPS ISOLATION TO COLD LEG INJECTION											LT	2YR		2BVT 1.47.11	
											DIAG-ST-O	2RFO		1/2-CMP-E-75-021	Per OMN-1
											DIAG-ST-S	2RFO		1/2-CMP-E-75-021	Per OMN-1
											RPV	2RFO		1/2-CMP-E-75-021	Per OMN-1
2SIS*MOV869A	2	A	Active	3	Gate	MOV	11-1 (A-3)	S	O/S		ET	R	VROJ - 31	2OST-1.10	Per OMN-1. May also be ET in 2OST-11.14B.
HIGH HEAD SI HOT LEG INJECTION ISOL											DIAG-ST-O	6RFO		1/2-CMP-E-75-021	Per OMN-1
											DIAG-ST-S	6RFO		1/2-CMP-E-75-021	Per OMN-1
											RPV	6RFO		1/2-CMP-E-75-021	Per OMN-1
											LT	2YR		2BVT 1.47.11	

Beaver Valley Power Station Unit 2 IST Program

VALVE TABLE

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

Valve ID / Name	Class	Cat.	Active / Passive	Size (in.)	Valve Type	Actuator Type	Drawing & Coord	Position Normal	Position Safety	Position Fail-Safe	Required Test	Frequency	Code Dev.	Procedure	Remarks
2SIS*MOV869B HIGH HEAD SI HOT LEG INJECTION ISOLATION	2	A	Active	3	Gate	MOV	11-1 (B-3)	S	O/S		ET	R	VROJ - 31	2OST-1.10	Per OMN-1. May also be ET in 2OST-11.14B.
											DIAG-ST-O	6RFO		1/2-CMP-E-75-021	Per OMN-1
											DIAG-ST-S	6RFO		1/2-CMP-E-75-021	Per OMN-1
											RPV	6RFO		1/2-CMP-E-75-021	Per OMN-1
											LT	2YR		2BVT 1.47.11	
2SIS*MOV8809A LHSI PUMP (2SIS*P2A) SUCTION ISOLATION	2	A	Active	14	Gate	MOV	11-1 (E-1)	O	S		ET	Q		2OST-47.3M	Per OMN-1
											DIAG-ST-S	6RFO		1/2-CMP-E-75-021	Per OMN-1
											RPV	6RFO		1/2-CMP-E-75-021	Per OMN-1
											LT	2YR		2BVT 1.47.11	
2SIS*MOV8809B LHSI PUMP (2SIS*P2B) SUCTION ISOLATION	2	A	Active	14	Gate	MOV	11-1 (G-2)	O	S		ET	Q		2OST-47.3O	Per OMN-1
											DIAG-ST-S	6RFO		1/2-CMP-E-75-021	Per OMN-1
											RPV	6RFO		1/2-CMP-E-75-021	Per OMN-1
											LT	2YR		2BVT 1.47.11	
2SIS*MOV8811A RS PP (2RSS*P21C) DISCH CROSSOVER TO LHSI P2A DISCH	2	B	Active	10	Gate	MOV	11-1 (E-5)	S	O		ET	Q		2OST-47.3M	Per OMN-1
											DIAG-ST-O	6RFO		1/2-CMP-E-75-021	Per OMN-1
											RPV	6RFO		1/2-CMP-E-75-021	Per OMN-1
2SIS*MOV8811B RS PP (2RSS*P21D) DISCH CROSSOVER TO LHSI P2B DISCH	2	B	Active	10	Gate	MOV	11-1 (F-5)	S	O		ET	Q		2OST-47.3O	Per OMN-1
											DIAG-ST-O	6RFO		1/2-CMP-E-75-021	Per OMN-1
											RPV	6RFO		1/2-CMP-E-75-021	Per OMN-1
2SIS*MOV8887A LOW HEAD SI PUMP 2A DISCH TO HOT LEGS ISOLATION	2	B	Active	10	Gate	MOV	11-1 (F-7)	O	O/S		ET	Q		2OST-47.3M	Per OMN-1
											DIAG-ST-O	6RFO		1/2-CMP-E-75-021	Per OMN-1
											DIAG-ST-S	6RFO		1/2-CMP-E-75-021	Per OMN-1
											RPV	6RFO		1/2-CMP-E-75-021	Per OMN-1
2SIS*MOV8887B LOW HEAD SI PUMP 2B DISCH TO HOT LEGS ISOLATION	2	B	Active	10	Gate	MOV	11-1 (E-8)	O	O/S		ET	Q		2OST-47.3O	Per OMN-1
											DIAG-ST-O	2RFO		1/2-CMP-E-75-021	Per OMN-1
											DIAG-ST-S	2RFO		1/2-CMP-E-75-021	Per OMN-1
											RPV	2RFO		1/2-CMP-E-75-021	Per OMN-1

Beaver Valley Power Station Unit 2 IST Program

VALVE TABLE

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

Valve ID / Name	Class	Cat.	Active / Passive	Size (in.)	Valve Type	Actuator Type	Drawing & Coord	Position Normal	Position Safety	Position Fail-Safe	Required Test	Frequency	Code Dev.	Procedure	Remarks
2SIS*MOV8888A	2	A	Active	10	Gate	MOV	11-1 (E-8)	O	O/S		ET	Q		2OST-47.3M	Per OMN-1
LOW HEAD SI PUMP 2A DISCH ISOLATION TO COLD LEGS											DIAG-ST-O	6RFO		1/2-CMP-E-75-021	Per OMN-1
											DIAG-ST-S	6RFO		1/2-CMP-E-75-021	Per OMN-1
											RPV	6RFO		1/2-CMP-E-75-021	Per OMN-1
											LT	2YR		2OST-11.16	
2SIS*MOV8888B	2	A	Active	10	Gate	MOV	11-1 (G-8)	O	O/S		ET	Q		2OST-47.3O	Per OMN-1
LOW HEAD SI PUMP 2B DISCH ISOLATION TO COLD LEGS											DIAG-ST-O	6RFO		1/2-CMP-E-75-021	Per OMN-1
											DIAG-ST-S	6RFO		1/2-CMP-E-75-021	Per OMN-1
											RPV	6RFO		1/2-CMP-E-75-021	Per OMN-1
											LT	2YR		2OST-11.16	
2SIS*MOV8889	2	A	Active	10	Gate	MOV	11-1 (F-8)	S	O/S		ET	R	VROJ - 32	2OST-1.10	Per OMN-1, May also be ET in 2OST-11.16
LOW HEAD SI PUMP COMBINED DISCH TO HOT LEGS ISOLATION											DIAG-ST-O	6RFO		1/2-CMP-E-75-021	Per OMN-1
											DIAG-ST-S	6RFO		1/2-CMP-E-75-021	Per OMN-1
											RPV	6RFO		1/2-CMP-E-75-021	Per OMN-1
											LT	2YR		2OST-11.16	
2SIS*MOV8890A	2	A	Active	4	Gate	MOV	11-1 (E-4)	S	O/S		ET	Q		2OST-47.3M	Per OMN-1
LOW HEAD SI PP 2A MINI FLOW RECIRC ISOLATION											DIAG-ST-O	6RFO		1/2-CMP-E-75-021	Per OMN-1
											DIAG-ST-S	6RFO		1/2-CMP-E-75-021	Per OMN-1
											RPV	6RFO		1/2-CMP-E-75-021	Per OMN-1
											LT	2YR		2BVT 1.47.11	
2SIS*MOV8890B	2	A	Active	4	Gate	MOV	11-1 (F-4)	S	O/S		ET	Q		2OST-47.3O	Per OMN-1
LOW HEAD SI PUMP 2B MINI FLOW RECIRC ISOLATION											DIAG-ST-O	6RFO		1/2-CMP-E-75-021	Per OMN-1
											DIAG-ST-S	6RFO		1/2-CMP-E-75-021	Per OMN-1
											RPV	6RFO		1/2-CMP-E-75-021	Per OMN-1
											LT	2YR		2BVT 1.47.11	
2SIS*RV130	2	A/C	Active	0.75x1	Relief	RV	11-2 (D-2)	S	O/S		LTJ	SP		2BVT 1.47.5	
RELIEF ON ACCUMULATOR FILL LINE											SPT	10YR		2BVT 1.60.5	

Beaver Valley Power Station Unit 2 IST Program

VALVE TABLE

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

Valve ID / Name	Class	Cat.	Active / Passive	Size (in.)	Valve Type	Actuator Type	Drawing & Coord	Position Normal	Position Safety	Position Fail-Safe	Required Test	Frequency	Code Dev.	Procedure	Remarks
2SIS*RV175	2	A/C	Active	0.75x1	Relief	RV	11-2 (F-1)	S	O/S		LTJ	SP		2BVT 1.47.5	
RELIEF ON BACK LEAKAGE LINE OUT SIDE RX CNMT											SPT	10YR		2BVT 1.60.5	
2SIS*RV858A	2	C	Active	1x2	Relief	RV	11-2 (D-4)	S	O/S		SPT	10YR		2BVT 1.60.5	
ACCUMULATOR (2SIS*TK21A) RELIEF															
2SIS*RV858B	2	C	Active	1x2	Relief	RV	11-2 (D-7)	S	O/S		SPT	10YR		2BVT 1.60.5	
ACCUMULATOR (2SIS*TK21B) RELIEF															
2SIS*RV858C	2	C	Active	1x2	Relief	RV	11-2 (D-9)	S	O/S		SPT	10YR		2BVT 1.60.5	
ACCUMULATOR (2SIS*TK21C) RELIEF															
2SIS*RV8864A	2	C	Active	0.75x1	Relief	RV	11-1 (F-7)	S	O/S		SPT	10YR		2BVT 1.60.5	
LHSI PUMP DISCHARGE RELIEF															
2SIS*RV8864B	2	C	Active	0.75x1	Relief	RV	11-1 (G-6)	S	O/S		SPT	10YR		2BVT 1.60.5	
LHSI PUMP DISCHARGE RELIEF															
2SIS*RV8865	2	C	Active	0.75x1	Relief	RV	11-1 (F-7)	S	O/S		SPT	10YR		2BVT 1.60.5	
LHSI PUMPS COMBINED HOT LEG INJECTION RELIEF															

Beaver Valley Power Station Unit 2 IST Program

VALVE TABLE

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

Valve ID / Name	Class	Cat.	Active / Passive	Size (in.)	Valve Type	Actuator Type	Drawing & Coord	Position Normal	Position Safety	Position Fail-Safe	Required Test	Frequency	Code Dev.	Procedure	Remarks
2CVS*151	2	A	Passive	8	Butterfly		12-1 (A-2)	LS	S		LTJ	SP		2BVT 1.47.5	
CNMT EJ SUCTION CNMT ISOL															
2CVS*151-1	2	A	Passive	8	Butterfly		12-1 (A-3)	LS	S		LTJ	SP		2BVT 1.47.5	
CNMT EJ SUCTION CNMT ISOL															
2CVS*93	2	A/C	Active	1	Check		12-1 (E-2)	O	O/S		CV-S-LT	SP	VROJ - 33	2BVT 1.47.5	Per CVCM Program
CNMT ACT MONITOR SUPPLY CHECK											LTJ	SP		2BVT 1.47.5	
											CV-O	NSO		2OM-54.3 (L5-133)	See VROJ-33
2CVS*SOV102	2	A	Active	1	Globe	SOV	12-1 (E-3)	O	O/S	S	LTJ	SP		2BVT 1.47.5	
POST ACCIDENT SAMPLING											FS-S	Q		2OST-47.3F	
											ST-O	Q		2OST-47.3F	
											ST-S	Q		2OST-47.3F	
											RPV	2YR/18MO		2BVT 1.47.5	18 months per Tech Specs
2CVS*SOV151A	2	A	Active	2	Globe	SOV	12-1 (B-4)	O	S	S	LTJ	SP		2BVT 1.47.5	
CNMT VAC PP 21A SUCTION ISOL											FS-S	Q		2OST-47.3L	
											ST-S	Q		2OST-47.3L	
											RPV	2YR/18MO		2BVT 1.47.5	18 months per Tech Specs
2CVS*SOV151B	2	A	Active	2	Globe	SOV	12-1 (D-4)	O	S	S	LTJ	SP		2BVT 1.47.5	
CNMT VAC PP 21B SUCTION ISOL											FS-S	Q		2OST-47.3L	
											ST-S	Q		2OST-47.3L	
											RPV	2YR/18MO		2BVT 1.47.5	18 months per Tech Specs
2CVS*SOV152A	2	A	Active	2	Globe	SOV	12-1 (B-4)	O	S	S	LTJ	SP		2BVT 1.47.5	
CNMT VAC PP 21A SUCTION ISOL											FS-S	Q		2OST-47.3F	
											ST-S	Q		2OST-47.3F	
											RPV	2YR/18MO		2BVT 1.47.5	18 months per Tech Specs

Beaver Valley Power Station Unit 2 IST Program

VALVE TABLE

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

Valve ID / Name	Class	Cat.	Active / Passive	Size (in.)	Valve Type	Actuator Type	Drawing & Coord	Position Normal	Position Safety	Position Fail-Safe	Required Test	Frequency	Code Dev.	Procedure	Remarks
2CVS*SOV152B	2	A	Active	2	Globe	SOV	12-1 (D-4)	O	S	S	LTJ	SP		2BVT 1.47.5	
CNMT VAC PP 21B SUCTION ISOL											FS-S	Q		2OST-47.3F	
											ST-S	Q		2OST-47.3F	
											RPV	2YR/18MO		2BVT 1.47.5	18 months per Tech Specs
2CVS*SOV153A	2	A	Active	1	Globe	SOV	12-1 (F-3)	O	S	S	LTJ	SP		2BVT 1.47.5	
AIR ACTIVITY MONITOR INLET ISOLATION											FS-S	Q		2OST-47.3F	
											ST-S	Q		2OST-47.3F	
											RPV	2YR/18MO		2BVT 1.47.5	18 months per Tech Specs
2CVS*SOV153B	2	A	Active	1	Globe	SOV	12-1 (F-2)	O	S	S	LTJ	SP		2BVT 1.47.5	
AIR ACTIVITY MONITOR INLET ISOLATION											FS-S	Q		2OST-47.3F	
											ST-S	Q		2OST-47.3F	
											RPV	2YR/18MO		2BVT 1.47.5	18 months per Tech Specs
2LMS*51	2	A	Passive	0.5	Globe/Sealed		12-2 (E-6)	SS	S		LTJ	SP		2BVT 1.47.5	
ISOL TO (2LMS-PIT102)															
2LMS*52	2	A	Passive	0.5	Globe/Sealed		12-2 (E-6)	SS	S		LTJ	SP		2BVT 1.47.5	
ISOL TO (2LMS-PIT102)															
2LMS*SOV950	2	B	Active	0.375	Globe	SOV	12-1 (F-9)	O	O/S	O	FS-O	Q		2OST-47.3L	
CNMT PRESSURE TRANSMITTER ISOL (2LMS*PT950)											ST-O	Q		2OST-47.3L	
											ST-S	Q		2OST-47.3L	
											RPV	2YR		2OST-47.105	
2LMS*SOV951	2	B	Active	0.375	Globe	SOV	12-1 (E-9)	O	O/S	O	FS-O	Q		2OST-47.3L	
CNMT PRESSURE TRANSMITTER ISOL (2LMS*PT951)											ST-O	Q		2OST-47.3L	
											ST-S	Q		2OST-47.3L	
											RPV	2YR		2OST-47.105	
2LMS*SOV952	2	B	Active	0.375	Globe	SOV	12-1 (C-9)	O	O/S	O	FS-O	Q		2OST-47.3F	
CNMT PRESSURE TRANSMITTER ISOL (2LMS*PT952)											ST-O	Q		2OST-47.3F	
											ST-S	Q		2OST-47.3F	
											RPV	2YR		2OST-47.105	

Beaver Valley Power Station Unit 2 IST Program

VALVE TABLE

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

Valve ID / Name	Class	Cat.	Active / Passive	Size (in.)	Valve Type	Actuator Type	Drawing & Coord	Position Normal	Position Safety	Position Fail-Safe	Required Test	Frequency	Code Dev.	Procedure	Remarks
2LMS*SOV953	2	B	Active	0.375	Globe	SOV	12-1 (B-9)	O	O/S	O	FS-O	Q		2OST-47.3F	
CNMT PRESSURE TRANSMITTER ISOL (2LMS*PT953)											ST-O	Q		2OST-47.3F	
											ST-S	Q		2OST-47.3F	
											RPV	2YR		2OST-47.105	

Beaver Valley Power Station Unit 2 IST Program

VALVE TABLE

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

Valve ID / Name	Class	Cat.	Active / Passive	Size (in.)	Valve Type	Actuator Type	Drawing & Coord	Position Normal	Position Safety	Position Fail-Safe	Required Test	Frequency	Code Dev.	Procedure	Remarks
2QSS*227	2	C	Active	2	Check		13-2 (C-6)	S	O/S		CV-O	Q		2OST-13.10A	
CHEMICAL INJECTION PUMP P24A DISCHARGE CHECK											CV-S	Q		2OST-13.10B	
2QSS*228	2	C	Active	2	Check		13-2 (E-6)	S	O/S		CV-O	Q		2OST-13.10B	
CHEMICAL INJECTION PUMP P24B DISCHARGE CHECK											CV-S	Q		2OST-13.10A	
2QSS*267	2	A/C	Active	2.5	Check		13-2 (C-10)	S	O/S		LTJ	SP		2BVT 1.47.5	
CHEM INJECT PUMP TO CNMT SUMP DISCH CHECK											CV-ME	R	VROJ - 35	2OST-1.10	
2QSS*3	2	A/C	Active	10	Check		13-2 (D-10)	S	O/S		LTJ	SP		2BVT 1.47.5	
QUENCH PUMP P21B DISCHARGE CHECK											CV-ME	CSD	VCSJ - 10	2OST-1.10	
2QSS*303	2	C	Active	2	Check		13-2 (A-8)	S	O/S		CV-O	Q		2OST-13.10A	
CHEM INJECT TO QUENCH SPRAY PUMP (2QSS*P21A) CHECK											CV-S	CSD	VCSJ - 12	2OST-1.10	
2QSS*304	2	C	Active	2	Check		13-2 (F-8)	S	O/S		CV-O	Q		2OST-13.10B	
CHEMICAL INJECT TO QUENCH SPRAY PMP (2QSS*P21B) CHECK											CV-S	CSD	VCSJ - 12	2OST-1.10	
2QSS*4	2	A/C	Active	10	Check		13-2 (C-9)	S	O/S		LTJ	SP		2BVT 1.47.5	
QUENCH PUMP P21A DISCHARGE CHECK											CV-ME	CSD	VCSJ - 10	2OST-1.10	
2QSS*AOV120A	2	B	Active	6	Globe	AOV	13-2 (E-3)	O	S	S	FS-S	Q		2OST-47.3I	
REFUELING WATER COOLING PUMP SUCTION ISOL											ST-S	Q		2OST-47.3I	
											RPV	2YR		2OST-47.3I	
2QSS*AOV120B	2	B	Active	6	Globe	AOV	13-2 (D-3)	O	S	S	FS-S	Q		2OST-47.3N	
REFUELING WATER COOLING PUMP SUCTION ISOL											ST-S	Q		2OST-47.3N	
											RPV	2YR		2OST-47.3N	
2QSS*MOV100A	2	B	Active	12	Gate	MOV	13-2 (A-8)	O	O		ST-O	Q		2OST-47.3I	
QUENCH SPRAY PUMP 21A SUCTION ISOL VALVE											RPV	2YR		2OST-47.3I	
2QSS*MOV100B	2	B	Active	12	Gate	MOV	13-2 (G-8)	O	O		ST-O	Q		2OST-47.3O	
QUENCH PUMP 21B SUCTION ISOLATION VALVE											RPV	2YR		2OST-47.3O	

Beaver Valley Power Station Unit 2 IST Program

VALVE TABLE

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

Valve ID / Name	Class	Cat.	Active / Passive	Size (in.)	Valve Type	Actuator Type	Drawing & Coord	Position Normal	Position Safety	Position Fail-Safe	Required Test	Frequency	Code Dev.	Procedure	Remarks
2QSS*MOV101A	2	A	Active	10	Gate	MOV	13-2 (C-9)	O	O/S		LTJ	SP		2BVT 1.47.5	
QUENCH PUMP 21A DISCHARGE ISOLATION VALVE											DIAG-ST-O	6RFO		1/2-CMP-E-75-021	Per OMN-1
											DIAG-ST-S	6RFO		1/2-CMP-E-75-021	Per OMN-1
											RPV	6RFO		1/2-CMP-E-75-021	Per OMN-1
											ET	18MO or R		2OST-13.1	Per OMN-1
2QSS*MOV101B	2	A	Active	10	Gate	MOV	13-2 (D-9)	O	O/S		LTJ	SP		2BVT 1.47.5	
QUENCH PUMP 21B DISCHARGE ISOLATION VALVE											DIAG-ST-O	6RFO		1/2-CMP-E-75-021	Per OMN-1
											DIAG-ST-S	6RFO		1/2-CMP-E-75-021	Per OMN-1
											RPV	6RFO		1/2-CMP-E-75-021	Per OMN-1
											ET	18MO or R		2OST-13.2	Per OMN-1
2QSS*MOV102A	2	B	Active	6	Gate	MOV	13-2 (C-5)	S	O		ET	R	VROJ - 34	2OST-1.10	Per OMN-1
QUENCH SPRAY CHEM ADD TANK DISCH TO CHEM INJ PMP 24A											DIAG-ST-O	6RFO		1/2-CMP-E-75-021	Per OMN-1
											RPV	6RFO		1/2-CMP-E-75-021	Per OMN-1
2QSS*MOV102B	2	B	Active	6	Gate	MOV	13-2 (E-5)	S	O		ET	R	VROJ - 34	2OST-1.10	Per OMN-1
CHEM ADDITION TANK DISCH TO PUMP P24B ISOL											DIAG-ST-O	6RFO		1/2-CMP-E-75-021	Per OMN-1
											RPV	6RFO		1/2-CMP-E-75-021	Per OMN-1
2QSS*RV101A	2	A/C	Active	0.75x1	Relief	RV	13-2 (C-9)	S	O/S		LTJ	SP		2BVT 1.47.5	
2QSS*MOV101A BONNET RELIEF											SPT	10YR		2BVT 1.60.5	
2QSS*RV101B	2	A/C	Active	0.75x1	Relief	RV	13-2 (E-9)	S	O/S		LTJ	SP		2BVT 1.47.5	
2QSS*MOV101B BONNET RELIEF											SPT	10YR		2BVT 1.60.5	
2QSS*RV102A	2	C	Active	1.5x2	Relief	RV	13-2 (C-6)	S	O/S		SPT	10YR		2BVT 1.60.5	
CHEM INJECT PMP P24A DISCH RELIEF															
2QSS*RV102B	2	C	Active	1.5x2	Relief	RV	13-2 (E-6)	S	O/S		SPT	10YR		2BVT 1.60.5	
QUENCH SPRAY CHEM ADD TANK DISCH TO CHEM INJ PMP 24B															
2QSS*SOV100A	2	A	Active	2	Globe	SOV	13-2 (D-7)	S	O/S	S	LTJ	SP		2BVT 1.47.5	
CHEM INJ PMP DISCH TO CNMT SUMP											FS-S	CSD	VCSJ - 11	2OST-1.10	
											ST-O	CSD	VCSJ - 11	2OST-1.10	
											ST-S	CSD	VCSJ - 11	2OST-1.10	
											RPV	2YR		2BVT 1.47.5	

Beaver Valley Power Station Unit 2 IST Program

VALVE TABLE

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

Valve ID / Name	Class	Cat.	Active / Passive	Size (in.)	Valve Type	Actuator Type	Drawing & Coord	Position Normal	Position Safety	Position Fail-Safe	Required Test	Frequency	Code Dev.	Procedure	Remarks
2QSS*SOV100B	2	A	Active	2	Globe	SOV	13-2 (E-7)	S	O/S	S	LTJ	SP		2BVT 1.47.5	
CHEM INJ PUMP DISCH TO CNMT SUMP											FS-S	CSD	VCSJ - 11	2OST-1.10	
											ST-O	CSD	VCSJ - 11	2OST-1.10	
											ST-S	CSD	VCSJ - 11	2OST-1.10	
											RPV	2YR		2BVT 1.47.5	
2QSS*SOV101A	2	B	Active	2	Globe	SOV	13-2 (D-7)	O	O	S	FS-S	Q		2OST-47.3I	
CHEM INJ DISCH TO QUENCH PUMP P21A											ST-O	Q		2OST-47.3I	
											RPV	2YR		2OST-13.10A	
2QSS*SOV101B	2	B	Active	2	Globe	SOV	13-2 (E-7)	O	O	S	FS-S	Q		2OST-47.3N	
CHEM INJ PUMP DISCH TO QUENCH PUMP 21B											ST-O	Q		2OST-47.3N	
											RPV	2YR		2OST-13.10B	
2QSS*SOV102A	2	B	Active	2	Globe	SOV	13-2 (D-7)	O	O	S	FS-S	Q		2OST-47.3N	
CHEM INJ PUMP DISCH TO QUENCH PUMP 21A											ST-O	Q		2OST-47.3N	
											RPV	2YR		2OST-13.10A	
2QSS*SOV102B	2	B	Active	2	Globe	SOV	13-2 (E-7)	O	O	S	FS-S	Q		2OST-47.3I	
CHEM INJ PUMP DISCH TO QUENCH PUMP 21B											ST-O	Q		2OST-47.3I	
											RPV	2YR		2OST-13.10B	
2RSS*10	2	A	Passive	1.5	Gate		13-1 (E-9)	S	S		LT	2YR		2BVT 1.13.6	
RECIRC PUMP P21B DRAIN TO NUCLEAR VENT AND DRN SYSTEM															
2RSS*11	2	A	Passive	1.5	Gate		13-1 (E-4)	S	S		LT	2YR		2BVT 1.13.6	
RECIRC PUMP P21C DRAIN TO NUCLEAR VENT AND DRN SYSTEM															
2RSS*12	2	A	Passive	1.5	Gate		13-1 (E-7)	S	S		LT	2YR		2BVT 1.13.6	
RECIRC PUMP P21D DRAIN TO NUCLEAR VENT AND DRN SYSTEM															
2RSS*27	2	A	Passive	4	Gate		13-1 (C-2)	LS	S		LT	2YR		2BVT 1.13.5	
RECIRC PUMP P21A DISCHARGE RECIRC ISOL															
2RSS*28	2	A	Passive	4	Gate		13-1 (C-9)	LS	S		LT	2YR		2BVT 1.13.5	
RECIRC PUMP P21B DISCHARGE RECIRC ISOL															

Beaver Valley Power Station Unit 2 IST Program

VALVE TABLE

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

Valve ID / Name	Class	Cat.	Active / Passive	Size (in.)	Valve Type	Actuator Type	Drawing & Coord	Position Normal	Position Safety	Position Fail-Safe	Required Test	Frequency	Code Dev.	Procedure	Remarks
2RSS*29 RECIRC PUMP P21A DISCHARGE CHECK	2	C	Active	12	Check		13-1 (B-2)	S	O/S		CV-ME	CSD	VCSJ - 13	2OST-1.10	
2RSS*3 DEMINERALIZED WATER TO RECIRC PUMP P21C ISOL	2	A	Passive	4	Gate		13-1 (B-3)	LS	S		LT	2YR		2BVT 1.13.6	
2RSS*30 RECIRC PUMP P21B DISCHARGE CHECK	2	C	Active	12	Check		13-1 (B-9)	S	O/S		CV-ME	CSD	VCSJ - 13	2OST-1.10	
2RSS*31 RECIRC PUMP P21C DISCHARGE CHECK	2	C	Active	12	Check		13-1 (B-4)	S	O/S		CV-ME	CSD	VCSJ - 13	2OST-1.10	
2RSS*32 RECIRC PUMP P21D DISCHARGE CHECK	2	C	Active	12	Check		13-1 (B-7)	S	O/S		CV-ME	CSD	VCSJ - 13	2OST-1.10	
2RSS*4 DEMINERALIZED WATER TO RECIRC PUMP P21D ISOL	2	A	Passive	4	Gate		13-1 (C-8)	LS	S		LT	2YR		2BVT 1.13.6	
2RSS*5 RECIRC PUMP P21A SUCTION RECIRC ISOL	2	A	Passive	4	Gate		13-1 (E-1)	LS	S		LT	2YR		2BVT 1.13.6	
2RSS*6 RECIRC PUMP P21B SUCTION RECIRC ISOL	2	A	Passive	4	Gate		13-1 (E-10)	LS	S		LT	2YR		2BVT 1.13.6	
2RSS*9 RECIRC PUMP P21A DRAIN TO NUCLEAR VENT AND DRN SYSTEM	2	A	Passive	1.5	Gate		13-1 (F-2)	S			LT	2YR		2BVT 1.13.6	
2RSS*MOV154C RECIRC PUMP P21C RECIRCULATION VALVE	2	B	Active	3	Gate	MOV	13-1 (C-4)	S	O/S		ET	R	VROJ - 36	2OST-1.10	Per OMN-1
											DIAG-ST-O	6RFO	VROJ - 36	1/2-CMP-E-75-021	Per OMN-1
											DIAG-ST-S	6RFO	VROJ - 36	1/2-CMP-E-75-021	Per OMN-1
2RSS*MOV154D RECIRC PUMP P21D RECIRCULATION VALVE	2	B	Active	3	Gate	MOV	13-1 (C-7)	S	O/S		ET	R	VROJ - 36	2OST-1.10	Per OMN-1
											DIAG-ST-O	6RFO	VROJ - 36	1/2-CMP-E-75-021	Per OMN-1
											DIAG-ST-S	6RFO	VROJ - 36	1/2-CMP-E-75-021	Per OMN-1

Beaver Valley Power Station Unit 2 IST Program

VALVE TABLE

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

Valve ID / Name	Class	Cat.	Active / Passive	Size (in.)	Valve Type	Actuator Type	Drawing & Coord	Position Normal	Position Safety	Position Fail-Safe	Required Test	Frequency	Code Dev.	Procedure	Remarks
2RSS*MOV155A	2	B	Active	12	Butterfly	MOV	13-1 (G-4)	O	O/S		ET	Q		2OST-47.3Q	Per OMN-1
RECIRC SPRAY PUMP 21A OUTSIDE CNMT SUCTION ISOL											DIAG-ST-O	6RFO		1/2-CMP-75-Quarter Turn-1E	Per OMN-1
											DIAG-ST-S	6RFO		1/2-CMP-75-Quarter Turn-1E	Per OMN-1
											RPV	6RFO		1/2-CMP-75-Quarter Turn-1E	Per OMN-1
2RSS*MOV155B	2	B	Active	12	Butterfly	MOV	13-1 (G-7)	O	O/S		ET	Q		2OST-47.3G	Per OMN-1
RECIRC SPRAY PUMP P21B OUTSIDE CNMT SUCTION ISOL											DIAG-ST-O	6RFO		1/2-CMP-75-Quarter Turn-1E	Per OMN-1
											DIAG-ST-S	6RFO		1/2-CMP-75-Quarter Turn-1E	Per OMN-1
											RPV	6RFO		1/2-CMP-75-Quarter Turn-1E	Per OMN-1
2RSS*MOV155C	2	B	Active	12	Butterfly	MOV	13-1 (F-5)	O	O/S		ET	Q		2OST-47.3Q	Per OMN-1
RECIRC PUMP 21C OUTSIDE CNMT SUCTION ISOLATION											DIAG-ST-O	6RFO		1/2-CMP-75-Quarter Turn-1E	Per OMN-1
											DIAG-ST-S	6RFO		1/2-CMP-75-Quarter Turn-1E	Per OMN-1
											RPV	6RFO		1/2-CMP-75-Quarter Turn-1E	Per OMN-1
2RSS*MOV155D	2	B	Active	12	Butterfly	MOV	13-1 (F-6)	O	O/S		ET	Q		2OST-47.3G	Per OMN-1
RECIRC SPRAY PUMP P21D OUTSIDE CNMT SUCTION ISOL											DIAG-ST-O	6RFO		1/2-CMP-75-Quarter Turn-1E	Per OMN-1
											DIAG-ST-S	6RFO		1/2-CMP-75-Quarter Turn-1E	Per OMN-1
											RPV	6RFO		1/2-CMP-75-Quarter Turn-1E	Per OMN-1
2RSS*MOV156A	2	B	Active	12	Gate	MOV	13-1 (B-2)	O	O/S		ST-O	Q		2OST-47.3Q	
RECIRC SPRAY PUMP 21A OUTSIDE CNMT DISCH ISOL											ST-S	Q		2OST-47.3Q	
											RPV	2YR/18MO		2OST-47.3Q	18 months per Tech Specs
2RSS*MOV156B	2	B	Active	12	Gate	MOV	13-1 (B-9)	O	O/S		ST-O	Q		2OST-47.3G	
RECIRC SPRAY PUMP 21B OUTSIDE CNMT DISCH ISOLATION											ST-S	Q		2OST-47.3G	
											RPV	2YR/18MO		2OST-47.3G	18 months per Tech Specs

Beaver Valley Power Station Unit 2 IST Program

VALVE TABLE

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

Valve ID / Name	Class	Cat.	Active / Passive	Size (in.)	Valve Type	Actuator Type	Drawing & Coord	Position Normal	Position Safety	Position Fail-Safe	Required Test	Frequency	Code Dev.	Procedure	Remarks
2RSS*MOV156C	2	B	Active	12	Gate	MOV	13-1 (B-4)	O	O/S		ET	Q		2OST-47.3Q	Per OMN-1
RECIRC SPRAY PUMP 21C OUTSIDE CNMT DISCH ISOLATION											DIAG-ST-O	6RFO		1/2-CMP-E-75-021	Per OMN-1
											DIAG-ST-S	6RFO		1/2-CMP-E-75-021	Per OMN-1
											RPV	18MO		2OST-47.3Q	18 months per Tech Specs
2RSS*MOV156D	2	B	Active	12	Gate	MOV	13-1 (B-7)	O	O/S		ET	Q		2OST-47.3G	Per OMN-1
RECIRC SPRAY PUMP 21D OUTSIDE CNMT DISCH ISOLATION											DIAG-ST-O	6RFO		1/2-CMP-E-75-021	Per OMN-1
											DIAG-ST-S	6RFO		1/2-CMP-E-75-021	Per OMN-1
											RPV	18MO		2OST-47.3G	18 months per Tech Specs
2RSS*RV101C	2	C	Active	0.75x1	Relief	RV	13-1 (C-4)	S	O/S		SPT	10YR		2BVT 1.60.5	
RECIRC PUMP P21C RECIRCULATION LINE RELIEF															
2RSS*RV101D	2	C	Active	0.75x1	Relief	RV	13-1 (C-7)	S	O/S		SPT	10YR		2BVT 1.60.5	
RECIRC PUMP P21D RECIRCULATION LINE RELIEF															
2RSS*RV156A	2	C	Active	0.75x1	Relief	RV	13-1 (B-2)	S	O/S		SPT	10YR		2BVT 1.60.5	
RECIRC PUMP P21A DISCHARGE VALVE RELIEF															
2RSS*RV156B	2	C	Active	0.75x1	Relief	RV	13-1 (B-9)	S	O/S		SPT	10YR		2BVT 1.60.5	
RECIRC PUMP P21B DISCHARGE VALVE RELIEF															
2RSS*RV156C	2	C	Active	0.75x1	Relief	RV	13-1 (B-4)	S	O/S		SPT	10YR		2BVT 1.60.5	
RECIRC PUMP P21C DISCHARGE VALVE RELIEF															
2RSS*RV156D	2	C	Active	0.75x1	Relief	RV	13-1 (B-7)	S	O/S		SPT	10YR		2BVT 1.60.5	
RECIRC PUMP P21D DISCHARGE VALVE RELIEF															

Beaver Valley Power Station Unit 2 IST Program

VALVE TABLE

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

Valve ID / Name	Class	Cat.	Active / Passive	Size (in.)	Valve Type	Actuator Type	Drawing & Coord	Position Normal	Position Safety	Position Fail-Safe	Required Test	Frequency	Code Dev.	Procedure	Remarks
2SSR*AOV100A1	2	A	Active	0.75	Globe	AOV	14A-1 (C-9)	O	S	S	LTJ	SP		2BVT 1.47.5	
PRZR LIQUID SPACE SAMPLE INSIDE CNMT ISOL											FS-S	Q		2OST-47.3H	
											ST-S	Q		2OST-47.3H	
											RPV	2YR/18MO		2OST-47.3R	18 months per Tech Specs
2SSR*AOV100A2	2	A	Active	0.75	Globe	AOV	14A-1 (D-9)	O	S	S	LTJ	SP		2BVT 1.47.5	
PRZR LIQUID SPACE SAMPLE OUTSIDE CNMT ISOL											FS-S	Q		2OST-47.3F	
											ST-S	Q		2OST-47.3F	
											RPV	2YR/18MO		2OST-47.3F	18 months per Tech Specs
2SSR*AOV102A1	2	A	Active	0.75	Globe	AOV	14A-2 (C-1)	S	S	S	LTJ	SP		2BVT 1.47.5	
PRI COOL COLD LEG SAMPLE INSIDE CNMT ISOL											FS-S	Q		2OST-47.3H	
											ST-S	Q		2OST-47.3H	
											RPV	2YR/18MO		2OST-47.3R	18 months per Tech Specs
2SSR*AOV102A2	2	A	Active	0.75	Globe	AOV	14A-2 (D-1)	S	S	S	LTJ	SP		2BVT 1.47.5	
PRI COOL COLD LEG SAMPLE OUTSIDE CNMT ISOL											FS-S	Q		2OST-47.3F	
											ST-S	Q		2OST-47.3F	
											RPV	2YR/18MO		2OST-47.3F	18 months per Tech Specs
2SSR*AOV109A1	2	A	Active	0.75	Globe	AOV	14A-1 (C-7)	O	S	S	LTJ	SP		2BVT 1.47.5	
SAFETY INJECT ACCUM SAMPLE INSIDE CNMT ISOL											FS-S	Q		2OST-47.3H	
											ST-S	Q		2OST-47.3H	
											RPV	2YR/18MO		2OST-47.3R	18 months per Tech Specs
2SSR*AOV109A2	2	A	Active	0.75	Globe	AOV	14A-1 (D-7)	O	S	S	LTJ	SP		2BVT 1.47.5	
SAFETY INJECT ACCUM SAMPLE OUTSIDE CNMT ISOL											FS-S	Q		2OST-47.3F	
											ST-S	Q		2OST-47.3F	
											RPV	2YR/18MO		2OST-47.3F	18 months per Tech Specs

Beaver Valley Power Station Unit 2 IST Program

VALVE TABLE

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

Valve ID / Name	Class	Cat.	Active / Passive	Size (in.)	Valve Type	Actuator Type	Drawing & Coord	Position Normal	Position Safety	Position Fail-Safe	Required Test	Frequency	Code Dev.	Procedure	Remarks
2SSR*AOV112A1	2	A	Active	0.75	Globe	AOV	14A-1 (C-8)	O	S	S	LTJ	SP		2BVT 1.47.5	
PRZR VAPOR SPACE SAMPL INSIDE CNMT ISOL											FS-S	Q		2OST-47.3H	
											ST-S	Q		2OST-47.3H	
											RPV	2YR/18MO		2OST-47.3R	18 months per Tech Specs
2SSR*AOV112A2	2	A	Active	0.75	Globe	AOV	14A-1 (D-8)	O	S	S	LTJ	SP		2BVT 1.47.5	
PRZR VAPOR SPACE SAMPLE OUTSIDE CNMT											FS-S	Q		2OST-47.3F	
											ST-S	Q		2OST-47.3F	
											RPV	2YR/18MO		2OST-47.3F	18 months per Tech Specs
2SSR*AOV117A	2	B	Active	0.75	Globe	AOV	14A-1 (B-2)	O	S	S	FS-S	Q		2OST-47.3L	
21A STM GEN BLOWDOWN SAMPLE OUTSIDE CNMT ISOL											ST-S	Q		2OST-47.3L	
											RPV	2YR		2OST-47.3L	
2SSR*AOV117B	2	B	Active	0.75	Globe	AOV	14A-1 (B-3)	O	S	S	FS-S	Q		2OST-47.3L	
21B STM GEN BLOWDOWN SAMPLE OUTSIDE CNMT ISOL											ST-S	Q		2OST-47.3L	
											RPV	2YR		2OST-47.3L	
2SSR*AOV117C	2	B	Active	0.75	Globe	AOV	14A-1 (B-5)	O	S	S	FS-S	Q		2OST-47.3L	
21C STM GEN BLOWDOWN SAMPLE OUTSIDE CNMT ISOL											ST-S	Q		2OST-47.3L	
											RPV	2YR		2OST-47.3L	
2SSR*RV117	2	A/C	Active	0.75x1	Relief	RV	14A-1 (D-6)	S	O/S		LTJ	SP		2BVT 1.47.5	
(2SSR*AOV109A) OVERPRESS RELIEF											SPT	10YR		2BVT 1.60.5	
2SSR*RV118	2	A/C	Active	0.75x1	Relief	RV	14A-2 (C-1)	S	O/S		LTJ	SP		2BVT 1.47.5	
(2SSR*AOV102A) OVERPRESS RELIEF											SPT	10YR		2BVT 1.60.5	
2SSR*RV119	2	A/C	Active	0.75x1	Relief	RV	14A-1 (D-9)	S	O/S		LTJ	SP		2BVT 1.47.5	
(2SSR*AOV100A) OVERPRESS RELIEF											SPT	10YR		2BVT 1.60.5	
2SSR*RV120	2	A/C	Active	0.75x1	Relief	RV	14A-2 (C-2)	S	O/S		LTJ	SP		2BVT 1.47.5	
(2SSR*SOV128A) OVERPRESS RELIEF											SPT	10YR		2BVT 1.60.5	
2SSR*RV121	2	A/C	Active	0.75x1	Relief	RV	14A-1 (D-8)	S	O/S		LTJ	SP		2BVT 1.47.5	
(2SSR*AOV112A) OVERPRESS RELIEF											SPT	10YR		2BVT 1.60.5	

Beaver Valley Power Station Unit 2 IST Program

VALVE TABLE

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

Valve ID / Name	Class	Cat.	Active / Passive	Size (in.)	Valve Type	Actuator Type	Drawing & Coord	Position Normal	Position Safety	Position Fail-Safe	Required Test	Frequency	Code Dev.	Procedure	Remarks
2SSR*RV122	2	A/C	Active	0.75x1	Relief	RV	14A-2 (C-2)	S	O/S		LTJ	SP		2BVT 1.47.5	
(2SSR*SOV129A) OVERPRESS RELIEF											SPT	10YR		2BVT 1.60.5	
2SSR*SOV128A1	2	A	Active	0.375	Globe	SOV	14A-2 (B-3)	S	O/S	S	LTJ	SP		2BVT 1.47.5	
PRI COOL HOT LEG SAMPLE CNMT ISOL											FS-S	Q		2OST-47.3H	
											ST-O	Q		2OST-47.3H	
											ST-S	Q		2OST-47.3H	
											RPV	2YR/18MO		2-CHM-SAM-3.37	18 months per Tech Specs
2SSR*SOV128A2	2	A	Active	0.375	Globe	SOV	14A-2 (D-2)	S	O/S	S	LTJ	SP		2BVT 1.47.5	
PRI COOL HOT LEG SAMPLE OUTSIDE CNMT ISOL											FS-S	Q		2OST-47.3F	
											ST-O	Q		2OST-47.3F	
											ST-S	Q		2OST-47.3F	
											RPV	2YR/18MO		2-CHM-SAM-3.37	18 months per Tech Specs
2SSR*SOV129A1	2	A	Active	0.375	Globe	SOV	14A-2 (B-4)	S	O/S	S	LTJ	SP		2BVT 1.47.5	
RHR/CNMT SUMP SAMPLE CNMT ISOL											FS-S	Q		2OST-47.3H	
											ST-O	Q		2OST-47.3H	
											ST-S	Q		2OST-47.3H	
											RPV	2YR/18MO		2BVT 1.47.5	18 months per Tech Specs
											RPV	2YR/18MO		2OST-10.5	18 months per Tech Specs
2SSR*SOV129A2	2	A	Active	0.375	Globe	SOV	14A-2 (D-2)	S	O/S	S	LTJ	SP		2BVT 1.47.5	
RHR/CNMT SUMP SAMPLE OUTSIDE CNMT ISOL											FS-S	Q		2OST-47.3F	
											ST-O	Q		2OST-47.3F	
											ST-S	Q		2OST-47.3F	
											RPV	2YR/18MO		2BVT 1.47.5	18 months per Tech Specs
											RPV	2YR/18MO		2OST-10.5	18 months per Tech Specs

Beaver Valley Power Station Unit 2 IST Program

VALVE TABLE

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

Valve ID / Name	Class	Cat.	Active / Passive	Size (in.)	Valve Type	Actuator Type	Drawing & Coord	Position Normal	Position Safety	Position Fail-Safe	Required Test	Frequency	Code Dev.	Procedure	Remarks
2SSR*SOV130A1	2	A	Active	0.375	Globe	SOV	14A-2 (B-10)	O	O/S	S	LTJ	SP		2BVT 1.47.5	
PRZR RELIEF TK GAS/PDTT SAMPLE CNMT ISOL											FS-S	Q		2OST-47.3H	
											ST-O	Q		2OST-47.3H	
											ST-S	Q		2OST-47.3H	
											RPV	2YR/18MO		2BVT 1.47.5	18 months per Tech Specs
2SSR*SOV130A2	2	A	Active	0.375	Globe	SOV	14A-2 (C-10)	O	O/S	S	LTJ	SP		2BVT 1.47.5	
PRZR RELIEF TK GAS/PDTT SAMPLE OUTSIDE CNMT ISOL											FS-S	Q		2OST-47.3F	
											ST-O	Q		2OST-47.3F	
											ST-S	Q		2OST-47.3F	
											RPV	2YR/18MO		2BVT 1.47.5	18 months per Tech Specs

Beaver Valley Power Station Unit 2 IST Program

VALVE TABLE

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

Valve ID / Name	Class	Cat.	Active / Passive	Size (in.)	Valve Type	Actuator Type	Drawing & Coord	Position Normal	Position Safety	Position Fail-Safe	Required Test	Frequency	Code Dev.	Procedure	Remarks
2PAS*SOV105A1	2	A	Active	0.375	Globe	SOV	14C-2 (A-2)	S	O/S	S	LTJ	SP		2BVT 1.47.5	
CONTAINMENT ATMOSPHERE SAMPLE LINE INSIDE ISOLATION											FS-S	Q		2OST-47.3P	
											ST-O	Q		2OST-47.3P	
											ST-S	Q		2OST-47.3P	
											RPV	2YR/18MO		2BVT 1.47.5	18 months per Tech Specs
2PAS*SOV105A2	2	A	Active	0.375	Globe	SOV	14C-2 (A-3)	S	O/S	S	LTJ	SP		2BVT 1.47.5	
CONTAINMENT ATMOSPHERE SAMPLE LINE OUTSIDE ISOL											FS-S	Q		2OST-47.3N	
											ST-O	Q		2OST-47.3N	
											ST-S	Q		2OST-47.3N	
											RPV	2YR/18MO		2BVT 1.47.5	18 months per Tech Specs

Beaver Valley Power Station Unit 2 IST Program

VALVE TABLE

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

Valve ID / Name	Class	Cat.	Active / Passive	Size (in.)	Valve Type	Actuator Type	Drawing & Coord	Position Normal	Position Safety	Position Fail-Safe	Required Test	Frequency	Code Dev.	Procedure	Remarks
2CCP*27A	3	B	Active	20	Butterfly		15-1 (D-6)	O	S		MAN	R		2OST-1.10	
COMP COOL PUMP P21C DISCH CROSS CONN TO HDR A															
2CCP*27B	3	B	Active	20	Butterfly		15-1 (D-6)	O	S		MAN	R		2OST-1.10	
COMP COOL PUMP P21C DISCH CROSS CONN TO HDR B															
2CCP*289	3	A/C	Active	2	Check		15-3 (C-1)	O	S		CV-S-LT	R	VROJ - 40	2BVT 1.60.6	
RCP 21A THERMAL BARRIER SUPPLY CK											CV-BDT-O	NSO		ISTC-3550	During operation of RCP
											LT	2YR		2BVT 1.60.6	
2CCP*290	3	A/C	Active	2	Check		15-3 (F-1)	O	S		CV-S-LT	R	VROJ - 40	2BVT 1.60.6	
RCPB THERMAL BARRIER COOLING WATER SUPPLY CHECK											CV-BDT-O	NSO		ISTC-3550	During operation of RCP
											LT	2YR		2BVT 1.60.6	
2CCP*291	3	A/C	Active	2	Check		15-3 (F-6)	O	S		CV-S-LT	R	VROJ - 40	2BVT 1.60.6	
RCPC THERMAL BARRIER COOLING WATER SUPPLY CHECK											CV-BDT-O	NSO		ISTC-3550	During operation of RCP
											LT	2YR		2BVT 1.60.6	
2CCP*321	3	B	Active	2	Gate		15-1 (B-3)	LO	S		MAN	R		2OST-15.5	
CCP SURGE TK A SURGE LINE ISOL TO PP P21A SUCT											MAN	2YR		2OST-15.1	
2CCP*322	3	B	Active	2	Gate		15-1 (F-3)	LO	S		MAN	R		2OST-15.5	
CCP SURGE TK B SURGE LINE ISOL TO PP P21B SUCT											MAN	2YR		2OST-15.2	
2CCP*323	3	B	Active	2	Gate		15-1 (C-3)	LO	S		MAN	R		2OST-15.5	
CCP SURGE TK A SURGE LINE ISOL TO PP P21C SUCT											MAN	2YR		2OST-15.1	
2CCP*324	3	B	Active	20	Butterfly		15-1 (E-3)	O	S		MAN	R		2OST-15.5	
SUCTION HEADER CROSS CONNECT											MAN	2YR		2OST-15.2	
2CCP*325	3	B	Active	20	Butterfly		15-1 (C-3)	O	S		MAN	R		2OST-15.5	
SUCTION HEADER CROSS CONNECT											MAN	2YR		2OST-15.1	
2CCP*326	3	B	Active	2	Gate		15-1 (E-3)	LO	S		MAN	R		2OST-15.5	
CCP SURGE TK B SURGE LINE ISOL TO PP P21C SUCT											MAN	2YR		2OST-15.2	

Beaver Valley Power Station Unit 2 IST Program

VALVE TABLE

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

Valve ID / Name	Class	Cat.	Active / Passive	Size (in.)	Valve Type	Actuator Type	Drawing & Coord	Position Normal	Position Safety	Position Fail-Safe	Required Test	Frequency	Code Dev.	Procedure	Remarks
2CCP*352	3	C	Active	2	Check		15-2 (A-1)	O	S		CV-S-LT	R	VROJ - 41	2BVT 1.60.6	
RETURN FROM CONTAINMENT INST AIR COMPRESSORS CHECK											CV-BDT-O	NSO		ISTC-3550	During operation of CNMT air compressors
2CCP*354	3	B	Active	20	Butterfly		15-1 (E-8)	O	S		MAN	R		2OST-1.10	
CCP HT EX COMBINED DISCH HEADER CROSS CONN															
2CCP*355	3	B	Active	20	Butterfly		15-1 (D-8)	O	S		MAN	R		2OST-1.10	
CCP HT EX COMBINED DISCH HEADER CROSS CONN															
2CCP*4	3	C	Active	20	Check		15-1 (B-5)	O	O/S		CV-O	R	VROJ - 37	2OST-15.5	
COMPONENT COOLING PUMP P21A DISCH CHECK											CV-S	R	VROJ - 37	2OST-15.5	
											CV-S	Q		2OST-15.1	
											CV-O	CSD or R	VROJ - 37	2OST-15.1	
											CV-S	CSD or R	VROJ - 37	2OST-15.1	
2CCP*5	3	C	Active	20	Check		15-1 (F-5)	O	O/S		CV-O	R	VROJ - 37	2OST-15.5	
COMPONENT COOLING PUMP P21B DISCH CHECK											CV-S	R	VROJ - 37	2OST-15.5	
											CV-S	Q		2OST-15.2	
											CV-O	CSD or R	VROJ - 37	2OST-15.2	
											CV-S	CSD or R	VROJ - 37	2OST-15.2	
2CCP*6	3	C	Active	20	Check		15-1 (D-5)	O	O/S		CV-O	R	VROJ - 37	2OST-15.5	
COMPONENT COOLING PUMP P21C DISCH CHCK											CV-S	R	VROJ - 37	2OST-15.5	
											CV-S	Q		2OST-15.3	
											CV-O	CSD or R	VROJ - 37	2OST-15.3	
											CV-S	CSD or R	VROJ - 37	2OST-15.3	
2CCP*AOV107A	3	A	Active	2	Globe	AOV	15-3 (C-5)	O	S	S	FS-S	CSD or R	VROJ - 38	2OST-1.10	
RCP A THERMAL BARRIER COOLING WATER DISCHARGE											ST-S	CSD or R	VROJ - 38	2OST-1.10	
											LT	2YR		2BVT 1.60.6	
											RPV	2YR		2OST-1.10	

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

Valve ID / Name	Class	Cat.	Active / Passive	Size (in.)	Valve Type	Actuator Type	Drawing & Coord	Position Normal	Position Safety	Position Fail-Safe	Required Test	Frequency	Code Dev.	Procedure	Remarks
2CCP*AOV107B	3	A	Active	2	Globe	AOV	15-3 (F-5)	O	S	S	FS-S	CSD or R	VROJ - 38	2OST-1.10	
RCP B THERMAL BARRIER COOLING WATER DISCHARGE											ST-S	CSD or R	VROJ - 38	2OST-1.10	
											LT	2YR		2BVT 1.60.6	
											RPV	2YR		2OST-1.10	
2CCP*AOV107C	3	A	Active	2	Globe	AOV	15-3 (F-10)	O	S	S	FS-S	CSD or R	VROJ - 38	2OST-1.10	
RCP C THERMAL BARRIER COOLING WATER DISCHARGE											ST-S	CSD or R	VROJ - 38	2OST-1.10	
											LT	2YR		2BVT 1.60.6	
											RPV	2YR		2OST-1.10	
2CCP*AOV171	3	B	Active	3	Globe	AOV	15-2 (E-7)	O	S	S	FS-S	Q		2OST-47.3I	
PRIMARY DRAINS COOLER COOLING WTR SUPPLY											ST-S	Q		2OST-47.3I	
											RPV	2YR		2OST-47.3R	
2CCP*AOV172	3	B	Active	3	Globe	AOV	15-2 (D-7)	O	S	S	FS-S	Q		2OST-47.3K	
PRIMARY DRAINS COOLER COOLING WTR SUPPLY											ST-S	Q		2OST-47.3K	
											RPV	2YR		2OST-47.3S	
2CCP*AOV173	3	B	Active	3	Globe	AOV	15-2 (B-7)	O	S	S	FS-S	Q		2OST-47.3I	
PRIMARY DRAINS COOLER COOLING WTR DISCH											ST-S	Q		2OST-47.3I	
											RPV	2YR		2OST-47.3R	
2CCP*AOV174	3	B	Active	3	Globe	AOV	15-2 (B-7)	O	S	S	FS-S	Q		2OST-47.3K	
PRIMARY DRAINS COOLER COOLING WTR DISCH											ST-S	Q		2OST-47.3K	
											RPV	2YR		2OST-47.3S	
2CCP*MOV112A	3	B	Active	18	Butterfly	MOV	15-2 (D-8)	S	O		ET	Q	VCSJ - 14	2OST-15.3	Per OMN-1
(2RHS*E21A,22A) SUPPLY ISOL											ET	Q	VCSJ - 14	2OST-15.1	Per OMN-1
											ET	CSD	VCSJ - 14	2OST-10.3	Per OMN-1
											DIAG-ST-O	6RFO		1/2-CMP-75-Qtr Turn-1E	Per OMN-1
											RPV	6RFO		1/2-CMP-75-Qtr Turn-1E	Per OMN-1
2CCP*MOV112B	3	B	Active	18	Butterfly	MOV	15-2 (F-9)	S	O		ET	Q	VCSJ - 14	2OST-15.3	Per OMN-1
(2RHS*E21B,22B) SUPPLY ISOL											ET	Q	VCSJ - 14	2OST-15.2	Per OMN-1
											ET	CSD	VCSJ - 14	2OST-10.4	Per OMN-1
											DIAG-ST-O	6RFO		1/2-CMP-75-Qtr Turn-1E	Per OMN-1
											RPV	6RFO		1/2-CMP-75-Qtr Turn-1E	Per OMN-1

Beaver Valley Power Station Unit 2 IST Program

VALVE TABLE

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

Valve ID / Name	Class	Cat.	Active / Passive	Size (in.)	Valve Type	Actuator Type	Drawing & Coord	Position Normal	Position Safety	Position Fail-Safe	Required Test	Frequency	Code Dev.	Procedure	Remarks
2CCP*MOV118	3	B	Active	2	Ball	MOV	15-2 (C-2)	O	S		ET	Q		2OST-47.3I	Per OMN-1
CNMT INSTR AIR COMPRESSORS CLG WATER SUPPLY ISOL											DIAG-ST-S	9YR		1/2-CMP-75-Qtr Turn-1E	Per OMN-1
											RPV	9YR		1/2-CMP-75-Qtr Turn-1E	Per OMN-1
2CCP*MOV119	3	B	Active	2	Ball	MOV	15-2 (C-2)	O	S		ET	Q		2OST-47.3K	Per OMN-1
CNMT INSTR AIR COMPRESSORS CLG WTR SUPPLY ISOL											DIAG-ST-S	9YR		1/2-CMP-75-Qtr Turn-1E	Per OMN-1
											RPV	9YR		1/2-CMP-75-Qtr Turn-1E	Per OMN-1
2CCP*MOV120	3	B	Active	2	Ball	MOV	15-2 (A-1)	O	S		ET	Q		2OST-47.3K	Per OMN-1
CNMT INSTRU AIR COMPRESS CLG WTR RETURN ISOL											DIAG-ST-S	9YR		1/2-CMP-75-Qtr Turn-1E	Per OMN-1
											RPV	9YR		1/2-CMP-75-Qtr Turn-1E	Per OMN-1
2CCP*MOV150-1	2	A	Active	18	Butterfly	MOV	15-2 (D-3)	O	O/S		LTJ	SP		2BVT 1.47.5	
PRIM COMP CLG HDR ISOL - OUTSIDE CONTNMNT											ET	R	VROJ - 39	2OST-1.10	Per OMN-1
											RPV	6RFO/18MO		2OST-1.10	18 months per Tech Specs
											DIAG-ST-O	6RFO		1/2-CMP-75-Qtr Turn-1E	Per OMN-1
											DIAG-ST-S	6RFO		1/2-CMP-75-Qtr Turn-1E	Per OMN-1
2CCP*MOV150-2	2	A	Active	18	Butterfly	MOV	15-2 (D-4)	O	O/S		LTJ	SP		2BVT 1.47.5	
PRIM COMP CLG HDR ISOL - INSIDE CONTNMNT											ET	R	VROJ - 39	2OST-1.10	Per OMN-1
											RPV	6RFO/18MO		2OST-1.10	18 months per Tech Specs
											DIAG-ST-O	6RFO		1/2-CMP-75-Qtr Turn-1E	Per OMN-1
											DIAG-ST-S	6RFO		1/2-CMP-75-Qtr Turn-1E	Per OMN-1
2CCP*MOV151-1	2	A	Active	18	Butterfly	MOV	15-2 (E-3)	O	O/S		LTJ	SP		2BVT 1.47.5	
PRIM COMP CLG HDR ISOL - OUTSIDE CONTNMNT											ET	R	VROJ - 39	2OST-1.10	Per OMN-1
											RPV	6RFO/18MO		2OST-1.10	18 months per Tech Specs
											DIAG-ST-O	6RFO		1/2-CMP-75-Qtr Turn-1E	Per OMN-1
											DIAG-ST-S	6RFO		1/2-CMP-75-Qtr Turn-1E	Per OMN-1

Beaver Valley Power Station Unit 2 IST Program

VALVE TABLE

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

Valve ID / Name	Class	Cat.	Active / Passive	Size (in.)	Valve Type	Actuator Type	Drawing & Coord	Position Normal	Position Safety	Position Fail-Safe	Required Test	Frequency	Code Dev.	Procedure	Remarks
2CCP*MOV151-2	2	A	Active	18	Butterfly	MOV	15-2 (E-5)	O	O/S		LTJ	SP		2BVT 1.47.5	
PRIM COMP CLG HDR ISOL - INSIDE CONTAINMENT											ET	R	VROJ - 39	2OST-1.10	Per OMN-1
											RPV	6RFO/18MO		2OST-1.10	18 months per Tech Specs
											DIAG-ST-O	6RFO		1/2-CMP-75-Qtr Turn-1E	Per OMN-1
											DIAG-ST-S	6RFO		1/2-CMP-75-Qtr Turn-1E	Per OMN-1
2CCP*MOV156-1	2	A	Active	18	Butterfly	MOV	15-2 (D-3)	O	O/S		LTJ	SP		2BVT 1.47.5	
PRIM COMP CLG HDR ISOL - OUTSIDE CONTNMNT											ET	R	VROJ - 39	2OST-1.10	Per OMN-1
											RPV	6RFO/18MO		2OST-1.10	18 months per Tech Specs
											DIAG-ST-O	6RFO		1/2-CMP-75-Qtr Turn-1E	Per OMN-1
											DIAG-ST-S	6RFO		1/2-CMP-75-Qtr Turn-1E	Per OMN-1
2CCP*MOV156-2	2	A	Active	18	Butterfly	MOV	15-2 (D-5)	O	O/S		LTJ	SP		2BVT 1.47.5	
PRIM COMP CLG HDR ISOL - INSIDE CONTNMNT											ET	R	VROJ - 39	2OST-1.10	Per OMN-1
											RPV	6RFO/18MO		2OST-1.10	18 months per Tech Specs
											DIAG-ST-O	6RFO		1/2-CMP-75-Qtr Turn-1E	Per OMN-1
											DIAG-ST-S	6RFO		1/2-CMP-75-Qtr Turn-1E	Per OMN-1
2CCP*MOV157-1	2	A	Active	18	Butterfly	MOV	15-2 (E-3)	O	O/S		LTJ	SP		2BVT 1.47.5	
PRIM COMP CLG HDR ISOL - OUTSIDE CONTNMNT											ET	R	VROJ - 39	2OST-1.10	Per OMN-1
											RPV	6RFO/18MO		2OST-1.10	18 months per Tech Specs
											DIAG-ST-O	6RFO		1/2-CMP-75-Qtr Turn-1E	Per OMN-1
											DIAG-ST-S	6RFO		1/2-CMP-75-Qtr Turn-1E	Per OMN-1
2CCP*MOV157-2	2	A	Active	18	Butterfly	MOV	15-2 (E-4)	O	O/S		LTJ	SP		2BVT 1.47.5	
PRIM COMP CLG HDR ISOL - INSIDE CONTNMNT											ET	R	VROJ - 39	2OST-1.10	Per OMN-1
											RPV	6RFO/18MO		2OST-1.10	18 months per Tech Specs
											DIAG-ST-O	6RFO		1/2-CMP-75-Qtr Turn-1E	Per OMN-1
											DIAG-ST-S	6RFO		1/2-CMP-75-Qtr Turn-1E	Per OMN-1
2CCP*MOV175-1	3	B	Active	10	Butterfly	MOV	15-5 (A-4)	O	S		DIAG-ST-S	9YR		1/2-CMP-75-Qtr Turn-1E	Per OMN-1
PRI COMP CLG SUPPLY ISOL											RPV	9YR		1/2-CMP-75-Qtr Turn-1E	Per OMN-1
											ET	18MO or R		2OST-47.3I	Per OMN-1

Beaver Valley Power Station Unit 2 IST Program

VALVE TABLE

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

Valve ID / Name	Class	Cat.	Active / Passive	Size (in.)	Valve Type	Actuator Type	Drawing & Coord	Position Normal	Position Safety	Position Fail-Safe	Required Test	Frequency	Code Dev.	Procedure	Remarks
2CCP*MOV175-2	3	B	Active	10	Butterfly	MOV	15-5 (A-5)	O	S		DIAG-ST-S	9YR		1/2-CMP-75-Qtr Turn-1E	Per OMN-1
PRIM COMP CLG SUPPLY ISOL											RPV	9YR		1/2-CMP-75-Qtr Turn-1E	Per OMN-1
											ET	18MO or R		2OST-47.3K	Per OMN-1
2CCP*MOV176-1	3	B	Active	10	Butterfly	MOV	15-5 (A-4)	O	S		DIAG-ST-S	9YR		1/2-CMP-75-Qtr Turn-1E	Per OMN-1
PRIM COMP CLG SUPPLY ISOL											RPV	9YR		1/2-CMP-75-Qtr Turn-1E	Per OMN-1
											ET	18MO or R		2OST-47.3I	Per OMN-1
2CCP*MOV176-2	3	B	Active	10	Butterfly	MOV	15-5 (A-5)	O	S		DIAG-ST-S	9YR		1/2-CMP-75-Qtr Turn-1E	Per OMN-1
PRIM COMP CLG SUPPLY ISOL											RPV	9YR		1/2-CMP-75-Qtr Turn-1E	Per OMN-1
											ET	18MO or R		2OST-47.3K	Per OMN-1
2CCP*MOV177-1	3	B	Active	10	Butterfly	MOV	15-5 (G-5)	O	S		DIAG-ST-S	9YR		1/2-CMP-75-Qtr Turn-1E	Per OMN-1
PRIM COMP CLG RET ISOL											RPV	9YR		1/2-CMP-75-Qtr Turn-1E	Per OMN-1
											ET	18MO or R		2OST-47.3I	Per OMN-1
2CCP*MOV177-2	3	B	Active	10	Butterfly	MOV	15-5 (G-5)	O	S		DIAG-ST-S	9YR		1/2-CMP-75-Qtr Turn-1E	Per OMN-1
PRIM COMP CLG RET ISOL											RPV	9YR		1/2-CMP-75-Qtr Turn-1E	Per OMN-1
											ET	18MO or R		2OST-47.3K	Per OMN-1
2CCP*MOV178-1	3	B	Active	10	Butterfly	MOV	15-5 (G-5)	O	S		DIAG-ST-S	9YR		1/2-CMP-75-Qtr Turn-1E	Per OMN-1
PRIM COMP CLG RET ISOL											RPV	9YR		1/2-CMP-75-Qtr Turn-1E	Per OMN-1
											ET	18MO or R		2OST-47.3I	Per OMN-1
2CCP*MOV178-2	3	B	Active	10	Butterfly	MOV	15-5 (G-5)	O	S		DIAG-ST-S	9YR		1/2-CMP-75-Qtr Turn-1E	Per OMN-1
PRIM COMP CLG RET ISOL											RPV	9YR		1/2-CMP-75-Qtr Turn-1E	Per OMN-1
											ET	18MO or R		2OST-47.3K	Per OMN-1
2CCP*RV102	2	A/C	Active	0.75x1	Relief	RV	15-2 (D-4)	S	O/S		LTJ	SP		2BVT 1.47.5	
COMP COOL WTR CONTAINMENT ISOL RELIEF											SPT	10YR		2BVT 1.60.5	
2CCP*RV103	2	A/C	Active	0.75x1	Relief	RV	15-2 (E-5)	S	O/S		LTJ	SP		2BVT 1.47.5	
COMP COOL WTR CONTAINMENT ISOL RELIEF											SPT	10YR		2BVT 1.60.5	
2CCP*RV104	2	A/C	Active	0.75x1	Relief	RV	15-2 (D-4)	S	O/S		LTJ	SP		2BVT 1.47.5	
COMP COOL WTR CONTAINMENT ISOL RELIEF											SPT	10YR		2BVT 1.60.5	

Beaver Valley Power Station Unit 2 IST Program

VALVE TABLE

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

Valve ID / Name	Class	Cat.	Active / Passive	Size (in.)	Valve Type	Actuator Type	Drawing & Coord	Position Normal	Position Safety	Position Fail-Safe	Required Test	Frequency	Code Dev.	Procedure	Remarks
2CCP*RV105 COMP COOL WTR CONTAINMENT RELIEF	2	A/C	Active	0.75x1	Relief	RV	15-2 (E-4)	S	O/S		LTJ SPT	SP 10YR		2BVT 1.47.5 2BVT 1.60.5	
2CCP*RV109 SEAL WATER HX (2CHS*E21) RELIEF	3	C	Active	0.75x1	Relief	RV	15-5 (D-5)	S	O/S		SPT	10YR		2BVT 1.60.5	
2CCP*RV116A RCPA THERMAL BARRIER CLG WTR SUPPLY RELIEF	3	C	Active	0.75x1	Relief	RV	15-3 (C-2)	S	O/S		SPT	10YR		2BVT 1.60.5	
2CCP*RV116B RCPB THERMAL BARRIER CLG WTR SUPPLY RELIEF	3	C	Active	0.75x1	Relief	RV	15-3 (F-1)	S	O/S		SPT	10YR		2BVT 1.60.5	
2CCP*RV116C RCPC THERMAL BARRIER CLG WTR SUPPLY RELIEF	3	C	Active	0.75x1	Relief	RV	15-3 (F-6)	S	O/S		SPT	10YR		2BVT 1.60.5	
2CCP*RV119A RESIDUAL HX 2RHS*21A CLG WTR RETURN RELIEF	3	C	Active	0.75x1	Relief	RV	15-2 (B-10)	S	O/S		SPT	10YR		2BVT 1.60.5	
2CCP*RV119B RESIDUAL HX 2RHS*21B CLG WTR RETURN RELIEF	3	C	Active	0.75x1	Relief	RV	15-2 (E-10)	S	O/S		SPT	10YR		2BVT 1.60.5	
2CCP*RV120A PRIMARY COMP CLG WTR SUPPLY TO CNMT INSTR AIR COMPR RLF	3	C	Active	0.75x1	Relief	RV	15-2 (C-2)	S	O/S		SPT	10YR		2BVT 1.60.5	
2CCP*RV136A RESIDUAL HX SEAL CLR 2RHS*22A CLG WTR SUPPLY RLF	3	C	Active	0.75x1	Relief	RV	15-2 (B-9)	S	O/S		SPT	10YR		2BVT 1.60.5	
2CCP*RV136B RESIDUAL HX SEAL CLR 2RHS*22B CLG WTR SUPPLY RLF	3	C	Active	0.75x1	Relief	RV	15-2 (E-9)	S	O/S		SPT	10YR		2BVT 1.60.5	
2CCP*RV139B CNMT PNT CLG COIL NO. 39 RELIEF	3	C	Active	0.75x1	Relief	RV	15-2 (G-3)	S	O/S		SPT	10YR		2BVT 1.60.5	
2CCP*RV139D CNMT PNT CLG COIL NO. 41 RELIEF	3	C	Active	0.75x1	Relief	RV	15-2 (F-3)	S	O/S		SPT	10YR		2BVT 1.60.5	
2CCP*RV139E CNMT PNT CLG COIL NO. 40 RELIEF	3	C	Active	0.75x1	Relief	RV	15-2 (F-3)	S	O/S		SPT	10YR		2BVT 1.60.5	

Beaver Valley Power Station Unit 2 IST Program

VALVE TABLE

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

Valve ID / Name	Class	Cat.	Active / Passive	Size (in.)	Valve Type	Actuator Type	Drawing & Coord	Position Normal	Position Safety	Position Fail-Safe	Required Test	Frequency	Code Dev.	Procedure	Remarks
2CCP*RV139F CNMT PNT CLG COIL NO. 28 RELIEF	3	C	Active	0.75x1	Relief	RV	15-2 (E-3)	S	O/S		SPT	10YR		2BVT 1.60.5	
2CCP*RV139G CNMT PNT CLG COIL NO. 76 RELIEF	3	C	Active	0.75x1	Relief	RV	15-2 (A-3)	S	O/S		SPT	10YR		2BVT 1.60.5	
2CCP*RV139H CNMT PNT CLG COIL NO. 73 RELIEF	3	C	Active	0.75x1	Relief	RV	15-2 (A-3)	S	O/S		SPT	10YR		2BVT 1.60.5	
2CCP*RV139I CNMT PNT CLG COIL NO. 77 RELIEF	3	C	Active	0.75x1	Relief	RV	15-2 (B-3)	S	O/S		SPT	10YR		2BVT 1.60.5	
2CCP*RV139J CNMT PNT CLG COIL NO. 74 RELIEF	3	C	Active	0.75x1	Relief	RV	15-2 (B-3)	S	O/S		SPT	10YR		2BVT 1.60.5	
2CCP*RV139K CNMT PNT CLG COIL NO. 78 RELIEF	3	C	Active	0.75x1	Relief	RV	15-2 (C-3)	S	O/S		SPT	10YR		2BVT 1.60.5	
2CCP*RV139L CNMT PNT CLG COIL NO. 75 RELIEF	3	C	Active	0.75x1	Relief	RV	15-2 (C-3)	S	O/S		SPT	10YR		2BVT 1.60.5	
2CCP*RV140 PRIMARY DRAINS COOLER 2DGS-E22 COOL WTR SUP RLF	3	C	Active	0.75x1	Relief	RV	15-2 (E-7)	S	O/S		SPT	10YR		2BVT 1.60.5	
2CCP*RV141 PRIMARY DRAINS COOLER 2DGS-E22 COOL WTR RTN RLF	3	C	Active	0.75x1	Relief	RV	15-2 (B-7)	S	O/S		SPT	10YR		2BVT 1.60.5	

Beaver Valley Power Station Unit 2 IST Program

VALVE TABLE

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

Valve ID / Name	Class	Cat.	Active / Passive	Size (in.)	Valve Type	Actuator Type	Drawing & Coord	Position Normal	Position Safety	Position Fail-Safe	Required Test	Frequency	Code Dev.	Procedure	Remarks
2FNC*121	2	A	Passive	6	Ball		20-1 (D-2)	LS	S		LTJ	SP		2BVT 1.47.5	
REFUELING CAVITY SUPPLY FROM FILTERS INSIDE CNMT ISOL															
2FNC*122	2	A	Passive	6	Ball		20-1 (F-2)	LS	S		LTJ	SP		2BVT 1.47.5	
REFUELING CAVITY SUCTION INSIDE CNMT ISOL															
2FNC*38	2	A	Passive	6	Ball		20-1 (E-2)	LS	S		LTJ	SP		2BVT 1.47.5	
REFUELING CAVITY SUPPLY OUTSIDE CNMT ISOL															
2FNC*9	2	A	Passive	6	Ball		20-1 (E-2)	LS	S		LTJ	SP		2BVT 1.47.5	
REFUELING CAVITY SUCTION OUTSIDE CNMT ISOL															

Beaver Valley Power Station Unit 2 IST Program

VALVE TABLE

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

Valve ID / Name	Class	Cat.	Active / Passive	Size (in.)	Valve Type	Actuator Type	Drawing & Coord	Position Normal	Position Safety	Position Fail-Safe	Required Test	Frequency	Code Dev.	Procedure	Remarks
2MSS*18	3	C	Active	3	Check		21-2 (A-3)	S	O/S		CV-O	R	VROJ - 42	2OST-24.4A	
(2FWE*T22) STM SUPPLY CHECK											CV-DIS	CVCM	VROJ - 42	1/2CMP-75-ENERTECH CHECK-1M	Sample disassembly and inspection with [2MSS*19, 20, 196, 199 and 352] per CVCM Program as tied to TDAFWP overspeed trip test (2OST-24.9).
											PMT	CVCM	VROJ - 42	2OST-24.4A	Stroke open during CPT after disassembly and inspection.
2MSS*19	3	C	Active	3	Check		21-2 (C-2)	S	O/S		CV-O	R	VROJ - 42	2OST-24.4A	
(2FWE*T22) STM SUPPLY CHECK											CV-DIS	CVCM	VROJ - 42	1/2CMP-75-ENERTECH CHECK-1M	Sample disassembly and inspection with [2MSS*18, 20, 196, 199 and 352] per CVCM Program as tied to TDAFWP overspeed trip test (2OST-24.9).
											PMT	CVCM	VROJ - 42	2OST-24.4A	Stroke open during CPT after disassembly and inspection.
2MSS*196	3	C	Active	3	Check		21-2 (D-3)	S	O/S		CV-O	R	VROJ - 42	2OST-24.4A	
(2FWE*T22) STM SUPPLY CHECK											CV-DIS	CVCM	VROJ - 42	1/2CMP-75-ENERTECH CHECK-1M	Sample disassembly and inspection with [2MSS*18, 19, 20, 199 and 352] per CVCM Program as tied to TDAFWP overspeed trip test (2OST-24.9).
											PMT	CVCM	VROJ - 42	2OST-24.4A	Stroke open during CPT after disassembly and inspection.

Beaver Valley Power Station Unit 2 IST Program

VALVE TABLE

SYSTEM NAME: Main Steam SYSTEM NUMBER: 21

Valve ID / Name	Class	Cat.	Active / Passive	Size (in.)	Valve Type	Actuator Type	Drawing & Coord	Position Normal	Position Safety	Position Fail-Safe	Required Test	Frequency	Code Dev.	Procedure	Remarks
2MSS*199	3	C	Active	3	Check		21-2 (C-3)	S	O/S		CV-O	R	VROJ - 42	2OST-24.4A	
(2FWE*T22) STM SUPPLY CHECK											CV-DIS	CVCM	VROJ - 42	1/2CMP-75-ENERTECH CHECK-1M	Sample disassembly and inspection with [2MSS*18, 19, 20, 196, and 352] per CVCM Program as tied to TDAFWP overspeed trip test (2OST-24.9).
											PMT	CVCM	VROJ - 42	2OST-24.4A	Stroke open during CPT after disassembly and inspection.
2MSS*20	3	C	Active	3	Check		21-2 (D-2)	S	O/S		CV-O	R	VROJ - 42	2OST-24.4A	
(2FWE*T22) STM SUPPLY CHECK											CV-DIS	CVCM	VROJ - 42	1/2CMP-75-ENERTECH CHECK-1M	Sample disassembly and inspection with [2MSS*18, 19, 196, 199 and 352] per CVCM Program as tied to TDAFWP overspeed trip test (2OST-24.9).
											PMT	CVCM	VROJ - 42	2OST-24.4A	Stroke open during CPT after disassembly and inspection.
2MSS*352	3	C	Active	3	Check		21-2 (A-2)	S	O/S		CV-O	R	VROJ - 42	2OST-24.4A	
(2FWE*T22) STM SUPPLY CHECK											CV-DIS	CVCM	VROJ - 42	1/2CMP-75-ENERTECH CHECK-1M	Sample disassembly and inspection with [2MSS*18, 19, 20, 196, and 199] per CVCM Program as tied to TDAFWP overspeed trip test (2OST-24.9).
											PMT	CVCM	VROJ - 42	2OST-24.4A	Stroke open during CPT after disassembly and inspection.

Beaver Valley Power Station Unit 2 IST Program

VALVE TABLE

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

Valve ID / Name	Class	Cat.	Active / Passive	Size (in.)	Valve Type	Actuator Type	Drawing & Coord	Position Normal	Position Safety	Position Fail-Safe	Required Test	Frequency	Code Dev.	Procedure	Remarks
2MSS*AOV101A	2	B	Active	32	Globe	AOV	21-1 (G-7)	O	S	S	FS-S	CSD	VCSJ - 15	2OST-21.7	
(2RCS*SG21A) MN STM ISOL VALVE											ST-S (A)	CSD	VCSJ - 15	2OST-21.7	
											ST-S (B)	CSD	VCSJ - 15	2OST-21.7	
											RPV	2YR		2OST-21.7	
2MSS*AOV101B	2	B	Active	32	Globe	AOV	21-1 (D-7)	O	S	S	FS-S	CSD	VCSJ - 15	2OST-21.7	
(2RCS*SG21B) MN STM ISOL VALVE											ST-S (A)	CSD	VCSJ - 15	2OST-21.7	
											ST-S (B)	CSD	VCSJ - 15	2OST-21.7	
											RPV	2YR		2OST-21.7	
2MSS*AOV101C	2	B	Active	32	Globe	AOV	21-1 (B-7)	O	S	S	FS-S	CSD	VCSJ - 15	2OST-21.7	
(2RCS*SG21C) MN STM ISOL VALVE											ST-S (A)	CSD	VCSJ - 15	2OST-21.7	
											ST-S (B)	CSD	VCSJ - 15	2OST-21.7	
											RPV	2YR		2OST-21.7	
2MSS*AOV102A	2	B	Active	2	Globe	AOV	21-1 (G-7)	S	S	S	FS-S	Q		2OST-47.3M	
21A STEAM GENERATOR MN STM BYPASS TRIP VALVE											ST-S	Q		2OST-47.3M	
											RPV	2YR		2OST-47.3M	
2MSS*AOV102B	2	B	Active	2	Globe	AOV	21-1 (E-7)	S	S	S	FS-S	Q		2OST-47.3M	
21B STEAM GENERATOR MN STM BYPASS TRIP VALVE											ST-S	Q		2OST-47.3M	
											RPV	2YR		2OST-47.3M	
2MSS*AOV102C	2	B	Active	2	Globe	AOV	21-1 (C-7)	S	S	S	FS-S	Q		2OST-47.3M	
21C STEAM GENERATOR MN STM BYPASS TRIP VALVE											ST-S	Q		2OST-47.3M	
											RPV	2YR		2OST-47.3M	

Beaver Valley Power Station Unit 2 IST Program

VALVE TABLE

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

Valve ID / Name	Class	Cat.	Active / Passive	Size (in.)	Valve Type	Actuator Type	Drawing & Coord	Position Normal	Position Safety	Position Fail-Safe	Required Test	Frequency	Code Dev.	Procedure	Remarks
2MSS*SOV105A	2	B	Active	3	Globe	SOV	21-2 (D-1)	S	O/S	O	FS-O	Q		2OST-24.4A	
TURBINE DRIVEN AUX FEEDWATER PMP STEAMLINE A ISOL VALVE											FS-O	Q		2OST-24.4	
											FS-O	Q		2OST-47.3T	
											ST-O	Q		2OST-24.4A	
											ST-O	Q		2OST-24.4	
											ST-O	Q		2OST-47.3T	
											ST-S	Q		2OST-24.4A	
											ST-S	Q		2OST-24.4	
											ST-S	Q		2OST-47.3T	
											RPV	2YR		2OST-24.4A	
											RPV	2YR		2OST-24.4	
2MSS*SOV105B	2	B	Active	3	Globe	SOV	21-2 (C-2)	S	O/S	O	FS-O	Q		2OST-24.4A	
TURBINE DRIVEN AUX FEEDWATER PMP STEAMLINE B ISOL VALVE											FS-O	Q		2OST-24.4	
											FS-O	Q		2OST-47.3T	
											ST-O	Q		2OST-24.4A	
											ST-O	Q		2OST-24.4	
											ST-O	Q		2OST-47.3T	
											ST-S	Q		2OST-24.4A	
											ST-S	Q		2OST-24.4	
											ST-S	Q		2OST-47.3T	
											RPV	2YR		2OST-24.4A	
											RPV	2YR		2OST-24.4	

Beaver Valley Power Station Unit 2 IST Program

VALVE TABLE

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

Valve ID / Name	Class	Cat.	Active / Passive	Size (in.)	Valve Type	Actuator Type	Drawing & Coord	Position Normal	Position Safety	Position Fail-Safe	Required Test	Frequency	Code Dev.	Procedure	Remarks
2MSS*SOV105C	2	B	Active	3	Globe	SOV	21-2 (A-1)	S	O/S	O	FS-O	Q		2OST-24.4	
TURBINE DRIVEN AUX FEEDWATER PMP STEAMLINE C ISOL VALVE											FS-O	Q		2OST-24.4A	
											FS-O	Q		2OST-47.3T	
											ST-O	Q		2OST-24.4A	
											ST-O	Q		2OST-24.4	
											ST-O	Q		2OST-47.3T	
											ST-S	Q		2OST-24.4A	
											ST-S	Q		2OST-24.4	
											ST-S	Q		2OST-47.3T	
											RPV	2YR		2OST-24.4A	
											RPV	2YR		2OST-24.4	
2MSS*SOV105D	2	B	Active	3	Globe	SOV	21-2 (D-2)	S	O/S	O	FS-O	Q		2OST-24.4	
TURBINE DRIVEN AUX FEEDWATER PMP STEAMLINE A ISOL VALVE											FS-O	Q		2OST-24.4A	
											FS-O	Q		2OST-47.3T	
											ST-O	Q		2OST-24.4A	
											ST-O	Q		2OST-24.4	
											ST-O	Q		2OST-47.3T	
											ST-S	Q		2OST-24.4A	
											ST-S	Q		2OST-24.4	
											ST-S	Q		2OST-47.3T	
											RPV	2YR		2OST-24.4	
											RPV-	2YR		2OST-24.4	

Beaver Valley Power Station Unit 2 IST Program

VALVE TABLE

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

Valve ID / Name	Class	Cat.	Active / Passive	Size (in.)	Valve Type	Actuator Type	Drawing & Coord	Position Normal	Position Safety	Position Fail-Safe	Required Test	Frequency	Code Dev.	Procedure	Remarks
2MSS*SOV105E	2	B	Active	3	Globe	SOV	21-2 (C-2)	S	O/S	O	FS-O	Q		2OST-24.4	
TURBINE DRIVEN AUX FEEDWATER PMP STEAMLINE B ISOL VALVE											FS-O	Q		2OST-24.4A	
											FS-O	Q		2OST-47.3T	
											ST-O	Q		2OST-24.4A	
											ST-O	Q		2OST-24.4	
											ST-O	Q		2OST-47.3T	
											ST-S	Q		2OST-24.4A	
											ST-S	Q		2OST-24.4	
											ST-S	Q		2OST-47.3T	
											RPV	2YR		2OST-24.4	
											RPV-	2YR		2OST-24.4	
2MSS*SOV105F	2	B	Active	3	Globe	SOV	21-2 (A-2)	S	O/S	O	FS-O	Q		2OST-24.4	
TURBINE DRIVEN AUX FEEDWATER PUMP STEAMLINE C ISOL VALVE											FS-O	Q		2OST-24.4A	
											FS-O	Q		2OST-47.3T	
											ST-O	Q		2OST-24.4A	
											ST-O	Q		2OST-24.4	
											ST-O	Q		2OST-47.3T	
											ST-S	Q		2OST-24.4A	
											ST-S	Q		2OST-24.4	
											ST-S	Q		2OST-47.3T	
											RPV	2YR		2OST-24.4	
											RPV-	2YR		2OST-24.4	
2MSS*SOV120	2	B	Active	0.375	Globe	SOV	21-2 (G-5)	S	O/S	S	FS-S	Q		2OST-47.3M	
RADIATION MONITOR [2MSS*RQI101A,B,C] DISCHARGE ISOLATION VALVE											ST-O	Q		2OST-47.3M	
											ST-S	Q		2OST-47.3M	
											RPV	2YR		2OST-47.3M	
2MSS*SV101A	2	C	Active	6x10	Safety	SV	21-1 (F-5)	S	O/S		SPT	5YR		2BVT 1.21.2	
(2RCS*SG21A) MN STM SAFETY											SPT	5YR		2BVT 1.60.5	
2MSS*SV101B	2	C	Active	6x10	Safety	SV	21-1 (C-5)	S	O/S		SPT	5YR		2BVT 1.21.2	
(2RCS*SG21B) MN STM SAFETY											SPT	5YR		2BVT 1.60.5	

Beaver Valley Power Station Unit 2 IST Program

VALVE TABLE

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

Valve ID / Name	Class	Cat.	Active / Passive	Size (in.)	Valve Type	Actuator Type	Drawing & Coord	Position Normal	Position Safety	Position Fail-Safe	Required Test	Frequency	Code Dev.	Procedure	Remarks
2MSS*SV101C	2	C	Active	6x10	Safety	SV	21-1 (A-5)	S	O/S		SPT	5YR		2BVT 1.21.2	
(2RCS*SG21C) MN STM SAFETY											SPT	5YR		2BVT 1.60.5	
2MSS*SV102A	2	C	Active	6x10	Safety	SV	21-1 (F-5)	S	O/S		SPT	5YR		2BVT 1.21.2	
(2RCS*SG21A) MN STM SAFETY											SPT	5YR		2BVT 1.60.5	
2MSS*SV102B	2	C	Active	6x10	Safety	SV	21-1 (C-5)	S	O/S		SPT	5YR		2BVT 1.21.2	
(2RCS*SG21B) MN STM SAFETY											SPT	5YR		2BVT 1.60.5	
2MSS*SV102C	2	C	Active	6x10	Safety	SV	21-1 (A-5)	S	O/S		SPT	5YR		2BVT 1.21.2	
(2RCS*SG21C) MN STM SAFETY											SPT	5YR		2BVT 1.60.5	
2MSS*SV103A	2	C	Active	6x10	Safety	SV	21-1 (F-4)	S	O/S		SPT	5YR		2BVT 1.21.2	
(2RCS*SG21A) MN STM SAFETY											SPT	5YR		2BVT 1.60.5	
2MSS*SV103B	2	C	Active	6x10	Safety	SV	21-1 (C-4)	S	O/S		SPT	5YR		2BVT 1.21.2	
(2RCS*SG21B) MN STM SAFETY											SPT	5YR		2BVT 1.60.5	
2MSS*SV103C	2	C	Active	6x10	Safety	SV	21-1 (A-4)	S	O/S		SPT	5YR		2BVT 1.21.2	
(2RCS*SG21C) MN STM SAFETY											SPT	5YR		2BVT 1.60.5	
2MSS*SV104A	2	C	Active	6x10	Safety	SV	21-1 (F-4)	S	O/S		SPT	5YR		2BVT 1.21.2	
(2RCS*SG21A) MN STM SAFETY											SPT	5YR		2BVT 1.60.5	
2MSS*SV104B	2	C	Active	6x10	Safety	SV	21-1 (C-4)	S	O/S		SPT	5YR		2BVT 1.21.2	
(2RCS*SG21B) MN STM SAFETY											SPT	5YR		2BVT 1.60.5	
2MSS*SV104C	2	C	Active	6x10	Safety	SV	21-1 (A-4)	S	O/S		SPT	5YR		2BVT 1.21.2	
(2RCS*SG21C) MN STM SAFETY											SPT	5YR		2BVT 1.60.5	
2MSS*SV105A	2	C	Active	6x10	Safety	SV	21-1 (F-3)	S	O/S		SPT	5YR		2BVT 1.21.2	
(2RCS*SG21A) MN STM SAFETY											SPT	5YR		2BVT 1.60.5	
2MSS*SV105B	2	C	Active	6x10	Safety	SV	21-1 (C-3)	S	O/S		SPT	5YR		2BVT 1.21.2	
(2RCS*SG21B) MN STM SAFETY											SPT	5YR		2BVT 1.60.5	
2MSS*SV105C	2	C	Active	6x10	Safety	SV	21-1 (A-3)	S	O/S		SPT	5YR		2BVT 1.21.2	
(2RCS*SG21C) MN STM SAFETY											SPT	5YR		2BVT 1.60.5	

Beaver Valley Power Station Unit 2 IST Program

VALVE TABLE

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

Valve ID / Name	Class	Cat.	Active / Passive	Size (in.)	Valve Type	Actuator Type	Drawing & Coord	Position Normal	Position Safety	Position Fail-Safe	Required Test	Frequency	Code Dev.	Procedure	Remarks
2SDS*AOV111A1	2	B	Active	1.5	Globe	AOV	21-3 (A-4)	O	S	S	FS-S	Q		2OST-47.3P	
MN STEAMLINE A DRAIN TO CONDENSER											ST-S	Q		2OST-47.3P	
											RPV	2YR		2OST-47.3P	
2SDS*AOV111A2	2	B	Active	1.5	Globe	AOV	21-3 (B-4)	O	S	S	FS-S	Q		2OST-47.3N	
MN STEAMLINE A DRAIN TO CONDENSER											ST-S	Q		2OST-47.3N	
											RPV	2YR		2OST-47.3N	
2SDS*AOV111B1	2	B	Active	1.5	Globe	AOV	21-3 (A-6)	O	S	S	FS-S	Q		2OST-47.3P	
MN STEAMLINE B DRAIN TO CONDENSER											ST-S	Q		2OST-47.3P	
											RPV	2YR		2OST-47.3P	
2SDS*AOV111B2	2	B	Active	1.5	Globe	AOV	21-3 (B-6)	O	S	S	FS-S	Q		2OST-47.3N	
MN STEAMLINE B DRAIN TO CONDENSER											ST-S	Q		2OST-47.3N	
											RPV	2YR		2OST-47.3N	
2SDS*AOV111C1	2	B	Active	1.5	Globe	AOV	21-3 (B-8)	O	S	S	FS-S	Q		2OST-47.3P	
MN STEAMLINE C DRAIN TO CONDENSER											ST-S	Q		2OST-47.3P	
											RPV	2YR		2OST-47.3P	
2SDS*AOV111C2	2	B	Active	1.5	Globe	AOV	21-3 (B-8)	O	S	S	FS-S	Q		2OST-47.3N	
MN STEAMLINE C DRAIN TO CONDENSER											ST-S	Q		2OST-47.3N	
											RPV	2YR		2OST-47.3N	
2SDS*AOV129A	2	B	Active	1	Globe	AOV	21-3 (C-1)	O	S	S	FS-S	Q		2OST-47.3P	
RESIDUAL HEAT RELEASE PIPING DRAIN ISOL											ST-S	Q		2OST-47.3P	
											RPV	2YR		2OST-47.3P	
2SDS*AOV129B	2	B	Active	1	Globe	AOV	21-3 (B-1)	O	S	S	FS-S	Q		2OST-47.3N	
RESIDUAL HEAT RELEASE PIPING DRAIN ISOL											ST-S	Q		2OST-47.3N	
											RPV	2YR		2OST-47.3N	
2SVS*23	2	B	Active	4	Gate		21-1 (F-3)	O	O/S		MAN	2YR		2OST-47.3M	
(2SVS*PCV101A) ISOL															
2SVS*24	2	B	Active	4	Gate		21-1 (D-3)	O	O/S		MAN	2YR		2OST-47.3M	
(2SVS*PCV101B) ISOL															

Beaver Valley Power Station Unit 2 IST Program

VALVE TABLE

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

Valve ID / Name	Class	Cat.	Active / Passive	Size (in.)	Valve Type	Actuator Type	Drawing & Coord	Position Normal	Position Safety	Position Fail-Safe	Required Test	Frequency	Code Dev.	Procedure	Remarks
2SVS*25 (2SVS*PCV101C) ISOL	2	B	Active	4	Gate		21-1 (B-3)	O	O/S		MAN	2YR		2OST-47.3M	
2SVS*27 (2RCS*SG21A) MN STEAM RESIDUAL HEAT RELEASE ISOL	2	B	Active	6	Gate		21-2 (E-8)	O	O/S		MAN	2YR		2OST-47.3G	
2SVS*28 (2RCS*SG21B) MN STM RESIDUAL HEAT RELEASE ISOL	2	B	Active	6	Gate		21-2 (E-9)	O	O/S		MAN	2YR		2OST-47.3G	
2SVS*29 (2RCS*SG21C) MN STM RESIDUAL HEAT RELEASE ISOL	2	B	Active	6	Gate		21-2 (E-10)	O	O/S		MAN	2YR		2OST-47.3G	
2SVS*4 (2SVS*HCV104) ISOL	2	B	Active	8	Gate		21-2 (F-7)	O	O/S		MAN	2YR		2OST-47.3G	
2SVS*80 (2RCS*SG21A) MN STM RESIDUAL HEAT RELEASE CHECK	2	C	Active	6	Check		21-2 (F-8)	S	O/S		CV-DIS	CVCM	VROJ - 43	1/2 CMP-75-ENERTECH CHECK-1M	Sample Disassembly & Inspection with [2SVS*81, 82] per CVCM Program
											PMT	CVCM	VROJ - 43	2OM-50.4.M	Partial stroke open during S/U after disassembly and inspection
2SVS*81 (2RCS*SG21B) MN STM RESIDUAL HEAT RELEASE CHECK	2	C	Active	6	Check		21-2 (F-9)	S	O/S		CV-DIS	CVCM	VROJ - 43	1/2 CMP-75-ENERTECH CHECK-1M	Sample Disassembly & Inspection with [2SVS*80, 82] per CVCM Program
											PMT	CVCM	VROJ - 43	2OM-50.4.M	Partial stroke open during S/U after disassembly and inspection
2SVS*82 (2RCS*SG21C) MN STM RESIDUAL HEAT RELEASE CHECK	2	C	Active	6	Check		21-2 (F-10)	S	O/S		CV-DIS	CVCM	VROJ - 43	1/2 CMP-75-ENERTECH CHECK-1M	Sample Disassembly & Inspection with [2SVS*80, 81] per CVCM Program
											PMT	CVCM	VROJ - 43	2OM-50.4.M	Partial stroke open during S/U after disassembly and inspection

Beaver Valley Power Station Unit 2 IST Program

VALVE TABLE

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

Valve ID / Name	Class	Cat.	Active / Passive	Size (in.)	Valve Type	Actuator Type	Drawing & Coord	Position Normal	Position Safety	Position Fail-Safe	Required Test	Frequency	Code Dev.	Procedure	Remarks
2SVS*HCV104	2	B	Active	10	Globe	HCV	21-2 (F-7)	S	O/S	S	FS-S	Q		2OST-47.3G	
RESIDUAL HEAT RELEASE VALVE											RPV	Q		2OST-47.3G	
											ST-O	Q		2OST-47.3G	
											ST-S	Q		2OST-47.3G	
2SVS*PCV101A	2	B	Active	10	Globe	PCV	21-1 (F-4)	S	O/S	S	FS-S	Q		2OST-47.3M	
21A STEAM GENERATOR ATMOS STM DUMP VALVE											ST-O	Q		2OST-47.3M	
											ST-S	Q		2OST-47.3M	
											RPV	2YR		2OST-47.3M	
2SVS*PCV101B	2	B	Active	10	Globe	PCV	21-1 (D-4)	S	O/S	S	FS-S	Q		2OST-47.3M	
21B STEAM GENERATOR ATMOS STM DUMP VALVE											ST-O	Q		2OST-47.3M	
											ST-S	Q		2OST-47.3M	
											RPV	2YR		2OST-47.3M	
2SVS*PCV101C	2	B	Active	10	Globe	PCV	21-1 (B-4)	S	O/S	S	FS-S	Q		2OST-47.3M	
21C STEAM GENERATOR ATMOS STM DUMP VALVE											ST-O	Q		2OST-47.3M	
											ST-S	Q		2OST-47.3M	
											RPV	2YR		2OST-47.3M	

Beaver Valley Power Station Unit 2 IST Program

VALVE TABLE

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

Valve ID / Name	Class	Cat.	Active / Passive	Size (in.)	Valve Type	Actuator Type	Drawing & Coord	Position Normal	Position Safety	Position Fail-Safe	Required Test	Frequency	Code Dev.	Procedure	Remarks
2FWE*100 AUX FEED TO SG 'B' CHECK	2	C	Active	4	Check		24-3 (C-10)	S	O/S		CV-S-LT	R	VROJ - 45	2OST-24.8A	
											CV-O	CSD	VCSJ - 17	2OST-24.6A	
											CV-O	CSD	VCSJ - 17	2OST-24.6B	
2FWE*101 AUX FEED TO SG 'C' CHECK	2	C	Active	4	Check		24-3 (E-10)	S	O/S		CV-S-LT	R	VROJ - 45	2OST-24.8A	
											CV-O	CSD	VCSJ - 17	2OST-24.6A	
											CV-O	CSD	VCSJ - 17	2OST-24.6B	
2FWE*42A AUX FEED CHECK 'A' HEADER TO SG 'A'	2	A/C	Active	4	Check		24-3 (A-8)	S	O/S		LM	NSO		2OM-54.3	Monitored shiftly by 2OM-54.3, Station Log PAB 2 per ISTC-3550
											CV-O	CSD	VCSJ - 16	2OST-24.6A	
											CV-S	CSD	VCSJ - 16	2OST-24.6B	
2FWE*42B AUX FEED CHECK 'B' HEADER TO SG 'A'	2	A/C	Active	4	Check		24-3 (B-8)	S	O/S		LM	NSO		2OM-54.3	Monitored shiftly by 2OM-54.3, Station Log PAB 2 per ISTC-3550
											CV-O	CSD	VCSJ - 16	2OST-24.6B	
											CV-S	CSD	VCSJ - 16	2OST-24.6A	
2FWE*43A AUX FEED CHECK 'A' HEADER TO SG 'B'	2	A/C	Active	4	Check		24-3 (C-8)	S	O/S		LM	NSO		2OM-54.3	Monitored shiftly by 2OM-54.3, Station Log PAB 2 per ISTC-3550
											CV-O	CSD	VCSJ - 16	2OST-24.6A	
											CV-S	CSD	VCSJ - 16	2OST-24.6B	
2FWE*43B AUX FEED CHECK 'B' HEADER TO SG 'B'	2	A/C	Active	4	Check		24-3 (C-8)	S	O/S		LM	NSO		2OM-54.3	Monitored shiftly by 2OM-54.3, Station Log PAB 2 per ISTC-3550
											CV-O	CSD	VCSJ - 16	2OST-24.6B	
											CV-S	CSD	VCSJ - 16	2OST-24.6A	

Beaver Valley Power Station Unit 2 IST Program

VALVE TABLE

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

Valve ID / Name	Class	Cat.	Active / Passive	Size (in.)	Valve Type	Actuator Type	Drawing & Coord	Position Normal	Position Safety	Position Fail-Safe	Required Test	Frequency	Code Dev.	Procedure	Remarks
2FWE*44A	2	A/C	Active	4	Check		24-3 (D-8)	S	O/S		LM	NSO		2OM-54.3	Monitored shiftly by 2OM-54.3, Station Log PAB 2 per ISTC-3550
AUX FEED CHECK 'A' HEADER TO SG 'C'											CV-O	CSD	VCSJ - 16	2OST-24.6A	
											CV-S	CSD	VCSJ - 16	2OST-24.6B	
2FWE*44B	2	A/C	Active	4	Check		24-3 (E-8)	S	O/S		LM	NSO		2OM-54.3	Monitored shiftly by 2OM-54.3, Station Log PAB 2 per ISTC-3550
AUX FEED CHECK 'B' HEADER TO SG 'C'											CV-O	CSD	VCSJ - 16	2OST-24.6B	
											CV-S	CSD	VCSJ - 16	2OST-24.6A	
2FWE*90	3	B	Active	6	Butterfly		24-3 (D-2)	LS	O		MAN	2YR		2OST-24.1	Position Verification 31 days per Tech Specs
(2FWE*P22) SUPPLY FROM SERVICE WATER															
2FWE*91	3	B	Active	4	Butterfly		24-3 (E-2)	LS	O		MAN	2YR		2OST-24.1	Position Verification 31 days per Tech Specs
(2FWE*P23A) SUPPLY FROM SERVICE WATER															
2FWE*92	3	B	Active	4	Butterfly		24-3 (F-2)	LS	O		MAN	2YR		2OST-24.1	Position Verification 31 days per Tech Specs
(2FWE*P23B) SUPPLY FROM SERVICE WATER															
2FWE*99	2	C	Active	4	Check		24-3 (B-10)	S	O/S		CV-S-LT	R	VROJ - 45	2OST-24.8A	
AUX FED TO SG 'A' CHECK											CV-O	CSD	VCSJ - 17	2OST-24.6A	
											CV-O	CSD	VCSJ - 17	2OST-24.6B	
2FWE*FCV122	3	B/C	Active	6	Check/FCV	FCV	24-3 (E-5)	O/S	O/S		CV-O	R	VROJ - 46	2OST-24.4A	
(2FWE*P22) DISCHARGE CHECK AND RECIRCULATING VALVE											MAN-O	R	VROJ - 46	2OST-24.4A	
											MAN-S	R	VROJ - 46	2OST-24.4A	
											CV-S	CSD	VCSJ - 18	2OST-24.6A	
											CV-S	CSD	VCSJ - 18	2OST-24.6B	
											MAN-O	2YR		2OST-24.4	
2FWE*FCV123A	3	B/C	Active	4	Check/FCV	FCV	24-3 (F-6)	O/S	O/S		CV-O	CSD	VCSJ - 19	2OST-24.6A	
(2FWE*P23A) DISCHARGE CHECK AND RECIRCULATING VALVE											CV-S	CSD	VCSJ - 19	2OST-24.6B	
											MAN-O	CSD	VCSJ - 19	2OST-24.6A	
											MAN-S	CSD	VCSJ - 19	2OST-24.6A	
											MAN-O	2YR		2OST-24.2	

Beaver Valley Power Station Unit 2 IST Program

VALVE TABLE

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

Valve ID / Name	Class	Cat.	Active / Passive	Size (in.)	Valve Type	Actuator Type	Drawing & Coord	Position Normal	Position Safety	Position Fail-Safe	Required Test	Frequency	Code Dev.	Procedure	Remarks
2FWE*FCV123B	3	B/C	Active	4	Check/FCV	FCV	24-3 (G-6)	O/S	O/S		CV-O	CSD	VCSJ - 19	2OST-24.6B	
(2FWE*P23B) DISCHARGE CHECK AND RECIRCULATING VALVE											CV-S	CSD	VCSJ - 19	2OST-24.6A	
											MAN-O	CSD	VCSJ - 19	2OST-24.6B	
											MAN-S	CSD	VCSJ - 19	2OST-24.6B	
											MAN-O	2YR		2OST-24.3	
2FWE*HCV100A	2	B	Active	3	Globe	HCV	24-3 (D-7)	O	O/S		ST-O	Q		2OST-47.3L	
21C SG AUX FEEDWATER THROTTLE VLV											ST-S	Q		2OST-47.3L	
											RPV	2YR		2OST-47.3L	
2FWE*HCV100B	2	B	Active	3	Globe	HCV	24-3 (E-7)	O	O/S		ST-O	Q		2OST-47.3G	
21C SG AUX FEEDWATER THROTTLE VLV											ST-S	Q		2OST-47.3G	
											RPV	2YR		2OST-47.3G	
2FWE*HCV100C	2	B	Active	3	Globe	HCV	24-3 (C-7)	O	O/S		ST-O	Q		2OST-47.3L	
21B SG AUX FEEDWATER THROTTLE VLV											ST-S	Q		2OST-47.3L	
											RPV	2YR		2OST-47.3L	
2FWE*HCV100D	2	B	Active	3	Globe	HCV	24-3 (C-7)	O	O/S		ST-O	Q		2OST-47.3G	
21B SG AUX FEEDWATER THROTTLE VLV											ST-S	Q		2OST-47.3G	
											RPV	2YR		2OST-47.3G	
2FWE*HCV100E	2	B	Active	3	Globe	HCV	24-3 (A-7)	O	O/S		ST-O	Q		2OST-47.3L	
21A SG AUX FEEDWATER THROTTLE VLV											ST-S	Q		2OST-47.3L	
											RPV	2YR		2OST-47.3L	
2FWE*HCV100F	2	B	Active	3	Globe	HCV	24-3 (B-7)	O	O/S		ST-O	Q		2OST-47.3G	
21A SG AUX FEEDWATER THROTTLE VLV											ST-S	Q		2OST-47.3G	
											RPV	2YR		2OST-47.3G	
2FWE*RV101	3	C	Active	3x4	Relief	RV	24-3 (D-5)	S	O/S		SPT	10YR		2BVT 1.60.5	
(2FWE*P22) DISCHARGE RELIEF															
2FWE*RV102	3	C	Active	0.75x1	Relief	RV	24-3 (E-2)	S	O/S		SPT	10YR		2BVT 1.60.5	
EMERGENCY WATER SUPPLY RELIEF															

Beaver Valley Power Station Unit 2 IST Program

VALVE TABLE

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

Valve ID / Name	Class	Cat.	Active / Passive	Size (in.)	Valve Type	Actuator Type	Drawing & Coord	Position Normal	Position Safety	Position Fail-Safe	Required Test	Frequency	Code Dev.	Procedure	Remarks
2FWS*28	2	C	Active	16	Check		24-2A (F-7)	O	S		CV-S-LT	R	VROJ - 44	2OST-24.8	
FEED HEADER CHECK (2RCS*SG21A)											CV-BDT-O	NSO		ISTC-3550	During main feedwater flow to S/Gs
2FWS*29	2	C	Active	16	Check		24-2A (D-7)	O	S		CV-S-LT	R	VROJ - 44	2OST-24.8	
FEED HEADER CHECK (2RCS*SG21B)											CV-BDT-O	NSO		ISTC-3550	During main feedwater flow to S/Gs
2FWS*30	2	C	Active	16	Check		24-2A (B-7)	O	S		CV-S-LT	R	VROJ - 44	2OST-24.8	
FEED HEADER CHECK (2RCS*SG21C)											CV-BDT-O	NSO		ISTC-3550	During main feedwater flow to S/Gs
2FWS*FCV478	3	B	Active	16	Globe	FCV	24-2A (F-3)	T	S	S	FS-S	CSD	VCSJ - 21	2OST-1.10	
21A SG MAIN FEED REG VALVE											ST-S	CSD	VCSJ - 21	2OST-1.10	
											RPV	2YR		2OST-1.10	
2FWS*FCV479	3	B	Active	6	Globe	FCV	24-2A (E-3)	S	S	S	FS-S	Q		2OST-47.3K	
21A SG BYPASS FW CONTROL VALVE											ST-S	Q		2OST-47.3K	
											RPV	2YR		2OST-47.3K	
2FWS*FCV488	3	B	Active	16	Globe	FCV	24-2A (D-3)	T	S	S	FS-S	CSD	VCSJ - 21	2OST-1.10	
21B SG MAIN FEED REG VALVE											ST-S	CSD	VCSJ - 21	2OST-1.10	
											RPV	2YR		2OST-1.10	
2FWS*FCV489	3	B	Active	6	Globe	FCV	24-2A (C-3)	S	S	S	FS-S	Q		2OST-47.3K	
21B SG BYPASS FW CONTROL VALVE											ST-S	Q		2OST-47.3K	
											RPV	2YR		2OST-47.3K	
2FWS*FCV498	3	B	Active	16	Globe	FCV	24-2A (B-3)	T	S	S	FS-S	CSD	VCSJ - 21	2OST-1.10	
21C SG MAIN FEED REG VALVE											ST-S	CSD	VCSJ - 21	2OST-1.10	
											RPV	2YR		2OST-1.10	
2FWS*FCV499	3	B	Active	6	Globe	FCV	24-2A (A-3)	S	S	S	FS-S	Q		2OST-47.3K	
21C SG BYPASS FW CONTROL VALVE											ST-S	Q		2OST-47.3K	
											RPV	2YR		2OST-47.3K	
2FWS*HYV157A	2	B	Active	16	Gate	HYV	24-2A (F-6)	O	S		ST-S	CSD	VCSJ - 20	2OST-1.10	
21A SG FEEDWATER ISOLATION VALVE											RPV	2YR		2OST-1.10	

Beaver Valley Power Station Unit 2 IST Program

VALVE TABLE

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

Valve ID / Name	Class	Cat.	Active / Passive	Size (in.)	Valve Type	Actuator Type	Drawing & Coord	Position Normal	Position Safety	Position Fail-Safe	Required Test	Frequency	Code Dev.	Procedure	Remarks
2FWS*HYV157B	2	B	Active	16	Gate	HYV	24-2A (D-6)	O	S		ST-S	CSD	VCSJ - 20	2OST-1.10	
21B SG FEEDWATER ISOLATION VALVE											RPV	2YR		2OST-1.10	
2FWS*HYV157C	2	B	Active	16	Gate	HYV	24-2A (B-6)	O	S		ST-S	CSD	VCSJ - 20	2OST-1.10	
21C SG FEEDWATER ISOLATION VALVE											RPV	2YR		2OST-1.10	

Beaver Valley Power Station Unit 2 IST Program

VALVE TABLE

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

Valve ID / Name	Class	Cat.	Active / Passive	Size (in.)	Valve Type	Actuator Type	Drawing & Coord	Position Normal	Position Safety	Position Fail-Safe	Required Test	Frequency	Code Dev.	Procedure	Remarks
2BDG*AOV100A1	2	B	Active	3	Globe	AOV	25-1 (G-4)	O	S	S	FS-S	CSD	VCSJ - 22	2OST-1.10	
STM GEN 21A BLOWDOWN OUTSIDE CNMT ISOLATION											ST-S	CSD	VCSJ - 22	2OST-1.10	
											RPV	2YR		2OST-1.10	
2BDG*AOV100B1	2	B	Active	3	Globe	AOV	25-1 (E-4)	O	S	S	FS-S	CSD	VCSJ - 22	2OST-1.10	
STM GEN 21B BLOWDOWN OUTSIDE CNMT ISOLATION											ST-S	CSD	VCSJ - 22	2OST-1.10	
											RPV	2YR		2OST-1.10	
2BDG*AOV100C1	2	B	Active	3	Globe	AOV	25-1 (B-4)	O	S	S	FS-S	CSD	VCSJ - 22	2OST-1.10	
STM GEN 21C BLOWDOWN OUTSIDE CNMT ISOLATION											ST-S	CSD	VCSJ - 22	2OST-1.10	
											RPV	2YR		2OST-1.10	
2BDG*AOV101A1	2	B	Active	3	Globe	AOV	25-1 (G-2)	O	S	S	FS-S	CSD	VCSJ - 22	2OST-1.10	
STM GEN 21A BLOWDOWN INSIDE CNMT ISOLATION											ST-S	CSD	VCSJ - 22	2OST-1.10	
											RPV	2YR		2OST-1.10	
2BDG*AOV101A2	2	B	Active	3	Globe	AOV	25-1 (G-3)	O	S	S	FS-S	CSD	VCSJ - 22	2OST-1.10	
STM GEN 21A BLOWDOWN INSIDE CNMT ISOLATION											ST-S	CSD	VCSJ - 22	2OST-1.10	
											RPV	2YR		2OST-1.10	
2BDG*AOV101B1	2	B	Active	3	Globe	AOV	25-1 (E-2)	O	S	S	FS-S	CSD	VCSJ - 22	2OST-1.10	
STM GEN 21B INSIDE CNMT ISOLATION											ST-S	CSD	VCSJ - 22	2OST-1.10	
											RPV	2YR		2OST-1.10	
2BDG*AOV101B2	2	B	Active	3	Globe	AOV	25-1 (E-3)	O	S	S	FS-S	CSD	VCSJ - 22	2OST-1.10	
STM GEN 21B BLOWDOWN INSIDE CNMT ISOLATION											ST-S	CSD	VCSJ - 22	2OST-1.10	
											RPV	2YR		2OST-1.10	
2BDG*AOV101C1	2	B	Active	3	Globe	AOV	25-1 (B-2)	O	S	S	FS-S	CSD	VCSJ - 22	2OST-1.10	
STM GEN 21C BLOWDOWN INSIDE CNMT ISOLATION											ST-S	CSD	VCSJ - 22	2OST-1.10	
											RPV	2YR		2OST-1.10	
2BDG*AOV101C2	2	B	Active	3	Globe	AOV	25-1 (B-3)	O	S	S	FS-S	CSD	VCSJ - 22	2OST-1.10	
STM GEN 21C BLOWDOWN INSIDE CNMT ISOLATION											ST-S	CSD	VCSJ - 22	2OST-1.10	
											RPV	2YR		2OST-1.10	

Beaver Valley Power Station Unit 2 IST Program

VALVE TABLE

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

Valve ID / Name	Class	Cat.	Active / Passive	Size (in.)	Valve Type	Actuator Type	Drawing & Coord	Position Normal	Position Safety	Position Fail-Safe	Required Test	Frequency	Code Dev.	Procedure	Remarks
2ASS*AOV130A	3	B	Active	8	Globe	AOV	27A-1 (F-4)	O	S	S	FS-S	Q		2OST-47.30	
SUPPLY LINE TO AUXILIARY BLDG ISOL											ST-S	Q		2OST-47.30	
											RPV	2YR		2OST-47.30	
2ASS*AOV130B	3	B	Active	8	Globe	AOV	27A-1 (F-4)	O	S	S	FS-S	Q		2OST-47.30	
BACKUP ISOL OF STEAM SUPPLY TO AUXILIARY BLDG											ST-S	Q		2OST-47.30	
											RPV	2YR		2OST-47.30	

Beaver Valley Power Station Unit 2 IST Program

VALVE TABLE

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

Valve ID / Name	Class	Cat.	Active / Passive	Size (in.)	Valve Type	Actuator Type	Drawing & Coord	Position Normal	Position Safety	Position Fail-Safe	Required Test	Frequency	Code Dev.	Procedure	Remarks
2SWE*MOV116A	3	B	Active	30	Butterfly	MOV	30-1 (A-7)	S	O/S		ET	Q		2OST-30.1A	Per OMN-1
STBY SW PUMPS DISCH TO SWS A HDR											DIAG-ST-O	9YR		1/2-CMP-75-Quarter Turn-1E	Per OMN-1
											DIAG-ST-S	9YR		1/2-CMP-75-Quarter Turn-1E	Per OMN-1
											RPV	9YR		1/2-CMP-75-Quarter Turn-1E	Per OMN-1
2SWE*MOV116B	3	B	Active	30	Butterfly	MOV	30-1 (A-6)	S	O/S		ET	Q		2OST-30.1B	Per OMN-1
STBY SW PUMPS DISCH TO SWS B HDR											DIAG-ST-O	9YR		1/2-CMP-75-Quarter Turn-1E	Per OMN-1
											DIAG-ST-S	9YR		1/2-CMP-75-Quarter Turn-1E	Per OMN-1
											RPV	9YR		1/2-CMP-75-Quarter Turn-1E	Per OMN-1
2SWS*100	3	B	Active	3	Globe		30-2 (E-3)	T	S		MAN	2YR		2OST-47.3O	
[2SWS*TCV101B] Bypass															
2SWS*106	3	C	Active	30	Check		30-1 (A-7)	O	O/S		CV-O	R		2OST-30.13A	Per CVCM Program (see VROJ-48)
SW SUPPLY A HDR CHECK											CV-O	Q		2OST-30.6A	Per CVCM Program. (see VROJ-48)
											CV-O	Q		2OST-30.2	Per CVCM Program. (see VROJ-48)
											CV-DIS	CVCM	VROJ - 48	1/2CMP-75-WAFER CHECK-1M	Sample disassembly and inspection with [2SWS*107] per CVCM Program
											PMT	CVCM	VROJ - 48	2OST-30.6A	Partial stroke open after disassembly and inspection.
											PMT	CVCM	VROJ - 48	2OST-30.2	Partial stroke open after disassembly and inspection.

Beaver Valley Power Station Unit 2 IST Program

VALVE TABLE

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

Valve ID / Name	Class	Cat.	Active / Passive	Size (in.)	Valve Type	Actuator Type	Drawing & Coord	Position Normal	Position Safety	Position Fail-Safe	Required Test	Frequency	Code Dev.	Procedure	Remarks
2SWS*107	3	C	Active	30	Check		30-1 (A-6)	O	O/S		CV-O	R		2OST-30.13B	Per CVCM Program (see VROJ-48)
SW SUPPLY B HDR CHECK											CV-O	Q		2OST-30.6B	Per CVCM Program. (see VROJ-48)
											CV-O	Q		2OST-30.3	Per CVCM Program. (see VROJ-48)
											CV-DIS	CVCM	VROJ - 48	1/2CMP-75-WAFER CHECK-1M	Sample disassembly and inspection with [2SWS*106] per CVCM Program
											PMT	CVCM	VROJ - 48	2OST-30.6B	Partial stroke open after disassembly and inspection.
											PMT	CVCM	VROJ - 48	2OST-30.3	Partial stroke open after disassembly and inspection.
2SWS*111	3	C	Active	6	Check		30-2 (C-8)	S	O		CV-O	Q		2OST-36.1	
DG HX (2EGS*E21A (E22A)) SUPPLY HDR CHK											CV-DIS	CVCM	VROJ - 52	1/2CMP-75-WAFER CHECK-1M	Sample disassembly and inspection with [2SWS*112] per CVCM Program
											PMT	CVCM	VROJ - 52	2OST-36.1	Partial stroke open after disassembly and inspection.
2SWS*112	3	C	Active	6	Check		30-2 (E-8)	S	O		CV-O	Q		2OST-36.2	
DG HX (2EGS*E21B, (E22B)) SUPPLY HDR CHK											CV-DIS	CVCM	VROJ - 52	1/2CMP-75-WAFER CHECK-1M	Sample disassembly and inspection with [2SWS*111] per CVCM Program
											PMT	CVCM	VROJ - 52	2OST-36.2	Partial stroke open after disassembly and inspection.
2SWS*115A	C	B	Active	1.5	Ball		30-1 (B-2)	S	O		MAN	2YR		2OST-30.17A	
SWS STRAINER [47] BACKWASH THROTTLE VALVE															
2SWS*115B	3	B	Active	1.5	Ball		30-1 (F-2)	S	O		MAN	2YR		2OST-30.17B	
SWS STRAINER [48] BACKWASH THROTTLE VALVE															
2SWS*142	3	B	Active	3	Gate		30-2 (A-1)	S	O		MAN	2YR		2OST-47.3M	
CONT RM COOLING COIL (2HVC*ACU201A) INLET ISOL															

Beaver Valley Power Station Unit 2 IST Program

VALVE TABLE

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

Valve ID / Name	Class	Cat.	Active / Passive	Size (in.)	Valve Type	Actuator Type	Drawing & Coord	Position Normal	Position Safety	Position Fail-Safe	Required Test	Frequency	Code Dev.	Procedure	Remarks
2SWS*143	3	B	Active	3	Gate		30-2 (F-1)	S	O		MAN	2YR		2OST-47.3O	
CONT RM COOLING COIL (2HVC*ACU201B) INLET ISOL															
2SWS*486	3	C	Active	3	Check		30-1 (C-3)	S	O/S		CV-O	Q or CSD	VCSJ - 26	2OST-30.6A	
SW PP 21A VACUUM BKR											CV-S-LT	Q		2OST-30.2	
2SWS*487	3	C	Active	3	Check		30-1 (D-3)	S	O/S		CV-O	Q or CSD	VCSJ - 26	2OST-30.6B	
SW PP 21B VACUUM BKR											CV-S-LT	Q		2OST-30.3	
2SWS*488	3	C	Active	3	Check		30-1 (G-3)	S	O/S		CV-O	Q or CSD	VCSJ - 26	2OST-30.6B	
SW PP 21C VACUUM BKR											CV-O	Q or CSD	VCSJ - 26	2OST-30.6A	
											CV-S-LT	Q		2OST-30.6B	
											CV-S-LT	Q		2OST-30.6A	
2SWS*57	3	C	Active	30	Check		30-1 (C-3)	O	O/S		CV-O	R	VROJ - 47	2OST-30.13A	
SW PP (2SWS*P21A) DISCH CHECK											CV-S-PR	Q or CSD	VCSJ - 23	2OST-30.6A	
											CV-O	(See VROJ47)	VROJ - 47	2OST-30.2	
2SWS*58	3	C	Active	30	Check		30-1 (D-4)	O	O/S		CV-O	R	VROJ - 47	2OST-30.13B	
SW PP (2SWS*P21B) DISCH CHECK											CV-S-PR	Q or CSD	VCSJ - 23	2OST-30.6B	
											CV-O	(See VROJ47)	VROJ - 47	2OST-30.3	
2SWS*59	3	C	Active	30	Check		30-1 (G-3)	O	O/S		CV-O	R	VROJ - 47	2OST-30.13B	
SW PP (2SWS*P21C) DISCH CHECK											CV-O	R	VROJ - 47	2OST-30.13A	
											CV-S-PR	Q or CSD	VCSJ - 23	2OST-30.6B	
											CV-S-PR	Q or CSD	VCSJ - 23	2OST-30.6A	
											CV-O	(See VROJ47)	VROJ - 47	2OST-30.6B	
											CV-O	(See VROJ47)	VROJ - 47	2OST-30.6A	
2SWS*99	3	B	Active	3	Globe		30-2 (B-3)	T	S		MAN	2YR		2OST-47.3M	
[2SWS*TCV101A] Bypass															
2SWS*AOV118A	3	B	Passive	2	Globe	AOV	30-1 (B-1)	S	S	S	RPV	2YR		2OST-30.17A	Unit 1 filtered water is RIP, so NSA is in Service Water Mode (shut)
UNIT 1 SUPPLY TO SERVICE WATER PUMP SEALS															

Beaver Valley Power Station Unit 2 IST Program

VALVE TABLE

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

Valve ID / Name	Class	Cat.	Active / Passive	Size (in.)	Valve Type	Actuator Type	Drawing & Coord	Position Normal	Position Safety	Position Fail-Safe	Required Test	Frequency	Code Dev.	Procedure	Remarks
2SWS*AOV118B	3	B	Passive	2	Globe	AOV	30-1 (E-1)	S	S	S	RPV	2YR		2OST-30.17B	Unit 1 filtered water is RIP, so NSA is in Service Water Mode (shut)
UNIT 1 SUPPLY TO SERVICE WATER PUMP SEALS															
2SWS*MOV102A	3	B	Active	30	Butterfly	MOV	30-1 (C-4)	O	O		ET	Q or CSD	VCSJ - 24	2OST-30.6A	Per OMN-1
SW PP 21A HDR A DISCHARGE VALVE											DIAG-ST-O	9YR		1/2-CMP-75-Quarter Turn-1E	Per OMN-1
											RPV	9YR		1/2-CMP-75-Quarter Turn-1E	Per OMN-1
2SWS*MOV102B	3	B	Active	30	Butterfly	MOV	30-1 (D-4)	O	O		ET	Q or CSD	VCSJ - 24	2OST-30.6B	Per OMN-1
SW PP 21B HDR B DISCHARGE VALVE											DIAG-ST-O	9YR		1/2-CMP-75-Quarter Turn-1E	Per OMN-1
											RPV	9YR		1/2-CMP-75-Quarter Turn-1E	Per OMN-1
2SWS*MOV102C1	3	B	Active	30	Butterfly	MOV	30-1 (G-4)	S	O		ET	Q or CSD	VCSJ - 24	2OST-30.6A	Per OMN-1
SW PP 21C HDR A DISCHARGE VALVE											DIAG-ST-O	9YR		1/2-CMP-75-Quarter Turn-1E	Per OMN-1
											RPV	9YR		1/2-CMP-75-Quarter Turn-1E	Per OMN-1
2SWS*MOV102C2	3	B	Active	30	Butterfly	MOV	30-1 (G-4)	S	O		ET	Q or CSD	VCSJ - 24	2OST-30.6B	Per OMN-1
SW PP 21C HDR B DISCHARGE VALVE											DIAG-ST-O	9YR		1/2-CMP-75-Quarter Turn-1E	Per OMN-1
											RPV	9YR		1/2-CMP-75-Quarter Turn-1E	Per OMN-1
2SWS*MOV103A	3	B	Active	24	Butterfly	MOV	30-1 (C-7)	S	O/S		ET	CSD or R	VROJ - 51	2OST-30.13A	Per OMN-1
RECIRC SPRAY HX'S SERVICE WTR SUPPLY HDR A ISOL VLV											ET	CSD or R	VROJ - 51	2OST-1.10	Per OMN-1
											DIAG-ST-O	3RFO		1/2-CMP-75-Quarter Turn-1E	Per OMN-1
											DIAG-ST-S	3RFO		1/2-CMP-75-Quarter Turn-1E	Per OMN-1
											RPV	3RFO		1/2-CMP-75-Quarter Turn-1E	Per OMN-1

Beaver Valley Power Station Unit 2 IST Program

VALVE TABLE

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

Valve ID / Name	Class	Cat.	Active / Passive	Size (in.)	Valve Type	Actuator Type	Drawing & Coord	Position Normal	Position Safety	Position Fail-Safe	Required Test	Frequency	Code Dev.	Procedure	Remarks
2SWS*MOV103B	3	B	Active	24	Butterfly	MOV	30-1 (C-6)	S	O/S		ET	CSD or R	VROJ - 51	2OST-30.13B	Per OMN-1
RECIRC SPRAY HX'S SERVICE WTR SUPPLY HDR ISOL VLV											ET	CSD or R	VROJ - 51	2OST-1.10	Per OMN-1
											DIAG-ST-O	3RFO		1/2-CMP-75-Quarter Turn-1E	Per OMN-1
											DIAG-ST-S	3RFO		1/2-CMP-75-Quarter Turn-1E	Per OMN-1
											RPV	3RFO		1/2-CMP-75-Quarter Turn-1E	Per OMN-1
2SWS*MOV104A	3	B	Active	16	Gate	MOV	30-3 (A-1)	O	O/S		ST-S	Q		2OST-47.3Q	Passive Open
RECIRC SPRAY HX 21A COOLING WATER SUPPLY VALVE											RPV	2YR		2OST-47.3Q	
2SWS*MOV104B	3	B	Active	16	Gate	MOV	30-3 (E-1)	O	O/S		ST-S	Q		2OST-47.3O	Passive Open
RECIRC SPRAY HX 21B COOLING WATER SUPPLY VALVE											RPV	2YR		2OST-47.3O	
2SWS*MOV104C	3	B	Active	16	Gate	MOV	30-3 (C-1)	O	O/S		ST-S	Q		2OST-47.3Q	Passive Open
RECIRC SPRAY HX 21C COOLING WATER SUPPLY VALVE											RPV	2YR		2OST-47.3Q	
2SWS*MOV104D	3	B	Active	16	Gate	MOV	30-3 (D-1)	O	O/S		ST-S	Q		2OST-47.3O	Passive Open
RECIRC SPRAY HX 21D COOLING WATER SUPPLY VALVE											RPV	2YR		2OST-47.3O	
2SWS*MOV105A	3	B	Active	16	Butterfly	MOV	30-3 (A-3)	O	O/S		ET	Q		2OST-47.3Q	Per OMN-1
RECIRC SPRAY HX 21A COOLING WATER DISCHARGE VALVE											DIAG-ST-S	6RFO		1/2-CMP-75-Quarter Turn-1E	Per OMN-1 (Passive Open)
											RPV	6RFO		1/2-CMP-75-Quarter Turn-1E	Per OMN-1
2SWS*MOV105B	3	B	Active	16	Butterfly	MOV	30-3 (E-2)	O	O/S		ET	Q		2OST-47.3O	Per OMN-1
RECIRC SPRAY HX 21B COOLING WATER DISCHARGE VALVE											DIAG-ST-S	6RFO		1/2-CMP-75-Quarter Turn-1E	Per OMN-1 (Passive Open)
											RPV	6RFO		1/2-CMP-75-Quarter Turn-1E	Per OMN-1
2SWS*MOV105C	3	B	Active	16	Butterfly	MOV	30-3 (C-2)	O	O/S		ET	Q		2OST-47.3Q	Per OMN-1
RECIRC SPRAY HX 21C COOLING WATER DISCHARGE VALVE											DIAG-ST-S	6RFO		1/2-CMP-75-Quarter Turn-1E	Per OMN-1 (Passive Open)
											RPV	6RFO		1/2-CMP-75-Quarter Turn-1E	Per OMN-1

Beaver Valley Power Station Unit 2 IST Program

VALVE TABLE

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

Valve ID / Name	Class	Cat.	Active / Passive	Size (in.)	Valve Type	Actuator Type	Drawing & Coord	Position Normal	Position Safety	Position Fail-Safe	Required Test	Frequency	Code Dev.	Procedure	Remarks
2SWS*MOV105D	3	B	Active	16	Butterfly	MOV	30-3 (D-2)	O	O/S		ET	Q		2OST-47.3O	Per OMN-1
RECIRC SPRAY HX 21D COOLING WATER DISCHARGE VALVE											DIAG-ST-S	6RFO		1/2-CMP-75-Quarter Turn-1E	Per OMN-1 (Passive Open)
											RPV	6RFO		1/2-CMP-75-Quarter Turn-1E	Per OMN-1
2SWS*MOV106A	3	B	Active	30	Butterfly	MOV	30-1 (C-7)	O	O/S		ET	CSD or R	VROJ - 51	2OST-30.13A	Per OMN-1
CCP HX'S SERVICE WTR SUPPLY HDR A ISOL VLV											ET	CSD or R	VROJ - 51	2OST-1.10	Per OMN-1
											DIAG-ST-O	3RFO		1/2-CMP-75-Quarter Turn-1E	Per OMN-1
											DIAG-ST-S	3RFO		1/2-CMP-75-Quarter Turn-1E	Per OMN-1
											RPV	3RFO		1/2-CMP-75-Quarter Turn-1E	Per OMN-1
2SWS*MOV106B	3	B	Active	30	Butterfly	MOV	30-1 (C-6)	O	O/S		ET	CSD or R	VROJ - 51	2OST-30.13B	Per OMN-1
CCP HX'S SERVICE WTR SUPPLY HDR B ISOL VLV											ET	CSD or R	VROJ - 51	2OST-1.10	Per OMN-1
											DIAG-ST-O	3RFO		1/2-CMP-75-Quarter Turn-1E	Per OMN-1
											DIAG-ST-S	3RFO		1/2-CMP-75-Quarter Turn-1E	Per OMN-1
											RPV	3RFO		1/2-CMP-75-Quarter Turn-1E	Per OMN-1
2SWS*MOV107A	3	B	Active	24	Butterfly	MOV	30-1 (F-7)	O	S		ET	CSD	VCSJ - 25	2OST-1.10	Per OMN-1
CCS HX SERV WTR SUPPLY HDR A ISOL VLV											DIAG-ST-S	6RFO		1/2-CMP-75-Quarter Turn-1E	Per OMN-1
											RPV	6RFO		1/2-CMP-75-Quarter Turn-1E	Per OMN-1
2SWS*MOV107B	3	B	Active	24	Butterfly	MOV	30-1 (F-7)	O	S		ET	CSD	VCSJ - 25	2OST-1.10	Per OMN-1
CCS HX SERV WTR SUPPLY HDR A ISOL VLV											DIAG-ST-S	6RFO		1/2-CMP-75-Quarter Turn-1E	Per OMN-1
											RPV	6RFO		1/2-CMP-75-Quarter Turn-1E	Per OMN-1
2SWS*MOV107C	3	B	Active	24	Butterfly	MOV	30-1 (F-6)	O	S		ET	CSD	VCSJ - 25	2OST-1.10	Per OMN-1
CCS HX SERV WTR SUPPLY HDR B ISOL VLV											DIAG-ST-S	6RFO		1/2-CMP-75-Quarter Turn-1E	Per OMN-1
											RPV	6RFO		1/2-CMP-75-Quarter Turn-1E	Per OMN-1

Beaver Valley Power Station Unit 2 IST Program

VALVE TABLE

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

Valve ID / Name	Class	Cat.	Active / Passive	Size (in.)	Valve Type	Actuator Type	Drawing & Coord	Position Normal	Position Safety	Position Fail-Safe	Required Test	Frequency	Code Dev.	Procedure	Remarks
2SWS*MOV107D	3	B	Active	24	Butterfly	MOV	30-1 (F-6)	O	S		ET	CSD	VCSJ - 25	2OST-1.10	Per OMN-1
CCS HX SERV WTR SUPPLY HDR B ISOL VLV											DIAG-ST-S	6RFO		1/2-CMP-75-Quarter Turn-1E	Per OMN-1
											RPV	6RFO		1/2-CMP-75-Quarter Turn-1E	Per OMN-1
2SWS*MOV113A	3	B	Active	6	Gate	MOV	30-2 (C-8)	S	O		ET	Q		2OST-47.3Q	Per OMN-1
EMER. GEN HX 21A SERV WTR HDR A COOLING WTR INLET VLV											DIAG-ST-O	6RFO		1/2-CMP-E-75-021	Per OMN-1
											RPV	6RFO		1/2-CMP-E-75-021	Per OMN-1
2SWS*MOV113B	3	B/P	Passive	6	Gate	MOV	30-2 (E-8)	S	S		RPV	2YR		2OST-36.1	
EMER. GEN HX 21B SERV WTR HDR A COOLING WTR INLET VLV															
2SWS*MOV113C	3	B/P	Passive	6	Gate	MOV	30-2 (C-8)	S	S		RPV	2YR		2OST-36.2	
EMERG. GEN HX 21A SERV WTR HDR B COOLING WTR INLET VLV															
2SWS*MOV113D	3	B	Active	6	Gate	MOV	30-2 (E-8)	S	O		ET	Q		2OST-47.3O	Per OMN-1
EMERG GEN HX 21B SERV WTR HDR B COOLING WTR INLET VLV											DIAG-ST-O	6RFO		1/2-CMP-E-75-021	Per OMN-1
											RPV	6RFO		1/2-CMP-E-75-021	Per OMN-1
2SWS*MOV152-1	2	A	Active	8	Butterfly	MOV	29-4 (A-2)	O	S		LTJ	SP		2BVT 1.47.5	
CNTMNT AIR RECIRC CLG COILS SUPPLY HDR ISOL MOV											RPV	6RFO/18MO		2OST-47.3Q	18 months per Tech Specs
											DIAG-ST-S	6RFO		1/2-CMP-75-Quarter Turn-1E	Per OMN-1
											ET	18MO or R		2OST-47.3Q	Per OMN-1
2SWS*MOV152-2	2	A	Active	8	Butterfly	MOV	29-4 (A-2)	O	S		LTJ	SP		2BVT 1.47.5	
CNTMNT AIR RECIRC CLG COILS SUPPLY HDR ISOL MOV											RPV	6RFO/18MO		2OST-47.3S	18 months per Tech Specs
											DIAG-ST-S	6RFO		1/2-CMP-75-Quarter Turn-1E	Per OMN-1
											ET	18MO or R		2OST-47.3O	Per OMN-1
2SWS*MOV153-1	2	A	Passive	8	Butterfly	MOV	29-4 (C-2)	LS	LS		LTJ	SP		2BVT 1.47.5	
CNTMNT AIR RECIRC CLG COILS SUPPLY HDR ISOL MOV															
2SWS*MOV153-2	2	A	Passive	8	Butterfly	MOV	29-4 (C-2)	LS	LS		LTJ	SP		2BVT 1.47.5	
CNTMNT AIR RECIRC CLG COILS SUPPLY HDR ISOL MOV															

Beaver Valley Power Station Unit 2 IST Program

VALVE TABLE

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

Valve ID / Name	Class	Cat.	Active / Passive	Size (in.)	Valve Type	Actuator Type	Drawing & Coord	Position Normal	Position Safety	Position Fail-Safe	Required Test	Frequency	Code Dev.	Procedure	Remarks
2SWS*MOV154-1	2	A	Passive	8	Butterfly	MOV	29-4 (D-2)	LS	LS		LTJ	SP		2BVT 1.47.5	
CNTMNT AIR RECIRC CLG COILS RETURN HDR ISOL MOV															
2SWS*MOV154-2	2	A	Passive	8	Butterfly	MOV	29-4 (D-2)	LS	LS		LTJ	SP		2BVT 1.47.5	
CNTMNT AIR RECIRC CLG COILS RETURN HDR ISOL MOV															
2SWS*MOV155-1	2	A	Active	8	Butterfly	MOV	29-4 (G-2)	O	S		LTJ	SP		2BVT 1.47.5	
CNTMNT AIR RECIRC CLG COILS RETURN HDR ISOL MOV											RPV	6RFO/18MO		2OST-47.3Q	18 months per Tech Specs
											DIAG-ST-S	6RFO		1/2-CMP-75-Quarter Turn-1E	Per OMN-1
											ET	18MO or R		2OST-47.3Q	Per OMN-1
2SWS*MOV155-2	2	A	Active	8	Butterfly	MOV	29-4 (G-2)	O	S		LTJ	SP		2BVT 1.47.5	
CNTMNT AIR RECIRC CLG COILS RETURN HDR ISOL MOV											RPV	6RFO/18MO		2OST-47.3S	18 months per Tech Specs
											DIAG-ST-S	6RFO		1/2-CMP-75-Quarter Turn-1E	Per OMN-1
											ET	18MO or R		2OST-47.3O	Per OMN-1
2SWS*RV101A	3	C	Active	0.75x1	Relief	RV	30-3 (A-1)	S	O/S		SPT	10YR		2BVT 1.60.5	
Recirc Spray H/X 21A Inlet Relief															
2SWS*RV101B	3	C	Active	0.75x1	Relief	RV	30-3 (E-1)	S	O/S		SPT	10YR		2BVT 1.60.5	
Recirc Spray H/X 21B Inlet Relief															
2SWS*RV101C	3	C	Active	0.75x1	Relief	RV	30-3 (B-1)	S	O/S		SPT	10YR		2BVT 1.60.5	
Recirc Spray H/X 21C Inlet Relief															
2SWS*RV101D	3	C	Active	0.75x1	Relief	RV	30-3 (D-1)	S	O/S		SPT	10YR		2BVT 1.60.5	
Recirc Spray H/X 21D Inlet Relief															
2SWS*RV102A	3	C	Active	0.75	Relief	RV	30-3 (B-6)	S	O/S		SPT	10YR		2BVT 1.60.5	
"A" CCP H/X Relief															
2SWS*RV102B	3	C	Active	0.75x1	Relief	RV	30-3 (D-6)	S	O/S		SPT	10YR		2BVT 1.60.5	
"B" CCP H/X Relief															
2SWS*RV102C	3	C	Active	0.75	Relief	RV	30-3 (D-6)	S	O/S		SPT	10YR		2BVT 1.60.5	
"C" CCP H/X Relief															

Beaver Valley Power Station Unit 2 IST Program

VALVE TABLE

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

Valve ID / Name	Class	Cat.	Active / Passive	Size (in.)	Valve Type	Actuator Type	Drawing & Coord	Position Normal	Position Safety	Position Fail-Safe	Required Test	Frequency	Code Dev.	Procedure	Remarks
2SWS*RV152	2	A/C	Active	0.75x1	Relief	RV	29-4 (A-2)	S	O/S		LTJ	SP		2BVT 1.47.5	
COOLING WATER TO CAR FAN COOLERS CONTAINMENT PEN 27 RELIEF VALVE											SPT	10YR		2BVT 1.60.5	
2SWS*RV153	2	A/C	Active	0.75x1	Relief	RV	29-4 (C-2)	S	O/S		LTJ	SP		2BVT 1.47.5	
COOLING WATER TO CAR FAN COOLERS CONTAINMENT PEN 14 RELIEF VALVE											SPT	10YR		2BVT 1.60.5	
2SWS*RV154	2	A/C	Active	0.75x1	Relief	RV	29-4 (D-2)	S	O/S		LTJ	SP		2BVT 1.47.5	
COOLING WATER TO CAR FAN COOLERS CONTAINMENT PEN 25 RELIEF VALVE											SPT	10YR		2BVT 1.60.5	
2SWS*RV155	2	A/C	Active	0.75x1	Relief	RV	29-4 (G-2)	S	O/S		LTJ	SP		2BVT 1.47.5	
COOLING WATER TO CAR FAN COOLERS CONTAINMENT PEN 21 RELIEF VALVE											SPT	10YR		2BVT 1.60.5	

Beaver Valley Power Station Unit 2 IST Program

VALVE TABLE

SYSTEM NAME: Fire Protection **SYSTEM NUMBER:** 33

Valve ID / Name	Class	Cat.	Active / Passive	Size (in.)	Valve Type	Actuator Type	Drawing & Coord	Position Normal	Position Safety	Position Fail-Safe	Required Test	Frequency	Code Dev.	Procedure	Remarks
2FPW*382	2	A/C	Active	2.5	Check		33-1D (C-4)	S	S		LTJ	SP		2BVT 1.47.5	
2HVR-FLTA211A HDR CHECK											CV-ME	CSD	VCSJ - 27	2OST-1.10	
2FPW*388	2	A/C	Active	2.5	Check		33-1D (A-4)	S	S		LTJ	SP		2BVT 1.47.5	
2HVR-FLTA211B HDR CHECK											CV-ME	CSD	VCSJ - 27	2OST-1.10	
2FPW*753	2	A/C	Active	4	Check		33-1D (F-4)	S	S		LTJ	SP		2BVT 1.47.5	
RHS PUMPS-CABLE PENETRATION AREA DELUGE HDR CHECK											CV-ME	CSD	VCSJ - 27	2OST-1.10	
2FPW*761	2	A/C	Active	6	Check		33-1D (D-4)	S	S		LTJ	SP		2BVT 1.47.5	
CONTMT HOSE RACKS HDR CHECK											CV-ME	R	VROJ - 49	2OST-1.10	
2FPW*AOV204	2	A	Active	2	Globe	AOV	33-1D (C-4)	S	S	S	LTJ	SP		2BVT 1.47.5	
CNMT FILTER (2HVR-FLTA211A) CNMT ISOL											FS-S	Q		2OST-47.3P	
											ST-S	Q		2OST-47.3P	
											RPV	2YR/18MO		2OST-47.3P	18 months per Tech Specs
2FPW*AOV205	2	A	Active	4	Globe	AOV	33-1D (F-4)	S	S	S	LTJ	SP		2BVT 1.47.5	
RHS PUMP DELUGE SYSTEM CNMT ISOL VLV											FS-S	Q		2OST-47.3P	
											ST-S	Q		2OST-47.3P	
											RPV	2YR/18MO		2OST-47.3P	18 months per Tech Specs
2FPW*AOV206	2	A	Active	6	Globe	AOV	33-1D (D-4)	S	S	S	LTJ	SP		2BVT 1.47.5	
CNMT HOSE RACK HDR ISOL VLV											FS-S	Q		2OST-47.3P	
											ST-S	Q		2OST-47.3P	
											RPV	2YR/18MO		2OST-47.3P	18 months per Tech Specs
2FPW*AOV221	2	A	Active	2	Globe	AOV	33-1D (A-4)	S	S	S	LTJ	SP		2BVT 1.47.5	
CNMT FILTER (2HVR-FLTA211B) CNMT ISOL											FS-S	Q		2OST-47.3P	
											ST-S	Q		2OST-47.3P	
											RPV	2YR/18MO		2OST-47.3P	18 months per Tech Specs

Beaver Valley Power Station Unit 2 IST Program

VALVE TABLE

SYSTEM NAME: Compressed Air **SYSTEM NUMBER:** 34

Valve ID / Name	Class	Cat.	Active / Passive	Size (in.)	Valve Type	Actuator Type	Drawing & Coord	Position Normal	Position Safety	Position Fail-Safe	Required Test	Frequency	Code Dev.	Procedure	Remarks
2IAC*22	2	A/C	Active	3	Check		34-3 (C-10)	O	S		LTJ	SP		2BVT 1.47.5	
(2IAC-TK21) RECEIVER INLET CHECK											CV-S	R	VROJ - 50	2OST-1.10	By observation of external weight arm to close
											CV-BDT-O	NSO		ISTC-3550	During normal operation of CNMT Instrument Air Compressor
2IAC*MOV130	2	A	Active	3	Plug	MOV	34-3 (C-10)	O	S		LTJ	SP		2BVT 1.47.5	
CONTMT INSTRUMENT AIR ISOL VALVE											ET	Q		2OST-47.3L	Per OMN-1
											RPV	6RFO/18MO		2OST-47.3L	18 months per Tech Specs
											DIAG-ST-S	6RFO		1/2-CMP-E-75-021	Per OMN-1
2IAC*MOV133	2	A	Active	4	Plug	MOV	34-3 (C-1)	O	S		LTJ	SP		2BVT 1.47.5	
CONTMT INSTRUMENT AIR ISOL VALVE											ET	Q		2OST-47.3L	Per OMN-1
											RPV	6RFO/18MO		2OST-47.3R	18 months per Tech Specs
											DIAG-ST-S	6RFO		1/2-CMP-E-75-021	Per OMN-1
2IAC*MOV134	2	A	Active	4	Plug	MOV	34-3 (C-1)	O	S		LTJ	SP		2BVT 1.47.5	
CONTMT INSTRUMENT AIR ISOL VALVE											ET	Q		2OST-47.3F	Per OMN-1
											RPV	6RFO/18MO		2OST-47.3F	18 months per Tech Specs
											DIAG-ST-S	6RFO		1/2-CMP-E-75-021	Per OMN-1
2SAS*14	2	A	Passive	2	Globe		34-1B (C-6)	LS	S		LTJ	SP		2BVT 1.47.5	
SERVICE AIR MANIFOLD ISOL															
2SAS*15	2	A	Passive	2	Globe		34-1B (C-6)	LS	S		LTJ	SP		2BVT 1.47.5	
SERVICE AIR MANIFOLD ISOL															

Beaver Valley Power Station Unit 2 IST Program

VALVE TABLE

SYSTEM NAME: 4KV Station Service SYSTEM NUMBER: 36

Valve ID / Name	Class	Cat.	Active / Passive	Size (in.)	Valve Type	Actuator Type	Drawing & Coord	Position Normal	Position Safety	Position Fail-Safe	Required Test	Frequency	Code Dev.	Procedure	Remarks
2EGA*100	3	C	Active	0.75	Check		36-3 (E-4)	S	S		CV-BDT-O	Q		2OST-47.3L	
(2EGA-C21A) DISCH CHECK											CV-S	Q		2OST-47.3L	
2EGA*101	3	C	Active	0.75	Check		36-3 (F-4)	S	S		CV-BDT-O	Q		2OST-47.3L	
(2EGA-C22A) DISCH CHECK											CV-S	Q		2OST-47.3L	
2EGA*118	3	C	Active	0.5	Excess Flw Chk		36-3 (E-4)	O	S		CV-BDT-O	Q		2OST-47.3L	
AIR START TANK 21A TO COMPRESSOR PRES SWITCH CLASS BREAK EXCESS FLOW CHECK VALVE											CV-S	Q		2OST-47.3L	
2EGA*119	3	C	Active	0.5	Excess Flw Chk		36-3 (F-4)	O	S		CV-BDT-O	Q		2OST-47.3L	
AIR START TANK 22A TO COMPRESSOR PRES SWITCH CLASS BREAK EXCESS FLOW CHECK VALVE											CV-S	Q		2OST-47.3L	
2EGA*130	3	C	Active	0.75	Check		36-3 (E-9)	S	S		CV-BDT-O	Q		2OST-47.3F	
(2EGA-C21B) DISCH CHECK											CV-S	Q		2OST-47.3F	
2EGA*131	3	C	Active	0.75	Check		36-3 (F-9)	S	S		CV-BDT-O	Q		2OST-47.3F	
(2EGA-C22B) DISCH CHECK											CV-S	Q		2OST-47.3F	
2EGA*155	3	C	Active	0.5	Excess Flw Chk		36-1 (E-9)	O	S		CV-BDT-O	Q		2OST-47.3F	
AIR START TANK 21B TO COMPRESSOR PRES SWITCH CLASS BREAK EXCESS FLOW CHECK VALVE											CV-S	Q		2OST-47.3F	
2EGA*156	3	C	Active	0.5	Excess Flw Chk		36-1 (F-9)	O	S		CV-BDT-O	Q		2OST-47.3F	
AIR START TANK 22B TO COMPRESSOR PRES SWITCH CLASS BREAK EXCESS FLOW CHECK VALVE											CV-S	Q		2OST-47.3F	
2EGA*RV205	3	C	Active	0.5	Relief	RV	36-3 (E-4)	S	O/S		SPT	10YR		2BVT 1.60.5	
(2EGA*TK21A) RELIEF															
2EGA*RV206	3	C	Active	0.5	Relief	RV	36-3 (E-9)	S	O/S		SPT	10YR		2BVT 1.60.5	
(2EGA*TK21B) RELIEF															
2EGA*RV207	3	C	Active	0.5	Relief	RV	36-3 (F-4)	S	O/S		SPT	10YR		2BVT 1.60.5	
(2EGA*TK22A) RELIEF															
2EGA*RV208	3	C	Active	0.5	Relief	RV	36-3 (F-9)	S	O/S		SPT	10YR		2BVT 1.60.5	
(2EGS*TK22B) RELIEF															
2EGF*10	3	C	Active	3	Check		36-1 (E-7)	S	O/S		CV-O	Q		2OST-36.2	
(2EGF*STR42) OUTLET CHECK											CV-S	Q		2OST-36.2	

Beaver Valley Power Station Unit 2 IST Program

VALVE TABLE

SYSTEM NAME: 4KV Station Service **SYSTEM NUMBER:** 36

Valve ID / Name	Class	Cat.	Active / Passive	Size (in.)	Valve Type	Actuator Type	Drawing & Coord	Position Normal	Position Safety	Position Fail-Safe	Required Test	Frequency	Code Dev.	Procedure	Remarks
2EGF*7	3	C	Active	3	Check		36-1 (F-1)	S	O/S		CV-O	Q		2OST-36.1	
(2EGF*STR39) OUTLET CHECK											CV-S	Q		2OST-36.1	
2EGF*8	3	C	Active	3	Check		36-1 (F-6)	S	O/S		CV-O	Q		2OST-36.2	
(2EGF*STR41) OUTLET CHECK											CV-S	Q		2OST-36.2	
2EGF*9	3	C	Active	3	Check		36-1 (E-1)	S	O/S		CV-O	Q		2OST-36.1	
(2EGF*STR40) OUTLET CHECK											CV-S	Q		2OST-36.1	
2EGO*106	3	B	Active	4	Gate		36-5B (F-8)	LO	S		MAN	R		2OST-36.4	
DG 2-2 LUBE OIL STRAINER (2EGO*STR22B) INLET ISOL															
2EGO*107	3	B	Active	4	Gate		36-5A (F-8)	LO	S		MAN	R		2OST-36.3	
DG 2-1 LUBE OIL STRAINER (2EGO*STR22A) INLET ISOL															
2EGO*108	3	B	Active	4	Gate		36-5B (E-8)	LO	S		MAN	R		2OST-36.4	
DG 2-2 LUBE OIL STRAINER (2EGO*STR22B) OUTLET ISOL															
2EGO*109	3	B	Active	4	Gate		36-5A (E-8)	LO	S		MAN	R		2OST-36.3	
DG 2-1 LUBE OIL STRAINER (2EGO*STR22A) OUTLET ISOL															
2EGO*114	3	B	Active	4	Gate		36-5B (F-7)	S	O		MAN	R		2OST-36.4	
DG 2-2 LUBE OIL STRAINER (2EGO*STR24B) INLET ISOL															
2EGO*115	3	B	Active	4	Gate		36-5A (F-7)	S	O		MAN	R		2OST-36.3	
DG 2-1 LUBE OIL STRAINER (2EGO*STR24A) INLET ISOL															
2EGO*116	3	B	Active	4	Gate		36-5B (E-7)	S	O		MAN	R		2OST-36.4	
DG 2-2 LUBE OIL STRAINER (2EGO*STR24B) OUTLET ISOL															
2EGO*117	3	B	Active	4	Gate		36-5A (E-7)	S	O		MAN	R		2OST-36.3	
DG 2-1 LUBE OIL STRAINER (2EGE*STR24A) OUTLET ISOL															

Beaver Valley Power Station Unit 2 IST Program

VALVE TABLE

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

Valve ID / Name	Class	Cat.	Active / Passive	Size (in.)	Valve Type	Actuator Type	Drawing & Coord	Position Normal	Position Safety	Position Fail-Safe	Required Test	Frequency	Code Dev.	Procedure	Remarks
2HVC*MOD201A	3	B	Active	36	Butterfly	MOD	44A-2 (D-2)	O	S		ST-S	Q		2OST-47.3I	
CONTROL ROOM OUTSIDE AIR INTAKE DAMPER											RPV	2YR		2OST-47.3I	
2HVC*MOD201B	3	B	Active	36	Butterfly	MOD	44A-2 (D-2)	O	S		ST-S	Q		2OST-47.3G	
CONTROL ROOM OUTSIDE AIR INTAKE DAMPER											RPV	2YR		2OST-47.3G	
2HVC*MOD201C	3	B	Active	36	Butterfly	MOD	44A-2 (C-2)	S	S		ST-S	Q		2OST-47.3I	
CONTROL ROOM AIR EXHAUST DAMPER											RPV	2YR		2OST-47.3I	
2HVC*MOD201D	3	B	Active	36	Butterfly	MOD	44A-2 (C-2)	S	S		ST-S	Q		2OST-47.3G	
CONTROL ROOM AIR EXHAUST DAMPER											RPV	2YR		2OST-47.3G	
2HVC*MOD204A	3	B	Active	8	Butterfly	MOD	44A-2 (F-2)	S	O		ST-O	Q		2OST-47.3I	
CONTROL ROOM EMERGENCY SUPPLY FAN INTAKE DAMPER											RPV	2YR		2OST-47.3I	
2HVC*MOD204B	3	B	Active	8	Butterfly	MOD	44A-2 (G-2)	S	O		ST-O	Q		2OST-47.3G	
CONTROL ROOM EMERGENCY SUPPLY FAN INTAKE DAMPER											RPV	2YR		2OST-47.3G	

VALVE COLD SHUTDOWN JUSTIFICATION 4

Valve Asset 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) cool down. They must close as cool down continues to ensure all RHR flow is through the RHR Heat Exchangers.

Test Requirement: Per ISTC-3510, "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 the slightly subatmospheric containment, they are not accessible for testing during plant operation because the radiation levels and air temperature inside containment are higher than normal during power operation and would involve higher radiological dose rates and heat stress risk to plant personnel. This presents a working environment for station personnel that is not considered practicable for quarterly surveillance testing on a routine basis on-line. ISTC-3521(c) states, "If exercising is not practicable during operation at power, 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 in Mode 5 as the operable RCS loops per Technical Specification 3.4.7 or 3.4.8 as applicable, these valves cannot be tested without entering the required action statement which requires immediate restoration of the RCS loop made inoperable. 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 4

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, as part of the cold shutdown valve population.

Alternate Test: Full-stroke exercised in accordance with ASME OM Code Case OMN-12 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), as part of the cold shutdown valve population. In addition, these valves will also be fail-safe tested closed per 2OST-10.3 and 2OST-10.4.

References: ISTC-3510, ISTC-3521(c), and ISTC-3560
NUREG-1449.
Technical Specification 3.4.7 and 3.4.8.
OMN-12

VALVE COLD SHUTDOWN JUSTIFICATION 5

Valve Asset 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 ISTC-3510, "Exercising Test Frequency", Active Category A valves shall be tested nominally every 3 months.

Basis for CSJ: During normal plant operation, the RHR System is isolated from the RCS and 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. ISTC-3521(c) states, "If exercising is not practicable during operation at power, 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 in Mode 5 as the operable RCS loops per Technical Specification 3.4.7 or 3.4.8 as applicable, these valves cannot be tested without entering the required action statement which requires immediate restoration of the RCS loop made inoperable.

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

VALVE COLD SHUTDOWN JUSTIFICATION 5

Basis for CSJ: 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, as part of the cold shutdown valve population.

Alternate Test: Full-stroke exercised in accordance with ASME OM Code Case OMN-1 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), as part of the cold shutdown valve population.

References: ISTC-3510 and ISTC-3521(c).
NUREG-1449.
Technical Specification 3.4.7 and 3.4.8.
OMN-1 Paragraph 3.6.3(b).

VALVE COLD SHUTDOWN JUSTIFICATION 6

Valve Asset 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) cool down. They must open as cool down continues to ensure all RHR flow is through the RHR Heat Exchangers.

Test Requirement: Per ISTC-3510, "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 the slightly subatmospheric containment, they are not accessible for testing during plant operation because the radiation levels and air temperature inside containment are higher than normal during power operation and would involve higher radiological dose rates and heat stress risk to plant personnel. This presents a working environment for station personnel that is not considered practicable for quarterly surveillance testing on a routine basis on-line. ISTC-3521(c) states, "If exercising is not practicable during operation at power, 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 in Mode 5 as the operable RCS loops per Technical Specification 3.4.7 or 3.4.8 as applicable, these valves cannot be tested without entering the required action statement which requires immediate restoration of the RCS loop made inoperable. 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. 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

VALVE COLD SHUTDOWN JUSTIFICATION 6

Basis for CSJ: 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, as part of the cold shutdown valve population.

Alternate Test: Full-stroke exercised in accordance with ASME OM Code Case OMN-12 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), as part of the cold shutdown valve population. In addition, these valves will also be fail-safe tested open per 2OST 10.3 and 2OST-10.4.

NOTE: Since these are low safety significant valves, their exercise frequency may be extended to refueling per OMN-12 Paragraph 5.5.1.

References:
ISTC-3510, ISTC-3512(c) and ISTC-3560.
NUREG-1449
Technical Specification 3.4.7 and 3.4.8.
OMN-12 Paragraph 5.5.1.

VALVE COLD SHUTDOWN JUSTIFICATION _7_

Valve Asset 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 flow path 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 ISTC-3510, "Exercising Test Frequency", Active Category C check valves shall be exercised nominally every 3 months.

Basis for CSJ: 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-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, per Analysis Calculation 10080-N-558, 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 in order to ensure repeatability of breakaway torque test results for IST trending purposes. Setting up the conditions necessary to equalize or remove any d/p requires isolation of one train of the LHSI System, installation of a drain hose on a downstream vent valve in the LHSI System, and draining radioactive water to remove the d/p. Isolating one train of an Emergency Core Cooling System during plant operation would place the plant into a Technical Specification required action statement and would create excessive unavailability time if done at power. If tested quarterly, the amount of radioactive water drained from the system in order to bleed off pressure would create additional liquid waste for disposal which is not practicable. ISTC-3522(b) states, "If exercising is not practicable during operation at power, it shall be performed during cold shutdowns".

Alternate Test: Full-stroke exercised open using a manual mechanical exerciser attached to its mechanical weight loaded swing arm in accordance with ISTC-5221(b) and the guidelines provided in NUREG-1482, Rev.1, Section 4.1.7, and closed (bi-directional test) by observation of its mechanical weight loaded swing arm during refueling outages per 2OST-1.10 (Cold Shutdown Valve Exercise Test).

References: ISTC-3510, ISTC-3522(b) and ISTC-5221(b)
Analysis Calculation 10080-N-558.
NUREG-1482, Rev.1, Section 4.1.7.

VALVE COLD SHUTDOWN JUSTIFICATION 8

Valve Asset 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 ISTC-3510, "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 Table ISTC-3500-1, "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 power removed from the Accumulator Isolation Valve operator control circuit per SR 3.5.1.5. In addition, NUREG-1482, Rev.1, 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. ISTC-3521(c) states, "If exercising is not practicable during operation at power, 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-52.4.R.1.F (Station Shutdown from 100% Power to Mode 5), and recorded in 2OST-1.10 (Cold Shutdown Valve Exercise Test).

References: ISTC-3510, ISTC-3521(c) and Table ISTC-3500-1.
NUREG-1482, Rev.1, Section 3.1.1.
Technical Specification SR 3.5.1.5.

VALVE COLD SHUTDOWN JUSTIFICATION 9

Valve Asset 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 flow path when normal charging is lost.

Test Requirement: Per ISTC-3510, "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 flow path 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. ISTC-3521(c) states, "If exercising is not practicable during operation at power, it may be limited to full-stroke exercising during cold shutdowns."

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

References: ISTC-3510, ISTC-3521(c) and ISTC-3560.

VALVE COLD SHUTDOWN JUSTIFICATION 10

Valve Asset 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 nos. 63 and 64. They must open to provide a flow path 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 ISTC-3510, "Exercising Test Frequency", Active Category C check valves shall be exercised nominally every 3 months.

Basis for CSJ: These check valves are normally closed. Their safety positions are closed for containment isolation of penetration nos. 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 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 the slightly subatmospheric containment, they are not accessible for testing during plant operation because the radiation levels and air temperature inside containment are higher than normal during power operation and would involve higher radiological dose rates and heat stress risk to plant personnel. This presents a working environment for station personnel that is not considered practicable for quarterly surveillance testing on a routine basis on-line. ISTC-3522(b) states, "If exercising is not practicable during operation at power, it shall be performed during cold shutdowns."

Alternate Test: Full-stroke exercised open using a manual mechanical exerciser attached to its mechanical weight loaded swing arm in accordance with ISTC-5221(b) and the guidelines provided in NUREG-1482, Rev.1, Section 4.1.7, and closed by observation of its mechanical weight loaded swing arm during refueling outages per 2OST-1.10 (Cold Shutdown Valve Exercise Test).

References: ISTC-3510, ISTC-3522(b) and ISTC-5221(b).
NUREG-1482, Rev.1, Section 4.1.7.

VALVE COLD SHUTDOWN JUSTIFICATION 11

Valve Asset 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 ISTC-3510, "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 is not desired to 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. NUREG-1482, Rev. 1, Section 3.1.1, "Deferring Valve testing to Each Cold Shutdown or Refueling Outage," Example (1) states that all valves whose failure in a non-conservative position during the cycling test that would result in a loss of system function would typically be excluded from testing during plant operations. Per ISTC-3521(c) states, "If exercising is not practicable during operation at power, it may be limited to full-stroke exercising during cold shutdowns."

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

References: ISTC-3510, ISTC-3521(c) and ISTC-3560.
NUREG-1482, Rev. 1, Section 3.1.1.

VALVE COLD SHUTDOWN JUSTIFICATION __12__

Valve Asset 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 ISTC-3510, "Exercising Test Frequency", Active Category C 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 ISTC-5221 and NUREG-1482, Rev.1, Section 4.1.3. 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. 11. Back leakage 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.

Therefore, full-stroke exercising in the closed direction is not practical during plant operation. ISTC-3522(b) states, "If exercising is not practicable during operation at power, it shall be performed 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: ISTC-3510, ISTC-3522(b) and ISTC-5221.
NUREG-1482, Rev.1, Section 4.1.3.

VALVE COLD SHUTDOWN JUSTIFICATION 13

Valve Asset 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 flow path 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 ISTC-3510, "Exercising Test Frequency", Active Category C 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 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 the slightly subatmospheric containment, they are not accessible for testing during plant operation because the radiation levels and air temperature inside containment are higher than normal during power operation and would involve higher radiological dose rates and heat stress risk to plant personnel. This presents a working environment for station personnel that is not considered practicable for quarterly surveillance testing on a routine basis on-line. ISTC-3522(b) states, "If exercising is not practicable during operation at power, it shall be performed during cold shutdowns."

Alternate Test: Full-stroke exercised open using a manual mechanical exerciser attached to its mechanical weight loaded swing arm in accordance with ISTC-5221(b) and the guidelines provided in NUREG-1482, Rev.1, Section 4.1.7, and closed by observation of its mechanical weight loaded swing arm during refueling outages per 2OST-1.10 (Cold Shutdown Valve Exercise Test).

References: ISTC-3510, ISTC-3522(b) and ISTC-5221(b).
NUREG-1482, Rev.1, Section 4.1.7.

VALVE COLD SHUTDOWN JUSTIFICATION 14

Valve Asset 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 ISTC-3510, "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 in Mode 5 as the operable RCS loops per Technical Specification 3.4.7 or 3.4.8 as applicable, these valves cannot be tested without entering the required 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 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 or when the plant is defueled, if more than 92 days will pass since they were last tested. They will also be full-stroke exercised when removing the RHR System from service during station startup if greater than 92 days will pass until the respective quarterly surveillance test is scheduled.

VALVE COLD SHUTDOWN JUSTIFICATION 14

Alternate Test: Full-stroke exercised quarterly in accordance with ASME OM Code Case OMN-1 per 2OST-15.1, 2OST-15.2 or 2OST-15.3 (CCP Pump Tests) during power operation. In addition, full-stroke exercised at cold shutdown in accordance with ASME OM Code Case OMN-1 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), as part of the cold shutdown valve population.

References:

ISTC-3510.
NUREG-1449.
Technical Specification 3.4.7 and 3.4.8.
OMN-1 Paragraph 3.6.3(b).

VALVE COLD SHUTDOWN JUSTIFICATION 15

Valve Asset 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 ISTC-3510, "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 or part-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. For this reason, BVPS-2 Technical Specification Amendment No. 137 deleted the requirement to part-stroke exercise these valves. Therefore, per ISTC-3521(c), "If exercising is not practicable during operation at power, it may be limited to full-stroke exercising during cold shutdowns."

Alternate Test: Full-stroke exercised and timed closed and fail-safe tested closed when going to or following cold shutdowns with Tavg $\geq$ 515F per 2OST-21.7 (MSIV Full Closure Test).

References: ISTC-3510, ISTC-3521(c) and ISTC-3560.-
NUREG-1482, Rev.1, Section 4.2.6.
BVPS-2 Technical Specification 4.7.1.5 (Amendment No. 137).
CA 02-04450-19.

VALVE COLD SHUTDOWN JUSTIFICATION 16

Valve Asset 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 flow path 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 ISTC-3510, "Exercising Test Frequency", Active Category C 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 ISTC-5221 and NUREG-1482, Rev. 1, Section 4.1.3, in order to verify both forward and reverse stroke exercising. However, this 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. ISTC-3522(b) states, "If exercising is not practicable during operation at power, it shall be performed during cold shutdowns."

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

References: ISTC-3510, ISTC-3522(b) and ISTC-5221.
NUREG-1482, Rev. 1, Section 4.1.3.

VALVE COLD SHUTDOWN JUSTIFICATION 17

Valve Asset 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 flow path to the Steam Generators during an accident.

Test Requirement: Per ISTC-3510, "Exercising Test Frequency", Active Category C 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 ISTC-5221 and NUREG-1482, Rev.1, Section 4.1.3. However, 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. ISTC-3522(b) states, "If exercising is not practicable during operation at power, it shall be performed during cold shutdowns."

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

References: ISTC-3510, ISTC-3522(b) and ISTC-5221.
NUREG-1482, Rev.1, Section 4.1.3.

VALVE COLD SHUTDOWN JUSTIFICATION 18

Valve Asset No(s): 2FWE*FCV122

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

System: 24 - Auxiliary Feedwater

Function: This Turbine-Driven Auxiliary Feedwater Pump (TDAFWP) discharge flow control/check valve has a dual function. This 3-way automatic recirculation control valve acts as both a manual automatic flow control valve in one direction and a check valve in the other direction. As a manual automatic flow control valve, it must open to provide approximately 30% recirculation flow for the TDAFWP to prevent pump damage in the event of isolation of an AFW discharge line to the Steam Generators. It must close in order to isolate this same recirculation flow path when full TDAFWP flow is being directed to the Steam Generators during an accident. As a check valve, it must open to provide a flow path from the TDAFWP to the Steam Generators. It must close to prevent reverse flow and feedwater intra-system recirculation through an idle TDAFWP.

Test Requirement: Per ISTC-3510, "Exercising Test Frequency", Active Category B valves and Category C check valves shall be tested nominally every 3 months

Basis for CSJ: This 3-way automatic recirculation control valve acts as both a manual automatic flow control valve in one direction and a check valve in the other direction. It is normally closed as a check valve and normally open as manual automatic flow control valve during plant operation. As a manual automatic flow control valve, its safety position is open for TDAFWP recirculation and closed for isolation of this recirculation flow path. As a check valve, its safety position is open for AFW system injection to the Steam Generators and closed to prevent reverse flow through an idle TDAFWP. 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 ISTC-5221 and NUREG-1482, Rev.1, Section 4.1.3, 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, 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. ISTC-3521(c) and ISTC-3522(b) state, If exercising is not practicable during operation at power, it may be limited to full-stroke exercising during cold shutdowns.

VALVE COLD SHUTDOWN JUSTIFICATION 18

Alternate Test: The flow control valve function of this valve in the open direction will be full-stroke exercised open quarterly (although only required every 2 years) per 2OST-24.4 (TDAFWP Tests on Recirculation Flow). The check valve function of this valve in the closed direction will be full-stroke exercised during cold shutdowns per 2OST-24.6A or 6B (Train A and B AFW System Check Valve Exercise and Flow Verification Test). The flow control valve function of this valve and the check valve function of this valve in the open direction is discussed in VROJ No. 46.

References: ISTC-3510, ISTC-3521(c), ISTC-3522(b) and ISTC-5221
NUREG-1482, Rev.1, Section 4.1.3.

VALVE COLD SHUTDOWN JUSTIFICATION 19

Valve Asset No(s): 2FWE*FCV123A
2FWE*FCV123B

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

System: 24 - Auxiliary Feedwater

Function: These Motor-Driven Auxiliary Feedwater (AFW) Pump discharge flow control/check valves have a dual function. These 3-way automatic recirculation control valves act as both a manual automatic flow control valve in one direction and a check valve in the other direction. 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 flow path 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 flow path 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 ISTC-3510, "Exercising Test Frequency", Active Category B valves and Category C check valves shall be tested nominally every 3 months.

Basis for CSJ: These 3-way automatic recirculation control valves act as both a manual automatic flow control valve in one direction and a check valve in the other direction. They 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 Motor-Driven AFW Pump recirculation and closed for isolation of this recirculation flow path. 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 ISTC-5221 and NUREG-1482, Rev.1, Section 4.1.3, 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, 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. ISTC-3521(c) and ISTC-3522(b) state, If exercising is not practicable during operation at power, it may be limited to full-stroke exercising during cold shutdowns.

VALVE COLD SHUTDOWN JUSTIFICATION 19

Alternate Test: The flow control valve function of these valves in the open direction will be full-stroke exercised open quarterly (although only required every 2 years) per 2OST-24.2 and 2OST-24.3 Motor-Driven (AFW Pump Tests on Recirculation Flow) and at cold shutdown per 2OST-24.6A(6B) (Train A and B AFW System Check Valve Exercise and Flow Verification Test). 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-24.6A(6B) (Train A and B AFW System Check Valve Exercise and Flow Verification Test).

References: ISTC-3510, ISTC-3521(c), ISTC-3522(b) and ISTC-5221.
NUREG-1482, Rev.1, Section 4.1.3.

VALVE COLD SHUTDOWN JUSTIFICATION 20

Valve Asset 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 ISTC-3510, "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. ISTC-3521(c) states, "If exercising is not practicable during operation at power, 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: ISTC-3510 and ISTC-3521(c).

VALVE COLD SHUTDOWN JUSTIFICATION 21

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

Category: B **Class:** 3

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 ISTC-3510, "Exercising Test Frequency", Active Category B valves shall be tested nominally every 3 months.

Basis for CSJ: These valves are normally 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. ISTC-3521(c) states, "If exercising is not practicable during operation at power, it may be limited to full-stroke exercising during cold shutdowns."

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

References: ISTC-3510, ISTC-3521(c) and ISTC-3560

VALVE COLD SHUTDOWN JUSTIFICATION 22

Valve Asset No(s):	2BDG*AOV100A1	2BDG*AOV101A1	2BDG*AOV101A2
	2BDG*AOV100B1	2BDG*AOV101B1	2BDG*AOV101B2
	2BDG*AOV100C1	2BDG*AOV101C1	2BDG*AOV101C2

Category: B **Class:** 2

System: 25 – Steam Generator Blowdown

Function: These inside and outside containment Steam Generator blowdown isolation valves must close in the event of high energy line break (HELB) outside of containment. [2BDG*AOV100A1, B1 and C1] must also close for containment isolation of Penetration Nos. 39, 40 and 41.

Test Requirement: Per ISTC-3510, "Exercising Test Frequency", Active Category B valves shall be tested nominally every 3 months.

Basis for CSJ: These valves are normally open in order to provide a flow path for the normal processing of blowdown from the secondary side of each Steam Generator. Their safety positions are closed in the event of HELB or for containment isolation of Penetration Nos. 39, 40 and 41. Since the three valves from each Steam Generator blowdown flow path are in series with one another, failure of one of them to re-open during stroke time testing in the closed direction would isolate the blowdown flow path. With blowdown isolated, the affected Steam Generator secondary chemistry would begin to deteriorate to a point, where if it exceeded administrative limits, the Unit would have to shutdown. NUREG-1482, Rev.1, Section 3.1.1, "Deferring Valve Testing to Each Cold Shutdown or Refueling Outage," Example (1) states that all valves whose failure in a non-conservative position during the cycling test that would result in a loss of system function would typically be excluded from testing during plant operations. Per ISTC-3521(c), "If exercising is not practicable during operation at power, it may be limited to full-stroke exercising during cold shutdowns."

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

References: ISTC-3510, ISTC-3521(c) and ISTC-3560.
NUREG-1482, Rev.1, Section 3.1.1.

VALVE COLD SHUTDOWN JUSTIFICATION 23

Valve Asset 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 ISTC-3510, "Exercising Test Frequency", Active Category C 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. ISTC-3522(b) states, "If exercising is not practicable during operation at power, it shall be performed during cold shutdowns."

Alternate Test: Full-stroke exercised closed quarterly, per 2OST-30.6A or 6B (Train A or B SWS Pump Tests). If not able to be tested quarterly, the valve(s) will be full-stroke exercised closed when the idle SWS Pump is returned to service, or at least during cold shutdowns per 2OST-30.6A or 6B (Train A or B SWS Pump Tests). Full-stroke exercising in the open direction is discussed in VROJ No. 47.

References: ISTC-3510 and ISTC-3522(b).

VALVE COLD SHUTDOWN JUSTIFICATION 24

Valve Asset 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 ISTC-3510, "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. ISTC-3521(c) states, "If exercising is not practicable during operation at power, it may be limited to full-stroke exercising during cold shutdowns."

Alternate Test: Full-stroke exercised quarterly in accordance with ASME OM Code Case OMN-1 per 2OST-30.6A or 6B (Train A or B SWS Pump Tests). If not able to be exercised quarterly, the valve(s) will be full-stroke exercised when the idle SWS Pump is returned to service, or at least during cold shutdowns per 2OST-30.6A or 6B (Train A or B SWS Pump Tests).

References: ISTC-3510 and ISTC-3521(c).
OMN-1 Paragraph 3.6.3(b).

VALVE COLD SHUTDOWN JUSTIFICATION 25

Valve Asset 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 ISTC-3510, "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 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 reduce the SWS supply to the inservice turbine plant cooling loads including the CCS and chiller unit heat exchangers. This would reduce 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.

In addition, isolation of these loads by closing [2SWS*MOV107A, B, C or D] during normal plant operation without also maximizing flow to other SWS cooling loads on the same train, would require the SWS pump operating on this train to be shutdown (in order to prevent damaging the pump by operating at less than the minimum continuous flow of 9100 gpm per DCP-1490). During normal plant operation, two Service Water System trains are required to be operable per Technical Specification 3.7.8. Shutting down the SWS pump operating on the SWS train being tested would result in the following:

(1) Loss of the redundant SWS subsystem due to no flow to the following safety-related cooling loads on that train. This is because the SWS subsystems cannot be cross-connected at these cooling loads in order to maintain train separation as required by GDC 44.

    Emergency Diesel Generator Coolers
    Charging Pump Coolers
    Control Room cooling
    Safeguards Area cooling
    Rod Control Area cooling (not normally aligned)
    Motor Control Center Room cooling
    PASS Cooling (B Train only)

    This would also require entry into the 72 hour Technical Specification 3.7.8 Required Action.

VALVE COLD SHUTDOWN JUSTIFICATION 25

Basis for CSJ:

(2) Maintenance Rule out-of-service time would be accumulated for the EDG and Charging Pump operating on that train until the SWS header being tested is restored to operable status.

(3) Partial draining of the SWS header being tested would occur due to gravity draining to the outfall. It is estimated that it would take approximately four hours to restore the header to a filled and vented condition.

(4) The removal of the above equipment from service would result in high PRA risk which has been evaluated to exceed current limits for performing such an activity without first obtaining management authorization.

Pre-test alignment of the SWS subsystems would be required to ensure enough flow for SWS pump operation on the train being tested as well as enabling as much cooling flow as possible to the station loads normally in service. This would involve extra-ordinary time consuming valve line-ups which are not desirable during normal plant operation. These valve line-ups are estimated to take more than one shift (eight hours) per train to perform, both before and after the test.

Since both SWS subsystems must be maintained operable during normal operation, closing [2SWS*MOV107A, B, C or D] is only possible during cold shutdowns when one train of SWS can be isolated, because both trains of SWS are no longer required by Technical Specifications. Per ISTC-3521(c), "If exercising is not practicable during operation at power, it may be limited to full-stroke exercising during cold shutdowns".

Alternate Test: Full-stroke exercised in accordance with ASME OM Code Case OMN-1 during cold shutdowns per 2OST-1.10 (Cold Shutdown Valve Exercise Test).

References:

ISTC-3510 and ISTC-3521(c).
DCP-1490.
Technical Specification 3.7.8.
OMN-1 Paragraph 3.6.3(b).

VALVE COLD SHUTDOWN JUSTIFICATION __26__

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

Category: __C__ **Class:** __3__

System: 30 - Service Water

Function: These Service Water (SWS) Pump vacuum breaker 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 tripped. They must close during SWS Pump operation to prevent loss of SWS cooling to station loads required during an accident.

Test Requirement: Per ISTC-3510, "Exercising Test Frequency", Active Category C 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. ISTC-3522(b) states, "If exercising is not practicable during operation at power, it shall be performed during cold shutdowns."

Alternate Test: Full-stroke exercised closed quarterly per 2OST-30.2, 2OST-30.3 and 2OST-30.6A or 6B (SWS Pump Tests). Full-stroke exercised open quarterly, per 2OST-30.6A or 6B (Train A or B SWS Pump Tests). If not able to be tested quarterly, the valve(s) will be full-stroke exercised open when the idle SWS Pump is returned to service, or at least during cold shutdowns per 2OST-30.6A or 6B (Train A or B SWS Pump Test).

References: ISTC-3510 and ISTC-3522(b).

VALVE COLD SHUTDOWN JUSTIFICATION **27**

Valve Asset 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 be closed to provide containment isolation of penetration no's. 101, 116 and 117.

Test Requirement: Per ISTC-3510, "Exercising Test Frequency", Active Category C 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 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 the slightly subatmospheric containment, they are not accessible for testing during plant operation because the radiation levels and air temperature inside containment are higher than normal during power operation and would involve higher radiological dose rates and heat stress risk to plant personnel. This presents a working environment for station personnel that is not considered practicable for quarterly surveillance testing on a routine basis on-line. ISTC-3522(b) states, "If exercising is not practicable during operation at power, it shall be performed during cold shutdowns."

Alternate Test: Full-stroke exercised open using a manual mechanical exerciser attached to its mechanical weight loaded swing arm in accordance with ISTC-5221(b) and the guidelines provided in NUREG-1482, Rev.1, Section 4.1.7, and closed by observation of its mechanical weight loaded swing arm during refueling outages per 2OST-1.10 (Cold Shutdown Valve Exercise Test).

References: ISTC-3510, ISTC-3522(b) and ISTC-3522(b).
NUREG-1482, Rev.1, Section 4.1.7.

VALVE COLD SHUTDOWN JUSTIFICATION 28

Valve Asset 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 set point during refueling operations.

Test Requirement: Per ISTC-3510, "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. ISTC-3521(c) states, "If exercising is not practicable during operation at power, it may be limited to full-stroke exercising during cold shutdowns."

Alternate Test: Full-stroke exercised in accordance with ASME OM Code Case OMN-1 during cold shutdowns per 2OST-1.10 (Cold Shutdown Valve Exercise Test).

NOTE: Since these are low safety significant valves, their exercise frequency may be extended to refueling per OMN-1 Paragraph 3.6.1.

References: ISTC-3510 and ISTC-3521(c).
OMN-1 Paragraphs 3.6.1 and 3.6.3(b).

SECTION VIII: VALVE REFUELING OUTAGE JUSTIFICATIONS (VROJ) AND INDEX

VROJ	SYSTEM NO.	COMPONENT(S)
VROJ32	11	2SIS*MOV8889
VROJ33	12	2CVS*93
VROJ34	13	2QSS*MOV102A, 2QSS*MOV102B
VROJ35	13	2QSS*267
VROJ36	13	2RSS*MOV154C, 2RSS*MOV154D
VROJ37	15	2CCP*4, 2CCP*5, 2CCP*6
VROJ38	15	2CCP*AOV107A, 2CCP*AOV107B, 2CCP*AOV107C
VROJ39	15	2CCP*MOV150-1, 2CCP*MOV150-2, 2CCP*MOV151-1, 2CCP*MOV151-2, 2CCP*MOV156-1, 2CCP*MOV156-2, 2CCP*MOV157-1, 2CCP*MOV157-2
VROJ40	15	2CCP*289, 2CCP*290, 2CCP*291
VROJ41	15	2CCP*352
VROJ42	21	2MSS*352, 2MSS*18, 2MSS*19, 2MSS*20, 2MSS*199, 2MSS*196
VROJ43	21	2SVS*80, 2SVS*81, 2SVS*82
VROJ44	24	2FWS*28, 2FWS*29, 2FWS*30
VROJ45	24	2FWE*99, 2FWE*100, , 2FWE*101
VROJ46	24	2FWE*FCV122
VROJ47	30	2SWS*57, 2SWS*58, 2SWS*59
VROJ48	30	2SWS*106, 2SWS*107
VROJ49	33	2FPW*761
VROJ50	34	2IAC*22
VROJ51	30	2SWS*MOV103A, 2SWS*MOV103B, 2SWS*MOV106A, 2SWS*MOV106B
VROJ52	30	2SWS*111, 2SWS*112

VALVE REFUELING OUTAGE JUSTIFICATION 1

Valve Asset 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 ISTC-3510, "Exercising Test Frequency," Active Category C 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 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 the slightly subatmospheric containment, it is not accessible for testing during plant operation because the radiation levels and air temperature inside containment are higher than normal during power operation and would involve higher radiological dose rates and heat stress risk to plant personnel. This presents a working environment for station personnel that is not considered practicable for quarterly surveillance testing on a routine basis on-line. ISTC-3522(b) states, "If exercising is not practicable during operation at power, it shall be performed during cold shutdowns." Because this check valve is normally isolated by upstream and downstream isolation valves, a d/p across the check valve is created due to thermal expansion when the cooler nitrogen gas is subjected to higher containment temperatures. Therefore, in order to cycle this check valve open so that it can be verified to close, trapped d/p must first be equalized or removed. A rather involved clearance is needed to isolate this check valve so that trapped d/p can be equalized or removed. This clearance also involves isolating nitrogen supply to the Volume Control Tank (VCT), Hydrogen Analyzers, Primary Drains Tanks, Pressure Relief Tank (PRT), Auxiliary Boiler, and hot water heating. Therefore, testing at cold shutdown is not practicable. ISTC-3522(c) states, "If exercising is not practicable during operation at power and cold shutdowns, it shall be performed during refueling outages."

Alternate Test: Full-stroke exercised closed by observation of its external weight arm during refueling outages per 2OST-1.10 (Cold Shutdown Valve Test).

NOTE: Bi-directional exercising in the non-safety related open direction will be satisfied by demonstrating the ability to provide nitrogen makeup to the PRT during station shutdown per 2OM-52.4.R.2.F.

References: ISTC-3510, ISTC-3522(b) and ISTC-3522(c).

VALVE REFUELING OUTAGE JUSTIFICATION 2

Valve Asset 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 ISTC-3510, "Exercising Test Frequency," Active Category C 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 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 the slightly subatmospheric containment, it is not accessible for testing during plant operation because the radiation levels and air temperature inside containment are higher than normal during power operation and would involve higher radiological dose rates and heat stress risk to plant personnel. This presents a working environment for station personnel that is not considered practicable for quarterly surveillance testing on a routine basis on-line. ISTC-3522(b) states, "If exercising is not practicable during operation at power, it shall be performed during cold shutdowns." Because this check valve is normally isolated by upstream and downstream isolation valves, a d/p across the check valve is created due to thermal expansion when the cooler fluid is subjected to higher containment temperatures. Therefore, in order to cycle this check valve open so that it can be verified to close, trapped d/p must first be equalized or removed. This involves installing a hose and draining the containment penetration, which is considered to be a hardship that is not practicable during cold shutdowns. ISTC-3522(c) states, "If exercising is not practicable during operation at power and cold shutdowns, it shall be performed during refueling outages."

Alternate Test: Full-stroke exercised closed by observation of its external weight arm during refueling outages per 2OST-1.10 (Cold Shutdown Valve Test).

NOTE: Bi-directional exercising in the non-safety related open direction will be satisfied by demonstrating the ability to provide nitrogen makeup to the PRT during station shutdown per 2OM-52.4.R.2.F.

References: ISTC-3510, ISTC-3522(b) and ISTC-3522(c).

VALVE REFUELING OUTAGE JUSTIFICATION 3

Valve Asset 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 ISTC-3510, "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 flow path 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 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

VALVE REFUELING OUTAGE JUSTIFICATION 3

Basis for ROJ: 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. ISTC-3521(c) states, "If exercising is not practicable during operation at power, 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. ISTC-3521(e) states, "If exercising is not practicable during operation at power 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 and fail-safe tested closed during cold shutdown if proper RCS conditions exist, or at least during refueling outages per 2OST-6.9 (Reactor Vessel Head Vent System Test.

References: ISTC-3510, ISTC-3521(c), ISTC-3521(e) and ISTC-3560.
EM 103665.
DLCO Calculation No. 10080-DLC(P)-900-XD, Rev. 0.
Westinghouse Letters DLW-89-667, PSE-SSA-4743 and PT-SSAD-6813.

VALVE REFUELING OUTAGE JUSTIFICATION 4

Valve Asset 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 flow path from the Charging Pumps to the Reactor Coolant System (RCS) loops for high head safety injection (HHSI). They must close to prevent reverse flow through an idle Charging Pump.

Test Requirement: Per ISTC-3510, "Exercising Test Frequency," Active Category C check valves shall be exercised nominally every 3 months.

Basis for ROJ: These check valves are normally open when their associated Charging Pump is in service. 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 withISTC-5221 and NUREG-1482, Rev.1, Section 4.1.3, cannot be performed because the Charging Pumps will not develop the required flow. Full-stroke exercising in the open direction cannot be performed via the HHSI hot or cold legs injection flow paths 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. ISTC-3522(b) states, "If full-stroke exercising during operation at power is not practicable it shall be performed during cold shutdowns." However, during cold shutdowns, full flow exercising in the open direction cannot be performed because this could result in low-temperature overpressurization of the RCS. ISTC-3522(c) states, "If exercising is not practicable during operation at power and cold shutdowns, it shall be performed during refueling outages."

Exercising the non-running Charging Pump discharge check valve(s) in the closed direction is normally done during quarterly pump testing by virtue of pump delta-p being greater than the system minimum operating point (MOP) curve for the operating pump. The quarterly pump test, however, can only be performed at lower flow rates on a flat portion of the pump curve. Therefore, a large change in flow is required to cause the delta-p to drop below the MOP curve. This quarterly test provides assurance that the check valves are closed, preventing gross leakage. Verification that Charging Pump delta-p does not degrade below the system MOP curve at a substantial flow condition, verifies the adjacent pumps' discharge check valves are adequately closed and capable of fulfilling their function in the closed direction by ensuring the performance of the operating pump exceeds minimum system requirements. Therefore, in order to ensure acceptable check valve closure of the non-running pumps' discharge check valves, a functional test at substantial

VALVE REFUELING OUTAGE JUSTIFICATION 4

Basis for ROJ: flow conditions will be performed. However, as stated in the first paragraph above, full-flow testing can only be performed during a refueling outage. ISTC-3522(c) states, "If exercising is not practicable during operation at power and cold shutdowns, it shall be performed during refueling outages."

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

References: ISTC-3510, ISTC-3522(b), ISTC-3522(c) and ISTC-5221.
NUREG-1482, Rev.1, Section 4.1.3.
CR 01-0807 and CA 01-0807-01.

VALVE REFUELING OUTAGE JUSTIFICATION 5

Valve Asset 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 ISTC-3510, "Exercising Test Frequency," Active Category C 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. 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 the slightly subatmospheric containment, it is not accessible for testing during plant operation because the radiation levels and air temperature inside containment are higher than normal during power operation and would involve higher radiological dose rates and heat stress risk to plant personnel. This presents a working environment for station personnel that is not considered practicable for quarterly surveillance testing on a routine basis on-line. ISTC-3522(b) states, "If exercising is not practicable during operation at power, it shall be performed during cold shutdowns." In addition, 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 exercise this check valve, the charging system and RCP's would both have to be shutdown. Per NUREG-1482, Rev.1, 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 which is considered to be an additional hardship that is not practicable during cold shutdowns. ISTC-3522(c) states, "If exercising is not practicable during operation at power and cold shutdowns, it shall be performed during refueling outages."

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: ISTC-3510, ISTC-3522(b) and ISTC-3522(c).
NUREG-1482, Rev.1, Section 3.1.1.4.

VALVE REFUELING OUTAGE JUSTIFICATION 6

Valve Asset 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 ISTC-3510, "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. ISTC-3521(c) states, "If exercising is not practicable during operation at power, 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, Rev.1, 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. ISTC-3521(e) states, "If exercising is not practicable during operation at power or cold shutdowns, it may be limited to full-stroke exercising during refueling outages."

Alternate Test: Full-stroke exercised in accordance with ASME OM Code Case OMN-1 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: ISTC-3510, ISTC-3521(c) and ISTC-3521(e)
NUREG-1482, Rev.1, Section 3.1.1.4.
OMN-1 Paragraph 3.6.3(c).

VALVE REFUELING OUTAGE JUSTIFICATION 7

Valve Asset 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 ISTC-3510, "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 flow path 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. ISTC-3521(c) states, "If exercising is not practicable during operation at power, 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, Rev.1, 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. ISTC-3521(e) states, "If exercising is not practicable during operation at power or cold shutdowns, it may be limited to full-stroke exercising during refueling outages."

Alternate Test: Full-stroke exercised and timed closed and fail-safe tested 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: ISTC-3510, ISTC-3521(c), ISTC-3521(e) and ISTC-3560.
NUREG-1482, Rev.1, Section 3.1.1.4.

VALVE REFUELING OUTAGE JUSTIFICATION 8

Valve Asset 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 ISTC-3510, "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 flow path 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. ISTC-3521(c) states, "If exercising is not practicable during operation at power, 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, Rev.1, 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. ISTC-3521(e) states, "If exercising is not practicable during operation at power or cold shutdowns, it may be limited to full-stroke exercising during refueling outages."

Alternate Test: Full-stroke exercised in accordance with ASME OM Code Case OMN-1 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: ISTC-3510, ISTC-3521(c) and ISTC-3521(e).
NUREG-1482, Rev.1, Section 3.1.1.4.
OMN-1 Paragraph 3.6.3(c).

VALVE REFUELING OUTAGE JUSTIFICATION 9

Valve Asset 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 ISTC-3510, "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. ISTC-3521(c) states, "If exercising is not practicable during operation at power, 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, Rev.1, 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. ISTC-3521(e) states, "If exercising is not practicable during operation at power or cold shutdowns, it may be limited to full-stroke exercising during refueling outages."

Alternate Test: Since these are low safety significant valves, their exercise frequency may me extended to refueling per OMN-1 Paragraph 3.6.1. Therefore, full-stroke exercised in accordance with ASME OM Code Case OMN-1 during refueling outages per 2OST-1.10 (Cold Shutdown Valve Exercise Test).

References: ISTC-3510, ISTC-3521(c) and ISTC-3521(e).
NUREG-1482, Rev.1, Section 3.1.1.4.
OMN-1 Paragraphs 3.6.1 and 3.6.3(c).

VALVE REFUELING OUTAGE JUSTIFICATION 10

Valve Asset 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 ISTC-3510, "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 flow path 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. ISTC-3521(c) states, "If exercising is not practicable during operation at power, 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, Rev.1, 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. ISTC-3521(e) states, "If exercising is not practicable during operation at power or cold shutdowns, it may be limited to full-stroke exercising during refueling outages."

Alternate Test: Full-stroke exercised in accordance with ASME OM Code Case OMN-1 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: ISTC-3510, ISTC-3521(c) and ISTC-3521(e).
NUREG-1482, Rev.1, Section 3.1.1.4.
OMN-1 Paragraph 3.6.3(c).

VALVE REFUELING OUTAGE JUSTIFICATION 11

Valve Asset 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 ISTC-3510, "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. ISTC-3521(c) states, "If exercising is not practicable during operation at power, 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, Rev.1, 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. ISTC-3521(e) states, "If exercising is not practicable during operation at power or cold shutdowns, it may be limited to full-stroke exercising during refueling outages."

Alternate Test: Full-stroke exercised in accordance with ASME OM Code Case OMN-1 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: ISTC-3510, ISTC-3521(c) and ISTC-3521(e).
NUREG-1482, Rev.1, Section 3.1.1.4.
OMN-1 Paragraph 3.6.3(c).

VALVE REFUELING OUTAGE JUSTIFICATION 12

Valve Asset 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 ISTC-3510, "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 flow path 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. ISTC-3521(c) states, "If exercising is not practicable during operation at power, 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, Rev.1, 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. ISTC-3521(e) states, "If exercising is not practicable during operation at power or cold shutdowns, it may be limited to full-stroke exercising during refueling outages."

Alternate Test: Full-stroke exercised and timed closed and fail-safe tested 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: ISTC-3510, ISTC-3521(c), ISTC-3521(e) and ISTC-3560.
NUREG-1482, Rev.1, Section 3.1.1.4.

VALVE REFUELING OUTAGE JUSTIFICATION _13_

Valve Asset 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 ISTC-3510, "Exercising Test Frequency," Active Category C 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 isolated containment penetration due to thermal expansion. Full 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 the slightly subatmospheric containment, it is not accessible for testing during plant operation because the radiation levels and air temperature inside containment are higher than normal during power operation and would involve higher radiological dose rates and heat stress risk to plant personnel. This presents a working environment for station personnel that is not considered practicable for quarterly surveillance testing on a routine basis on-line. ISTC-3522(b) states, "If exercising is not practicable during operation at power, it shall be performed 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 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 stroke exercise these check valves, the charging system and RCP's would both have to be shutdown in order to remove any d/p across the check valve. Per NUREG-1482, Rev.1, 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. ISTC-3522(c) states, "If exercising is not practicable during operation at power and cold shutdowns, it shall be performed during refueling outages."

VALVE REFUELING OUTAGE JUSTIFICATION 13

Alternate Test: Full-stroke exercised open using a manual mechanical exerciser attached to its mechanical weight loaded swing arm in accordance with ISTC-5221(b) and the guidelines provided in NUREG-1482, Rev.1, Section 4.1.7, 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: ISTC-3510, ISTC-3522(b), ISTC-3522(c) and ISTC-5221(b)
NUREG-1482, Rev.1, Sections 3.1.1.4 and 4.1.7.

VALVE REFUELING OUTAGE JUSTIFICATION 14

Valve Asset 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 ISTC-3510, "Exercising Test Frequency," Active Category C 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 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 the slightly subatmospheric containment, they are not accessible for testing during plant operation because the radiation levels and air temperature inside containment are higher than normal during power operation and would involve higher radiological dose rates and heat stress risk to plant personnel. This presents a working environment for station personnel that is not considered practicable for quarterly surveillance testing on a routine basis on-line. ISTC-3522(b) states, "If exercising is not practicable during operation at power, it shall be performed 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 full or part-stroke exercise these check valves, the charging system and RCP's would both have to be shutdown. Per NUREG-1482, Section Rev.1, 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. 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 which is considered to be an additional hardship that is not practicable during cold shutdowns. ISTC-3522(c) states, "If exercising is not practicable during operation at power and cold shutdowns, it shall be performed during refueling outages."

VALVE REFUELING OUTAGE JUSTIFICATION 14

Alternate Test: Full-stroke exercised closed by observation of its external weight arm during refueling outages per 2OST-1.10 (Cold Shutdown Valve Test).

NOTE: Bi-directional exercising to the non-safety related open position is satisfied by normal system operation of a RCP per ISTC-3550.

References: ISTC-3510, ISTC-3522(b) and ISTC-3522(c).
NUREG-1482, Rev.1, Section 3.1.1.4.

VALVE REFUELING OUTAGE JUSTIFICATION 15

Valve Asset No(s): 2CHS*MOV8130A, 2CHS*MOV8130B, 2CHS*MOV8131A, 2CHS*MOV8131B, 2CHS*MOV8132A 2CHS*MOV8132B, 2CHS*MOV8133A 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 ISTC-3510, "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. ISTC-3521(c) states, "If exercising is not practicable during operation at power, 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, Rev.1, 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. ISTC-3521(e) states, "If exercising is not practicable during operation at power or cold shutdowns, it may be limited to full-stroke exercising during refueling outages."

VALVE REFUELING OUTAGE JUSTIFICATION 15

Alternate Test: Full-stroke exercised in accordance with ASME OM Code Case OMN-1 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: ISTC-3510, ISTC-3521(c) and ISTC-3521(e).
NUREG-1482, Rev.1, Section 3.1.1.4.
OMN-1 Paragraph 3.6.3(c).

VALVE REFUELING OUTAGE JUSTIFICATION 16

Valve Asset 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 flow path from the LHSI Pumps to the Reactor Coolant System (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 ISTC-3510, "Exercising Test Frequency," Active Category C 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 flow rate in accordance with ISTC-5221 and NUREG-1482, Rev.1, Section 4.1.3, cannot be performed because the LHSI Pumps will not develop enough head to overcome RCS pressure. During cold shutdowns, full 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. ISTC-3522(c) states, "If exercising is not practicable during operation at power and cold shutdowns, it shall be performed 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: ISTC-3510, ISTC-3522(c) and ISTC-5221.
NUREG-1482, Rev.1, Section 4.1.3.

VALVE REFUELING OUTAGE JUSTIFICATION 17

Valve Asset 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 flow path 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 ISTC-3510, "Exercising Test Frequency," Active Category C 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 ISTC-5221 and NUREG-1482, Rev.1, Section 4.1.3, cannot be performed because the Charging Pumps will not develop the required flow. During cold shutdowns, full flow exercising in the open direction cannot be performed because this could result in low-temperature overpressurization of the RCS. Full 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 4.1.6, "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. ISTC-3522(c) states, "If exercising is not practicable during operation at power and cold shutdowns, it shall be performed during refueling outages."

Alternate 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: ISTC-3510, ISTC-3522(c) and ISTC-5221
NUREG-1482, Rev.1, Sections 4.1.3 and 4.1.6.

VALVE REFUELING OUTAGE JUSTIFICATION 18

Valve Asset 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 ISTC-3510, "Exercising Test Frequency," Active Category C 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 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 the slightly subatmospheric containment, it is not accessible for testing during plant operation because the radiation levels and air temperature inside containment are higher than normal during power operation and would involve higher radiological dose rates and heat stress risk to plant personnel. This presents a working environment for station personnel that is not considered practicable for quarterly surveillance testing on a routine basis on-line. ISTC-3522(b) states, "If exercising is not practicable during operation at power, it shall be performed 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 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 equalized or removed which is considered to be an additional hardship that is not practicable during cold shutdowns. ISTC-3522(c) states, "If exercising is not practicable during operation at power and cold shutdowns, it shall be performed during refueling outages."

Alternate Test: Full-stroke exercised closed by observation of its external weight arm during refueling outages per 2OST-1.10 (Cold Shutdown Valve Test).

NOTE: Bi-directional exercising in the non-safety related open direction will be satisfied by demonstrating the ability to provide makeup to the Safety Injection Accumulator per 2OM-11.4.D (Makeup To Safety Injection Accumulator).

References: ISTC-3510, ISTC-3522(b) and ISTC-3522(c).

VALVE REFUELING OUTAGE JUSTIFICATION 19

Valve Asset 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 ISTC-3510, "Exercising Test Frequency," Active Category C 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 ISTC-5221 and NUREG-1482, Rev.1, Section 4.1.3, cannot be performed because the Charging Pumps will not develop the required flow. In addition, they also cannot be full 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 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 the slightly subatmospheric containment, they are not accessible for testing during plant operation because the radiation levels and air temperature inside containment are higher than normal during power operation and would involve higher radiological dose rates and heat stress risk to plant personnel. This presents a working environment for station personnel that is not considered practicable for quarterly surveillance testing on a routine basis on-line. ISTC-3522(b) states, "If exercising is not practicable during operation at power, it shall be performed 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 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 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 which is considered to be an additional hardship that is not practicable during cold shutdowns.

VALVE REFUELING OUTAGE JUSTIFICATION 19

Basis for ROJ: In addition, full 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. ISTC-3522(c) states, "If exercising is not practicable during operation at power and cold shutdowns, it shall be performed 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: ISTC-3510, ISTC-3522(b), ISTC-3522(c) and ISTC-5221.
NUREG-1482, Rev.1, Section 4.1.3.

VALVE REFUELING OUTAGE JUSTIFICATION 20

Valve Asset 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 flow path from the LHSI Pumps to the reactor coolant system (RCS) cold legs during a safety injection.

Test Requirement: Per ISTC-3510, "Exercising Test Frequency," Active Category C check valves shall be exercised nominally every 3 months.

Basis for ROJ: These check valves are normally closed during plant operation and are pressure isolation valves (PIV's) that isolate 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 flow rate in accordance with ISTC-5221 and NUREG-1482, Rev.1, Section 4.1.3, cannot be performed because the LHSI Pumps will not develop enough head to overcome RCS pressure. During cold shutdowns, full 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. ISTC-3522(c) states, "If exercising is not practicable during operation at power and cold shutdowns, it shall be performed during refueling outages." Full 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 4.1.6, "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. ISTC-3522(c) states, "If exercising is not practicable during plant operation at power and cold shutdowns, it shall be performed during refueling outages."

Alternate Test: Full-stroke exercised open per 2OST-11.14A (LHSI Full Flow Test) at the frequency specified by the Check Valve Condition Monitoring (CVCM) Program. Full-stroke exercised closed by leakage testing during refueling outages per 2OST-11.16 (Leakage Testing RCS PIV's).

References: ISTC-3510, ISTC-3522(c) and ISTC-5221.
NUREG-1482, Rev.1, Section 4.1.3.
ASME OM Code, Appendix II (Check Valve Condition Monitoring Program).

VALVE REFUELING OUTAGE JUSTIFICATION 21

Valve Asset 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 flow path from the HHSI Pumps to the reactor coolant system (RCS) hot legs during a safety injection. The valves also serve as Class 1 to Class 2 RCS boundary barrier valves.

Test Requirement: Per ISTC-3510, "Exercising Test Frequency," Active Category C 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 flow rate in accordance with ISTC-5221 and NUREG-1482, Rev.1, Section 4.1.3, cannot be performed because the HHSI Pumps will not develop the required flow. During cold shutdowns, full stroke exercising in the open direction cannot be performed because this could result in low-temperature overpressurization of the RCS. ISTC-3522(c) states, "If exercising is not practicable during operation at power and cold shutdowns, it shall be performed during refueling outages."

Alternate Test: Full-stroke exercised open during refueling outages per 2OST-11.14B (HHSI Full Flow Test).

NOTE: Bi-directional exercising of [2SIS*122, 123, 126 and 127] in the non-safety related closed direction will be satisfied in conjunction with leakage testing of [2SIS*128 and 129] per 2OST-11.16 (Leakage Testing RCS PIV's) at the frequency specified by the Check Valve Condition Monitoring (CVCM) Program. Bi-directional exercising of [2SIS*124 and 125] in the non-safety related closed direction will be satisfied by the valves ability to stop flow from the opposite trains hot leg during forward flow testing per 2OST-11.14B (HHSI Full Flow Test) at the frequency specified by the Check Valve Condition Monitoring (CVCM) Program.

References: ISTC-3510, ISTC-3522(c) and ISTC-5221.
NUREG-1482, Rev.1, Section 4.1.3.
ASME OM Code, Appendix II (Check Valve Condition Monitoring Program).

VALVE REFUELING OUTAGE JUSTIFICATION 22

Valve Asset 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 flow path from the LHSI Pumps to the reactor coolant system (RCS) hot legs during a safety injection. The valves also serve as Class 1 to Class 2 RCS boundary barrier valves and function as pressure isolation valve (PIV's) that isolate the LHSI piping from the higher pressure RCS.

Test Requirement: Per ISTC-3510, "Exercising Test Frequency," Active Category C check valves shall be exercised nominally every 3 months.

Basis for ROJ: These check valves are normally closed during plant operation and are pressure isolation valve (PIV's) that isolate 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 flow rate in accordance with ISTC-5221 and NUREG-1482, Rev.1, Section 4.1.3, cannot be performed because the LHSI Pumps will not develop enough head to overcome RCS pressure. During cold shutdowns, full -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. ISTC-3522(c) states, "If exercising is not practicable during operation at power and cold shutdowns, it shall be performed during refueling outages." Full 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, Rev.1, Section 4.1.6, "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. ISTC-3522(c) states, "If exercising is not practicable during plant operation at power and cold shutdowns, it shall be performed during refueling outages."

Alternate Test: Full-stroke exercised open per 2OST-11.14A (LHSI Full Flow Test) at the frequency specified by the Check Valve Condition Monitoring (CVCM) Program. Full-stroke exercised closed by leakage testing during refueling outages per 2OST-11.16 (Leakage Testing RCS PIV's).

References: ISTC-3510, ISTC-3522(c) and ISTC-5221.
NUREG-1482, Rev.1, Section 4.1.3.
ASME OM Code, Appendix II (Check Valve Condition Monitoring Program).

VALVE REFUELING OUTAGE JUSTIFICATION 23

Valve Asset 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. The valve also serves as a pressure isolation valve (PIV).

Test Requirement: Per ISTC-3510, "Exercising Test Frequency," Active Category C 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 as a pressure isolation valve (PIV). 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 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 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 the slightly subatmospheric containment, it is not accessible for testing during plant operation because the radiation levels and air temperature inside containment are higher than normal during power operation and would involve higher radiological dose rates and heat stress risk to plant personnel. This presents a working environment for station personnel that is not considered practicable for quarterly surveillance testing on a routine basis on-line. ISTC-3522(b) states, "If exercising is not practicable during operation at power, it shall be performed 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 (up to 360 psig – RHR limit) during cold shutdown, full stroke exercising by cycling the mechanical weight loaded swing arms in the open and closed directions may not be possible during cold shutdown if back leakage 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 which is considered to be an additional hardship that is not practicable during cold shutdowns.

VALVE REFUELING OUTAGE JUSTIFICATION 23

Basis for ROJ: In addition, full 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. ISTC-3522(c) states, "If exercising is not practicable during operation at power and cold shutdowns, it shall be performed 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). The valve is also leak tested as required by Tech. Specs. for PIVs per 2OST-11.16 (Leakage Testing RCS PIV's).

References: ISTC-3510, ISTC-3522(b) and ISTC-3522(c).

VALVE REFUELING OUTAGE JUSTIFICATION 24

Valve Asset 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 serve a reactor coolant system (RCS) pressure boundary isolation function as pressure isolation valves (PIV's). They must also close to provide containment isolation of penetration no's. 60 and 62. They must open for LHSI cold leg recirculation.

Test Requirement: Per ISTC-3510, "Exercising Test Frequency," Active Category C 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 as pressure isolation valves (PIV's). 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 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 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 the slightly subatmospheric containment, they are not accessible for testing during plant operation because the radiation levels and air temperature inside containment are higher than normal during power operation and would involve higher radiological dose rates and heat stress risk to plant personnel. This presents a working environment for station personnel that is not considered practicable for quarterly surveillance testing on a routine basis on-line. ISTC-3522(b) states, "If exercising is not practicable during operation at power, it shall be performed 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 stroke exercising by cycling the mechanical weight loaded swing arms in the open and closed directions may not be possible during cold shutdown if back leakage through the downstream check valves is present.

VALVE REFUELING OUTAGE JUSTIFICATION 24

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 which is considered to be an additional hardship that is not practicable during cold shutdowns. In addition, full 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. ISTC-3522(c) states, "If exercising is not practicable during operation at power and cold shutdowns, it shall be performed 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). The valves are also leak tested as required by Tech. Specs. for PIVs per 2OST-11.16 (Leakage Testing RCS PIV's).

References: ISTC-3510, ISTC-3522(b) and ISTC-3522(c).

VALVE REFUELING OUTAGE JUSTIFICATION 25

Valve Asset 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 flow path from the HHSI Pumps to the reactor coolant system (RCS) cold legs during a safety injection. The valves also serve as Class 1 to Class 2 RCS boundary barrier valves.

Test Requirement: Per ISTC-3510, "Exercising Test Frequency," Active Category C 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 flow rate in accordance with ISTC-5221 and NUREG-1482, Rev.1, Section 4.1.3, cannot be performed because the HHSI Pumps will not develop the required flow. During cold shutdowns, full stroke exercising in the open direction cannot be performed because this could result in low-temperature overpressurization of the RCS. ISTC-3522(c) states, "If exercising is not practicable during operation at power and cold shutdowns, it shall be performed during refueling outages."

Alternate Test: Full-stroke exercised open during refueling outages per 2OST-11.14B (HHSI Full Flow Test).

NOTE: Bi-directional exercising in the non-safety related closed direction will be satisfied in conjunction with leakage testing of [2SIS*107, 108 and 109] per 2OST-11.16 (Leakage Testing RCS PIV's) at the frequency specified by the Check Valve Condition Monitoring (CVCM) Program.

References: ISTC-3510, ISTC-3522(c) and ISTC-5221.
NUREG-1482, Rev.1, Section 4.1.3.
ASME OM Code, Appendix II (Check Valve Condition Monitoring Program).

VALVE REFUELING OUTAGE JUSTIFICATION 26

Valve Asset 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) Accumulator Series Discharge Check Valves are required to open upon depressurization of the Reactor Coolant System (RCS) to allow water from the SI Accumulators to be injected into the RCS during a loss of coolant accident (LOCA). [2SIS*141 and 145] must also open to provide a flow path for the Residual Heat Removal (RHR) System when it is placed into service for cool down of the plant to cold shutdown conditions. These valves also serve as RCS pressure isolation valves (PIVs).

Test Requirement: Per ISTC-3510, "Exercising Test Frequency," Active Category C check valves shall be exercised nominally every 3 months.

Basis for ROJ: These check valves are normally closed as pressure isolation valves (PIV's) during plant operation in order to isolate the lower pressure Safety Injection (SI) Accumulators from the high pressure RCS. In the reverse direction, these valves do not have installed instrumentation, or weighted arms. Therefore, the only way to verify closure is with a leak test. Per NUREG-1482, Rev.1, Section 4.1.6, "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. Their safety position in the open direction is 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 cool down of the plant to cold shutdown conditions. Full stroke exercising in the open direction cannot be performed during plant operation because the RCS is at a higher pressure than the SI Accumulators. Full-stroke exercising of all six check valves in the open direction by initiating the maximum required accident condition flow rate in accordance with ISTC-5221 and NUREG-1482, Rev.1, Section 4.1.3, cannot be performed during cold shutdowns because of a lack of installed instrumentation to measure flow, and due to a possibility of developing low temperature overpressurization of the RCS. ISTC-3522(c) states, "If exercising is not practicable during operation at power and cold shutdowns, it shall be performed during refueling outages."

Alternate Test: Full-stroke exercised open by measuring a level change over time as the SI Accumulators are dumped per 2OST-11.TBD (TBD) at the frequency specified by the Check Valve Condition Monitoring (CVCM) Program. Full-stroke exercised closed by leakage testing during refueling outages per 2OST-11.4 and 11.5 (Accumulator Check Valve Leakage Tests).

References: ISTC-3510, ISTC-3522(c), ISTC-5221 and ISTC-5222.
NUREG-1482, Rev.1, Sections 4.1.3 and 4.1.6.
ASME OM Code, Appendix II (Check Valve Condition Monitoring Program).

VALVE REFUELING OUTAGE JUSTIFICATION _27_

Valve Asset 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 flow path 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 ISTC-3510, "Exercising Test Frequency," Active Category C 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 flow rate in accordance withISTC-5221 and NUREG-1482, Rev.1, Section 4.1.3, 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. Full 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. ISTC-3522(c) states, "If exercising is not practicable during operation at power and cold shutdowns, it shall be performed during refueling outages."

Alternate Test: Full-stroke exercised open per 2OST-11.14A (LHSI Full Flow Test) at the frequency specified by the Check Valve Condition Monitoring (CVCM) Program.

NOTE: Bi-directional exercising in the non-safety related closed direction will be satisfied by measuring leakage across the check valves while the RCS is pressurized per 2OST-11.16 (Leakage Testing RCS PIV's) at the frequency specified by the Check Valve Condition Monitoring (CVCM) Program.

References: ISTC-3510, ISTC-3522(c) and ISTC-5221.
NUREG-1482, Rev.1, Section 4.1.3.
ASME OM Code, Appendix II (Check Valve Condition Monitoring Program).

VALVE REFUELING OUTAGE JUSTIFICATION 28

Valve Asset 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 flow path from the HHSI Pumps to the reactor coolant system (RCS) "A" loop hot leg during a safety injection.

Test Requirement: Per ISTC-3510, "Exercising Test Frequency," Active Category C 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 flow rate in accordance with ISTC-5221 and NUREG-1482, Rev.1, Section 4.1.3, cannot be performed because the HHSI Pumps will not develop the required flow. During cold shutdowns, full stroke exercising in the open direction cannot be performed because this could result in low-temperature overpressurization of the RCS. ISTC-3522(c) states, "If exercising is not practicable during operation at power and cold shutdowns, it shall be performed during refueling outages."

Alternate Test: Full-stroke exercised open per 2OST-11.14B (HHSI Full Flow Test) at the frequency specified by the Check Valve Condition Monitoring (CVCM) Program.

NOTE: Bi-directional exercising in the non-safety related closed direction will be satisfied by measuring leakage across the check valves while the RCS is pressurized per 2OST-11.16 (Leakage Testing RCS PIV's) at the frequency specified by the Check Valve Condition Monitoring (CVCM) Program.

References: ISTC-3510, ISTC-3522(c) and ISTC-5221.
NUREG-1482, Rev.1, Section 4.1.3.
ASME OM Code, Appendix II (Check Valve Condition Monitoring Program).

VALVE REFUELING OUTAGE JUSTIFICATION 29

Valve Asset 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 flow path 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 flow rate in accordance with ISTC-5221 and NUREG-1482, Rev.1, Section 4.1.3, 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. Full -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. ISTC-3522(c) states, "If exercising is not practicable during operation at power and cold shutdowns, it shall be performed during refueling outages."

Alternate Test: Full-stroke exercised open per 2OST-11.14A (LHSI Full Flow Test) at the frequency specified by the Check Valve Condition Monitoring (CVCM) Program.

NOTE: Bi-directional exercising in the non-safety related closed direction will be satisfied by measuring leakage across the check valves while the RCS is pressurized per 2OST-11.16 (Leakage Testing RCS PIV's) at the frequency specified by the Check Valve Condition Monitoring (CVCM) Program.

References: ISTC-3510, ISTC-3522(c) and ISTC-5221.
NUREG-1482, Rev.1, Section 4.1.3.
ASME OM Code, Appendix II (Check Valve Condition Monitoring Program).

VALVE REFUELING OUTAGE JUSTIFICATION 30

Valve Asset 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 flow path to the reactor coolant system (RCS) cold legs when transferring to the cold leg recirculation mode.

Test Requirement: Per ISTC-3510, "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. ISTC-3521(c) states, "If exercising is not practicable during operation at power, 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, Rev.1, 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. ISTC-3521(e) states, "If exercising is not practicable during operation at power or cold shutdowns, it may be limited to full-stroke exercising during refueling outages."

Alternate Test: Since this is a low safety significant valve, its exercise frequency may me extended to refueling per OMN-1 Paragraph 3.6.1. Therefore, full-stroke exercised in accordance with ASME OM Code Case OMN-1 during refueling outages per 2OST-1.10 (Cold Shutdown Valve Exercise Test).

References: ISTC-3510, ISTC-3521(c) and ISTC-3521(e).
NUREG-1482, Rev.1, Section 3.1.1.4.
OMN-1 Paragraphs 3.6.1 and 3.6.3(c).

VALVE REFUELING OUTAGE JUSTIFICATION 31

Valve Asset 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 flow path 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 ISTC-3510, "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. ISTC-3521(c) states, "If exercising is not practicable during operation at power, 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, Rev.1, 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. ISTC-3521(e) states, "If exercising is not practicable during operation at power or cold shutdowns, it may be limited to full-stroke exercising during refueling outages."

Alternate Test: Since these are low safety significant valves, their exercise frequency may me extended to refueling per OMN-1 Paragraph 3.6.1. Therefore, full-stroke exercised in accordance with ASME OM Code Case OMN-1 during refueling outages per 2OST-11.14B (HHIS Full Flow Test) and recorded in 2OST-1.10 (Cold Shutdown Valve Exercise Test).

References: ISTC-3510, ISTC-3521(c) and ISTC-3521(e).
NUREG-1482, Rev.1, Section 3.1.1.4.
OMN-1 Paragraphs 3.6.1 and 3.6.3(c).

VALVE REFUELING OUTAGE JUSTIFICATION 32

Valve Asset 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 flow path 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 ISTC-3510, "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. ISTC-3521(c) states, "If exercising is not practicable during operation at power, 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 is considered to be an additional hardship that is not practicable during cold shutdowns. ISTC-3521(e) states, "If exercising is not practicable during operation at power or cold shutdowns, it may be limited to full-stroke exercising during refueling outages."

Alternate Test: Since this is a low safety significant valve, its exercise frequency may me extended to refueling per OMN-1 Paragraph 3.6.1. Therefore, full-stroke exercised in accordance with ASME OM Code Case OMN-1 during refueling outages per 2OST-11.16 (Leakage Testing RCS PIV's) and recorded in 2OST-1.10 (Cold Shutdown Valve Exercise Test).

References: ISTC-3510, ISTC-3521(c) and ISTC-3521(e).
OMN-1 Paragraphs 3.6.1 and 3.6.3(c).

VALVE REFUELING OUTAGE JUSTIFICATION 33

Valve Asset 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 ISTC-35101, "Exercising Test Frequency," Active Category C 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 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. Because this check valve is located inside the slightly subatmospheric containment, it is not accessible to perform leak testing during plant operation because the radiation levels and air temperature inside containment are higher than normal during power operation and would involve higher radiological dose rates and heat stress risk to plant personnel. This presents a working environment for station personnel that is not considered practicable for quarterly surveillance testing on a routine basis on-line. 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, Rev.1, Section 4.1.6, "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. ISTC-3522(c) states, "If exercising is not practicable during operation at power and during cold shutdowns, it shall be performed during refueling outages."

VALVE REFUELING OUTAGE JUSTIFICATION 33

Alternate Test:

Full-stroke exercised closed by leakage testing during refueling outages per 2BVT 1.47.5 (Type-C Leak Test) at the frequency specified by the Check Valve Condition Monitoring (CVCM) Program.

NOTE: Per NUREG-1482, Rev.1, Section 4.4.1, "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, Rev.1, Section 4.4.1, 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 ISTC-5221 and NUREG-1482, Rev.1, Section 4.1.3.

Full-stroke exercised open during normal system operation by observing Containment Airborne Activity Radiation Monitor performance per 2OM-54.3, Station Log L5-133 in accordance with ISTC-3550, "Valves in Regular Use."

References:

ISTC-3510, ISTC-3522(c) and ISTC-3550
NUREG-1482, Rev.1, Sections 4.1.3, 4.1.6 and 4.4.1.
ASME OM Code, Appendix II (Check Valve Condition Monitoring Program).

VALVE REFUELING OUTAGE JUSTIFICATION 34

Valve Asset 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 flow path 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 ISTC-3510, "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.

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. ISTC-3521(e) states, "If exercising is not practicable during operation at power or cold shutdowns, it may be limited to full-stroke exercising during refueling outages."

VALVE REFUELING OUTAGE JUSTIFICATION 34

Alternate Test: Since these are also low safety significant valves, their exercise frequency may me extended to refueling per OMN-1 Paragraph 3.6.1. Therefore, full-stroke exercised in accordance with ASME OM Code Case OMN-1 during refueling outages per 2OST-1.10 (Cold Shutdown Valve Exercise Test).

References: ISTC-3510 and ISTC-3521(e).
OMN-1 Paragraphs 3.6.1 and 3.6.3(c).

VALVE REFUELING OUTAGE JUSTIFICATION 35

Valve Asset 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 flow path of 23% to 25% sodium hydroxide solution from the Chemical Injection Pumps directly to the containment sump following a CIB.

Test Requirement: Per ISTC-3510, "Exercising Test Frequency," Active Category C 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 flow path 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 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 the slightly subatmospheric containment, it is not accessible for testing during plant operation because the radiation levels and air temperature inside containment are higher than normal during power operation and would involve higher radiological dose rates and heat stress risk to plant personnel. This presents a working environment for station personnel that is not considered practicable for quarterly surveillance testing on a routine basis on-line. 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 is considered to be an additional hardship that is not practicable during cold shutdowns. ISTC-3522(c) states, "If exercising is not practicable during operation at power and cold shutdowns, it shall be performed during refueling outages."

Alternate Test: Full-stroke exercised open using a manual mechanical exerciser attached to its mechanical weight loaded swing arm in accordance with ISTC-5221(b) and the guidelines provided in NUREG-1482, Rev.1, Section 4.1.7, and closed by observation of its mechanical weight loaded swing arm during refueling outages per 2OST-1.10 (Cold Shutdown Valve Exercise Test).

References: ISTC-3510, ISTC-3522(c) and ISTC-5221(b).
NUREG-1482, Rev.1, Section 4.1.7.

VALVE REFUELING OUTAGE JUSTIFICATION 36

Valve Asset 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 flow path for [2RSS*P21C and D] when pump flow rate is low following a CIB or during the recirculation mode of safety injection. They must close to isolate the recirculation flow path so that all recirculation spray flow is directed to the spray rings in containment following a CIB.

Test Requirement: Per ISTC-3510, "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 flow path for C and D recirculation spray pumps if flow rate is low following a CIB or during the recirculation mode of safety injection, and closed to isolate the recirculation flow path 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 flow rate. In order to cycle these valves open and closed for timing, recirculation spray pump flow must be initiated or a jumper wire must be installed in the circuitry of each valve. Installing a jumper creates a hardship as described in NUREG-1482, Rev.1, Section 3.1.1, "Deferring Valve Testing to Each Cold Shutdown or Refueling Outage." In addition, establishing recirculation spray pump flow can only be accomplished during refueling outages as described in the "Pump Outline Table" for [2RSS*P21C and D]. ISTC-3521(e) states, "if exercising is not practicable during operation at power or cold shutdowns, it may be limited to full-stroke exercising during refueling outages.

Alternate Test: Full-stroke exercised in accordance with ASME OM Code Case OMN-1 during refueling outages per 2BVT 1.13.5 (Recirculation Spray Pump Test) or 2OST-1.10 (Cold Shutdown Valve Exercise Test).

References: ISTC-3510 and ISTC-3521(e).
NUREG-1482, Rev.1, Section 3.1.1.
OMN-1 Paragraph 3.6.3(c).

VALVE REFUELING OUTAGE JUSTIFICATION 37

Valve Asset 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 ISTC-3510, "Exercising Test Frequency," Active Category C check valves shall be exercised nominally every 3 months.

Basis for ROJ: These check valves are normally open during plant operation with 3500 – 5000 gpm flow through them. Their safety positions are open to provide CCP cooling to the RHR Heat Exchangers to support cool down 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 by passing > 6457 gpm flow cannot be performed during plant operation because normal plant operating loads do not support enough CCP flow to develop the maximum required accident condition flow rate in accordance with ISTC-5221 and NUREG-1482, Rev.1, Section 4.1.3. In order to increase flow above the maximum required accident condition flow rate, the manual throttle valves at the discharge of the RHR Heat Exchangers would require additional throttling in the open direction. Since these valves are located inside the slightly subatmospheric containment, they are not accessible during plant operation because the radiation levels and air temperature inside containment are higher than normal during power operation and would involve higher radiological dose rates and heat stress risk to plant personnel. This presents a working environment for station personnel that is not considered practicable for quarterly surveillance testing on a routine basis on-line. 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. Per NUREG-1482, Rev.1, 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 above could also result in a delayed plant startup. ISTC-3522(c) states, "If exercising is not practicable during operation at power and cold shutdowns, it shall be performed during refueling outage."

VALVE REFUELING OUTAGE JUSTIFICATION 37

Alternate Test: Full-stroke exercised closed quarterly per 2OST-15.1, 2OST-15.2 and 2OST-15.3 (CCP Pump Tests). Full-stroke exercised open and closed during cold shutdowns when the RCP's are secured per 2OST-15.1, 2OST-15.2 and 2OST-15.3 (CCP Pump Tests), or at least during refueling outages per 2OST-15.5 (Refueling Test of CCP Pumps) or individual 2OST-15.1, 2OST-15.2 or 2OST-15.3 (CCP Pump Tests).

References: ISTC-3510 and ISTC-3522(c).
NUREG-1482, Rev.1, Sections 3.1.1.4 and 4.1.3.

VALVE REFUELING OUTAGE JUSTIFICATION 38

Valve Asset 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 ISTC-3510, "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. ISTC-3521(c) states, "If exercising is not practicable during operation at power, 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, Rev.1, 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. ISTC-3521(e) states, "If exercising is not practicable during operation at power or cold shutdowns, it may be limited to full-stroke exercising during refueling outages."

Alternate Test: Full-stroke exercised and timed closed and fail-safe tested 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: ISTC-3510, ISTC-3521(c), ISTC-3521(e) and ISTC-3560.
NUREG-1482, Rev.1, Section 3.1.1.4.

VALVE REFUELING OUTAGE JUSTIFICATION 39

Valve Asset No(s): 2CCP*MOV150-1, 2CCP*MOV150-2, 2CCP*MOV151-1, 2CCP*MOV151-2, 2CCP*MOV156-1, 2CCP*MOV156-2, 2CCP*MOV157-1, 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 ISTC-3510, "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. ISTC-3521(c) states, "If exercising is not practicable during operation at power, 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, Rev.1, 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.

ISTC-3521(e) states, "If exercising is not practicable during operation at power 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 in Mode 5 as the operable RCS loops per Technical Specification 3.4.7 or 3.4.8 as applicable, these valves cannot be tested without entering the required action statement which requires immediate restoration of the RCS loop made inoperable. In Mode 6, with water level greater than or equal to 23 feet above the top of the Reactor Vessel flange, only one RHR loop is required to be operable and in operation per Technical Specification 3.9.4. However, if

VALVE REFUELING OUTAGE JUSTIFICATION 39

Basis for ROJ: the water level is less than 23 feet above the top of the Reactor Vessel flange, two RHR loops are required to be operable and one RHR loop in operation per Technical Specification 3.9.5, and immediate restoration of the inoperable RHR loop shall be initiated. Failure of any valve to re-open during testing 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 cannot be cycled when the RCP's are operating, these valves should only be exercised closed during refueling outages when the core is defueled or while in Mode 6 when the water level above the top of the Reactor Vessel flange is greater than or equal to 23 feet.

Alternate Test: Full-stroke exercised in accordance with ASME OM Code Case OMN-1 during refueling outages per 2OST-1.10 (Cold Shutdown Valve Exercise Test).

References:
ISTC-3510, ISTC-3521(c) and ISTC-3521(e).
NUREG-1482, Rev.1, Section 3.1.1.4.
NUREG-1449.
Technical Specification 3.4.7, 3.4.8, 3.9.4 and 3.9.5.
OMN-1 Paragraph 3.6.3(c).

VALVE REFUELING OUTAGE JUSTIFICATION 40

Valve Asset 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 ISTC-3510, "Exercising Test Frequency," Active Category C 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 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 the slightly subatmospheric containment which is not accessible during plant operation because the radiation levels and air temperature inside containment are higher than normal during power operation and would involve higher radiological dose rates and heat stress risk to plant personnel. This presents a working environment for station personnel that is not considered practicable for quarterly surveillance testing on a routine basis on-line. 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. Leak testing would also require the removal of the RCPs from service. NUREG-1482, Rev.1, Section 4.1.6, "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. ISTC-3522(c) states, "If exercising is not practicable during operation at power and cold shutdowns, it shall be performed 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).

NOTE: Bi-directional exercising in the non-safety related open direction is satisfied during normal system operation of the RCP's since temperature parameters associated with the RCPs are continuously monitored per ISTC-3550.

References: ISTC-3510, ISTC-3522(c) and ISTC-3550.
NUREG-1482, Rev.1, Section 4.1.6.

VALVE REFUELING OUTAGE JUSTIFICATION 41

Valve Asset 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 ISTC-3510, "Exercising Test Frequency," Active Category C 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 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, Rev.1, Section 4.1.6, "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. ISTC-3522(c) states, "If exercising is not practicable during operation at power and cold shutdowns, it shall be performed 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).

NOTE: Bi-directional exercising in the non-safety related open direction is satisfied during normal system operation of cooling water to the CNMT Air Compressors per ISTC-3550.

References: ISTC-3510, ISTC-3522(c) and ISTC-3550.
NUREG-1482, Rev.1, Section 4.1.6.

VALVE REFUELING OUTAGE JUSTIFICATION 42

Valve Asset 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 ISTC-3510, "Exercising Test Frequency," Active Category C 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. In accordance with ISTC-5221 and NUREG-1482, Rev.1, Section 4.1.3, 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 flow rate.

The full-flow test of the TDAFW Pump can only be performed in Mode 3, however, it is not practicable to perform this test in Mode 3 during shutdown for or during startup after each cold shutdown for several reasons. At that time, the introduction of relatively cold auxiliary feedwater into the Steam Generators (S/Gs) produces a potential for thermal shock to both the Main Feed Piping (Thermal Sleeves) and the secondary side of the Steam Generators (S/Gs). Although the thermal sleeves and S/Gs are designed for thermal shock, exposure of the Station to these events shall be minimized in order to ensure that the benefits of plant life extension can be realized.

The TDAFW Pump is designed to take suction from the Demineralized Water Storage Tank, [2FWE*TK210]. The water in [2FWE*TK210], however, is not treated for pH or Oxygen. Therefore, it could have some impact on the corrosion rates in the S/G. From a Chemistry perspective, it is preferred to minimize the use of this water while in Modes 1, 2 or 3.

In addition during startup, this test can only be performed once the steam pressure exceeds 600 psig. Testing at this time causes a temperature transient. The turbine draws steam from the S/Gs causing the Reactor Coolant System (RCS) to cool down. In addition, the cold auxiliary feedwater is injected into the S/Gs, causing the RCS to cool even more. This cool down delays startup and is critical path time. At this point in the outage, the only heat source for the RCS is the reactor coolant pumps. Therefore, any cool down is costly in the amount of time required to heat back up again.

VALVE REFUELING OUTAGE JUSTIFICATION 42

Basis for ROJ: Based on the above, performing the full-flow test of the TDAFWP at cold shutdowns is considered to be impracticable. Instead, testing of the TDAFWP will be performed during refueling outages only. Therefore, the full-stroke open exercise of the check valves will also be performed at a refueling outage frequency. Note that the quarterly Group B test of the TDAFWP, which is run on recirculation flow only, does not require full-steam flow.

These check valves do not have installed instrumentation or weighted arms to allow testing in the reverse direction. Therefore, the only way to verify closure is by disassembly during refueling outages. Per ISTC-5221(c), as an alternative to the testing in ISTC-5221(a) and ISTC-5221(b), a sample disassembly inspection program shall be used to verify obturator movement. Further, ISTC-5221(c)(3) states, "At least one valve in each group shall be disassembled and examined at each refuel outage". Therefore per ISTC-3522(c), "If exercising is not practicable during operation at power and cold shutdowns, it shall be performed during refueling outages."

Alternate Test: Full-stroke exercised open when in Mode 3 during shutdown for or during startup after refueling outages when plant conditions permit directing full flow to the S/Gs during Comprehensive Pump testing of [2FWE*P22] per 2OST-24.4A (TDAFWP and Check Valve Full-Flow Test).

In addition, the check valves will be full-stroke exercised open and closed during refueling outages by way of a disassembly and inspection in accordance with the sample frequency requirements of ISTC-5221(c) per 1/2CMP-75-ENERTECH CHECK-1M at the frequency specified by the Check Valve Condition Monitoring (CVCM) Program. If the sample valve fails its inspection, then all valves in the group shall be disassembled and inspected during the same outage. As a PMT following valve re-assembly, the inspected valve will be exercised in the open direction during the Comprehensive Pump Test of [2FWE*P22] per 2OST-24.4A (TDAFWP and Check Valve Full-Flow Test).

References: ISTC-3510, ISTC-3522(c) and ISTC-5221(c).
NUREG-1482, Rev.1, Section 4.1.3.
ASME OM Code, Appendix II (Check Valve Condition Monitoring Program).

VALVE REFUELING OUTAGE JUSTIFICATION 43

Valve Asset 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 ISTC-3510, "Exercising Test Frequency," Active Category C 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 flow path to atmosphere and closed during a HELB accident. Full 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 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 cool down could occur outside of Technical Specification and administrative limits, which if exceeded, could create positive reactivity. In addition, these check valves do not have installed instrumentation or weighted arms to allow testing in the reverse direction. Therefore, the only way to verify closure is by disassembly during refueling outages. Per ISTC-5221(c), "If the test methods in ISTC-5221(a) and ISTC-5221(b) are impractical for certain check valves, or if sufficient flow cannot be achieved or verified, a sample disassembly examination program shall be used to verify valve obturator movement." Further, ISTC-5221(c)(3) states, "At least one valve in each group shall be disassembled and examined at each refuel outage". Therefore per ISTC-3522(c), "If exercising is not practicable during operation at power and cold shutdowns, it shall be performed during refueling outages."

Alternate Test: Maintenance is to disassemble and inspect one check valve in the open and closed directions (full stroke) in accordance with the sample frequency requirements of ISTC-5221(c), per 1/2 CMP-75-ENERTECH CHECK-1M at the frequency specified by the Check Valve Condition Monitoring (CVCM) Program. If a sample valve fails its inspection, then all valves in the group shall be disassembled and inspected during the same outage. As a PMT following valve re-assembly, a part-stroke exercise in the open direction will be performed 2OM-50.4.M (Station Startup - Mode 5 to Mode 3).

VALVE REFUELING OUTAGE JUSTIFICATION 43

References:
ISTC-3510 and ISTC-3522(c)
NUREG-1482, Rev.1, Section 4.1.4.
CR 981791.
ASME OM Code, Appendix II (Check Valve Condition Monitoring Program).

VALVE REFUELING OUTAGE JUSTIFICATION _44_

Valve Asset 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 ISTC-3510, "Exercising Test Frequency," Active Category C 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 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 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, Rev.1, Section 4.1.6, "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. ISTC-3522(c) states, "If exercising is not practicable during operation at power and cold shutdowns, it shall be performed 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).

NOTE: Bi-directional exercising in the non-safety related open direction is satisfied by normal system operation with feedwater flow to the Steam Generators per ISTC-3550.

References: ISTC-3510, ISTC-3522(c) and ISTC-3550.
NUREG-1482, Rev.1, Section 4.1.6.

VALVE REFUELING OUTAGE JUSTIFICATION 45

Valve Asset 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 flow path 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 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, Rev.1, Section 4.1.6, "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. ISTC-3522(c) states, "If exercising is not practicable during operation at power and cold shutdowns, it shall be performed 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. 17.

References: ISTC-3510 and ISTC-3522(c)
NUREG-1482, Rev.1, Section 4.1.6.

VALVE REFUELING OUTAGE JUSTIFICATION 46

Valve Mark No(s): 2FWE*FCV122

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

System: 24 - Auxiliary Feedwater

Function: This Turbine-Driven Auxiliary Feedwater Pump (TDAFWP) discharge flow control/check valve has a dual function. This 3-way automatic recirculation control valve acts as both a manual automatic flow control valve in one direction and check valve in the other direction. As a manual automatic flow control valve, it must open to provide approximately 30% recirculation flow for the TDAFWP to prevent pump damage in the event of isolation of an AFW discharge line to the Steam Generators. It must close in order to isolate this same recirculation flow path when full TDAFWP flow is being directed to the Steam Generators during an accident. As a check valve, it must open to provide a flow path from the TDAFWP to the Steam Generators. It must close to prevent reverse flow and feedwater intra-system recirculation through an idle TDAFWP.

Test Requirement: Per ISTC-3510, "Exercising Test Frequency", Active Category B valves and Category C check valves shall be tested nominally every 3 months.

Basis for ROJ: This 3-way automatic recirculation control valve acts as both a manual automatic flow control valve in one direction and check valve in the other direction. It is normally closed as a check valve and normally open as manual automatic flow control valve during plant operation. As a manual automatic flow control valve, its safety position is open for TDAFWP recirculation and closed for isolation of this recirculation flow path. As a check valve, its safety position is open for AFW system injection to the Steam Generators and closed to prevent reverse flow through an idle TDAFWP. In accordance with ISTC-5221 and NUREG-1482, Rev.1, Section 4.1.3, a full-stroke exercise of the flow control valve function of this valve in the closed direction and the check valve function of this valve in the open direction may be achieved by initiating the maximum required accident condition flow. In order to meet this requirement, a full-flow test of the TDAFWP must be performed at its design flow rate.

The full-flow test of the TDAFW Pump can only be performed in Mode 3, however, it is not practicable to perform this test in Mode 3 during shutdown for or during startup after each cold shutdown for several reasons. At that time, the introduction of relatively cold auxiliary feedwater into the Steam Generators (S/Gs) produces a potential for thermal shock to both the Main Feed Piping (Thermal Sleeves) and the secondary side of the S/Gs. Although the thermal sleeves and S/Gs are designed for thermal shock, exposure of the Station to these events shall be minimized in order to ensure that the benefits of plant life extension can be realized.

VALVE REFUELING OUTAGE JUSTIFICATION 46

Basis for ROJ: The TDAFW Pump is designed to take suction from the Demineralized Water Storage Tank, [2FWE*TK210]. The water in [2FWE*TK210], however, is not treated for pH or Oxygen. Therefore, it could have some impact on the corrosion rates in the S/G. From a Chemistry perspective, it is preferred to minimize the use of this water while in Modes 1, 2 or 3.

In addition during startup, this test can only be performed once the steam pressure exceeds 600 psig. Testing at this time causes a temperature transient. The turbine draws steam from the S/Gs causing the Reactor Coolant System (RCS) to cool down. In addition, the cold auxiliary feedwater is injected into the S/Gs, causing the RCS to cool even more. This cool down delays startup and is critical path time. At this point in the outage, the only heat source for the RCS is the reactor coolant pumps. Therefore, any cool down is costly in the amount of time required to heat back up again.

Based on the above, performing the full-flow test of the TDAFWP at cold shutdowns is considered to be impracticable. Instead, testing of the TDAFWP will be performed during refueling outages only. Therefore, testing of the flow control valve function of this valve in the closed direction and the check valve function of this valve in the open direction will also be performed at a refueling outage frequency during the Comprehensive pump test. ISTC-3521(e) and ISTC-3522(c) state in part, If exercising is not practicable during operation at power and cold shutdowns, it may be limited to full-stroke exercising during refueling outages".

Alternate Test: The flow control valve function of this valve in the closed direction will be full-stroke exercised closed and the check valve function of this valve in the open direction will be full-stroke exercised open in Mode 3 during shutdown for or during startup after refueling outages during the Comprehensive Pump Test (CPT) of [2FWE*P22] per 2OST-24.4A (TDAFWP and Check Valve Full-Flow Test). The flow control valve function of this valve in the open direction will be full-stroke exercised open quarterly (although only required every 2 years) per either 2OST-24.4 (TDAFWP Test on Recirculation Flow) during the Group B pump test or per 1OST-24.4A (TDAFWP and Check Valve Full-Flow Test) during the CPT at refueling. The check valve function of this valve in the closed direction is discussed in VCSJ No. 18.

References: ISTC-3510, ISTC-3521(e), ISTC-3522(c) and ISTC-5221.
NUREG-1482, Rev.1, Section 4.1.3.

VALVE REFUELING OUTAGE JUSTIFICATION 47

Valve Asset 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 ISTC-3510, "Exercising Test Frequency," Active Category C 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 ISTC-5221 and NUREG-1482, Rev.1, Section 4.1.3. Note that full-stroke exercising in the open direction may still be possible during warm summer months when additional flow paths and heat exchangers are in service, however, this can normally only be accomplished by aligning the SWS system through additional flow paths 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 flow paths 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 flow rates during an accident. In addition, setting up the plant conditions necessary to align the SWS system through additional flow paths and/or heat exchangers as described above is considered to be an additional hardship that is not practicable during cold shutdowns. ISTC-3522(c) states, "If exercising is not practicable during operation at power and cold shutdowns, it shall be performed during refueling outages."

Alternate Test: Full-stroke exercised open during warm summer months when additional flow paths and heat exchangers are in service per 2OST-30.2, 2OST-30.3 and 2OST-30.6A or 6B (SWS Pump Tests). At least full-stroke exercised open during refueling outages per 2OST-30.13A or 13B (SWS Full Flow Tests), if not full-stroke tested open within the previous 92 days. Full-stroke exercising in the closed direction is discussed in VCSJ No. 23.

References: ISTC-3510, ISTC-3522(c) and ISTC-5221.
NUREG-1482, Rev.1, Section 4.1.3.

VALVE REFUELING OUTAGE JUSTIFICATION 48

Valve Asset 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 ISTC-3510, "Exercising Test Frequency," Active Category C 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 ISTC-5221 and NUREG-1482, Rev.1, Section 4.1.3. Note that full-stroke exercising in the open direction may still be possible during warm summer months when additional flow paths and heat exchangers are in service, however, this can normally only be accomplished by aligning the SWS system through additional flow paths 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 flow paths 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 flow rates during an accident. In addition, setting up the plant conditions necessary to align the SWS system through additional flow paths and/or heat exchangers as described above which is considered to be an additional hardship that is not practicable during cold shutdowns. ISTC-3522(c) states, "If exercising is not practicable during operation at power and cold shutdowns, it shall be performed during refueling outages."

VALVE REFUELING OUTAGE JUSTIFICATION 48

Basis for ROJ: Full stroke exercising in the closed direction is not practicable for the following reasons:

- Local observation of check valve closure is not possible because the check valves do not have position indicating devices that would indicate closure.
- Measuring a change in system pressure across the check valves is not possible because upstream isolation valves are not leak tight and may allow pressure to equalize across the SWS headers.
- Seat leakage measurement by shutting down the operating Service Water Pump supplying the associated SWS header, and by providing an upstream vent path with a Standby Service Water Pump providing reverse flow, is not always possible because a large enough leakage path may not exist. In order to create a large enough leakage path with a Standby Service Water Pump supplying the SWS header, both SWS headers must be cross-connected at the Service Water Pumps. Since both SWS headers are needed for the test, this limits the ability to perform work on the Service Water System. In addition during testing, cooling water would have to be isolated to one train of the Charging Pumps, Control Room Air Conditioning Units and Primary Plant Component Cooling Water System. This would affected the availability of these components and system along with the Residual Heat Removal System. In addition, there is no installed instrumentation to check for reverse flow. A temporary flow instrument would have to be installed to measure flow.

Per ISTC-5221(c), "If the test methods in ISTC-5221(a) and ISTC-5221(b) are impractical for certain check valves, or if sufficient flow cannot be achieved or verified, a sample disassembly examination program shall be used to verify valve obturator movement." Further, ISTC-5221(c)(3) states "At least one valve in each group shall be disassembled and examined at each refueling outage".

Alternate Test: Maintenance is to disassemble and inspect one valve in the open and closed direction (full stroke) in accordance with the sample frequency requirements of ISTC-5221(c) per 1/2CMP-75-WAFER CHECK-1M at the frequency specified by the Check Valve Condition Monitoring (CVCM) Program. If the sample valve fails its inspection, then the remaining valve in the group shall be disassembled and inspected during the same outage. As a PMT following valve re-assembly, a part-stroke exercise in the open direction will be performed per 2OST-30.2, 3, 6A or 6B (SWS Pump Tests).

NOTE: Although these check valves are included in the CVCM Program, exercise testing in the open direction will continue to be performed quarterly per 2OST-30.2, 3, 6A or 6B (SWS Pump Tests) or per 2OST-30.13A or 13B (SWS Full Flow Tests) at a refueling frequency.

References: ISTC-3510, ISTC-3522(c) and ISTC-5221.
NUREG-1482, Rev.1, Section 4.1.3.

VALVE REFUELING OUTAGE JUSTIFICATION 49

Valve Asset 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 ISTC-3510, "Exercising Test Frequency," Active Category C 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 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 the slightly subatmospheric containment, it is not accessible for testing during plant operation because the radiation levels and air temperature inside containment are higher than normal during power operation and would involve higher radiological dose rates and heat stress risk to plant personnel. This presents a working environment for station personnel that is not considered practicable for quarterly surveillance testing on a routine basis on-line. ISTC-3522(b) states, "If exercising is not practicable during operation at power, it shall be performed 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 must first be drained in order to cycle the check valve. This involves installing a hose and draining the containment penetration, which is considered to be a hardship that is not practicable during cold shutdowns. ISTC-3522(c) states, "If exercising is not practicable during operation at power and cold shutdowns, it shall be performed during refueling outages."

Alternate Test: Full-stroke exercised open using a manual mechanical exerciser attached to its mechanical weight loaded swing arm in accordance with ISTC-5221(b) and the guidelines provided in NUREG-1482, Rev.1, Section 4.1.7, and closed by observation of its mechanical weight loaded swing arm during refueling outages per 2OST-1.10 (Cold Shutdown Valve Exercise Test).

Full-stroke exercised closed by observation to its mechanical weight loaded swing arm during refueling outages per 2OST-1.10 (Cold Shutdown Valve Test). This activity also satisfies the bi-directional exercise requirement in the non-safety related open direction.

References: ISTC-3510, ISTC-3522(b) and ISTC-3522(c).
NUREG-1482, Rev.1, Section 4.1.7.

VALVE REFUELING OUTAGE JUSTIFICATION _50_

Valve Asset 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 ISTC-3510, "Exercising Test Frequency," Active Category C 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 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. ISTC-3522(b) states, "If exercising is not practicable during operation at power, it shall be performed during cold shutdowns." It is not practicable to cycle this check valve during cold shutdown because the containment instrument air system must either be shutdown or supported by a special valve alignment from the station service air system to maintain an air supply to containment components. Shutting down the containment instrument air system during cold shutdown or refueling is not practicable because this would cause loss of control air to containment instrumentation and air-operated components. Temporary use of the station service air system to support containment instrument air is to be minimized because the air is not dried and containment instrument air pressure indication would be lost. Using station service air could also add moisture to containment instrumentation and air-operated components that could adversely impact these components later during normal plant operation. Therefore, it is not practicable to test these valves during cold shutdown. ISTC-3522(c) states, "If exercising is not practicable during operation at power and cold shutdowns, it shall be performed during refueling outages."

Alternate Test: Full-stroke exercised open using a manual mechanical exerciser attached to its mechanical weight loaded swing arm in accordance with ISTC-5221(b) and the guidelines provided in NUREG-1482, Rev.1, Section 4.1.7, and closed by observation of its mechanical weight loaded swing arm during refueling outages per 2OST-1.10 (Cold Shutdown Valve Exercise Test).

References: ISTC-3510, ISTC-3522(b) and ISTC-3522(c).
NUREG-1482, Rev.1, Section 4.1.7.

VALVE REFUELING OUTAGE JUSTIFICATION 51

Valve Asset No(s): 2SWS*MOV103A
2SWS*MOV103B
2SWS*MOV106A
2SWS*MOV106B

Category: B **Class:** 3

System: 30 - Service Water

Function: These Recirculation Spray (RSS) Heat Exchanger Service Water (SWS) Supply Isolation Valves [2SWS*MOV103A and B] must open to supply SWS cooling water to RSS Heat Exchangers during a CIB. They must reclose in the long-term post accident following a CIB and 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.

The SWS Supply Header Isolation Valves [2SWS*MOV106A and B] 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 ISTC-3510, "Exercising Test Frequency," Active Category B valves shall be tested nominally every 3 months.

Basis for ROJ: [2SWS*MOV103A and B] 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 cool down of the plant to cold shutdown conditions. [2SWS*MOV106A and B] 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 cool down of the plant to cold shutdown conditions.

<u>During Normal Plant Operation:</u>

[2SWS*MOV103A and B] cannot be cycled open and closed during normal plant operation without directing service water (Ohio River water) to the RSS Heat Exchangers and/or connecting SWS piping. The piping and heat exchangers are normally maintained in a dry lay-up condition in order to maintain them in an operationally ready state. Plant operating experience has shown the introduction of service water deposits (Asiatic clams, other marine life, river mud and silt) into the heat exchangers and/or connecting piping would unnecessarily degrade the operational readiness of the system.

VALVE REFUELING OUTAGE JUSTIFICATION 51

Basis for ROJ: In addition, opening [2SWS*MOV103A or B] by themselves, cannot be performed during plant operation unless [2SWS*MOV106A or B] or the RSS Heat Exchanger Inlet Isolation Valves [2SWS*MOV104A-D] are closed because the SWS cannot simultaneously support normal plant operations and full flow to the RSS Heat Exchangers. If testing was conducted with RSS Heat Exchanger Inlet Isolation Valves [2SWS*MOV104A-D] shut, draining of the connecting SWS piping, which is of significant diameter and length, would lead to increased maintenance and radiological exposure. If testing was conducted with [2SWS*MOV104A-D] open, additional draining and cleaning of the RSS Heat Exchangers (in addition to the piping) would also lead to increased maintenance, radiological exposure and possibly a plant shutdown if cleaning of the RSS Heat Exchangers could not be accomplished within the Technical Specification 72 hour required action time.

Therefore, exercising these valves quarterly is considered to be impractical during normal operation. Per ISTC-3521(c), "If exercising is not practicable during operation at power, it may be limited to full-stroke exercising during cold shutdowns".

During normal plant operation, two service water trains are required to be OPERABLE per T.S. 3.7.8. Closing [2SWS*MOV106A(B)] during plant operation without also directing flow to RSS Heat Exchangers by opening [2SWS*MOV103A(B)], would require the SWS pump operating on the SWS train being tested to be shutdown (in order to prevent damaging the pump by operating at less than minimum flow). Shutting down the SWS pump operating on the SWS train being tested would result in the following:

(1) Loss of the redundant SWS subsystem due to no flow to the following safety-related cooling loads on that train. This is because the SWS subsystems cannot be cross-connected at these cooling loads in order to maintain train separation as required by GDC 44.

Emergency Diesel Generator Coolers

Charging Pump Coolers

Control Room cooling

Safeguards Area cooling

Rod Control Area cooling (not normally aligned)

Motor Control Center Room cooling

PASS cooling (B Train only)

This would also require entry into the 72 hour Technical Specification 3.7.8 Required Action.

(2) Maintenance Rule out-of-service time would be accumulated for EDG and Charging Pump operating on the train until the SWS header being tested is restored to operable status.

VALVE REFUELING OUTAGE JUSTIFICATION 51

Basis for ROJ:

(3) Partial draining of the SWS header being tested would occur due to gravity draining to the outfall. It is estimated it would take approximately four hours to restore the header to a filled and vented condition.

(4) The removal of the above equipment from service would result in high PRA risk which has been evaluated to exceed current limits for performing such an activity without first obtaining management authorization.

Pre-test alignment of the SWS subsystems would be required to enable as much cooling flow as possible to the station loads placed on the SWS header in service, if [2SWS*MOV106A(B)] were to be closed and the SWS pump shutdown (without also directing flow to the RSS Heat Exchangers). This would involve extra-ordinary time consuming valve line-ups which are not desirable during normal plant operation. These valve line-ups are estimated to take more than one shift (eight hours) per train to perform, both before and after the test.

Since both SWS subsystems must be maintained operable during normal operation, [2SWS*MOV103A(B)] must be opened with flow to the RSS Heat Exchangers when also closing [2SWS*MOV106A(B)]. Opening [2SWS*MOV103A and B] has been shown to be impractical during normal operation, therefore, testing of [2SWS*MOV106A and B] is also considered to be impractical during normal operation. Per ISTC-3521(c), "If exercising is not practicable during operation at power, it may be limited to full-stroke exercising during cold shutdowns".

<u>During Cold Shutdown:</u>

Testing of these valves is possible during cold shutdowns when one train of SWS can be isolated, because both trains of SWS are no longer required by Technical Specifications. However, this can be a burden during some cold shutdowns. Although it is not required by Technical 3.7.8 to have two service water trains OPERABLE in MODE 5, it is desired to maintain two trains of SWS in operation in order to maintain cooling to the opposite train cooling loads. This would include cooling to the Emergency Diesel Generator for electric power availability, Charging Pump for boration flow path & RCS inventory flow path, and the Residual Heat Removal (RHR) System cooling via Primary Component Cooling (CCP). Both trains of RHR are used during cool down of the plant to cold shutdown and are required to be operable in MODE 5 per Technical Specification 3.4.8 when all three Reactor Coolant Loops are inoperable or not in service.

VALVE REFUELING OUTAGE JUSTIFICATION 51

Basis for ROJ:

Testing [2SWS*MOV103A and B] and [2SWS*MOV106A and B] during cold shutdowns would also involve shutting down the SWS pump operating on the SWS train being tested. Testing [2SWS*MOV106A or B] would result in partial draining of the SWS header being tested due to gravity draining to the outfall. It is estimated it would take approximately four hours to restore the header to a filled and vented condition. In addition, re-alignment of the SWS subsystems to enable testing of [2SWS*MOV106A and B] while maintaining two SWS subsystems in operation during cold shutdown would require extra-ordinary time consuming valve line-ups which are not desirable during cold shutdowns of short duration. These valve line-ups are estimated to take more than one shift (eight hours) per train to perform, both before and after the test, and would divert necessary resources from other outage work. The entire testing evolution could increase the outage duration if performed during cold shutdowns of short duration. ISTC-3521(g) states that plant startup need not be delayed to complete inservice testing during cold shutdown. Per ISTC-3521(e), "If exercising is not practicable during operation at power or cold shutdowns, it may be limited to full-stroke exercising during refueling outages".

Therefore, full-stroke exercising [2SWS*MOV103A and B] and [2SWS*MOV106A and B] in both directions will be performed during cold shutdowns of sufficient duration and at least during refueling outages if not tested within the previous 92 days.

<u>During Refueling Outages:</u>

However, in order to remove the impact of performing the SWS Full-Flow Tests during refueling outages, testing may be performed on-line, just prior to the refueling outage. This testing has been reviewed from a risk perspective and is considered to be acceptable when appropriate environmental conditions exist. Following the testing on-line, the RSS Heat Exchangers will be drained to remove most of the mud, silt, Asiatic clams and other marine life flushed into the heat exchangers. Actual cleaning of the heat exchangers will occur during the refueling outage as part of the GL 89-13 Program. Therefore, performing this test in the weeks just prior to the refueling outage will minimize the impact of the test on the station, while ensuring the heat exchangers are maintained operationally ready.

Alternate Test:

Full-stroke exercised in accordance with ASME OM Code Case OMN-1 during cold shutdowns of sufficient duration per 2OST-1.10 (Cold Shutdown Valve Exercise Test). Otherwise, full-stroke exercised in accordance with ASME OM Code Case OMN-1 at a refueling outage frequency while on-line (in the weeks just prior to the refueling outage) or during the refueling outage (if not tested within the previous 92 days) per 2OST-30.13A and 2OST-30.13B (SWS Full-Flow Tests).

References:

ISCT-3510, ISTC-3521(c), ISTC-3521(e) and ISTC-3521(g).
Technical Specifications 3.4.8 and 3.7.8.
OMN-1 Paragraphs 3.6.3(b) and 3.6.3(c).

VALVE REFUELING OUTAGE JUSTIFICATION 52

Valve Asset No(s): 2SWS*111
2SWS*112

Category: C **Class:** 3

System: 30 - Service Water

Function: These Service Water System (SWS) header check valves to the Emergency Diesel Generator Heat Exchangers must open to allow cooling water flow to the heat exchangers during an accident.

Test Requirement: Per ISTC-3510, "Exercising Test Frequency," Active Category C check valves shall be exercised nominally every 3 months.

Basis for ROJ: These check valves are normally shut during plant operation. Their safety position is open to provide SWS cooling to the Emergency Diesel Generator Heat Exchangers during an accident. Full-stroke exercising in the open direction can be performed with flow each month during testing of the Emergency Diesel Generators. However, bi-directional testing in the closed direction cannot be performed without disassembling the check valves because these check valves do not have installed instrumentation or weighted arms to allow testing in the reverse direction. Therefore, the only way to verify closure is by disassembly during refueling outages. Per ISTC-5221(c), as an alternative to the testing in ISTC-5221(a) and ISTC-5221(b), a sample disassembly inspection program shall be used to verify obturator movement. Further, ISTC-5221(c)(3) states, "At least one valve in each group shall be disassembled and examined at each refuel outage". Therefore per ISTC-3522(c), "If exercising is not practicable during operation at power and cold shutdowns, it shall be performed during refueling outages."

Alternate Test: Maintenance is to disassemble and inspect one valve in the open and closed direction (full stroke) in accordance with the sample frequency requirements of ISTC-5221(c) per 1/2CMP-75-WAFER CHECK-1M at the frequency specified by the Check Valve Condition Monitoring (CVCM) Program. If the sample valve fails its inspection, then the remaining valve in the group shall be disassembled and inspected during the same outage. As a PMT following valve re-assembly, a part-stroke exercise in the open direction will be performed per 2OST-36.1 or 1OST-36.2 (Emergency Diesel Generator Tests).

NOTE: Although these check valves are included in the CVCM Program, exercise testing in the open direction will continue to be performed at least quarterly per 2OST-36.1 and or 1OST-36.2 (Emergency Diesel Generator Tests).

References: ISTC-3510, ISTC-3522(c) and ISTC-5221.

SECTION IX: VALVE RELIEF REQUESTS

VALVE RELIEF REQUEST 1

Proposed Alternative In Accordance with 10CFR50.55a(a)(3)(i)

On the basis that the proposed alternative provides an acceptable level of quality and safety.

ASME Code Component(s) Affected: Motor-operated valve assemblies included in the Beaver Valley Motor-Operated Valve Program

Applicable Code Edition and Addenda: ASME OM Code-2001, with Addenda through OMb-2003.

Applicable Code Requirement(s): ISTA-3130, "Application of Codes Cases", ISTA-3130(b) states, "Code Cases shall be applicable to the edition and addenda specified in the test plan."

ISTC-5120, "Motor-Operated Valves", ISTC-5121(a) states; "Active valves shall have their stroke times measured when exercised in accordance with ISTC-3500."

ISTC-3700, "Position Verification Testing" states in part, "Valves with remote position indicators shall be observed locally at least once every 2 years to verify that valve operation is accurately indicated."

Reason for Request: NUREG-1482, Revision 1, Section 4.2.5 states in part; As an alternative to MOV stroke-time testing, ASME developed Code Case OMN-1, "Alternative Rules for Preservice and Inservice Testing of Certain Electric Motor-Operated Valve Assemblies in LWR Power Plants" which provides periodic exercising and diagnostic testing for use in assessing the operational readiness of MOVs. Section 4.2.5 further states; The NRC staff recommends that the licensees implement ASME Code Case OMN-1 as accepted by the NRC (with certain conditions) in the regulations or RG 1.192, as alternatives to the stroke-time testing provisions in the ASME Code for MOVs. RG 1.192 allows licensees with an applicable Code of record to implement ASME Code Case OMN-1 (in accordance with the provisions in the regulatory guide) as an alternative to the Code provisions for MOV stroke-time testing, without submitting request for relief from their Code of record. Licensees with a Code of record that is not applicable to the acceptance of this Code Case may submit a request for relief to apply the Code Case consistent with the indicated conditions to provide an acceptable level of quality and safety. The Code of record for Beaver Valley Power Station Unit No. 2 Third Ten-Year Inservice Test Interval is ASME OM Code-2001 Edition through OMb-2003 Addenda and the applicable Code for OMN-1, as stated in RG 1.192, was only reaffirmed through the OMa-1999 Addenda.

VALVE RELIEF REQUEST 1

Proposed Alternative and Basis for Use:

Pursuant to the guidelines provided in NUREG-1482, Revision 1, Section 4.2.5, implement Code Case OMN-1 in lieu of the stroke-time provisions specified in ISTC-5120 for MOVs. Code Case OMN-1 has been determined by the NRC to provide an acceptable level of quality and safety when implemented in conjunction with the conditions imposed in RG 1.192. Also, implement the provisions specified in ISTC-3700 in conjunction with the MOV diagnostic test frequency (specified in the IST Program Valve Tables) in lieu of the ISTC-3700 frequency of once every 2 years.

Using the provisions of this relief request as an alternative to the MOV stroke-time testing requirements of ISTC-5120, the position verification frequency of ISTC-3700, and applying Code Case OMN-1 per ISTA-3130(b), provides an acceptable level of quality for the determination of valve operational readiness. Code Case OMN-1 should be considered acceptable for use with ASME OM Code-2001 with Addenda through OMb-2003 as the Code of record.

Duration of Proposed Alternatives:

The proposed alternative identified in this relief request shall be utilized during the Third Ten-Year Inservice Test Interval.

Precedents:

None

References:

NUREG-1482, Revision 1, Section 4.2.5, "Alternatives to Stroke-Time Testing"

Regulatory Guide 1.192, "Operation and Maintenance Code Case Acceptability, ASME OM Code", Table 2, "Conditionally Acceptable OM Code Cases"

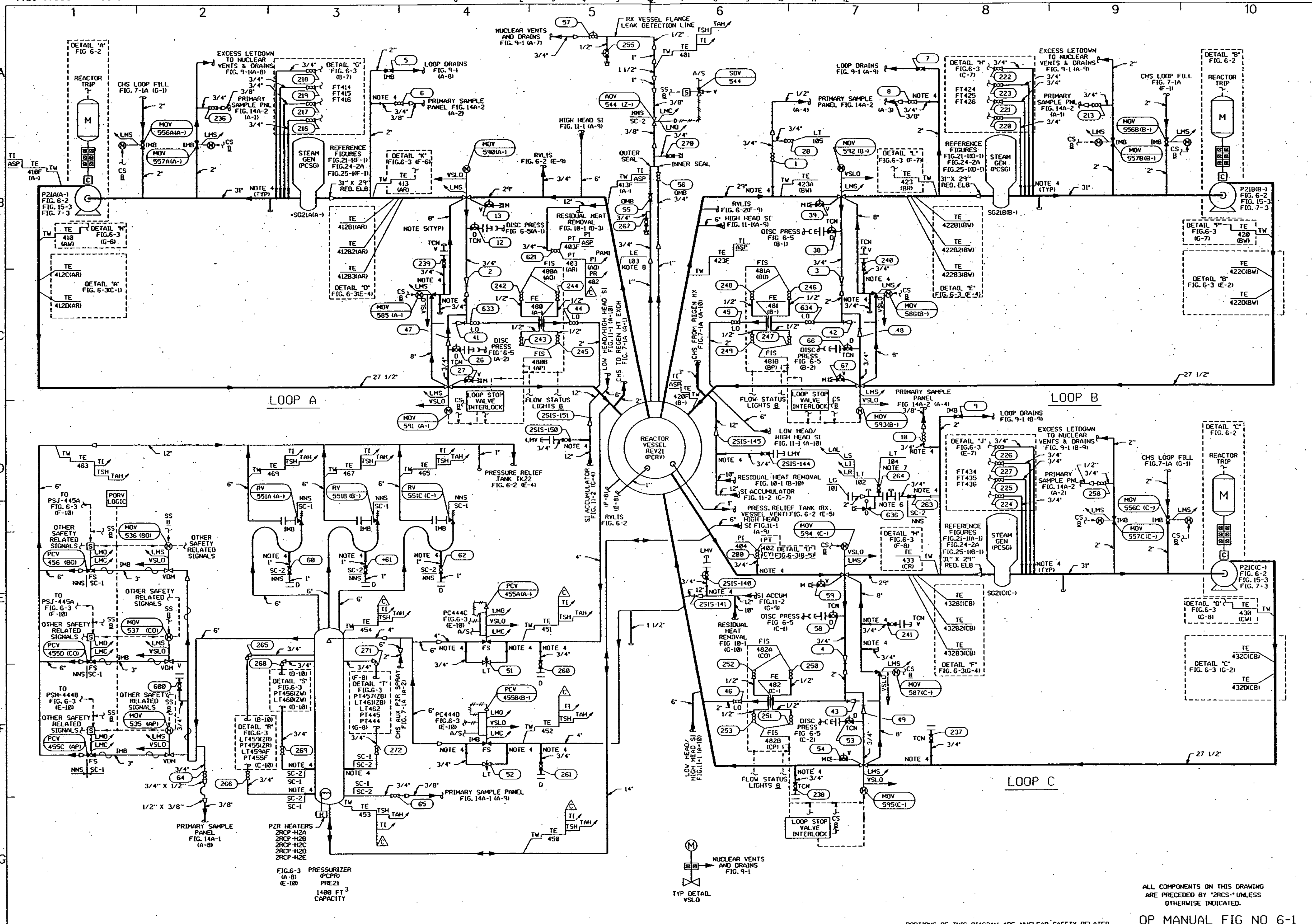
ISTA-3130, "Application of Code Cases"

ISTC-5120, "Motor Operated Valves"

ISTC-3700, "Position Verification Testing"

Code Case OMN-1, "Alternative Rules for Preservice and Inservice Testing of Certain Electric Motor-Operated Valve Assemblies in LWR Power Plants"

No. 10080-RM-406-1



PORTIONS OF THIS DIAGRAM ARE NUCLEAR SAFETY RELATED

OP MANUAL FIG NO 6-1

REVISION 21 INCORPORATED ECP-05-0213
[DCN 2-RM-0406-001-E05-0213-01
ECP-06-0281
[DCN 2-RM-0406-001-E06-0281-03
ECP-06-0283
[DCN 2-RM-0406-001-E06-0283-01

FENOC FIRSTENERGY NUCLEAR OPERATING COMPANY

SCALE NONE — DATE 11-6-06 — DRAWN BY DKK

BEAVER VALLEY POWER STATION UNIT NO. 2

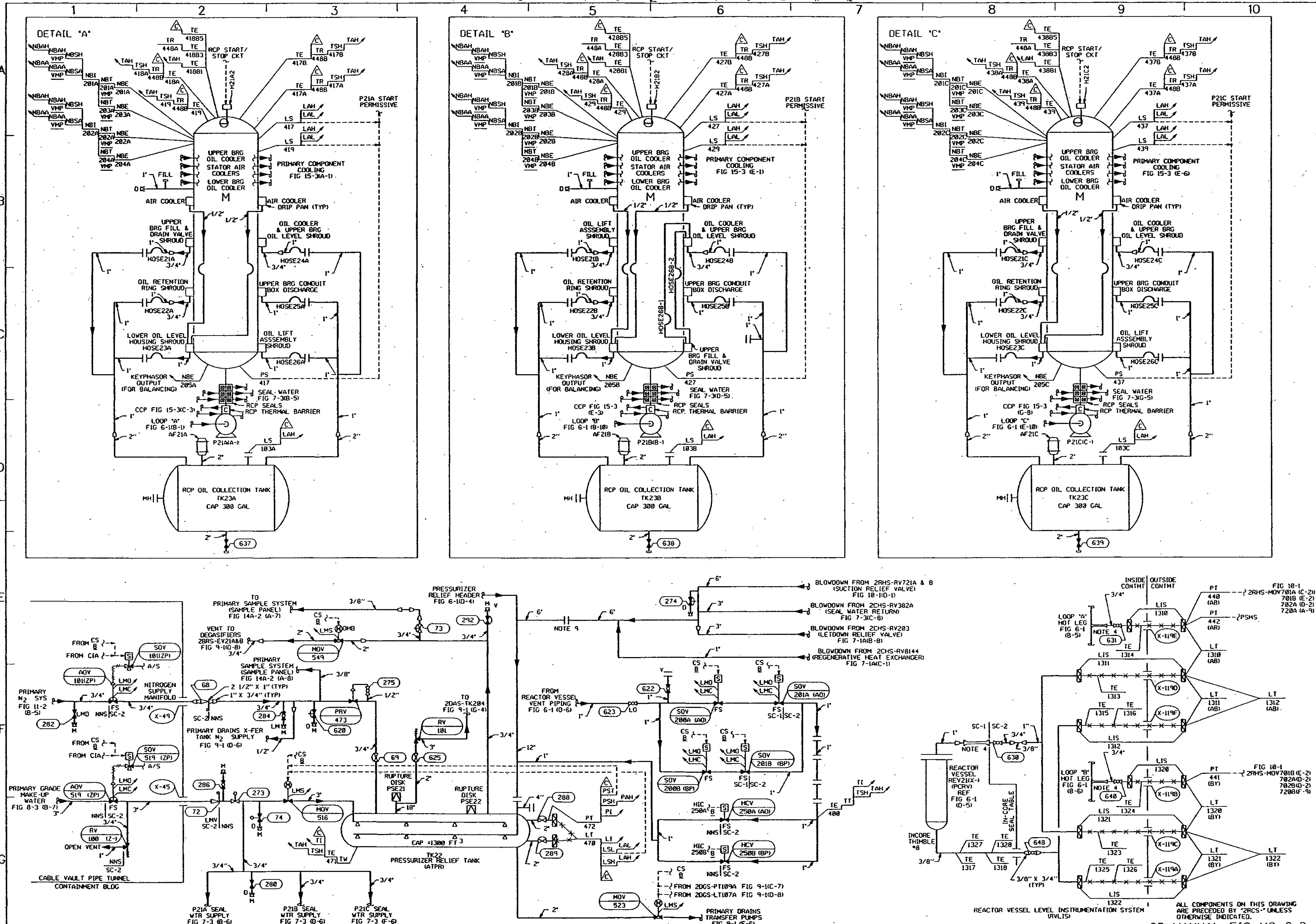
VALVE OPER NO DIAGRAM
REACTOR COOLANT SYSTEM

AA 10080-RM-406-1 REV. 21

PREPARED ON THE BVPS CAEDD SYSTEM

07-NOV-2006 19:20 K:\u2\m4060010.dgn

No. 10080-RM-406-2



OP MANUAL FIG NO 6-2

REVISION 18 INCORPORATED ECP-02-0314 IDCN 2-RM-0406-002-E02-0314-01

FENOC FirstEnergy Nuclear Operating Company

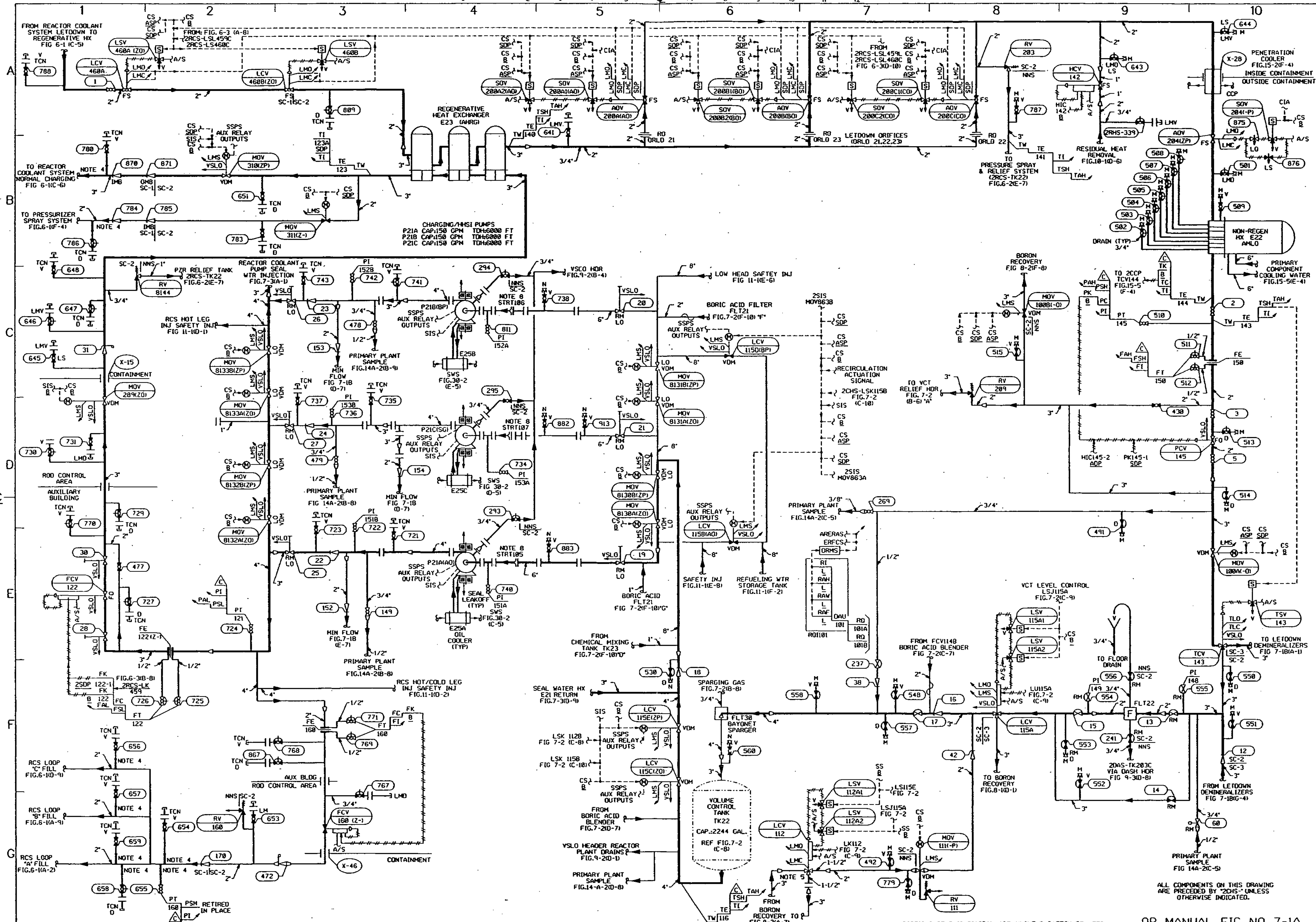
BEAVER VALLEY POWER STATION UNIT NO 2

VALVE OPER NO DIAGRAM
REACTOR COOLANT SYSTEM

SCALE NONE	DATE 11-5-06	DRAWN BY DKK	AA	DWG NO. 10080-RM-406-2 REV. 18

05-NOV-2006 23:58 K:\u2\m4060028.dgn

No.10080-RM-407-1A



PORTIONS OF THIS DIAGRAM ARE NUCLEAR SAFETY RELATED

OP MANUAL FIG NO 7-1A

REVISION 17 INCORPORATED ECP-03-0213
IDCN 2-RM-0407-001A-E03-0213-11

FENOC FirstEnergy Nuclear Operating Company

BEAVER VALLEY POWER STATION UNIT NO 2

VALVE OPER NO DIAGRAM
CHEMICAL AND VOLUME CONTROL SH-1

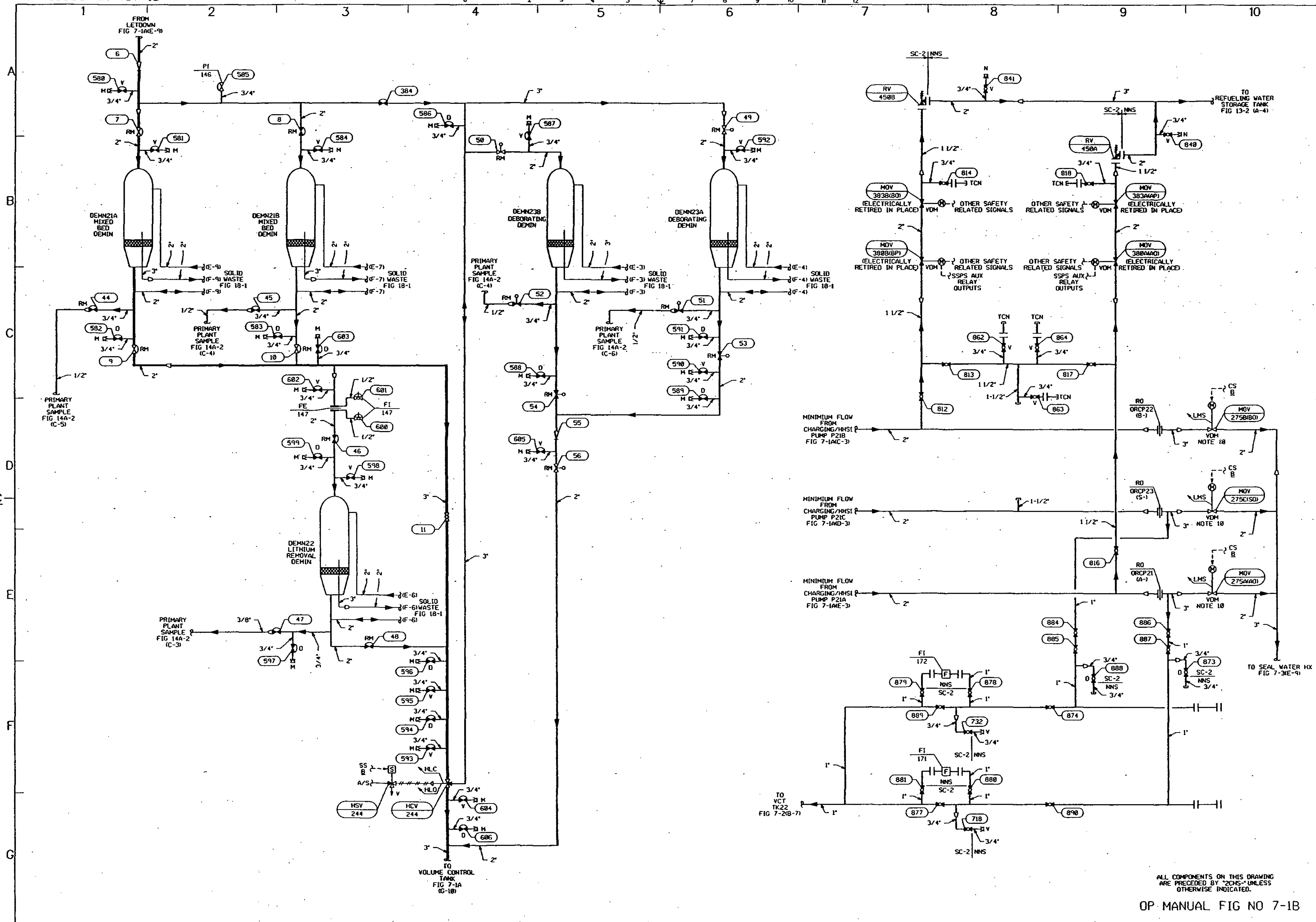
10-10-06 MVF

AA 10080-RM-407-1A 17

PREPARED ON THE BVPS CAEDOI SYSTEM

10-OCT-2006 10:38 K:\u2\M4070001A.DGN

No.10080-RM-407-1B



ALL COMPONENTS ON THIS DRAWING ARE PRECEDED BY "2CHS-" UNLESS OTHERWISE INDICATED.

OP MANUAL FIG NO 7-1B

PORTIONS OF THIS DIAGRAM ARE NUCLEAR SAFETY RELATED

REVISION 10 INCORPORATED ECP-06-0204 (DCN 2-RM-0407-001B-E06-0204-01) NOTIFICATION 600267165

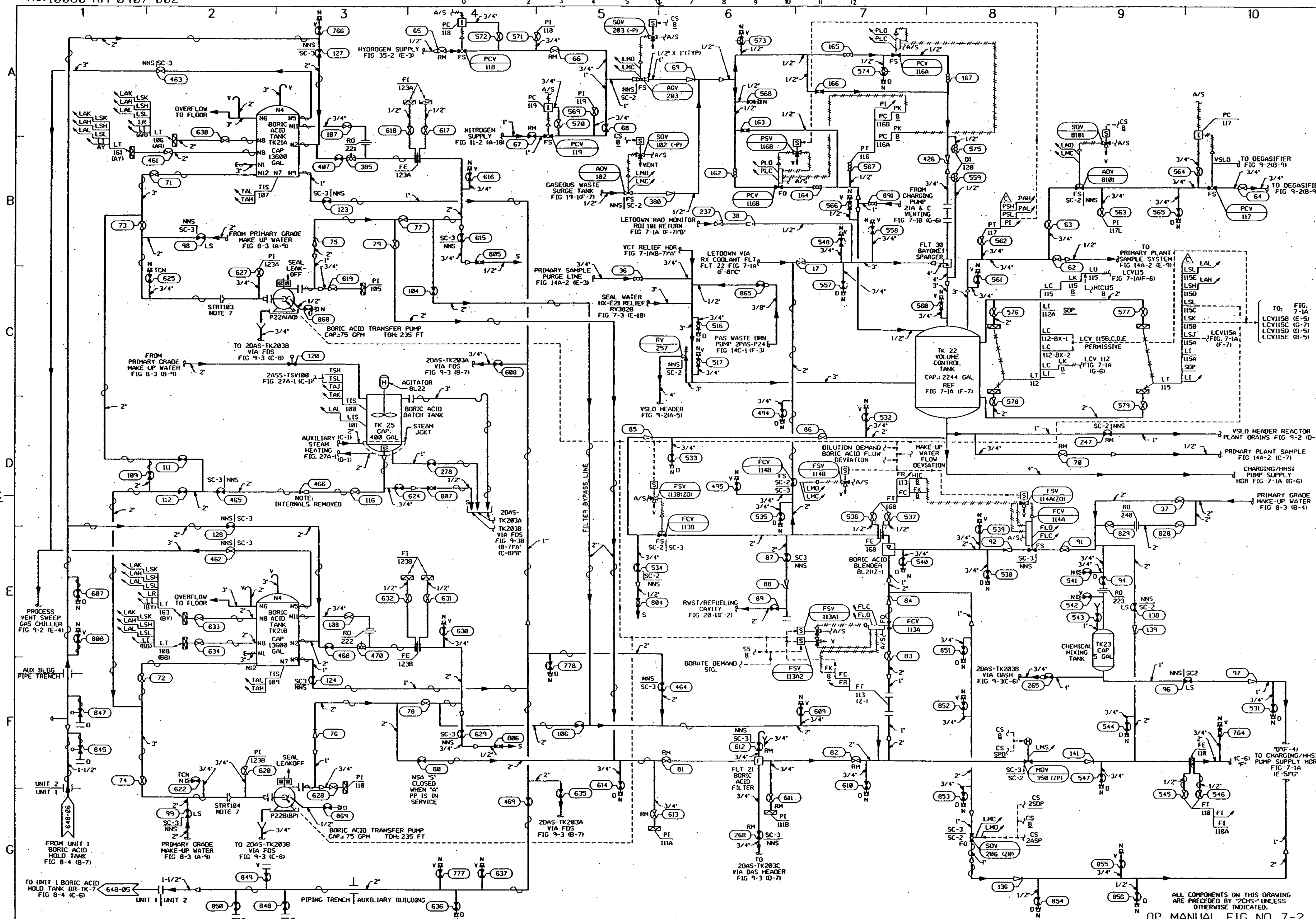
FENOC FirstEnergy Nuclear Operating Company

BEAVER VALLEY POWER STATION UNIT NO 2

VALVE OPER NO DIAG
CHEMICAL AND VOLUME CONTROL SH-2

AA 10080-RM-407-1B 10

No. 10080-RM-0407-002



OP MANUAL FIG NO 7-2

REVISION 17 INCORPORATED ECP-06-0223 IDCN 2-RM-0407-002-E06-0223-01 EER 600346877

FENOC FirstEnergy Nuclear Operating Company

BEAVER VALLEY POWER STATION UNIT NO 2

VALVE OPER NO DIAGRAM CHARGING SYSTEM VCT AND MAKE-UP

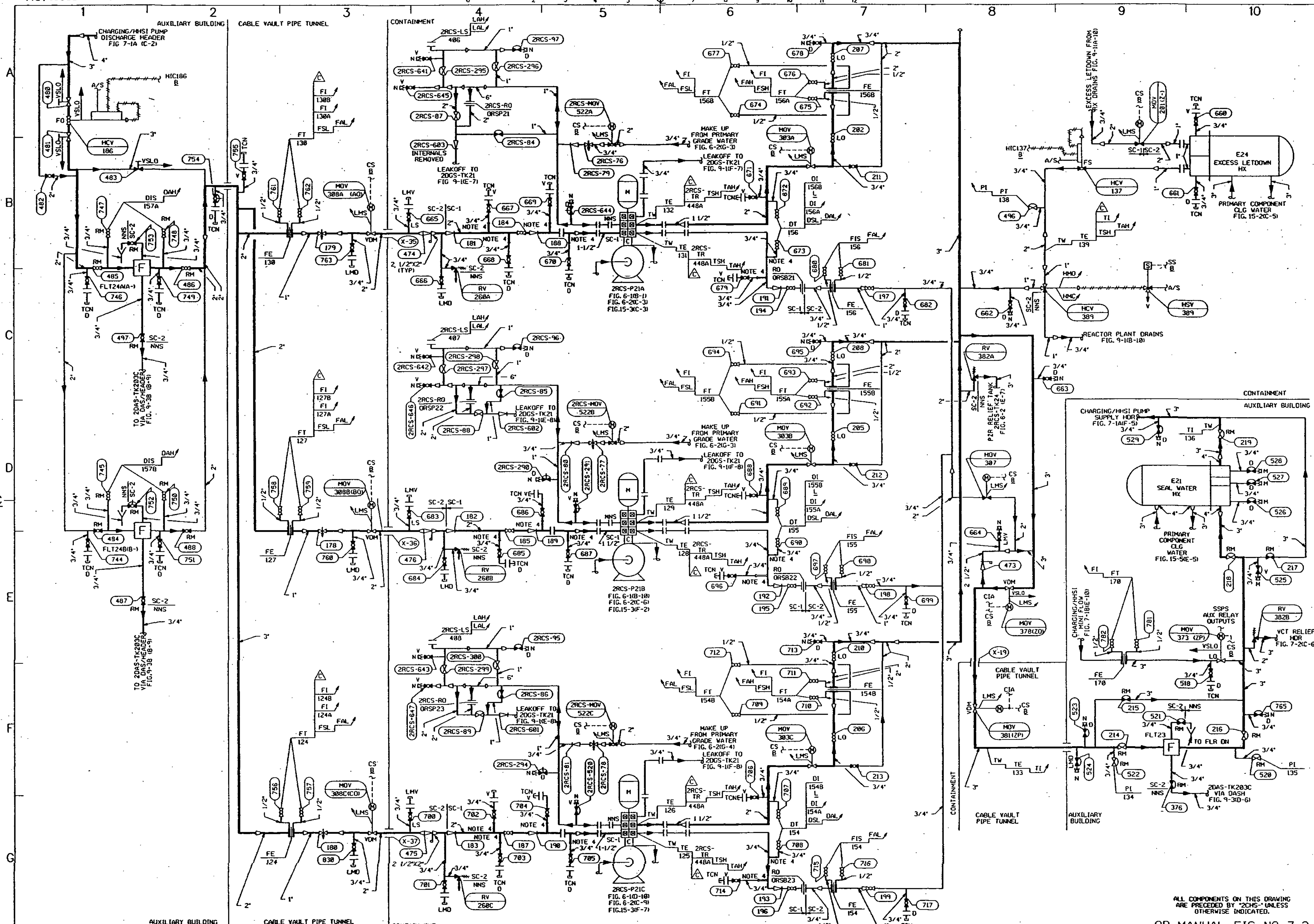
AA 10080-RM-0407-002 17

2-8-07

PREPARED ON THE BVPS CADDS SYSTEM

08-FEB-2007 15:11 K:\u2\RM-0407-002.DGN

No. 10080-RM-407-3



OP MANUAL FIG NO 7-3

REVISION 14
INCORPORATED
ECP-06-0200
(DCN 2-RM-0407-003-E06-0200-01)

FENOC FirstEnergy Nuclear Operating Company

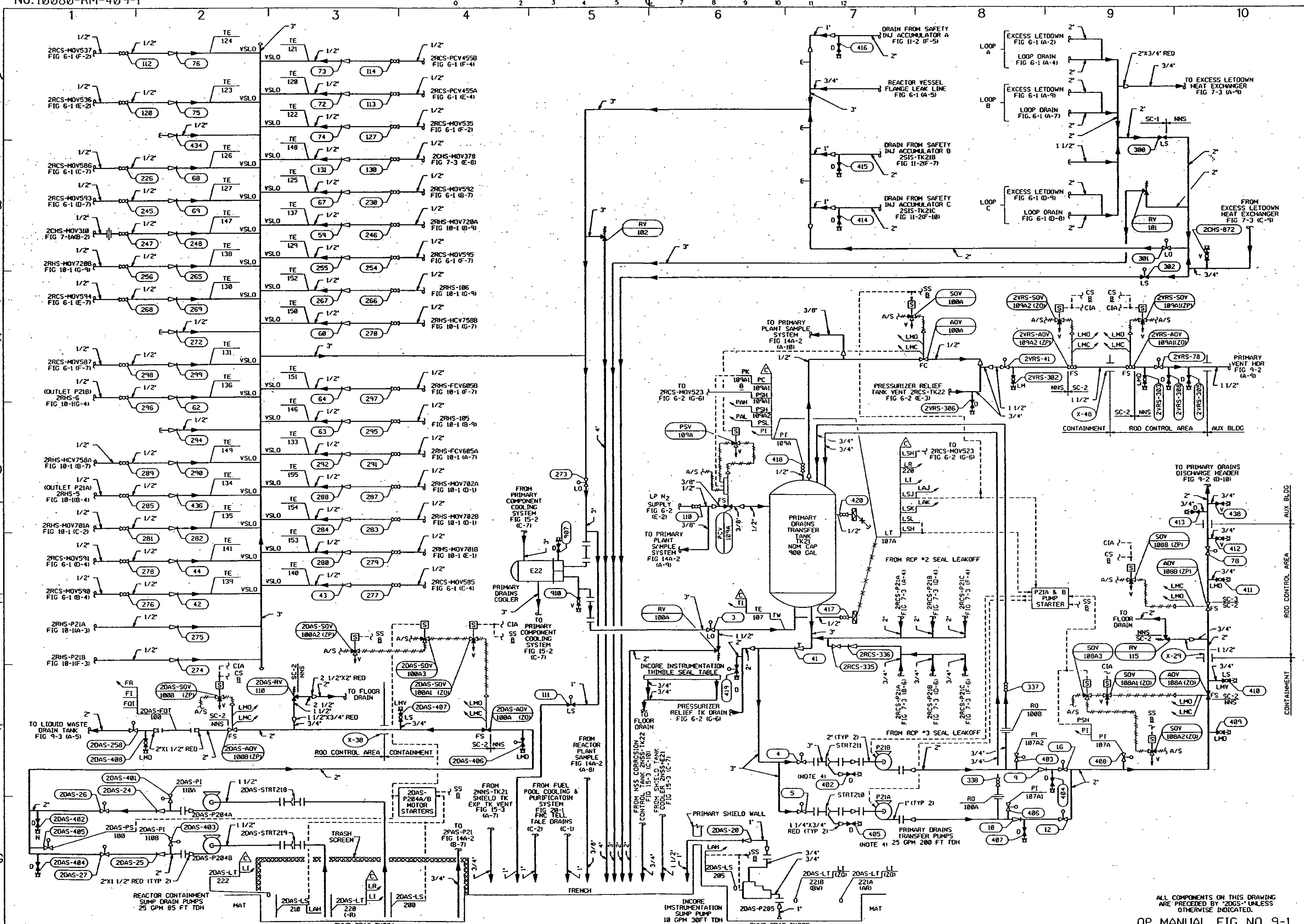
BEAVER VALLEY POWER STATION UNIT NO 2

VALVE OPER NO DIAGRAM
RCP SEAL WATER/EXCESS LTDN

10-26-06

AA 10080-RM-407-3 14

No. 10080-RM-409-1



ALL COMPONENTS ON THIS DRAWING ARE PRECEDED BY "2DGS-" UNLESS OTHERWISE INDICATED.

OP MANUAL FIG NO 9-1

PORTIONS OF THIS DIAGRAM ARE NUCLEAR SAFETY RELATED

REVISION 11 INCORPORATED ECP-06-0281 (DCN 2-RM-0409-001-E06-0281-03)

FENOC FirstEnergy Nuclear Operating Company

BEAVER VALLEY POWER STATION UNIT NO 2

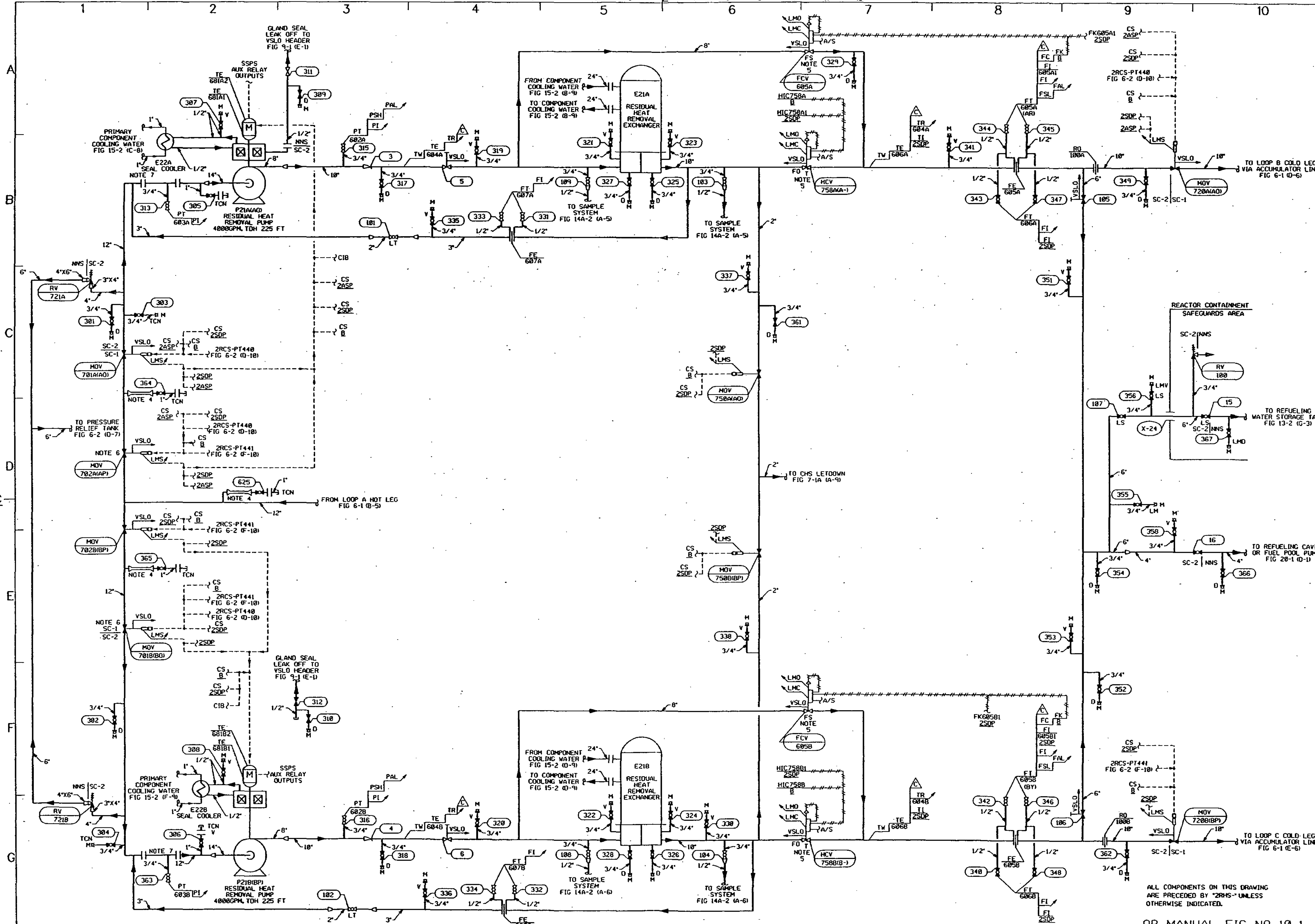
VALVE OPER NO DIAGRAM
REACTOR PLANT DRAINS SYSTEM

SCALE	NONE
DATE	11-7-06
DRAWN BY	DKK
DWG. NO.	AA 10080-RM-409-1
REV.	11

PREPARED ON THE BVPS CAEDD SYSTEM

06-NOV-2006 22:07 K:\u2\rm409001.dgn

No.10080-RM-410-1



OP MANUAL FIG NO 10-1

REVISION 14
INCORPORATED
ECP-06-0182
IDCN 2-RM-0410-001-E06-0182-01
NOTIFICATION 600303169

FENOC FirstEnergy Nuclear Operating Company

BEAVER VALLEY POWER STATION UNIT NO 2

VALVE OPER NO DIAGRAM
RESIDUAL HEAT REMOVAL PIPING

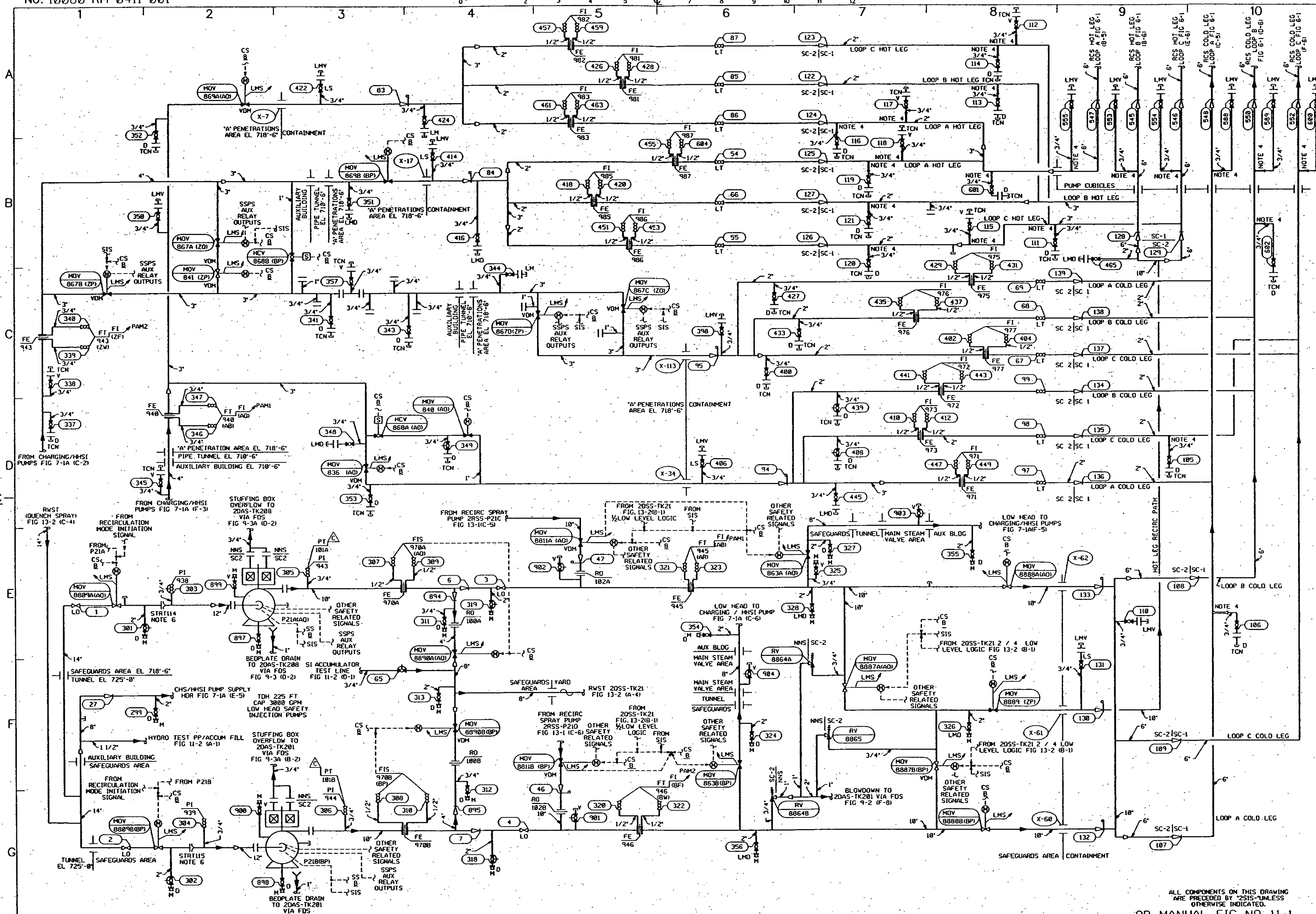
SCALE NONE | DATE 6-13-06 | DRAWN BY HVF

AA | 10080-RM-410-1 | REV. 14

PREPARED ON THE BVPS CAEDD SYSTEM

13-JUN-2006 09:21 K:\w2\M4100010.DGN

No. 10080-RM-0411-001



ALL COMPONENTS ON THIS DRAWING ARE PRECEDED BY "2SIS-"UNLESS OTHERWISE INDICATED.

PORTIONS OF THIS DIAGRAM ARE NUCLEAR SAFETY RELATED

OP MANUAL FIG NO 11-1

REVISION 14
INCORPORATED
ECP-06-0223
EDCN 2-RM-0411-001-E06-0223-01
EER 600346077

FENOC FirstEnergy Nuclear Operating Company

BEAVER VALLEY POWER STATION UNIT NO 2

VALVE OPER NO DIAGRAM
LOW/HIGH HEAD SAFETY INJECTION

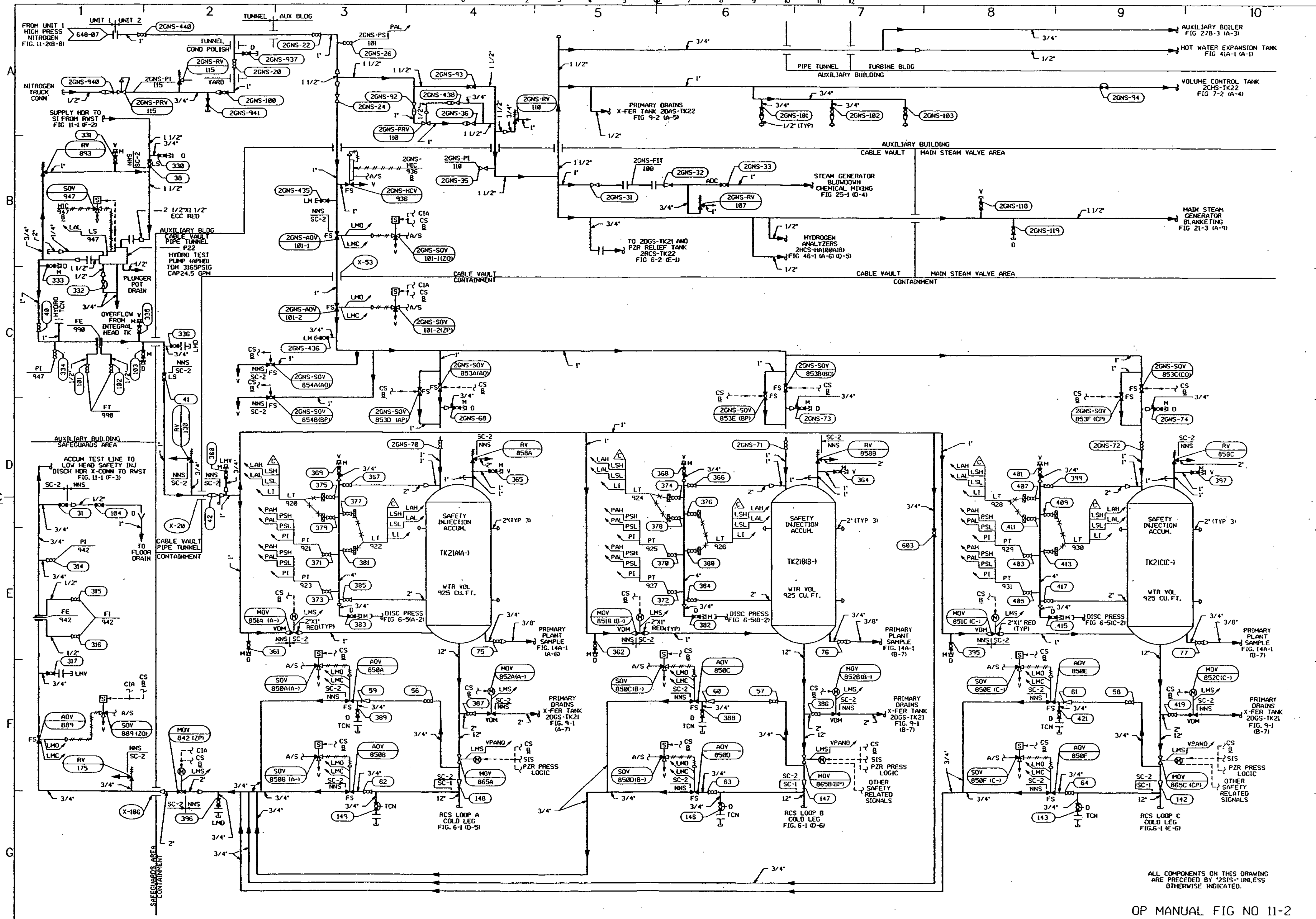
SCALE NONE | DATE 2-21-07 | DRAWN BY MVF

AA | 10080-RM-0411-001 | 14

PREPARED ON THE BVPS CAEDD SYSTEM

23-FEB-2007 08:11 K:\u2\rm-0411-001.dgn

No. 10080-RM-411-2



ALL COMPONENTS ON THIS DRAWING ARE PRECEDED BY "2SIS-" UNLESS OTHERWISE INDICATED.

OP MANUAL FIG NO 11-2

REVISION 14 INCORPORATED ECR-05-0389 IDCN 2-RM-0411-002-E05-0389-01 REF CA-05-02463-01

FENOC FirstEnergy Nuclear Operating Company

BEAVER VALLEY POWER STATION UNIT NO 2

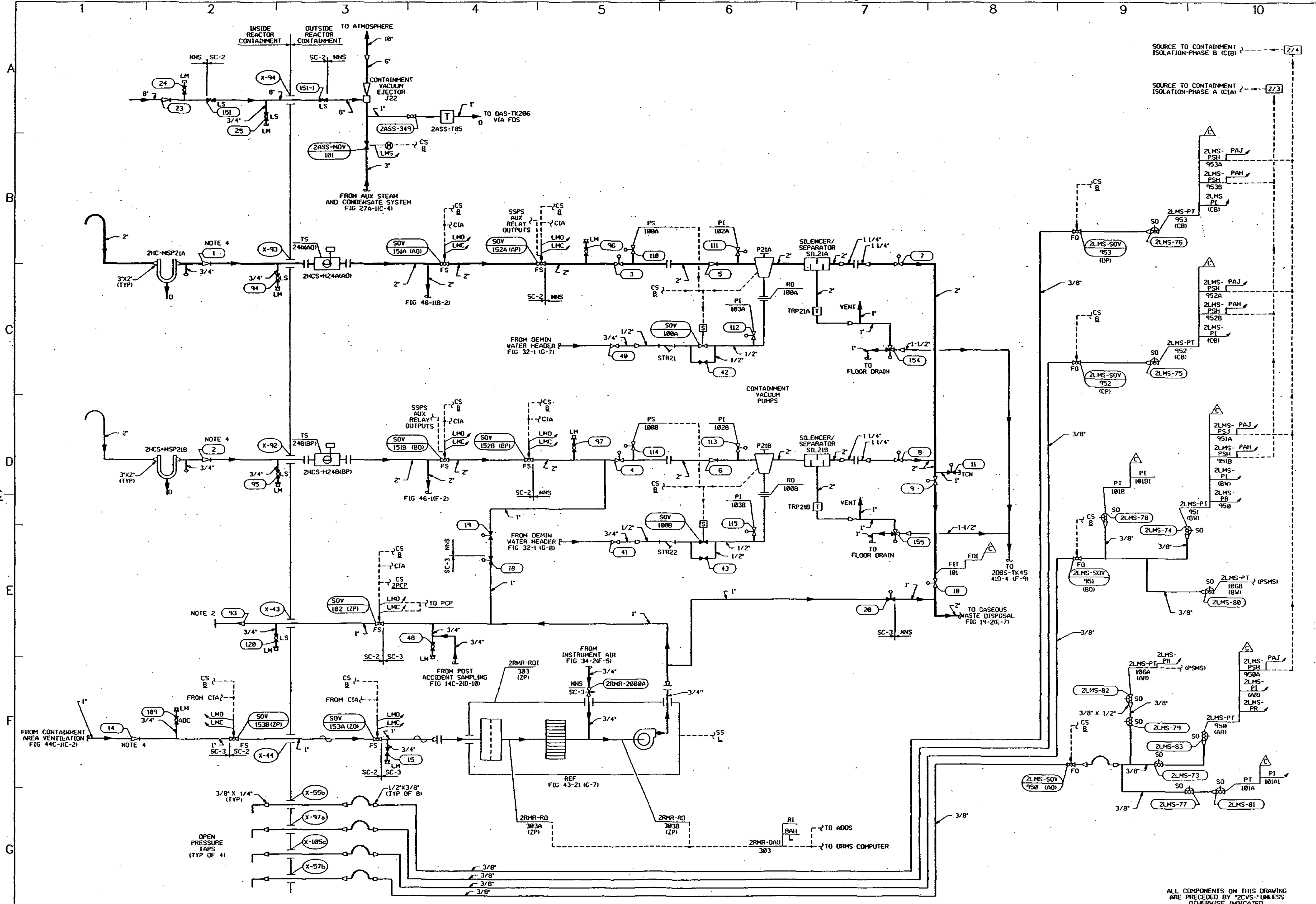
VALVE OPER NO DIAGRAM SI ACCUMULATORS/NITROGEN

AA 10080-RM-411-2 14

PREPARED ON THE BVPS CAEDDI SYSTEM

04-AUG-2005 13:08 K:\u2\M4110020.DGN

No. 10080-RM-412-1



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PORTIONS OF THIS DIAGRAM ARE NUCLEAR SAFETY RELATED

OP MANUAL FIG NO 12-1

REVISION 13
INCORPORATED
ECP-06-0204
(DCN 2-RM-0412-001-E06-0204-01)
NOTIFICATION 600267165

FENOC FirstEnergy NUCLEAR OPERATING COMPANY

BEAVER VALLEY POWER STATION UNIT NO 2

VALVE OPER NO DIAGRAM
CONTAINMENT VACUUM SYSTEM

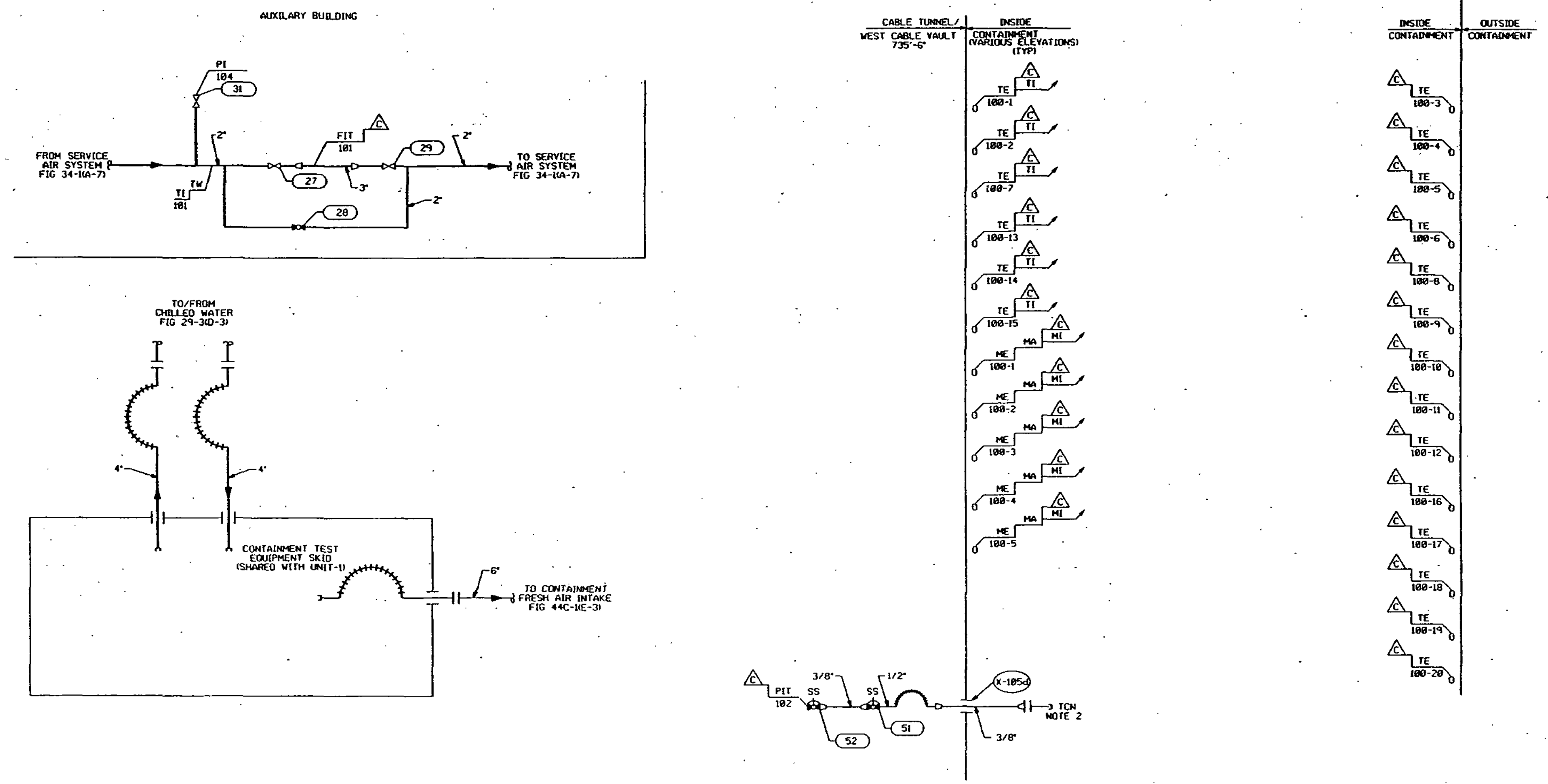
SCALE NONE — DATE 7-31-06 — DRAWN BY MVF

AA 10080-RM-412-1 13

PREPARED ON THE BVPS CAEDOI SYSTEM

31-JUL-2006 10:29 K:\u2\rm4120010.dgn

No. 10080-RM-412-2



ALL COMPONENTS ON THIS DRAWING ARE PRECEDED BY "2LMS-" UNLESS OTHERWISE INDICATED

OP MANUAL FIG NO. 12-2

PORTIONS OF THIS DIAGRAM ARE NUCLEAR SAFETY RELATED

REVISION 5
INCORPORATED
ECP-06-0204
IDCN 2-RM-0412-002-E06-0204-01
NOTIFICATION 600267165

FENOC FirstEnergy Nuclear Operating Company

BEAVER VALLEY POWER STATION UNIT NO 2

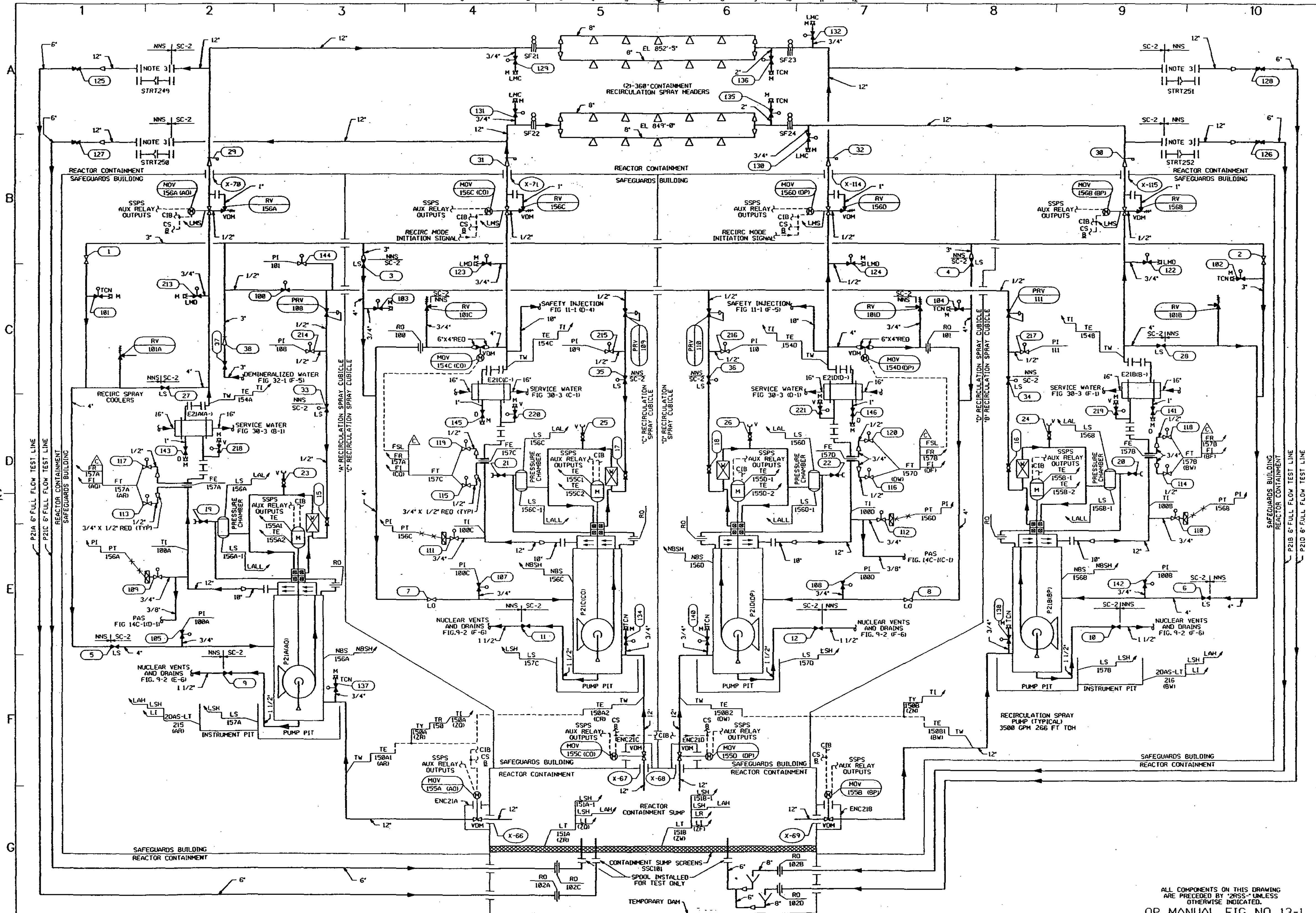
VALVE OPER NO DIAGRAM
LEAKAGE MONITORING

SCALE	DATE	DRAWN BY	DWG NO.	REV.
NONE	7-31-06	MVF	AA 10080-RM-412-2	5

PREPARED ON THE BVPS CAEDD SYSTEM

31-JUL-2006 11:03 K:\u2\rm4120020.dgn

No. 10080-RM-413-1



ALL COMPONENTS ON THIS DRAWING ARE PRECEDED BY "2RSS-" UNLESS OTHERWISE INDICATED.

PORTIONS OF THIS DIAGRAM ARE NUCLEAR SAFETY RELATED

OP MANUAL FIG NO 13-1

REVISION 10 INCORPORATED ECP-05-0362 (DCN 2-RM-0413-001-E05-0362-03)

FENOC FirstEnergy Nuclear Operating Company

BEAVER VALLEY POWER STATION UNIT NO 2

VALVE OPER NO DIAGRAM RECIRCULATION SPRAY SYSTEM

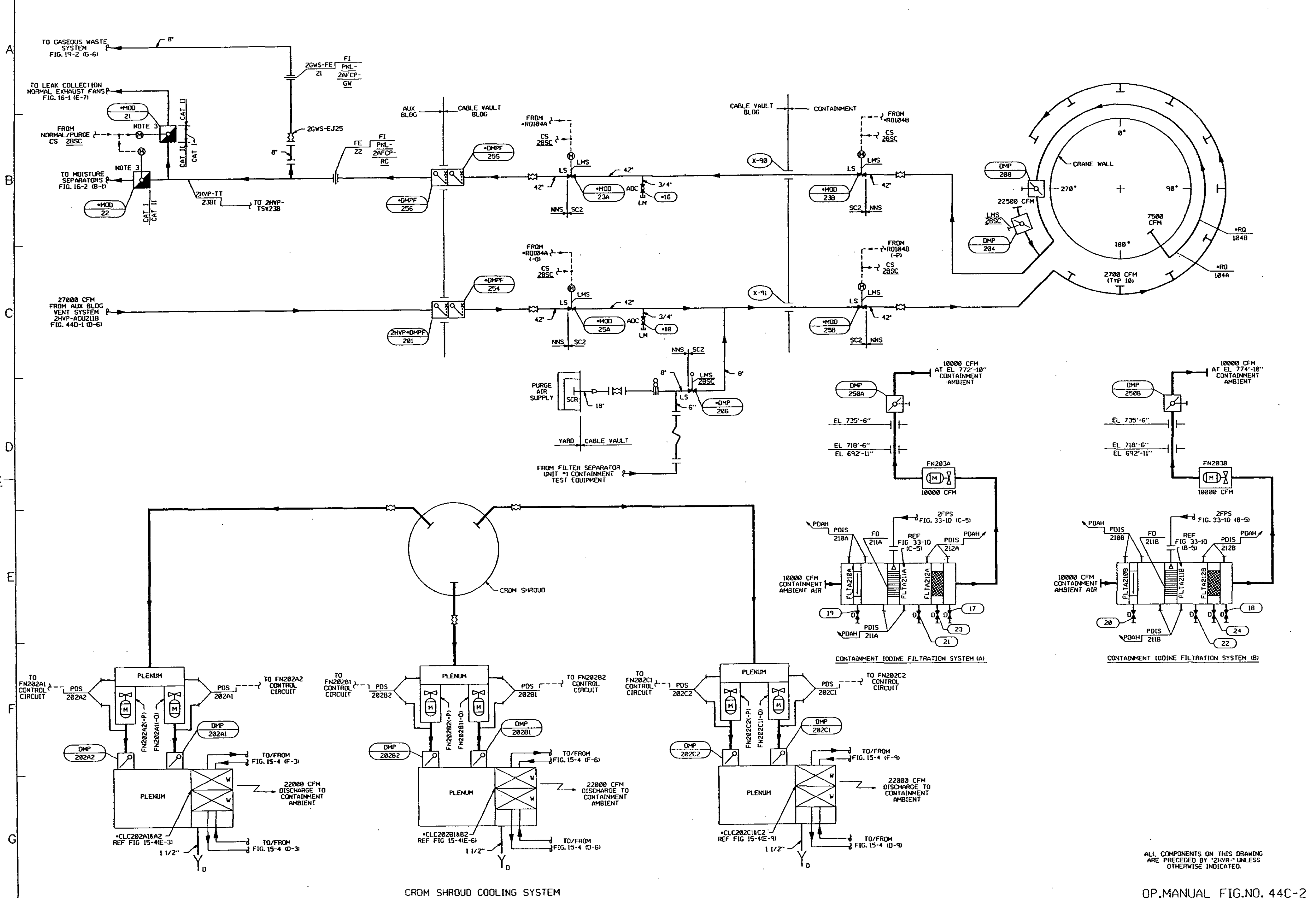
AA 10080-RM-413-1 10

DATE 11-16-06 DRAWN BY DKK SCALE NONE

PREPARED ON THE BVPS CAEDD SYSTEM

30-NOV-2006 08:40 K:\u2\rm4130010.dgn

No. 10080-RM-444C-2



OP.MANUAL FIG.NO. 44C-2

Duquesne Light Company
NUCLEAR GROUP
PITTSBURGH,PA

BEAVER VALLEY POWER STATION UNIT NO. 2

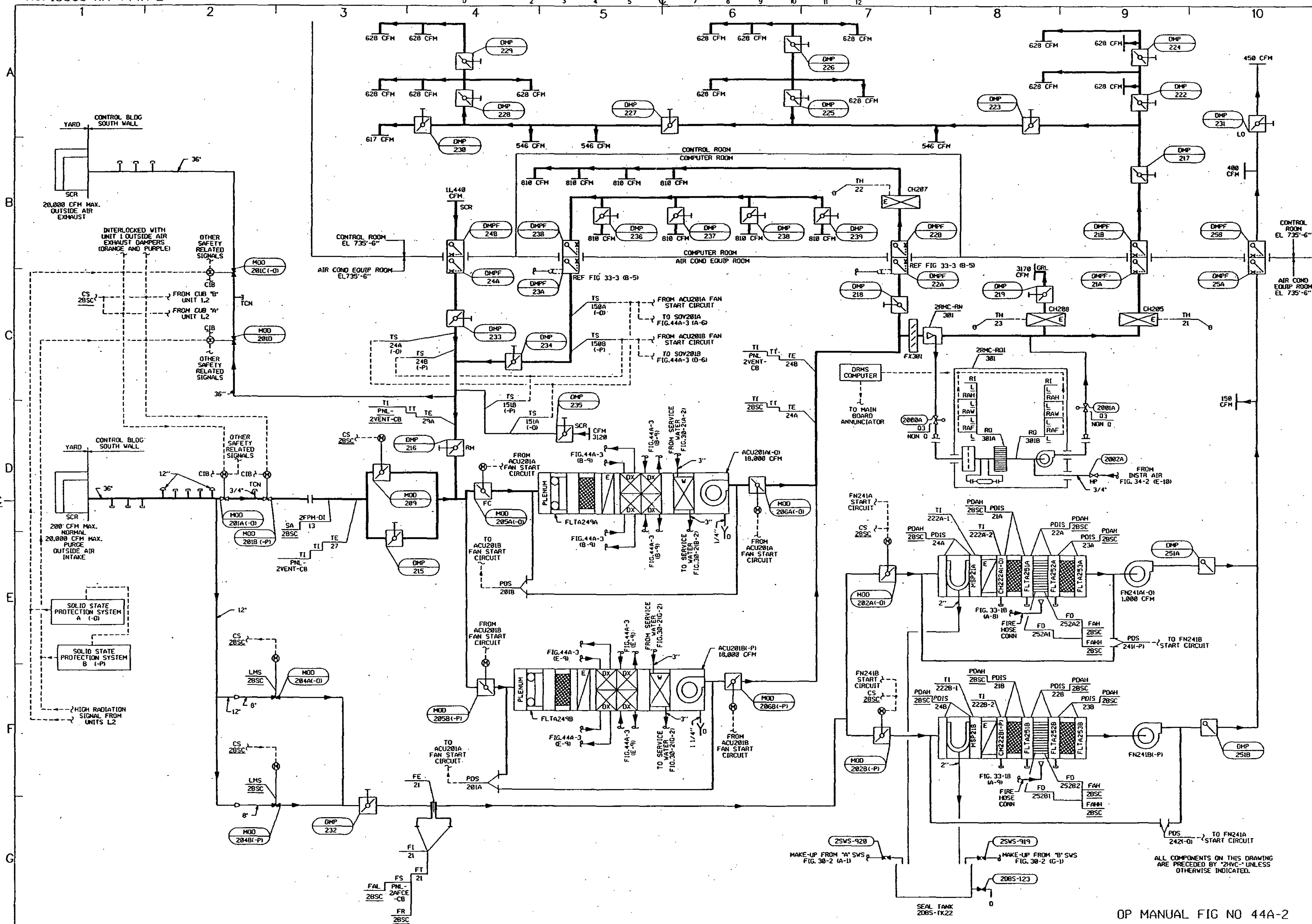
VALVE OPER NO. DIAGRAM
CONTMT AREA VENTILATION SYSTEM

AA 10080-RM-444C-2 4

DATE 02-06-87
DRAWN BY DJ.AVIGNE

13-NOV-1996 12:35

No. 10080-RM-444A-2



PORTIONS OF THIS DIAGRAM ARE NUCLEAR SAFETY RELATED

REVISION 15
INCORPORATED
ECP-06-0204
IDCN 2-RM-0444A-002-E06-0204-01
NOTIFICATION 600267165
ECP-06-0175
IDCN 2-RM-0444A-002-E06-0175-01

FENOC FirstEnergy Nuclear Operating Company

BEAVER VALLEY POWER STATION UNIT NO 2

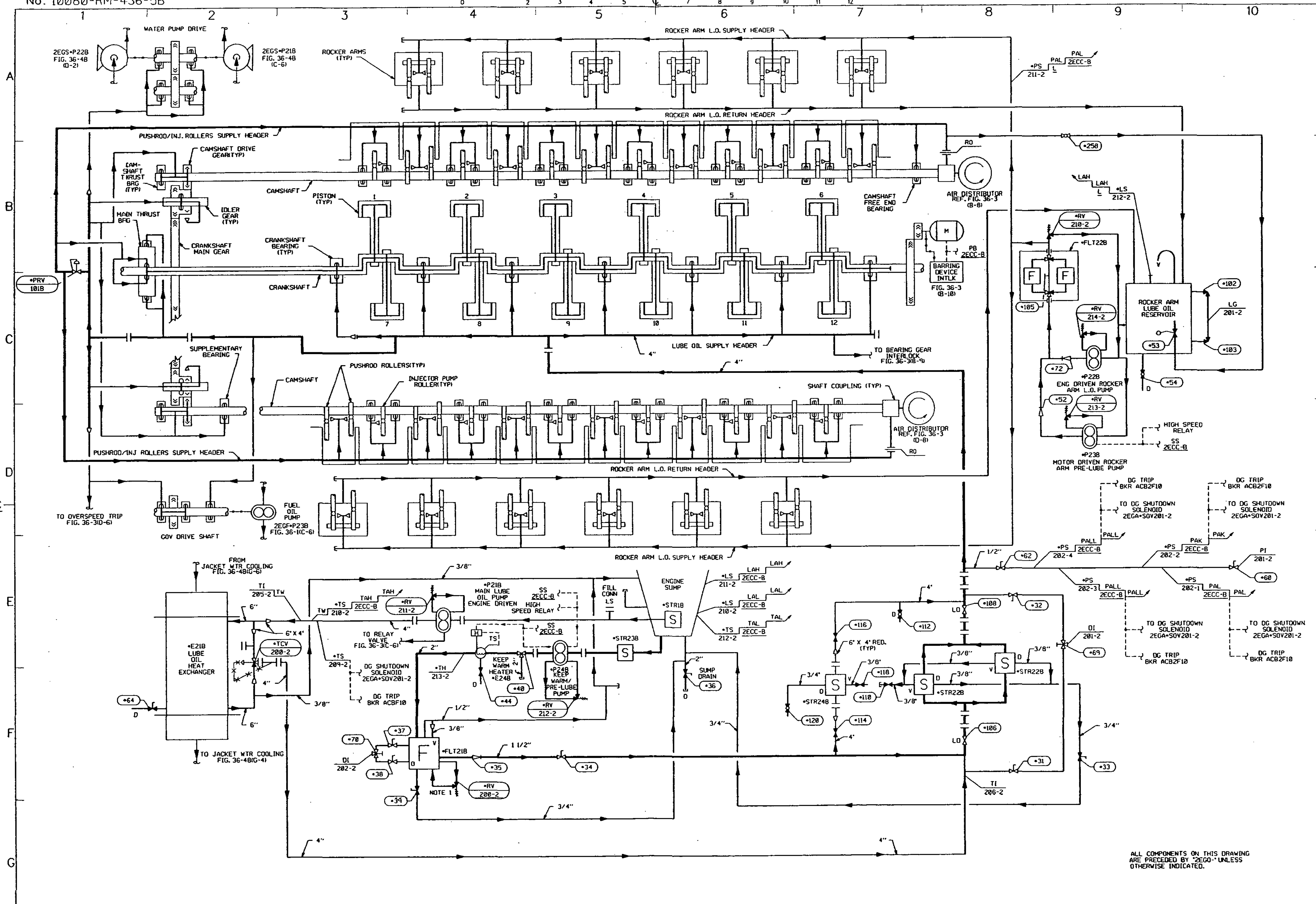
VALVE OPER NO DIAGRAM
COMPUTER AND CONTROL ROOM AIR-COND

SCALE NONE — DATE 8-28-06 — DRAWN BY MYF

AA 10080-RM-444A-2 15

PREPARED ON THE BVPS CAEDD SYSTEM

No. 10080-RM-436-5B



OP MANUAL FIG. NO. 36-5B

Duquesne Light Company — NUCLEAR GROUP — PITTSBURGH,PA

BEAVER VALLEY POWER STATION UNIT NO. 2

VALVE OPER NO. DIAGRAM
DIESEL GEN. LUBE OIL

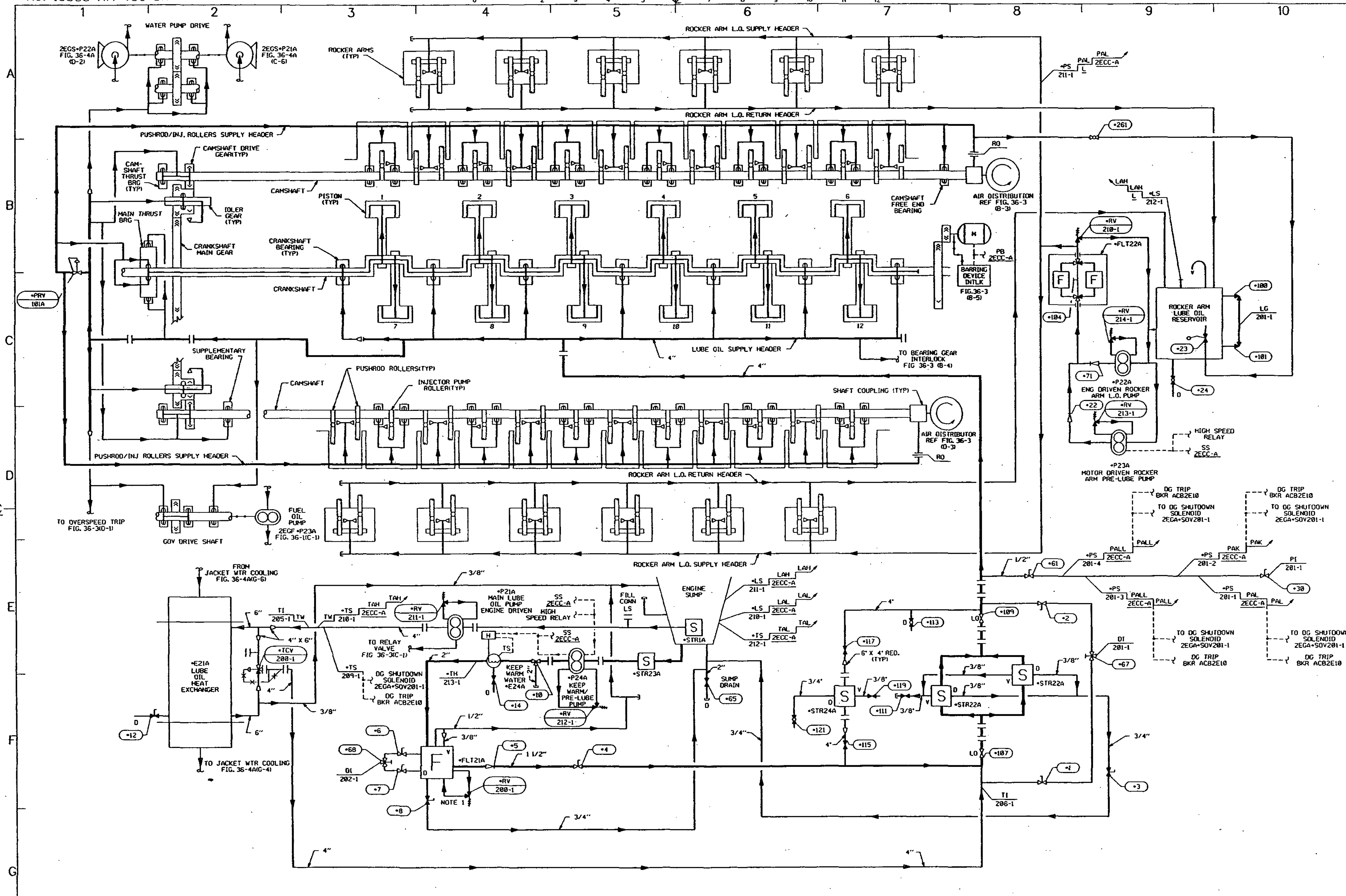
DATE 12-22-86 · DRAWN BY M MURPHY

AA 10080-RM-436-5B REV. 6

ISSUES						
1 ORIGINAL U.N.O.S. FDS 3-2-87	2 INCORP'D VDR 2-87-38 VDR 2-87-63 SATISFIED VDR 2-89-92 U.N.O.S. JFC FOR FDS 4-10-90 WBM 2-20-90 O/CHK: MVF KRV	3 INCORP'D VDR 2-90-12 U.N.O.S. FDS 10-8-90 MVF 9-25-90 O/CHK: MVF/FMC	4 INCORP'D VDR 2-91-204 U.O.M. JFC FOR FDS 3-25-92 MPB 12-04-91 O/CHK: MVF/FMC	5 INCORP'D VDR 2-93-89 U.O.M. FDS 12-13-93 MVF 12-06-93 O/CHK: MVF JMP	6 INCORP'D VCN 2-97-40 REF CR 971841 MVF 1-14-98 O/CHK: MICRO	

14-APR-1998 07:52 K:\U2\M436005B.DGN

No. 10080-RM-436-5A



ALL COMPONENTS ON THIS DRAWING ARE PRECEDED BY "2EGO-" UNLESS OTHERWISE INDICATED.

QUALITY GROUP CLASSIFICATIONS ARE "INCORPORATED BY REFERENCE" INTO THE UFSAR. A CHANGE TO QUALITY GROUP CLASSIFICATIONS CONSTITUTES A CHANGE TO THE UFSAR.

OP MANUAL FIG NO 36-5A

REVISION 6 INCORPORATED ECR-04-0199 CA 04-01109-2

FENOC FirstEnergy Nuclear Operating Company

BEAVER VALLEY POWER STATION UNIT NO 2

VALVE OPER NO DIAGRAM DIESEL GEN. LUBE OIL

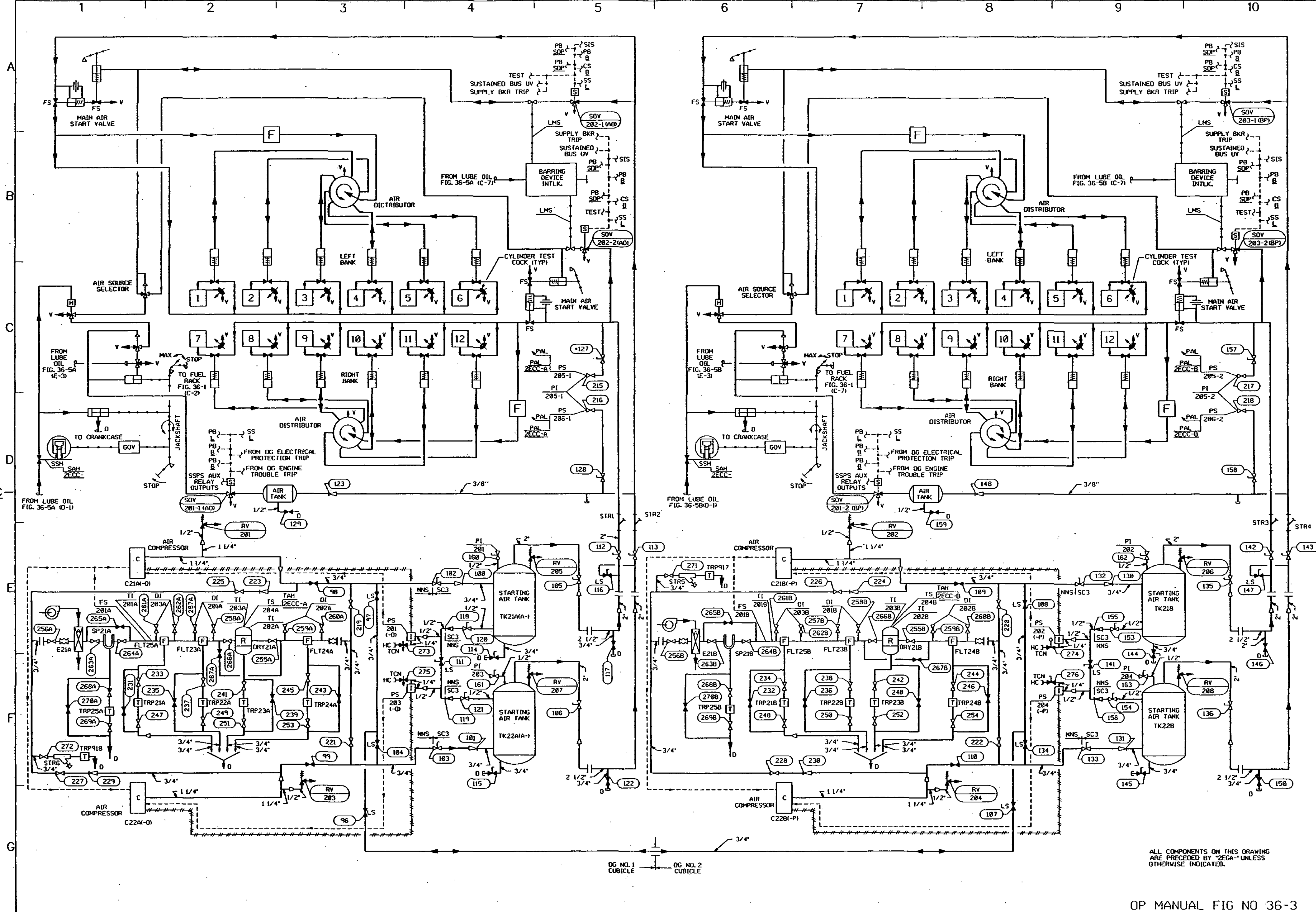
DATE 8-4-04

AA 10080-RM-436-5A 6

PREPARED ON THE BVPS CAEDDS SYSTEM

04-AUG-2004 15:07 K:\u2\M436005A.DGN

No. 10080-RM-436-3



OP MANUAL FIG NO 36-3

REVISION 12
INCORPORATED
ECR 03-0414
CA 03-07126-1

FENOC FirstEnergy Nuclear Operating Company

BEAVER VALLEY POWER STATION UNIT NO 2

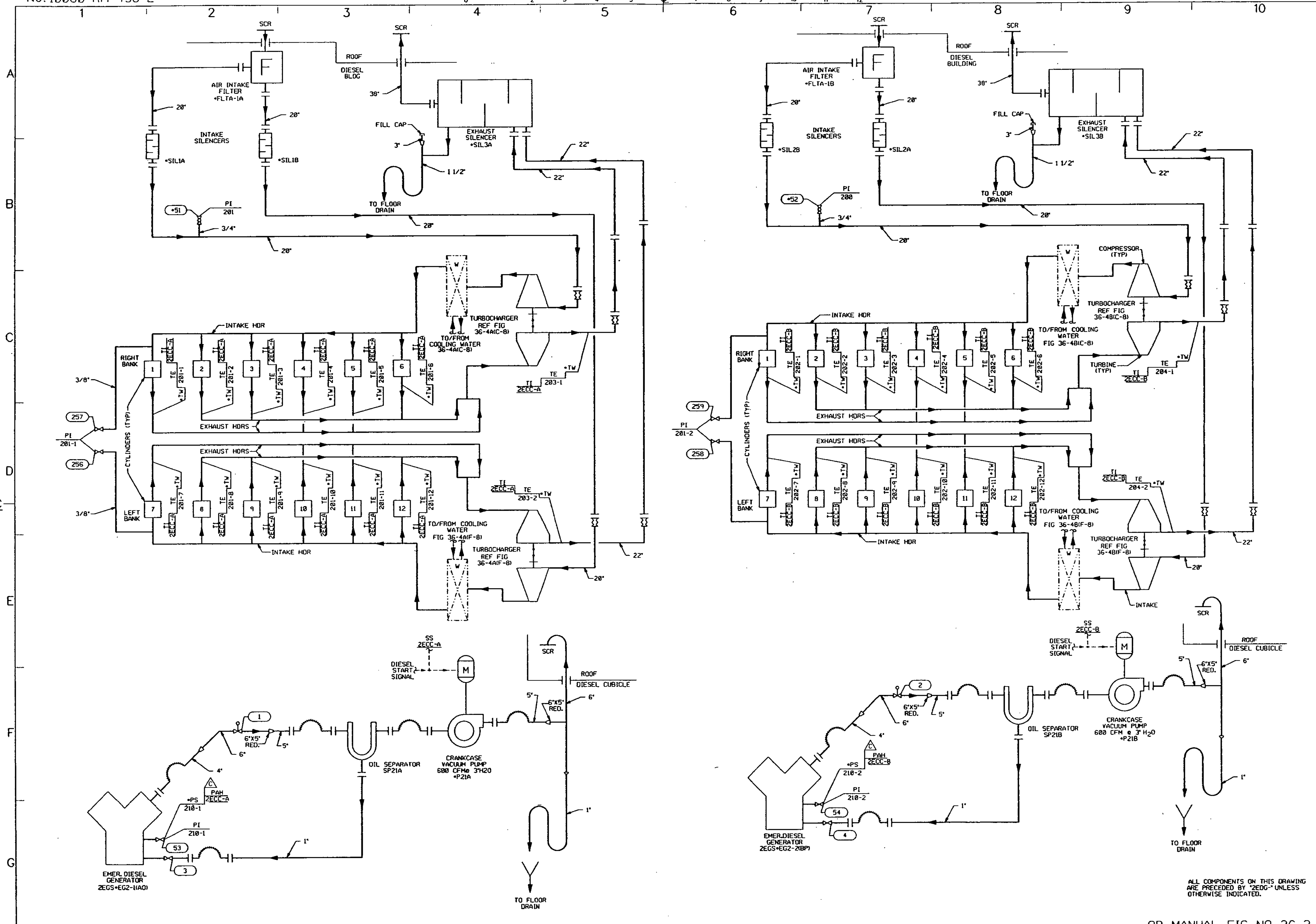
VALVE OPER NO DIAGRAM
DIESEL STARTING AIR

SCALE NONE DATE 9-20-03 DRAWN BY MYF

AA 10080-RM-436-3 12

PREPARED ON THE BVPS CAEDDI SYSTEM

20-SEP-2003 13:41 K:\u2\M4360030.DGN



OP. MANUAL FIG. NO. 36-2

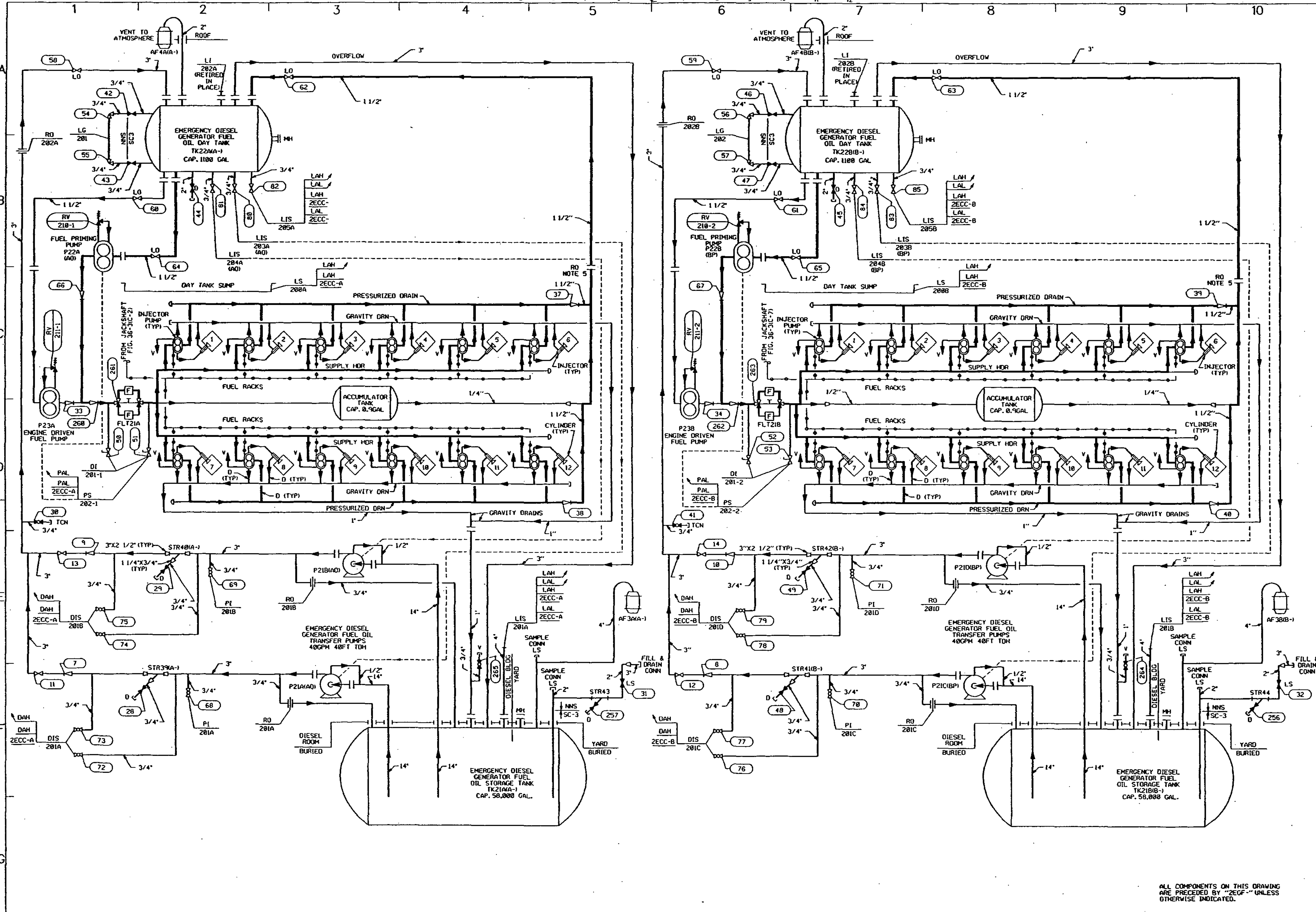
Duquesne Light Company — NUCLEAR GROUP — PITTSBURGH, PA

BEAVER VALLEY POWER STATION UNIT NO. 2

VALVE OPER NO. DIAGRAM
DIESEL AIR INTAKE, EXH & VACUUM

10080-RM-436-2 — 3

No. 10080-RM-436-1



ALL COMPONENTS ON THIS DRAWING ARE PRECEDED BY "2EGF-" UNLESS OTHERWISE INDICATED.

OP MANUAL FIG NO 36-1

REVISION 5
INCORPORATED
ECR-04-0511
CA 04-01807-4
IDCN 2-RM-0436-001-E04-0511-01

FENOC FirstEnergy Nuclear Operating Company

BEAVER VALLEY POWER STATION UNIT NO 2

VALVE OPER NO DIAGRAM
DIESEL FUEL OIL

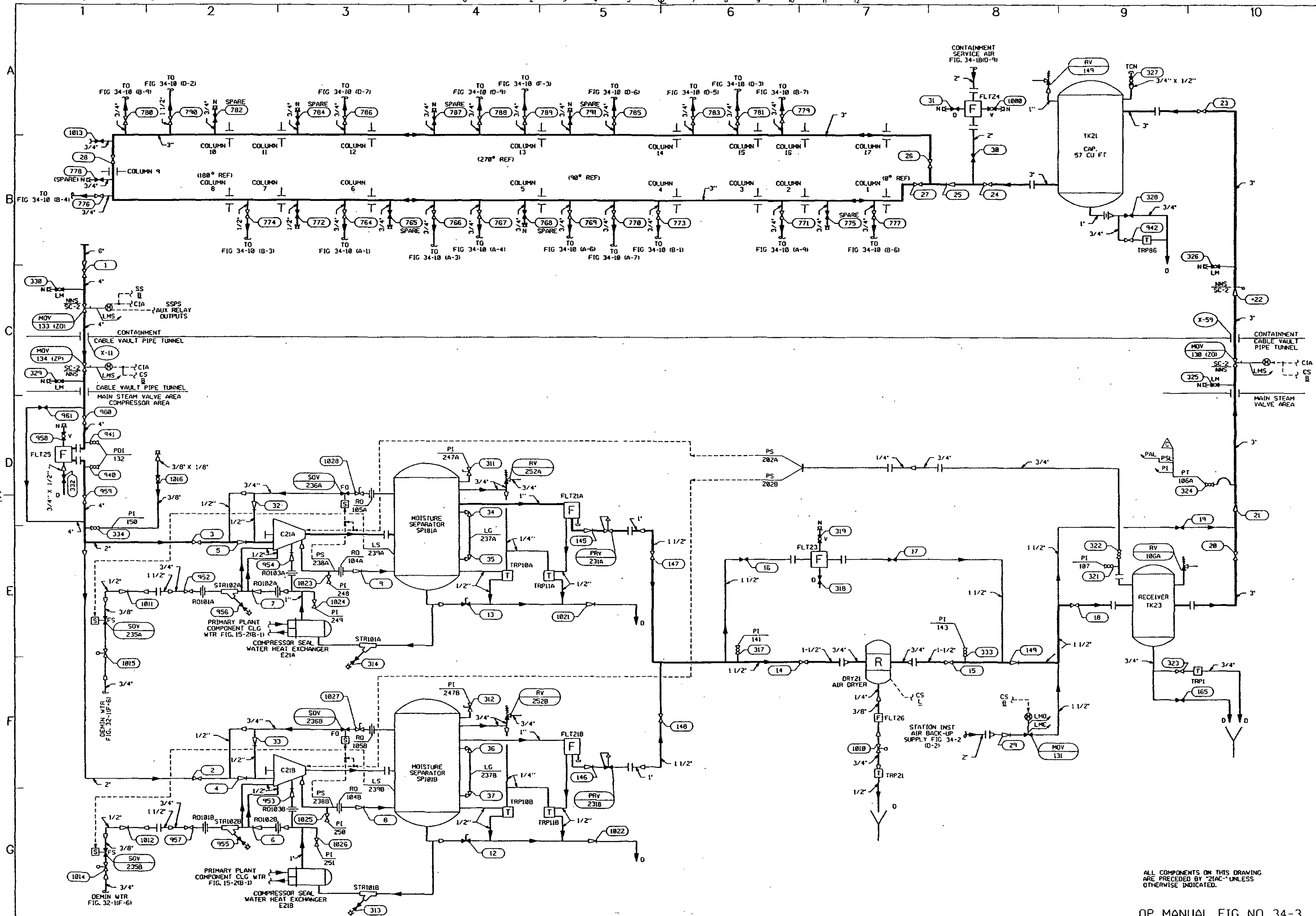
SCALE NONE | DATE 11-10-04 | DRAWN BY MYF

AA | 10080-RM-436-1 | 5

PREPARED ON THE BVPS CAEDDI SYSTEM

10-NOV-2004 14:02 K:\u2\M4360010.DGN

No. 10080-RM-434-3



OP MANUAL FIG NO 34-3

REVISION 14
INCORPORATED
ECR-05-0317
[DCN-2-RM-0434-003-E05-0317-01
CA-04-05743-01

FENOC FirstEnergy Nuclear Operating Company

BEAVER VALLEY POWER STATION UNIT NO 2

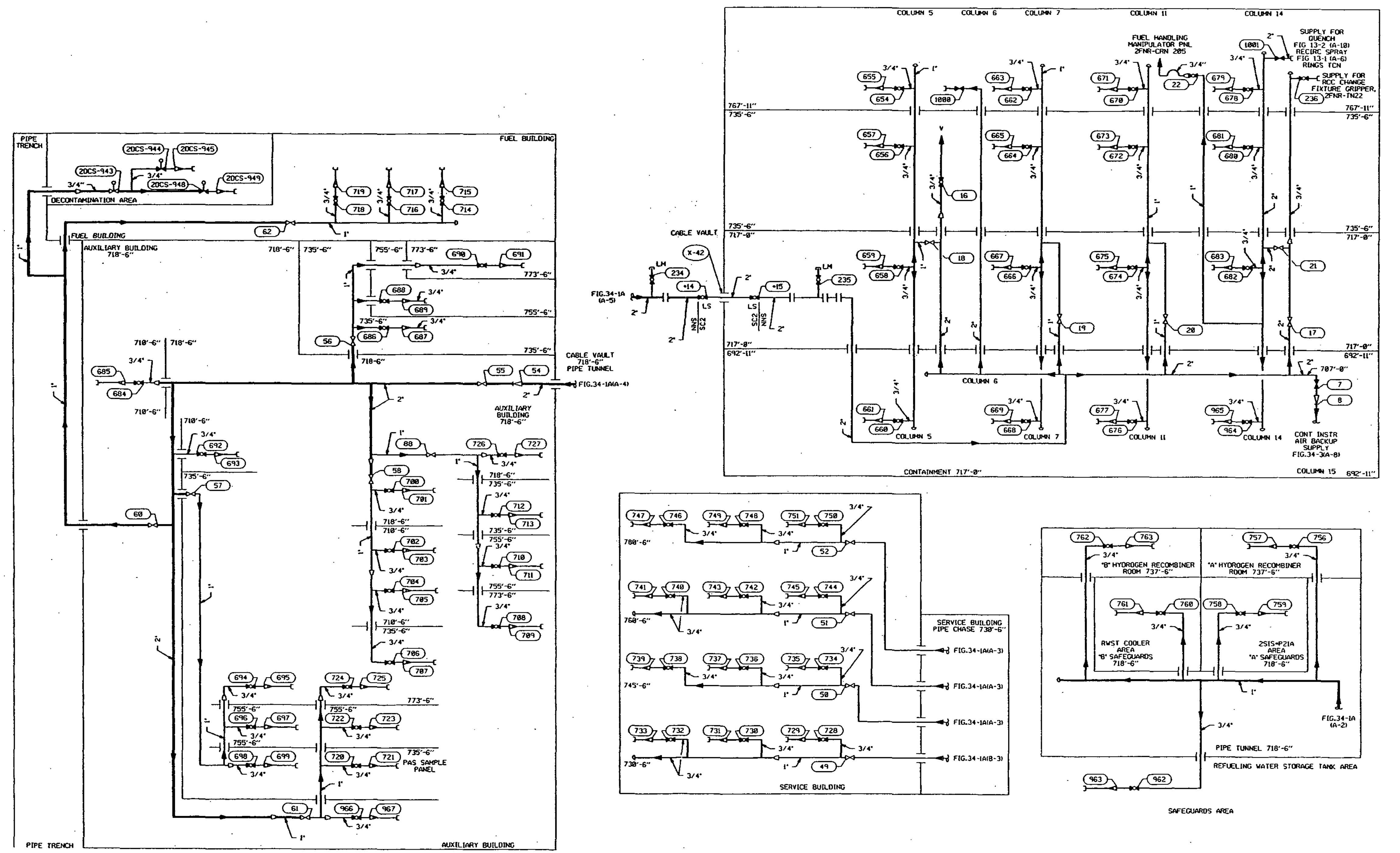
VALVE OPER NO DIAGRAM
CONTAINMENT INSTRUMENT AIR

AA 10080-RM-434-3 14

PREPARED ON THE BVPS CAEDD SYSTEM

09-AUG-2005 09:21 K:\u2\M4340030.DGN

No. 10080-RM-434-1B



ALL COMPONENTS ON THIS DRAWING ARE PRECEDED BY "2SAS-" UNLESS OTHERWISE INDICATED.

OP MANUAL FIG NO 34-1B

REVISION 4
INCORPORATED
CA 02-04981-05
ECR 03-0050
ITEM 57

FENOC FirstEnergy Nuclear Operating Company

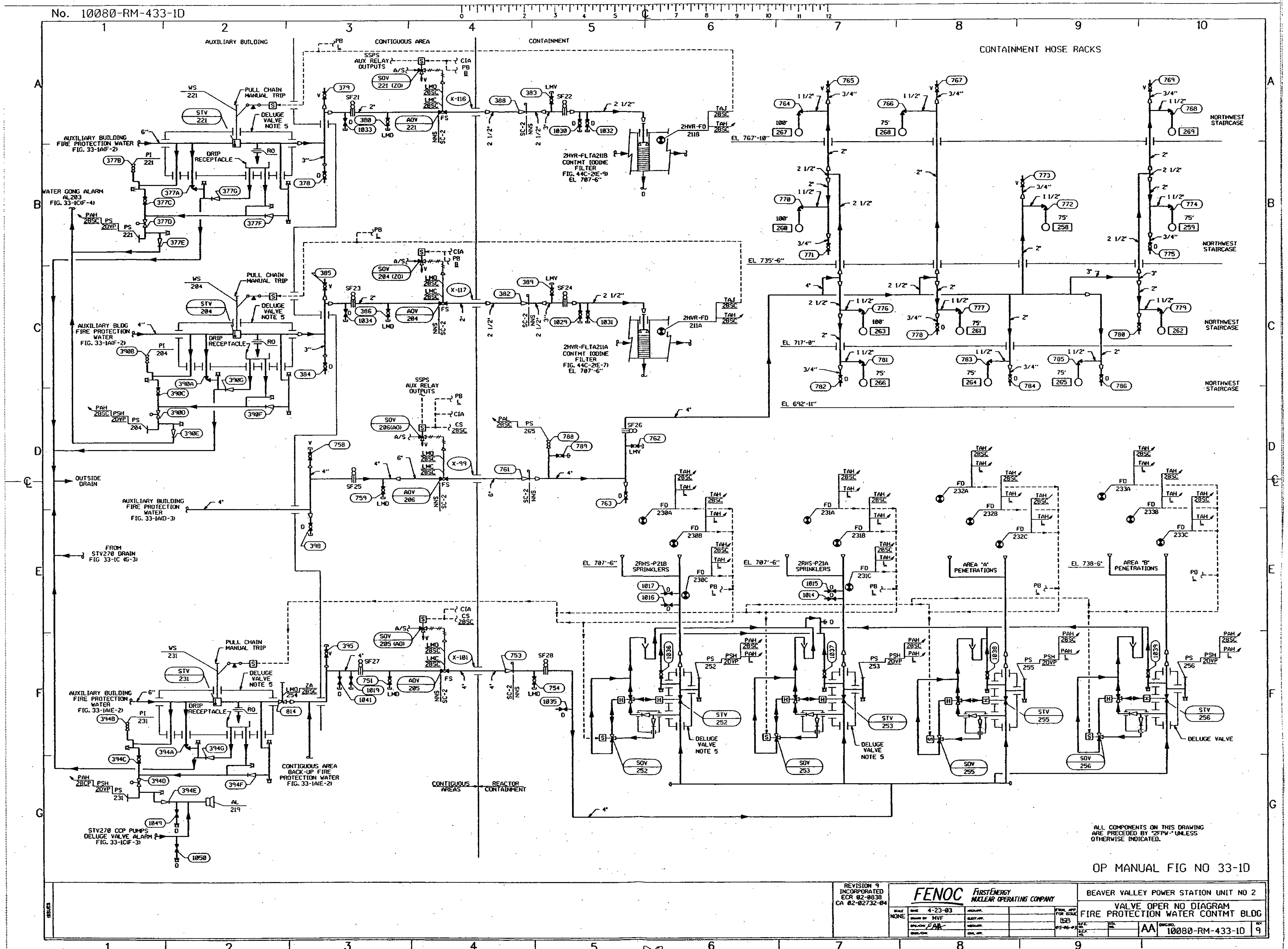
BEAVER VALLEY POWER STATION UNIT NO 2

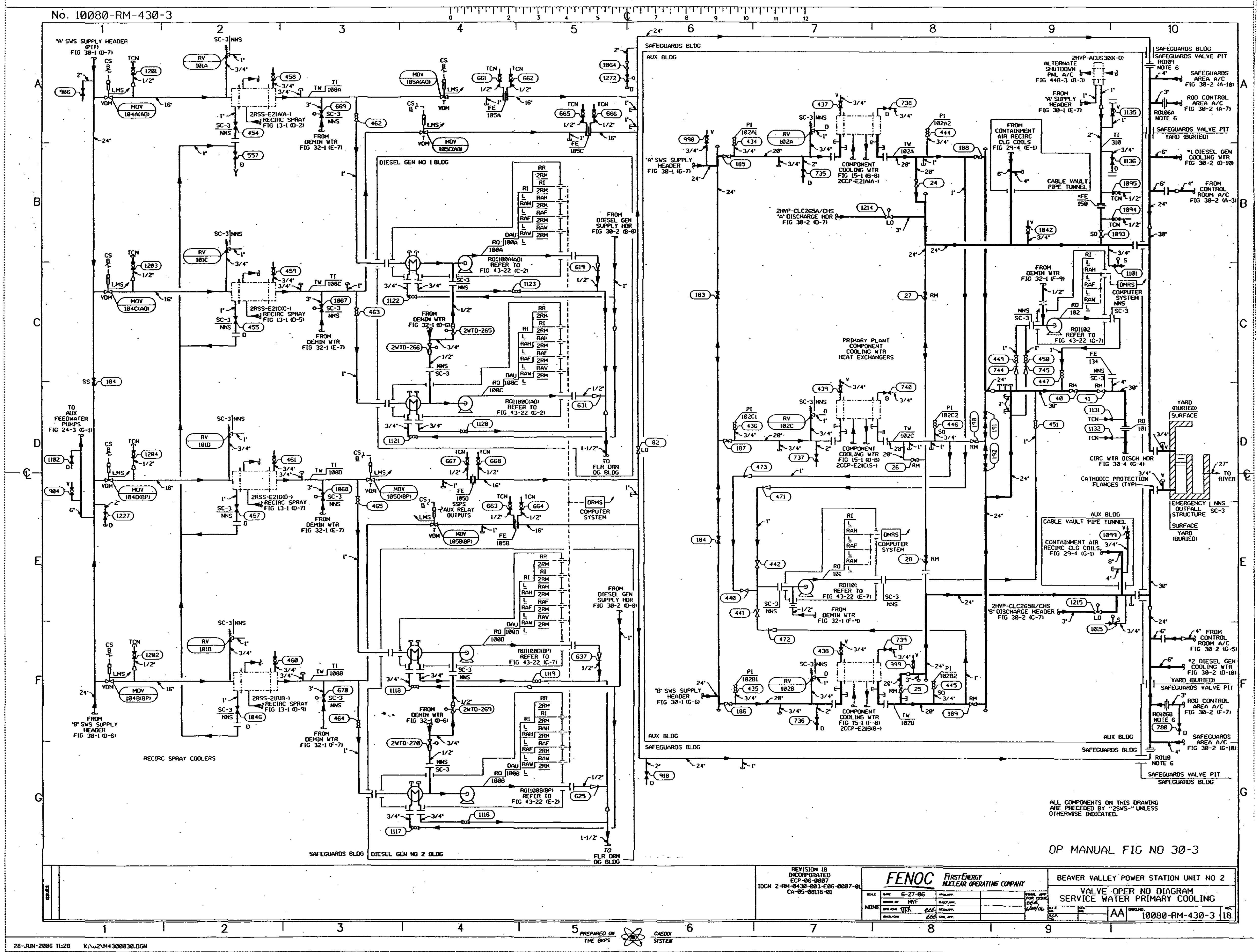
VALVE OPER NO DIAGRAM
SERVICE AIR SYSTEM-DISTRIBUTION

SCALE NONE | DATE 7-17-03 | DRAWN BY MYF | AA | 10080-RM-434-1B | REV. 4

PREPARED ON THE BVPS CAEDD SYSTEM

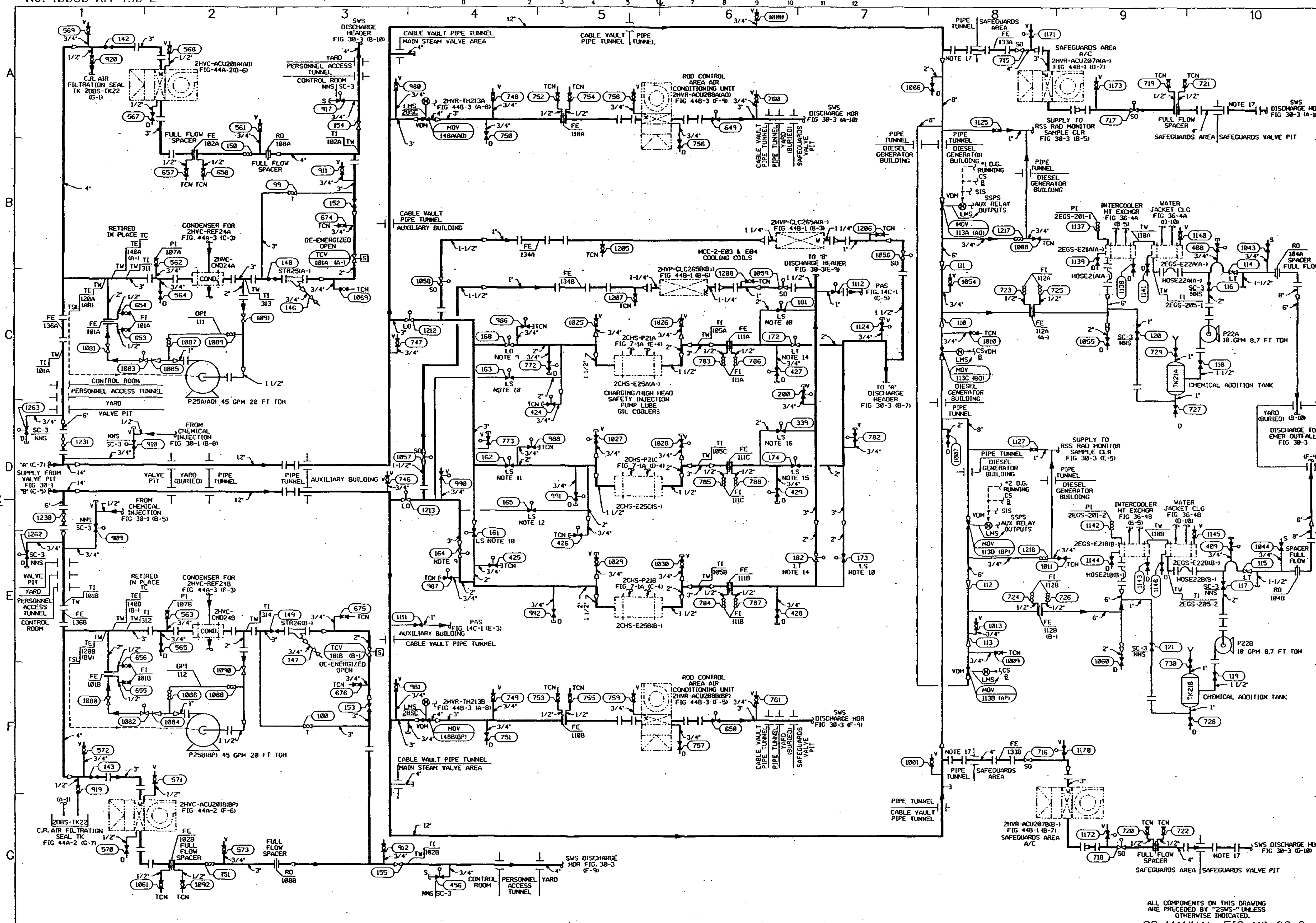
28-JUL-2003 15:13 K:\u2\M434001B.DGN


No. 10080-RM-433-1D
AUXILIARY BUILDING
CONTIGUOUS AREA
CONTAINMENT
CONTAINMENT HOSE RACKS
NORTHWEST STAIRCASE
EL 767'-10"
EL 735'-6"
EL 717'-0"
EL 692'-11"
AUXILIARY BUILDING FIRE PROTECTION WATER FIG. 33-1A(F-2)
AUXILIARY BLDG FIRE PROTECTION WATER FIG. 33-1A(F-2)
AUXILIARY BUILDING FIRE PROTECTION WATER FIG. 33-1A(D-3)
AUXILIARY BUILDING FIRE PROTECTION WATER FIG. 33-1A(E-2)
WATER GONG ALARM AL203 FIG. 33-1C(F-4)
PULL CHAIN MANUAL TRIP
DELUGE VALVE NOTE 5
DRIP RECEPTACLE
SSPS AUX RELAY OUTPUTS
2HVR-FLTA21IB CONTMT IODINE FILTER FIG. 44C-2(E-9) EL 707'-6"
2HVR-FLTA21IA CONTMT IODINE FILTER FIG. 44C-2(E-7) EL 707'-6"
OUTSIDE DRAIN
FROM STV270 DRAIN FIG 33-1C (G-3)
CONTIGUOUS AREA BACK-UP FIRE PROTECTION WATER FIG. 33-1A(E-2)
STV270 CCP PUMPS DELUGE VALVE ALARM FIG. 33-1C(F-3)
CONTIGUOUS AREAS
REACTOR CONTAINMENT
2RHS-P21B SPRINKLERS
2RHS-P21A SPRINKLERS
AREA "A" PENETRATIONS
AREA "B" PENETRATIONS
DELUGE VALVE
ALL COMPONENTS ON THIS DRAWING ARE PRECEDED BY "2FPW-" UNLESS OTHERWISE INDICATED.
OP MANUAL FIG NO 33-1D
REVISION 9 INCORPORATED ECR 02-0838 CA 02-02732-04
FENOC FirstEnergy Nuclear Operating Company
BEAVER VALLEY POWER STATION UNIT NO 2
VALVE OPER NO DIAGRAM
FIRE PROTECTION WATER CONTMT BLDG
SCALE NONE
DATE 4-23-03
DRAWN BY MVF
AA 10080-RM-433-1D 9
PREPARED ON THE BVPS CAEDDI SYSTEM
23-APR-2003 11:00 K:\u2\M433001D.DGN



No. 10080-RM-430-3
"A" SWS SUPPLY HEADER (PIT) FIG 30-1 (D-7)
"B" SWS SUPPLY HEADER FIG 30-1 (D-6)
TO AUX FEEDWATER PUMPS FIG 24-3 (G-1)
RECIRC SPRAY COOLERS
DIESEL GEN NO 1 BLDG
SAFEGUARDS BLDG
DIESEL GEN NO 2 BLDG
FROM DIESEL GEN SUPPLY HDR FIG 30-2 (B-8)
TO FLR DRN DG BLDG
AUX BLDG
PRIMARY PLANT COMPONENT COOLING WTR HEAT EXCHANGERS
COMPONENT COOLING WTR FIG 15-1 (B-8) 2CCP-E21A(A-)
COMPONENT COOLING WTR FIG 15-1 (D-8) 2CCP-E21C(S-)
COMPONENT COOLING WTR FIG 15-1 (F-8) 2CCP-E21B(B-)
2HVP-CLC265A/CHS "A" DISCHARGE HDR FIG 30-2 (D-7)
2HVP-CLC265B/CHS "B" DISCHARGE HEADER FIG 30-2 (C-7)
FROM CONTAINMENT AIR RECIRC CLG COILS FIG 29-4 (E-1)
CABLE VAULT PIPE TUNNEL
CONTAINMENT AIR RECIRC CLG COILS FIG 29-4 (G-1)
CIRC WTR DISCH HDR FIG 30-4 (G-4)
CATHODIC PROTECTION FLANGES (TYP)
EMERGENCY OUTFALL STRUCTURE
TO RIVER
SAFEGUARDS VALVE PIT
YARD (BURIED)
ALL COMPONENTS ON THIS DRAWING ARE PRECEDED BY "2SWS-" UNLESS OTHERWISE INDICATED.
OP MANUAL FIG NO 30-3
REVISION 18 INCORPORATED ECP-06-0087 IDCN 2-RM-0430-003-E06-0007-01 CA-05-08118-01
FENOC FirstEnergy Nuclear Operating Company
BEAVER VALLEY POWER STATION UNIT NO 2
VALVE OPER NO DIAGRAM SERVICE WATER PRIMARY COOLING
6-27-06
AA 10080-RM-430-3 18
PREPARED ON THE BVPS CAEDDI SYSTEM
28-JUN-2006 11:28 k:\u2\M4300030.DGN

No. 10080-RM-430-2



ALL COMPONENTS ON THIS DRAWING ARE PRECEDED BY "2SWS-" UNLESS OTHERWISE INDICATED.

PORTIONS OF THIS DIAGRAM ARE NUCLEAR SAFETY RELATED

OP MANUAL FIG NO 30-2

REVISION 35 INCORPORATED ECP-03-0061 IDCN 2-RM-0430-002-E03-0061-01

FENOC FirstEnergy Nuclear Operating Company

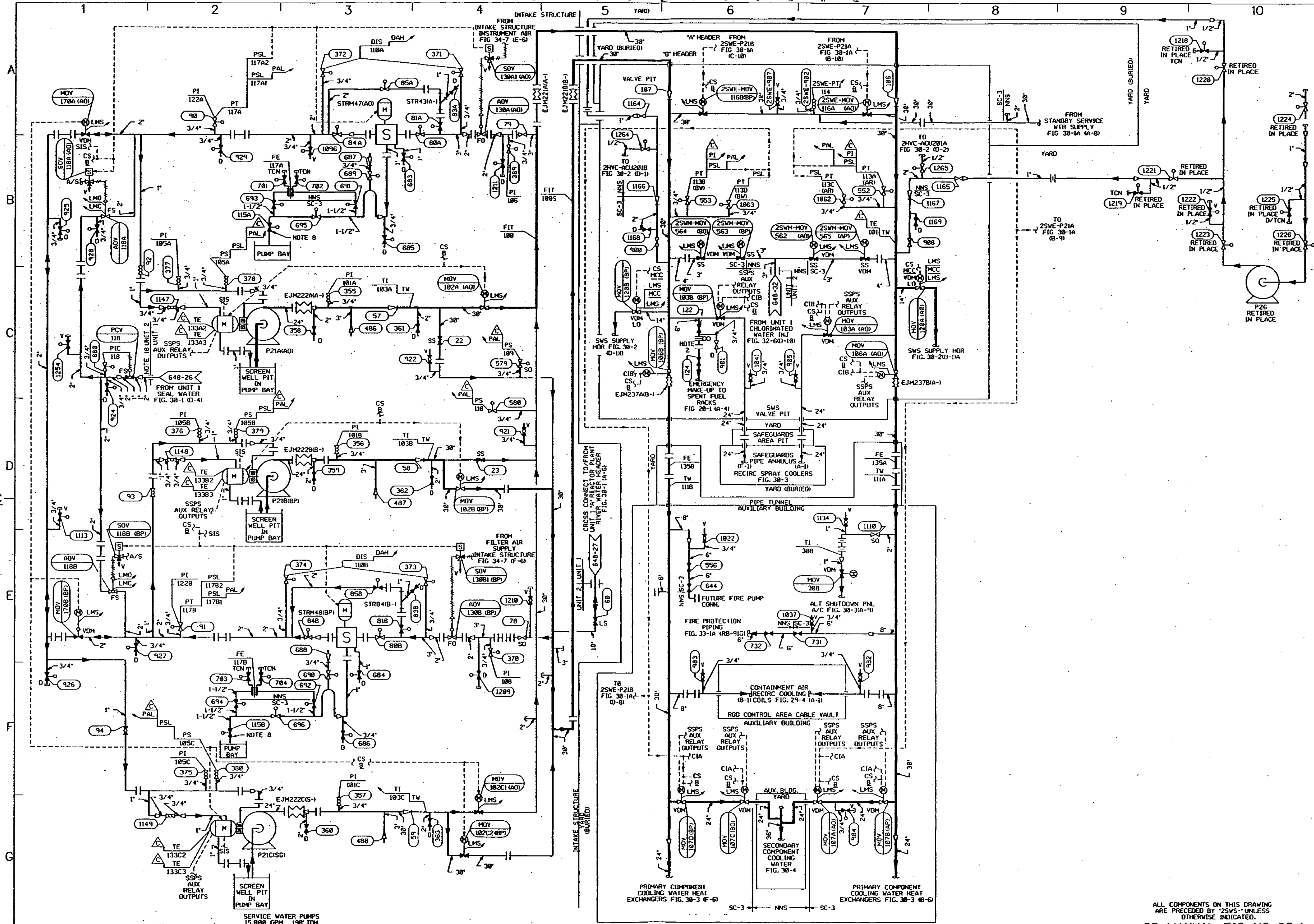
BEAVER VALLEY POWER STATION UNIT NO 2

VALVE OPER NO DIAGRAM
SERVICE WATER PRIMARY COOLING

AA 10080-RM-430-2 35

10-OCT-2006 09:52 K:\u2\M4300020.DGN

No. 10080-RM-430-1



ALL COMPONENTS ON THIS DRAWING ARE PRECEDED BY "2SWS-" UNLESS OTHERWISE INDICATED.

PORTIONS OF THIS DIAGRAM ARE NUCLEAR SAFETY RELATED OP MANUAL FIG NO 30-1

REVISION 31 INCORPORATED ECP-02-0133
DDCN 2-RM-0430-001-E02-0133-01
DDCN 2-RM-0430-001-E02-0133-04
DDCN 2-RM-0430-001-E02-0133-05

FENOC FirstEnergy Nuclear Operating Company

BEAVER VALLEY POWER STATION UNIT NO 2

VALVE OPER NO DIAGRAM
SERVICE WTR SUPPLY & DISTRIBUTION

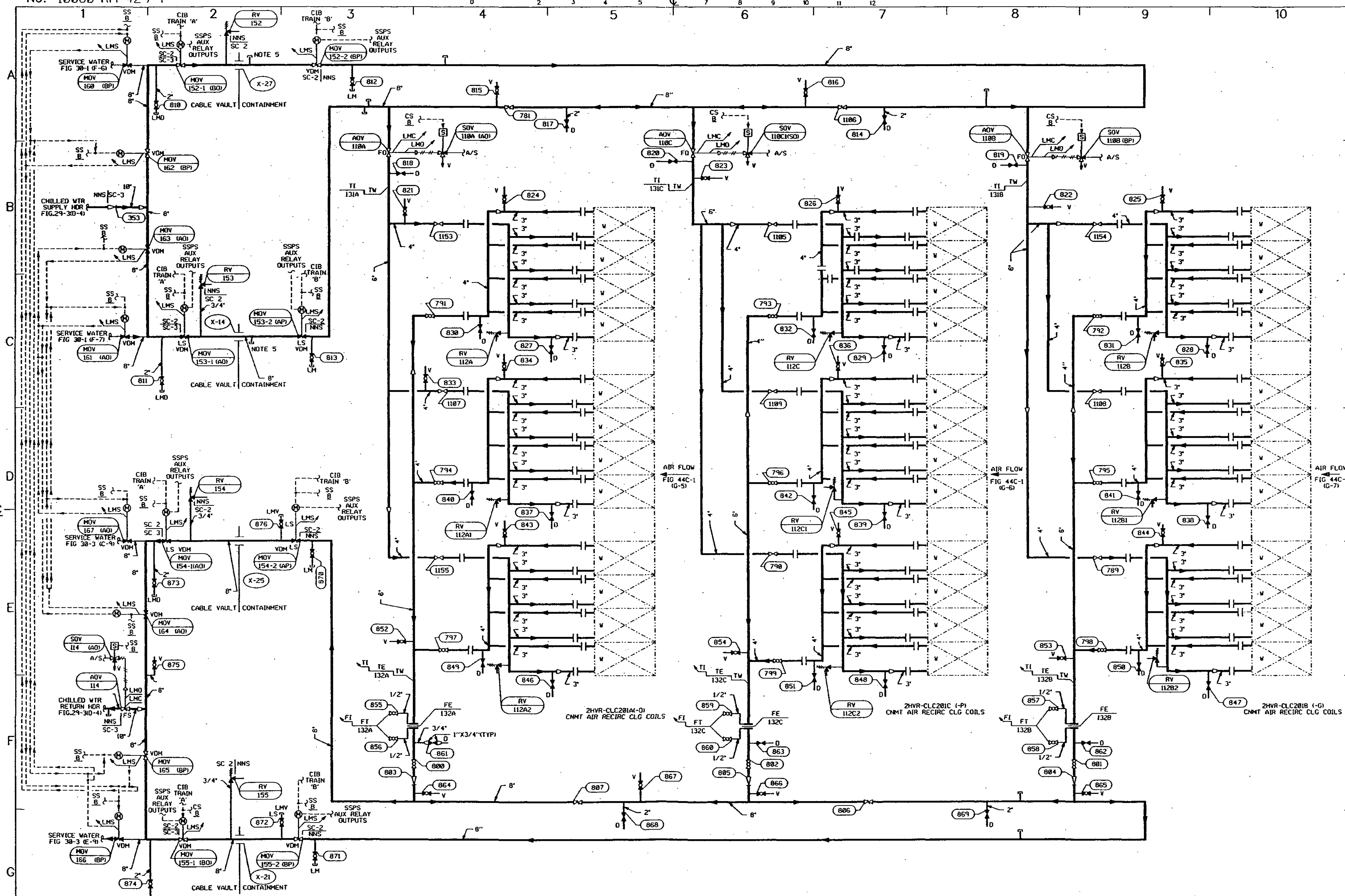
DATE 10-24-06 DRAWN BY MYF SCALE NONE

AA 10080-RM-430-1 31

PREPARED ON THE BVPS CAEDD SYSTEM

24-OCT-2006 14:22 K:\u2\RM4300010.DGN

No. 10080-RM-429-4



ALL COMPONENTS ON THIS DRAWING ARE PRECEDED BY "2SWS" UNLESS OTHERWISE INDICATED.

OP MANUAL FIG NO 29-4

REVISION 11 INCORPORATED ECP-06-0007 DCN-2-RM-0429-004-E06-0007-01 CA-05-08118-01

FENOC FirstEnergy Nuclear Operating Company

DATE 6-27-06 DRAWN BY MVF

BEAVER VALLEY POWER STATION UNIT NO 2

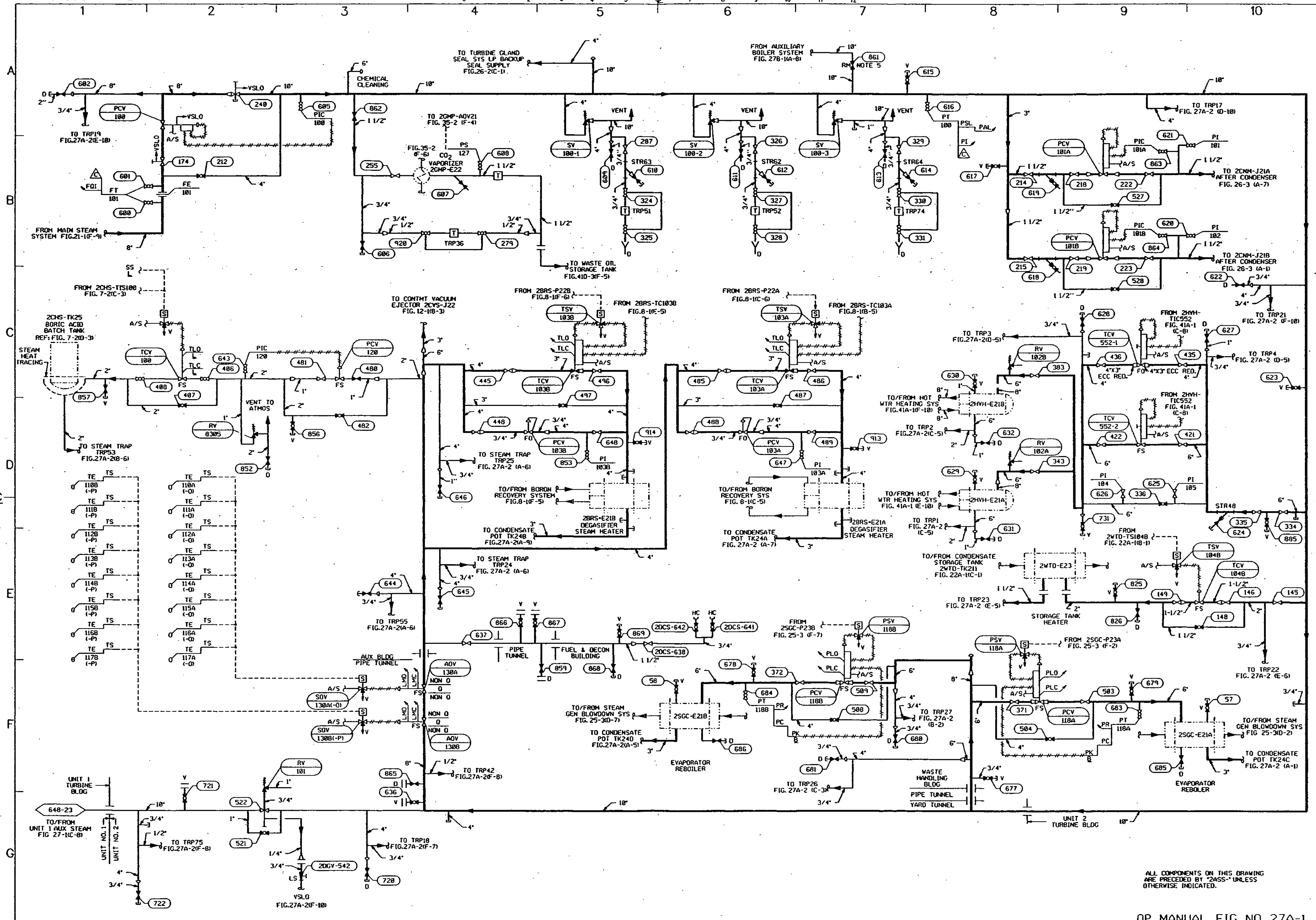
VALVE OPER NO DIAGRAM CHILLED WATER - CONTAINMENT

AA 10080-RM-429-4 11

PREPARED ON THE BVPS CAEDOI SYSTEM

26-JUN-2006 12:55 K:\w2\M4290040.DGN

No. 10080-RM-427A-1



ALL COMPONENTS ON THIS DRAWING ARE PRECEDED BY "2ASS-" UNLESS OTHERWISE INDICATED.

OP MANUAL FIG NO 27A-1

REVISION 14 INCORPORATED ECP-06-0007 IDCN-2-RM-0427A-001-E06-0007-01 CA-05-08118-01

FENOC FirstEnergy Nuclear Operating Company

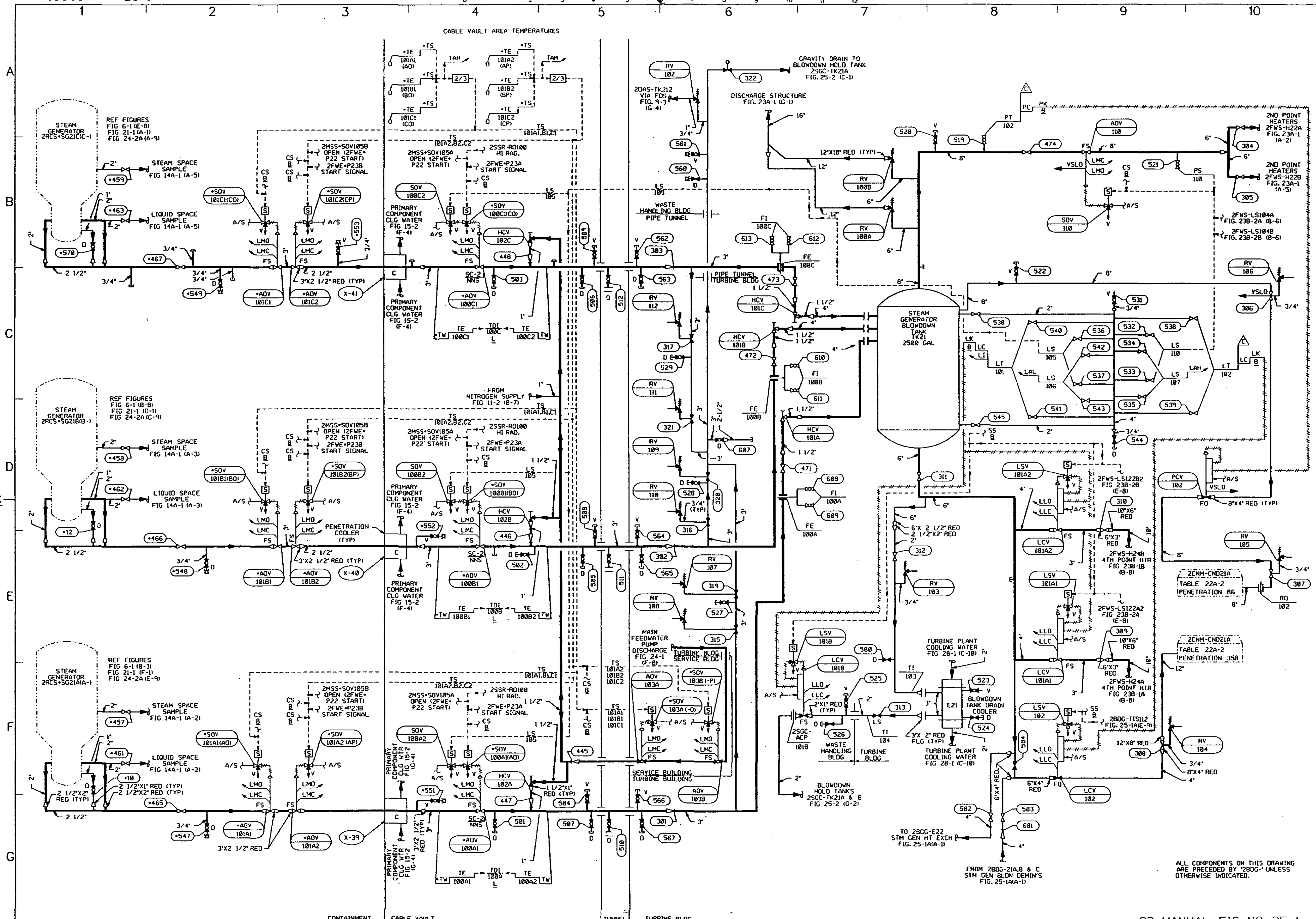
BEAVER VALLEY POWER STATION UNIT NO 2

VALVE OPER NO DIAGRAM
AUX STM & CONDENSATE-STEAM

SCALE NONE | DATE 6-27-06 | DRAWN BY MVF | AA | 10080-RM-427A-1 | 14

PREPARED ON THE BVPS CAEDD SYSTEM

No. 10080-RM-425-1



OP. MANUAL FIG. NO. 25-1

Duquesne Light Company NUCLEAR GROUP — PITTSBURGH, PA

BEAVER VALLEY POWER STATION UNIT NO. 2

VALVE OPER NO. DIAGRAM
STEAM GENERATOR BLOWDOWN

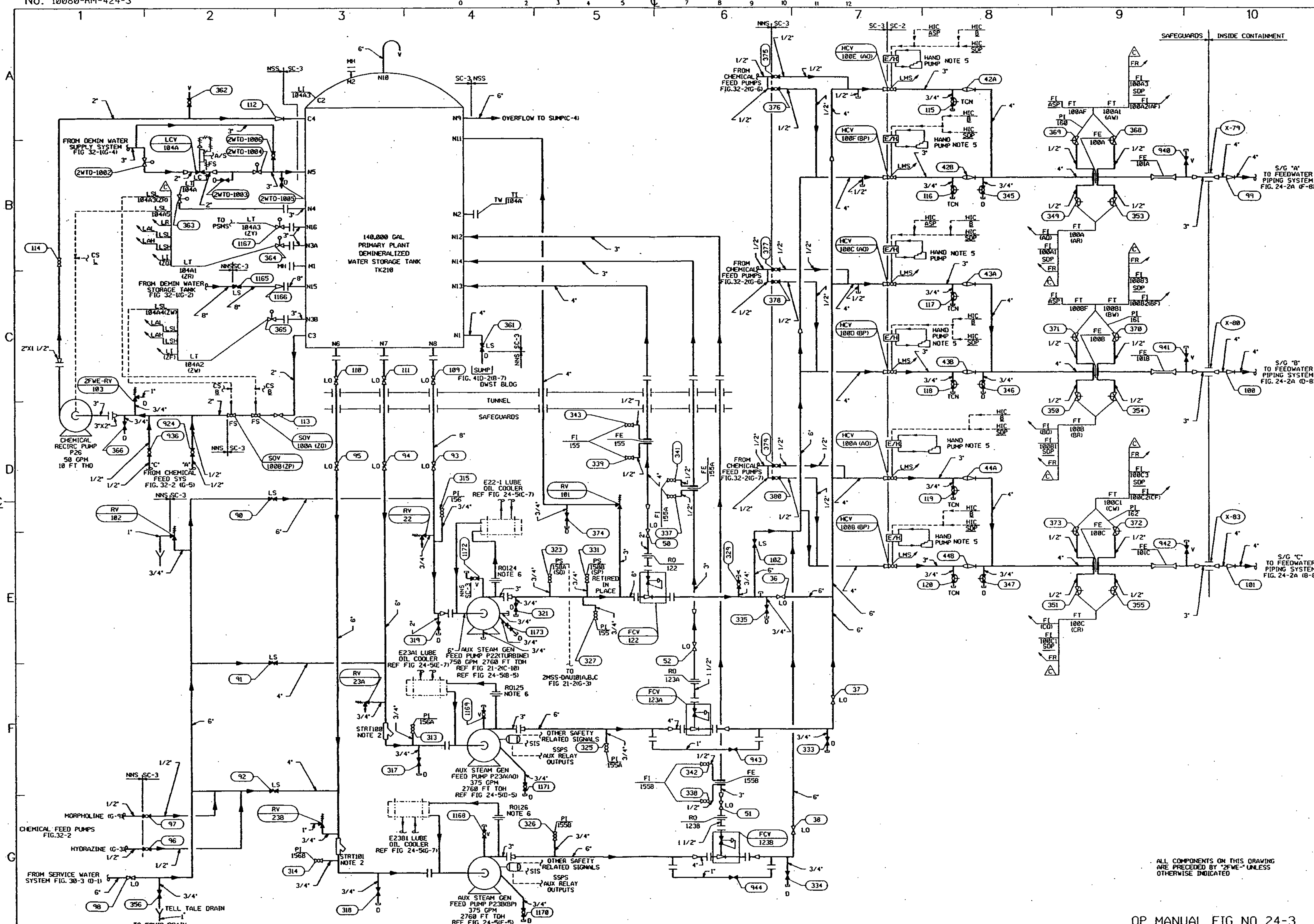
DRAWN BY K.CLARKE — DATE 01-14-87

AA 10080-RM-425-1 11

29-SEP-2000 16:05 G:\u2\M4250010.DGN

PREPARED ON THE MEAD CAEDOS SYSTEM

No. 10080-RM-424-3



ALL COMPONENTS ON THIS DRAWING ARE PRECEDED BY "2FWE-" UNLESS OTHERWISE INDICATED

OP MANUAL FIG NO 24-3

REVISION 9 INCORPORATED ECR 02-0839 CA 02-02732-04

FENOC FirstEnergy Nuclear Operating Company

BEAVER VALLEY POWER STATION UNIT NO 2

VALVE OPER NO DIAGRAM
AUXILIARY FEEDWATER

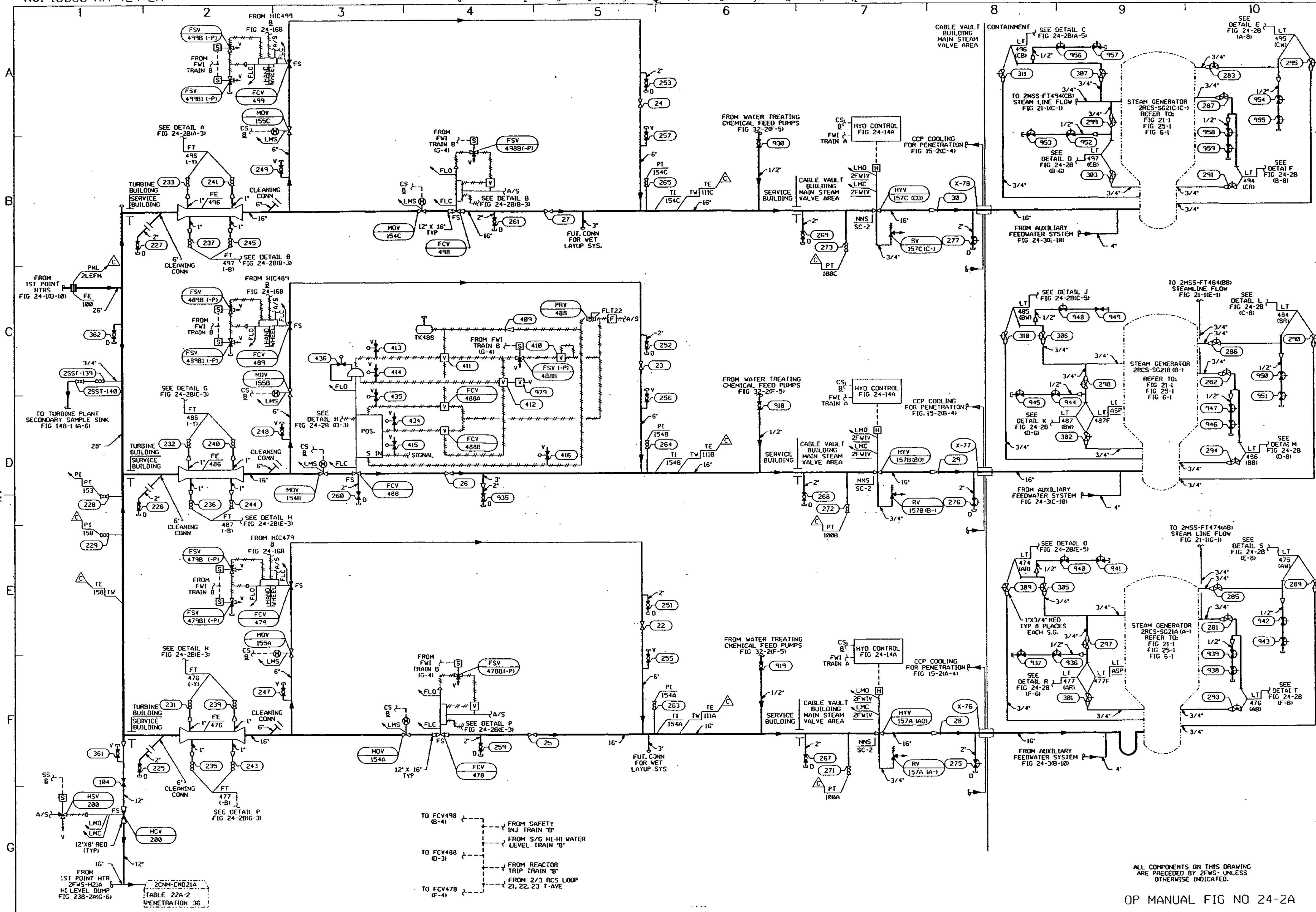
DATE 4-25-03 — DRAWN BY MVF — SCALE NONE

AA 10080-RM-424-3 — REV. 9

PREPARED ON THE BVPS CAEDDI SYSTEM

25-APR-2003 10:29 K:\u2\rm4240030.dgn

No. 10080-RM-424-2A



ALL COMPONENTS ON THIS DRAWING ARE PRECEDED BY 2FWS- UNLESS OTHERWISE INDICATED.

OP MANUAL FIG NO 24-2A

REVISION 11
INCORPORATED
ECR-05-0324
IDCN 2-RM-0424-002A-E05-0324-01
TM-2-05-015
IDCN 2-RM-0424-002A-T2-05-015-01

FENOC FirstEnergy Nuclear Operating Company

BEAVER VALLEY POWER STATION UNIT NO 2

VALVE OPER NO DIAGRAM
MAIN FEEDWATER SYSTEM SH 2

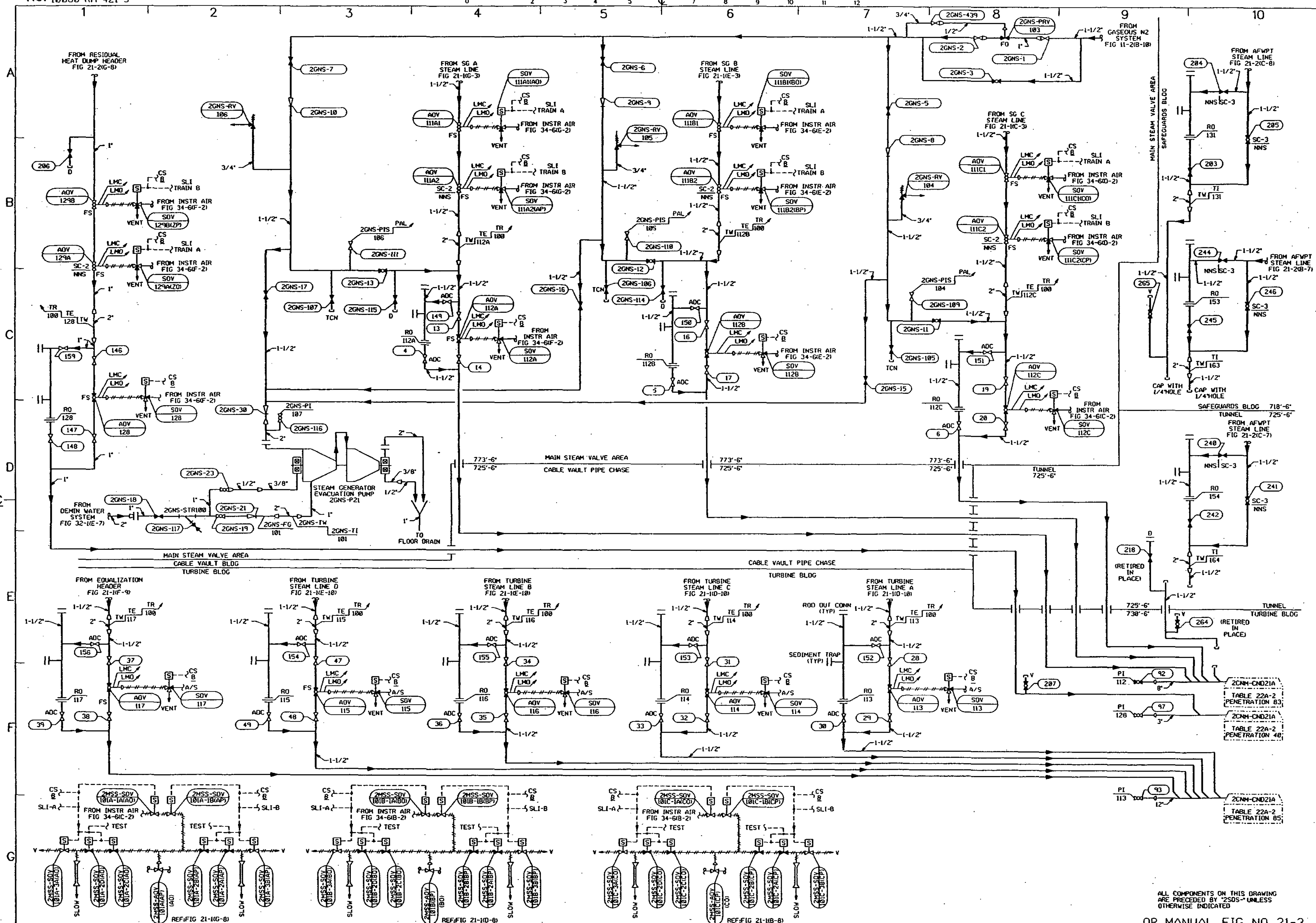
NONE | 11-22-05 | MVF

AA | 10080-RM-424-2A | 11

PREPARED ON THE BVPS CAEGDI SYSTEM

22-NOV-2005 09:21 K:\u2\M424002A.DGN

No. 10080-RM-421-3



ALL COMPONENTS ON THIS DRAWING ARE PRECEDED BY "2SDS-" UNLESS OTHERWISE INDICATED

OP MANUAL FIG NO 21-3

REVISION 10 INCORPORATED ECR 02-0838 CA 02-02732-04

FENOC FirstEnergy Nuclear Operating Company

BEAVER VALLEY POWER STATION UNIT NO 2

VALVE OPER NO DIAGRAM
STEAM DRAINS

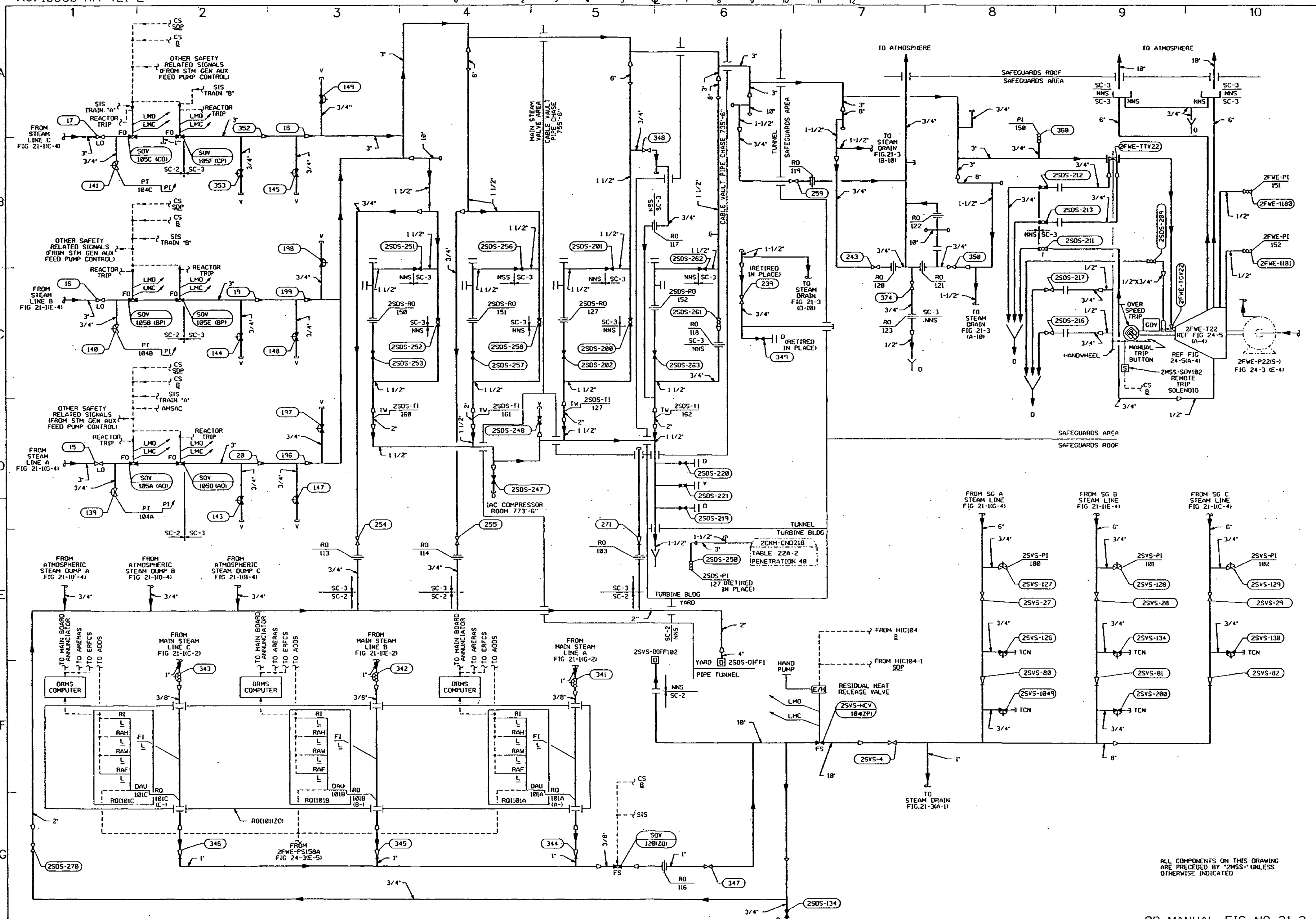
SCALE NONE | DATE 4-2-03 | DRAWN BY MVF

AA 10080-RM-421-3 10

PREPARED ON THE BVPS CAEDOI SYSTEM

02-APR-2003 15:03 K:\u2\M421803Ø.DGN

No. 10080-RM-421-2



OP MANUAL FIG NO 21-2

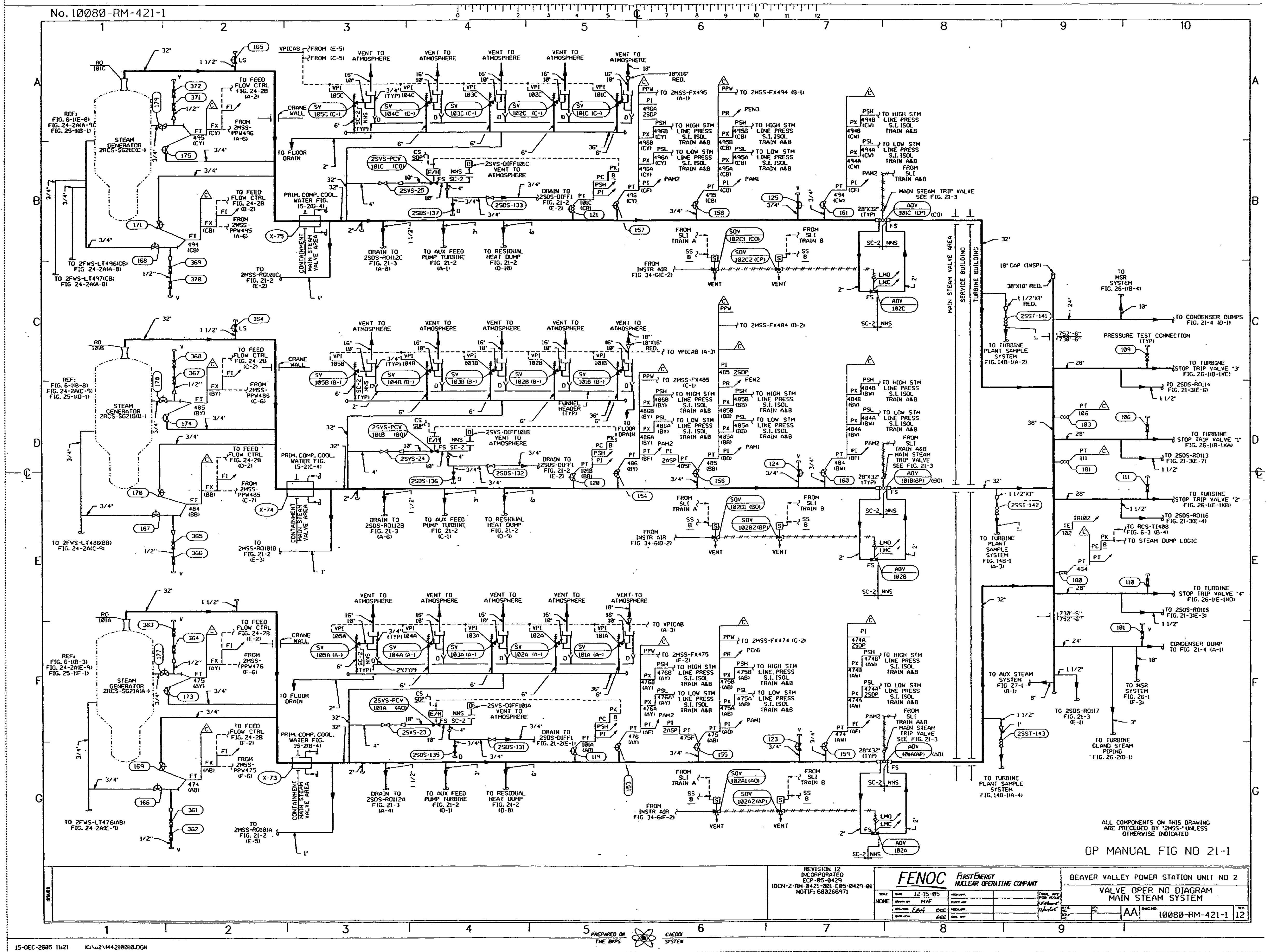
REVISION 16 INCORPORATED ECP-05-0429 10CN-2-RM-0421-002-E05-0429-01 NOTIF: 600266971

FENOC FirstEnergy Nuclear Operating Company

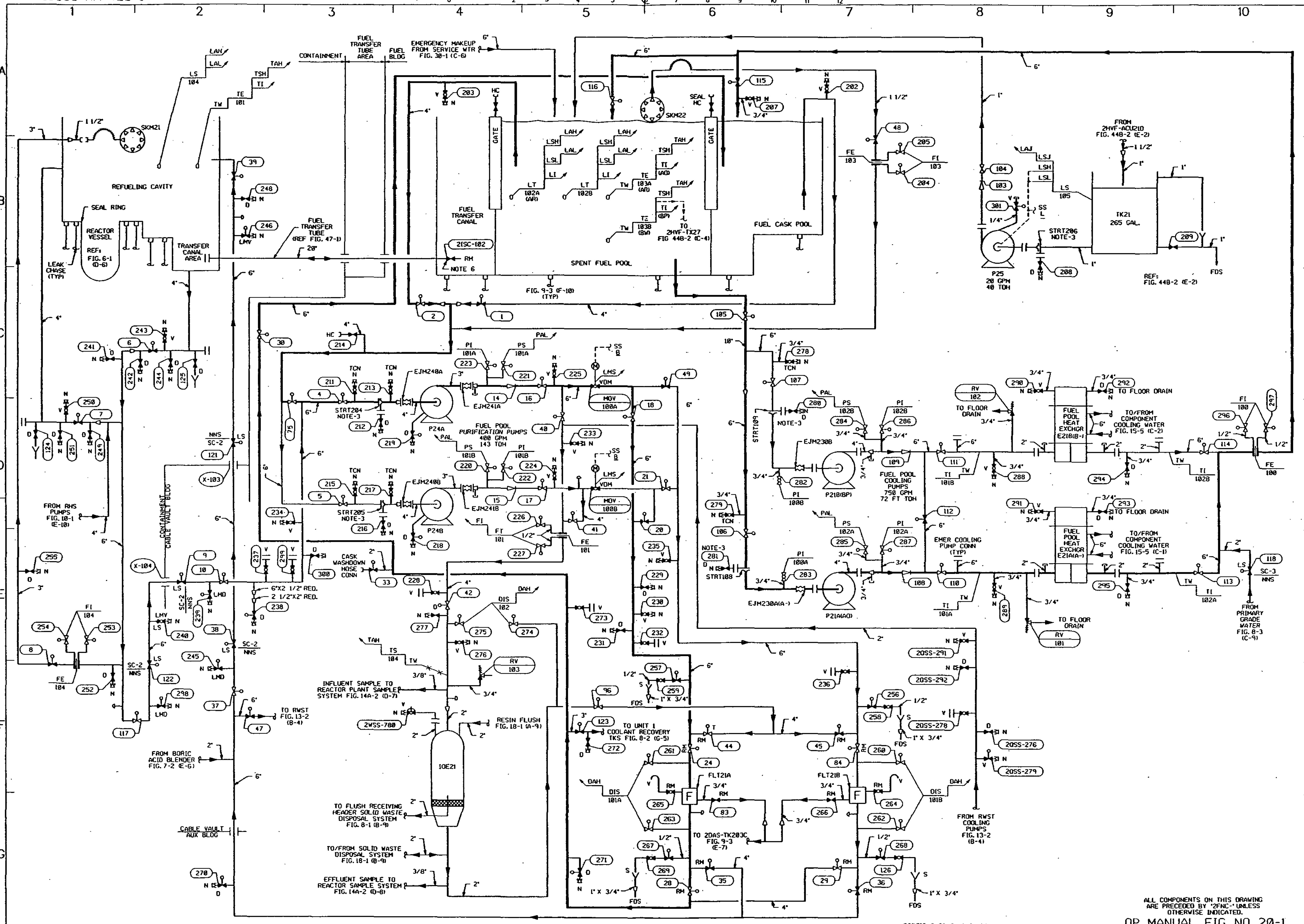
BEAVER VALLEY POWER STATION UNIT NO 2

VALVE OPER NO DIAGRAM
AFW PUMP STEAM & RESID HEAT REL

12-15-05 MVF NONE AA 10080-RM-421-2 16


No. 10080-RM-421-1
STEAM GENERATOR 2RCS-SG21C(C-)
STEAM GENERATOR 2RCS-SG21B(B-)
STEAM GENERATOR 2RCS-SG21A(A-)
VENT TO ATMOSPHERE
CRANE WALL
TO FLOOR DRAIN
PRIM. COMP. COOL. WATER FIG. 15-2(D-4)
CONTAINMENT MAIN STEAM VALVE AREA
DRAIN TO 2SDS-RO112C FIG. 21-3 (A-8)
TO AUX FEED PUMP TURBINE FIG. 21-2 (A-1)
TO RESIDUAL HEAT DUMP FIG. 21-2 (D-10)
TO HIGH STM LINE PRESS S.I. ISOL TRAIN A&B
TO LOW STM LINE PRESS S.I. ISOL TRAIN A&B
MAIN STEAM TRIP VALVE SEE FIG. 21-3
FROM INSTR AIR FIG 34-6(C-2)
MAIN STEAM VALVE AREA
SERVICE BUILDING
TURBINE BUILDING
TO MSR SYSTEM FIG. 26-1(B-4)
TO CONDENSER DUMPS FIG. 21-4 (D-1)
PRESSURE TEST CONNECTION (TYP)
TO TURBINE STOP TRIP VALVE "3" FIG. 26-1(B-1)(C)
TO TURBINE STOP TRIP VALVE "1" FIG. 26-1(B-1)(A)
TO TURBINE STOP TRIP VALVE "2" FIG. 26-1(E-1)(B)
TO TURBINE STOP TRIP VALVE "4" FIG. 26-1(E-1)(D)
TO STEAM DUMP LOGIC
CONDENSER DUMP TO FIG 21-4 (A-1)
TO AUX STEAM SYSTEM FIG 27-1 (B-1)
TO TURBINE GLAND STEAM PIPING FIG. 26-2(D-1)
TO TURBINE PLANT SAMPLE SYSTEM FIG. 14B-1(A-4)
ALL COMPONENTS ON THIS DRAWING ARE PRECEDED BY "2MSS-" UNLESS OTHERWISE INDICATED
OP MANUAL FIG NO 21-1
REVISION 12 INCORPORATED ECP-05-0429
IDCN-2-RM-0421-001-E05-0429-01
NOTIF: 600266971
FENOC FirstEnergy Nuclear Operating Company
BEAVER VALLEY POWER STATION UNIT NO 2
VALVE OPER NO DIAGRAM MAIN STEAM SYSTEM
12-15-05
AA 10080-RM-421-1 12
PREPARED ON THE BVPS CADDS SYSTEM
15-DEC-2005 11:21 K:\u2\M4210010.DGN

No. 10080-RM-420-1



ALL COMPONENTS ON THIS DRAWING ARE PRECEDED BY "2FNC-" UNLESS OTHERWISE INDICATED.

PORTIONS OF THIS DIAGRAM ARE NUCLEAR SAFETY RELATED

OP MANUAL FIG NO 20-1

REVISION 10 INCORPORATED ECP-06-0204
IDCN 2-RM-0420-001-E06-0204-01
NOTIFICATION 600267165
ECP-02-0275
IDCN 2-RM-0420-001-E02-0275-01

FENOC FirstEnergy Nuclear Operating Company

BEAVER VALLEY POWER STATION UNIT NO 2

VALVE OPER NO DIAGRAM
FUEL POOL COOLING & PURIFICATION

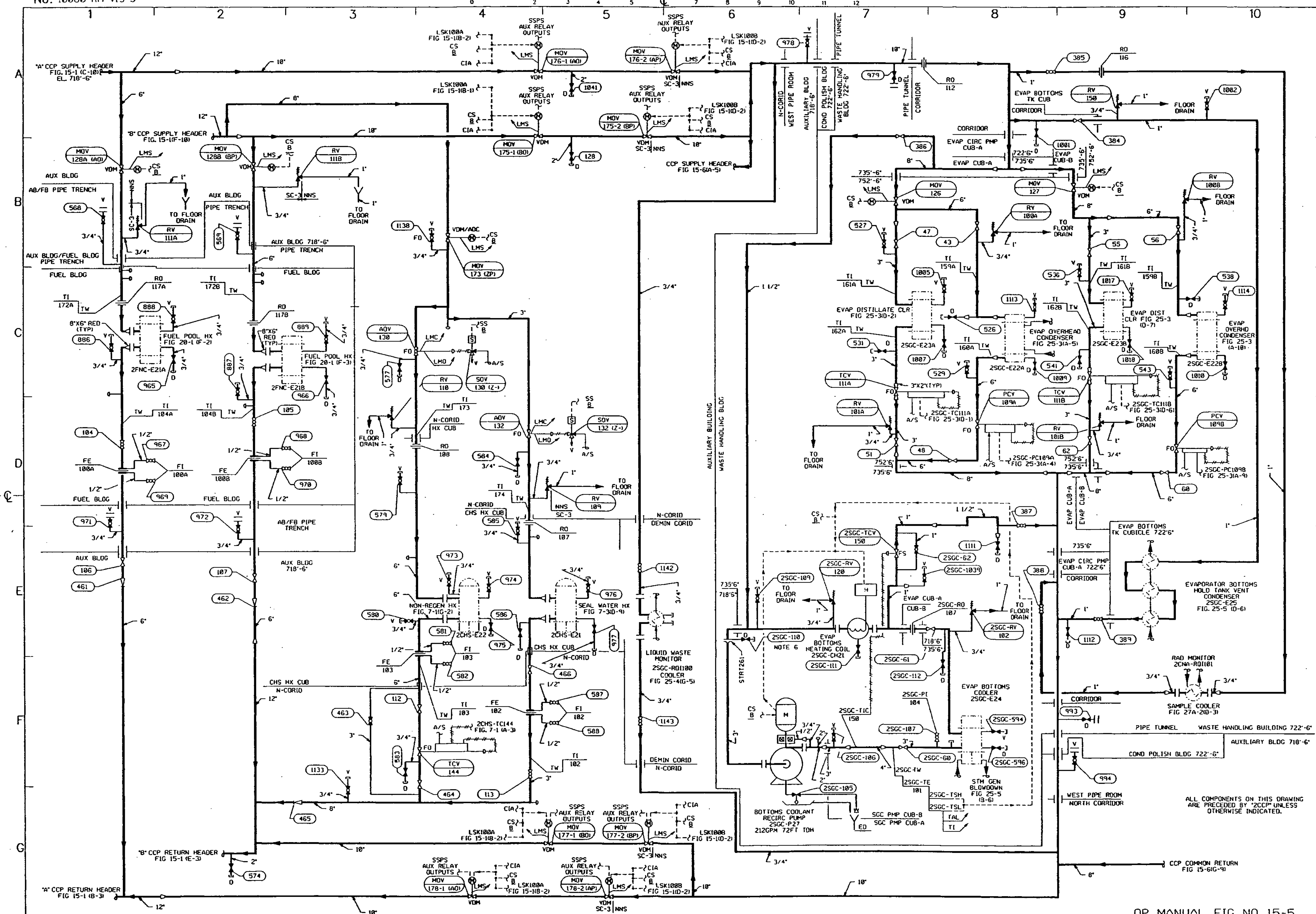
SCALE NONE | DATE 8-28-06 | MVF

AA | 10080-RM-420-1 | 10

PREPARED ON THE BVPS CAEDD SYSTEM

28-AUG-2006 08:37 K:\u2\M4200010.DGN

No. 10080-RM-415-5



OP MANUAL FIG NO 15-5

REVISION 8 INCORPORATED ECR-04-0414 IDCN-2-RM-0415-005-E04-0414-01

FENOC FirstEnergy Nuclear Operating Company

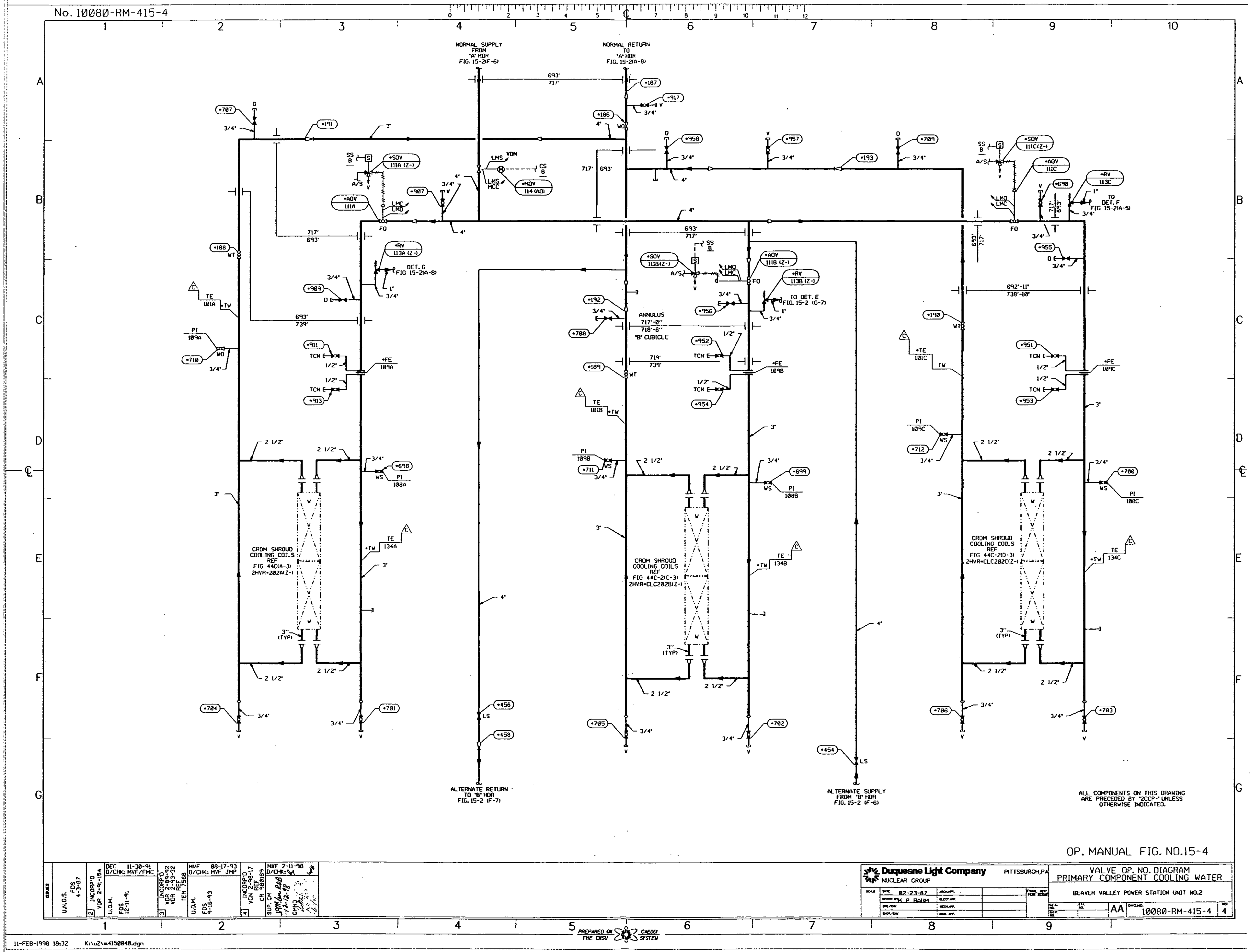
BEAVER VALLEY POWER STATION UNIT NO 2

VALVE OPER NO DIAGRAM
PRIMARY COMPONENT COOLING WATER

SCALE NONE — DATE 6-29-05 — DRAWN BY MVF

AA 10080-RM-415-5 8

PREPARED ON THE BVPS CAEDD SYSTEM



OP. MANUAL FIG. NO.15-4

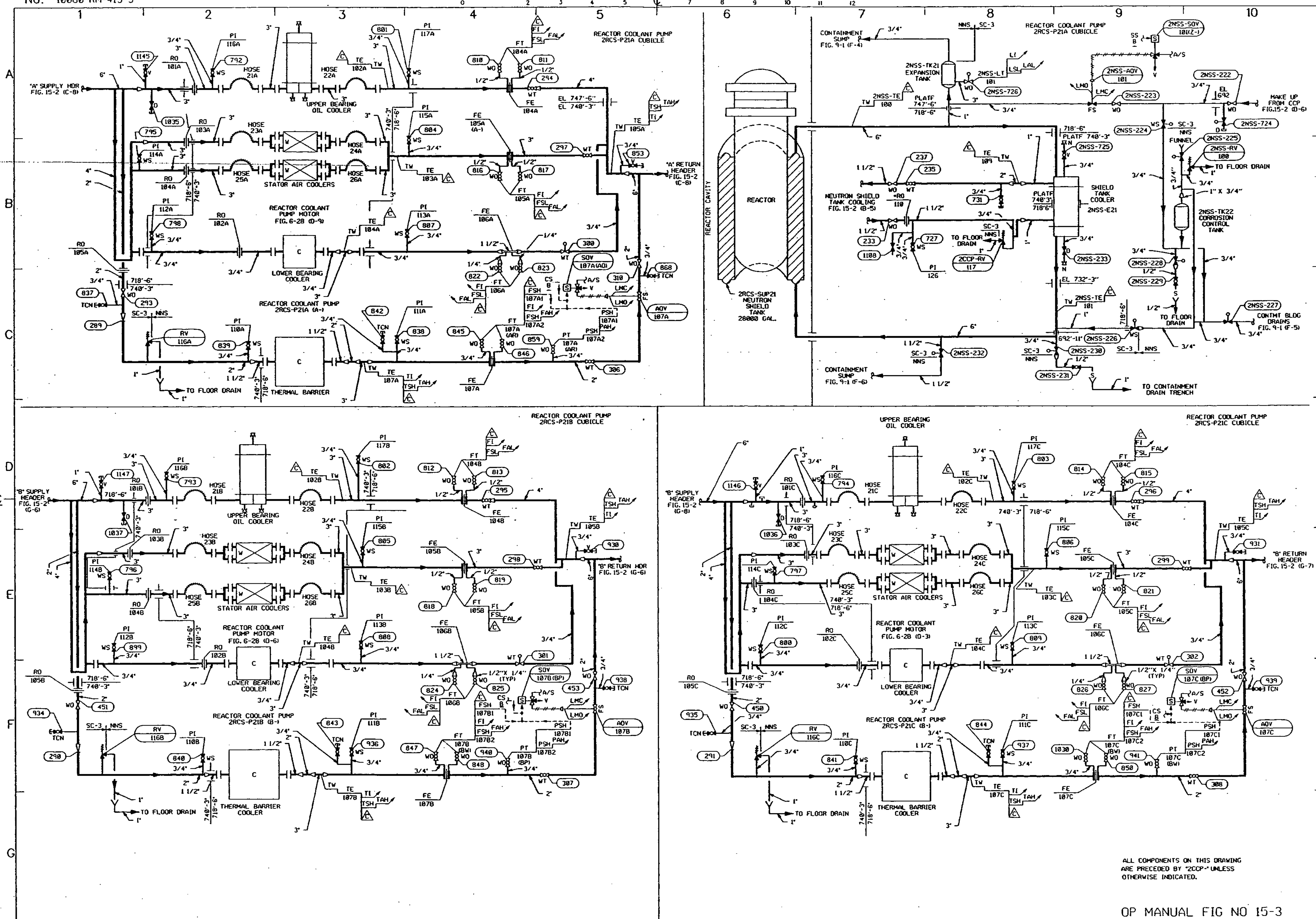
Duquesne Light Company NUCLEAR GROUP PITTSBURGH, PA

VALVE OP. NO. DIAGRAM PRIMARY COMPONENT COOLING WATER

BEAVER VALLEY POWER STATION UNIT NO.2

AA 10080-RM-415-4 4

No. 10080-RM-415-3



ALL COMPONENTS ON THIS DRAWING ARE PRECEDED BY "2CCP-" UNLESS OTHERWISE INDICATED.

OP MANUAL FIG NO 15-3

REVISION 8 INCORPORATED ECR 03-0603 CA 03-09984-1 CA 03-10016-1

FENOC FirstEnergy Nuclear Operating Company

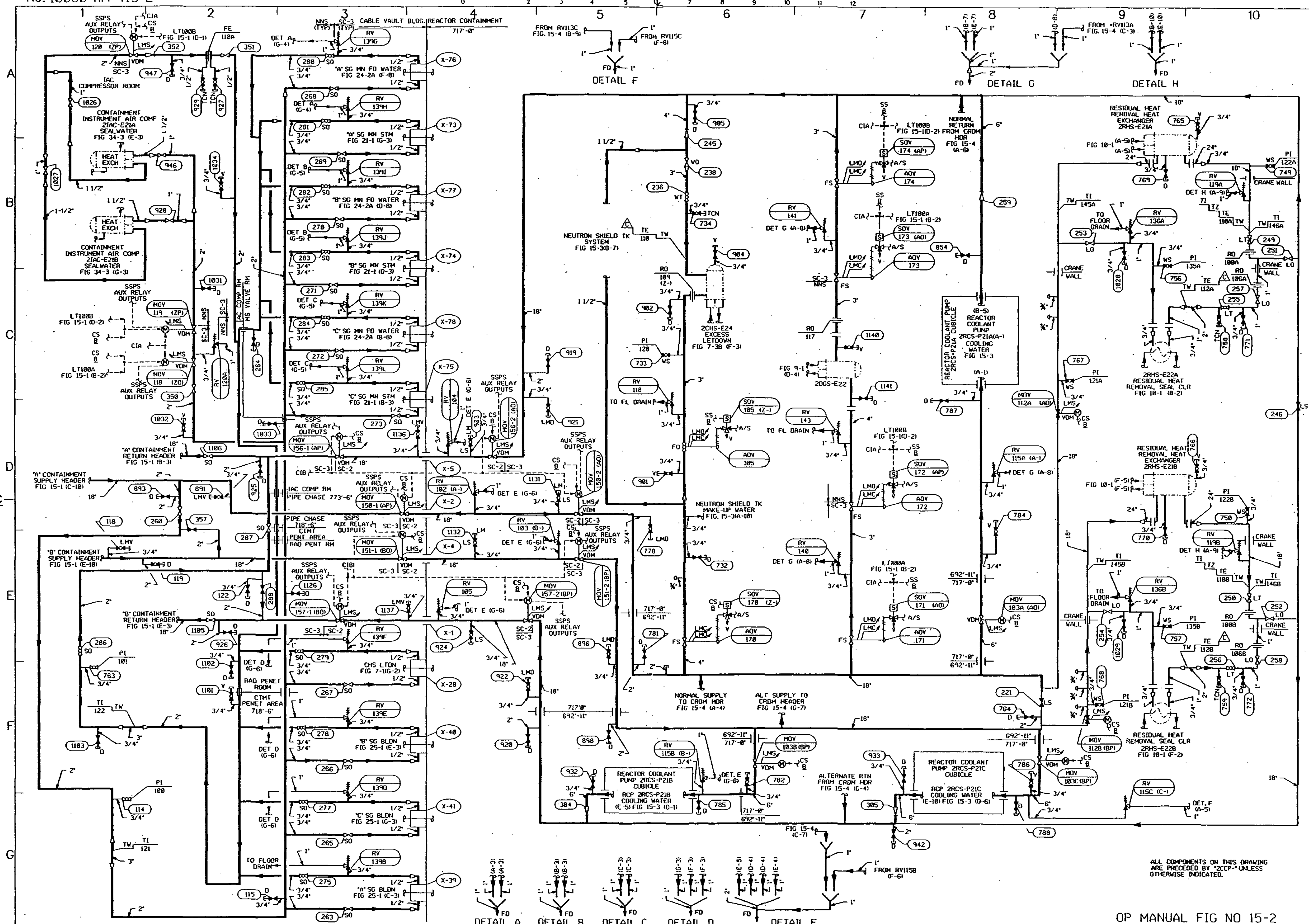
BEAVER VALLEY POWER STATION UNIT NO 2

VALVE OPER NO DIAGRAM
PRIMARY COMPONENT COOLING WATER

AA 10080-RM-415-3 8

18-DEC-2003 12:38 K:\u2\m4150030.dgn

No. 10080-RM-415-2



OP MANUAL FIG NO 15-2

REVISION 17
INCORPORATED
ECP-06-0007
IDCN 2-RM-0415-002-E06-0007-01
CA-05-08118-01

FENOC FirstEnergy Nuclear Operating Company

BEAVER VALLEY POWER STATION UNIT NO 2

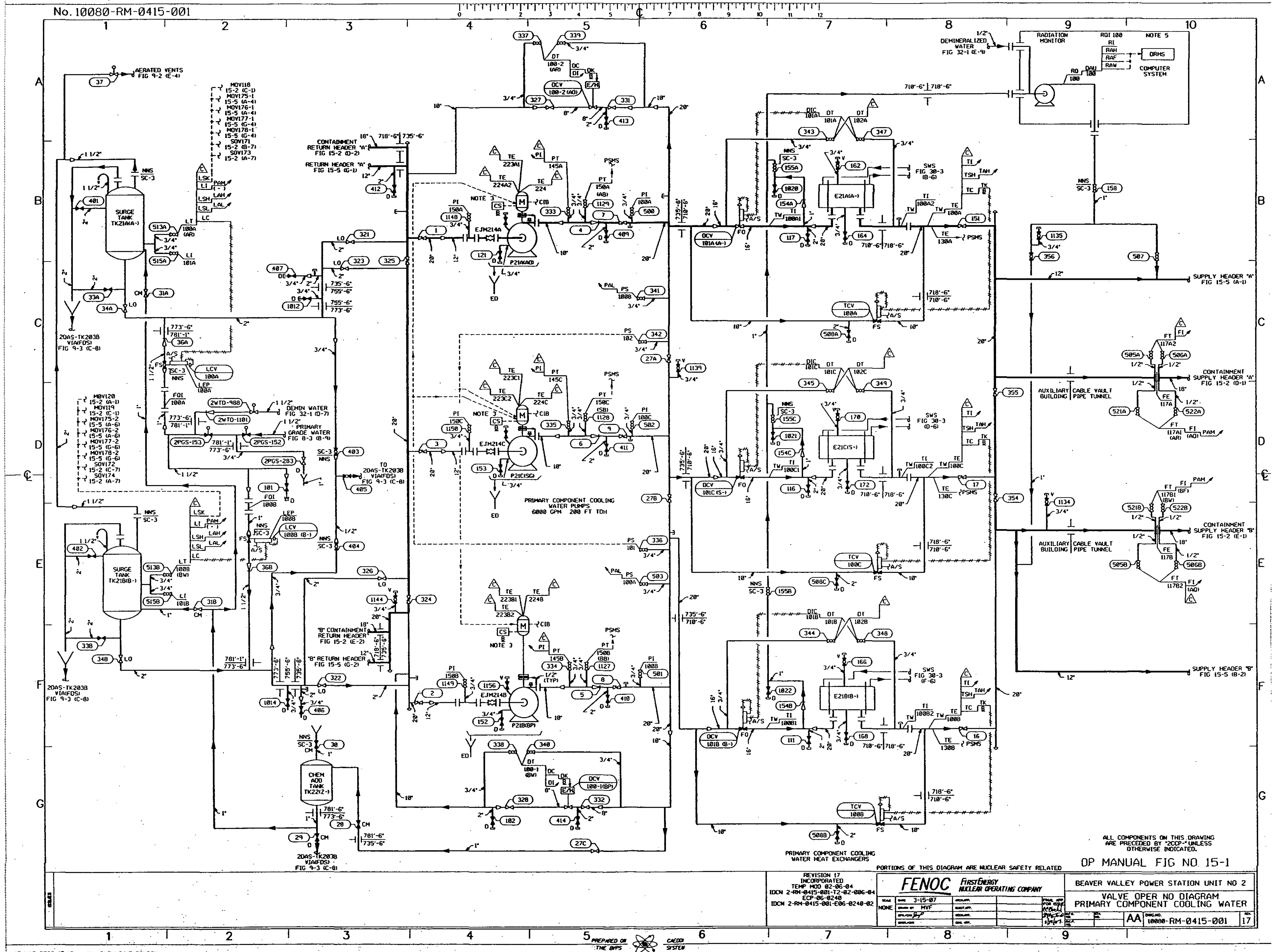
VALVE OPER NO DIAGRAM
PRIMARY COMPONENT COOLING WATER

AA 10080-RM-415-2 17

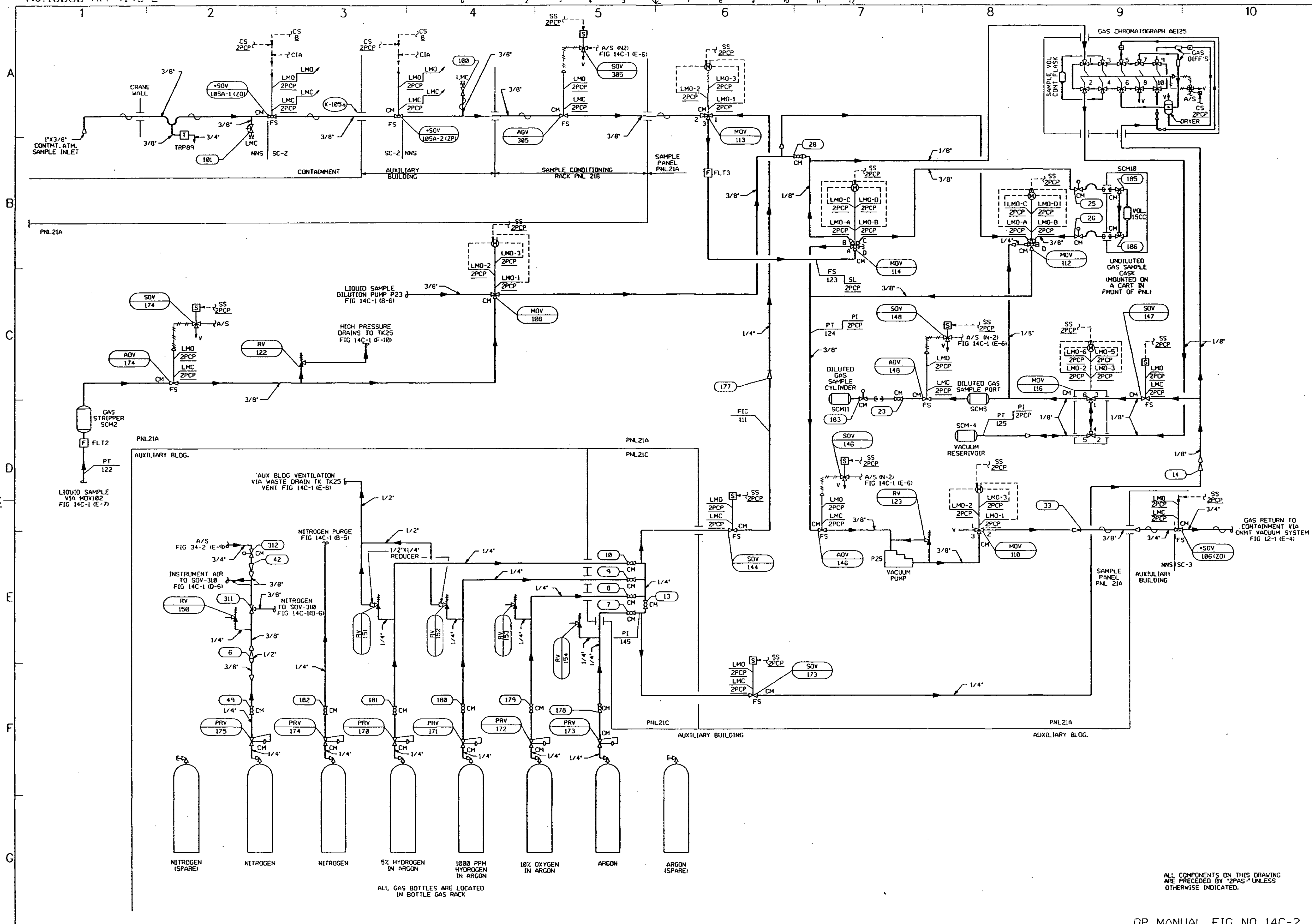
6-28-06

PREPARED ON THE BVPS CADD SYSTEM

20-JUN-2006 10:35 K:\w2\M4150020.DGN


No. 10080-RM-0415-001
SURGE TANK TK21A(A-)
SURGE TANK TK21B(B-)
CHEM ADD TANK TK22(Z-)
PRIMARY COMPONENT COOLING WATER PUMPS 6000 GPM 200 FT TDH
PRIMARY COMPONENT COOLING WATER HEAT EXCHANGERS
RADIATION MONITOR
COMPUTER SYSTEM
SUPPLY HEADER "A" FIG 15-5 (A-1)
CONTAINMENT SUPPLY HEADER "A" FIG 15-2 (D-1)
CONTAINMENT SUPPLY HEADER "B" FIG 15-2 (E-1)
SUPPLY HEADER "B" FIG 15-5 (B-2)
AUXILIARY BUILDING
CABLE VAULT PIPE TUNNEL
ALL COMPONENTS ON THIS DRAWING ARE PRECEDED BY "2CCP-" UNLESS OTHERWISE INDICATED.
PORTIONS OF THIS DIAGRAM ARE NUCLEAR SAFETY RELATED
OP MANUAL FIG NO 15-1
REVISION 17 INCORPORATED TEMP MOD 02-06-04
FENOC FIRSTENERGY NUCLEAR OPERATING COMPANY
BEAVER VALLEY POWER STATION UNIT NO 2
VALVE OPER NO DIAGRAM
PRIMARY COMPONENT COOLING WATER
AA 10080-RM-0415-001 17
3-15-07
MVF
15-MAR-2007 15:42

No. 10080-RM-414C-2



OP. MANUAL FIG. NO. 14C-2

ISSUES						
1 ORIGINAL U.N.O.S. FDS 3-27-87	2 INCORP'D VDR 2-89-65 SATISFIED VDR 2-89-92 U.N.O.S. JFC FOR FDS 4-10-90	3 ORL 1-23-90 D/CHK: MVF KRV INCORP'D VDR 2-94-41 VDR 2-94-78 VDR 2-96-6 VCN 2-96-19 VCN 2-98-51 DCP 2035	4 MVF 03-07-96 D/CHK: MVF JMP SUP. CM FJM 3-22-96 OMND EAC FOR BJT 3-22-96	5 MVF 05-08-96 D/CHK: MVF/JMP INCORP'D VCN 2-96-74 SUP. CM FJM 5-13-96 OMND JWT FOR BJT 5-16-96	6 MVF 10-30-96 D/CHK: JMP FHC INCORP'D VCN 2-96-181 SUP. CM FJM 11-03-96 OMND HDW FOR BJT 12-09-96	MVF 4-9-98 D/CHK: MICRO INCORP'D VCN 2-97-86 SUP. CM

Duquesne Light Company NUCLEAR GROUP PITTSBURGH, PA

BEAVER VALLEY POWER STATION UNIT NO. 2

VALVE OPER NO. DIAGRAM

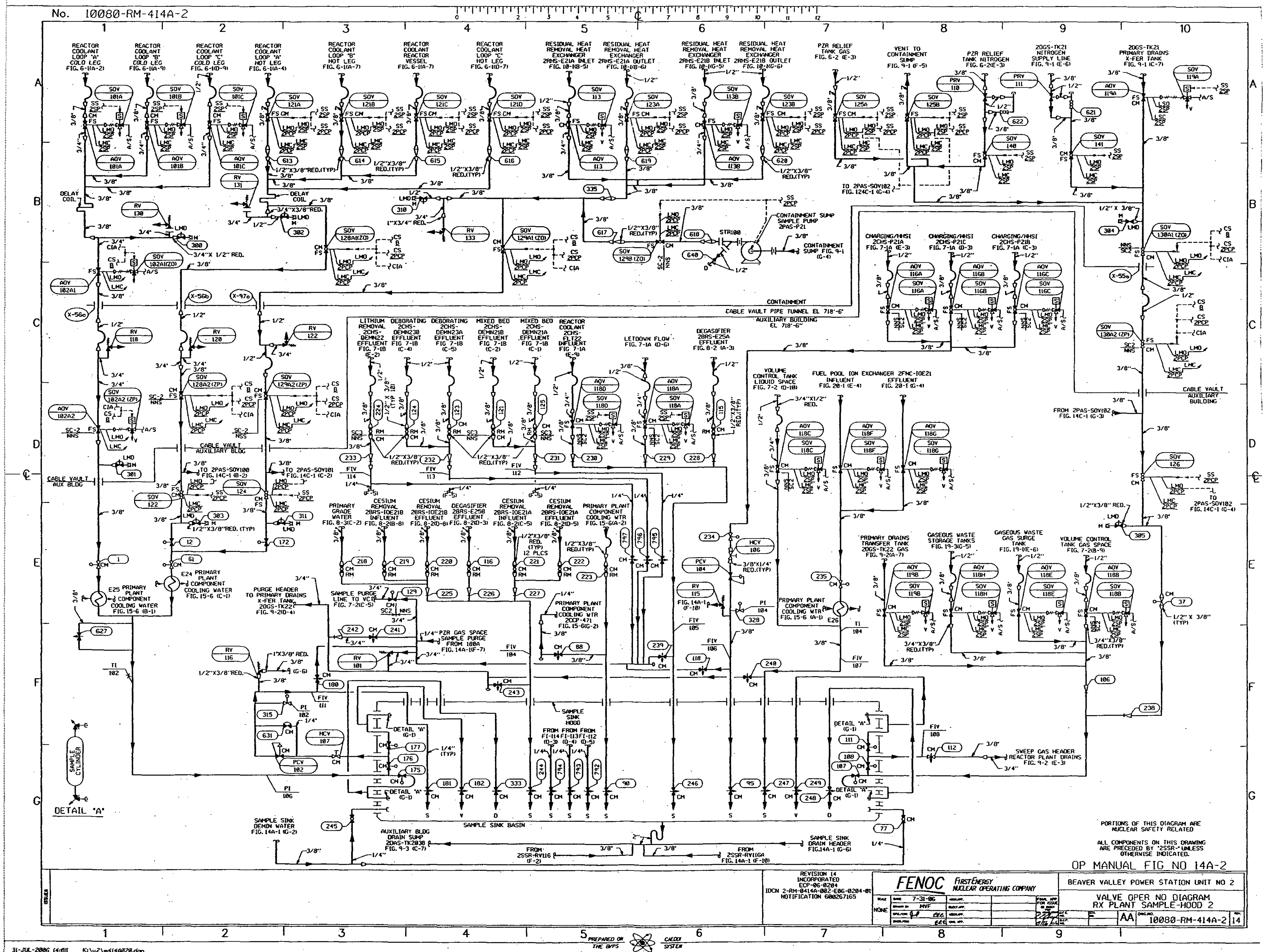
POST ACCIDENT SAMPLE SYSTEM GASEOUS SAMPLES

DATE 2-25-87 DRAWN BY T. IVANCO

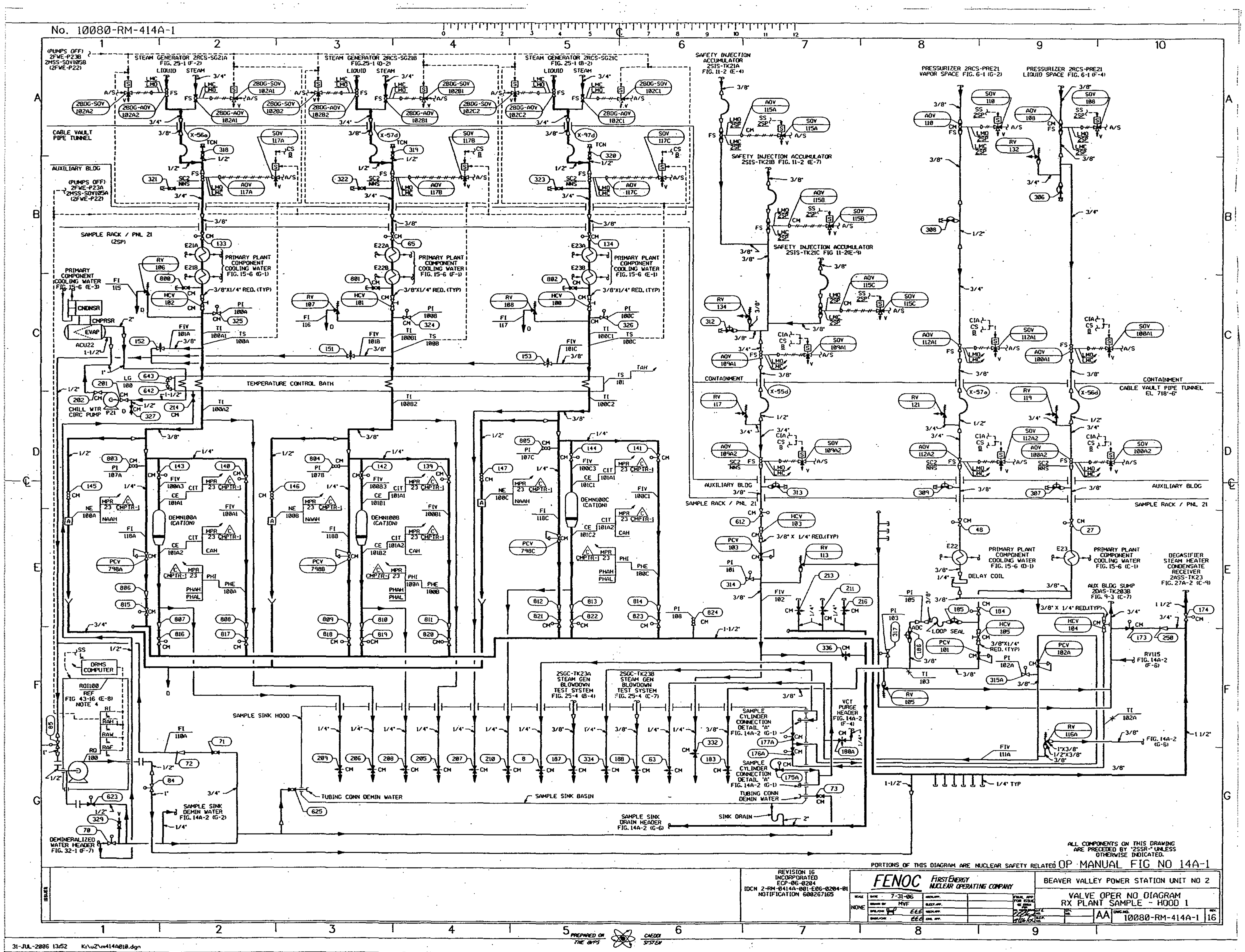
AA 10080-RM-414C-2 6

PREPARED ON THE INTERGRAPH CAEDD SYSTEM

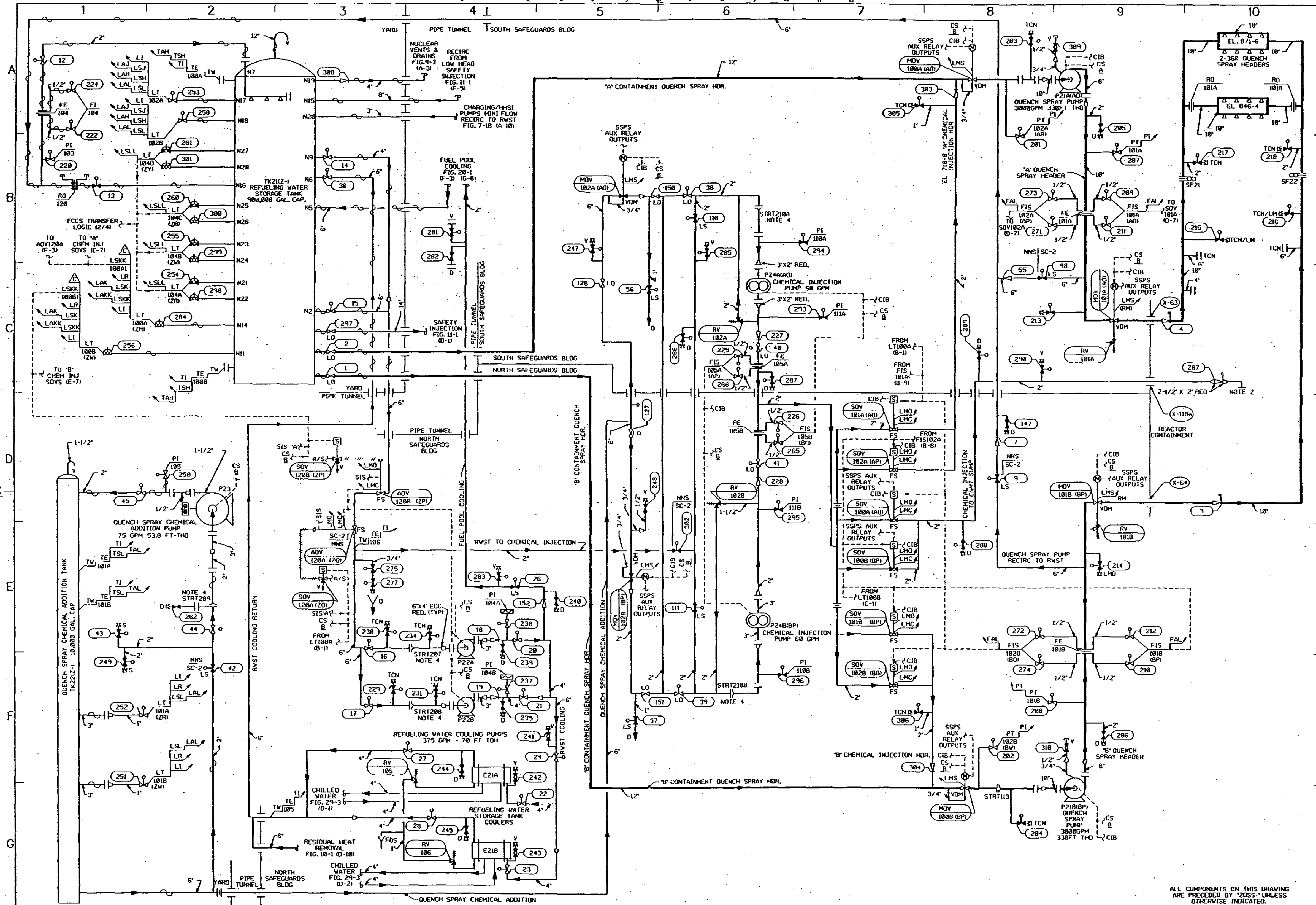
14-APR-1998 16:11 K:\U2\M414C020.DGN



No. 10080-RM-414A-2
OP MANUAL FIG NO 14A-2
PORTIONS OF THIS DIAGRAM ARE NUCLEAR SAFETY RELATED
ALL COMPONENTS ON THIS DRAWING ARE PRECEDED BY "2SSR-" UNLESS OTHERWISE INDICATED.
REVISION 14
INCORPORATED
ECP-06-0204
IDCN 2-RM-0414A-002-E06-0204-01
NOTIFICATION 600267165
FENOC FirstEnergy NUCLEAR OPERATING COMPANY
BEAVER VALLEY POWER STATION UNIT NO 2
VALVE OPER NO DIAGRAM
RX PLANT SAMPLE-HOOD 2
7-31-06
MVF
AA
10080-RM-414A-2
14
PREPARED ON THE BVPS CAEDD SYSTEM
31-JUL-2006 14:08 K:\u2\m414A020.dgn


No. 10080-RM-414A-1
PORTIONS OF THIS DIAGRAM ARE NUCLEAR SAFETY RELATED
OP MANUAL FIG NO 14A-1
ALL COMPONENTS ON THIS DRAWING ARE PRECEDED BY "2SSR-" UNLESS OTHERWISE INDICATED.
REVISION 16
INCORPORATED
ECP-06-0204
DCN 2-RM-0414A-001-E06-0204-01
NOTIFICATION 600267165
FENOC
FirstEnergy Nuclear Operating Company
BEAVER VALLEY POWER STATION UNIT NO 2
VALVE OPER NO DIAGRAM
RX PLANT SAMPLE - HOOD 1
AA
10080-RM-414A-1
16
31-JUL-2006 13:52

No. 10080-RM-0413-002



ALL COMPONENTS ON THIS DRAWING ARE PRECEDED BY "2QSS-" UNLESS OTHERWISE INDICATED.

PORTIONS OF THIS DIAGRAM ARE NUCLEAR SAFETY RELATED

OP MANUAL FIG NO 13-2

REVISION 15
INCORPORATED
ECP-06-0223
IDCN 2-RM-0413-002-E06-0223-01
EER 600346877

FENOC FirstEnergy Nuclear Operating Company

BEAVER VALLEY POWER STATION UNIT NO 2

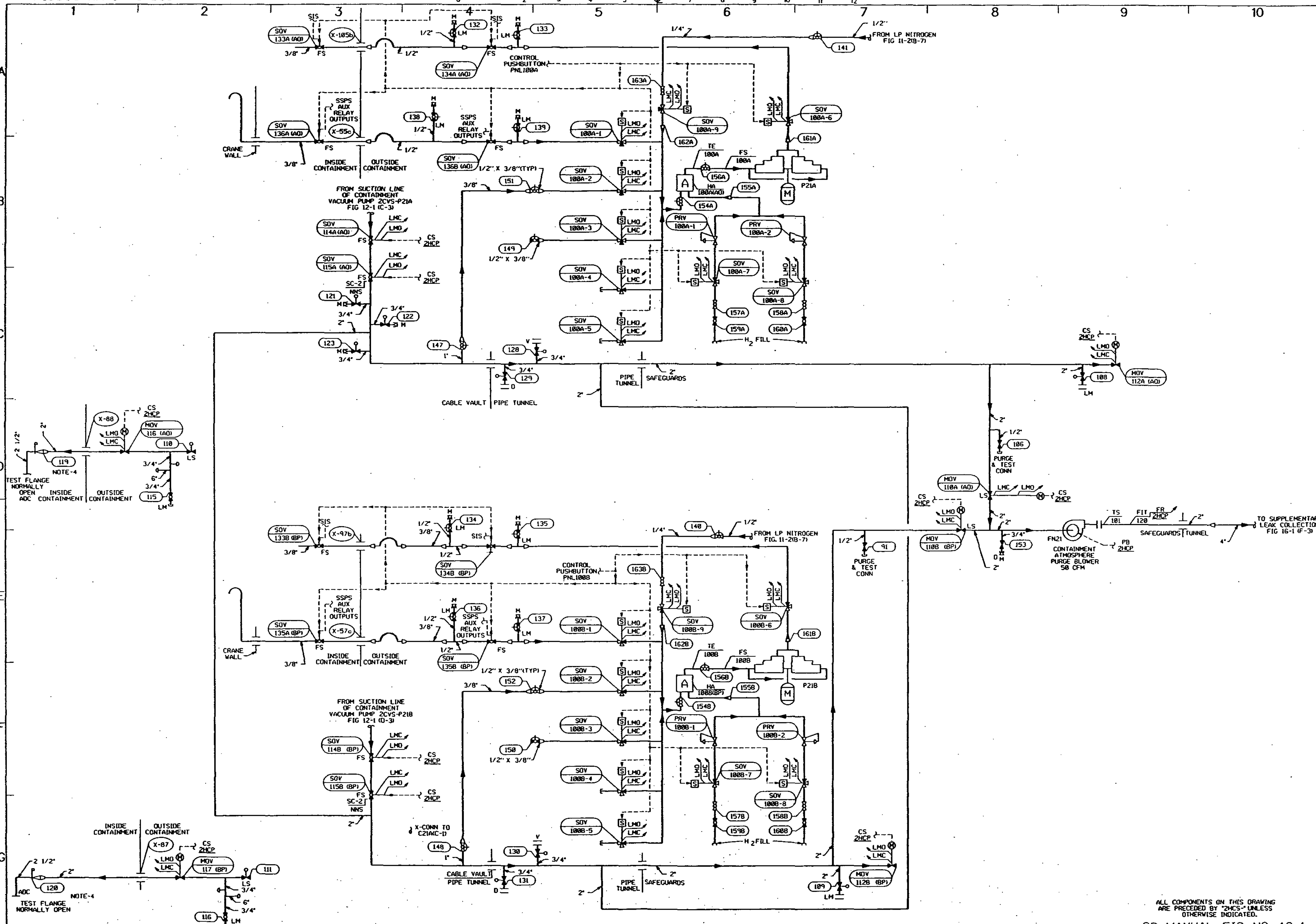
VALVE OPER NO DIAGRAM
QUENCH SPRAY SYSTEM

AA 10080-RM-0413-002 15

PREPARED ON THE BVPS CAEDD SYSTEM

08-FEB-2007 14:02 K:\u2\RM-0413-002.DGN

No. 10080-RM-0446-001



PORTIONS OF THIS DIAGRAM ARE NUCLEAR SAFETY RELATED

OP MANUAL FIG NO 46-1

REVISION 13
INCORPORATED
ECP-06-0188
IDCN 2-RM-0446-001-E06-0188-01
RESPONSIBLE ENGINEER COMMENTS

FENOC FirstEnergy Nuclear Operating Company

BEAVER VALLEY POWER STATION UNIT NO 2

VALVE OPER NO DIAGRAM
POST DBA HYDROGEN CONTROL SYSTEM

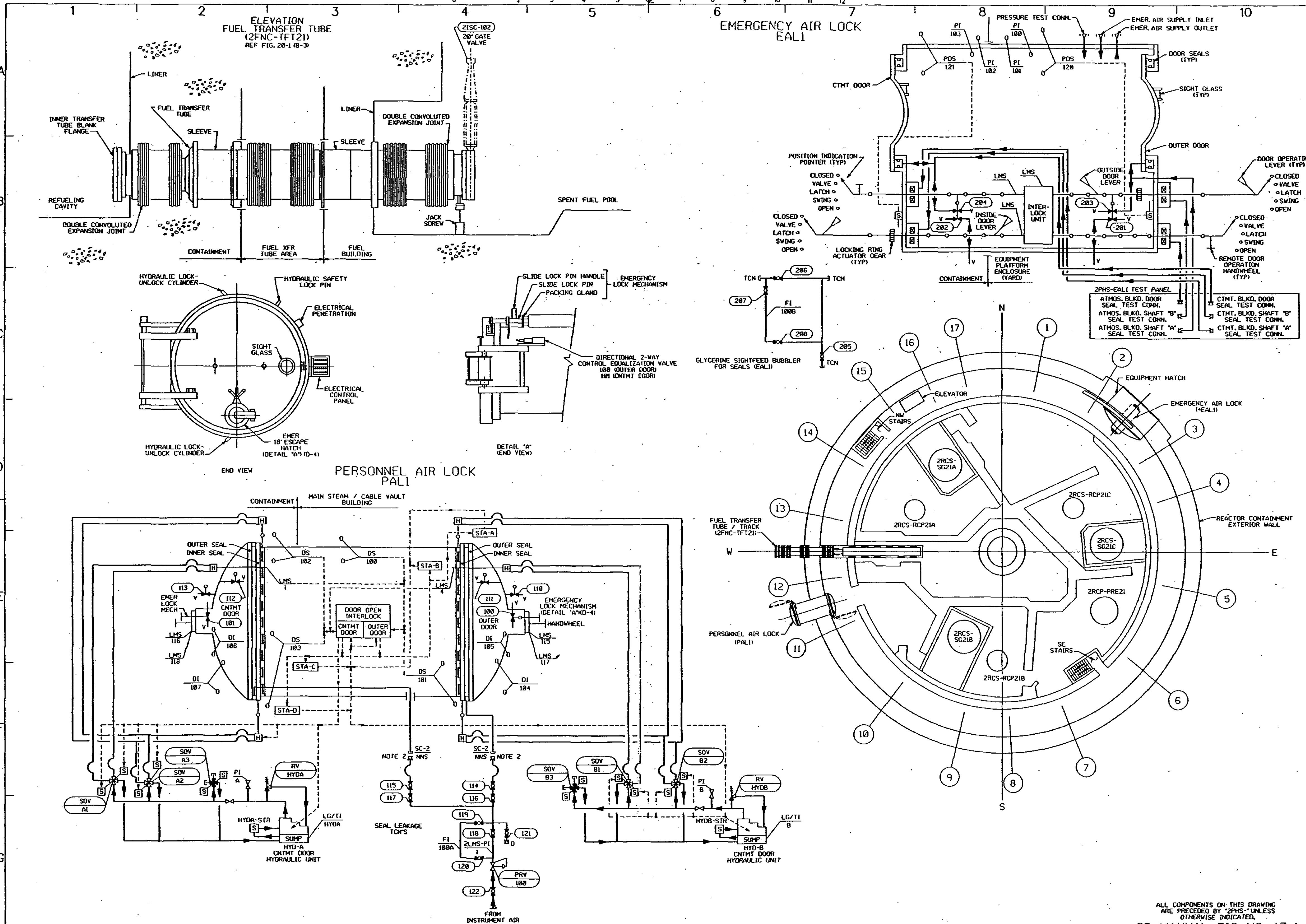
NONE | 3-20-07 | MVF

AA | 10080-RM-0446-001 | 13

22-MAR-2007 10:08 K:\u2\RM-0446-001.DGN

PREPARED ON THE BVPS CAEDD SYSTEM

No. 10080-RM-447-1



ALL COMPONENTS ON THIS DRAWING ARE PRECEDED BY "2PHS-" UNLESS OTHERWISE INDICATED.

PORTIONS OF THIS DIAGRAM ARE NUCLEAR SAFETY RELATED

OP MANUAL FIG NO 47-1

REVISION 9
INCORPORATED
ECP-06-0184
IDCN 2-RM-0447-001-E06-0184-01

FENOC FirstEnergy Nuclear Operating Company

BEAVER VALLEY POWER STATION UNIT NO 2

VALVE OPER NO. DIAGRAM
CNTMT AIR LOCKS & FUEL XFER TUBE

SCALE NONE | DATE 10-10-06 | DRAWN BY MVF

AA | 10080-RM-447-1 | 9

PREPARED ON THE BVPS CADD SYSTEM

11-OCT-2006 09:56 K:\u2\M4470010.DGN