50-331 DUANE ARNOLD IEL&PC

GUIDANCE ON DEVELOPING ACCEPTABLE
INSERVICE TESTING PROGRAMS

Rec'd w/ ltr dtd 10/6/93.....9310130300

PUMP AND VALVE INSERVICE TESTING PROGRAM

FOR

DUANE ARNOLD ENERGY CENTER

Commercial Service Date: February 1, 1975

3277 DAEC Road
Palo, Iowa 52324

IOWA ELECTRIC LIGHT and POWER COMPANY
IE Tower, 200 First Street SE
Cedar Rapids, Iowa 52401

Prepared by: David G. Nelson Date: 9-27-93

Independent Review: [signature] Date: 9-27-93

Reviewed by: [signature] Date: 9-30-93
Codes & Materials Group Leader

Approved by: [signature] Date: 9-30-93
Supervisor, Mechanical Engineering

Approved by: [signature] Date: 10/4/93
Manager, Engineering

Approved by: [signature] Date: 10-4-93
Plant Superintendent - Nuclear

Approved by: [signature] Date: 10/4/93
Manager, Nuclear Licensing

Approved by: [signature] Date: 10/06/93
Manager, Corporate Quality Assurance

Approved by: [signature] Date: 10/6/93
Manager, Nuclear Division

Implementation Date OCT 07 1993

Iowa Electric Light and Power Company
Duane Arnold Energy Center
(Docket No. 50-331)

ASME INSERVICE TESTING PROGRAM

FOR

PUMPS AND VALVES

RECORD OF REVISIONS

REVISION	DATE
Original	March 1, 1978
Rev. 1	October 1978
Rev. 2	May 1, 1980
Rev. 3	November 1, 1980
Rev. 4	January 1, 1983
Rev. 5	December 23, 1983
Rev. 6	August 1, 1984
Rev. 7	November 1, 1985
Rev. 8	April 1, 1987
Rev. 9	January 5, 1990
Rev. 10	August 14, 1990
Rev. 11	September 13, 1991
Rev. 12	September 20, 1993

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Inservice Testing Program

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1.0 INTRODUCTION

Revision 12 of the Duane Arnold Energy Center ASME Inservice Testing Program for Pumps and Valves will be in effect through February 1, 1995, the end of the second 120-month (10-year) inspection interval, unless changed for other reasons. The program will be updated prior to the start of the third inspection interval in accordance with the requirements of 10CFR50.55a(g).

This document outlines the inservice testing (IST) program for Duane Arnold Energy Center, based on the requirements of Section XI of the ASME Boiler & Pressure Vessel Code, 1980 Edition through the Winter 1981 Addenda. All References to IWP or IWV in this document correspond to Subsection IWP or IWV, respectively, of the ASME Section XI, 1980 Edition through the Winter 1981 Addenda unless otherwise noted.

- Title 10, Code of Federal Regulations, Part 50, paragraph 50.55a(g)
- NRC Regulatory Guides - Division 1
- Standard Review Plan 3.9.6, "Inservice Testing of Pumps and Valves"
- Division 1 (Draft) Regulatory Guide and Value/Impact Statement, "Identification of Valves for Inclusion in Inservice Test Programs"
- "NRC Staff Guidance for Preparing Pump and Valve Testing Programs and Associated Relief Request," January 1978
- Updated Final Safety Analysis Report, Duane Arnold Energy Center
- Technical Specifications, Duane Arnold Energy Center
- Safety Evaluation via D. B. Vassallo's letter to L. Liu dated September 26, 1983
- "NRC Guidance on Developing Acceptable Inservice Testing Programs" (Generic Letter 89-04)
- Safety Evaluation via J. N. Hannon's letter to L. Liu dated March 11, 1992
- Safety Evaluation via J. N. Hannon's letter to L. Liu dated February 11, 1993

- Safety Evaluation via J. N. Hannon's letter to L. Liu dated July 16, 1993

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The inservice tests identified in this program will verify the operational readiness of pumps and valves whose functions are required to mitigate the consequences of an accident or to bring the reactor to a cold shutdown condition. The IST classification of each pump and valve matches the ISI classification indicated on the P&IDs except those pumps and valves in the IST boundaries that are identified as non-classed (NC).

2.0 TESTING PROGRAM FOR PUMPS

2.1 General Information

This Inservice Testing Program for pumps meets the requirements of Subsection IWP of Section XI of the ASME Boiler and Pressure Vessel Code, 1980 Edition through the Winter 1981 Addenda. Where these requirements are determined to be impractical, specific requests for relief are included in Section 2.4.

2.2 Pump Program Table

Appendix A lists the pumps included in the Duane Arnold Energy Center IST Program. Data contained in these tables identifies those pumps subject to inservice testing with the respective inservice test quantities, testing intervals and any applicable remarks. The column headings are explained below:

- PUMP NUMBER: The pump identification number
- PUMP NAME: The system of which the pump is a component
- IST CLASS: The ISI classification of the pump
- DRAWING NO.: The DAEC drawing number for the P&ID referring to the pump
- DWG COOR: The drawing coordinate location of the pump on the P&ID
- TEST TYPE: Inservice test quantities to be measured. When the quantity appears in this column, that quantity will be measured during inservice testing in accordance with Subsection IWP. If a modified test is planned or if the quantity does not appear in this column, a request for relief number will be referenced. The following designations are used:

  PTMN - Speed
  PTMPIB - Inlet pressure before pump start
  PTMPID - Inlet pressure during pump run
  PTMDP - Differential pressure
  PTMPF - Pressure/flow curve comparison
  PTMQ - Flowrate
  PTMVA1 - Vibration amplitude position 1
  PTMVA2 - Vibration amplitude position 2

- TEST FREQUENCY: The frequency of testing (See Table 3.2-2)

- RELIEF REQUEST: Reference to any applicable relief request or cold shutdown justification

- PROGRAM REMARKS: Additional information as applicable

2.3 TECHNICAL INFORMATION

2.3.1 Measurement of Test Quantities

- SPEED: Per Subarticle IWP-4400, shaft speed measurements are not applicable (NA) for pumps directly coupled to synchronous or induction-type drivers. For variable speed pumps, the speed is set at the reference speed per Subarticle IWP-3100.

- INLET PRESSURE: For pumps taking suction from a tank or the residual heat removal (RHR) service water complex basin, inlet pressure may be calculated (using appropriate correction factors) from a measured tank or basin level. (See Relief Request PR-004) All other inlet pressure measurements will be taken using pressure instruments at or near the pump inlet.

- DIFFERENTIAL PRESSURE: Differential pressure will be calculated from inlet and discharge pressure measurements or measured directly from differential pressure instrumentation.

- FLOWRATE: Pump flowrate will be measured by direct reading based on inline flow instrumentation or will be calculated from tank level change over an elapsed time interval.

- VIBRATION: Pump vibration will be measured when accessibility allows.

2.3.2 Allowable Ranges of Test Quantities

The allowable ranges specified in Table IWP-3100-2 will be used for differential pressure, flow and vibration measurements. In some cases, the performance of a pump may be adequate to fulfill its safety function even though there is some parameter variation outside of the allowable ranges as set forth in Table IWP-3100-2. Should a measured test quantity fall outside the allowable range, an expanded allowable range may be determined, on a case by case basis, in accordance with ASME Code interpretation XI-1-79-19. If new ranges are

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specified, an evaluation shall be performed to demonstrate that:

1) the Code limits cannot be met, and

2) with less conservative ranges, a degraded pump hydraulic condition can be detected and appropriate corrective action taken.

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2.3.3 Bearing Lubricant

As specified in Table IWP-3100-1, pump bearing lubricant level or pressure will be observed during inservice testing, when practical.

2.3.4 Instrument Accuracy

Instrument accuracies for the DAEC IST Program will conform to those given in Table IWP-4110-1, except for specific cases where relief has been requested.

2.3.5 Relief Requests

Requests for relief from code requirements are identified PR-XXX. Relief requests are included in Section 2.4.

SECTION 2.4

RELIEF REQUESTS FOR PUMP TESTING PROGRAM

RELIEF REQUEST NO. PR-001

PUMP NUMBER:

Diesel Fuel Oil Transfer 1P-44A, 1P-44B

SECTION XI REQUIREMENT:

Measure pump vibration amplitude quarterly. (IWP-3100)

BASIS FOR RELIEF:

The diesel fuel oil pumps and motors are submerged inside the diesel fuel oil tank (1T-35) and thus are inaccessible for the purpose of taking such measurements. The installation of accelerometers on the pumps is deemed impractical due to the environmental conditions involved and the impracticality of removing the pumps periodically to calibrate and/or repair the accelerometer. Additionally, since the accelerometers would be inaccessible, any abnormal indications from the equipment might be related to a hardware problem that could not be verified without the removal of the pump.

ALTERNATE TESTING:

The Diesel Fuel Oil Transfer Pumps are included in the Duane Arnold Energy Center Preventive Maintenance Program and are removed, disassembled, inspected and rebuilt every other outage. The pumps are inspected for signs of mechanical wear or vibration induced damage. Detailed measurements with a micrometer are taken and the condition of the pump is compared with the manufacturer's tolerances. Any adverse conditions are noted and corrected before the pumps are reassembled and placed back into service. Proper pump operation is verified by conducting the quarterly pump surveillance prior to the pump being declared operable in accordance with IWP-3111. 12

The results of the most recent inspection (November 1988) revealed that the pumps are in "like new" condition after more than fourteen years of service.

Bearing vibration measurements are taken to detect (indirectly) evidence of mechanical degradation. Duane Arnold's preventive maintenance activities are tailored to inspect (directly) for evidence of degradation. No additional testing is necessary because Duane Arnold's combination of historical data and preventive maintenance is superior to the indirect test required by the Code. The pumps will be disassembled and inspected in accordance with the DAEC Preventive Maintenance Program.

RELIEF REQUEST NO. PR-004

PUMP NUMBER:

RHR SERVICE WATER 1P-22A, B, C, D
ESW 1P-99A, B
RIVER WATER 1P-117A, B, C, D
DIESEL FUEL OIL TRANSFER 1P-44A, B
STANDBY LIQUID CONTROL 1P-230A, B

SECTION XI REQUIREMENT:

Measure pump inlet pressure before starting the pump and during the test. (Table IWP-3100-1)

BASIS FOR RELIEF:

The above listed pumps, except for 1P-230 A & B, are submerged and have inlet pressures which correspond to levels of the wet pit, the river, or diesel oil storage tank. Because these levels remain relatively constant before and during the test, only one measurement per test is necessary. In the case of the standby liquid control (SBLC) pumps, 1P-230 A & B, no gauge is installed at the pump suction and suction pressure is assumed to be equivalent to the static head corresponding to the average height of test tank level above the pump suction.

ALTERNATE TESTING:

One inlet pressure, based on wet pit, river, or oil tank level, will be calculated per test for pumps other than 1P-230 A & B.

One suction pressure for the SBLC Pumps will be calculated from the average test tank level during the test.

RELIEF REQUEST NO. PR-005

PUMP NUMBER:

System	Pump Number
River Water	1P-117A, 1P-117B, 1P-117C, 1P-117D
Core Spray	1P-211A, 1P-211B
RCIC	1P-226
RHR	1P-229A, 1P-229B, 1P-229C, 1P-229D

SECTION XI REQUIREMENT:

The resistance of the system shall be varied until either the measured differential pressure or the measured flow rate equals the corresponding reference value. (IWP-3100)

BASIS FOR RELIEF:

Operating experience has shown that flow rates (independent variables during inservice performance testing) for these pumps cannot be readily duplicated with the present flow control systems. Flow control for these systems can only be accomplished through the operation of relatively large gate and globe valves as throttling valves. Because these valves are not generally equipped with position indicators which reflect percent open, the operator must repeatedly "jog" the motor or air operator to try to make minor adjustments in flow rate. These efforts, to exactly duplicate the reference values, would require excessive valve manipulation which could ultimately result in damage to valves or operators.

ALTERNATE TESTING:

The alternative approach calls for the establishment of reference values for flow rate and differential pressure during a reference value test. The reference flow rate (Q_r) and differential pressure (dP_r) define a point on the pump performance curve as shown in Figure PR-005.1. The solid line in Figure PR-005.1 represents the pump curve which exists during the reference value test. 12

If the pump characteristics were to degrade during time, the pump would operate on a different curve as represented by the broken line in Figure PR-005.1. Given that Q_r cannot be duplicated exactly in subsequent tests, inservice tests will be performed by taking two sets of measurements and establishing a dP which corresponds to Q_r for the inservice test as described.

RELIEF REQUEST NO. PR-005 (cont.)

After the pump has run for at least five minutes, a flow rate will be obtained which is lower than the reference flow rate (Q_r) but greater than a specified lower limit as established in the Test Procedure. When the lower flow rate (Q_l) is established, the suction pressure during testing (P_{il}) and the discharge pressure (P_{dl}) will be measured. The differential pressure (dP_l) corresponding to the lower flow rate is computed by:

$$dP_l = P_{dl} - P_{il}$$

After the test quantities corresponding to Q_l have been recorded, the flow rate is adjusted to a value higher than Q_r but less than a specified upper limit as established in the Test Procedure. When the higher flow rate (Q_h) is established, the suction pressure and discharge pressure will be measured and the differential pressure (dP_h) corresponding to Q_h will be computed.

As shown in Figure PR-005.1, two points have been established that define a small portion of the pump curve. By linear interpolation between the two points, a differential pressure corresponding to Q_r can be computed.

The general equation of the line between points (Q_l, dP_l) and (Q_h, dP_h) is:

$$dP = a - bQ$$

Writing the above equation in terms of Q_l, dP_l, Q_h and dP_h and solving for Q_r yields:

$$dP = dP_l + \left(\frac{dP_l - dP_h}{Q_h - Q_l}\right)(Q_l - Q_r) \qquad \text{(Eq. 1)}$$

Assuming that the pump curve is nearly linear between Q_l and Q_h, Equation 1 gives an accurate value for dP which corresponds to Q_r. This precise value of dP obtained analytically can then be compared to the Alert and Required Action limits which are computed using dP_r.

RELIEF REQUEST NO. PR-005 (cont.)

The major assumption in the approach described above is that the pump curve is nearly linear between Q_l and Q_h. Therefore, values for Q_l and Q_h should fall within a narrow range of Q_r, so that the curve in that range approaches linearity. The appropriate flow rate range between the lower and upper procedural limits have been determined on a pump by pump basis.

RELIEF REQUEST NO. PR-005 (cont.)

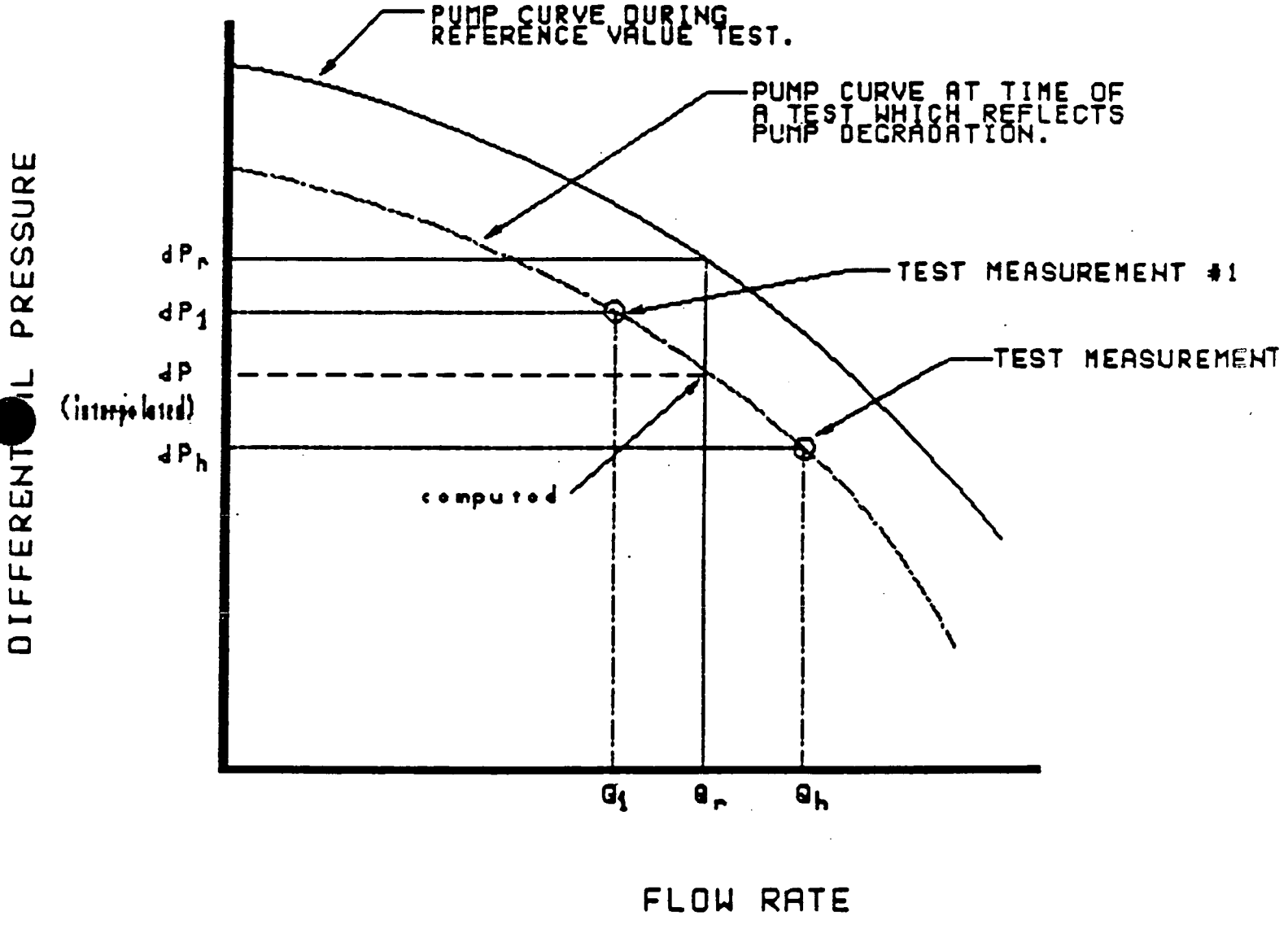

Figure PR-005.1 Alternate Testing Approach for Determination of Hydraulic Change

RELIEF REQUEST NO. PR-007

PUMP NUMBER:

CORE SPRAY 1P-211A & B
HIGH PRESSURE COOLANT INJECTION (HPCI) 1P-216

SECTION XI REQUIREMENT:

Instrument accuracy shall be within the limits of Table IWP-4110-1. (IWP-4110)

BASIS FOR RELIEF:

The instrumentation loop accuracies listed below do not meet the requirements of Table IWP-4110-1.

FUNCTION	LOOP ACCURACY (±%)
Core Spray Pump Disc. Press	2.24
HPCI Pump Disc. Press	2.24
HPCI Pump Suction Press	2.06
HPCI Pump Turbine Speed	2.26

Suitable 1E-qualified instrument loop elements needed to replace those existing that contribute to the problem are not commercially available at this time.

ALTERNATE TESTING:

Inservice test measurements of pressure and speed, as discussed above, will be made using instruments with loop accuracies that are less than or equal to ±2.26 percent of full scale.

RELIEF REQUEST NO. PR-010

WITHDRAWN

RELIEF REQUEST NO. PR-011

WITHDRAWN

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RELIEF REQUEST NO. PR-012

PUMP NUMBER:

SYSTEM	PUMP NUMBER
Core Spray	1P-211A, 1P-211B
Residual Heat Removal Service Water	1P-22A, 1P-22B, 1P-22C, 1P-22D
High Pressure Coolant Injection	1P-216
Reactor Core Isolation Cooling	1P-226

SECTION XI REQUIREMENT:

The full-scale range of each instrument shall be three times the reference value or less. (IWP-4120)

BASIS FOR RELIEF:

In several instances the accuracy of installed flow rate instrumentation does not meet the requirements of IWP-4110. In these instances, temporary instrumentation is used to replace less accurate panel meters. However, the available electronic instruments suitable for this service generally do not meet their range limitations imposed by IWP-4120, in that the instrument ranges exceed the respective reference values by greater than a factor of 3. Since the accuracies of the instruments used for the inservice test are based on the actual indicated reading and not on full-scale range of the instruments, this is considered to be acceptable. The specific systems affected are listed below:

SYSTEM	REF. VALUE	INST. RANGE(1)
Core Spray	30 ma	0-200 ma
RHR Service Water	30 mv	0-200 mv
H.P. Coolant Inj.	50 mv	0-200 mv
RCIC	50 mv	0-200 mv

(1) Based on FLUKE Model 8024B Digital Multimeter

ALTERNATE TESTING:

No alternate method of measurement is proposed.

RELIEF REQUEST NO. PR-013

WITHDRAWN

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RELIEF REQUEST NO. PR-014

PUMP NUMBER:

All pumps in Program.

SECTION XI REQUIREMENT:

The temperature of all centrifugal pump bearings outside the main flow path shall be measured at points selected to be responsive to changes in the temperature of the bearings. (IWP-4310)

BASIS FOR RELIEF:

- Bearings of the selected pumps addressed in the DAEC IST Program are water cooled -- cooling water supplied from the flowstream or the Emergency Service Water System. Thus, bearing temperature measurements are highly dependent on the temperature of the cooling medium.

- The data associated with bearing temperatures taken at one-year intervals provides little statistical basis for determining the incremental degradation of a bearing or any meaningful trending information or correlation.

- Vibration measurements are a significantly more reliable indication of pump bearing degradation than are temperature measurements. All pumps addressed by this relief request are subjected to vibration measurements on a quarterly basis in accordance with Subarticle IWP-4500.

- Although excessive bearing temperature is an indication of an imminent or existing bearing failure, it is highly unlikely that such a condition would go unnoticed during routine monthly and quarterly surveillance testing since it would manifest itself in other obvious indications such as audible noise, reduced pump hydraulic performance, unusual vibration, increased motor current, etc.

- The gain from taking bearing measurements, which in most cases would be done locally using portable instruments, cannot offset the cost in terms of dilution of operator effort, distraction of operators from other primary duties, excessive operating periods for pumps, and personnel radiation exposure.

ALTERNATE TESTING:

None

RELIEF REQUEST NO. PR-015

PUMP NUMBER:

System	Pump number
HPCI	1P-216

SECTION XI REQUIREMENT:

The resistance of the system shall be varied until either the measured differential pressure or the measured flow rate equals the corresponding reference value. (IWP-3100)

BASIS FOR RELIEF:

Operating experience has shown that flow rates (independent variables during inservice performance testing) for the HPCI pump cannot be readily duplicated with the present flow control systems. Efforts to exactly duplicate the reference values would require excessive valve manipulation which could ultimately result in damage to valves or operators. In order to perform accurate trending and data analysis, the use of an accurate reference value is very important. The complexities of the flow control systems found within these systems makes it extremely difficult to exactly duplicate the reference values.

ALTERNATE TESTING:

Pump differential (discharge) pressure and flow rate will be evaluated using a reference value test derived pump curve. The reference value test pump curve will cover a limited range of pump operation. The reference value test pump curve will be restricted to an operating regime that is representative of accident conditions, or conditions that are the most sensitive indicator of pump degradation.

Based of the reference value test pump curve, a series of "parallel" acceptance criteria curves will be established for Required Action range and Alert range limits. Both upper and lower limits will be established.

Detailed Technical Description:

The reference value curve (Figure PR-015.1, the solid line) will be established by measuring five (5) to eight (8) sets of differential pressure/flow data when the equipment is known to be operating acceptably. The measurements will be distributed (as uniformly as possible) across the entire range of potential inservice test conditions.

RELIEF REQUEST NO. PR-015 (cont.)

The reference value curve will be computed using a third order polynomial regression technique that employs a least-squares fit of the data by successive polynomials of order 1 through 3. The standard deviation about the regression line will be evaluated for each case. The resulting reference value curve is expressed as a third order polynomial in the general form:

$$y=a_3x^3+a_2x^2+a_1x+a_0$$

, where

y : dependent variable
x : independent variable

The Required Action and Alert Range Curves (Figure PR-015.1) will be scaler multiples of the reference value curve. 12

Since the typical curve (Figure PR-015.1) may be subject to interpretation, a tabular summary (Table PR-015.1) of the acceptance criteria will actually be used to evaluate the inservice test results. 12

The measurements taken during an inservice test will be restricted. Only test measurements within the envelope of reference value test measurements will be acceptable. The Inservice test differential pressure/flow will be plotted on a typical pump curve (such as Figure PR-015.1), noted on the associated acceptance criteria table (such as Table PR-015.1), and included in the permanent test records. 12

Finally, the combined differential pressure/flow test measurement will be evaluated for changes from test-to-test. While the "points" on the curve cannot be trended in a meaningful way, the differential pressure/flow data can be "normalized". The normalized value can be trended across time to determine whether pump hydraulic performance is degrading (Figure PR-015.2). The normalized value of differential pressure/flow is defined as a ratio: 12

$$Y_n = \frac{y}{a_3x^3+a_2x^2+a_1x+a_0}$$

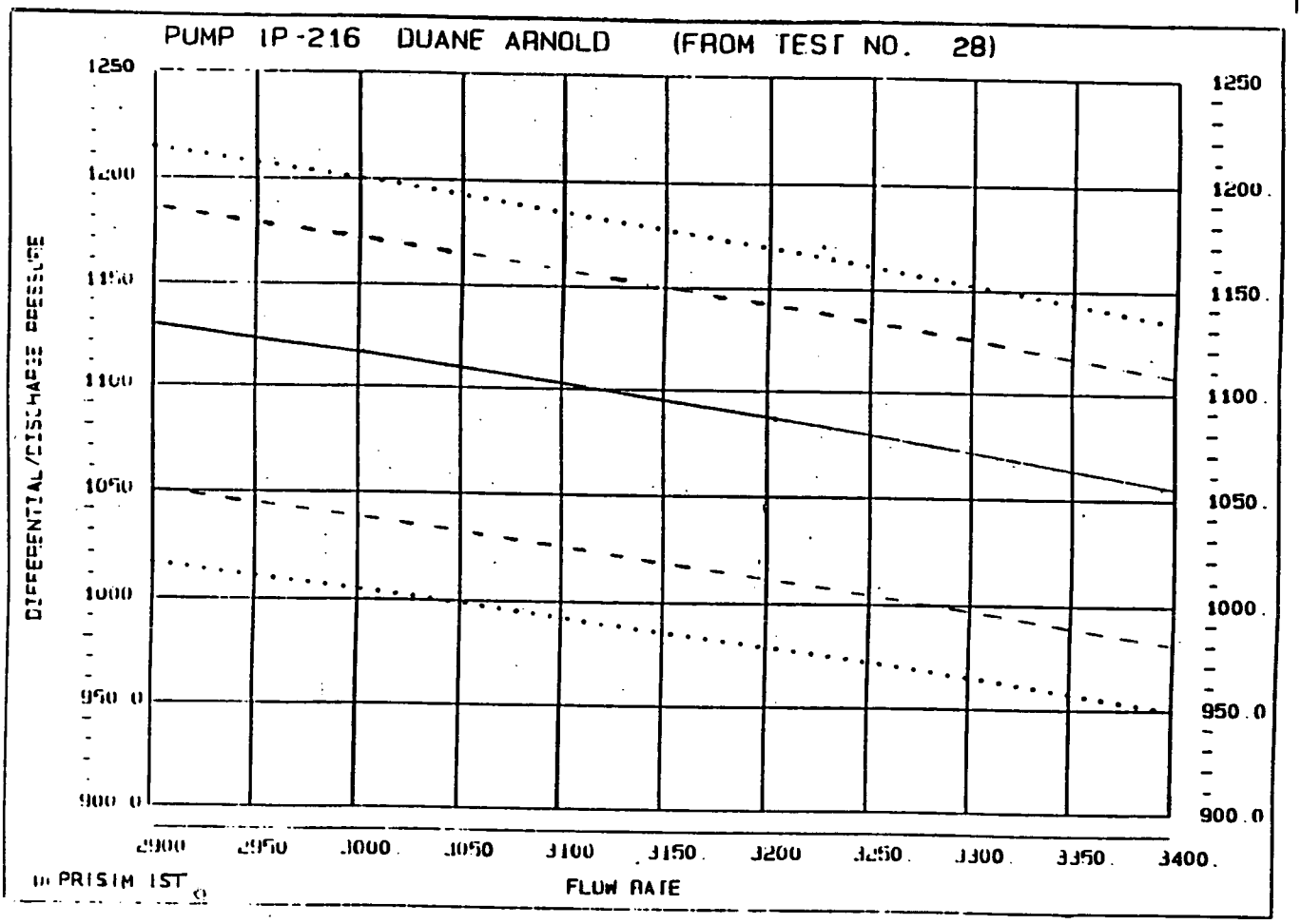
, where

Y_n : normalized dependent variable
Y : actual test measurement of the dependent variable
x : actual test measurement of the independent variable

RELIEF REQUEST NO. PR-015 (cont.)

Upper Required Action Range Limit (the upper dotted line)

Upper Alert Range Limit (the upper dashed line)



Differential Pressure Lower Alert Range Limit (the lower dashed line)

Lower Required Action Range Limit (the lower dotted line)

Figure PR-015.1

RELIEF REQUEST NO. PR-015 (cont.)

IOWA ELECTRIC LIGHT AND POWER COMPANY *** pcPRISM-IST **
DUANE ARNOLD ENERGY CENTER

INSERVICE TEST ACCEPTANCE CRITERIA FOR
PUMP NUMBER : 1P-216 REFERENCE TEST : 028

* DATE: 09/20/9C
* PAGE: 1

FLOW RATE	PRESSURE UPPER REQUIRED ACTION LIMIT	PRESSURE UPPER ALERT RANGE LIMIT	PRESSURE EXPECTED VALUE	PRESSURE LOWER ALERT RANGE LIMIT	PRESSURE LOWER REQUIRED ACTION LIMIT
2,900.000	1,214.654	1,186.406	1,129.911	1,050.817	1,016.920
2,908.475	1,213.495	1,185.274	1,128.832	1,049.814	1,015.949
2,916.949	1,212.329	1,184.135	1,127.747	1,048.805	1,014.973
2,925.424	1,211.155	1,182.989	1,126.656	1,047.790	1,013.990
2,933.898	1,209.975	1,181.836	1,125.558	1,046.769	1,013.003
2,942.373	1,208.788	1,180.677	1,124.454	1,045.743	1,012.009
2,950.847	1,207.595	1,179.511	1,123.344	1,044.710	1,011.009
2,959.322	1,206.394	1,178.338	1,122.227	1,043.671	1,010.004
2,967.797	1,205.187	1,177.159	1,121.104	1,042.627	1,008.993
2,976.271	1,203.972	1,175.973	1,119.974	1,041.576	1,007.977
2,984.746	1,202.751	1,174.780	1,118.838	1,040.520	1,006.954
2,993.220	1,201.523	1,173.581	1,117.696	1,039.457	1,005.926
3,001.695	1,200.288	1,172.374	1,116.547	1,038.389	1,004.892
3,010.170	1,199.046	1,171.161	1,115.392	1,037.314	1,003.853
3,018.644	1,197.798	1,169.942	1,114.230	1,036.234	1,002.807
3,027.119	1,196.542	1,168.715	1,113.062	1,035.148	1,001.756
3,035.593	1,195.280	1,167.482	1,111.888	1,034.056	1,000.699
3,044.068	1,194.010	1,166.242	1,110.707	1,032.958	999.636
3,052.542	1,192.734	1,164.996	1,109.520	1,031.853	998.568
3,061.017	1,191.451	1,163.742	1,108.326	1,030.743	997.494
3,069.492	1,190.161	1,162.482	1,107.126	1,029.627	996.413
3,077.966	1,188.864	1,161.215	1,105.920	1,028.505	995.328
3,086.441	1,187.560	1,159.942	1,104.707	1,027.377	994.236
3,094.915	1,186.249	1,158.661	1,103.487	1,026.243	993.138
3,103.390	1,184.931	1,157.374	1,102.261	1,025.103	992.035
3,111.864	1,183.606	1,156.080	1,101.029	1,023.957	990.926
3,120.339	1,182.275	1,154.780	1,099.790	1,022.805	989.811
3,128.814	1,180.936	1,153.472	1,098.545	1,021.647	988.691
3,137.288	1,179.591	1,152.158	1,097.294	1,020.483	987.564
3,145.763	1,178.238	1,150.837	1,096.035	1,019.313	986.432
3,154.237	1,176.879	1,149.509	1,094.771	1,018.137	985.294
3,162.712	1,175.512	1,148.175	1,093.500	1,016.955	984.150
3,171.186	1,174.139	1,146.833	1,092.222	1,015.767	983.000
3,179.661	1,172.759	1,145.485	1,090.938	1,014.573	981.845
3,188.136	1,171.372	1,144.130	1,089.648	1,013.373	980.683
3,196.610	1,169.977	1,142.769	1,088.351	1,012.167	979.516
3,205.085	1,168.576	1,141.400	1,087.048	1,010.954	978.343
3,213.559	1,167.168	1,140.025	1,085.738	1,009.736	977.164
3,222.034	1,165.753	1,138.642	1,084.421	1,008.512	975.979
3,230.508	1,164.331	1,137.253	1,083.099	1,007.282	974.789
3,238.983	1,162.902	1,135.858	1,081.769	1,006.045	973.592
3,247.458	1,161.466	1,134.455	1,080.433	1,004.803	972.390
3,255.932	1,160 023	1,133.045	1,079.091	1,003.555	971.182

Table PR-015.1

RELIEF REQUEST NO. PR-015 (cont.)

IOWA ELECTRIC LIGHT AND POWER COMPANY *** pcPRISIM-IST **
DUANE ARNOLD ENERGY CENTER

INSERVICE TEST ACCEPTANCE CRITERIA FOR * DATE: 09/20/90
PUMP NUMBER : 1P-216 REFERENCE TEST : 028 * PAGE: 2

FLOW RATE	PRESSURE UPPER REQUIRED ACTION LIMIT	PRESSURE UPPER ALERT RANGE LIMIT	PRESSURE EXPECTED VALUE	PRESSURE LOWER ALERT RANGE LIMIT	PRESSURE LOWER REQUIRED ACTION LIMIT
3,264.407	1,158.573	1,131.629	1,077.742	1,002.300	969.968
3,272.881	1,157.116	1,130.206	1,076.387	1,001.040	968.748
3,281.356	1,155.652	1,128.776	1,075.025	999.773	967.522
3,289.831	1,154.181	1,127.339	1,073.656	998.500	966.291
3,298.305	1,152.703	1,125.895	1,072.281	997.222	965.053
3,306.780	1,151.217	1,124.445	1,070.900	995.937	963.810
3,315.254	1,149.725	1,122.987	1,069.512	994.646	962.561
3,323.729	1,148.226	1,121.523	1,068.117	993.349	961.306
3,332.203	1,146.720	1,120.052	1,066.716	992.046	960.045
3,340.678	1,145.207	1,118.574	1,065.309	990.737	958.778
3,349.153	1,143.687	1,117.089	1,063.895	989.422	957.505
3,357.627	1,142.159	1,115.597	1,062.474	988.101	956.226
3,366.102	1,140.625	1,114.099	1,061.047	986.773	954.942
3,374.576	1,139.084	1,112.593	1,059.613	985.440	953.651
3,383.051	1,137.535	1,111.081	1,058.172	984.100	952.355
3,391.525	1,135.980	1,109.562	1,056.725	982.755	951.053
3,400.000	1,134.417	1,108.036	1,055.272	981.403	949.7

Table PR-015.1 (cont.)

RELIEF REQUEST NO. PR-015 (cont.)

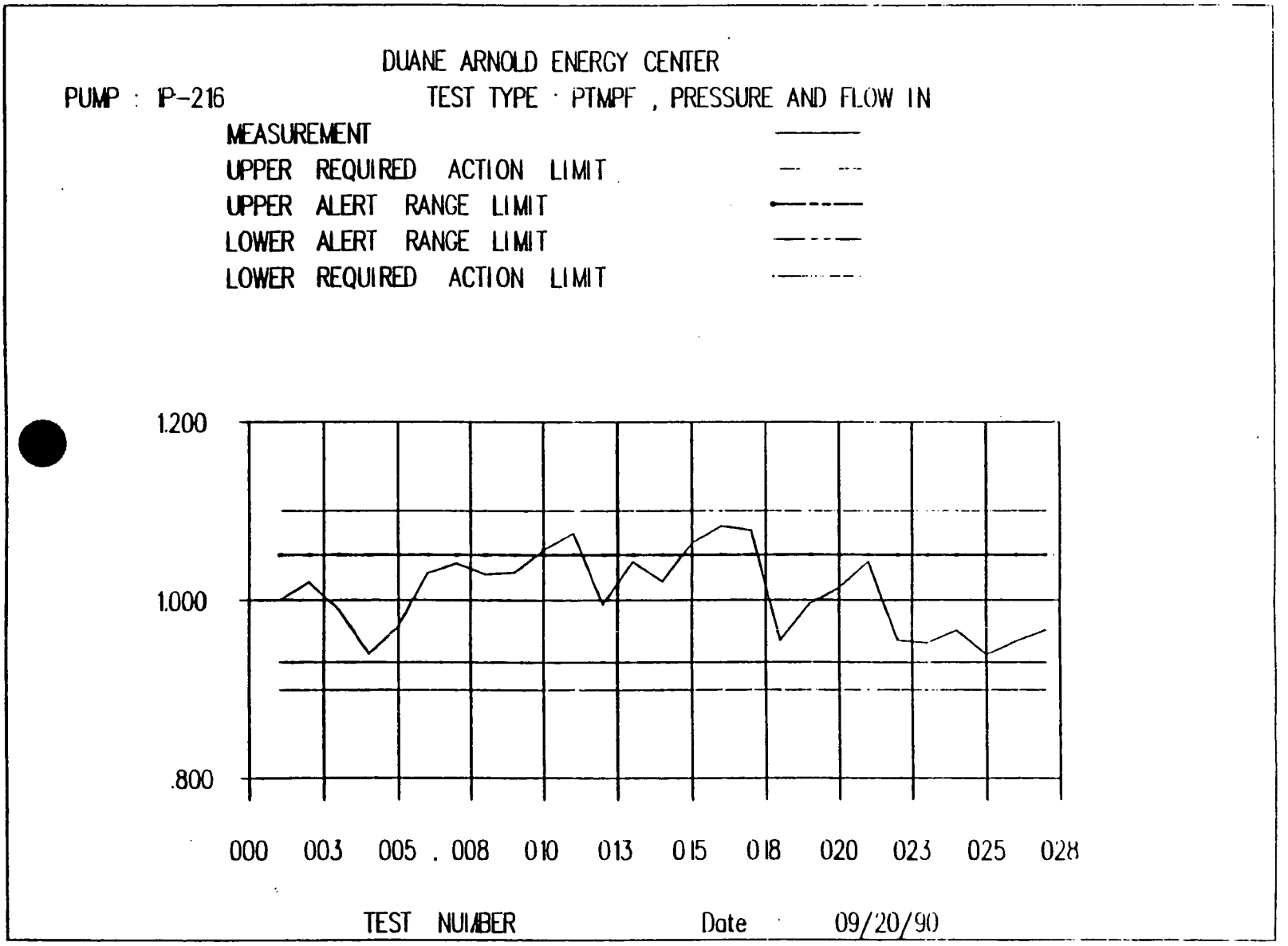


Figure PR-015.2

RELIEF REQUEST NO. PR-016

(RESERVED)

RELIEF REQUEST NO. PR-017

(RESERVED)

RELIEF REQUEST NO. PR-017 (cont.)

(RESERVED)

3.0 INSERVICE TESTING PROGRAM FOR VALVES

3.1 General Information

This testing program for valves meets the requirements of Subsection IWV of Section XI of the ASME Boiler and Pressure Vessel Code, 1980 Edition and Winter 1981 Addenda. Where these requirements are determined to be impractical, cold shutdown justifications and specific requests for relief are included in Sections 3.4 and 3.5 respectively.

3.2 Valve Program Table

Appendix B lists all ISI class 1, 2, 3 and NC valves included in the DAEC IST Program. The following information is included for each valve:

- VALVE NUMBER: The valve identification number
- DWG COOR: The valve location coordinates on the P&ID
- IST CLASS: The IST classification of the valve
- FUNCTION CATEGORY: The category(s) assigned to the valve based on the definitions in Subarticle IWV-2200. Four separate categories are defined:

  CATEGORY A: Valves for which seat leakage is limited to a specific maximum amount in the closed position for fulfillment of their safety function.

  CATEGORY B: Valves for which a specific amount of leakage in the closed position is not measured but require stroke testing to verify their ability to fulfill their safety function.

  CATEGORY C: Valves which are self-actuating in response to some system characteristic, such as pressure (relief valves) or flow direction (check valves).

  CATEGORY D: Valves which are actuated by an energy source capable of only a single operation (eg. explosively-actuated valves).

- SIZE: The nominal size of the valve in inches

- BODY STYLE: The valve body design as indicated by the following abbreviations:

AIR PILOT	AP
ANGLE	ANG
AUTO VENT	AV
BALL	BAL
BUTTERFLY	BTF
CHECK	CK
DIAPHRAGM	DIA
EXCESS FLOW CHECK	XFC
EXPLOSIVE SHEAR	SH
GATE	GA
GLOBE	GL
NEEDLE	NDL
NOTCHED GLOBE	NGL
PLUG	PLG
RELIEF	RV
RUPTURE DIAPHRAGM	RPD
SAFETY	SV
STOP CHECK	SCK
TRIP VALVE	TV
2-WAY	2WY
3-WAY	3WY
4-WAY	4WY

- ACTUATOR: The type of valve actuator as indicated by the following abbreviations:

MOTOR OPERATOR	MO
AIR PILOT OPERATOR	AP
AIR OPERATOR	AO
SOLENOID OPERATOR	SO
HYDRAULIC OPERATOR	HO
EXPLOSIVE OPERATOR	EXP
MANUAL	M
SELF ACTUATED & MANUAL OPERATED	MSA
SELF ACTUATED	SA
SELF ACTUATED & MOTOR OPERATED	SAM
SELF ACTUATED & PILOT OPERATED	SAP
SELF ACTUATED, TESTABLE CHECK	SAT

- NORMAL POSITION: The position of the valve during normal plant operation, specified as follows:

O	Normally open
C	Normally closed
O/KL	Normally open/key locked
O/FO	Normally open/fail open
O/FC	Normally open/fail closed
O/KO	Normally open/key locked & fail open
O/LO	Normally open/locked open
O/ND	Normally open/breaker de-energized
C/FO	Normally closed/fail open
C/FC	Normally closed/fail closed
C/KC	Normally closed/key locked & fail closed
C/KL	Normally closed/key locked
C/LC	Normally closed/locked closed
C/ND	Normally closed
NE	Normally energized
ND	Normally de-energized
SYS	Open or closed, depending on usage

Note: Valves with fail-safe positions are indicated as either FO - fail open or FC - fail closed.

- TEST TYPE: The test(s) that will be performed to fulfill the requirements of subsection IWV. The test definitions and abbreviations used are identified in Table 3.2-1.

- TEST FREQ; The frequency at which the required tests will be performed. Test frequencies are defined in Table 3.2-2.

- MAXIMUM LIMIT: The limiting maximum value of full stroke time, in seconds, for power-operated valves in category A or B and the leak rate acceptance criteria for category A valves as set forth in the plant records. Also, for check valves exercised by a mechanical exerciser, the maximum torque value. 12

- RELIEF REQUEST: The reference to a relief request (Section 3.5) or a cold shutdown justification (Section 3.4) for valve testing.

- TECHNICAL POSITION: The reference to a technical approach or position (Section 3.3) or additional information as applicable

TABLE 3.2-1: INSERVICE VALVE TESTS

TEST	TEST NAME	TEST DESCRIPTION
AT-1	Type C leaktest	Containment isolation valves will be Type C leak tested in accordance with DAEC Technical Specifications, Section 4.7.A.2.c and 10CFR50 Appendix J.
AT-2	Excess flow check valve test	Excess flow check valves will be tested for operability in accordance with DAEC Technical Specifications, Section 4.7.D.
AT-4	Vacuum breaker leaktest	The suppression chamber-drywell vacuum breakers will be leak tested in accordance with DAEC Technical Specification, Section 4.7.A.4.d.
AT-5	Pressure isolation valve leaktest	Those valves so designated will be leak tested in accordance with Subsubarticle IWV-3420 per the NRC SER dated 9/26/83.
AT-6	Accumulator check valve leaktest	Leaktest of air/nitrogen accumulator check valves.
AT-7	Purge/vent pressure decay test	Pressure decay test of Containment purge and vent valves.
BTPC	Partial-stroke exercise test to the CLOSED position (IWV-3412)	Exercise test in the closed direction, verified by stroke time measurement, will be performed to confirm partial stroke capacity from intermediate position to the fully closed position.
BTO	Full-stroke exercise test to the OPEN position (IWV-3412 and 3413)	Exercise test in the open direction, verified by stroke time measurement, will be performed to confirm the full stroke capability of each valve. The stroke direction is based on the direction the valve disk must travel to fulfill a safety function.
BTC	Full-stroke exercise test to the CLOSE position (IWV-3412 and 3413)	Exercise test in the closed direction, verified by stroke time measurement, will be performed to confirm the full stroke capability of each valve. The stroke direction is based on the direction the valve disk must travel to fulfill a safety function.

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TABLE 3.2-1: INSERVICE VALVE TESTS

TEST	TEST NAME	TEST DESCRIPTION
ET-O	Full-stroke exercise test to the OPEN position (IWV-3412)	Exercise test in the open direction will be performed to confirm the full stroke capability of each valve. Stroke time measurements will not be taken.
ET-C	Full-stroke exercise test to the CLOSE position (IWV-3412)	Exercise test in the closed direction will be performed to confirm the full stroke capability of each valve. Stroke time measurements will not be taken.
BTD	Full stroke exercise test to de-energized position	Solenoid valves, which direct control air to main air operated valves, are shown to stroke to their de-energized position by proper operation of the associated main valves.
BTE	Full stroke exercise test to energized position	Solenoid valves, which direct control air to main air operated valves, are shown to stroke to their energized position by proper operation of the associated main valves.
CT-CO	Check valve exercise test to OPEN position (IWV-3522)	Check valves will be exercised from the fully closed to the open position. Verification of safety basis system flow through the check valve shall be an adequate demonstration that the valve is open. The stroke direction tested (open) is based on the direction the valve disk must travel to fulfill a safety function.
CT-CC	Check valve exercise test to CLOSED position (IWV-3522)	Check valves will be exercised from the open to the closed position. The stroke direction tested (closed) is based on the direction the valve disk must travel to fulfill a safety function.
CT-PO	Check valve partial stroke exercise test to OPEN position (IWV-3522)	Check valves will be tested from the closed to a partially open position.

TABLE 3.2-1: INSERVICE VALVE TESTS

TEST	TEST NAME	TEST DESCRIPTION
CT-PC	Check valve partial stroke exercise test to CLOSED position (IWV-3522)	Check valves will be tested from the open to a partially closed position.
CT-SP	Safety/Relief valve set point verification test (IWV-3510)	Relief and safety valve set points will be verified in accordance with OM-1 1981.
CTCME	Mech. Exer. Closed	Mechanical exercise to the CLOSE position.
CTOME	Mech. Exer. Open	Mechanical exercise to the OPEN position.
DT-E	Explosive valve test (IWV-3610 and 3620)	Explosively-actuated valves will be tested in accordance with IWV-3610.
DT-M	Rupture diaphgram	Rupture diaphragm test per manufacturers' recommendation.
FST	Fail-safe test (IWV-3415)	Valves with fail-safe actuators will be tested to verify proper fail-safe operation upon loss of actuator power.
PIT	Position indication checks (IWV-3300)	Valves with position indicators will be checked to verify that remote valve indicators accurately reflect valve position.

TABLE 3.2-2: TEST FREQUENCY

TEST FREQUENCY	OPERATIONAL CONDITION (1)	FREQUENCY OF TESTING
M1	No operational condition limitations	Monthly testing required
OP	Power operation	At least once per 92 days
CS	Cold Shutdown	See (2) below
RR	Refueling	Nominally every two years - during reactor refueling
R2	Refueling	One half of main steam relief & safety valves tested during successive refueling outages.
SA	Refueling	Tested on a group sample basis
Y2	No operational condition limitations	Every two years (IWV-3300)
Y5	No operational condition limitations	Every five years per OM-1 1981
Y10	No operational condition limitations	Every ten years per OM-1 1981

(12)

(1) Operational conditions are defined in DAEC Technical Specifications, page 1.0-3

(2) Inservice valve testing will commence within 48 hours of reaching the cold shutdown condition as defined in DAEC Technical Specifications. Testing not completed before startup may be completed during subsequent cold shutdowns. Valve testing need not be performed more often than once every three months. In the case of extended cold shutdowns, the testing need not be started within the 48 hour limitation. However, in these instances, all valves must be tested prior to startup.

Note: It is expected that the required testing will normally be completed with 96 hours following cold shutdown. However, completion of all valve testing during cold shutdown is not required if plant operating conditions do not permit testing of specific valves.

SECTION 3.3: TECHNICAL APPROACHES AND POSITIONS

TAV-01 There are 89 CRD Hydraulic Control Units (HCUs). Each CRD HCU contains one of these valves. The valve number listed in Appendix B, "Valve Listing" is typical of 89. All 89 valves will be tested as specified for the typical valve.

TAV-02 through TAV-04 - DELETED

TAV-05: Reverse Testing of Containment Isolation Valves

The 10CFR50, Appendix J, Type C Local Leak Rate Test (LLRT) of this valve is performed in the reverse direction. Testing in the reverse direction is justified in the Appendix J Program.

TAV-06: Testing of Containment Isolation Valves as Groups

The 10CFR50, Appendix J, Type C LLRTs of these valves do not yield valve specific seat leakage measurements. The leakage limit assigned to these valves is the limit for the entire group of valves at the penetration. This method is justified in the Appendix J Program. 12

TAV-07: TIP Shear Valves

The TIP shear valves cannot be seat leak tested due to their design/operating characteristics. The assembly would have to be replaced if the valves were fired to perform a seat leak test. This position is justified in the Appendix J Program.

TAV-08: Limited Rotation of Purge/Vent Valves

The "full" stroke of these 1/4 turn butterfly valves is restricted by physical modifications. Rotation is restricted to the range from closed to 30 degrees open.
References: Generic Item B-24; Branch Technical Position CSB 6-4

TAV-09: Drywell/Wetwell Vacuum Breakers

Individual leak rates for these valves are not obtainable. Therefore, the 0.009 psi/min. limit applies to all CV-4327A through CV-4327H valves.
References: Tech. Spec. 4.7.A.4.d; UFSAR 6.2.6.3.5.3

TAV-10: Rupture Diaphragms

Only testable rupture diaphragms are identified in the Program. Non-testable rupture diaphragms are not identified. They will be replaced based on manufacturer's recommendations.
Reference: IWV-3620

TAV-11: Containment Hard Vent

DAEC installed a Containment Hard Vent as requested in Generic Letter 89-16 to provide a means of venting primary containment irrespective of the release of radioactivity to the environment. This system will be utilized only when plant conditions have degraded beyond design conditions considered in the DAEC Final Safety Analysis Report. Because the hard vent system is not intended to be used to mitigate events considered in the Final Safety Analysis Report, components other than those provided for primary containment isolation are not within the scope of the Inservice Test (IST) Program, as discussed in IWV-1100. These components have been added to the IST Program for testing on an augmented basis. A number of the test frequencies associated with these components differ from the requirements listed in the Code. However, since these components are not within the scope of the Code, specific relief is not required, as discussed in the NRC Document, MINUTES OF THE PUBLIC MEETINGS ON GENERIC LETTER 89-04, dated October 25, 1989. The intent of including these components in the Program is to provide some level of operational readiness for the Hard Vent System.

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TAV-12: Feedwater Injection Check Valves

Calculation M93-12 provides quantitative criteria to demonstrate the ability of check valves V-14-001 and V-14-003 to full stroke open. At reactor power levels greater than or equal to 90 percent, the calculation can be used to verify that the feedwater injection check valves meet the HPCI/RCIC flow requirements. The open exercise frequency for these valves is in accordance with the intent of OMa-1988, paragraph 4.3.2.2. The test frequencies of paragraph 4.3.2.2 are conditional, tied to plant operating conditions which allow testing. The maximum allowed test cycle is refueling, or once per operating cycle, for performance of full-stroke exercise. If cycling is achievable during normal plant operation, then the valves are to be tested quarterly. The test cycle for the feedwater injection check valves, utilizing calculation M93-12 to verify full-stroke open exercising, will be at least once per cycle, and quarterly when above 90 percent reactor power.

SECTION 3.4

COLD SHUTDOWN TEST JUSTIFICATIONS
FOR
VALVE TESTING PROGRAM

COLD SHUTDOWN TEST JUSTIFICATIONS

CSJ-01 MO-4841A and MO-4841B - Reactor Building Closed Cooling Water System (RBCCW) Drywell Isolation Valves

During plant operation, RBCCW is supplied (and returned) through these valves to provide cooling to critical components in the drywell including the reactor recirculation pump motor windings, seal water coolers and lube oil coolers. Closing MO-4841A or B will interrupt cooling flow and could result in damage to pump and motor components.

CSJ-02 MO-4441 and MO-4442 - Reactor Feedwater Outboard Containment Isolation Valves

During plant operation at power, reactor feedwater is supplied through both these valves to maintain reactor coolant inventory in the reactor vessel and maintain reactor vessel water level. Closing either of these valves will isolate two of the four supplies of feedwater into the reactor vessel. This could result in thermal shock to the reactor vessel feedwater nozzles and spargers upon resumption of flow and a plant trip due to the potential for severe reactor vessel water level transients during the evolutions.

CSJ-03 DELETED 12

CSJ-04 MO-4627 and MO-4628 - Reactor Recirculation Pump Discharge Valves

Closing either of these valves during plant operation places the recirculation system in a "single loop" configuration. Although single-loop operation is possible, it requires power reduction and is a complex evolution. It is not considered prudent to routinely and voluntarily place the plant in this configuration.

CSJ-05 DELETED

12

CSJ-06 DELETED

CSJ-07 V-22-0016 - HPCI Turbine Exhaust Check Valve
V-24-0023 - RCIC Turbine Exhaust Check Valve

During plant operation these valves must be capable of opening to allow turbine exhaust steam to exit into the suppression chamber. Testing of these valves to the closed position requires downstream valves to be closed when air pressure is used to verify valve closure. While the tests are in progress, the respective pump is effectively inoperable since there is no path for turbine exhaust steam.

CSJ-08 V-22-0017 - HPCI Turbine Exhaust Check Valve
V-24-0008 - RCIC Turbine Exhaust Check Valve

During plant operation these valves must be capable of opening to allow turbine exhaust steam to exit into the suppression chamber. These valves are provided with a manual operator that forces the plug to the closed position. While the manual operator is in the closed position, the respective pump is effectively inoperable since there is no path for turbine exhaust steam. Furthermore, the associated turbine stop valve must be defeated in the closed position to preclude turbine auto initiation that could result in personnel injury as a result of steam exhausting via the blowout plugs.

CSJ-09 V-22-0021 and V-22-0022 - HPCI Condensate Drain Valves

During HPCI system operation these valves allow condensate to drain from the HPCI turbine exhaust drain pot to the suppression chamber. Testing of this valve to the closed position requires V-22-022 to be closed. If HPCI were to initiate while this test was in progress, condensate could backup into the turbine exhaust piping and casing resulting in potential damage to critical components or adverse affects with respect to system performance.

CSJ-10 V-22-0063 and V-22-0064 - HPCI Exhaust Line Vacuum Breakers
V-24-0046 and V-22-0047 - RCIC Exhaust Line Vacuum Breakers

These valves open following operation of the respective turbine to prevent a vacuum buildup in the exhaust line and subsequent filling of the turbine exhaust piping from the torus. If HPCI or RCIC should initiate during the period when these valves are isolated for air testing they would not function and respective operation of the pump could cause water to back fill into the piping. Operating a turbine with the exhaust piping filled with water could result in damage to the turbine or the exhaust piping.

CSJ-11 MO-1908 and MO-1909 - Residual Heat Removal Shutdown Cooling Supply Valves

These valves are electrically interlocked to prevent opening with reactor pressure greater than 135 psig to preclude overpressurization of the residual heat removal system.

CSJ-12 V-23-0049 - HPCI Pump Discharge Check Valve

This valve opens to provide an injection flow path into the reactor vessel for the HPCI system. HPCI injection with the reactor at power is not possible due to the potential for severe reactor vessel water level transients. This valve is not accessible during power operation.

CSJ-13 V-25-0036 - RCIC Injection Check Valve

This valve cannot be cycled during reactor operation without placing the RCIC system inoperable or actually injecting water into the reactor vessel. RCIC injection with the reactor at power is not possible due to the potential for severe reactor vessel water level transients.

CSJ-14 CV-4428 and CV-4429 - Reactor Head Vent Valves

These valves cannot be cycled during reactor operation. To do so would cause an unnecessary reactor transient which would affect continued reactor operation.

CSJ-15 MO-1905 and MO-2003 - LPCI Inboard Isolation Valves

These valves should not be cycled during reactor operation. These valves open automatically open upon receipt of a LPCI initiation signal, but only when reactor vessel pressure is less than 450 psig. Engineering calculations (reference: NG-92-4109) have shown that the valve and its associated actuator is not designed to be operated at a differential pressure associated with power operations. Should the associated injection check valve leak, the motor operated valves would be subjected to an excessive differential pressure and could be damaged if stroked.

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CSJ-16 MO-2117 and MO-2137 - CS Injection Inboard Isolation Valves

These valves should not be cycled during reactor operation. These valves automatically open on the receipt of a Core Spray initiation signal but only when the reactor vessel pressure is less than 450 psig. Engineering calculations (reference: NG-92-4109) have shown that the valve and its associated actuator is not designed to be operated at a differential pressure associated with power operations. Should the associated injection check valve leak, the motor operated valves would be subjected to an excessive differential pressure and could be damaged if stroked.

SECTION 3.5

RELIEF REQUESTS FOR VALVE TESTING PROGRAM

RELIEF REQUEST NO. VR-002

SYSTEMS:

Various

COMPONENTS:

All solenoid and air-pilot operator valves without individual position indication.

CATEGORY:

B

FUNCTION:

Solenoid and air-pilot operators are used to control actuators on many valves.

TEST REQUIREMENT:

Exercise Category B valves to the closed and/or open position and evaluate stroke time quarterly (IWV-3412, IWV-3413, and IWV-3417(a)).

BASIS FOR RELIEF:

Solenoid and air-pilot valves which control the air supply to a main valve usually do not have indicator lights. However, the operation of the main valve within its stroke time limit implies that the solenoid and/or air-pilot valve is performing satisfactorily.

ALTERNATE TESTING:

For solenoid-operated and air pilot-operated valves which control the air supply to air-operated valves and have no individual position indication, verification that the main valve has stroked to the correct position within its respective time limits will provide adequate evidence that the solenoid or air pilot-operated valve has stroked to its proper position and has done so within the required time.

RELIEF REQUEST NO. VR-003

SYSTEM:

Residual Heat Removal

COMPONENTS:

V-19-0149
V-20-0082

CATEGORY:

A/C

FUNCTION:

These valves open to provide a pathway for LPCI flow into the recirculation system and close to isolate the RHR system from the high pressure of the recirculation system.

TEST REQUIREMENT:

Check valves shall be exercised at least every 3 months. (IWV-3521)

BASIS FOR RELIEF:

These valves cannot be stroked during power operation because the RHR pumps cannot develop sufficient head to overcome recirculation system pressure. These valves cannot be manually stroked during operation because they are located in the drywell and are inaccessible.

In-situ testing has determined that these check valves fully open at approximately 10000 gpm. To ensure compliance with IWV-3522, positive verification of valve operation is required. To achieve this verification, a mechanical indicator is attached to the rotating shaft. This testing cannot be conducted at Cold Shutdown because the containment is inerted with nitrogen. In order to gain personnel access to the drywell, the nitrogen must be vented (normally a 16 - 24 hour operation). The containment must be re-inerted before the plant is restarted (another 16 - 24 hour operation). Inerting and de-inerting the drywell solely for the purpose of valve testing is excessively burdensome. Additionally, a full stroke test of these valves cannot be performed with flow at Cold Shutdown because it would be necessary to test two channels/loops of a safety system at the same time. Current guidance only allows the operation of one train of a safety system for surveillance purposes. 12

RELIEF REQUEST NO. VR-003 (Continued)

One of these valves is partially stroked during Cold Shutdown for the operation of the shutdown cooling mode of RHR. This is only a partial stroke test as the normal flow rate in this mode is only 4000 gpm versus a maximum required accident flow rate of 14,400 gpm and no positive verification of valve position is made. While shifting system operation to the idle loop is possible, it is a time consuming operation. In order to change loops and inject cooling flow through the other loop, more than 8 hours of preparation and lineup work would be required of the control room personnel, assuming no other testing/duties ongoing at the time. 12

ALTERNATE TESTING:

One of these valves will be partially stroked to the open position each cold shutdown.

V-19-0149 and V-20-0082 will be stroked to the full open position during each refueling outage, utilizing a mechanical position indicator to prove positive valve operation. 12

RELIEF REQUEST NO. VR-004

SYSTEM:

Nuclear Boiler

COMPONENTS:

V-14-0001 and V-14-0003

CATEGORY:

A/C

FUNCTION:

These valves are the reactor feedwater supply inboard isolation valves. They open for feedwater flow, RCIC and HPCI injection into the vessel and act as containment isolation valves.

TEST REQUIREMENT:

Check valves shall be exercised at least every 3 months. (IWV-3521)

12

BASIS FOR RELIEF:

The valves cannot be exercised during power operation. During plant operation at power, reactor feedwater is supplied through both valves to maintain reactor coolant inventory in the reactor vessel and maintain reactor vessel water level. Closing either of these valves will isolate two of the four supplies of feedwater into the reactor vessel. This action could result in thermal shock to the reactor vessel feedwater nozzles and spargers upon resumption of flow and a plant trip due to the potential severe reactor vessel water level transients.

These valves cannot normally be tested during Cold Shutdown because the containment is inerted with nitrogen. Personnel would be required to access the drywell to perform a mechanical exercise of these valves. The nitrogen must be vented (normally a 16-24 hour operation). The containment must be re-inerted before the plant is restarted (another 16-24 hour operation) Inerting and de-inerting the drywell solely for the purpose of testing is excessively burdensome. In addition, the LLRT is done with air, therefore, the line between the check valves and upstream isolation valve must be drained. This is a time consuming process resulting in lengthened shutdown times and unnecessary hours of exposure.

RELIEF REQUEST NO. VR-004 (CONTINUED)

ALTERNATE TESTING:

The valves will be exercised to the fully closed position each refueling outage and verified by local leak rate testing. 12

RELIEF REQUEST NO. VR-005

SYSTEM:

Various

COMPONENTS:

PSV-1911	PSV-2122	PSV-2609	PSV-4439B	PSV-4403
PSV-1952	PSV-2129	PSV-3221A	PSV-4439C	PSV-4404
PSV-1975	PSV-2223	PSV-3221B	PSV-4439D	PSV-4405
PSV-1988	PSV-2228	PSV-3222A	PSV-4439E	PSV-4406
PSV-2043	PSV-2301	PSV-3222B	PSV-4439F	PSV-4407
PSV-2057	PSV-2430	PSV-3223A	PSV-4842	
PSV-2068	PSV-2474	PSV-3223B	PSV-4400	
PSV-2102	PSV-2501	PSV-4336	PSV-4401	
PSV-2109	PSV-2607	PSV-4439A	PSV-4402	

12

CATEGORY:

C

FUNCTION:

These valves provide overpressure protection to the associated system components.

TEST REQUIREMENT:

Safety and relief valves shall be tested in accordance with Subsection IWV-3510.

BASIS FOR RELIEF:

ANSI/ASME OM-1-1981, "Requirements for Inservice Performance Testing of Nuclear Power Plant Pressure Relief Devices", was developed to supersede the requirements of Subsection IWV-3510. This standard is more definitive and better suited to operational testing than is ASME/PTC 25.3-1976 which is referenced in IWV-3512.

ALTERNATE TESTING:

Safety and relief valves will be tested in accordance with the requirements of ANSI/ASME OM-1-1981 except for valves with setpoints less than 70 psig. For these valves, a setpoint tolerance of ± 2 psig will be maintained as specified in the original installation, construction, manufacture Code. The setpoints for all valves will be restored to within the specified tolerance of the original installation/ construction/manufacture Code before it is reinstalled.

12

RELIEF REQUEST NO. VR-006

SYSTEM:

Nuclear Boiler

COMPONENTS:

Reactor Relief Valves PIS No.	Solenoid Valves PIS No.
PSV-4400*	SV-4400
PSV-4401	SV-4401
PSV-4402*	SV-4402
PSV-4405*	SV-4405
PSV-4406*	SV-4406
PSV-4407	SV-4407

*Automatic Depressurization System (ADS)

CATEGORY:

B/C for the relief valves
B for solenoid valves

FUNCTION:

The functions of the relief valves are to (1) open upon receipt of an ADS signal to blowdown the reactor vessel (for the ADS valves only), (2) act as primary system safety valves actuating on high system pressure or by manual actuation from the Control Room, and (3) to close to maintain the primary system pressure boundary and prevent uncontrolled depressurization of the reactor (stuck open relief valve). The function of the solenoid valves is to energize upon receipt of a manual or ADS actuation signal and, in so doing, vent the poppet valve assembly causing the associated main valves to open.

TEST REQUIREMENTS:

Exercise valves every three months (IWV-3412 (a)).

Evaluate stroke times with respect to the previously measured stroke time (IWV-3417 (a)).

BASIS FOR RELIEF:

These valves can only be tested at very low reactor power levels with primary system pressure greater than 50 psig. The test sequence requires an Operator to:

RELIEF REQUEST NO. VR-006 (Continued)

a. Open at least one turbine bypass valve and discharge main steam directly to the condenser,

b. Actuate the relief valve and observe the corresponding closure of the turbine bypass valve (pressure control on the turbine bypass valve is fairly quick to respond, 1-1/2 seconds), and the response of pressure switches and thermocouples downstream of the relief valve.

c. Close the relief valve and observe the corresponding opening of the turbine bypass valve and the response of pressure switches and thermocouples downstream of the relief valves.

Each relief valve actuation produces hydrodynamic loads which are transmitted to the suppression pool (Torus). The Duane Arnold Mark I Containment, Plant Unique Analysis Report (PUAR) fatigue evaluation is based on 740 relief valve actuations with normal operating conditions (i.e., 740 actuations for testing purposes). Quarterly testing of the subject valves would result in 4 (quarters) x 40 (years) x 6 (valves) = 960 test actuations, which would exceed the approved design basis.

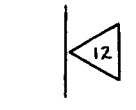
Finally, the failure of any relief valve to close would cause an uncontrolled rapid depressurization of the primary system (stuck open relief valve transient). The resulting severe thermal gradients in the reactor vessel are not desirable, and should be minimized.

These valves should not be tested during cold shutdowns in order to reduce the number of challenges to safety/relief valves as recommended by NUREG-0737 and the BWR Owners Group Evaluation of NUREG-0737 Item II.K.3.16, Reduction of Challenges and Failures of Relief Valves.

The subject valves are fast acting valves (normally exercise in less than 2 seconds) and they do not have stem/disk position indicators.

ALTERNATE TESTING:

At least half of these valves will be removed, tested, disassembled, inspected and rebuilt every cycle in accordance with Technical Specification 4.6.D.1. Stroke timing of the solenoid actuators is performed by an outside vendor such as Wyle Labs. Comparison to previously measured stroke time will not be performed. The subject valves will be exercised once every refueling outage during plant startup.



RELIEF REQUEST NO. VR-007

SYSTEM:

DIESEL GENERATOR

COMPONENTS:

SV-3261A, SV-3261B
SV-3262A, SV-3262B

CATEGORY:

B

FUNCTION:

These valves are the air start solenoid valves for the A and B Standby Diesel Generators. When the start sequence for the diesel generators is initiated, these valves open to allow pressurized air stored in air receivers to charge the diesel generator air start headers.

TEST REQUIREMENT:

Measure power operated valve stroke times and take corrective action. IWV-3413, IWV-3417

BASIS FOR RELIEF:

Relief is requested from the stroke time requirements of Section XI. It is impractical to measure the stroke time of the air start valves directly, since there is no visible stem movement and the valves have no position indicators.

ALTERNATE TESTING:

Starting the Standby Emergency Diesel Generators using the air start system will be considered demonstration of proper operation of the air start solenoids. Therefore, the air start solenoids will be tested when the diesel generators are tested in accordance with Technical Specification 4.8.A.1.a.1. Technical Specification section 4.8.A.1.a.1 states that the diesel generators shall be manually started once each month. Each diesel air start system consists of two air compressors, one driven by an AC motor and the other driven by a small diesel engine. During monthly testing, the small diesel engine air start train is isolated and the diesel is started using the AC motor train only. However, no stroke time measurement is taken during this test. Quarterly testing exercises the small diesel engine train in a similar manner. Once every six months, the

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RELIEF REQUEST NO. VR-007 (Continued)

diesel generator is "cold-fast" started, during which time the small diesel engine train valve stroke time is indirectly measured by ensuring that the diesel starts within Technical Specification limits. Because the stroke time is indirectly measured, the corrective action requirements of IWV-3417 will not be implemented.

Additionally, the solenoid valves will be periodically replaced or refurbished under DAEC's Maintenance Program for Solenoid Valves. 12

RELIEF REQUEST NO. VR-008

SYSTEM:

NUCLEAR BOILER, REACTOR RECIRCULATION, REACTOR CORE ISOLATION COOLING, CORE SPRAY, HIGH PRESSURE COOLANT INJECTION, AND REACTOR VESSEL INSTRUMENTATION

COMPONENTS:

Excess flow check valves

CATEGORY:

A/C

FUNCTION:

Excess flow check valves limit leakage from the reactor coolant system in the event of an instrumentation piping failure outside containment. They also perform a containment isolation function if an instrument line were to fail inside and outside of the containment vessel.

TEST REQUIREMENT:

Exercise in the closed direction every three months (CT-CC). Conduct valve seat leakage tests once every two (2) years.(AT-1)

BASIS FOR RELIEF:

Exercising of these valves is impractical during normal operation since it requires isolating instrumentation downstream of the excess flow check valves. Additionally, this testing involves a total of 94 valves which would require excessive cold shutdown time solely to accomplish this testing and would greatly increase total personnel radiation exposure.

The excess flow check valves, designated FLO-FUSE by the manufacturer (Marietta Valve Corp., Boonton, New Jersey), have no provision for leaktesting nor are there such provisions in the upstream side of the lead-in tubing from the root valves. This, there is no practical method of conducting leaktests of these valves.

It should be noted that these valves see little or no flow and function essentially only during the exercise testing described below. Also, the significant internal components are fabricated from corrosion-resistant materials that are not expected to degrade during the plant lifetime. For these reasons, general seat degradation is highly unlikely. Gross failure of the seat, if present, will be identified during exercise testing.

RELIEF REQUEST NO. VR-008 (Continued)

ALTERNATE TESTING:

These valves will be exercised in accordance with DAEC Technical Specifications, Section 4.7.D. During these tests, downstream tubing will be vented and drained and valve performance monitored by individual valve position indication and the cessation of flow from the instrument tubing. Following testing, each valve is opened by actuating a solenoid-operated bypass valve that equalizes pressure and allows the valve to reset (open). Individual valve position is provided.

RELIEF REQUEST NO. VR-011

SYSTEM:

CONTAINMENT ATMOSPHERE CONTROL

COMPONENTS:

CV-4327A	CV-4327F
CV-4327B	CV-4327G
CV-4327C	CV-4327H
CV-4327D	

CATEGORY:

A/C

FUNCTION:

These are the pressure suppression chamber to drywell vacuum breaker valves which equalize the pressure between the two volumes should the suppression chamber pressure exceed that in the drywell.

TEST REQUIREMENT:

Measure valve seat leakage and compare the measured leakage to a specific maximum leakage for each valve (IWV-3426).

BASIS FOR RELIEF:

A specific maximum leakage per valve is not applicable to the vacuum breaker valve testing. As part of the containment integrity testing, a pressure decay test is performed on the pressure suppression chamber in accordance with DAEC Technical Specifications Section 4.7.A.4.d. This test is designed to verify leak tightness between the drywell and the suppression chamber and thus the aggregate leak tightness of the vacuum breaker valves.

ALTERNATE TESTING:

The leak tightness of the pressure suppression chamber to drywell vacuum breakers will be demonstrated during containment integrity testing. This test consists of establishing a drywell to suppression chamber pressure differential of 1.1 psi and measuring the suppression chamber pressure increase over a ten (10) minute period. If this pressure increase is less than 0.009 psi/min the vacuum breakers have demonstrated adequate leak tightness.

RELIEF REQUEST NO. VR-012

SYSTEM:

Control Rod Hydraulic

COMPONENTS:

V-17-0083
V-17-0096

CATEGORY:

A/C

FUNCTION:

Valves V-17-0083 and V-17-0096 prevent backflow through the reactor recirculation pumps seal purge line. They also function as primary containment isolation valves.

TEST REQUIREMENTS:

Exercise every three (3) months (CT-CC) IWV-3521.

BASIS FOR RELIEF:

These simple check valves cannot be remotely operated. They are located inside primary containment and are not accessible for testing during reactor operation. These valves cannot be exercised by utilizing the outside drywell test lines because air would be introduced into the reactor recirculation pump seals which could cause the pump bearings to be damaged.

These valves cannot normally be manually exercised at Cold Shutdown because the containment is inerted with nitrogen. In order to conduct a test of these valves, downstream manual block valves inside containment would require closing in order to ensure that air is not introduced into the pump seals. In order to gain personnel access to the drywell, the nitrogen must be vented (normally a 16 - 24 hour operation). The containment must be re-inerted before the plant is restated (normally a 16 - 24 hour operation). Inerting and de-inerting the drywell solely for the purpose of valve testing is excessively burdensome.

ALTERNATE TESTING:

These valves will be exercised during leak testing conducted at refueling in accordance with DAEC Technical Specification 4.7.A.2.C (Appendix J, Type C tests).

RELIEF REQUEST NO. VR-013

SYSTEM:

Control Rod Drive (CRD) Hydraulic

COMPONENTS:

SV-1840A & B	V-17-0062
CV-1849	V-18-0118(CRD #)*
CV-1850	V-18-0919(CRD #)*
SV-1855	V-18-1453(CRD #)*
SV-1856	
SV-1868A & B	*Typical of 89 Valves, one per CRD
SV-1869A & B	

CATEGORY:

B -- CV-1849, CV-1850, SV-1840A & B, SV-1855, SV-1856 SV-1868A & B, and SV-1869A & B. 12

C -- V-17-0062, V-18-0118(CRD #), V-18-0919(CRD #) and V-18-1453(CRD #)

FUNCTION:

SV-1840A & SV-1840B	Backup scram valves; bleed off scram air header upon receiving a SCRAM signal from the Reactor Protection System.
CV-1849	Opens with SCRAM signal to pressurize lower side of CRD piston from accumulator.
CV-1850	Opens with SCRAM signal to vent top of CRD piston to scram discharge header.
SV-1855 & SV-1856	Pilot valves for CV-1849 & CV-1850, respectively. Open on SCRAM signal to vent air operators.
V-17-0062	Back-up SCRAM check valve; ensure the venting of the scram valve pilot air header if SV-1840B has a plugged vent port with the air supply isolated.
V-18-0118 (CRD #)	Prevent bypassing SCRAM water (from the accumulator) to charging water header (if depressurized); open to charge accumulators following SCRAM.

RELIEF REQUEST VR-013 (Continued)

V-18-0919 (CRD #) Prevent backflow into cooling water header during SCRAM; allow cooling water circulating during normal operation.

V-18-1453 (CRD #) Open to allow flow from top of CRD pistons to the SCRAM discharge header.

SV-1868A & B
SV-1869A & B Safety related pilot valves for CV-1859A & B and CV-1867A & B. Open on SCRAM signal to vent air operators.

TEST REQUIREMENTS:

Exercise and time air-operated and solenoid valves every three months (BTO, BTC). IWV-3411, IWV-3413, IWV-3417.

Exercise check valves every three months (CT-CO, CT-CC) IWV-3521. The corresponding fail-safe test is discussed in VR-017.

BASIS FOR RELIEF:

Individual testing of the backup scram valves SV-1840A and SV-1840B requires modifying the electrical configuration of the reactor protection system by jumpers, etc. and inserting a scram signal to each valve -- a complex test.

Testing of valves SV-1840A, SV-1840B, V-17-0062 would require or result in depressurization of the SCRAM air header and the initiation of a full SCRAM signal. Valves CV-1849, CV-1850, SV-1855, SV-1856 and V-18-1453(CRD #) can only be tested by scramming each individual control rod. Due to the extensive effort and operational constraints associated with scram testing, this is impractical to accomplish on a quarterly basis or even during cold shutdown periods.

SV-1868A, SV-1868B, SV-1869A, and SV-1869B activate CV-1859A, CV-1859B, CV-1867A and CV-1867B; however, these control valves may also be tested quarterly by use of alternate solenoid valves which are not tied to the Reactor Protection System (RPS). Testing the SCRAM discharge volume vent and drain solenoid valves SV-1868A, SV-1868B, SV-1869A, and SV-1869B to activate CV-1867A & B, CV-1859A & B would require or result in an initiation of a full SCRAM signal. Due to the extensive effort and operational constraints associated with scram testing, this is impractical to accomplish on a quarterly basis or even during cold shutdown.

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RELIEF REQUEST NO. VR-013 (Continued)

Closure testing of valves V-18-0118(CRD #) require that the control rod drive pumps be stopped to depressurize the charging water header. This test will not be performed during power operation because stopping the pumps results in loss of cooling water to all control rod drive mechanisms and seal damage could result. In addition, stopping the control rod drive pumps stops the flow of seal purge water to the reactor recirculation pumps seals which could result in seal damage due to the ingestion of dirt from an unclean piping system. This test cannot be performed during each cold shutdown because one of the recirculation pumps is usually kept running. USNRC Generic Letter 89-04, Attachment 1, Position 7, provides pre-approval for this testing frequency.

Proper operation of the check valve V-18-0919(CRD #) is monitored during plant operation. Failure of any of these valves manifests itself in abnormal operation of the associated control rod drive which would be noted (and corrected) by the plant staff.

ALTERNATIVE TESTING:

Proper operation of these valves is demonstrated by testing performed during plant operation or each refueling outage. SV-1840A & B are tested once per operating cycle as required by a commitment (NG-84-0825). During the test, valve operation is locally observed upon initiation of a manual scram. This testing of the backup SCRAM valves meets the requirements of NUREG-0979, "Safety Evaluation Report Related to the Fuel Design Approval of the GESSAR II, BWR/6 Nuclear Island Design."

V-17-0062

Valves SV-1840A and SV-1840B will be tested at each refueling by inserting a SCRAM signal and monitoring that the valves energize to vent the air header. Check valve V-17-0062 is verified open when SV-1840A and SV-1840B energize and vent. In order for air to exhaust from both SV-1840A and SV-1840B, check valve V-17-0062 must be fully open. Non-intrusive test methods will be applied to V-17-0062 to prove the valve fully open. Valves SV-1868A and SV-1868B, SV-1869A and SV-1869B will be tested at each refueling by initiating a SCRAM signal to the valves and verifying that the de-energized CRD supplies air to the main valves (CV-1867A, CV-1867B, CV-1859A and CV-1859B).

RELIEF REQUEST VR-013 (Continued)

SV-1840A, SV-1840B, CV-1849, CV-1850, SV-1855, SV-1856 and V-18-1453(CRD #)

These valves are tested once each operating cycle per DAEC Technical Specifications, Section 4.3.C. Following each refueling outage, all operable control rods are SCRAM time tested from the fully withdrawn position with nuclear system pressure above 950 psig. The time-position performance of each control rod and all rods collectively are compared against the acceptance criteria established for various rod insertion positions per DAEC Technical Specifications, Section 3.3.C.

In addition to the rod insertion time test, SV-1840A and SV-1840B are also included in the Preventative Maintenance Program, where they are rebuilt or replaced every three years. Since obtaining stroke times for purposes of noticeable degradation is unlikely and burdensome, the refurbishment and or replacement will meet the intent of trending stroke times. 12

V-18-0118(CRD #)

Once each operating cycle, the CRD charging header is depressurized and HCU accumulator levels monitored over a period of time. Proper operation of these valves is verified by each accumulator remaining in a charged condition during the test.

V-18-0919(CRD #)

During normal plant operation at power, each partially or fully withdrawn operable control rod is exercised one notch at least once each week (Technical Specification, Section 4.3.A.2.a). Excessive backleakage through these valves would prevent rod movement.

SV-1868A & B and SV-1869A & B

These valves are tested with the associated main valves (CV-1859A & B and CV-1967A & B). The main valves are exercised closed and the stroke times are verified to be within specified limits, during the Mode Switch Placed in Shutdown test, performed each refueling.

RELIEF REQUEST NO. VR-017

SYSTEM:

All Systems

COMPONENTS:

All solenoid and air operated valves equipped to fail open or closed.

Note: There are no other valve operator types with fail safe requirements.

CATEGORY:

A and B

FUNCTION:

Upon loss of actuator power (electrical or pneumatic), the valve must stroke to its fail-safe position.

TEST REQUIREMENTS:

When practical, valves with fail-safe actuators shall be tested by observing the operation of the valves upon loss of actuator power. (IWV-3415)

BASIS FOR RELIEF:

Solenoid valves which control the air supply to air-operated valves and direct solenoid-operated valves must stroke to their fail-safe position upon interruption of their electric power or air supply. (FST)

De-energizing the solenoid valve has the same effect as loss of electrical power or loss of control air. Therefore, stroking the valve from the Control Room (BTO, BTC) to its fail-safe position constitutes a fail-safe test for most valves.

ALTERNATE TESTING:

For most configurations, normal stroking (BTO, BTC), to the fail-safe position of valves equipped to fail open or closed constitutes an FST. No additional testing of these valves is necessary.

RELIEF REQUEST NO. VR-017 (Continued)

Where complicated fail safe configurations exist, or where test solenoids are provided, a separate fail safe test, utilizing the proper solenoids and/or methods are used to verify true fail safe operation. The following valves are tested to their fail safe position by means other than normal stroking:

MSIVs - CV-4412, CV-4413, CV-4415, CV-4416, CV-4418, CV-4419, CV-4420, CV-4421

These valves have two fail-safe modes. The first is loss of electrical supply. This mode can be tested on line by normal closure of the MSIVs. The closure signal deenergizes the solenoid valves which control the actuator air-valves. This fail-safe mode is tested on a quarterly basis and during startup from an outage/shutdown.

The second fail-safe is on loss of nitrogen supply to the actuator. In this case the nitrogen being supplied to the underside of the actuator piston, which keeps the valve open, is exhausted to atmosphere upon the failure of the supply system. The rate of closure will be in 3 to 5 seconds, after the nitrogen pressure has decayed to the point at which the air-valves will reposition (internal spring force has overcome the pneumatic force). Closing the MSIVs utilizing spring force only is in accordance with the recommendations of General Electric Service Information Letter 477. During refueling shutdowns, the MSIVs are also cycled utilizing the accumulators only (non-safety grade nitrogen makeup is isolated) in accordance with NRC Information Notice 85-84, Inadequate Inservice Testing of Main Steam Isolation Valves. A test which closes the valve 10% is performed monthly and a test which closes the valve full close is performed every refuel outage. 12

CRD - CV-1849, CV-1850

These valves are tested for its fail-safe position on a full SCRAM signal during the SCRAM insertion time test every refuel outage. The appropriate solenoids SV-1855(CRD #) and SV-1856(CRD #) are energized which allow CV-1849 and CV-1850 to fail open.

RELIEF REQUEST NO. VR-019

SYSTEM:

NUCLEAR BOILER

COMPONENTS:

V-14-0009	V-14-0032	V-14-0112
V-14-0014	V-14-0100	V-14-0116
V-14-0015	V-14-0104	V-14-0120
V-14-0016	V-14-0108	V-14-0124

CATEGORY:

A/C

FUNCTION:

These valves must close upon loss of normal air or nitrogen supply to the automatic depressurization system (ADS) relief valve accumulators and the main steam isolation valve accumulators.

TEST REQUIREMENT:

Exercise valves in the closed direction every three months (CT-CC).

BASIS FOR RELIEF:

The position of these valves cannot be verified during normal operation since they are simple check valves and have no position indicators. In addition, access to these valves is limited since they are located either inside the drywell or the steam tunnel.

ALTERNATE TESTING:

These valves will be exercised during refueling. More frequent testing is not practical because a leak test must be performed to verify that they close.

RELIEF REQUEST NO. VR-020

SYSTEM:

STANDBY LIQUID CONTROL (SBLC)

COMPONENTS:

V-26-0008
V-26-0009

CATEGORY:

A/C

FUNCTIONS:

The functions of these check valves are to open during SBLC injection and close for containment isolation.

TEST REQUIREMENT:

Exercise valve in the open and closed directions every three months (CT-CO, CT-CC).

BASIS FOR RELIEF:

These check valves are normally closed. They can only be stroked closed during seat leakage tests performed during reactor refueling. To stroke these valves open, the SBLC pumps must discharge directly into the reactor vessel through explosively-actuated isolation valves. This cannot be done during normal operation or cold shutdown since the SBLC system must be drained and flushed to prevent contamination of the reactor coolant with sodium pentaborate. In addition, extensive testing is required to replace the explosive charges of the isolation valves.

ALTERNATE TESTING:

These valves will be exercised open and closed during operational tests and leak testing performed each cycle in accordance with DAEC Technical Specifications 4.4.A.2.b and 4.7.A.2.c, respectively. Technical Specification 4.4.A.2.b requires demonstration of design flow through the system and into the reactor vessel. Section 4.7.A.2.c refers to Appendix J, Type C leak testing.

RELIEF REQUEST NO. VR-021

SYSTEM:

High Pressure Coolant Injection (HPCI)
Reactor Core Isolation Cooling (RCIC)

COMPONENTS:

V-23-0001
V-25-0001

CATEGORY:

C

FUNCTION:

V-23-0001 is a 14 inch swing check valve with the valve hinge pins mounted in the valve body. V-25-0001 is a 6 inch swing check valve with the valve hinge pins mounted to the valve bonnet. These valves prevent backflow into the suppression pool in the event of a pump suction shift from the condensate storage tank (CST) to the suppression pool. They open to provide flow from the suppression pool to the HPCI or RCIC pumps. 12

TEST REQUIREMENTS:

Exercise every three months (IWV-3521).

BASIS FOR RELIEF:

There is no convenient method for verifying the ability of these valves to swing to the full-open or full-closed positions. The system test piping circuits utilize the CST for pump suction rather than the suppression pool. Taking suction from the suppression pool during testing is undesirable because, in so doing, torus water would be transferred to the condensate storage tank. Torus water is not demineralized, thus the entire condensate storage tank inventory would require processing following each test which would result in additional radioactive waste. 12

For the reasons noted above, these valves cannot be opened. Therefore, they cannot be stroked from the open to the fully closed position (i.e., a close test during quarterly testing could only demonstrate that the valve stayed closed). As a result, full-closed testing also cannot be demonstrated quarterly. 12

RELIEF REQUEST NO. VR-021 (Continued)

Since these valves are not normally subjected to system conditions which cause them to change position, no wear-induced degradation is expected. 12

ALTERNATE TESTING:

In lieu of the code-required full stroke test, valve operability will be demonstrated by disassembling the valves in accordance with USNRC Generic Letter 89-04, Attachment 1, Position 2. Every refueling outage, each valve will be disassembled and the disc will be verified to swing freely to the open and closed positions. A reverse flow closure test of these valves will be conducted post reassembly to verify proper disc to seat alignment. 12

RELIEF REQUEST NO. VR-025

SYSTEM:

CONTAINMENT ATMOSPHERE CONTROL

COMPONENTS:

V-43-0214

CATEGORY:

A/C

FUNCTIONS:

This valve prevents backflow from the containment into the drywell nitrogen supply line and also functions as a primary containment isolation valve.

TEST REQUIREMENT:

Check valve shall be exercised at least once very three months, except as provided by IWV-3522. (IWV-3521)

BASIS FOR RELIEF:

This check valve cannot be remotely operated. It is located inside primary containment and is not accessible for testing during reactor operation. Additionally, the primary containment is inerted with nitrogen during plant operation. De-inerting and re-inerting the containment atmosphere each cold shutdown solely for the purpose of conducting valve testing would represent an excessive operational burden. This valve can be exercised closed during leakrate testing performed during refueling outage.

ALTERNATE TESTING:

This valve will be checked in the closed position during leaktesting conducted in accordance with DAEC Technical Specification 4.7.A.2.c. (Appendix J, Type C leak test.)

RELIEF REQUEST NO. VR-031

SYSTEM:

Neutron Monitoring

COMPONENTS:

1S266/CK

CATEGORY:

A/C

FUNCTION:

This valve provides containment isolation for the nitrogen purge portion of the TIP system.

TEST REQUIREMENTS:

Check valves shall be exercised at least once every three months, except as provided by IWV-3522. (IWV-3521)

BASIS FOR RELIEF:

This valve is a simple check valve and the only practical method to verify closure is by performing a leak test. Conducting such test every three months or at cold shutdown is excessively time consuming and difficult.

In order to perform a leak test, the TIP purge line must be separated at a flange by maintenance technicians which results in a breach of primary containment integrity. Therefore, this test cannot be performed quarterly during plant operation. The LLRT rig must be set up and connected to the system. The leak rate test itself would require approximately 20 manhours to complete. General area dose rates near these valves at cold shutdown are approximately 200 Mr/hour. The man-Rem exposure per test (4 man-Rem) plus the significant wear and tear on the system caused by breaking the flanges make this test impractical to perform at cold shutdown or on a quarterly basis.

ALTERNATE TESTING:

This valve will be exercised to the closed position during leak testing conducted once each cycle in accordance with DAEC Technical Specification 4.7.A.2.c. (Appendix J, Type C leak test).

RELIEF REQUEST NO. VR-032

SYSTEM:

Containment Atmosphere Monitoring System

COMPONENTS:

SV-8101A	SV-8106A
SV-8101B	SV-8106B
SV-8102A	SV-8107A
SV-8102B	SV-8107B
SV-8103A	SV-8108A
SV-8103B	SV-8108B
SV-8104A	SV-8109A
SV-8104B	SV-8109B
SV-8105A	SV-8110A
SV-8105B	SV-8110B

CATEGORY:

A

FUNCTION:

These valves provide containment isolation for the containment atmosphere monitoring system.

TEST REQUIREMENTS:

The stroke time of all power-operated valves shall be measured. (IWV-3413 (b), IWV-3417 (a))

BASIS FOR RELIEF:

These valves are not provided with individual position indicators and meaningful stroke time measurements cannot be taken.

ALTERNATE TESTING:

These valves will be exercised and their positions verified every three months. Stroke times will not be measured. Additionally, semi-annually, solenoid current measurements and/or stroke time measurements will be taken utilizing non-intrusive test techniques during valve operation to gather additional data on the solenoid operating condition and monitor for degradation. 12

RELIEF REQUEST NO. VR-033

SYSTEM:

Core Spray

COMPONENTS:

V-21-0072
V-21-0073

CATEGORY:

C

FUNCTION:

These check valves provide a flow path for core spray to the reactor vessel and prevent backflow from the reactor vessel to the core spray system.

TEST REQUIREMENTS:

Check valves shall be exercised at least once very three months, except as provided in IWV-3522. (IWV-3521)

BASIS FOR RELIEF:

These check valves are normally closed. To open the valves, the core spray pumps must be operated at rated flow discharging directly into the reactor vessel. This cannot be done during normal operation because the core spray pumps are not capable of overcoming reactor pressure.

Core spray injection during cold shutdown with the reactor head in place is impractical due to the difficulty of controlling reactor vessel water level. Core spray injection at rated flow would result in a vessel level increase of approximately 30" per minute. With the injection going into the vessel shroud region and high rate of change in water level and a possible difference in level between the shroud region and the main vessel, it would very easily be possible to flood the main steam lines or overpressurize the reactor vessel (with regard to the pressure/temperature fracture prevention criteria) if this test were performed at Cold Shutdown with the head in place.

ALTERNATE TESTING:

These valves will be exercised at each refueling outage by verifying that each division of core spray can deliver rated flow to the reactor vessel.

RELIEF REQUEST NO. VR-034

SYSTEM:

Neutron Monitoring
Post-Accident Sampling System (PASS)
Containment Atmosphere Control
RHR Sample Lines
Radwaste Sump System

COMPONENTS:

1S260A/BALL	SV-4594A	SV-4331A	SV-1972	CV-3728
1S260B/BALL	SV-4594B	SV-4331B	SV-1973	CV-3729
1S260C/BALL	SV-4595A	SV-4332A	SV-2051	CV-4309
	SV-4595B	SV-4332B	SV-2052	
	SV-8772A	SV-4333A		
	SV-8772B	SV-4333B		
		SV-4334A		
		SV-4334B		

12

CATEGORY:

A/B

FUNCTIONS:

The TIP System valves function as containment isolation for the TIP tube penetrations.

The PASS system valves provide a flow path for post-accident sampling of the reactor recirculation system and return of the sample flowstream to the torus.

The CAD system valves provide a flow path into the containment in the event that containment dilution is required during an accident and serve as containment isolation valves.

The RHR sample valves provide a flow path for post-accident sampling of the RHR system.

The drywell equipment and floor drain sump valves function as containment isolation valves.

TEST REQUIREMENT:

Evaluate stroke times in accordance with IWV-3417(a).

RELIEF REQUEST NO. VR-034 (Continued)

BASIS FOR RELIEF:

It is impractical to apply the requirements of IWV-3417(a) to valves with stroke times less than 2 seconds without installing sophisticated timing devices. Operator reaction times could easily vary by .5 seconds or more, thereby invalidating the 50% criteria for increasing the surveillance frequency. As noted in USNRC Generic Letter 89-04, Attachment 1, Position 6, power operated valves with normal stroke times of 2 seconds or less are "rapid-acting valves". Relief may be granted from the requirements of Section XI, Paragraph IWV-3417(a) for these valves provided the licensee assigns a maximum limiting value of full stroke time of 2 seconds to these valves and, upon exceeding this limit, declares the valve inoperable and takes corrective action in accordance with IWV-3417(b).

ALTERNATE TESTING:

Stroke times for these valves will be measured. Valves exceeding the maximum allowable stroke time of 2 seconds will be declared inoperable. The results of this test will be evaluated with respect to the maximum allowable stroke time but will not be compared to previous tests per the criteria set forth above or in IWV-3417(a).

RELIEF REQUEST NO. VR-035

SYSTEM:

Emergency Service Water (ESW)

COMPONENTS:

CV-1956A	CV-2080
CV-1956B	CV-2081

CATEGORY:

B

FUNCTION:

CV-1956 A & B open to provide a return path for ESW cooling water from the control building chillers. CV-2080 and CV-2081 are ESW supply valves to the emergency diesel generators.

TEST REQUIREMENTS:

Evaluate stroke times in accordance with IWV-3417 (a).

BASIS FOR RELIEF:

CV-1956A & B are actuated by the starting logic of the associated emergency service water pump, with no individual control handswitch. Also, there are no position indicators for these valves. The test sequence requires an operator to be stationed at the valves, which are physically separated from the pumps, to measure the stroke time of the valve. The operator starts timing upon announcement of the ESW pump start and stops timing based upon the cessation of valve stem movement. For these reasons, precise stroke time measurements are impractical. CV-2080 and CV-2081 do not have position indication. To measure the stroke times of these valves the operator starts timing upon operation of the handswitch for the valve and stops timing based upon cessation of valve stem movement. Thus precise stroke time measurements are impractical.

ALTERNATE TESTING:

These valves will be exercised every three months. During this testing, valve operation will be observed, and a stroke time estimated based on valve stem movement. Because the stroke time is estimated, the results of this test will be evaluated with expect to the maximum allowable stroke time but will not be compared to the previous tests per the criteria set forth above or in IWV-3417 (a).

RELIEF REQUEST NO. VR-037

SYSTEM:

VARIOUS

COMPONENTS:

All containment isolation valves. 12

CATEGORY:

A & A/C

FUNCTIONS:

Containment isolation

TEST REQUIREMENT:

Category A valves shall be leak tested: (IWV-3420)

- at least once every two years. (IWV-3422)

- with the pressure differential in the same direction as when the valve is performing its function...(IWV-3423)

- leakage determined by one of two methods. (IWV-3424)

- Owner shall specify the test medium. (IWV-3425)

- If a leakage rate exceeds the rate determined by the previous test by an amount that reduces the margin between the measured leakage and the maximum permissible rate by 50% or greater, the test frequency shall be doubled. Further, if the trend of leakage rates indicates that the next scheduled test will exceed the maximum permissible leakage rate by greater than 10%, the valve shall be replaced or repaired. (IWV-3427(b)) 12

BASIS FOR RELIEF:

The intent of Articles IWV-3421 through IWV-3425 is met by a containment isolation valve surveillance program that complies with the requirements of 10CFR50, Appendix J for Type C Local Leak Rate Testing. Per Generic Letter 89-04, Attachment 1, Position 10, the usefulness of IWV-3427(b) does not justify the burden of complying with this requirement.

RELIEF REQUEST NO. VR-037 (Continued)

ALTERNATE TESTING:

10CFR50.55(a)(3)(i), " Acceptable Level of Quality and Safety".

Containment isolation valve seat leak rate testing will be performed in accordance with the requirements of 10CFR50, Appendix J for Type C testing. The requirements of IWV-3426 and IWV-3427(a) will continue to be met as required by Generic Letter 89-04, Position 10. 12

RELIEF REQUEST NO. VR-039

WITHDRAWN

RELIEF REQUEST NO. VR-040

WITHDRAWN

RELIEF REQUEST NO. VR-041

WITHDRAWN

RELIEF REQUEST NO. VR-043

WITHDRAWN

RELIEF REQUEST NO. VR-044

WITHDRAWN

RELIEF REQUEST NO. VR-045

WITHDRAWN

RELIEF REQUEST NO. VR-046

WITHDRAWN

RELIEF REQUEST NO. VR-047

WITHDRAWN

RELIEF REQUEST NO. VR-048

WITHDRAWN

RELIEF REQUEST NO. VR-050

SYSTEM:

Containment Atmosphere Control

COMPONENTS:

CV-4327A
CV-4327B
CV-4327C
CV-4327D
CV-4327F
CV-4327G
CV-4327H

CATEGORY:

A/C

FUNCTION:

These are the pressure suppression chamber to drywell vacuum breaker valves which open to equalize the pressure between the two volumes should the drywell pressure decrease below that of the suppression chamber. These valves in conjunction with the torus to reactor building vacuum breakers protect the drywell if the drywell pressure becomes less than the reactor building.

TEST REQUIREMENTS:

Check valves shall be exercised at least once every three months, except as provided by IWV-3522. (IWV-3521)

Valves that are normally closed during plant operation and whose function is to open on reversal of pressure differential shall be tested by proving that the disk moves promptly away from the seat when the closing pressure differential is removed and flow through the valves is initiate, or when a mechanical opening force is applied to the disk. If the test is made without flow through the valve, a mechanical exerciser shall be used to move the disk. The force or torque delivered must be limited to less than 10% of the equivalent force..., except that for vacuum breaker valves, the exerciser force or torque delivered to the disk may be equivalent to the desired functional pressure differential force. This implies that force or torque measurements are required.

RELIEF REQUEST NO. VR-050 (Continued)

BASIS FOR RELIEF:

These valves are located inside the torus and, as such, are not accessible for obtaining the required measurements during reactor operation or during cold shutdown. In order to gain access to the torus, the containment would require de-inerting, a 36" hatch would need to be removed, and temporary lighting and walkways would need to be installed. Upon completion of testing, this process would be reversed and a local leak rate test of the torus hatch would be required.

ALTERNATE TESTING:

These valves will be partially stroked quarterly during plant operation using installed air operators without any quantitative set point measurements. Additionally, each will be tested to the open and closed positions using a mechanical exerciser and obtaining setpoint measurements at least once each refueling cycle.

RELIEF REQUEST NO. VR-051

SYSTEM:

Various

COMPONENTS AND FUNCTION:

* V-22-0064, V-22-0063, V-24-0046, V-24-0047
These HPCI/RCIC Vacuum Breaker Check Valves open to prevent syphoning of torus water into the HPCI/RCIC exhaust lines.

V-22-0021
This valve routes HPCI exhaust drainpot drain condensate to the torus. 12

V-22-0022 HPCI exhaust drainpot drain check valve supports normal operation of HPCI.

V-22-0028, V-22-0029, V-24-0012
These check valves open to provide a flow path for HPCI/RCIC lube oil cooling and/or Gland Seal condensate pump discharge. With the pumps in standby, these check valves prevent barometric condenser in-leakage.

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V-22-0026, V-24-0010
Barometric condenser condensate pump discharge check valves, support operation of HPCI/RCIC in the open and closed positions.

* V-25-0006 RCIC Minimum flow line check valve.

* V-23-0014 HPCI Minimum flow line check valve.

V-20-0006, V-19-0014, V-19-0016
These minimum flow check valves are on the RHR pump discharge bypass lines and must open to provide adequate minimum flow to prevent pump overheating.

V-20-0008
This minimum flow check valve is on the RHR pump discharge bypass line and must open to provide adequate minimum flow to prevent pump overheating. It is separated from the other RHR minimum flow check valves due to different orientation. 12

V-21-0009, V-21-0012 Core Spray minimum flow line check valves.

CATEGORY:

C

RELIEF REQUEST NO. VR-051 (Continued)

TEST REQUIREMENT:

Check valves shall be exercised to the positions in which they perform their safety functions at least every 3 months. (IWV-3521, IWV-3522(a), IWV-3522(b))

BASIS FOR RELIEF:

Verification of maximum accident required flow to verify stroke-open position is not possible without extensive equipment modification. Disassembly and inspection of these valves, either quarterly during operation or during cold shutdown, would require major system operating restrictions.

ALTERNATE TESTING:

All valves, except those indicated by an asterisk (*), will be partial stroke tested by performance of the respective quarterly system surveillance. The asterisked (*) valves have no means to verify partial stroking during performance of quarterly system surveillance testing.

The group of valves, indicated by an asterisk, are sized for maintaining a specific differential pressure rather than a specified flow so that full flow testing is not possible. For valve V-23-014, the HPCI system response time to attain 3000 gpm is less than 25 seconds and thus does not provide sufficient time to verify operation of this minimum flow check valve before MO-2318, minimum flow line isolation, closes.

During refuel outages each of the individually listed valves will be disassembled and inspected in accordance with the requirements of USNRC Generic Letter 89-04 for full stroke operability. One valve of each group of identical valves in similar applications will be disassembled and inspected (in rotation) each refueling outage. With eighteen month refueling cycles, all valves in a group of four would be tested approximately every six years. Disassembled valves will be part-stroke exercised and/or reverse flow tested prior to returning them to service following reassembly as indicated in Table 1, which is a summary of the Program requirements and the testing that will be performed on each valve.

The use of non-intrusive testing equipment is being implemented. Upon satisfactory verification of non-intrusive methods, including disassembly to verify valve conditions, the current disassembly and inspection program may be replaced with non-intrusive testing.

RELIEF REQUEST NO. VR-051 (Continued)

Table 1

Valve No.	Code Required	Possible Testing Quarterly	Cold Shtdn	Testing After Disassembly & Insp.
V-19-014	CT-CC, CT-CO	CT-CC, CT-PO	N/A	CT-CC, CT-PO
V-19-016	CT-CC, CT-CO	CT-CC, CT-PO	N/A	CT-CC, CT-PO
V-20-006	CT-CC, CT-CO	CT-CC, CT-PO	N/A	CT-CC, CT-PO
V-20-008	CT-CC, CT-CO	CT-CC, CT-PO	N/A	CT-CC, CT-PO
V-21-009	CT-CO	CT-PO	N/A	CT-PO
V-21-012	CT-CO	CT-PO	N/A	CT-PO
V-22-021	CT-CC, CT-CO AT-01	CT-PO	CT-CC	AT-01, CT-PO
V-22-022	CT-CC, CT-CO AT-01	CT-PO	CT-CC	AT-01, CT-PO
V-22-026	CT-CC, CT-CO	CT-PO	N/A	CT-PO
V-22-028	CT-CC, CT-CO	CT-PO	N/A	CT-PO
V-22-029	CT-CC, CT-CO	CT-PO	N/A	CT-PO
V-22-063	CT-CC, CT-CO AT-01	N/A	CT-CC, CT-PO	AT-01, CT-PO
V-22-064	CT-CC, CT-CO AT-01	N/A	CT-CC, CT-PO	AT-01, CT-PO
V-23-014	CT-CO	N/A	N/A	None
V-24-010	CT-CC, CT-CO	CT-PO	N/A	CT-PO
V-24-012	CT-CC, CT-CO	CT-PO	N/A	CT-PO
V-24-046	CT-CC, CT-CO AT-01	N/A	CT-CC, CT-PO	AT-01, CT-PO
V-24-047	CT-CC, CT-CO AT-01	N/A	CT-CC, CT-PO	AT-01, CT-PO
V-25-006	CT-CO	N/A	N/A	None

RELIEF REQUEST NO. VR-051 (Continued)

Table 1 (Continued)

Legend:

CT-CC Full exercise closed
CT-CO Full exercise open
CT-PO Partial exercise open
AT-01 Seat leakage test performed during refuel outages

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RELIEF REQUEST NO. VR-052

WITHDRAWN

RELIEF REQUEST NO. VR-053

SYSTEM:

A Side Control Building HVAC Instrument Air Supply

COMPONENTS:

V-73-006, V-73-007

CATEGORY:

C

FUNCTION:

To isolate the normal instrument air supply line from the back-up emergency air supply line, on a loss of normal instrument air.

TEST REQUIREMENTS:

Check valves shall be exercised at least once every three months (IWV-3520).

BASIS FOR RELIEF:

The system is only required to have one isolation valve. Total backflow leakage through the line these valves are on must be limited to a specific maximum amount. The valves are installed with no test connections between the valves so that a pressure decay or leak rate test **on** the individual valves is not possible. Therefore, testing of the individual valves is not possible without disassembly of the valve. Repeated disassembly of the valve will destroy the brass body and not permit reassembly. These valves have no known failures due to leakage.

ALTERNATE TESTING:

These valves will be back flow tested as one unit every three months. A pressure decay test will be performed on the system to verify total back leakage through these two valves does not exceed a specific maximum amount. Both valves shall be repaired or replaced if total backleakage through the pair of valves exceeds maximum allowable.

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APPENDIX A
(pages 1 - 4)

PUMP LISTING

********** IOWA ELECTRIC LIGHT AND POWER COMPANY **********
DUANE ARNOLD ENERGY CENTER

INSERVICE TESTING PROGRAM - PUMP TABLES
IST CLASS 1, 2, 3, AND NC PUMPS

REVISION: 12
DATE : 09/20/93
PAGE : A-1

PUMP NUMBER	PUMP NAME	IST CLASS	DRAWING NUMBER	DWG COOR	TEST TYPE	TEST FREQUENCY	RELIEF REQUEST	PROGRAM REMARK
1P-022A	RHRSW	3	M-146	A-8	PTMDP	OP		
					PTMPIB	OP	PR-004	
					PTMQ	OP	PR-012	
					PTMVA1	OP		
					PTMVA2	OP		
1P-022B	RHRSW	3	M-146	A-5	PTMDP	OP		
					PTMPIB	OP	PR-004	
					PTMQ	OP	PR-012	
					PTMVA1	OP		
					PTMVA2	OP		
1P-022C	RHRSW	3	M-146	A-7	PTMDP	OP		
					PTMPIB	OP	PR-004	
					PTMQ	OP	PR-012	
					PTMVA1	OP		
					PTMVA2	OP		
1P-022D	RHRSW	3	M-146	A-5	PTMDP	OP		
					PTMPIB	OP	PR-004	
					PTMQ	OP	PR-012	
					PTMVA1	OP		
					PTMVA2	OP		
1P-044A	DFO	NC	M-132	A-2	PTMDP	OP		
					PTMPIB	OP	PR-004	
					PTMQ	OP		
					PTMVA1	OP	PR-001	
					PTMVA2	OP	PR-001	
1P-044B	DFO	NC	M-132	A-3	PTMDP	OP		
					PTMPIB	OP	PR-004	
					PTMQ	OP		
					PTMVA1	OP	PR-001	
					PTMVA2	OP	PR-001	
1P-099A	ESW	3	M-146	A-7	PTMDP	OP		
					PTMPIB	OP	PR-004	
					PTMQ	OP		
					PTMVA1	OP		
					PTMVA2	OP		
1P-099B	ESW	3	M-146	A-6	PTMDP	OP		

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INSERVICE TESTING PROGRAM - PUMP TABLES
IST CLASS 1, 2, 3, AND NC PUMPS

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PUMP NUMBER	PUMP NAME	IST CLASS	DRAWING NUMBER	DWG COOR	TEST TYPE	TEST FREQUENCY	RELIEF REQUEST	PROGRAM REMARK
1P-099B	ESW	3	M-146	A-6	PTMPIB	OP	PR-004	
					PTMQ	OP		
					PTMVA1	OP		
					PTMVA2	OP		
1P-112A	SCREEN	NC	M-129	C-7	PTMDP	OP		
					PTMPIB	OP		
					PTMPID	OP		
					PTMQ	OP		
					PTMVA1	OP		
					PTMVA2	OP		
1P-112B	SCREEN	NC	M-129	C-3	PTMDP	OP		
					PTMPIB	OP		
					PTMPID	OP		
					PTMQ	OP		
					PTMVA1	OP		
					PTMVA2	OP		
1P-117A	RW	3	M-129	C-7	PTMDP	OP		
					PTMPIB	OP	PR-004	
					PTMQ	OP	PR-005	
					PTMVA1	OP		
					PTMVA2	OP		
1P-117B	RW	3	M-129	C-4	PTMDP	OP		
					PTMPIB	OP	PR-004	
					PTMQ	OP	PR-005	
					PTMVA1	OP		
					PTMVA2	OP		
1P-117C	RW	3	M-129	C-6	PTMDP	OP		
					PTMPIB	OP	PR-004	
					PTMQ	OP	PR-005	
					PTMVA1	OP		
					PTMVA2	OP		
1P-117D	RW	3	M-129	C-3	PTMDP	OP		
					PTMPIB	OP	PR-004	
					PTMQ	OP	PR-005	
					PTMVA1	OP		
					PTMVA2	OP		
1P-211A	CS	2	M-121	C-3	PTMDP	OP	PR-007	PR-012

INSERVICE TESTING PROGRAM - PUMP TABLES
IST CLASS 1, 2, 3, AND NC PUMPS

PUMP NUMBER	PUMP NAME	IST CLASS	DRAWING NUMBER	DWG COOR	TEST TYPE	TEST FREQUENCY	RELIEF REQUEST	PROGRAM REMARK
1P-211A	CS	2	M-121	C-3	PTMPIB	OP		
					PTMPID	OP		
					PTMQ	OP	PR-005	
					PTMVA1	OP		
					PTMVA2	OP		
1P-211B	CS	2	M-121	C-4	PTMDP	OP	PR-007	PR-012
					PTMPIB	OP		
					PTMPID	OP		
					PTMQ	OP	PR-005	
					PTMVA1	OP		
					PTMVA2	OP		
1P-216	HPCI	2	M-123	D-2	PTMN	OP	PR-007	PR-012
					PTMPF	OP	PR-015	
					PTMPIB	OP		
					PTMPID	OP		
					PTMVA1	OP		
					PTMVA2	OP		
					PTMVA3	OP		
					PTMVA4	OP		
1P-226	RCIC	NC	M-125	D-4	PTMDP	OP		PR-012
					PTMN	OP		
					PTMPIB	OP		
					PTMPID	OP		
					PTMQ	OP	PR-005	
					PTMVA1	OP		
					PTMVA2	OP		
1P-229A	RHR	2	M-120	B-3	PTMDP	OP		
					PTMPIB	OP		
					PTMPID	OP		
					PTMQ	OP	PR-005	
					PTMVA1	OP		
					PTMVA2	OP		
1P-229B	RHR	2	M-119	B-7	PTMDP	OP		
					PTMPIB	OP		
					PTMPID	OP		
					PTMQ	OP	PR-005	
					PTMVA1	OP		
					PTMVA2	OP		

INSERVICE TESTING PROGRAM - PUMP TABLES
IST CLASS 1, 2, 3, AND NC PUMPS

REVISION: 12
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PAGE : A-4

PUMP NUMBER	PUMP NAME	IST CLASS	DRAWING NUMBER	DWG COOR	TEST TYPE	TEST FREQUENCY	RELIEF REQUEST	PROGRAM REMARK
1P-229C	RHR	2	M-120	B-2	PTMDP	OP		
					PTMPIB	OP		
					PTMPID	OP		
					PTMQ	OP	PR-005	
					PTMVA1	OP		
					PTMVA2	OP		
1P-229D	RHR	2	M-119	B-8	PTMDP	OP		
					PTMPIB	OP		
					PTMPID	OP		
					PTMQ	OP	PR-005	
					PTMVA1	OP		
					PTMVA2	OP		
1P-230A	SBLC	NC	M-126	B-5	PTMDP	OP		
					PTMPIB	OP	PR-004	
					PTMQ	OP		
					PTMVA1	OP		
					PTMVA2	OP		
1P-230B	SBLC	NC	M-126	C-5	PTMDP	OP		
					PTMPIB	OP	PR-004	
					PTMQ	OP		
					PTMVA1	OP		
					PTMVA2	OP		

APPENDIX B
(pages B01 - B84)

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VALVE LISTING

APPENDIX B
VALVE LISTING

DRAWING : C51-1-7(APED)
DRAWING TITLE : TIP SYSTEM

VALVE NUMBER	DWG COOR	IST CLASS	FUNCTION CATEGORY	SIZE (INCH)	BODY STYLE	ACTU-ATOR	NORMAL POSI-TION	TEST TYPE	TEST FREQ	MAXIMUM LIMIT	TEST UNIT	RELIEF REQUEST OR COLD SHUTDOWN	TECHNICAL POSITION
1S260A/BALL	A-1	NC	A	.375	BAL	SO	C	AT-01	RR	375.000	SCCM		
								BTC	OP	2.000	SECS	VR-034	
FUNCTION : TIP BALL VALVE													
1S260A/SHR	A-1	NC	A/D	.375	SH	EXP	O/KL	DT-E	SA		PF		TAV-07
FUNCTION : TIP EXPLOSIVE VALVE													
1S260B/BALL	A-1	NC	A	.375	BAL	SO	C	AT-01	RR	375.000	SCCM		
								BTC	OP	2.000	SECS	VR-034	
FUNCTION : TIP BALL VALVE													
1S260B/SHR	A-1	NC	A/D	.375	SH	EXP	O/KL	DT-E	SA		PF		TAV-07
FUNCTION : TIP EXPLOSIVE VALVE													
1S260C/BALL	A-1	NC	A	.375	BAL	SO	C	AT-01	RR	375.000	SCCM		
								BTC	OP	2.000	SECS	VR-034	
FUNCTION : TIP BALL VALVE													
1S260C/SHR	A-1	NC	A/D	.375	SH	EXP	O/KL	DT-E	SA		PF		TAV-07
FUNCTION : TIP EXPLOSIVE VALVE													
1S266/CK	A-1	NC	A/C	.375	CK	SA	SYS	AT-01	RR	1500.000	SCCM		
								CT-CC	RR		PF	VR-031	
FUNCTION : TIP CHECK VALVE													

APPENDIX B
VALVE LISTING

DRAWING : M-109
DRAWING TITLE : CONDENSATE AND DEMINERALIZED WATER

VALVE NUMBER	DWG COOR	IST CLASS	FUNCTION CATEGORY	SIZE (INCH)	BODY STYLE	ACTU-ATOR	NORMAL POSI-TION	TEST TYPE	TEST FREQ	MAXIMUM LIMIT	TEST UNIT	RELIEF REQUEST OR COLD SHUTDOWN	TECHNICAL POSITION
V-09-065	F-3	NC	A	1.000	GA	M	C	AT-01	RR	1000.000	SCCM		
	FUNCTION : ISOLATION SHUTOFF												
V-09-111	F-3	NC	A	1.000	GA	M	C	AT-01	RR	1000.000	SCCM		
	FUNCTION : ISOLATION SHUTOFF												

APPENDIX B
VALVE LISTING

DRAWING : M-112
DRAWING TITLE : REACTOR BUILDING COOLING WATER SYSTEM

VALVE NUMBER	DWG COOR	IST CLASS	FUNCTION CATEGORY	SIZE (INCH)	BODY STYLE	ACTU-ATOR	NORMAL POSI-TION	TEST TYPE	TEST FREQ	MAXIMUM LIMIT	TEST UNIT	RELIEF REQUEST OR COLD SHUTDOWN	TECHNICAL POSITION
MO-4841A	E-3	NC	A	4.000	GA	MO	O	AT-01	RR	4000.000	SCCM		
								BTC	CS	20.000	SECS	CSJ-01	
								PIT	Y2		PF		
FUNCTION : ISOL OF RBCCW TO DW													
MO-4841B	F-3	NC	A	4.000	GA	MO	O	AT-01	RR	4000.000	SCCM		
								BTC	CS	20.000	SECS	CSJ-01	
								PIT	Y2		PF		
FUNCTION : ISOL OF RBCCW TO DW													
PSV-4842	F-2	NC	C	.750	RV	SA	SYS	CT-SP	Y10	154.500	PSIG	VR-005	
FUNCTION : PRESS RELF. HTEXCH 1E034													

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APPENDIX B
VALVE LISTING

DRAWING : M-113
DRAWING TITLE : RHR SERVICE WATER SYSTEM

VALVE NUMBER	DWG COOR	IST CLASS	FUNCTION CATEGORY	SIZE (INCH)	BODY STYLE	ACTUATOR	NORMAL POSITION	TEST TYPE	TEST FREQ	MAXIMUM LIMIT	TEST UNIT	RELIEF REQUEST OR COLD SHUTDOWN	TECHNICAL POSITION
CV-1956A	F-3	3	B	4.000	GA	AO	C/FO	BTO	OP	5.000	SECS	VR-035	
								FST	OP		PF	VR-017	
	FUNCTION : ESW, CNTL BLDG CHILL												
CV-1956B	F-1	3	B	4.000	GA	AO	C/FO	BTO	OP	5.000	SECS	VR-035	
								FST	OP		PF	VR-017	
	FUNCTION : ESW, CNTL BLDG CHILL												
CV-2080	F-5	3	B	6.000	GL	AO	C/FO	BTO	OP	5.000	SECS	VR-035	
								FST	OP		PF	VR-017	
	FUNCTION : ESW, STDBY DG HTEXCH												
CV-2081	F-5	3	B	6.000	GL	AO	C/FO	BTO	OP	5.000	SECS	VR-035	
								FST	OP		PF	VR-017	
	FUNCTION : ESW, STDBY DG HTEXCH												
MO-1943A	F-7	3	B	12.000	GA	MO	C/KL	BTC	OP	72.000	SECS		
								PIT	Y2		PF		
E11-F073A	FUNCTION : SERVICE WTR CROSSTIE												
MO-1943B	F-7	3	B	12.000	GA	MO	C/KL	BTC	OP	72.000	SECS		
								PIT	Y2		PF		
E11-F073B	FUNCTION : SERVICE WTR CROSSTIE												
MO-2039A	F-4	NC	B	4.000	GA	MO	O	BTC	OP	70.000	SECS		
								PIT	Y2		PF		
	FUNCTION : WELL WATER ISOLATION												
MO-2039B	F-2	NC	B	4.000	GA	MO	O	BTC	OP	70.000	SECS		
								PIT	Y2		PF		
	FUNCTION : WELL WATER ISOLATION												
MO-2077	F-4	3	B	4.000	GA	MO	O	BTC	OP	70.000	SECS		
								PIT	Y2		PF		
	FUNCTION : SFGRD EQUIP DISCH WW												
MO-2078	F-2	3	B	4.000	GA	MO	O	BTC	OP	70.000	SECS		
								PIT	Y2		PF		

DUANE ARNOLD ENERGY CENTER
INSERVICE TESTING PLAN - VALVES

APPENDIX B
VALVE LISTING

DRAWING : M-113
DRAWING TITLE : RHR SERVICE WATER SYSTEM

VALVE NUMBER	DWG COOR	IST CLASS	FUNCTION CATEGORY	SIZE (INCH)	BODY STYLE	ACTU-ATOR	NORMAL POSI-TION	TEST TYPE	TEST FREQ	MAXIMUM LIMIT	TEST UNIT	RELIEF REQUEST OR COLD SHUTDOWN	TECHNICAL POSITION	
FUNCTION : SFGRD EQUIP DISCH WW														
PSV-1988	D-7	3	C	.750	RV	SA	C	CT-SP	Y10	460.000	PSIG	VR-005		12
FUNCTION : RHR HX 1E201B RELIEF														
PSV-2068	C-6	3	C	.750	RV	SA	C	CT-SP	Y10	460.000	PSIG	VR-005		12
FUNCTION : RHR HX 1E201A RELIEF														
SV-1956A	F-3	NC	B	.500	3WY	SO	NE	BTD	OP		PF	VR-002		12
FUNCTION : SOL CV-1956A														
SV-1956B	F-2	NC	B	.500	3WY	SO	NE	BTD	OP		PF	VR-002		12
FUNCTION : SOL CV-1956B														
SV-2080	F-5	NC	B	.375	3WY	SO	NE	BTD	OP		PF	VR-002		
FUNCTION : SOL CV-2080														
SV-2081	F-5	NC	B	.375	3WY	SO	NE	BTD	OP		PF	VR-002		
FUNCTION : SOL CV-2081														
V-13-036	F-3	3	C	4.000	CK	SA	SYS	CT-CO	OP		PF			12
FUNCTION : ESW WTR SUPPLY CHILLER CK,1V-CH-1B														
V-13-051	F-4	3	C	4.000	CK	SA	SYS	CT-CO	OP		PF			12
FUNCTION : ESW WTR SUPPLY CHILLER CK,1V-CH-1A														
V-13-103	F-4	3	C	1.000	CK	SA	SYS	CT-CC	OP		PF			12
FUNCTION : CHK HTEXCH 1E053A														
V-13-104	F-4	3	C	1.000	CK	SA	SYS	CT-CC	OP		PF			12
FUNCTION : CHK HTEXCH 1E053B														

DUANE ARNOLD ENERGY CENTER
INSERVICE TESTING PLAN - VALVES

APPENDIX B
VALVE LISTING

DRAWING : M-114
DRAWING TITLE : NUCLEAR BOILER SYSTEM

VALVE NUMBER	DWG COOR	IST CLASS	FUNCTION CATEGORY	SIZE (INCH)	BODY STYLE	ACTUATOR	NORMAL POSITION	TEST TYPE	TEST FREQ	MAXIMUM LIMIT	TEST UNIT	RELIEF REQUEST OR COLD SHUTDOWN	TECHNICAL POSITION	
AP-4412A	G-3	NC	B	.375	4WY	AP	NE	BTD	OP		PF	VR-002		
								FST	OP		PF	VR-017		
FUNCTION : MSIV AIR PLT CV-4412														
AP-4412C	G-2	NC	B	.375	2WY	SO	C/FO	BTD	OP		PF	VR-002		12
								FST	OP		PF	VR-017		
FUNCTION : MSIV AIR PLT CV-4412														
AP-4413A	G-1	NC	B	.375	4WY	AP	NE	BTD	OP		PF	VR-002		
								FST	OP		PF	VR-017		
FUNCTION : MSIV AIR PLT CV-4413														
AP-4413C	F-1	NC	B	.375	2WY	SO	C/FO	BTD	OP		PF	VR-002		12
								FST	OP		PF	VR-017		
FUNCTION : MSIV AIR PLT CV-4413														
AP-4415A	D-7	NC	B	.375	4WY	AP	NE	BTD	OP		PF	VR-002		
								FST	OP		PF	VR-017		
FUNCTION : MSIV AIR PLT CV-4415														
AP-4415C	G-2	NC	B	.375	2WY	SO	C/FO	BTD	OP		PF	VR-002		12
								FST	OP		PF	VR-017		
FUNCTION : MSIV AIR PLT CV-4415														
AP-4416A	D-8	NC	B	.375	4WY	AP	NE	BTD	OP		PF	VR-002		
								FST	OP		PF	VR-017		
FUNCTION : MSIV AIR PLT CV-4416														
AP-4416C	F-1	NC	B	.375	2WY	SO	C/FO	BTD	OP		PF	VR-002		12
								FST	OP		PF	VR-017		
FUNCTION : MSIV AIR PLT CV-4416														
AP-4418A	D-3	NC	B	.375	4WY	AP	NE	BTD	OP		PF	VR-002		
								FST	OP		PF	VR-017		
FUNCTION : MSIV AIR PLT CV-4418														
AP-4418C	G-2	NC	B	.375	2WY	SO	C/FO	BTD	OP		PF	VR-002		12
								FST	OP		PF	VR-017		

APPENDIX B
VALVE LISTING

DRAWING : M-114
DRAWING TITLE : NUCLEAR BOILER SYSTEM

VALVE NUMBER	DWG COOR	IST CLASS	FUNCTION CATEGORY	SIZE (INCH)	BODY STYLE	ACTUATOR	NORMAL POSITION	TEST TYPE	TEST FREQ	MAXIMUM LIMIT	TEST UNIT	RELIEF REQUEST OR COLD SHUTDOWN	TECHNICAL POSITION
	FUNCTION : MSIV AIR PLT CV-4418												
AP-4419A	D-1	NC	B	.375	4WY	AP	NE	BTD	OP		PF	VR-002	
								FST	OP		PF	VR-017	
	FUNCTION : MSIV AIR PLT CV-4419												
AP-4419C	F-1	NC	B	.375	2WY	SO	C/FO	BTD	OP		PF	VR-002	
								FST	OP		PF	VR-017	
	FUNCTION : MSIV AIR PLT CV-4419												
AP-4420A	E-7	NC	B	.375	4WY	AP	NE	BTD	OP		PF	VR-002	
								FST	OP		PF	VR-017	
	FUNCTION : MSIV AIR PLT CV-4420												
AP-4420C	G-2	NC	B	.375	2WY	SO	C/FO	BTD	OP		PF	VR-002	
								FST	OP		PF	VR-017	
	FUNCTION : MSIV AIR PLT CV-4420												
AP-4421A	E-8	NC	B	.375	4WY	AP	NE	BTD	OP		PF	VR-002	
								FST	OP		PF	VR-017	
	FUNCTION : MSIV AIR PLT CV-4421												
AP-4421C	F-1	NC	B	.375	2WY	SO	C/FO	BTD	OP		PF	VR-002	
								FST	OP		PF	VR-017	
	FUNCTION : MSIV AIR PLT CV-4421												
CV-4412	E-3	1	A	20.000	GL	AO	O/FC	AT-01	RR	5428.000	SCCM	VR-037	
								BTC	OP	5.000	SECS		
								FST	RR		PF	VR-017	
								PIT	Y2		PF		
B21-F022A	FUNCTION : MSIV (INBOARD)												
CV-4413	E-2	1	A	20.000	GL	AO	O/FC	AT-01	RR	5428.000	SCCM	VR-037	
								BTC	OP	5.000	SECS		
								FST	RR		PF	VR-017	
								PIT	Y2		PF		
B21-F028A	FUNCTION : MSIV (OUTBOARD)												
CV-4415	C-7	1	A	20.000	GL	AO	O/FC	AT-01	RR	5428.000	SCCM	VR-037	

APPENDIX B
VALVE LISTING

DRAWING : M-114
DRAWING TITLE : NUCLEAR BOILER SYSTEM

VALVE NUMBER	DWG COOR	IST CLASS	FUNCTION CATEGORY	SIZE (INCH)	BODY STYLE	ACTU-ATOR	NORMAL POSI-TION	TEST TYPE	TEST FREQ	MAXIMUM LIMIT	TEST UNIT	RELIEF REQUEST OR COLD SHUTDOWN	TECHNICAL POSITION
CV-4415	C-7	1	A	20.000	GL	AO	O/FC	BTC	OP	5.000	SECS		
								FST	RR		PF	VR-017	
								PIT	Y2		PF		
B21-F022B	FUNCTION : MSIV (INBOARD)												
CV-4416	C-8	1	A	20.000	GL	AO	O/FC	AT-01	RR	5428.000	SCCM	VR-037	
								BTC	OP	5.000	SECS		
								FST	RR		PF	VR-017	
								PIT	Y2		PF		
B21-F028B	FUNCTION : MSIV (OUTBOARD)												
CV-4418	C-3	1	A	20.000	GL	AO	O/FC	AT-01	RR	5428.000	SCCM	VR-037	
								BTC	OP	5.000	SECS		
								FST	RR		PF	VR-017	
								PIT	Y2		PF		
B21-F022C	FUNCTION : MSIV (INBOARD)												
CV-4419	C-2	1	A	20.000	GL	AO	O/FC	AT-01	RR	5428.000	SCCM	VR-037	
								BTC	OP	5.000	SECS		
								FST	RR		PF	VR-017	
								PIT	Y2		PF		
B21-F028C	FUNCTION : MSIV (OUTBOARD)												
CV-4420	E-7	1	A	20.000	GL	AO	O/FC	AT-01	RR	5428.000	SCCM	VR-037	
								BTC	OP	5.000	SECS		
								FST	RR		PF	VR-017	
								PIT	Y2		PF		
B21-F022D	FUNCTION : MSIV (INBOARD)												
CV-4421	E-8	1	A	20.000	GL	AO	O/FC	AT-01	RR	5428.000	SCCM	VR-037	
								BTC	OP	5.000	SECS		
								FST	RR		PF	VR-017	
								PIT	Y2		PF		
B21-F028D	FUNCTION : MSIV (OUTBOARD)												
CV-4428	H-6	1	B	.500	GL	AO	C	BTC	CS	5.000	SECS	CSJ-14	
								PIT	Y2		PF		
B21-F003	FUNCTION : RX VSL HD SL ISO-IN												

APPENDIX B
VALVE LISTING

DRAWING : M-114
DRAWING TITLE : NUCLEAR BOILER SYSTEM

VALVE NUMBER	DWG COOR	IST CLASS	FUNCTION CATEGORY	SIZE (INCH)	BODY STYLE	ACTUATOR	NORMAL POSITION	TEST TYPE	TEST FREQ	MAXIMUM LIMIT	TEST UNIT	RELIEF REQUEST OR COLD SHUTDOWN	TECHNICAL POSITION
CV-4429	H-7	1	B	.500	GL	AO	C	BTC	CS	5.000	SECS	CSJ-14	
								PIT	Y2		PF		
B21-F004	FUNCTION : RX VSL HD SL ISO-OUT												
MO-4423	B-3	1	A	3.000	GA	MO	O	AT-01	RR	3000.000	SCCM		
								BTC	OP	15.000	SECS		
								PIT	Y2		PF		
B21-F016	FUNCTION : MAIN STEAM DRN(INBD)												
MO-4424	B-3	1	A	3.000	GA	MO	O	AT-01	RR	3000.000	SCCM		
								BTC	OP	15.000	SECS		
								PIT	Y2		PF		
B21-F019	FUNCTION : MAIN STM DRN (OUTBD)												
MO-4441	B-3	1	A/C	16.000	SCK	MO	O/KL	AT-01	RR	24000.000	SCCM	VR-037	TAV-06
								CT-CC	CS		PF	CSJ-02	
								PIT	Y2		PF		
	FUNCTION : FEEDWATER ISOLATION												
MO-4442	B-7	1	A/C	16.000	SCK	MO	O/KL	AT-01	RR	24000.000	SCCM	VR-037	TAV-06
								CT-CC	CS		PF	CSJ-02	
								PIT	Y2		PF		
	FUNCTION : FEEDWATER ISOLATION												
PSV-4400	E-5	1	B/C	6.000	RV	SAP	C/KL	BTC	RR		PF	VR-006	
								BTO	RR		PF	VR-006	
								CT-SP	R2	1130.000	PSIG	VR-005	
	FUNCTION : MN STM RELIEF/ADS VLV												
PSV-4401	E-4	1	B/C	6.000	RV	SAP	C/KL	BTC	RR		PF	VR-006	
								BTO	RR		PF	VR-006	
								CT-SP	R2	1120.000	PSIG	VR-005	
	FUNCTION : MN STM RELIEF/ADS VLV												
PSV-4402	C-6	1	B/C	6.000	RV	SAP	C/KL	BTC	RR		PF	VR-006	
								BTO	RR		PF	VR-006	
								CT-SP	R2	1130.000	PSIG	VR-005	
	FUNCTION : MN STM RELIEF/ADS VLV												

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DUANE ARNOLD ENERGY CENTER
INSERVICE TESTING PLAN - VALVES

APPENDIX B
VALVE LISTING

DRAWING : M-114
DRAWING TITLE : NUCLEAR BOILER SYSTEM

VALVE NUMBER	DWG COOR	IST CLASS	FUNCTION CATEGORY	SIZE (INCH)	BODY STYLE	ACTU-ATOR	NORMAL POSI-TION	TEST TYPE	TEST FREQ	MAXIMUM LIMIT	TEST UNIT	RELIEF REQUEST OR COLD SHUTDOWN	TECHNICAL POSITION	
PSV-4403	C-6	1	C	6.000	SV	SA	C	CT-SP	R2	1240.000	PSIG	VR-005		12
	FUNCTION : SAFETY RELIEF VALVE													
PSV-4404	C-5	1	C	6.000	SV	SA	C	CT-SP	R2	1240.000	PSIG	VR-005		12
	FUNCTION : SAFETY RELIEF VALVE													
PSV-4405	C-4	1	B/C	6.000	RV	SAP	C/KL	BTC	RR		PF	VR-006		
								BTO	RR		PF	VR-006		
								CT-SP	R2	1140.000	PSIG	VR-005		12
	FUNCTION : MN STM RELIEF/ADS VLV													
PSV-4406	E-6	1	B/C	6.000	RV	SAP	C/KL	BTC	RR		PF	VR-006		
								BTO	RR		PF	VR-006		
								CT-SP	R2	1140.000	PSIG	VR-005		12
	FUNCTION : MN STM RELIEF/ADS VLV													
PSV-4407	E-6	1	B/C	6.000	RV	SAP	C/KL	BTC	RR		PF	VR-006		
								BTO	RR		PF	VR-006		
								CT-SP	R2	1110.000	PSIG	VR-005		12
	FUNCTION : MN STM RELIEF/ADS VLV													
PSV-4439A	B-5	3	C	6.000	RV	SA	C	CT-SP	Y10	2.500	PSIG	VR-005		12
	FUNCTION : RLF VLV LN VAC BRKR													
PSV-4439B	B-4	3	C	6.000	RV	SA	C	CT-SP	Y10	2.500	PSIG	VR-005		12
	FUNCTION : RLF VLV LN VAC BRKR													
PSV-4439C	A-5	3	C	6.000	RV	SA	C	CT-SP	Y10	2.500	PSIG	VR-005		12
	FUNCTION : RLF VLV LN VAC BRKR													
PSV-4439D	B-4	3	C	6.000	RV	SA	C	CT-SP	Y10	2.500	PSIG	VR-005		12
	FUNCTION : RLF VLV LN VAC BRKR													
PSV-4439E	A-5	3	C	6.000	RV	SA	C	CT-SP	Y10	2.500	PSIG	VR-005		12
	FUNCTION : RLF VLV LN VAC BRKR													
PSV-4439F	A-4	3	C	6.000	RV	SA	C	CT-SP	Y10	2.500	PSIG	VR-005		12
	FUNCTION : RLF VLV LN VAC BRKR													

DUANE ARNOLD ENERGY CENTER
INSERVICE TESTING PLAN - VALVES

APPENDIX B
VALVE LISTING

DRAWING : M-114
DRAWING TITLE : NUCLEAR BOILER SYSTEM

VALVE NUMBER	DWG COOR	IST CLASS	FUNCTION CATEGORY	SIZE (INCH)	BODY STYLE	ACTU-ATOR	NORMAL POSI-TION	TEST TYPE	TEST FREQ	MAXIMUM LIMIT	TEST UNIT	RELIEF REQUEST OR COLD SHUTDOWN	TECHNICAL POSITION	
SV-4400	E-5	NC	B	.500	3WY	SO	ND	BTD	RR		PF	VR-002		12
								BTE	RR		PF	VR-006		
	FUNCTION : SOL PSV-4400													
SV-4401	E-4	NC	B	.500	3WY	SO	ND	BTD	RR		PF	VR-002		12
								BTE	RR		PF	VR-006		
	FUNCTION : SOL PSV-4401													
SV-4402	C-6	NC	B	.500	3WY	SO	ND	BTD	RR		PF	VR-002		12
								BTE	RR		PF	VR-006		
	FUNCTION : SOL PSV-4402													
SV-4405	C-4	NC	B	.500	3WY	SO	ND	BTD	RR		PF	VR-002		12
								BTE	RR		PF	VR-006		
	FUNCTION : SOL PSV-4405													
SV-4406	F-6	NC	B	.500	3WY	SO	ND	BTD	RR		PF	VR-002		12
								BTE	RR		PF	VR-006		
	FUNCTION : SOL PSV-4406													
SV-4407	F-6	NC	B	.500	3WY	SO	ND	BTD	RR		PF	VR-002		12
								BTE	RR		PF	VR-006		
	FUNCTION : SOL PSV-4407													
SV-4412A	G-8	NC	B	.250	3WY	SO	NE	BTD	OP		PF	VR-002		12
								FST	OP		PF	VR-017		
	FUNCTION : SOL CV-4412													
SV-4412B	G-8	NC	B	.250	3WY	SO	NE	BTD	OP		PF	VR-002		12
								FST	OP		PF	VR-017		
	FUNCTION : SOL CV-4412													
SV-4413A	F-2	NC	B	.250	3WY	SO	NE	BTD	OP		PF	VR-002		12
								FST	OP		PF	VR-017		
	FUNCTION : SOL CV-4413													
SV-4413B	F-2	NC	B	.250	3WY	SO	NE	BTD	OP		PF	VR-002		12
								FST	OP		PF	VR-017		

APPENDIX B
VALVE LISTING

DRAWING : M-114
DRAWING TITLE : NUCLEAR BOILER SYSTEM

VALVE NUMBER	DWG COOR	IST CLASS	FUNCTION CATEGORY	SIZE (INCH)	BODY STYLE	ACTUATOR	NORMAL POSITION	TEST TYPE	TEST FREQ	MAXIMUM LIMIT	TEST UNIT	RELIEF REQUEST OR COLD SHUTDOWN	TECHNICAL POSITION	
	FUNCTION : SOL CV-4413													
SV-4415A	G-8	NC	B	.250	3WY	SO	NE	BTD	OP		PF	VR-002		12
								FST	OP		PF	VR-017		
	FUNCTION : SOL CV-4415													
SV-4415B	G-8	NC	B	.250	3WY	SO	NE	BTD	OP		PF	VR-002		12
								FST	OP		PF	VR-017		
	FUNCTION : SOL CV-4415													
SV-4416A	G-8	NC	B	.250	3WY	SO	NE	BTD	OP		PF	VR-002		12
								FST	OP		PF	VR-017		
	FUNCTION : SOL CV-4416													
SV-4416B	G-8	NC	B	.250	3WY	SO	NE	BTD	OP		PF	VR-002		12
								FST	OP		PF	VR-017		
	FUNCTION : SOL CV-4416													
SV-4418A	G-8	NC	B	.250	3WY	SO	NE	BTD	OP		PF	VR-002		12
								FST	OP		PF	VR-017		
	FUNCTION : SOL CV-4418													
SV-4418B	G-8	NC	B	.250	3WY	SO	NE	BTD	OP		PF	VR-002		12
								FST	OP		PF	VR-017		
	FUNCTION : SOL CV-4418													
SV-4419A	G-8	NC	B	.250	3WY	SO	NE	BTD	OP		PF	VR-002		12
								FST	OP		PF	VR-017		
	FUNCTION : SOL CV-4419													
SV-4419B	G-8	NC	B	.250	3WY	SO	NE	BTD	OP		PF	VR-002		12
								FST	OP		PF	VR-017		
	FUNCTION : SOL CV-4419													
SV-4420A	G-8	NC	B	.250	3WY	SO	NE	BTD	OP		PF	VR-002		12
								FST	OP		PF	VR-017		
	FUNCTION : SOL CV-4420													
SV-4420B	G-8	NC	B	.250	3WY	SO	NE	BTD	OP		PF	VR-002		12

APPENDIX B
VALVE LISTING

DRAWING : M-114
DRAWING TITLE : NUCLEAR BOILER SYSTEM

VALVE NUMBER	DWG COOR	IST CLASS	FUNCTION CATEGORY	SIZE (INCH)	BODY STYLE	ACTU-ATOR	NORMAL POSI-TION	TEST TYPE	TEST FREQ	MAXIMUM LIMIT	TEST UNIT	RELIEF REQUEST OR COLD SHUTDOWN	TECHNICAL POSITION	
SV-4420B	G-8	NC	B	.250	3WY	SO	NE	FST	OP		PF	VR-017		12
	FUNCTION : SOL CV-4420													
SV-4421A	G-8	NC	B	.250	3WY	SO	NE	BTD	OP		PF	VR-002		12
								FST	OP		PF	VR-017		
	FUNCTION : SOL CV-4421													
SV-4421B	G-8	NC	B	.250	3WY	SO	NE	BTD	OP		PF	VR-002		12
								FST	OP		PF	VR-017		
	FUNCTION : SOL CV-4421													
SV-4428	H-6	NC	B	.250	3WY	SO	ND	BTD	CS		PF	VR-002		12
	FUNCTION : SOL CV-4428													
SV-4429	H-7	NC	B	.250	3WY	SO	ND	BTD	CS		PF	VR-002		12
	FUNCTION : SOL CV-4429													
V-14-001	B-6	1	A/C	16.000	CK	SA	SYS	AT-01	RR	24000.000	SCCM	VR-037		12
								CT-CC	RR		PF	VR-004		
								CT-CO	RR		PF		TAV-12	
	FUNCTION : FEEDWATER CHECK VLV													
V-14-003	B-4	1	A/C	16.000	CK	SA	SYS	AT-01	RR	24000.000	SCCM	VR-037		12
								CT-CC	RR		PF	VR-004		
								CT-CO	RR		PF		TAV-12	
	FUNCTION : FEEDWATER CHECK VLV													
V-14-009	F-6	NC	A/C	2.000	CK	SA	SYS	AT-06	RR	25.000	SCCM			
								CT-CC	RR		PF	VR-019		
	FUNCTION : ACCUM 1R003A CK VLV (PSV4406/4407)													
V-14-014	C-6	NC	A/C	2.000	CK	SA	SYS	AT-06	RR	25.000	SCCM			12
								CT-CC	RR		PF	VR-019		
	FUNCTION : ACCUM 1R003C CK VL (PSV4402)													
V-14-015	G-5	NC	A/C	2.000	CK	SA	SYS	AT-06	RR	25.000	SCCM			
								CT-CC	RR		PF	VR-019		
	FUNCTION : ACCUM 1R003B CK VLV (PSV4400/4401)													

APPENDIX B
VALVE LISTING

DRAWING : M-114
DRAWING TITLE : NUCLEAR BOILER SYSTEM

VALVE NUMBER	DWG COOR	IST CLASS	FUNCTION CATEGORY	SIZE (INCH)	BODY STYLE	ACTU-ATOR	NORMAL POSI-TION	TEST TYPE	TEST FREQ	MAXIMUM LIMIT	TEST UNIT	RELIEF REQUEST OR COLD SHUTDOWN	TECHNICAL POSITION
V-14-016	D-5	NC	A/C	2.000	CK	SA	SYS	AT-06	RR	25.000	SCCM		
								CT-CC	RR		PF	VR-019	
	FUNCTION : ACCUM 1R003D CK VL (PSV4405)												
V-14-032	F-1	NC	A/C	.750	CK	SA	SYS	AT-06	RR	1000.000	SCCM		
								CT-CC	RR		PF	VR-019	
	FUNCTION : ACCUM 1R002A CK VLV (CV4413)												
V-14-100	F-3	NC	A/C	.750	CK	SA	SYS	AT-06	RR	10000.000	SCCM		
								CT-CC	RR		PF	VR-019	
	FUNCTION : ACCUM 1R001A CK VLV (CV4412)												
V-14-104	G-8	NC	A/C	.750	CK	SA	SYS	AT-06	RR	10000.000	SCCM		
								CT-CC	RR		PF	VR-019	
	FUNCTION : ACCUM 1R001B CK VLV (CV4415)												
V-14-108	G-8	NC	A/C	.750	CK	SA	SYS	AT-06	RR	1000.000	SCCM		
								CT-CC	RR		PF	VR-019	
	FUNCTION : ACCUM 1R002B CK VLV (CV4416)												
V-14-112	G-8	NC	A/C	.750	CK	SA	SYS	AT-06	RR	10000.000	SCCM		
								CT-CC	RR		PF	VR-019	
	FUNCTION : ACCUM 1R001C CK VLV (CV4418)												
V-14-116	G-8	NC	A/C	.750	CK	SA	SYS	AT-06	RR	1000.000	SCCM		
								CT-CC	RR		PF	VR-019	
	FUNCTION : ACCUM 1R002C CK VALVE (CV4419)												
V-14-120	G-8	NC	A/C	.750	CK	SA	SYS	AT-06	RR	10000.000	SCCM		
								CT-CC	RR		PF	VR-019	
	FUNCTION : ACCUM 1R001D CK VLV (CV4420)												
V-14-124	G-8	NC	A/C	.750	CK	SA	SYS	AT-06	RR	1000.000	SCCM		
								CT-CC	RR		PF	VR-019	
	FUNCTION : ACCUM 1R002D CK VLV (CV4421)												
V-14-4412-LATER-A	E-3	NC	C	.250	CK	SA	SYS	CT-CC	OP		PF		
	FUNCTION : MSIV ACTUATOR SPEED CONTROL CHECK VALVE												

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APPENDIX B
VALVE LISTING

DRAWING : M-114
DRAWING TITLE : NUCLEAR BOILER SYSTEM

VALVE NUMBER	DWG COOR	IST CLASS	FUNCTION CATEGORY	SIZE (INCH)	BODY STYLE	ACTU-ATOR	NORMAL POSI-TION	TEST TYPE	TEST FREQ	MAXIMUM LIMIT	TEST UNIT	RELIEF REQUEST OR COLD SHUTDOWN	TECHNICAL POSITION	
V-14-4412-LATER-B	E-3	NC	C	.250	CK	SA	SYS	CT-CO	OP		PF			12
FUNCTION : MSIV ACTUATOR SPEED CONTROL CHECK VALVE														
V-14-4413-LATER-A	E-2	NC	C	.250	CK	SA	SYS	CT-CC	OP		PF			12
FUNCTION : MSIV ACTUATOR SPEED CONTROL CHECK VALVE														
V-14-4413-LATER-B	E-2	NC	C	.250	CK	SA	SYS	CT-CO	OP		PF			12
FUNCTION : MSIV ACTUATOR SPEED CONTROL CHECK VALVE														
V-14-4415-LATER-A	C-7	NC	C	.250	CK	SA	SYS	CT-CC	OP		PF			12
FUNCTION : MSIV ACTUATOR SPEED CONTROL CHECK VALVE														
V-14-4415-LATER-B	C-7	NC	C	.250	CK	SA	SYS	CT-CO	OP		PF			12
FUNCTION : MSIV ACTUATOR SPEED CONTROL CHECK VALVE														
V-14-4416-LATER-A	C-8	NC	C	.250	CK	SA	SYS	CT-CC	OP		PF			12
FUNCTION : MSIV ACTUATOR SPEED CONTROL CHECK VALVE														
V-14-4416-LATER-B	C-8	NC	C	.250	CK	SA	SYS	CT-CO	OP		PF			12
FUNCTION : MSIV ACTUATOR SPEED CONTROL CHECK VALVE														
V-14-4418-LATER-A	C-3	NC	C	.250	CK	SA	SYS	CT-CC	OP		PF			12
FUNCTION : MSIV ACTUATOR SPEED CONTROL CHECK VALVE														
V-14-4418-LATER-B	C-3	NC	C	.250	CK	SA	SYS	CT-CO	OP		PF			12
FUNCTION : MSIV ACTUATOR SPEED CONTROL CHECK VALVE														
V-14-4419-LATER-A	C-2	NC	C	.250	CK	SA	SYS	CT-CC	OP		PF			12
FUNCTION : MSIV ACTUATOR SPEED CONTROL CHECK VALVE														
V-14-4419-LATER-B	C-2	NC	C	.250	CK	SA	SYS	CT-CO	OP		PF			12
FUNCTION : MSIV ACTUATOR SPEED CONTROL CHECK VALVE														
V-14-4420-LATER-A	E-7	NC	C	.250	CK	SA	SYS	CT-CC	OP		PF			12
FUNCTION : MSIV ACTUATOR SPEED CONTROL CHECK VALVE														
V-14-4420-LATER-B	E-7	NC	C	.250	CK	SA	SYS	CT-CO	OP		PF			12
FUNCTION : MSIV ACTUATOR SPEED CONTROL CHECK VALVE														

APPENDIX B
VALVE LISTING

DRAWING : M-114
DRAWING TITLE : NUCLEAR BOILER SYSTEM

VALVE NUMBER	DWG COOR	IST CLASS	FUNCTION CATEGORY	SIZE (INCH)	BODY STYLE	ACTU-ATOR	NORMAL POSI-TION	TEST TYPE	TEST FREQ	MAXIMUM LIMIT	TEST UNIT	RELIEF REQUEST OR COLD SHUTDOWN	TECHNICAL POSITION
V-14-4421-LATER-A	E-8	NC	C	.250	CK	SA	SYS	CT-CC	OP		PF		
	FUNCTION : MSIV ACTUATOR SPEED CONTROL CHECK VALVE												
V-14-4421-LATER-B	E-8	NC	C	.250	CK	SA	SYS	CT-CO	OP		PF		
	FUNCTION : MSIV ACTUATOR SPEED CONTROL CHECK VALVE												
XFV-4453A	E-3	2	A/C	1.000	XFC	SA	SYS	AT-02	RR		PF	VR-008	
								CT-CC	RR		PF		
								PIT	Y2		PF		
	FUNCTION : EXCESS FLOW CK VLV												
XFV-4453B	D-3	2	A/C	1.000	XFC	SA	SYS	AT-02	RR		PF	VR-008	
								CT-CC	RR		PF		
								PIT	Y2		PF		
	FUNCTION : EXCESS FLOW CK VLV												
XFV-4454A	E-3	2	A/C	1.000	XFC	SA	SYS	AT-02	RR		PF	VR-008	
								CT-CC	RR		PF		
								PIT	Y2		PF		
	FUNCTION : EXCESS FLOW CK VLV												
XFV-4454B	D-1	2	A/C	1.000	XFC	SA	SYS	AT-02	RR		PF	VR-008	
								CT-CC	RR		PF		
								PIT	Y2		PF		
	FUNCTION : EXCESS FLOW CK VLV												
XFV-4455A	C-3	2	A/C	1.000	XFC	SA	SYS	AT-02	RR		PF	VR-008	
								CT-CC	RR		PF		
								PIT	Y2		PF		
	FUNCTION : EXCESS FLOW CK VALVE												
XFV-4455B	C-3	2	A/C	1.000	XFC	SA	SYS	AT-02	RR		PF	VR-008	
								CT-CC	RR		PF		
								PIT	Y2		PF		
	FUNCTION : EXCESS FLOW CK VLV												
XFV-4456A	C-3	2	A/C	1.000	XFC	SA	SYS	AT-02	RR		PF	VR-008	
								CT-CC	RR		PF		

APPENDIX B
VALVE LISTING

DRAWING : M-114
DRAWING TITLE : NUCLEAR BOILER SYSTEM

VALVE NUMBER	DWG COOR	IST CLASS	FUNCTION CATEGORY	SIZE (INCH)	BODY STYLE	ACTU-ATOR	NORMAL POSI-TION	TEST TYPE	TEST FREQ	MAXIMUM LIMIT	TEST UNIT	RELIEF REQUEST OR COLD SHUTDOWN	TECHNICAL POSITION
XFV-4456A	C-3	2	A/C	1.000	XFC	SA	SYS	PIT	Y2		PF		
	FUNCTION : EXCESS FLOW CHECK												
XFV-4456B	C-3	2	A/C	1.000	XFC	SA	SYS	AT-02	RR		PF	VR-008	
								CT-CC	RR		PF		
								PIT	Y2		PF		
	FUNCTION : EXCESS FLOW CHECK												
XFV-4457A	E-7	2	A/C	1.000	XFC	SA	SYS	AT-02	RR		PF	VR-008	
								CT-CC	RR		PF		
								PIT	Y2		PF		
	FUNCTION : EXCESS FLOW CHECK												
XFV-4457B	D-7	2	A/C	1.000	XFC	SA	SYS	AT-02	RR		PF	VR-008	
								CT-CC	RR		PF		
								PIT	Y2		PF		
	FUNCTION : EXCESS FLOW CHECK												
XFV-4458A	E-7	2	A/C	1.000	XFC	SA	SYS	AT-02	RR		PF	VR-008	
								CT-CC	RR		PF		
								PIT	Y2		PF		
	FUNCTION : EXCESS FLOW CK VLV												
XFV-4458B	D-7	2	A/C	1.000	XFC	SA	SYS	AT-02	RR		PF	VR-008	
								CT-CC	RR		PF		
								PIT	Y2		PF		
	FUNCTION : EXCESS FLOW CHECK												
XFV-4459A	C-7	2	A/C	1.000	XFC	SA	SYS	AT-02	RR		PF	VR-008	
								CT-CC	RR		PF		
								PIT	Y2		PF		
	FUNCTION : EXCESS FLOW CHECK												
XFV-4459B	C-7	2	A/C	1.000	XFC	SA	SYS	AT-02	RR		PF	VR-008	
								CT-CC	RR		PF		
								PIT	Y2		PF		
	FUNCTION : EXCESS FLOW CHECK												
XFV-4460A	C-7	2	A/C	1.000	XFC	SA	SYS	AT-02	RR		PF	VR-008	

APPENDIX B
VALVE LISTING

DRAWING : M-114
DRAWING TITLE : NUCLEAR BOILER SYSTEM

VALVE NUMBER	DWG COOR	IST CLASS	FUNCTION CATEGORY	SIZE (INCH)	BODY STYLE	ACTU-ATOR	NORMAL POSI-TION	TEST TYPE	TEST FREQ	MAXIMUM LIMIT	TEST UNIT	RELIEF REQUEST OR COLD SHUTDOWN	TECHNICAL POSITION
XFV-4460A	C-7	2	A/C	1.000	XFC	SA	SYS	CT-CC	RR		PF		
								PIT	Y2		PF		
	FUNCTION : EXCESS FLOW CHECK												
XFV-4460B	C-7	2	A/C	1.000	XFC	SA	SYS	AT-02	RR		PF	VR-008	
								CT-CC	RR		PF		
								PIT	Y2		PF		
	FUNCTION : EXCESS FLOW CHECK												

APPENDIX B
VALVE LISTING

DRAWING : M-115
DRAWING TITLE : REACTOR VESSEL INSTRUMENTATION

VALVE NUMBER	DWG COOR	IST CLASS	FUNCTION CATEGORY	SIZE (INCH)	BODY STYLE	ACTU-ATOR	NORMAL POSI-TION	TEST TYPE	TEST FREQ	MAXIMUM LIMIT	TEST UNIT	RELIEF REQUEST OR COLD SHUTDOWN	TECHNICAL POSITION
SV-4594A	D-3	2	A	1.000	GL	SO	C/FC	AT-01	RR	1000.000	SCCM		
								BTC	OP	2.000	SECS	VR-034	
								FST	OP		PF	VR-017	
								PIT	Y2		PF		
FUNCTION : INBD LOOP A JET PP SMPL ISOL													
SV-4594B	D-6	2	A	1.000	GL	SO	C/FC	AT-01	RR	1000.000	SCCM		
								BTC	OP	2.000	SECS	VR-034	
								FST	OP		PF	VR-017	
								PIT	Y2		PF		
FUNCTION : INBD LOOP B JET PP SMPL ISOL													
SV-4595A	D-3	NC	A	1.000	GL	SO	C/FC	AT-01	RR	1000.000	SCCM		
								BTC	OP	2.000	SECS	VR-034	
								FST	OP		PF	VR-017	
								PIT	Y2		PF		
FUNCTION : OUTBD LOOP A JET PP SMPL ISOL													
SV-4595B	D-6	NC	A	1.000	GL	SO	C/FC	AT-01	RR	1000.000	SCCM		
								BTC	OP	2.000	SECS	VR-034	
								FST	OP		PF	VR-017	
								PIT	Y2		PF		
FUNCTION : OUTBD LOOP B JET PP SMPL ISOL													
XFV-4501A	E-3	2	A	1.000	XFC	SA	SYS	AT-02	RR		PF	VR-008	
								CT-CC	RR		PF		
								PIT	Y2		PF		
FUNCTION : EXCESS FLOW CK VLV													
XFV-4501B	E-3	2	A	1.000	XFC	SA	SYS	AT-02	RR		PF	VR-008	
								CT-CC	RR		PF		
								PIT	Y2		PF		
FUNCTION : EXCESS FLOW CK VLV													
XFV-4503	E-3	2	A	1.000	XFC	SA	SYS	AT-02	RR		PF	VR-008	
								CT-CC	RR		PF		
								PIT	Y2		PF		
FUNCTION : EXCESS FLOW CK VLV													

APPENDIX B
VALVE LISTING

DRAWING : M-115
DRAWING TITLE : REACTOR VESSEL INSTRUMENTATION

VALVE NUMBER	DWG COOR	IST CLASS	FUNCTION CATEGORY	SIZE (INCH)	BODY STYLE	ACTU-ATOR	NORMAL POSI-TION	TEST TYPE	TEST FREQ	MAXIMUM LIMIT	TEST UNIT	RELIEF REQUEST OR COLD SHUTDOWN	TECHNICAL POSITION
XFV-4504	E-6	2	A	1.000	XFC	SA	SYS	AT-02	RR		PF	VR-008	
								CT-CC	RR		PF		
								PIT	Y2		PF		
	FUNCTION : EXCESS FLOW CK VLV												
XFV-4505	C-3	2	A	1.000	XFC	SA	SYS	AT-02	RR		PF	VR-008	
								CT-CC	RR		PF		
								PIT	Y2		PF		
	FUNCTION : EXCESS FLOW CK VLV												
XFV-4506	B-3	2	A	1.000	XFC	SA	SYS	AT-02	RR		PF	VR-008	
								CT-CC	RR		PF		
								PIT	Y2		PF		
	FUNCTION : EXCESS FLOW CK VLV												
XFV-4507	B-3	2	A	1.000	XFC	SA	SYS	AT-02	RR		PF	VR-008	
								CT-CC	RR		PF		
								PIT	Y2		PF		
	FUNCTION : EXCESS FLOW CHK.												
XFV-4508	B-3	2	A	1.000	XFC	SA	SYS	AT-02	RR		PF	VR-008	
								CT-CC	RR		PF		
								PIT	Y2		PF		
	FUNCTION : EXCESS FLOW CK VLV												
XFV-4510A	E-6	2	A	1.000	XFC	SA	SYS	AT-02	RR		PF	VR-008	
								CT-CC	RR		PF		
								PIT	Y2		PF		
	FUNCTION : EXCESS FLOW CK VLV												
XFV-4510B	E-7	2	A	1.000	XFC	SA	SYS	AT-02	RR		PF	VR-008	
								CT-CC	RR		PF		
								PIT	Y2		PF		
	FUNCTION : EXCESS FLOW CK VLV												
XFV-4511	B-3	2	A	1.000	XFC	SA	SYS	AT-02	RR		PF	VR-008	
								CT-CC	RR		PF		
								PIT	Y2		PF		

APPENDIX B
VALVE LISTING

DRAWING : M-115
DRAWING TITLE : REACTOR VESSEL INSTRUMENTATION

VALVE NUMBER	DWG COOR	IST CLASS	FUNCTION CATEGORY	SIZE (INCH)	BODY STYLE	ACTU-ATOR	NORMAL POSI-TION	TEST TYPE	TEST FREQ	MAXIMUM LIMIT	TEST UNIT	RELIEF REQUEST OR COLD SHUTDOWN	TECHNICAL POSITION
	FUNCTION : EXCESS FLOW CK VLV												
XFV-4512	B-3	2	A	1.000	XFC	SA	SYS	AT-02	RR		PF	VR-008	
								CT-CC	RR		PF		
								PIT	Y2		PF		
	FUNCTION : EXCESS FLOW CK VLV												
XFV-4513	B-3	2	A	1.000	XFC	SA	SYS	AT-02	RR		PF	VR-008	
								CT-CC	RR		PF		
								PIT	Y2		PF		
	FUNCTION : EXCESS FLOW CK VLV												
XFV-4514	B-3	2	A	1.000	XFC	SA	SYS	AT-02	RR		PF	VR-008	
								CT-CC	RR		PF		
								PIT	Y2		PF		
	FUNCTION : EXCESS FLOW CK VLV												
XFV-4515	B-3	2	A	1.000	XFC	SA	SYS	AT-02	RR		PF	VR-008	
								CT-CC	RR		PF		
								PIT	Y2		PF		
	FUNCTION : EXCESS FLOW CK VLV												
XFV-4516	B-3	2	A	1.000	XFC	SA	SYS	AT-02	RR		PF	VR-008	
								CT-CC	RR		PF		
								PIT	Y2		PF		
	FUNCTION : EXCESS FLOW CK VLV												
XFV-4518	D-6	2	A	1.000	XFC	SA	SYS	AT-02	RR		PF	VR-008	
								CT-CC	RR		PF		
								PIT	Y2		PF		
	FUNCTION : EXCESS FLOW CK VLV												
XFV-4519	D-3	2	A	1.000	XFC	SA	SYS	AT-02	RR		PF	VR-008	
								CT-CC	RR		PF		
								PIT	Y2		PF		
	FUNCTION : EXCESS FLOW CK VLV												
XFV-4528	D-6	2	A	1.000	XFC	SA	SYS	AT-02	RR		PF	VR-008	

APPENDIX B
VALVE LISTING

DRAWING : M-115
DRAWING TITLE : REACTOR VESSEL INSTRUMENTATION

VALVE NUMBER	DWG COOR	IST CLASS	FUNCTION CATEGORY	SIZE (INCH)	BODY STYLE	ACTU-ATOR	NORMAL POSI-TION	TEST TYPE	TEST FREQ	MAXIMUM LIMIT	TEST UNIT	RELIEF REQUEST OR COLD SHUTDOWN	TECHNICAL POSITION
XFV-4528	D-6	2	A	1.000	XFC	SA	SYS	CT-CC	RR		PF		
								PIT	Y2		PF		
	FUNCTION : EXCESS FLOW CK VLV												
XFV-4562	E-3	2	A	1.000	XFC	SA	SYS	AT-02	RR		PF	VR-008	
								CT-CC	RR		PF		
								PIT	Y2		PF		
	FUNCTION : EXCESS FLOW CK VLV												
XFV-4578	F-6	2	A	1.000	XFC	SA	SYS	AT-02	RR		PF	VR-008	
								CT-CC	RR		PF		
								PIT	Y2		PF		
	FUNCTION : EXCESS FLOW CK VLV												
XFV-4579	F-6	2	A	1.000	XFC	SA	SYS	AT-02	RR		PF	VR-008	
								CT-CC	RR		PF		
								PIT	Y2		PF		
	FUNCTION : EXCESS FLOW CK VLV												
XFV-4580	F-6	2	A	1.000	XFC	SA	SYS	AT-02	RR		PF	VR-008	
								CT-CC	RR		PF		
								PIT	Y2		PF		
	FUNCTION : EXCESS FLOW CK VLV												
XFV-4581	E-6	2	A	1.000	XFC	SA	SYS	AT-02	RR		PF	VR-008	
								CT-CC	RR		PF		
								PIT	Y2		PF		
	FUNCTION : EXCESS FLOW CK VLV												
XFV-4582	E-6	2	A	1.000	XFC	SA	SYS	AT-02	RR		PF	VR-008	
								CT-CC	RR		PF		
								PIT	Y2		PF		
	FUNCTION : EXCESS FLOW CK VLV												
XFV-4583	E-6	2	A	1.000	XFC	SA	SYS	AT-02	RR		PF	VR-008	
								CT-CC	RR		PF		
								PIT	Y2		PF		
	FUNCTION : EXCESS FLOW CK VLV												

APPENDIX B
VALVE LISTING

DRAWING : M-115
DRAWING TITLE : REACTOR VESSEL INSTRUMENTATION

VALVE NUMBER	DWG COOR	IST CLASS	FUNCTION CATEGORY	SIZE (INCH)	BODY STYLE	ACTU-ATOR	NORMAL POSI-TION	TEST TYPE	TEST FREQ	MAXIMUM LIMIT	TEST UNIT	RELIEF REQUEST OR COLD SHUTDOWN	TECHNICAL POSITION
XFV-4584	D-6	2	A	1.000	XFC	SA	SYS	AT-02	RR		PF	VR-008	
								CT-CC	RR		PF		
								PIT	Y2		PF		
	FUNCTION : EXCESS FLOW CK VLV												
XFV-4585	D-6	2	A	1.000	XFC	SA	SYS	AT-02	RR		PF	VR-008	
								CT-CC	RR		PF		
								PIT	Y2		PF		
	FUNCTION : EXCESS FLOW CK VLV												
XFV-4586	F-3	2	A	1.000	XFC	SA	SYS	AT-02	RR		PF	VR-008	
								CT-CC	RR		PF		
								PIT	Y2		PF		
	FUNCTION : EXCESS FLOW CK VLV												
XFV-4587	F-3	2	A	1.000	XFC	SA	SYS	AT-02	RR		PF	VR-008	
								CT-CC	RR		PF		
								PIT	Y2		PF		
	FUNCTION : EXCESS FLOW CK VLV												
XFV-4588	F-3	2	A	1.000	XFC	SA	SYS	AT-02	RR		PF	VR-008	
								CT-CC	RR		PF		
								PIT	Y2		PF		
	FUNCTION : EXCESS FLOW CK VLV												
XFV-4589	F-3	2	A	1.000	XFC	SA	SYS	AT-02	RR		PF	VR-008	
								CT-CC	RR		PF		
								PIT	Y2		PF		
	FUNCTION : EXCESS FLOW CK VLV												
XFV-4590	D-3	2	A	1.000	XFC	SA	SYS	AT-02	RR		PF	VR-008	
								CT-CC	RR		PF		
								PIT	Y2		PF		
	FUNCTION : EXCESS FLOW CK VLV												
XFV-4591	D-3	2	A	1.000	XFC	SA	SYS	AT-02	RR		PF	VR-008	
								CT-CC	RR		PF		
								PIT	Y2		PF		

APPENDIX B
VALVE LISTING

DRAWING : M-115
DRAWING TITLE : REACTOR VESSEL INSTRUMENTATION

VALVE NUMBER	DWG COOR	IST CLASS	FUNCTION CATEGORY	SIZE (INCH)	BODY STYLE	ACTU-ATOR	NORMAL POSI-TION	TEST TYPE	TEST FREQ	MAXIMUM LIMIT	TEST UNIT	RELIEF REQUEST OR COLD SHUTDOWN	TECHNICAL POSITION
FUNCTION : EXCESS FLOW CK VLV													

APPENDIX B
VALVE LISTING

DRAWING : M-116
DRAWING TITLE : REACTOR RECIRCULATION SYSTEM

VALVE NUMBER	DWG COOR	IST CLASS	FUNCTION CATEGORY	SIZE (INCH)	BODY STYLE	ACTUATOR	NORMAL POSITION	TEST TYPE	TEST FREQ	MAXIMUM LIMIT	TEST UNIT	RELIEF REQUEST OR COLD SHUTDOWN	TECHNICAL POSITION
CV-4639	F-6	2	A	.750	GL	AO	O/FC	AT-01	RR	1000.000	SCCM		TAV-05
								BTC	OP	5.000	SECS		
								FST	OP		PF	VR-017	
								PIT	Y2		PF		
B31-F019	FUNCTION : INBD RECIRC LOOP SMPL ISOL												
CV-4640	F-6	NC	A	.750	GL	AO	O/FC	AT-01	RR	1000.000	SCCM		
								BTC	OP	5.000	SECS		
								FST	OP		PF	VR-017	
								PIT	Y2		PF		
B31-F020	FUNCTION : OUTBD RECIRC LOOP SMPL ISOL												
MO	C-2	1	B	22.000	GA	MO	O	BTC	CS	30.000	SECS	CSJ-04	
								PIT	Y2		PF		
	FUNCTION : RECIRC PP DISCH ISOL												
MO-4628	C-8	1	B	22.000	GA	MO	O	BTC	CS	30.000	SECS	CSJ-04	
								PIT	Y2		PF		
	FUNCTION : RECIRC PP DISCH ISOL												
SV-4639	F-6	NC	B	1.000	3WY	SO	NE	BTD	OP		PF	VR-002	
	FUNCTION : SOLENOID VLV CV-4639												
SV-4640	F-6	NC	B	1.000	3WY	SO	NE	BTD	OP		PF	VR-002	
	FUNCTION : SOLENOID VLV CV-4640												
XFV-4607	A-5	2	A/C	1.000	XFC	SA	SYS	AT-02	RR		PF	VR-008	
								CT-CC	RR		PF		
								PIT	Y2		PF		
	FUNCTION : EXCESS FLOW CK VLV												

APPENDIX B
VALVE LISTING

DRAWING : M-116
DRAWING TITLE : REACTOR RECIRCULATION SYSTEM

VALVE NUMBER	DWG COOR	IST CLASS	FUNCTION CATEGORY	SIZE (INCH)	BODY STYLE	ACTU-ATOR	NORMAL POSI-TION	TEST TYPE	TEST FREQ	MAXIMUM LIMIT	TEST UNIT	RELIEF REQUEST OR COLD SHUTDOWN	TECHNICAL POSITION
XFV-4608	A-5	2	A/C	1.000	XFC	SA	SYS	AT-02	RR		PF	VR-008	
								CT-CC	RR		PF		
								PIT	Y2		PF		
	FUNCTION : EXCESS FLOW CK VLV												
XFV-4611	A-5	3	A/C	1.000	XFC	SA	SYS	AT-02	RR		PF	VR-008	
								CT-CC	RR		PF		
								PIT	Y2		PF		
	FUNCTION : EXCESS FLOW CK VLV												
XFV-4612	A-5	3	A/C	1.000	XFC	SA	SYS	AT-02	RR		PF	VR-008	
								CT-CC	RR		PF		
								PIT	Y2		PF		
	FUNCTION : EXCESS FLOW CK VLV												
XFV-4637	E-6	2	A/C	1.000	XFC	SA	SYS	AT-02	RR		PF	VR-008	
								CT-CC	RR		PF		
								PIT	Y2		PF		
	FUNCTION : EXCESS FLOW CK VLV												
XFV-4638	E-6	2	A/C	1.000	XFC	SA	SYS	AT-02	RR		PF	VR-008	
								CT-CC	RR		PF		
								PIT	Y2		PF		
	FUNCTION : EXCESS FLOW CK VLV												
XFV-4641A	H-7	2	A/C	1.000	XFC	SA	SYS	AT-02	RR		PF	VR-008	
								CT-CC	RR		PF		
								PIT	Y2		PF		
	FUNCTION : EXCESS FLOW CK VLV												
XFV-4641B	H-3	2	A/C	1.000	XFC	SA	SYS	AT-02	RR		PF	VR-008	
								CT-CC	RR		PF		
								PIT	Y2		PF		
	FUNCTION : EXCESS FLOW CK VLV												
XFV-4642A	G-7	2	A/C	1.000	XFC	SA	SYS	AT-02	RR		PF	VR-008	
								CT-CC	RR		PF		
								PIT	Y2		PF		

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APPENDIX B
VALVE LISTING

DRAWING : M-116
DRAWING TITLE : REACTOR RECIRCULATION SYSTEM

VALVE NUMBER	DWG COOR	IST CLASS	FUNCTION CATEGORY	SIZE (INCH)	BODY STYLE	ACTU-ATOR	NORMAL POSI-TION	TEST TYPE	TEST FREQ	MAXIMUM LIMIT	TEST UNIT	RELIEF REQUEST OR COLD SHUTDOWN	TECHNICAL POSITION
	FUNCTION : EXCESS FLOW CK VLV												
XFV-4642B	G-3	2	A/C	1.000	XFC	SA	SYS	AT-02	RR		PF	VR-008	
								CT-CC	RR		PF		
								PIT	Y2		PF		
	FUNCTION : EXCESS FLOW CK VLV												
XFV-4643A	G-7	2	A/C	1.000	XFC	SA	SYS	AT-02	RR		PF	VR-008	
								CT-CC	RR		PF		
								PIT	Y2		PF		
	FUNCTION : EXCESS FLOW CK VLV												
XFV-4643B	G-3	2	A/C	1.000	XFC	SA	SYS	AT-02	RR		PF	VR-008	
								CT-CC	RR		PF		
								PIT	Y2		PF		
	FUNCTION : EXCESS FLOW CK VLV												
XFV-4644A	G-3	2	A/C	1.000	XFC	SA	SYS	AT-02	RR		PF	VR-008	
								CT-CC	RR		PF		
								PIT	Y2		PF		
	FUNCTION : EXCESS FLOW CK VLV												
XFV-4644B	G-3	2	A/C	1.000	XFC	SA	SYS	AT-02	RR		PF	VR-008	
								CT-CC	RR		PF		
								PIT	Y2		PF		
	FUNCTION : EXCESS FLOW CK VLV												
XFV-4663	F-4	2	A/C	1.000	XFC	SA	SYS	AT-02	RR		PF	VR-008	
								CT-CC	RR		PF		
								PIT	Y2		PF		
	FUNCTION : EXCESS FLOW CK VLV												
XFV-4664	F-4	2	A/C	1.000	XFC	SA	SYS	AT-02	RR		PF	VR-008	
								CT-CC	RR		PF		
								PIT	Y2		PF		
	FUNCTION : EXCESS FLOW CK VLV												
XFV-4665	F-4	2	A/C	1.000	XFC	SA	SYS	AT-02	RR		PF	VR-008	

APPENDIX B
VALVE LISTING

DRAWING : M-116
DRAWING TITLE : REACTOR RECIRCULATION SYSTEM

VALVE NUMBER	DWG COOR	IST CLASS	FUNCTION CATEGORY	SIZE (INCH)	BODY STYLE	ACTU-ATOR	NORMAL POSI-TION	TEST TYPE	TEST FREQ	MAXIMUM LIMIT	TEST UNIT	RELIEF REQUEST OR COLD SHUTDOWN	TECHNICAL POSITION
XFV-4665	F-4	2	A/C	1.000	XFC	SA	SYS	CT-CC	RR		PF		
								PIT	Y2		PF		
	FUNCTION : EXCESS FLOW CK VLV												
XFV-4666	F-4	2	A/C	1.000	XFC	SA	SYS	AT-02	RR		PF	VR-008	
								CT-CC	RR		PF		
								PIT	Y2		PF		
	FUNCTION : EXCESS FLOW CK VLV												
XFV-4667	E-4	2	A/C	1.000	XFC	SA	SYS	AT-02	RR		PF	VR-008	
								CT-CC	RR		PF		
								PIT	Y2		PF		
	FUNCTION : EXCESS FLOW CK VLV												
XFV-4668	E-4	2	A/C	1.000	XFC	SA	SYS	AT-02	RR		PF	VR-008	
								CT-CC	RR		PF		
								PIT	Y2		PF		
	FUNCTION : EXCESS FLOW CK VLV												
XFV-4669	E-4	2	A/C	1.000	XFC	SA	SYS	AT-02	RR		PF	VR-008	
								CT-CC	RR		PF		
								PIT	Y2		PF		
	FUNCTION : EXCESS FLOW CK VLV												
XFV-4670	E-4	2	A/C	1.000	XFC	SA	SYS	AT-02	RR		PF	VR-008	
								CT-CC	RR		PF		
								PIT	Y2		PF		
	FUNCTION : EXCESS FLOW CK VLV												
XFV-4671	E-4	2	A/C	1.000	XFC	SA	SYS	AT-02	RR		PF	VR-008	
								CT-CC	RR		PF		
								PIT	Y2		PF		
	FUNCTION : EXCESS FLOW CK VLV												
XFV-4672	E-4	2	A/C	1.000	XFC	SA	SYS	AT-02	RR		PF	VR-008	
								CT-CC	RR		PF		
								PIT	Y2		PF		
	FUNCTION : EXCESS FLOW CK VLV												

APPENDIX B
VALVE LISTING

DRAWING : M-116
DRAWING TITLE : REACTOR RECIRCULATION SYSTEM

VALVE NUMBER	DWG COOR	IST CLASS	FUNCTION CATEGORY	SIZE (INCH)	BODY STYLE	ACTU-ATOR	NORMAL POSI-TION	TEST TYPE	TEST FREQ	MAXIMUM LIMIT	TEST UNIT	RELIEF REQUEST OR COLD SHUTDOWN	TECHNICAL POSITION
XFV-4673	E-4	2	A/C	1.000	XFC	SA	SYS	AT-02	RR		PF	VR-008	
								CT-CC	RR		PF		
								PIT	Y2		PF		
	FUNCTION : EXCESS FLOW CK VLV												
XFV-4674	E-4	2	A/C	1.000	XFC	SA	SYS	AT-02	RR		PF	VR-008	
								CT-CC	RR		PF		
								PIT	Y2		PF		
	FUNCTION : EXCESS FLOW CK VLV												
XFV-4675	D-4	2	A/C	1.000	XFC	SA	SYS	AT-02	RR		PF	VR-008	
								CT-CC	RR		PF		
								PIT	Y2		PF		
	FUNCTION : EXCESS FLOW CK VLV												
XFV-4676	D-4	2	A/C	1.000	XFC	SA	SYS	AT-02	RR		PF	VR-008	
								CT-CC	RR		PF		
								PIT	Y2		PF		
	FUNCTION : EXCESS FLOW CK VLV												
XFV-4677	D-4	2	A/C	1.000	XFC	SA	SYS	AT-02	RR		PF	VR-008	
								CT-CC	RR		PF		
								PIT	Y2		PF		
	FUNCTION : EXCESS FLOW CK VLV												
XFV-4678	D-4	2	A/C	1.000	XFC	SA	SYS	AT-02	RR		PF	VR-008	
								CT-CC	RR		PF		
								PIT	Y2		PF		
	FUNCTION : EXCESS FLOW CK VLV												
XFV-4679	A-1	2	A/C	1.000	XFC	SA	SYS	AT-02	RR		PF	VR-008	
								CT-CC	RR		PF		
								PIT	Y2		PF		
	FUNCTION : EXCESS FLOW CK VLV												
XFV-4680	A-7	2	A/C	1.000	XFC	SA	SYS	AT-02	RR		PF	VR-008	
								CT-CC	RR		PF		
								PIT	Y2		PF		

APPENDIX B
VALVE LISTING

DRAWING : M-116
DRAWING TITLE : REACTOR RECIRCULATION SYSTEM

VALVE NUMBER	DWG COOR	IST CLASS	FUNCTION CATEGORY	SIZE (INCH)	BODY STYLE	ACTU-ATOR	NORMAL POSI-TION	TEST TYPE	TEST FREQ	MAXIMUM LIMIT	TEST UNIT	RELIEF REQUEST OR COLD SHUTDOWN	TECHNICAL POSITION
	FUNCTION : EXCESS FLOW CK VLV												
XFV-4681	A-3	2	A/C	1.000	XFC	SA	SYS	AT-02	RR		PF	VR-008	
								CT-CC	RR		PF		
								PIT	Y2		PF		
	FUNCTION : EXCESS FLOW CK VLV												
XFV-4682	A-3	2	A/C	1.000	XFC	SA	SYS	AT-02	RR		PF	VR-008	
								CT-CC	RR		PF		
								PIT	Y2		PF		
	FUNCTION : EXCESS FLOW CK VLV												

APPENDIX B
VALVE LISTING

DRAWING : M-117
DRAWING TITLE : CONTROL ROD DRIVE HYDRAULIC SYSTEM, SHEET 1

VALVE NUMBER	DWG COOR	IST CLASS	FUNCTION CATEGORY	SIZE (INCH)	BODY STYLE	ACTU-ATOR	NORMAL POSI-TION	TEST TYPE	TEST FREQ	MAXIMUM LIMIT	TEST UNIT	RELIEF REQUEST OR COLD SHUTDOWN	TECHNICAL POSITION
CV-1804A	A-5	NC	A	1.000	GL	AO	O	AT-01	RR	1000.000	SCCM		
								BTC	OP	5.000	SECS		
								PIT	Y2		PF		
FUNCTION : CRD MINIPURGE RECIRC PUMP A ISOLATION													
CV-1804B	A-5	NC	A	1.000	GL	AO	O	AT-01	RR	1000.000	SCCM		
								BTC	OP	5.000	SECS		
								PIT	Y2		PF		
FUNCTION : CRD MINIPURGE RECIRC PUMP B ISOLATION													
SV-1804A	A-5	NC	B	.250	3WY	SO	NE	BTD	OP		PF	VR-002	
FUNCTION : CRD MINIPURGE SOLENOID													
SV-1804B	A-5	NC	B	.250	3WY	SO	NE	BTD	OP		PF	VR-002	
FUNCTION : CRD MINIPURGE SOLENOID													
SV-1840A	F-6	NC	B	1.000	3WY	SO	ND	BTE	RR		PF	VR-013	
FUNCTION : CRD BACKUP SCRAM VALVE													
SV-1840B	F-6	NC	B	1.000	3WY	SO	ND	BTE	RR		PF	VR-013	
FUNCTION : CRD BACKUP SCRAM VALVE													
V-17-052	E-3	1	A	3.000	CK	SA	SYS	AT-01	RR	3000.000	SCCM		
FUNCTION : CRD HYD CK TO RX (CNTMNT ISOL)													
V-17-053	E-2	1	A	3.000	CK	SA	SYS	AT-01	RR	3000.000	SCCM		
FUNCTION : CRD HYD CK TO RX (CNTMNT ISOL)													
V-17-062	G-6	NC	C	1.500	CK	SA	SYS	CT-CO	RR		PF	VR-013	
FUNCTION : CRD BACK-UP SCRAM CHECK VALVE													
V-17-083	A-6	2	A/C	1.000	CK	SA	SYS	AT-01	RR	1000.000	SCCM		
								CT-CC	RR		PF	VR-012	
FUNCTION : RECIRC PP B SEAL PURGE CK VLV													
V-17-096	A-4	2	A/C	1.000	CK	SA	SYS	AT-01	RR	1000.000	SCCM		
								CT-CC	RR		PF	VR-012	
FUNCTION : RECIRC PP A SEAL PURGE CK VLV													

APPENDIX B
VALVE LISTING

DRAWING : M-118
DRAWING TITLE : CONTROL ROD DRIVE HYDRAULIC SYSTEM, SHEET 2

VALVE NUMBER	DWG COOR	IST CLASS	FUNCTION CATEGORY	SIZE (INCH)	BODY STYLE	ACTU-ATOR	NORMAL POSI-TION	TEST TYPE	TEST FREQ	MAXIMUM LIMIT	TEST UNIT	RELIEF REQUEST OR COLD SHUTDOWN	TECHNICAL POSITION
CV-1849	D-7	2	B	.750	GA	AO	C/FO	BTO	RR	7.000	SECS	VR-013	TAV-01
								FST	RR		PF	VR-017	
C11-F126	FUNCTION : CRD SCRAM ACCUM DISCH INLET TO HCU												
CV-1850	D-6	2	B	.750	GA	AO	C/FO	BTO	RR	7.000	SECS	VR-013	TAV-01
								FST	RR		PF	VR-017	
C11-F127	FUNCTION : CRD SCRAM ACCUM DISCH OUTLET FROM HCU TO SDV												
CV-1859A	G-4	NC	B	1.000	GL	AO	O/FC	BTC	OP	30.000	SECS		
								FST	OP		PF	VR-017	
								PIT	Y2		PF		
	FUNCTION : CRD SDV VENT												
CV-1859B	G-4	2	B	1.000	GL	AO	O/FC	BTC	OP	10.000	SECS		
								FST	OP		PF	VR-017	
								PIT	Y2		PF		
	FUNCTION : CRD SDV VENT												
CV-1867A	D-5	NC	B	2.000	GL	AO	O/FC	BTC	OP	30.000	SECS		
								FST	OP		PF	VR-017	
								PIT	Y2		PF		
	FUNCTION : CRD SDV DRAIN												
CV-1867B	D-5	2	B	2.000	GL	AO	O/FC	BTC	OP	10.000	SECS		
								FST	OP		PF	VR-017	
								PIT	Y2		PF		
	FUNCTION : CRD SDV DRAIN												
SV-1855	E-6	NC	B	.500	3WY	SO	NE	BTD	RR		PF	VR-013	TAV-01
C11-F118	FUNCTION : CRD SCRAM PILOT SOLENOID VALVE												
SV-1856	E-6	NC	B	.500	3WY	SO	NE	BTD	RR		PF	VR-013	TAV-01
C11-F117	FUNCTION : CRD SCRAM PILOT SOLENOID VALVE												
SV-1868A	D-4	NC	B	.500	3WY	SO	NE	BTD	RR		PF	VR-013	
	FUNCTION : CRD SCRAM DUMP SOLENOID												
V-1868B	D-4	NC	B	.500	3WY	SO	NE	BTD	RR		PF	VR-013	

APPENDIX B
VALVE LISTING

DRAWING : M-118
DRAWING TITLE : CONTROL ROD DRIVE HYDRAULIC SYSTEM, SHEET 2

VALVE NUMBER	DWG COOR	IST CLASS	FUNCTION CATEGORY	SIZE (INCH)	BODY STYLE	ACTU-ATOR	NORMAL POSI-TION	TEST TYPE	TEST FREQ	MAXIMUM LIMIT	TEST UNIT	RELIEF REQUEST OR COLD SHUTDOWN	TECHNICAL POSITION
	FUNCTION : CRD SCRAM DUMP SOLENOID												
SV-1869A	D-4	NC	B	.500	3WY	SO	NE	BTD	RR		PF	VR-013	
	FUNCTION : CRD SCRAM DUMP SOLENOID												
SV-1869B	D-4	NC	B	.500	3WY	SO	NE	BTD	RR		PF	VR-013	
	FUNCTION : CRD SCRAM DUMP SOLENOID												
V-18-0118	B-8	2	C	.500	CK	SA	SYS	CT-CC	RR		PF	VR-013	TAV-01
C11-F115	FUNCTION : CRD CHARGING LINE CHECK VALVE												
V-18-0919	E-7	2	C	.500	CK	SA	SYS	CT-CC	OP		PF	VR-013	TAV-01
11-F138	FUNCTION : CRD COOLING WATER CHECK												
V-18-1453	D-6	2	C	.750	CK	SA	SYS	CT-CC	RR		PF	VR-013	TAV-01
								CT-CO	RR		PF	VR-013	
C11-F114	FUNCTION : CRD HCU CK VLV ,SCRAM DISCH RISER												

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APPENDIX B
VALVE LISTING

DRAWING : M-119
DRAWING TITLE : RESIDUAL HEAT REMOVAL (RHR) SYSTEM, SHEET 1

VALVE NUMBER	DWG COOR	IST CLASS	FUNCTION CATEGORY	SIZE (INCH)	BODY STYLE	ACTU-ATOR	NORMAL POSI-TION	TEST TYPE	TEST FREQ	MAXIMUM LIMIT	TEST UNIT	RELIEF REQUEST OR COLD SHUTDOWN	TECHNICAL POSITION	
MO-1902	G-7	2	B	10.000	GA	MO	C/KL	BTC	OP	10.000	SECS			
								PIT	Y2		PF			
E11-F021B	FUNCTION : INBD DRYWELL SPRAY													12
MO-1903	G-6	2	B	10.000	GL	MO	C	BTC	OP	10.000	SECS			
								PIT	Y2		PF			
E11-F016B	FUNCTION : OUTBD DRYWELL SPRAY													12
MO-1904	E-6	2	B	20.000	ANG	MO	O	BTC	OP	22.000	SECS			
								BTO	OP	22.000	SECS			
								PIT	Y2		PF			
E11-F017B	FUNCTION : RHR OUTBD INJECT													
MO-1905	E-6	1	A	20.000	GA	MO	C	AT-05	RR	5.000	GPM			
								BTC	CS	22.000	SECS	CSJ-15		12
								BTO	CS	22.000	SECS	CSJ-15		
								PIT	Y2		PF			
E11-F015B	FUNCTION : RHR INBD INJECT													
MO-1908	E-8	1	A	18.000	GA	MO	C	AT-05	RR	5.000	GPM			
								BTC	CS	22.000	SECS	CSJ-11		
								PIT	Y2		PF			
E11-F109	FUNCTION : RHR SHTDN CLG INBD SUCT ISOL													12
MO-1909	E-8	1	A	18.000	GA	MO	C	AT-05	RR	5.000	GPM			
								BTC	CS	22.000	SECS	CSJ-11		
								PIT	Y2		PF			
E11-F118	FUNCTION : RHR SHTDN CLG OUTBD SUCT ISOL													12
MO-1912	C-7	2	B	14.000	GA	MO	C/KL	BTC	OP	78.000	SECS			12
								PIT	Y2		PF			
E11-F006B	FUNCTION : 1P-229B SHUTDOWN CLG SUCTION													12
MO-1913	C-7	2	B	14.000	GA	MO	O/KL	BTO	OP	78.000	SECS			
								PIT	Y2		PF			
E11-F004B	FUNCTION : 1P-229B TORUS SUCTION													12
O-1920	C-8	2	B	14.000	GA	MO	C/KL	BTC	OP	78.000	SECS			

APPENDIX B
VALVE LISTING

DRAWING : M-119
DRAWING TITLE : RESIDUAL HEAT REMOVAL (RHR) SYSTEM, SHEET 1

VALVE NUMBER	DWG COOR	IST CLASS	FUNCTION CATEGORY	SIZE (INCH)	BODY STYLE	ACTUATOR	NORMAL POSITION	TEST TYPE	TEST FREQ	MAXIMUM LIMIT	TEST UNIT	RELIEF REQUEST OR COLD SHUTDOWN	TECHNICAL POSITION	
MO-1920	C-8	2	B	14.000	GA	MO	C/KL	PIT	Y2		PF			12
E11-F006D	FUNCTION : 1P-229D SHUTDOWN CLG SUCTION													
MO-1921	C-7	2	B	14.000	GA	MO	O/KL	BTO	OP	78.000	SECS			
								PIT	Y2		PF			
E11-F004D	FUNCTION : 1P-229D TORUS SUCTION													12
MO-1932	F-5	2	B	12.000	GA	MO	C/KL	BTC	OP	83.000	SECS			
								BTO	OP	83.000	SECS			
								PIT	Y2		PF			
E11-F028B	FUNCTION : OUTBD TORUS CLG/SPRAY													12
MO-1933	F-5	2	B	4.000	GL	MO	C	BTC	OP	10.000	SECS			
								PIT	Y2		PF			
E11-F027B	FUNCTION : TORUS SPRAY													12
MO-1934	F-5	2	B	12.000	GL	MO	C	BTC	OP	37.000	SECS			
								BTO	OP	37.000	SECS			
								PIT	Y2		PF			
	FUNCTION : TORUS COOLING/TEST													12
MO-1935	C-5	2	B	3.000	GA	MO	O	BTC	OP	17.000	SECS			
								BTO	OP	17.000	SECS			
								PIT	Y2		PF			
E11-F007B	FUNCTION : RHR 1P-229B/D MIN RECIRC ISOL													12
MO-1936	D-6	NC	B	4.000	GL	MO	C	BTC	OP	6.000	SECS			
								PIT	Y2		PF			
E11-F040	FUNCTION : OUTBD RHR DRN TO RW THROTTLE ISOL													12
MO-1937	D-6	2	B	4.000	GA	MO	C	BTC	OP	19.000	SECS			
								PIT	Y2		PF			
E11-F049	FUNCTION : INBD RNR DRN TO RW ISOL													12
MO-1939	D-4	2	B	12.000	GA	MO	O/KL	BTC	OP	72.000	SECS			
								BTO	OP	72.000	SECS			
								PIT	Y2		PF			
E11-F047B	FUNCTION : RHR HX 1E201B INLET THROTTLE													12

APPENDIX B
VALVE LISTING

DRAWING : M-119
DRAWING TITLE : RESIDUAL HEAT REMOVAL (RHR) SYSTEM, SHEET 1

VALVE NUMBER	DWG COOR	IST CLASS	FUNCTION CATEGORY	SIZE (INCH)	BODY STYLE	ACTU-ATOR	NORMAL POSI-TION	TEST TYPE	TEST FREQ	MAXIMUM LIMIT	TEST UNIT	RELIEF REQUEST OR COLD SHUTDOWN	TECHNICAL POSITION
MO-1940	D-4	2	B	18.000	GL	MO	O	BTC	OP	53.000	SECS		
								BTO	OP	53.000	SECS		
								PIT	Y2		PF		
	FUNCTION : RHR HX 1E201 BYPASS												
MO-1941	D-3	2	B	12.000	GA	MO	O/KL	BTC	OP	72.000	SECS		
								BTO	OP	72.000	SECS		
								PIT	Y2		PF		
E11-F003B	FUNCTION : RHR HX 1E201B OUTLET												
MO-1949A	D-4	NC	B	1.000	GL	MO	C	PIT	Y2		PF		
E11-F103B	FUNCTION : RHR HX 1E201B VENT												
MO-1949B	C-4	2	B	1.000	GL	MO	C	PIT	Y2		PF		
E11-F104B	FUNCTION : RHR HX 1E201B VENT												
MO-1989	D-7	2	B	24.000	GA	MO	O/KL	BTO	OP	133.000	SECS		
								PIT	Y2		PF		
E11-F020B	FUNCTION : 1P-229B/D TORUS SUCTION												
PSV-1911	D-8	2	C	1.000	RV	SA	C	CT-SP	Y1O	180.250	PSIG	VR-005	
	FUNCTION : RHR SHUTDOWN CLG SUCTION RELIEF												
PSV-1952	D-4	2	C	4.000	RV	SA	C	CT-SP	Y1O	460.000	PSIG	VR-005	
	FUNCTION : RHR HX 1E201B INLET RELIEF												
PSV-1975	G-3	2	C	1.000	RV	SA	C	CT-SP	Y1O	435.000	PSIG	VR-005	
	FUNCTION : PRESS RELF HTEXCH 1E201B INLET												
SV-1972	C-3	2	B	1.000	GL	SO	C/KL	BTC	OP	2.000	SECS	VR-034	
								BTO	OP	2.000	SECS	VR-034	
								FST	OP		PF		
	FUNCTION : ISOLATION RHR SAMPLE LINE												
SV-1973	C-2	NC	B	1.000	GL	SO	C/KL	BTC	OP	2.000	SECS	VR-034	
								BTO	OP	2.000	SECS	VR-034	
								FST	OP		PF		
	FUNCTION : SOL ISOLATION RHR SAMPLE LINE												

APPENDIX B
VALVE LISTING

DRAWING : M-119
DRAWING TITLE : RESIDUAL HEAT REMOVAL (RHR) SYSTEM, SHEET 1

VALVE NUMBER	DWG COOR	IST CLASS	FUNCTION CATEGORY	SIZE (INCH)	BODY STYLE	ACTU-ATOR	NORMAL POSI-TION	TEST TYPE	TEST FREQ	MAXIMUM LIMIT	TEST UNIT	RELIEF REQUEST OR COLD SHUTDOWN	TECHNICAL POSITION
V-19-001	A-7	2	C	12.000	CK	SA	SYS	CT-CC	OP		PF		
								CT-CO	OP		PF		
	FUNCTION : 1P-229D DISCH CHECK												
V-19-003	A-5	2	C	12.000	CK	SA	SYS	CT-CC	OP		PF		
								CT-CO	OP		PF		
	FUNCTION : 1P-229B DISCH CNECK												
V-19-014	B-8	2	C	3.000	CK	SA	SYS	CT-CC	OP		PF		
								CT-CO	SA		PF	VR-051	
	FUNCTION : 1P-229D MIN RECIRC CK												
V-19-016	B-5	2	C	3.000	CK	SA	SYS	CT-CC	OP		PF		
								CT-CO	SA		PF	VR-051	
	FUNCTION : 1P-229B MIN RECIRC CK												
V-19-149	E-7	1	A/C	20.000	CK	SA	SYS	AT-05	RR	5.000	GPM		
								CT-CC	RR		PF	VR-003	
								CT-CO	RR		PF	VR-003	
								CT-PO	CS		PF	VR-003	
	FUNCTION : RHR INJ RX RECIRC CK												

APPENDIX B
VALVE LISTING

DRAWING : M-120
DRAWING TITLE : RESIDUAL HEAT REMOVAL (RHR) SYSTEM, SHEET 2

VALVE NUMBER	DWG COOR	IST CLASS	FUNCTION CATEGORY	SIZE (INCH)	BODY STYLE	ACTU-ATOR	NORMAL POSI-TION	TEST TYPE	TEST FREQ	MAXIMUM LIMIT	TEST UNIT	RELIEF REQUEST OR COLD SHUTDOWN	TECHNICAL POSITION
MO-2000	F-2	2	B	10.000	GA	MO	C/KL	BTC	OP	10.000	SECS		
								PIT	Y2		PF		
E11-F021A	FUNCTION : INBD DRYWELL SPRAY												
MO-2001	F-4	2	B	10.000	GL	MO	C	BTC	OP	10.000	SECS		
								PIT	Y2		PF		
E11-F016A	FUNCTION : OUTBD DRYWELL SPRAY												
MO-2003	E-4	1	A	20.000	GA	MO	C	AT-05	RR	5.000	GPM		
								BTC	CS	22.000	SECS	CSJ-15	
								BTO	CS	22.000	SECS	CSJ-15	
								PIT	Y2		PF		
E11-F015A	FUNCTION : RHR INBD INJECT												
MO-2004	E-4	2	B	20.000	ANG	MO	O	BTC	OP	22.000	SECS		
								BTO	OP	22.000	SECS		
								PIT	Y2		PF		
E11-F017A	FUNCTION : RHR OUTBD INJECT												
MO-2005	E-4	2	B	12.000	GA	MO	C/KL	BTC	OP	83.000	SECS		
								BTO	OP	83.000	SECS		
								PIT	Y2		PF		
E11-F028A	FUNCTION : OUTBD TORUS CLG/SPRAY												
MO-2006	E-4	2	B	4.000	GL	MO	C	BTC	OP	10.000	SECS		
								PIT	Y2		PF		
E11-F027A	FUNCTION : TORUS SPRAY												
MO-2007	E-5	2	B	12.000	GL	MO	C	BTC	OP	37.000	SECS		
								BTO	OP	37.000	SECS		
								PIT	Y2		PF		
E11-F024A	FUNCTION : TORUS COOLING/TEST												
MO-2009	C-4	2	B	3.000	GA	MO	O	BTC	OP	17.000	SECS		
								BTO	OP	17.000	SECS		
								PIT	Y2		PF		
E11-F007A	FUNCTION : RHR PP 1P-229A/C MIN RECIRC ISOL												
MO-2011	C-3	2	B	14.000	GA	MO	C/KL	BTC	OP	78.000	SECS		

APPENDIX B
VALVE LISTING

DRAWING : M-120
DRAWING TITLE : RESIDUAL HEAT REMOVAL (RHR) SYSTEM, SHEET 2

VALVE NUMBER	DWG COOR	IST CLASS	FUNCTION CATEGORY	SIZE (INCH)	BODY STYLE	ACTU-ATOR	NORMAL POSI-TION	TEST TYPE	TEST FREQ	MAXIMUM LIMIT	TEST UNIT	RELIEF REQUEST OR COLD SHUTDOWN	TECHNICAL POSITION	
MO-2011	C-3	2	B	14.000	GA	MO	C/KL	PIT	Y2		PF			
E11-F006A	FUNCTION : 1P-229A SHUTDOWN CLG SUCTION													12
MO-2012	C-3	2	B	14.000	GA	MO	O/KL	BTO	OP	78.000	SECS			
								PIT	Y2		PF			
E11-F004A	FUNCTION : 1P-229A TORUS SUCTION													12
MO-2015	C-3	2	B	14.000	GA	MO	O/KL	BTO	OP	78.000	SECS			
								PIT	Y2		PF			
E11-F004C	FUNCTION : 1P-229C TORUS SUCTION													12
MO-2016	C-2	2	B	14.000	GA	MO	C/KL	BTC	OP	78.000	SECS			
								PIT	Y2		PF			
E11-F006C	FUNCTION : 1P-229C SHUTDOWN CLG SUCTION													12
MO-2029	D-5	2	B	12.000	GA	MO	O/KL	BTC	OP	72.000	SECS			
								BTO	OP	72.000	SECS			
								PIT	Y2		PF			
E11-F047A	FUNCTION : RHR HX 1E201A INLET THROTTLE													12
MO-2030	E-5	2	B	18.000	GL	MO	O	BTC	OP	53.000	SECS			
								BTO	OP	53.000	SECS			
								PIT	Y2		PF			
	FUNCTION : RHR HX 1E201A BYPASS													12
MO-2031	E-7	2	B	12.000	GA	MO	O/KL	BTC	OP	72.000	SECS			
								BTO	OP	72.000	SECS			
								PIT	Y2		PF			
E11-F003A	FUNCTION : RHR HX E201A OUTLET													12
MO-2044A	D-6	NC	B	1.000	GL	MO	C	PIT	Y2		PF			
E11-F103A	FUNCTION : RHR HX E201A VENT													12
MO-2044B	D-6	2	B	1.000	GL	MO	C	PIT	Y2		PF			
E11-F104A	FUNCTION : RHR HX E201A VENT													12
MO-2069	D-3	2	B	24.000	GA	MO	O/KL	BTO	OP	133.000	SECS			
								PIT	Y2		PF			

APPENDIX B
VALVE LISTING

DRAWING : M-120
DRAWING TITLE : RESIDUAL HEAT REMOVAL (RHR) SYSTEM, SHEET 2

VALVE NUMBER	DWG COOR	IST CLASS	FUNCTION CATEGORY	SIZE (INCH)	BODY STYLE	ACTUATOR	NORMAL POSITION	TEST TYPE	TEST FREQ	MAXIMUM LIMIT	TEST UNIT	RELIEF REQUEST OR COLD SHUTDOWN	TECHNICAL POSITION
FUNCTION : 1P-229A/C TORUS SUCTION													
PSV-2043	D-6	2	C	4.000	RV	SA	C	CT-SP	Y10	460.000	PSIG	VR-005	
FUNCTION : RHR HX 1E201A INLET RELIEF													
PSV-2057	E-7	2	C	1.000	RV	SA	C	CT-SP	Y10	435.000	PSIG	VR-005	
FUNCTION : PRESS RELF RHR LOOP A													
SV-2051	C-7	2	B	1.000	GA	SO	C/KL	BTC	OP	2.000	SECS	VR-034	
								BTO	OP	2.000	SECS	VR-034	
								FST	OP		PF		
FUNCTION : SOL RHR 1E201A OUT TO P.A.S.S.													
SV-2052	C-8	NC	B	1.000	GA	SO	C/KL	BTC	OP	2.000	SECS	VR-034	
								BTO	OP	2.000	SECS	VR-034	
								FST	OP		PF		
FUNCTION : SOL RHR IE201A OUT TO P.A.S.S.													
V-20-001	B-3	2	C	12.000	CK	SA	SYS	CT-CC	OP		PF		
								CT-CO	OP		PF		
FUNCTION : 1P-229C DISCH CHECK													
V-20-003	B-5	2	C	12.000	CK	SA	SYS	CT-CC	OP		PF		
								CT-CO	OP		PF		
FUNCTION : 1P-229A DISCH CHECK													
V-20-006	B-4	2	C	3.000	CK	SA	SYS	CT-CC	OP		PF		
								CT-CO	SA		PF	VR-051	
FUNCTION : 1P-229A MIN RECIRC CHECK													
V-20-008	B-2	2	C	3.000	CK	SA	SYS	CT-CC	OP		PF		
								CT-CO	RR		PF	VR-051	
FUNCTION : 1P-229C MIN RECIRC CHECK													
V-20-082	E-3	1	A/C	20.000	CK	SA	SYS	AT-05	RR	5.000	GPM		
								CT-CC	RR		PF	VR-003	
								CT-CO	RR		PF	VR-003	
								CT-PO	CS		PF	VR-003	

APPENDIX B
VALVE LISTING

DRAWING : M-120
DRAWING TITLE : RESIDUAL HEAT REMOVAL (RHR) SYSTEM, SHEET 2

VALVE NUMBER	DWG COOR	IST CLASS	FUNCTION CATEGORY	SIZE (INCH)	BODY STYLE	ACTU-ATOR	NORMAL POSI-TION	TEST TYPE	TEST FREQ	MAXIMUM LIMIT	TEST UNIT	RELIEF REQUEST OR COLD SHUTDOWN	TECHNICAL POSITION
FUNCTION : RHR INJ RX RECIRC CK													

12

APPENDIX B
VALVE LISTING

DRAWING : M-121
DRAWING TITLE : CORE SPRAY SYSTEM

VALVE NUMBER	DWG COOR	IST CLASS	FUNCTION CATEGORY	SIZE (INCH)	BODY STYLE	ACTU-ATOR	NORMAL POSI-TION	TEST TYPE	TEST FREQ	MAXIMUM LIMIT	TEST UNIT	RELIEF REQUEST OR COLD SHUTDOWN	TECHNICAL POSITION
MO-2100	B-5	2	B	12.000	GA	MO	O/KL	BTO	OP	73.000	SECS		
								PIT	Y2		PF		
FUNCTION : 1P-211A OUTBD TORUS SUCTION													12
MO-2104	D-3	2	B	2.000	GA	MO	O	BTC	OP	12.000	SECS		
								BTO	OP	12.000	SECS		
								PIT	Y2		PF		
FUNCTION : 1P-211A MIN RECIRC ISOL													12
MO-2112	F-5	2	B	8.000	GL	MO	C	BTC	OP	35.000	SECS		
								PIT	Y2		PF		
FUNCTION : 1P-211A TEST LINE ISOL (TORUS)													12
MO-2115	G-5	2	A	8.000	GA	MO	O	AT-01	RR	8000.000	SCCM	VR-037	
								BTC	OP	10.000	SECS		
								BTO	OP	10.000	SECS		
								PIT	Y2		PF		
FUNCTION : 1P-211A RX OUTBD INJECT													12
MO-2117	G-6	1	A	8.000	GA	MO	C	AT-01	RR	8000.000	SCCM	VR-037	
								AT-05	RR	4.000	GPM		
								BTC	CS	10.000	SECS	CSJ-16	12
								BTO	CS	10.000	SECS	CSJ-16	
								PIT	Y2		PF		
FUNCTION : 1P-211A RX INBD INJECT													
MO-2120	C-5	2	B	12.000	GA	MO	O/KL	BTO	OP	73.000	SECS		
								PIT	Y2		PF		
FUNCTION : 1P-211B OUTBD TORUS SUCTION													12
MO-2124	D-4	2	B	2.000	GA	MO	O	BTC	OP	12.000	SECS		
								BTO	OP	12.000	SECS		
								PIT	Y2		PF		
FUNCTION : 1P-211B MIN RECIRC ISOL													12
MO-2132	F-5	2	B	8.000	GL	MO	C	BTC	OP	35.000	SECS		
								PIT	Y2		PF		
FUNCTION : CORE SPRAY FULL FLOW TEST RETURN TO SUPP POOL													

APPENDIX B
VALVE LISTING

DRAWING : M-121
DRAWING TITLE : CORE SPRAY SYSTEM

VALVE NUMBER	DWG COOR	IST CLASS	FUNCTION CATEGORY	SIZE (INCH)	BODY STYLE	ACTUATOR	NORMAL POSITION	TEST TYPE	TEST FREQ	MAXIMUM LIMIT	TEST UNIT	RELIEF REQUEST OR COLD SHUTDOWN	TECHNICAL POSITION
MO-2135	E-5	2	A	8.000	GA	MO	O	AT-01	RR	8000.000	SCCM	VR-037	
								BTC	OP	10.000	SECS		
								BTO	OP	10.000	SECS		
								PIT	Y2		PF		
	FUNCTION : CORE SPRAY INJECTION TO RX VESSEL SPARGER												
MO-2137	E-6	1	A	8.000	GA	MO	C	AT-01	RR	8000.000	SCCM	VR-037	
								AT-05	RR	4.000	GPM		
								BTC	CS	10.000	SECS	CSJ-16	
								BTO	CS	10.000	SECS	CSJ-16	
								PIT	Y2		PF		
	FUNCTION : 1P-211B RX INBD INJECT												
MO-2146	C-5	2	B	12.000	GA	MO	O/KL	BTO	OP	74.000	SECS		
								PIT	Y2		PF		
	FUNCTION : 1P-211B INBD TORUS SUCTION												
MO-2147	B-5	2	B	12.000	GA	MO	O/KL	BTO	OP	74.000	SECS		
								PIT	Y2		PF		
	FUNCTION : 1P-211A INBD TORUS SUCTION												
PSV-2102	C-3	2	C	.750	RV	SA	SYS	CT-SP	Y10	128.750	PSIG	VR-005	
	FUNCTION : 1P-211A SUCTION RELIEF												
PSV-2109	G-4	2	C	2.000	RV	SA	SYS	CT-SP	Y10	460.000	PSIG	VR-005	
	FUNCTION : 1P-211A DISCH RELIEF												
PSV-2122	C-4	2	C	.750	RV	SA	SYS	CT-SP	Y10	128.750	PSIG	VR-005	
	FUNCTION : 1P-211B SUCTION RELIEF												
PSV-2129	E-4	2	C	2.000	RV	SA	SYS	CT-SP	Y10	460.000	PSIG	VR-005	
	FUNCTION : 1P-211B DISCH RELIEF												
V-21-007	D-3	2	C	10.000	CK	SA	SYS	CT-CO	OP		PF		
	FUNCTION : 1P-211A DISCH CK												
V-21-009	D-3	2	C	2.000	CK	SA	SYS	CT-CO	SA		PF	VR-051	
								CT-PO	OP		PF		

APPENDIX B
VALVE LISTING

DRAWING : M-121
DRAWING TITLE : CORE SPRAY SYSTEM

VALVE NUMBER	DWG COOR	IST CLASS	FUNCTION CATEGORY	SIZE (INCH)	BODY STYLE	ACTU-ATOR	NORMAL POSI-TION	TEST TYPE	TEST FREQ	MAXIMUM LIMIT	TEST UNIT	RELIEF REQUEST OR COLD SHUTDOWN	TECHNICAL POSITION
	FUNCTION : 1P-211A MIN RECIRC CK												12
V-21-010	D-4	2	C	10.000	CK	SA	SYS	CT-CO	OP		PF		
	FUNCTION : 1P-211B DISCH CK												12
V-21-012	D-4	2	C	2.000	CK	SA	SYS	CT-CO	SA		PF	VR-051	
								CT-PO	OP		PF		
	FUNCTION : 1P-211B MIN RECIRC CK												12
V-21-072	F-7	1	A/C	8.000	CK	SA	SYS	AT-05	RR	4.000	GPM		
								CT-CC	RR		PF	VR-033	
								CT-CO	RR		PF	VR-033	
	FUNCTION : 1P-211A INJ TO SPARGER CK												12
V-21-073	E-7	1	A/C	8.000	CK	SA	SYS	AT-05	RR	4.000	GPM		
								CT-CC	RR		PF	VR-033	
								CT-CO	RR		PF	VR-033	
	FUNCTION : 1P-211B INJ TO SPARGER CK												12
XFV-2119	G-7	2	A/C	1.000	XFC	SA	SYS	AT-02	RR		PF	VR-008	
								CT-CC	RR		PF		
								PIT	Y2		PF		
	FUNCTION : CS EXCESS FLOW CHECK												
XFV-2139	G-7	2	A/C	1.000	XFC	SA	SYS	AT-02	RR		PF	VR-008	
								CT-CC	RR		PF		
								PIT	Y2		PF		
	FUNCTION : CS EXCESS FLOW CHECK												

APPENDIX B
VALVE LISTING

DRAWING : M-122
DRAWING TITLE : HIGH PRESSURE COOLANT SYSTEM (HPCI), STEAM SIDE

VALVE NUMBER	DWG COOR	IST CLASS	FUNCTION CATEGORY	SIZE (INCH)	BODY STYLE	ACTUATOR	NORMAL POSITION	TEST TYPE	TEST FREQ	MAXIMUM LIMIT	TEST UNIT	RELIEF REQUEST OR COLD SHUTDOWN	TECHNICAL POSITION
CV-2211	C-2	2	A	1.000	GA	AO	O/FC	AT-01	RR	1000.000	SCCM		
								BTC	OP	5.000	SECS		
								FST	OP		PF	VR-017	
								PIT	Y2		PF		
	FUNCTION : HPCI STM LINE DRN ISOL												
CV-2212	C-2	NC	A	1.000	GA	AO	O/FC	AT-01	RR	1000.000	SCCM		
								BTC	OP	5.000	SECS		
								FST	OP		PF	VR-017	
								PIT	Y2		PF		
	FUNCTION : HPCI STM LINE DRN ISOL												
EV-2235	C-5	NC	B	1.000	GA	AO	C/FC	BTC	OP	5.000	SECS		
								FST	OP		PF	VR-017	
								PIT	Y2		PF		
	FUNCTION : HPCI CLOSED RADWASTE DISCH ISOL												
HV-2201	D-3	2	B	10.000	PLG	HO	C	BTC	OP	5.000	SECS		
								BTO	OP	35.000	SECS		
								PIT	Y2		PF		
	FUNCTION : HPCI TURBINE STOP VALVE												
MO-2202	D-3	2	B	10.000	GA	MO	C	BTC	OP	20.000	SECS		
								BTO	OP	20.000	SECS		
								PIT	Y2		PF		
E41-F001	FUNCTION : HPCI TURBINE STM SUPPLY												
MO-2238	F-6	1	A	10.000	GA	MO	O	AT-01	RR	10000.000	SCCM	VR-037	
								BTC	OP	13.000	SECS		
								BTO	OP	13.000	SECS		
								PIT	Y2		PF		
E41-F002	FUNCTION : HPCI STM SPLY ISOL I												
MO-2239	F-5	1	A	10.000	GA	MO	O	AT-01	RR	10000.000	SCCM	VR-037	
								BTC	OP	13.000	SECS		
								BTO	OP	13.000	SECS		
								PIT	Y2		PF		
E41-F003	FUNCTION : HPCI STM SPLY ISOL O												

APPENDIX B
VALVE LISTING

DRAWING : M-122
DRAWING TITLE : HIGH PRESSURE COOLANT SYSTEM (HPCI), STEAM SIDE

VALVE NUMBER	DWG COOR	IST CLASS	FUNCTION CATEGORY	SIZE (INCH)	BODY STYLE	ACTU-ATOR	NORMAL POSI-TION	TEST TYPE	TEST FREQ	MAXIMUM LIMIT	TEST UNIT	RELIEF REQUEST OR COLD SHUTDOWN	TECHNICAL POSITION	
MO-2247	C-5	2	B	2.000	GL	MO	C	BTO	OP	15.000	SECS			
								PIT	Y2		PF			
E41-F059	FUNCTION : HPCI LUBE OIL/CONDENSER CLG SUPPLY													12
MO-2290A	B-8	NC	A	2.000	GA	MO	O	AT-01	RR	2000.000	SCCM			
								BTC	OP	10.000	SECS			
								BTO	OP	10.000	SECS			
								PIT	Y2		PF			
	FUNCTION : HPCI/RCIC TURB EXHAUST VAC BRKR ISOL													
MO-2290B	B-8	NC	A	2.000	GA	MO	O	AT-01	RR	2000.000	SCCM			
								BTC	OP	10.000	SECS			
								BTO	OP	10.000	SECS			
								PIT	Y2		PF			
	FUNCTION : HPCI/RCIC TURB EXHAUST VAC BRKR ISOL													
PSV-2223	C-3	2	C	1.250	RV	SA	C	CT-SP	Y10	17.000	PSIG	VR-005		12
	FUNCTION : HPCI BAROM COND RELIEF													
PSV-2228	B-5	2	C	1.000	RV	SA	C	CT-SP	Y10	113.300	PSIG	VR-005		12
	FUNCTION : LUBE OIL COOLER RELIEF													
SV-2211	C-2	NC	B	1.000	3WY	SO	NE	BTD	OP		PF	VR-002		
	FUNCTION : SOL CV-2211													12
SV-2212	C-2	NC	B	1.000	3WY	SO	NE	BTD	OP		PF	VR-002		
	FUNCTION : SOL CV-2212													12
SV-2235	B-6	NC	B	1.000	3WY	SO	NE	BTD	OP		PF	VR-002		
	FUNCTION : SOL CV-2235													12
V-22-016	B-7	2	A/C	16.000	CK	SA	SYS	AT-01	RR	16000.000	SCCM	VR-037	TAV-06	
								CT-CC	CS		PF	CSJ-07		
								CT-CO	OP		PF			
	FUNCTION : HPCI TURBINE EXHAUST CHECK													
V-22-017	B-7	2	A/C	16.000	SCK	MSA	C/LO	AT-01	RR	16000.000	SCCM	VR-037	TAV-05	12
								CT-CC	CS		PF	CSJ-08	TAV-06	

APPENDIX B
VALVE LISTING

DRAWING : M-122
DRAWING TITLE : HIGH PRESSURE COOLANT SYSTEM (HPCI), STEAM SIDE

VALVE NUMBER	DWG COOR	IST CLASS	FUNCTION CATEGORY	SIZE (INCH)	BODY STYLE	ACTU-ATOR	NORMAL POSI-TION	TEST TYPE	TEST FREQ	MAXIMUM LIMIT	TEST UNIT	RELIEF REQUEST OR COLD SHUTDOWN	TECHNICAL POSITION	
V-22-017	B-7	2	A/C	16.000	SCK	MSA	C/LO	CT-CO	OP		PF			12
	FUNCTION : HPCI TURBINE EXHAUST CHECK													
V-22-021	B-7	NC	A/C	2.000	CK	SA	SYS	AT-01	RR	2000.000	SCCM		TAV-06	12
								CT-CC	CS		PF	CSJ-09		
								CT-CO	RR		PF	VR-051		
								CT-PO	OP		PF			
	FUNCTION : HPCI DRN POT DISCH CHECK													
V-22-022	B-7	NC	A/C	2.000	SCK	MSA	C/LO	AT-01	RR	2000.000	SCCM		TAV-05	12
								CT-CC	CS		PF	CSJ-09	TAV-06	
								CT-CO	RR		PF	VR-051		
								CT-PO	OP		PF			
	FUNCTION : HPCI DRN POT DISCH CHECK													
V-22-026	B-4	2	C	1.250	CK	SA	SYS	CT-CC	SA		PF	VR-051		12
								CT-CO	SA		PF	VR-051		
								CT-PO	OP		PF	VR-051		
	FUNCTION : HPCI, CONDST PP 1P219 EXH LINE													
V-22-028	B-4	2	C	2.000	CK	SA	SYS	CT-CC	SA		PF	VR-051		12
								CT-CO	SA		PF	VR-051		
								CT-PO	OP		PF			
	FUNCTION : BAROM COND/LO CLR CHECK													
V-22-029	B-5	2	C	2.000	CK	SA	SYS	CT-CC	SA		PF	VR-051		12
								CT-CO	SA		PF	VR-051		
								CT-PO	OP		PF			
	FUNCTION : HPCI BAROM COND RETURN CHECK													
V-22-063	B-8	2	A/C	3.000	CK	SA	SYS	AT-01	RR	3000.000	SCCM			12
								CT-CC	CS		PF	CSJ-10		
								CT-CO	SA		PF	VR-051		
								CT-PO	CS		PF			
	FUNCTION : HPCI TURBINE EXHAUST VACUUM BREAKER													
V-22-064	B-8	NC	A/C	3.000	CK	SA	SYS	AT-01	RR	3000.000	SCCM			12
								CT-CC	CS		PF	CSJ-10		

APPENDIX B
VALVE LISTING

DRAWING : M-122
DRAWING TITLE : HIGH PRESSURE COOLANT SYSTEM (HPCI), STEAM SIDE

VALVE NUMBER	DWG COOR	IST CLASS	FUNCTION CATEGORY	SIZE (INCH)	BODY STYLE	ACTU-ATOR	NORMAL POSI-TION	TEST TYPE	TEST FREQ	MAXIMUM LIMIT	TEST UNIT	RELIEF REQUEST OR COLD SHUTDOWN	TECHNICAL POSITION	
V-22-064	B-8	NC	A/C	3.000	CK	SA	SYS	CT-CO	SA		PF	VR-051		12
								CT-PO	CS		PF			
FUNCTION : HPCI TURBINE EXHAUST VACUUM BREAKER														
XFV-2246A	F-6	2	A/C	1.000	XFC	SA	SYS	AT-02	RR		PF	VR-008		12
								CT-CC	RR		PF			
								PIT	Y2		PF			
FUNCTION : HPCI EXCESS FLOW CHECK														
XFV-2246B	F-6	2	A/C	1.000	XFC	SA	SYS	AT-02	RR		PF	VR-008		12
								CT-CC	RR		PF			
								PIT	Y2		PF			
FUNCTION : HPCI EXCESS FLOW CHECK														
XFV-2246C	F-6	2	A/C	1.000	XFC	SA	SYS	AT-02	RR		PF	VR-008		12
								CT-CC	RR		PF			
								PIT	Y2		PF			
FUNCTION : HPCI EXCESS FLOW CHECK														
XFV-2246D	E-6	2	A/C	1.000	XFC	SA	SYS	AT-02	RR		PF	VR-008		12
								CT-CC	RR		PF			
								PIT	Y2		PF			
FUNCTION : HPCI EXCESS FLOW CHECK														

APPENDIX B
VALVE LISTING

DRAWING : M-123
DRAWING TITLE : HIGH PRESSURE COOLANT INJECTION (HPCI), WATER SIDE

VALVE NUMBER	DWG COOR	IST CLASS	FUNCTION CATEGORY	SIZE (INCH)	BODY STYLE	ACTU-ATOR	NORMAL POSI-TION	TEST TYPE	TEST FREQ	MAXIMUM LIMIT	TEST UNIT	RELIEF REQUEST OR COLD SHUTDOWN	TECHNICAL POSITION
CV-2315	D-6	2	B	8.000	GL	AO	C/FC	BTC	OP	24.000	SECS		
								FST	Y2		PF	VR-017	
								PIT	Y2		PF		
	FUNCTION : TEST BYPASS ISO.												
MO-2300	F-3	2	B	14.000	GA	MO	O	BTC	OP	68.000	SECS		
								PIT	Y2		PF		
E41-F004	FUNCTION : HPCI PP CST SUCTION												
2311	C-6	2	B	12.000	GA	MO	O	BTO	OP	20.000	SECS		
								PIT	Y2		PF		
E41-F007	FUNCTION : HPCI PP DISCH (INBD)												
MO-2312	C-7	1	A	12.000	GA	MO	C	AT-01	RR	24000.000	SCCM	VR-037	TAV-06
								BTC	OP	30.000	SECS		
								BTO	OP	30.000	SECS		
								PIT	Y2		PF		
E41-F006	FUNCTION : HPCI PUMP DISCH												
MO-2318	C-5	2	B	4.000	GL	MO	C	BTC	OP	10.000	SECS		
								BTO	OP	10.000	SECS		
								PIT	Y2		PF		
E41-F012	FUNCTION : HPCI MINFLW TORUS												
MO-2321	A-7	2	B	14.000	GA	MO	C	BTC	OP	56.000	SECS		
								BTO	OP	56.000	SECS		
								PIT	Y2		PF		
E41-F042	FUNCTION : HPCI PMP SUCT TORUS												
MO-2322	E-4	2	B	14.000	GA	MO	C	BTC	OP	71.000	SECS		
								BTO	OP	71.000	SECS		
								PIT	Y2		PF		
E41-F041	FUNCTION : HPCI OUTBD TORUS SUCT ISOL												
2301	E-3	2	C	1.500	RV	SA	SYS	CT-SP	Y10	128.750	PSIG	VR-005	

APPENDIX B
VALVE LISTING

DRAWING : M-123
DRAWING TITLE : HIGH PRESSURE COOLANT INJECTION (HPCI), WATER SIDE

VALVE NUMBER	DWG COOR	IST CLASS	FUNCTION CATEGORY	SIZE (INCH)	BODY STYLE	ACTU-ATOR	NORMAL POSI-TION	TEST TYPE	TEST FREQ	MAXIMUM LIMIT	TEST UNIT	RELIEF REQUEST OR COLD SHUTDOWN	TECHNICAL POSITION
	FUNCTION : HPCI BSTR PMP SUCTION RELIEF												
SV-2315B	D-5	NC	B	.375	3WY	SO	ND	BTD	OP		PF		12
	FUNCTION : HPCI FFT RETURN TO CST CV SOLENOID												
SV-2315C	D-5	NC	B	.375	3WY	SO	ND	BTD	OP		PF		12
	FUNCTION : HPCI FFT RETURN TO CST CV SOLENOID												
V-23-001	A-6	2	C	14.000	CK	SA	SYS	CT-CC	RR		PF	VR-021	
								CT-CO	RR		PF	VR-021	
	FUNCTION : HPCI TORUS SUCT LINE CHECK												12
V-23-014	C-4	2	C	4.000	CK	SA	SYS	CT-CO	SA		PF	VR-051	
	FUNCTION : HPCI MIN FLOW RECIRC LINE CHECK												
V-23-049	C-7	1	C	12.000	CK	SA	SYS	CTOME	CS	164.000	FTLB	CSJ-12	12
	FUNCTION : HPCI INJECTION TO FEEDWATER CHECK												

APPENDIX B
VALVE LISTING

DRAWING : M-124
DRAWING TITLE : REACTOR CORE ISOLATION COOLING (RCIC), STEAM SIDE

VALVE NUMBER	DWG COOR	IST CLASS	FUNCTION CATEGORY	SIZE (INCH)	BODY STYLE	ACTUATOR	NORMAL POSITION	TEST TYPE	TEST FREQ	MAXIMUM LIMIT	TEST UNIT	RELIEF REQUEST OR COLD SHUTDOWN	TECHNICAL POSITION
CV-2410	C-3	NC	A	1.000	GA	AO	O/FC	AT-01	OP	1000.000	SCCM		
								BTC	OP	5.000	SECS		
								FST	OP		PF	VR-017	
								PIT	Y2		PF		
E51-F025	FUNCTION : RCIC STM LINE DRN ISOL												
CV-2411	C-3	NC	A	1.000	GA	AO	O/FC	AT-01	RR	1000.000	SCCM		
								BTC	OP	5.000	SECS		
								FST	OP		PF	VR-017	
								PIT	Y2		PF		
E41-F026	FUNCTION : RCIC STM LINE DRN ISOL												
CV-2435	B-5	NC	B	1.000	GA	AO	C/FC	BTC	OP	5.000	SECS		
								FST	OP		PF	VR-017	
								PIT	Y2		PF		
	FUNCTION : RCIC CLOSED RADWASTE DISCH ISOL												
MO-2400	F-6	1	A	4.000	GA	MO	O	AT-01	RR	4000.000	SCCM		
								BTC	OP	20.000	SECS		
								BTO	OP	20.000	SECS		
								PIT	Y2		PF		
E51-F007	FUNCTION : RCIC INBD STM LINE ISOL												
MO-2401	F-5	1	A	4.000	GA	MO	O	AT-01	RR	4000.000	SCCM		
								BTC	OP	20.000	SECS		
								BTO	OP	20.000	SECS		
								PIT	Y2		PF		
E51-F045	FUNCTION : RCIC OUTBD STM LINE ISOL												
MO-2404	E-3	NC	B	4.000	GL	NO	C	BTC	OP	15.000	SECS		
								BTO	OP	15.000	SECS		
								PIT	Y2		PF		
E51-F045	FUNCTION : RCIC TURBINE STEAM SUPPLY												
MO-2405	E-3	NC	B	3.000	GA	MO	C	BTC	OP	15.000	SECS		
								BTO	OP	15.000	SECS		
								PIT	Y2		PF		
	FUNCTION : RCIC TRIP THROTTLE VLV												

APPENDIX B
VALVE LISTING

DRAWING : M-124
DRAWING TITLE : REACTOR CORE ISOLATION COOLING (RCIC), STEAM SIDE

VALVE NUMBER	DWG COOR	IST CLASS	FUNCTION CATEGORY	SIZE (INCH)	BODY STYLE	ACTU-ATOR	NORMAL POSI-TION	TEST TYPE	TEST FREQ	MAXIMUM LIMIT	TEST UNIT	RELIEF REQUEST OR COLD SHUTDOWN	TECHNICAL POSITION
MO-2426	C-5	NC	B	2.000	GL	MO	C	BTC	OP	15.000	SECS		
								BTO	OP	15.000	SECS		
								PIT	Y2		PF		
E51-F046	FUNCTION : RCIC LUBE OIL COOLER SUPPLY												
PSV-2430	C-6	NC	C	2.000	RV	SA	C	CT-SP	Y10	85.490	PSIG	VR-005	
	FUNCTION : RCIC LUBE OIL CLR RELIEF												
PSV-2474	C-3	NC	C	1.250	RV	SA	C	CT-SP	Y10	17.000	PSIG	VR-005	
	FUNCTION : RCIC BAROM CONDENSER RELIEF												
SV-2410	C-3	NC	B	.250	3WY	SO	NE	BTD	OP		PF	VR-002	
	FUNCTION : SOL FOR CV-2410												
SV-2411	C-3	NC	B	.250	3WY	SO	NE	BTD	OP		PF	VR-002	
	FUNCTION : SOL FOR CV-2411												
SV-2435	B-5	NC	B	.250	3WY	SO	ND	BTD	OP		PF	VR-002	
	FUNCTION : SOL CV-2435												
V-24-008	C-7	NC	A/C	10.000	SCK	MSA	C/LO	AT-01	RR	10000.000	SCCM	VR-037	TAV-05
								CT-CC	CS		PF	CSJ-08	TAV-06
								CT-CO	OP		PF		
	FUNCTION : RCIC TURBINE EXHAUST CHECK												
V-24-010	C-4	NC	C	1.250	CK	SA	SYS	CT-CC	SA		PF	VR-051	
								CT-CO	SA		PF	VR-051	
								CT-PO	OP		PF		
	FUNCTION : RCIC 1P228 DISCH CHECK												
V-24-012	C-5	NC	C	2.000	CK	SA	SYS	CT-CC	SA		PF	VR-051	
								CT-CO	SA		PF	VR-051	
								CT-PO	OP		PF		
	FUNCTION : RCIC BAROM COND RTN CHECK												
V-24-023	D-7	NC	A/C	10.000	CK	SA	SYS	AT-01	RR	10000.000	SCCM	VR-037	TAV-06
								CT-CC	CS		PF	CSJ-07	
								CT-CO	OP		PF		

APPENDIX B
VALVE LISTING

DRAWING : M-124
DRAWING TITLE : REACTOR CORE ISOLATION COOLING (RCIC), STEAM SIDE

VALVE NUMBER	DWG COOR	IST CLASS	FUNCTION CATEGORY	SIZE (INCH)	BODY STYLE	ACTU-ATOR	NORMAL POSI-TION	TEST TYPE	TEST FREQ	MAXIMUM LIMIT	TEST UNIT	RELIEF REQUEST OR COLD SHUTDOWN	TECHNICAL POSITION	
	FUNCTION : RCIC TURBINE EXHAUST CHECK													
V-24-046	C-7	NC	A/C	3.000	CK	SA	SYS	AT-01	RR	3000.000	SCCM			12
								CT-CC	CS		PF	CSJ-10		
								CT-CO	SA		PF	VR-051		
								CT-PO	CS		PF			
	FUNCTION : RCIC TURBINE EXHAUST VACUUM BREAKER													
V-24-047	C-7	NC	A/C	3.000	CK	SA	SYS	AT-01	RR	3000.000	SCCM			12
								CT-CC	CS		PF	CSJ-10		
								CT-CO	SA		PF	VR-051		
								CT-PO	CS		PF			
	FUNCTION : RCIC TURBINE EXHAUST VACUUM BREAKER													12
XFV-2443A	E-6	2	A/C	1.000	XFC	SA	SYS	AT-02	RR		PF	VR-008		
								CT-CC	RR		PF			
								PIT	Y2		PF			
	FUNCTION : RCIC EXCESS FLOW CHECK													12
XFV-2443B	E-6	2	A/C	1.000	XFC	SA	SYS	AT-02	RR		PF	VR-008		
								CT-CC	RR		PF			
								PIT	Y2		PF			
	FUNCTION : RCIC EXCESS FLOW CHECK													12
XFV-2443C	E-6	2	A/C	1.000	XFC	SA	SYS	AT-02	RR		PF	VR-008		
								CT-CC	RR		PF			
								PIT	Y2		PF			
	FUNCTION : RCIC EXCESS FLOW CHECK													12
XFV-2443D	E-6	2	A/C	1.000	XFC	SA	SYS	AT-02	RR		PF	VR-008		
								CT-CC	RR		PF			
								PIT	Y2		PF			
	FUNCTION : RCIC EXCESS FLOW CHECK													12

APPENDIX B
VALVE LISTING

DRAWING : M-125
DRAWING TITLE : REACTOR CORE ISOLATION COOLING (RCIC), WATER SIDE

VALVE NUMBER	DWG COOR	IST CLASS	FUNCTION CATEGORY	SIZE (INCH)	BODY STYLE	ACTU-ATOR	NORMAL POSI-TION	TEST TYPE	TEST FREQ	MAXIMUM LIMIT	TEST UNIT	RELIEF REQUEST OR COLD SHUTDOWN	TECHNICAL POSITION
MO-2500	F-4	NC	B	6.000	GA	MO	O	BTC	OP	41.000	SECS		
								PIT	Y2		PF		
E51-F010	FUNCTION : RCIC PP CST SUCTION												
MO-2510	C-4	NC	B	2.000	GL	MO	C	BTC	OP	5.000	SECS		
								BTO	OP	5.000	SECS		
								PIT	Y2		PF		
E51-F019	FUNCTION : RCIC MIN RECIRC ISOL (TORUS)												
MO-2511	D-5	NC	B	4.000	GA	MO	O	BTO	OP	15.000	SECS		
								PIT	Y2		PF		
E51-F012	FUNCTION : RCIC PP DISCH (INBD)												
MO-2512	D-6	1	A	4.000	GA	MO	C	AT-01	RR	24000.000	SCCM		TAV-06
								BTC	OP	15.000	SECS		
								BTO	OP	15.000	SECS		
								PIT	Y2		PF		
E51-F013	FUNCTION : RCIC PP DISCH (OUTBD)												
MO-2515	E-5	NC	B	4.000	GL	MO	C	BTC	OP	24.000	SECS		
								PIT	Y2		PF		
E51-F019	FUNCTION : RCIC TEST LINE ISOL (CST)												
MO-2516	A-5	NC	B	6.000	GA	MO	C	BTC	OP	34.000	SECS		
								BTO	OP	34.000	SECS		
								PIT	Y2		PF		
E51-F031	FUNCTION : RCIC INBD TORUS SUCTION												
MO-2517	F-4	NC	B	6.000	GA	MO	C	BTC	OP	41.000	SECS		
								BTO	OP	41.000	SECS		
								PIT	Y2		PF		
E51-F029	FUNCTION : RCIC OUTBD TORUS SUCTION												
PSV-2501	E-4	NC	C	1.000	RV	SA	C	CT-SP	Y1O	128.750	PSIG	VR-005	
	FUNCTION : RCIC SUCTION LINE RELIEF												
V-25-001	A-5	NC	C	6.000	CK	SA	SYS	CT-CC	RR		PF	VR-021	
								CT-CO	RR		PF	VR-021	

APPENDIX B
VALVE LISTING

DRAWING : M-125
DRAWING TITLE : REACTOR CORE ISOLATION COOLING (RCIC), WATER SIDE

VALVE NUMBER	DWG COOR	IST CLASS	FUNCTION CATEGORY	SIZE (INCH)	BODY STYLE	ACTU-ATOR	NORMAL POSI-TION	TEST TYPE	TEST FREQ	MAXIMUM LIMIT	TEST UNIT	RELIEF REQUEST OR COLD SHUTDOWN	TECHNICAL POSITION	
	FUNCTION : RCIC TORUS SUCT LINE CHECK													12
V-25-006	C-4	NC	C	2.000	CK	SA	SYS	CT-CO	SA		PF	VR-051		
	FUNCTION : RCIC MIN RECIRC LINE CHECK													12
V-25-036 E51-F014	D-6	1	C	4.000	CK	SAT	SYS	CTOME	CS	170.000	INLB	CSJ-13		12
	FUNCTION : RCIC INJECTION TO FEEDWATER CHECK													

APPENDIX B
VALVE LISTING

DRAWING : M-126
DRAWING TITLE : STAND-BY LIQUID CONTROL (SBLC) SYSTEM

VALVE NUMBER	DWG COOR	IST CLASS	FUNCTION CATEGORY	SIZE (INCH)	BODY STYLE	ACTU-ATOR	NORMAL POSI-TION	TEST TYPE	TEST FREQ	MAXIMUM LIMIT	TEST UNIT	RELIEF REQUEST OR COLD SHUTDOWN	TECHNICAL POSITION	
PSV-2607	E-5	NC	C	1.000	RV	SA	SYS	CT-SP	Y10	1400.000	PSIG	VR-005		12
	FUNCTION : SBLC PP 1P-230A DISCH RELIEF													
PSV-2609	B-5	NC	C	1.000	RV	SA	SYS	CT-SP	Y10	1400.000	PSIG	VR-005		12
	FUNCTION : SBLC PP 1P-230B DISCH RELIEF													
V-26-004	C-5	NC	C	1.500	CK	SA	SYS	CT-CO	OP		PF			12
	FUNCTION : SBLC PP 1P-230A DISCH CK													
V-26-006	C-5	NC	C	1.500	CK	SA	SYS	CT-CO	OP		PF			12
	FUNCTION : SBLC PP 1P-230B DISCH CK													
V-26-008	F-7	1	A/C	1.500	CK	SA	SYS	AT-01	RR	2250.000	SCCM			12
								CT-CC	RR		PF	VR-020		
								CT-CO	RR		PF	VR-020		
	FUNCTION : SBLC INJECTION CK													
V-26-009	D-8	1	A/C	1.500	CK	SA	SYS	AT-01	RR	2250.000	SCCM	VR-037		12
								CT-CC	RR		PF	VR-020		
								CT-CO	RR		PF	VR-020		
	FUNCTION : SBLC INJECTION CK													12
XS-2618A	F-6	NC	D	1.500	GA	EXP	C/KL	DT-E	SA		PF			
	FUNCTION : SBLC EXPLOSIVE VLV													12
XS-2618B	E-6	NC	D	1.500	GA	EXP	C/KL	DT-E	SA		PF			12
	FUNCTION : SBLC EXPLOSIVE VLV													

APPENDIX B
VALVE LISTING

DRAWING : M-127
DRAWING TITLE : REACTOR WATER CLEAN-UP (RWCU) SYSTEM

VALVE NUMBER	DWG COOR	IST CLASS	FUNCTION CATEGORY	SIZE (INCH)	BODY STYLE	ACTU-ATOR	NORMAL POSI-TION	TEST TYPE	TEST FREQ	MAXIMUM LIMIT	TEST UNIT	RELIEF REQUEST OR COLD SHUTDOWN	TECHNICAL POSITION
MO-2700	E-8	1	A	4.000	GA	MO	O	AT-01	RR	4000.000	SCCM		
								BTC	OP	20.000	SECS		
								PIT	Y2		PF		
G31-F001	FUNCTION : INBD CLEANUP SUCT ISOL												
MO-2701	E-7	1	A	4.000	GA	MO	O	AT-01	RR	4000.000	SCCM		
								BTC	OP	20.000	SECS		
								PIT	Y2		PF		
G31-F004	FUNCTION : OUTBD CLEANUP SUCT ISOL												
MO-2740	E-4	1	A	4.000	GL	MO	O	AT-01	RR	24000.000	SCCM		TAV-06
								BTC	OP	10.000	SECS		
								PIT	Y2		PF		
G31-F042	FUNCTION : CLEANUP OUTBD RTN ISOL												

APPENDIX B
VALVE LISTING

DRAWING : M-129
DRAWING TITLE : RIVER WATER SUPPLY - INTAKE

VALVE NUMBER	DWG COOR	IST CLASS	FUNCTION CATEGORY	SIZE (INCH)	BODY STYLE	ACTU-ATOR	NORMAL POSI-TION	TEST TYPE	TEST FREQ	MAXIMUM LIMIT	TEST UNIT	RELIEF REQUEST OR COLD SHUTDOWN	TECHNICAL POSITION
AV-2909A	D-7	NC	C	3.000	AV	SA	SYS	CT-CC	OP		PF		
	FUNCTION : AUTO VENT 1P-117A												
AV-2909B	D-6	NC	C	3.000	AV	SA	SYS	CT-CC	OP		PF		
	FUNCTION : AUTO VENT 1P-117B												
AV-2909C	D-5	NC	C	3.000	AV	SA	SYS	CT-CC	OP		PF		
	FUNCTION : AUTO VENT 1P-117C												
AV-2909D	D-4	NC	C	3.000	AV	SA	SYS	CT-CC	OP		PF		
	FUNCTION : AUTO VENT 1P-117D												
V-2909E	G-5	NC	C	3.000	AV	SA	SYS	CT-CC	OP		PF		
	FUNCTION : 1P-117A/C DISCH HDR VAC/AIR RELIEF												12
AV-2909F	F-5	NC	C	3.000	AV	SA	SYS	CT-CC	OP		PF		
	FUNCTION : 1P-117B/D DISCH HDR AIR/VAC RELIEF												12
V-29-001	D-6	3	C	18.000	CK	SA	SYS	CT-CC	OP		PF		
								CT-CO	OP		PF		
	FUNCTION : 1P-117A DISCH CK												12
V-29-003	D-5	3	C	18.000	CK	SA	SYS	CT-CC	OP		PF		
								CT-CO	OP		PF		
	FUNCTION : 1P-117C DISCH CK												12
V-29-005	D-5	3	C	18.000	CK	SA	SYS	CT-CC	OP		PF		
								CT-CO	OP		PF		
	FUNCTION : 1P-117B DISCH CK												12
V-29-007	D-4	3	C	18.000	CK	SA	SYS	CT-CC	OP		PF		
								CT-CO	OP		PF		
	FUNCTION : 1P-117D DISCH CK												12

APPENDIX B
VALVE LISTING

DRAWING : M-130-1
DRAWING TITLE : COMPRESSED AIR

VALVE NUMBER	DWG COOR	IST CLASS	FUNCTION CATEGORY	SIZE (INCH)	BODY STYLE	ACTU-ATOR	NORMAL POSI-TION	TEST TYPE	TEST FREQ	MAXIMUM LIMIT	TEST UNIT	RELIEF REQUEST OR COLD SHUTDOWN	TECHNICAL POSITION
V-30-287	C-4	NC	A	1.000	GA	M	C/LC	AT-01	RR	1000.000	SCCM		
	FUNCTION : SERV AIR, AIR BREATHING TO DW												

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APPENDIX B
VALVE LISTING

DRAWING : M-132
DRAWING TITLE : DIESEL GENERATOR SYSTEMS

VALVE NUMBER	DWG COOR	IST CLASS	FUNCTION CATEGORY	SIZE (INCH)	BODY STYLE	ACTU-ATOR	NORMAL POSI-TION	TEST TYPE	TEST FREQ	MAXIMUM LIMIT	TEST UNIT	RELIEF REQUEST OR COLD SHUTDOWN	TECHNICAL POSITION	
PSV-3221A	F-7	NC	C	.500	RV	SA	C	CT-SP	Y10	257.500	PSIG	VR-005		12
FUNCTION : AIR RCVR 1T-115A RELIEF														
PSV-3221B	C-7	NC	C	.500	RV	SA	C	CT-SP	Y10	257.500	PSIG	VR-005		12
FUNCTION : AIR RCVR 1T-115B RELIEF														
PSV-3222A	F-7	NC	C	.500	RV	SA	C	CT-SP	Y10	257.500	PSIG	VR-005		12
FUNCTION : AIR RCVR 1T-116A RELIEF														
PSV-3222B	C-7	NC	C	.500	RV	SA	C	CT-SP	Y10	257.500	PSIG	VR-005		12
FUNCTION : AIR RCVR 1T-116B RELIEF														
PSV-3223A	F-7	NC	C	.500	RV	SA	C	CT-SP	Y10	257.500	PSIG	VR-005		12
FUNCTION : AIR RCVR 1T-117A RELIEF														
PSV-3223B	C-7	NC	C	.500	RV	SA	C	CT-SP	Y10	257.500	PSIG	VR-005		12
FUNCTION : AIR RCVR 1T-117B RELIEF														
SV-3261A	F-6	NC	B	1.500	2WY	SO	C	ET-C	OP		PF	VR-007		
								ET-O	OP		PF	VR-007		
FUNCTION : DIESEL START SOLENOID														
SV-3261B	F-6	NC	B	1.500	2WY	SO	C	ET-C	OP		PF	VR-007		
								ET-O	OP		PF	VR-007		
FUNCTION : DIESEL START SOLENOID														
SV-3262A	C-6	NC	B	1.500	2WY	SO	C	ET-C	OP		PF	VR-007		
								ET-O	OP		PF	VR-007		
FUNCTION : DIESEL START SOLENOID														
SV-3262B	C-6	NC	B	1.500	2WY	SO	C	ET-C	OP		PF	VR-007		
								ET-O	OP		PF	VR-007		
FUNCTION : DIESEL START SOLENOID														
V-32-005	B-3	NC	C	1.500	CK	SA	SYS	CT-CO	OP		PF			
FUNCTION : 1P-044B DISCH CK														12
-32-010	B-2	NC	C	1.500	CK	SA	SYS	CT-CO	OP		PF			

APPENDIX B
VALVE LISTING

DRAWING : M-132
DRAWING TITLE : DIESEL GENERATOR SYSTEMS

VALVE NUMBER	DWG COOR	IST CLASS	FUNCTION CATEGORY	SIZE (INCH)	BODY STYLE	ACTU-ATOR	NORMAL POSI-TION	TEST TYPE	TEST FREQ	MAXIMUM LIMIT	TEST UNIT	RELIEF REQUEST OR COLD SHUTDOWN	TECHNICAL POSITION
	FUNCTION : 1P-044A DISCH CK												12
V-32-019	C-4	NC	C	1.500	CK	SA	SYS	CT-CC	OP		PF		
								CT-CO	OP		PF		
	FUNCTION : EDG FUEL PP SUCT CK (1T-37A)												12
V-32-021	F-4	NC	C	1.500	CK	SA	SYS	CT-CC	OP		PF		
								CT-CO	OP		PF		
	FUNCTION : EDG FUEL PP SUCT CK (1T-37B)												12
V-32-032	G-7	NC	A/C	.750	CK	SA	SYS	AT-06	OP	10.000	PSIG		
								CT-CC	OP		PF		
	FUNCTION : EDG AIR START COMPRSSR DISCH CK												12
V-32-034	D-7	NC	A/C	.750	CK	SA	SYS	AT-06	OP	10.000	PSIG		
								CT-CC	OP		PF		
	FUNCTION : EDG AIR START COMPRSSR DISCH CK												12
V-32-036	E-7	NC	A/C	.750	CK	SA	SYS	AT-06	OP	10.000	PSIG		
								CT-CC	OP		PF		
	FUNCTION : AIR RCVR 1T-115A INLET CK												12
V-32-039	E-7	NC	A/C	.750	CK	SA	SYS	AT-06	OP	10.000	PSIG		
								CT-CC	OP		PF		
	FUNCTION : AIR RCVR 1T-116A INLET CK												12
V-32-043	F-7	NC	C	2.000	CK	SA	SYS	CT-CO	OP		PF		
	FUNCTION : AIR RCVR 1T-115A OUTLET CK												12
V-32-045	F-7	NC	C	2.000	CK	SA	SYS	CT-CO	OP		PF		
	FUNCTION : AIR RCVR 1T-116A OUTLET CK												12
V-32-047	B-7	NC	A/C	.750	CK	SA	SYS	AT-06	OP	10.000	PSIG		
								CT-CC	OP		PF		
	FUNCTION : AIR RCVR 1T-115B INLET CK												12
V-32-048	B-7	NC	A/C	.750	CK	SA	SYS	AT-06	OP	10.000	PSIG		
								CT-CC	OP		PF		

APPENDIX B
VALVE LISTING

DRAWING : M-132
DRAWING TITLE : DIESEL GENERATOR SYSTEMS

VALVE NUMBER	DWG COOR	IST CLASS	FUNCTION CATEGORY	SIZE (INCH)	BODY STYLE	ACTU-ATOR	NORMAL POSI-TION	TEST TYPE	TEST FREQ	MAXIMUM LIMIT	TEST UNIT	RELIEF REQUEST OR COLD SHUTDOWN	TECHNICAL POSITION	
	FUNCTION : AIR RCVR 1T-116B INLET CK													12
V-32-052	C-7	NC	C	2.000	CK	SA	SYS	CT-CO	OP		PF			
	FUNCTION : AIR RCVR 1T-115B OUTLET CK													12
V-32-054	C-7	NC	C	2.000	CK	SA	SYS	CT-CO	OP		PF			
	FUNCTION : AIR RCVR 1T-116B OUTLET CK													12

APPENDIX B
VALVE LISTING

DRAWING : M-137
DRAWING TITLE : RADWASTE SUMP SYSTEM

VALVE NUMBER	DWG COOR	IST CLASS	FUNCTION CATEGORY	SIZE (INCH)	BODY STYLE	ACTU-ATOR	NORMAL POSI-TION	TEST TYPE	TEST FREQ	MAXIMUM LIMIT	TEST UNIT	RELIEF REQUEST OR COLD SHUTDOWN	TECHNICAL POSITION
CV-3704	F-7	NC	A	3.000	GA	AO	O/FC	AT-01	RR	3000.000	SCCM		
								BTC	OP	4.000	SECS		
								FST	OP		PF	VR-017	
								PIT	Y2		PF		
G11-F003	FUNCTION : DRWL FLOOR DRN ISOL.												
CV-3705	F-7	NC	A	3.000	GA	AO	O/FC	AT-01	RR	3000.000	SCCM		
								BTC	OP	4.000	SECS		
								FST	OP		PF	VR-017	
								PIT	Y2		PF		
G11-F004	FUNCTION : DRWL FLOOR DRN ISOL.												
CV-3728	D-6	NC	A	3.000	GA	AO	O/FC	AT-01	RR	3000.000	SCCM		
								BTC	OP	2.000	SECS	VR-034	
								FST	OP		PF	VR-017	
								PIT	Y2		PF		
G11-F019	FUNCTION : DRWL EQUIP DRN ISOL.												
CV-3729	D-6	NC	A	3.000	GA	AO	O/FC	AT-01	RR	3000.000	SCCM		
								BTC	OP	2.000	SECS	VR-034	
								FST	OP		PF	VR-017	
								PIT	Y2		PF		
G11-F020	FUNCTION : DRWL EQUIP DRN ISOL.												
SV-3704	E-7	NC	B	1.000	3WY	SO	NE	BTD	OP		PF	VR-002	
	FUNCTION : SOL CV-3704												
SV-3705	E-7	NC	B	1.000	3WY	SO	NE	BTD	OP		PF	VR-002	
	FUNCTION : SOL CV-3705												
SV-3728	C-6	NC	B	1.000	3WY	SO	NE	BTD	OP		PF	VR-002	
	FUNCTION : SOL CV-3728												
SV-3729	C-6	NC	B	1.000	3WY	SO	NE	BTD	OP		PF	VR-002	
	FUNCTION : SOL CV-3729												

APPENDIX B
VALVE LISTING

DRAWING : M-143
DRAWING TITLE : CONTAINMENT ATMOSPHERE CONTROL SYSTEM

VALVE NUMBER	DWG COOR	IST CLASS	FUNCTION CATEGORY	SIZE (INCH)	BODY STYLE	ACTU-ATOR	NORMAL POSI-TION	TEST TYPE	TEST FREQ	MAXIMUM LIMIT	TEST UNIT	RELIEF REQUEST OR COLD SHUTDOWN	TECHNICAL POSITION	
CV-4300	C-7	NC	A	18.000	BTF	AO	C/FC	AT-01	RR	15000.000	SCCM	VR-037	TAV-05	
								AT-07	OP	10.000	PSIG		TAV-06	12
								BTC	OP	5.000	SECS		TAV-08	
								FST	OP		PF	VR-017		
								PIT	Y2		PF			
	FUNCTION : INBD TORUS VENT ISOL													12
CV-4301	C-8	NC	A	18.000	BTF	AO	C/FC	AT-01	RR	15000.000	SCCM	VR-037	TAV-06	
								AT-07	OP	10.000	PSIG			12
								BTC	OP	5.000	SECS		TAV-08	
								FST	OP		PF	VR-017		
								PIT	Y2		PF			
	FUNCTION : OUTBD TORUS VENT ISOL													12
CV-4302	D-7	NC	A	18.000	BTF	AO	C/FC	AT-01	RR	15000.000	SCCM	VR-037	TAV-05	
								AT-07	OP	25.000	PSIG		TAV-06	12
								BTC	OP	5.000	SECS		TAV-08	
								FST	OP		PF	VR-017		
								PIT	Y2		PF			
	FUNCTION : INBD DRYWELL VENT ISOL													12
CV-4303	D-7	NC	A	18.000	BTF	AO	C/FC	AT-01	RR	15000.000	SCCM	VR-037	TAV-06	
								AT-07	OP	25.000	PSIG			12
								BTC	OP	5.000	SECS		TAV-08	
								FST	OP		PF	VR-017		
								PIT	Y2		PF			
	FUNCTION : INBD DRYWELL VENT ISOL													12
CV-4304	B-7	NC	A	20.000	BTF	AO	C/FO	AT-01	RR	7500.000	SCCM	VR-037	TAV-05	
								BTC	OP	5.000	SECS		TAV-06	
								BTO	OP	5.000	SECS			
								FST	OP		PF	VR-017		
								PIT	Y2		PF			
	FUNCTION : EXTERNAL VACUUM BKR ISOL													12
CV-4305	B-7	NC	A	20.000	BTF	AO	C/FO	AT-01	RR	7500.000	SCCM	VR-037	TAV-05	
								BTC	OP	5.000	SECS		TAV-06	
								BTO	OP	5.000	SECS			

APPENDIX B
VALVE LISTING

DRAWING : M-143
DRAWING TITLE : CONTAINMENT ATMOSPHERE CONTROL SYSTEM

VALVE NUMBER	DWG COOR	IST CLASS	FUNCTION CATEGORY	SIZE (INCH)	BODY STYLE	ACTU-ATOR	NORMAL POSI-TION	TEST TYPE	TEST FREQ	MAXIMUM LIMIT	TEST UNIT	RELIEF REQUEST OR COLD SHUTDOWN	TECHNICAL POSITION	
CV-4305	B-7	NC	A	20.000	BTF	AO	C/FO	FST	OP		PF	VR-017		
								PIT	Y2		PF			
FUNCTION : EXTERNAL VACUUM BKR ISOL														12
CV-4306	C-1	NC	A	18.000	BTF	AO	C/FC	AT-01	RR	15000.000	SCCM	VR-037	TAV-06	
								AT-07	OP	7.000	PSIG			12
								BTC	OP	5.000	SECS		TAV-08	
								FST	OP		PF	VR-017		
								PIT	Y2		PF			
FUNCTION : OUTBD CNTNMT PURGE SUPPLY ISOL														12
CV-4307	C-3	NC	A	18.000	BTF	AO	C/FC	AT-01	RR	15000.000	SCCM	VR-037	TAV-05	
								AT-07	OP	7.000	PSIG		TAV-06	12
								BTC	OP	5.000	SECS		TAV-08	
								FST	OP		PF	VR-017		
								PIT	Y2		PF			
FUNCTION : INBD DRYWELL PURGE INLET ISOL														12
CV-4308	B-3	NC	A	18.000	BTF	AO	C/FC	AT-01	RR	15000.000	SCCM	VR-037	TAV-05	
								AT-07	OP	7.000	PSIG		TAV-06	12
								BTC	OP	5.000	SECS		TAV-08	
								FST	OP		PF	VR-017		
								PIT	Y2		PF			
FUNCTION : INBD TORUS PURGE INLET ISOL														12
CV-4309	C-7	NC	A	2.000	GA	AO	C/FC	AT-01	RR	15000.000	SCCM			
								BTC	OP	2.000	SECS	VR-034		12
								FST	OP		PF	VR-017		
								PIT	Y2		PF			
FUNCTION : INBD TORUS VENT BYPASS ISOL														12
CV-4310	C-7	NC	A	2.000	GA	AO	C/FC	AT-01	RR	15000.000	SCCM			
								BTC	OP	5.000	SECS			
								FST	OP		PF	VR-017		
								PIT	Y2		PF			
FUNCTION : INBD DRYWELL VENT BYPASS ISOL														12
CV-4311	D-3	NC	A	6.000	GA	AO	C/FC	AT-01	RR	15000.000	SCCM	VR-037		

APPENDIX B
VALVE LISTING

DRAWING : M-143
DRAWING TITLE : CONTAINMENT ATMOSPHERE CONTROL SYSTEM

VALVE NUMBER	DWG COOR	IST CLASS	FUNCTION CATEGORY	SIZE (INCH)	BODY STYLE	ACTU-ATOR	NORMAL POSI-TION	TEST TYPE	TEST FREQ	MAXIMUM LIMIT	TEST UNIT	RELIEF REQUEST OR COLD SHUTDOWN	TECHNICAL POSITION
CV-4311	D-3	NC	A	6.000	GA	AO	C/FC	BTC	OP	5.000	SECS		
								FST	OP		PF	VR-017	
								PIT	Y2		PF		
FUNCTION : CNTNMT N2 MAKE-UP SUPPLY ISOL													12
CV-4312	C-3	NC	A	6.000	GA	AO	C/FC	AT-01	RR	15000.000	SCCM	VR-037	
								BTC	OP	5.000	SECS		
								FST	OP		PF	VR-017	
								PIT	Y2		PF		
FUNCTION : DRYWELL N2 MAKE-UP INLET ISOL													12
CV-4313	C-3	NC	A	6.000	GA	AO	C/FC	AT-01	RR	15000.000	SCCM	VR-037	
								BTC	OP	5.000	SECS		
								FST	OP		PF	VR-017	
								PIT	Y2		PF		
FUNCTION : TORUS N2 MAKE-UP INLET ISOL													12
CV-4327A	C-7	NC	A/C	18.000	CK	SAT	SYS	AT-04	RR	.009	PSIM	VR-011	TAV-09
								CT-CC	OP		PF	VR-050	
								CT-CO	OP		PF	VR-050	
								CTCME	RR		PF	VR-050	
								CTOME	RR	80.000	LBS	VR-050	
FUNCTION : TORUS-DRYWELL VAC BKR													12
CV-4327B	C-7	NC	A/C	18.000	CK	SAT	SYS	AT-04	RR	.009	PSIM	VR-011	TAV-09
								CT-CC	OP		PF	VR-050	
								CT-CO	OP		PF	VR-050	
								CTCME	RR		PF	VR-050	
								CTOME	RR	80.000	LBS	VR-050	
FUNCTION : TORUS-DRYWELL VAC BKR													12
CV-4327C	C-7	NC	A/C	18.000	CK	SAT	SYS	AT-04	RR	.009	PSIM	VR-011	TAV-09
								CT-CC	OP		PF	VR-050	
								CT-CO	OP		PF	VR-050	
								CTCME	RR		PF	VR-050	
								CTOME	RR	80.000	LBS	VR-050	
FUNCTION : TORUS-DRYWELL VAC BKR													12
V-4327D	C-7	NC	A/C	18.000	CK	SAT	SYS	AT-04	RR	.009	PSIM	VR-011	TAV-09

APPENDIX B
VALVE LISTING

DRAWING : M-143
DRAWING TITLE : CONTAINMENT ATMOSPHERE CONTROL SYSTEM

VALVE NUMBER	DWG COOR	IST CLASS	FUNCTION CATEGORY	SIZE (INCH)	BODY STYLE	ACTU-ATOR	NORMAL POSI-TION	TEST TYPE	TEST FREQ	MAXIMUM LIMIT	TEST UNIT	RELIEF REQUEST OR COLD SHUTDOWN	TECHNICAL POSITION
CV-4327D	C-7	NC	A/C	18.000	CK	SAT	SYS	CT-CC	OP		PF	VR-050	
								CT-CO	OP		PF	VR-050	
								CTCME	RR		PF	VR-050	
								CTOME	RR	80.000	LBS	VR-050	
	FUNCTION : TORUS-DRYWELL VAC BKR												
CV-4327F	C-7	NC	A/C	18.000	CK	SAT	SYS	AT-04	RR	.009	PSIM	VR-011	TAV-09
								CT-CC	OP		PF	VR-050	
								CT-CO	OP		PF	VR-050	
								CTCME	RR		PF	VR-050	
								CTOME	RR	80.000	LBS	VR-050	
	FUNCTION : TORUS-DRYWELL VAC BKR												
CV-4327G	C-7	NC	A/C	18.000	CK	SAT	SYS	AT-04	RR	.009	PSIM	VR-011	TAV-09
								CT-CC	OP		PF	VR-050	
								CT-CO	OP		PF	VR-050	
								CTCME	RR		PF	VR-050	
								CTOME	RR	80.000	LBS	VR-050	
	FUNCTION : TORUS-DRYWELL VAC BKR												
CV-4327H	C-7	NC	A/C	18.000	CK	SAT	SYS	AT-04	RR	.009	PSIM	VR-011	TAV-09
								CT-CC	OP		PF	VR-050	
								CT-CO	OP		PF	VR-050	
								CTCME	RR		PF	VR-050	
								CTOME	RR	80.000	LBS	VR-050	
	FUNCTION : TORUS-DRYWELL VAC BKR												
CV-4357	B-8	NC	A	8.000	BTF	AO	C/KC	AT-01	RR	15000.000	SCCM	VR-037	TAV-06
								BTC	RR	5.000	SECS		TAV-11
								FST	RR		PF		
								PIT	RR		PF		
	FUNCTION : CONTAINMENT HARD VENT ISOL VLV												
CV-4371A	E-5	NC	A	2.000	GA	AO	O/FC	AT-01	RR	3000.000	SCCM		
								BTC	OP	5.000	SECS		
								FST	OP		PF	VR-017	
								PIT	Y2		PF		
	FUNCTION : CNTNMT N2 SUPPLY ISOL												

APPENDIX B
VALVE LISTING

DRAWING : M-143
DRAWING TITLE : CONTAINMENT ATMOSPHERE CONTROL SYSTEM

VALVE NUMBER	DWG COOR	IST CLASS	FUNCTION CATEGORY	SIZE (INCH)	BODY STYLE	ACTU-ATOR	NORMAL POSI-TION	TEST TYPE	TEST FREQ	MAXIMUM LIMIT	TEST UNIT	RELIEF REQUEST OR COLD SHUTDOWN	TECHNICAL POSITION	
CV-4371C	E-7	NC	A	2.000	GA	AO	O/FC	AT-01	RR	3000.000	SCCM			
								BTC	OP	5.000	SECS			
								FST	OP		PF	VR-017		
								PIT	Y2		PF			
FUNCTION : TORUS DISCHARGE ISOL														12
CV-4378A	D-5	NC	A	2.000	GA	AO	O/FC	AT-01	RR	1000.000	SCCM			
								BTC	OP	5.000	SECS			
								FST	OP		PF	VR-017		
								PIT	Y2		PF			
FUNCTION : SUCTION INBD ISOL														12
CV-4378B	D-5	NC	A	2.000	GA	AO	O/FC	AT-01	RR	1000.000	SCCM			
								BTC	OP	5.000	SECS			
								FST	OP		PF	VR-017		
								PIT	Y2		PF			
FUNCTION : SUCTION OUTBD ISOL														12
MO-4320A	D-4	NC	B	2.000	GA	MO	C	BTO	OP	12.000	SECS			
								PIT	Y2		PF			
FUNCTION : CNTNMT ATMOS DILUTION N2 FLOW VLV														12
MO-4320B	E-4	NC	B	2.000	GA	MO	C	BTO	OP	12.000	SECS			
								PIT	Y2		PF			
FUNCTION : CNTMNT ATMOS DILUTION N2 FLOW VLV														12
MO-4323A	D-5	NC	B	2.000	GL	MO	C	BTO	OP	40.000	SECS			
								PIT	Y2		PF			
FUNCTION : CNTMNT SPRAY HDR N2 SUPPLY VLV														12
MO-4323B	E-5	NC	B	2.000	GL	MO	C	BTO	OP	40.000	SECS			
								PIT	Y2		PF			
FUNCTION : CNTMN ATMOS SPRAY HDR N2 SUPPLY ISOL														12
PSE-4357	B-8	NC	A	8.000	RPD	SA	C	AT-01	RR	5.000	SCCM	VR-037	TAV-11	
FUNCTION : CNTMNT HARD VENT RUPTURE DISC														12
SV-4336	D-5	NC	C	2.000	RV	SA	SYS	CT-SP	Y10	2470.000	PSIG	VR-005		12

APPENDIX B
VALVE LISTING

DRAWING : M-143
DRAWING TITLE : CONTAINMENT ATMOSPHERE CONTROL SYSTEM

VALVE NUMBER	DWG COOR	IST CLASS	FUNCTION CATEGORY	SIZE (INCH)	BODY STYLE	ACTU-ATOR	NORMAL POSI-TION	TEST TYPE	TEST FREQ	MAXIMUM LIMIT	TEST UNIT	RELIEF REQUEST OR COLD SHUTDOWN	TECHNICAL POSITION
	FUNCTION : CAD SUPPLY HDR RELIEF												
SV-4300	C-7	NC	B	.500	3WY	SO	ND	BTD	OP		PF	VR-002	
	FUNCTION : SOL CV-4300												
SV-4300A	C-7	NC	B	.500	3WY	SO	ND	BTD	OP		PF	VR-002	
	FUNCTION : DC SOL CV-4300												
SV-4301	C-8	NC	B	.500	3WY	SO	ND	BTD	OP		PF	VR-002	
	FUNCTION : SOL CV-4301												
SV-4302	D-7	NC	B	.500	3WY	SO	ND	BTD	OP		PF	VR-002	
	FUNCTION : SOL CV-4302												
SV-4303	D-7	NC	B	.500	3WY	SO	ND	BTD	OP		PF	VR-002	
	FUNCTION : SOL CV-4303												
SV-4304	B-7	NC	B	.500	3WY	SO	NE	BTD	OP		PF	VR-002	
								BTE	OP		PF	VR-002	
	FUNCTION : SOL CV-4304												
SV-4305	B-7	NC	B	.500	3WY	SO	NE	BTD	OP		PF	VR-002	
								BTE	OP		PF	VR-002	
	FUNCTION : SOL CV-4305												
SV-4306	E-1	NC	B	.500	3WY	SO	ND	BTD	OP		PF	VR-002	
	FUNCTION : SOL CV-4306												
SV-4307	E-3	NC	B	.500	3WY	SO	ND	BTD	OP		PF	VR-002	
	FUNCTION : SOL CV-4307												
SV-4308	E-3	NC	B	.500	3WY	SO	ND	BTD	OP		PF	VR-002	
	FUNCTION : SOL CV-4308												
SV-4309	C-8	NC	B	.500	3WY	SO	ND	BTD	OP		PF	VR-002	
	FUNCTION : SOL CV-4309												
V-4310	D-7	NC	B	.500	3WY	SO	ND	BTD	OP		PF	VR-002	

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APPENDIX B
VALVE LISTING

DRAWING : M-143
DRAWING TITLE : CONTAINMENT ATMOSPHERE CONTROL SYSTEM

VALVE NUMBER	DWG COOR	IST CLASS	FUNCTION CATEGORY	SIZE (INCH)	BODY STYLE	ACTU-ATOR	NORMAL POSI-TION	TEST TYPE	TEST FREQ	MAXIMUM LIMIT	TEST UNIT	RELIEF REQUEST OR COLD SHUTDOWN	TECHNICAL POSITION
	FUNCTION : SOL CV-4310												
SV-4311	F-3	NC	B	.500	3WY	SO	ND	BTD	OP		PF	VR-002	
	FUNCTION : SOL CV-4310												
SV-4312	F-3	NC	B	.500	3WY	SO	ND	BTD	OP		PF	VR-002	
	FUNCTION : SOL CV-4312												
SV-4313	F-3	NC	B	.500	3WY	SO	ND	BTD	OP		PF	VR-002	
	FUNCTION : SOL CV-4313												
SV-4331A	B-4	2	A	2.000	GA	SO	C/KC	AT-01	RR	3000.000	SCCM		
								BTC	OP	2.000	SECS	VR-034	
								BTO	OP	2.000	SECS	VR-034	
								FST	OP		PF	VR-017	
								PIT	Y2		PF		
	FUNCTION : CAD CNTMNT SPRAY HDR N2 VLV												
SV-4331B	B-4	NC	A	2.000	GA	SO	C/KC	AT-01	RR	3000.000	SCCM		
								BTC	OP	2.000	SECS	VR-034	
								BTO	OP	2.000	SECS	VR-034	
								FST	OP		PF	VR-017	
								PIT	Y2		PF		
	FUNCTION : CAD CNTMNT SPRAY HDR N2 VLV												
SV-4332A	B-4	2	A	2.000	GA	SO	C/KC	AT-01	RR	3000.000	SCCM		
								BTC	OP	2.000	SECS	VR-034	
								BTO	OP	2.000	SECS	VR-034	
								FST	OP		PF	VR-017	
								PIT	Y2		PF		
	FUNCTION : CAD CNTMNT SPRAY HDR N2 VLV												
SV-4332B	B-4	NC	A	2.000	GA	SO	C/KC	AT-01	RR	3000.000	SCCM		
								BTC	OP	2.000	SECS	VR-034	
								BTO	OP	2.000	SECS	VR-034	
								FST	OP		PF	VR-017	
								PIT	Y2		PF		
	FUNCTION : CAD CNTMNT SPRAY HDR N2 VLV												

APPENDIX B
VALVE LISTING

DRAWING : M-143
DRAWING TITLE : CONTAINMENT ATMOSPHERE CONTROL SYSTEM

VALVE NUMBER	DWG COOR	IST CLASS	FUNCTION CATEGORY	SIZE (INCH)	BODY STYLE	ACTU-ATOR	NORMAL POSI-TION	TEST TYPE	TEST FREQ	MAXIMUM LIMIT	TEST UNIT	RELIEF REQUEST OR COLD SHUTDOWN	TECHNICAL POSITION	
SV-4333A	C-4	2	A	2.000	GA	SO	C/KC	AT-01	RR	3000.000	SCCM			12
								BTC	OP	2.000	SECS	VR-034		
								BTO	OP	2.000	SECS	VR-034		
								FST	OP		PF	VR-017		
								PIT	Y2		PF			
	FUNCTION : CAD TORUS SPRAY HDR N2 VLV													12
SV-4333B	C-4	NC	A	2.000	GA	SO	C/KC	AT-01	RR	3000.000	SCCM			12
								BTC	OP	2.000	SECS	VR-034		
								BTO	OP	2.000	SECS	VR-034		
								FST	OP		PF	VR-017		
								PIT	Y2		PF			
	FUNCTION : CAD TORUS SPRAY HDR N2 VLV													12
SV-4334A	C-4	2	A	2.000	GA	SO	C/KC	AT-01	RR	3000.000	SCCM			12
								BTC	OP	2.000	SECS	VR-034		
								BTO	OP	2.000	SECS	VR-034		
								FST	OP		PF	VR-017		
								PIT	Y2		PF			
	FUNCTION : CAD TORUS SPRAY HDR N2 VLV													12
SV-4334B	C-4	NC	A	2.000	GA	SO	C/KC	AT-01	RR	3000.000	SCCM			12
								BTC	OP	2.000	SECS	VR-034		
								BTO	OP	2.000	SECS	VR-034		
								FST	OP		PF	VR-017		
								PIT	Y2		PF			
	FUNCTION : CAD TORUS SPRAY HDR N2 VLV													12
SV-4371A	E-4	NC	B	.500	3WY	SO	NE	BTD	OP		PF	VR-002		12
	FUNCTION : SOL CV-4371A													
SV-4371C	E-6	NC	B	.500	3WY	SO	NE	BTD	OP		PF	VR-002		12
	FUNCTION : SOL CV-4371C													
SV-4378A	D-5	NC	B	.500	3WY	SO	NE	BTD	OP		PF	VR-002		12
	FUNCTION : SOL CV-4378A													
V-4378B	D-5	NC	B	.500	3WY	SO	NE	BTD	OP		PF	VR-002		12

DUANE ARNOLD ENERGY CENTER
INSERVICE TESTING PLAN - VALVES

APPENDIX B
VALVE LISTING

DRAWING : M-143
DRAWING TITLE : CONTAINMENT ATMOSPHERE CONTROL SYSTEM

VALVE NUMBER	DWG COOR	IST CLASS	FUNCTION CATEGORY	SIZE (INCH)	BODY STYLE	ACTU-ATOR	NORMAL POSI-TION	TEST TYPE	TEST FREQ	MAXIMUM LIMIT	TEST UNIT	RELIEF REQUEST OR COLD SHUTDOWN	TECHNICAL POSITION	
	FUNCTION : SOL CV-4378B													12
V-43-032	A-6	NC	C	.500	CK	SA	SYS	CT-CO	OP		PF			12
	FUNCTION : INSTR AIR CK CV-4304													
V-43-035	A-8	NC	C	.500	CK	SA	SYS	CT-CO	OP		PF			12
	FUNCTION : INSTR AIR CK CV-4305													
V-43-0441	C-8	NC	A	1.000	CK	SA	C	AT-06	RR	550.000	SCCM		TAV-11	12
	FUNCTION : CNTMNT HARD VENT ACCUM CK													
V-43-082	B-4	NC	C	2.000	CK	SA	SYS	CT-CO	OP		PF			12
	FUNCTION : CAD CNTMNT SPRAY HDR CK													
V-43-084	B-4	NC	C	2.000	CK	SA	SYS	CT-CO	OP		PF			12
	FUNCTION : CAD CNTMNT SPRAY HDR CK													
V-43-086	C-4	NC	C	2.000	CK	SA	SYS	CT-CO	OP		PF			12
	FUNCTION : CAD TORUS SPRAY HDR CK													
V-43-088	C-4	NC	C	2.000	CK	SA	SYS	CT-CO	OP		PF			12
	FUNCTION : CAD TORUS SPRAY HDR CK													
V-43-168	A-7	NC	A/C	20.000	CK	SA	SYS	AT-01	RR	7500.000	SCCM	VR-037	TAV-06	
								CTCME	OP		PF			
								CTOME	OP	70.000	LBS			
								PIT	Y2		PF			
	FUNCTION : TORUS VACUUM BREAKER													12
V-43-169	A-7	NC	A/C	20.000	CK	SA	SYS	AT-01	RR	7500.000	SCCM	VR-037	TAV-06	
								CTCME	OP		PF			
								CTOME	OP	70.000	LBS			
								PIT	Y2		PF			
	FUNCTION : TORUS VACUUM BREAKER													12
V-43-214	E-5	NC	A/C	2.000	SCK	MSA	C/LO	AT-01	RR	3000.000	SCCM			12
								CT-CC	RR		PF	VR-025		
	FUNCTION : DRYWELL N2 HDR STOP CK													

DUANE ARNOLD ENERGY CENTER
INSERVICE TESTING PLAN - VALVES

APPENDIX B
VALVE LISTING

DRAWING : M-146
DRAWING TITLE : SERVICE WATER PUMPHOUSE

VALVE NUMBER	DWG COOR	IST CLASS	FUNCTION CATEGORY	SIZE (INCH)	BODY STYLE	ACTU-ATOR	NORMAL POSI-TION	TEST TYPE	TEST FREQ	MAXIMUM LIMIT	TEST UNIT	RELIEF REQUEST OR COLD SHUTDOWN	TECHNICAL POSITION	
AV-4926E	B-7	3	C	2.000	AV	SA	SYS	CT-CC	OP		PF			12
FUNCTION : 1P-022A/C DISCH HDR AUTO VENT														
AV-4926F	B-5	3	C	2.000	AV	SA	SYS	CT-CC	OP		PF			12
FUNCTION : 1P-022B/D DISCH HDR AUTO VENT														
AV-4929C	C-6	3	C	2.000	AV	SA	SYS	CT-CC	OP		PF			
FUNCTION : VENT AIR STRAINER 1S089A														
AV-4929D	C-6	3	C	2.000	AV	SA	SYS	CT-CC	OP		PF			
FUNCTION : VENT AIR STRAINER 1S089B														
CV-4909	F-6	3	B	24.000	BTF	AO	C/FC	BTC	OP	20.000	SECS			12
								FST	OP		PF			
								PIT	Y2		PF			
FUNCTION : RADWASTE DILUTION FLOW VLV														
CV-4914	E-6	3	B	20.000	BTF	AO	O/FO	BTO	OP	64.000	SECS			12
								FST	OP		PF			
								PIT	Y2		PF			
FUNCTION : B RWS MAKEUP														
CV-4915	E-7	3	B	20.000	BTF	AO	O/FO	BTO	OP	34.000	SECS			12
								FST	OP		PF			
								PIT	Y2		PF			
FUNCTION : A RWS MAKEUP														
SV-4909	F-6	NC	B	.250	3WY	SO	NE	BTD	OP		PF			12
								FST	OP		PF			
FUNCTION : SOL CV-4909														
SV-4934	E-8	NC	B	.250	3WY	SO	NE	BTD	OP		PF			
FUNCTION : SOL. RIV WTR CV'S														
SV-4935	E-8	NC	B	.250	3WY	SO	NE	BTD	OP		PF			
FUNCTION : SOL. RIV WTR CV'S														
-46-011	B-5	3	C	12.000	CK	SA	SYS	CT-CC	OP		PF			

APPENDIX B
VALVE LISTING

DRAWING : M-146
DRAWING TITLE : SERVICE WATER PUMPHOUSE

VALVE NUMBER	DWG COOR	IST CLASS	FUNCTION CATEGORY	SIZE (INCH)	BODY STYLE	ACTU-ATOR	NORMAL POSI-TION	TEST TYPE	TEST FREQ	MAXIMUM LIMIT	TEST UNIT	RELIEF REQUEST OR COLD SHUTDOWN	TECHNICAL POSITION	
V-46-011	B-5	3	C	12.000	CK	SA	SYS	CT-CO	OP		PF			
FUNCTION : 1P-022D DISCH CK (RHRSW)														
V-46-013	B-5	3	C	12.000	CK	SA	SYS	CT-CC	OP		PF			
								CT-CO	OP		PF			
FUNCTION : 1P-022B DISCH CK (RHRSW)														
V-46-018	B-6	3	C	8.000	CK	SA	SYS	CT-CC	OP		PF			
								CT-CO	OP		PF			
FUNCTION : 1P-099B DISCH CK (ESW)														
V-46-021	B-6	3	C	8.000	CK	SA	SYS	CT-CC	OP		PF			
								CT-CO	OP		PF			
FUNCTION : 1P-099A DISCH CK (ESW)														
V-46-026	B-7	3	C	12.000	CK	SA	SYS	CT-CC	OP		PF			
								CT-CO	OP		PF			
FUNCTION : 1P-022C DISCH CK (RHRSW)														
V-46-030	B-7	3	C	12.000	CK	SA	SYS	CT-CC	OP		PF			
								CT-CO	OP		PF			
FUNCTION : 1P-022A DISCH CK (RHRSW)														

DUANE ARNOLD ENERGY CENTER
INSERVICE TESTING PLAN - VALVES

APPENDIX B
VALVE LISTING

DRAWING : M-157
DRAWING TITLE : DRYWELL COOLING WATER SYSTEM

VALVE NUMBER	DWG COOR	IST CLASS	FUNCTION CATEGORY	SIZE (INCH)	BODY STYLE	ACTU-ATOR	NORMAL POSI-TION	TEST TYPE	TEST FREQ	MAXIMUM LIMIT	TEST UNIT	RELIEF REQUEST OR COLD SHUTDOWN	TECHNICAL POSITION
CV-5704A	F-6	NC	A	4.000	GL	AO	O/FO	AT-01	RR	4000.000	SCCM		TAV-06
								BTC	OP	5.000	SECS		
								FST	OP		PF	VR-017	
								PIT	Y2		PF		
FUNCTION : DW COOL LOOP A WELL WTR RTN ISOL													12
CV-5704B	F-6	NC	A	4.000	GL	AO	O/FO	AT-01	RR	4000.000	SCCM		TAV-06
								BTC	OP	5.000	SECS		
								FST	OP		PF	VR-017	
								PIT	Y2		PF		
FUNCTION : DW COOL LOOP B WELL WTR RTN ISOL													12
CV-5718A	B-8	NC	A	4.000	GL	AO	O/FO	AT-01	RR	4000.000	SCCM		TAV-06
								BTC	OP	5.000	SECS		
								FST	OP		PF	VR-017	
								PIT	Y2		PF		
FUNCTION : DW COOL LOOP A WELL WTR SUPPLY ISOL													12
CV-5718B	A-8	NC	A	4.000	GL	AO	O/FO	AT-01	RR	4000.000	SCCM		TAV-06
								BTC	OP	5.000	SECS		
								FST	OP		PF	VR-017	
								PIT	Y2		PF		
FUNCTION : DW COOL LOOP B WELL WTR SUPPLY ISOL													12
SV-5704A	F-6	NC	B	.250	3WY	SO	ND	BTE	OP		PF	VR-002	12
FUNCTION : SOL CV-5704A													
SV-5704B	F-6	NC	B	.250	3WY	SO	ND	BTE	OP		PF	VR-002	12
FUNCTION : SOL CV-5704B													
SV-5718A	B-8	NC	B	.250	3WY	SO	ND	BTE	OP		PF	VR-002	12
FUNCTION : SOL CV-5718A													
SV-5718B	A-8	NC	B	.250	3WY	SO	ND	BTE	OP		PF	VR-002	12
FUNCTION : SOL CV-5718B													
V-57-075	F-7	NC	A	3.000	GA	M	C/LC	AT-01	RR	4000.000	SCCM		TAV-06
FUNCTION : A LOOP BACKWASH INLET													12

APPENDIX B
VALVE LISTING

DRAWING : M-157
DRAWING TITLE : DRYWELL COOLING WATER SYSTEM

VALVE NUMBER	DWG COOR	IST CLASS	FUNCTION CATEGORY	SIZE (INCH)	BODY STYLE	ACTU-ATOR	NORMAL POSI-TION	TEST TYPE	TEST FREQ	MAXIMUM LIMIT	TEST UNIT	RELIEF REQUEST OR COLD SHUTDOWN	TECHNICAL POSITION	
V-57-076	E-7	NC	A	3.000	GA	M	C/LC	AT-01	RR	4000.000	SCCM		TAV-06	12
	FUNCTION : B LOOP BACKWASH INLET													
V-57-077	B-7	NC	A	3.000	GA	M	C/LC	AT-01	RR	4000.000	SCCM		TAV-06	12
	FUNCTION : BACKWASH DRAIN													
V-57-078	A-7	NC	A	3.000	GA	M	C/LC	AT-01	RR	4000.000	SCCM		TAV-06	12
	FUNCTION : BACKWASH DRAIN													

APPENDIX B
VALVE LISTING

DRAWING : M-173
DRAWING TITLE : Standby Filter Unit Control Bldg.

VALVE NUMBER	DWG COOR	IST CLASS	FUNCTION CATEGORY	SIZE (INCH)	BODY STYLE	ACTU-ATOR	NORMAL POSI-TION	TEST TYPE	TEST FREQ	MAXIMUM LIMIT	TEST UNIT	RELIEF REQUEST OR COLD SHUTDOWN	TECHNICAL POSITION	
V-73-006	B-6	NC	A/C	1.000	CK	SA	SYS	AT-06	OP	25.000	%DS	VR-053		12
								CT-CC	OP		PF			
	FUNCTION : 1VS012 PLT INSTRU AIR SUP CK													
V-73-007	B-6	NC	A/C	1.000	CK	SA	SYS	AT-06	OP	25.000	%DS	VR-053		12
								CT-CC	OP		PF			
	FUNCTION : 1VS012 PLT INSTRU AIR SUP CK													
V-73-034	B-6	NC	C	1.000	CK	SA	SYS	CT-CO	OP		PF			12
	FUNCTION : 1K003 AIR EXH LINE CK													
V-73-035	B-6	NC	C	1.000	CK	SA	SYS	CT-CO	OP		PF			12
	FUNCTION : 1K003 AIR EXH LINE CK													

APPENDIX B
VALVE LISTING

DRAWING : M-181
DRAWING TITLE : CONTAINMENT ATMOSPHERE MONITORING SYSTEM

VALVE NUMBER	DWG COOR	IST CLASS	FUNCTION CATEGORY	SIZE (INCH)	BODY STYLE	ACTU-ATOR	NORMAL POSI-TION	TEST TYPE	TEST FREQ	MAXIMUM LIMIT	TEST UNIT	RELIEF REQUEST OR COLD SHUTDOWN	TECHNICAL POSITION
SV-8101A	F-5	NC	A/C	1.000	GL	SO	O/FC	AT-01	RR	1000.000	SCCM		
								ET-C	OP		PF	VR-032	
								ET-O	OP		PF	VR-032	
								FST	OP		PF	VR-017	
FUNCTION : INBD ISOL VLV,SYS A O2 ANALYZER													
SV-8101B	F-4	NC	A/C	1.000	GL	SO	O/FC	AT-01	RR	1000.000	SCCM		
								ET-C	OP		PF	VR-032	
								ET-O	OP		PF	VR-032	
								FST	OP		PF	VR-017	
FUNCTION : INBD ISOL VLV,SYS B O2 ANALYZER													
SV-8102A	F-5	NC	A/C	1.000	GL	SO	O/FC	AT-01	RR	1000.000	SCCM		
								ET-C	OP		PF	VR-032	
								ET-O	OP		PF	VR-032	
								FST	OP		PF	VR-017	
FUNCTION : OUTBD ISOL VLV,SYS A O2 ANALYZER													
SV-8102B	F-4	NC	A/C	1.000	GL	SO	O/FC	AT-01	RR	1000.000	SCCM		
								ET-C	OP		PF	VR-032	
								ET-O	OP		PF	VR-032	
								FST	OP		PF	VR-017	
FUNCTION : OUTBD ISOL VLV,SYS B O2 ANALYZER													
SV-8103A	E-5	NC	A/C	1.000	GL	SO	O/FC	AT-01	RR	1000.000	SCCM		
								ET-C	OP		PF	VR-032	
								ET-O	OP		PF	VR-032	
								FST	OP		PF	VR-017	
FUNCTION : INBD ISOL VLV,SYS A O2 ANALYZER													
SV-8103B	E-4	NC	A/C	1.000	GL	SO	O/FC	AT-01	RR	1000.000	SCCM		
								ET-C	OP		PF	VR-032	
								ET-O	OP		PF	VR-032	
								FST	OP		PF	VR-017	
FUNCTION : INBD ISOL VLV,SYS B O2 ANALYZER													
SV-8104A	E-5	NC	A/C	1.000	GL	SO	O/FC	AT-01	RR	1000.000	SCCM		
								ET-C	OP		PF	VR-032	

APPENDIX B
VALVE LISTING

DRAWING : M-181
DRAWING TITLE : CONTAINMENT ATMOSPHERE MONITORING SYSTEM

VALVE NUMBER	DWG COOR	IST CLASS	FUNCTION CATEGORY	SIZE (INCH)	BODY STYLE	ACTU-ATOR	NORMAL POSI-TION	TEST TYPE	TEST FREQ	MAXIMUM LIMIT	TEST UNIT	RELIEF REQUEST OR COLD SHUTDOWN	TECHNICAL POSITION	
SV-8104A	E-5	NC	A/C	1.000	GL	SO	O/FC	ET-O	OP		PF	VR-032		
								FST	OP		PF	VR-017		
FUNCTION : OUTBD ISOL VLV,SYS A O2 ANALYZER														12
SV-8104B	E-4	NC	A/C	1.000	GL	SO	O/FC	AT-01	RR	1000.000	SCCM			
								ET-C	OP		PF	VR-032		
								ET-O	OP		PF	VR-032		
								FST	OP		PF	VR-017		
FUNCTION : OUTBD ISOL VLV,SYS B O2 ANALYZER														12
SV-8105A	E-5	NC	A/C	1.000	GL	SO	O/FC	AT-01	RR	1000.000	SCCM			
								ET-C	OP		PF	VR-032		
								ET-O	OP		PF	VR-032		
								FST	OP		PF	VR-017		
FUNCTION : INBD ISOL VLV,SYS A O2 ANALYZER														12
SV-8105B	E-4	NC	A/C	1.000	GL	SO	O/FC	AT-01	RR	1000.000	SCCM			
								ET-C	OP		PF	VR-032		
								ET-O	OP		PF	VR-032		
								FST	OP		PF	VR-017		
FUNCTION : INBD ISOL VLV,SYS B O2 ANALYZER														12
SV-8106A	E-5	NC	A/C	1.000	GL	SO	O/FC	AT-01	RR	1000.000	SCCM			
								ET-C	OP		PF	VR-032		
								ET-O	OP		PF	VR-032		
								FST	OP		PF	VR-017		
FUNCTION : OUTBD ISOL VLV,SYS A O2 ANALYZER														12
SV-8106B	E-6	NC	A/C	1.000	GL	SO	O/FC	AT-01	RR	1000.000	SCCM			
								ET-C	OP		PF	VR-032		
								ET-O	OP		PF	VR-032		
								FST	OP		PF	VR-017		
FUNCTION : OUTBD ISOL VLV,SYS B O2 ANALYZER														12
SV-8107A	D-5	NC	A/C	1.000	GL	SO	O/FC	AT-01	RR	1000.000	SCCM			
								ET-C	OP		PF	VR-032		
								ET-O	OP		PF	VR-032		
								FST	OP		PF	VR-017		

APPENDIX B
VALVE LISTING

DRAWING : M-181
DRAWING TITLE : CONTAINMENT ATMOSPHERE MONITORING SYSTEM

VALVE NUMBER	DWG COOR	IST CLASS	FUNCTION CATEGORY	SIZE (INCH)	BODY STYLE	ACTU-ATOR	NORMAL POSI-TION	TEST TYPE	TEST FREQ	MAXIMUM LIMIT	TEST UNIT	RELIEF REQUEST OR COLD SHUTDOWN	TECHNICAL POSITION
	FUNCTION : SYS A TORUS SAMPLE LINE INBD ISOL												12
SV-8107B	D-4	NC	A/C	1.000	GL	SO	O/FC	AT-01	RR	1000.000	SCCM		
								ET-C	OP		PF	VR-032	
								ET-O	OP		PF	VR-032	
								FST	OP		PF	VR-017	
	FUNCTION : SYS B TORUS SAMPLE LINE INBD ISOL												12
SV-8108A	D-5	NC	A/C	1.000	GL	SO	O/FC	AT-01	RR	1000.000	SCCM		
								ET-C	OP		PF	VR-032	
								ET-O	OP		PF	VR-032	
								FST	OP		PF	VR-017	
	FUNCTION : SYS A TORUS SAMPLE LINE OUTBD ISOL												12
SV-8108B	D-4	NC	A/C	1.000	GL	SO	O/FC	AT-01	RR	1000.000	SCCM		
								ET-C	OP		PF	VR-032	
								ET-O	OP		PF	VR-032	
								FST	OP		PF	VR-017	
	FUNCTION : SYS B TORUS SAMPLE LINE OUTBD ISOL												12
SV-8109A	D-5	NC	A/C	1.000	GL	SO	O/FC	AT-01	RR	1000.000	SCCM		
								ET-C	OP		PF	VR-032	
								FST	OP		PF	VR-017	
	FUNCTION : SYS A TORUS SAMPLE RTN INBD ISOL												12
SV-8109B	D-4	NC	A/C	1.000	GL	SO	O/FC	AT-01	RR	1000.000	SCCM		
								ET-C	OP		PF	VR-032	
								FST	OP		PF	VR-017	
	FUNCTION : SYS B TORUS SAMPLE RTN INBD ISOL												12
SV-8110A	D-5	NC	A/C	1.000	GL	SO	O/FC	AT-01	RR	1000.000	SCCM		
								ET-C	OP		PF	VR-032	
								FST	OP		PF	VR-017	
	FUNCTION : SYS A TORUS SAMPLE OUTBD ISOL												12
SV-8110B	D-4	NC	A/C	1.000	GL	SO	O/FC	AT-01	RR	1000.000	SCCM		
								ET-C	OP		PF	VR-032	
								FST	OP		PF	VR-017	

APPENDIX B
VALVE LISTING

DRAWING : M-181
DRAWING TITLE : CONTAINMENT ATMOSPHERE MONITORING SYSTEM

VALVE NUMBER	DWG COOR	IST CLASS	FUNCTION CATEGORY	SIZE (INCH)	BODY STYLE	ACTU-ATOR	NORMAL POSI-TION	TEST TYPE	TEST FREQ	MAXIMUM LIMIT	TEST UNIT	RELIEF REQUEST OR COLD SHUTDOWN	TECHNICAL POSITION
FUNCTION : SYS B TORUS SAMPLE RTN OUTBD ISOL													

APPENDIX B
VALVE LISTING

DRAWING : M-184
DRAWING TITLE : MAIN STEAM ISOLATION VALVE (MSIV) LEAKAGE CONTROL

VALVE NUMBER	DWG COOR	IST CLASS	FUNCTION CATEGORY	SIZE (INCH)	BODY STYLE	ACTU-ATOR	NORMAL POSI-TION	TEST TYPE	TEST FREQ	MAXIMUM LIMIT	TEST UNIT	RELIEF REQUEST OR COLD SHUTDOWN	TECHNICAL POSITION	
MO-8401A	F-3	1	A	1.000	GA	MO	C	AT-01	RR	1000.000	SCCM			12
								BTC	OP	10.000	SECS			
								BTO	OP	20.000	SECS			
								PIT	Y2		PF			
FUNCTION : MSIV-LCS LOOP A BLEED VLV														
MO-8401B	F-3	1	A	1.000	GA	MO	C	AT-01	RR	1000.000	SCCM			12
								BTC	OP	10.000	SECS			
								BTO	OP	20.000	SECS			
								PIT	Y2		PF			
FUNCTION : MSIV-LCS LOOP B BLEED VLV														
MO-8401C	F-3	1	A	1.000	GA	MO	C	AT-01	RR	1000.000	SCCM			12
								BTC	OP	10.000	SECS			
								BTO	OP	20.000	SECS			
								PIT	Y2		PF			
FUNCTION : MSIV-LCS LOOP C BLEED VLV														
MO-8401D	F-3	1	A	1.000	GA	MO	C	AT-01	RR	1000.000	SCCM			12
								BTC	OP	10.000	SECS			
								BTO	OP	20.000	SECS			
								PIT	Y2		PF			
FUNCTION : MSIV-LCS LOOP D BLEED VLV														
MO-8402A	F-3	NC	B	1.000	GA	MO	C	BTO	OP	20.000	SECS			
								PIT	Y2		PF			
FUNCTION : MSIV-LCS LOOP A BLEED VLV														12
MO-8402B	F-3	NC	B	1.000	GA	MO	C	BTO	OP	20.000	SECS			
								PIT	Y2		PF			
FUNCTION : MSIV-LCS LOOP B BLEED VLV														12
MO-8402C	F-3	NC	B	1.000	GA	MO	C	BTO	OP	20.000	SECS			
								PIT	Y2		PF			
FUNCTION : MSIV-LCS LOOP C BLEED VLV														12
MO-8402D	F-3	NC	B	1.000	GA	MO	C	BTO	OP	20.000	SECS			
								PIT	Y2		PF			

APPENDIX B
VALVE LISTING

DRAWING : M-184
DRAWING TITLE : MAIN STEAM ISOLATION VALVE (MSIV) LEAKAGE CONTROL

VALVE NUMBER	DWG COOR	IST CLASS	FUNCTION CATEGORY	SIZE (INCH)	BODY STYLE	ACTU-ATOR	NORMAL POSI-TION	TEST TYPE	TEST FREQ	MAXIMUM LIMIT	TEST UNIT	RELIEF REQUEST OR COLD SHUTDOWN	TECHNICAL POSITION
FUNCTION : MSIV-LCS LOOP D BLEED VLV													12
MO-8403A	F-4	NC	B	1.000	GA	MO	C	BTC	OP	10.000	SECS		
								BTO	OP	10.000	SECS		
								PIT	Y2		PF		
FUNCTION : MSIV-LCS LOOP A BYPASS VLV													12
MO-8403B	F-4	NC	B	1.000	GA	MO	C	BTC	OP	10.000	SECS		
								BTO	OP	10.000	SECS		
								PIT	Y2		PF		
FUNCTION : MSIV-LCS LOOP B BYPASS VLV													12
MO-8403C	F-4	NC	B	1.000	GA	MO	C	BTC	OP	10.000	SECS		
								BTO	OP	10.000	SECS		
								PIT	Y2		PF		
FUNCTION : MSIV-LCS LOOP C BYPASS VLV													12
MO-8403D	F-4	NC	B	1.000	GA	MO	C	BTC	OP	10.000	SECS		
								BTO	OP	10.000	SECS		
								PIT	Y2		PF		
FUNCTION : MSIV-LCS LOOP D BYPASS VLV													12

DUANE ARNOLD ENERGY CENTER
INSERVICE TESTING PLAN - VALVES

APPENDIX B
VALVE LISTING

DRAWING : M-187
DRAWING TITLE : POST ACCIDENT SAMPLING

VALVE NUMBER	DWG COOR	IST CLASS	FUNCTION CATEGORY	SIZE (INCH)	BODY STYLE	ACTU-ATOR	NORMAL POSI-TION	TEST TYPE	TEST FREQ	MAXIMUM LIMIT	TEST UNIT	RELIEF REQUEST OR COLD SHUTDOWN	TECHNICAL POSITION
SV-8772A	B-8	NC	A	1.000	GL	SO	C/FC	AT-01	RR	1000.000	SCCM		
								BTC	OP	2.000	SECS	VR-034	
								FST	OP		PF	VR-017	
								PIT	Y2		PF		
FUNCTION : PASS INBD LIQ SMPL RTN TORUS ISOL													
SV-8772B	B-8	NC	A	1.000	GL	SO	C/FC	AT-01	RR	1000.000	SCCM		
								BTC	OP	2.000	SECS	VR-034	
								FST	OP		PF	VR-017	
								PIT	Y2		PF		
FUNCTION : PASS OUTBD LIQ SMPL RTN TORUS ISOL													