INSERVICE TESTING PLAN

PUMPS AND VALVES

BYRON NUCLEAR GENERATING STATION

UNITS #1 AND #2

COMMONWEALTH EDISON COMPANY

REVISION SUMMARY SHEET
(Byron Station 2nd Interval)

Revision	Date of Revision	Page(s) Revised	Reason for Revision
0	Dec.'95	All	Initial 2nd Ten Year Interval Submittal

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SECTION 1.0

IST INFORMATION COMMON TO

PUMPS AND VALVES

1.1 INTRODUCTION AND PROGRAM DESCRIPTION

The Byron Inservice Testing Plan for pumps and valves was developed in accordance with the inservice testing requirements from the 1989 edition of the ASME Boiler and Pressure Vessel Code, Section XI, Subsections IWP and IWV. The 1989 edition of ASME Section XI subsequently references ASME/ANSI OM (Part 6) for pump testing, and ASME/ANSI OM (Part 10) for valve testing. The version of ASME/ANSI OM Part 6 and Part 10 followed shall be the OMa-1988 addendum to the OM-1987 edition. Where these requirements are determined to be impractical, specific relief is requested.

This Inservice Testing Plan will be effective for U-1 and U-2 from July 1, 1996 through and including June 30, 2006 (pending approval from the NRC for concurrent intervals).

The Commercial Service Date for Byron Unit 1 is September 16, 1985 and for Byron Unit 2 is August 21, 1987.

The key features of this Plan are: the Pump and Valve table listings, Relief Requests, Refueling Outage Justifications, Cold Shutdown Justifications, and Technical Positions. Administrative procedures, surveillance testing procedures, and other records required to define and execute the Inservice Testing Plan are all retained and available at Byron Station.

SECTION 2.0

IST PUMP PLAN

2.1 PUMP COMPONENTS AND TESTING INFORMATION

2.1.1 PUMP TABLE DESCRIPTIONS

The following information is included in the pump program tables:

PUMP NUMBER: The unique Byron Station Equipment Piece Number

PUMP NAME: The common name for the pump

CLASS: The ASME Code Class

P&ID: The Piping and Instrument Drawing number. If the pump appears on multiple P & ID's, the primary P & ID will be listed.

SPEED: "Yes" signifies that speed will be measured; "no" signifies a constant speed pump and speed will not be measured.

PRESSURE: "ΔP" indicates that differential pressure will be measured; "P" indicates that discharge pressure will be measured (positive displacement pumps). Relief requests or Technical Positions are indicated where applicable.

FLOW RATE: The flow rate of the pump, measured using permanently installed instruments or other means, provided the equipment accuracy meets the requirements of OMa-1988, Part 6, Paragraph 4.6.1.1, Table 1. "Q" indicates that the flow rate will be measured.

VIBRATION: Pump vibration measurements shall be made using portable or hand held instruments at locations as marked on the pumps. A "V" indicates that vibration measurements will be taken. If required, a more detailed explanation of the vibration data collection methodology is described in the relief request or technical position indicated.

TEST INTERVAL: Indicates the frequency of performing the Inservice Tests.

			TEST PARAMETERS					
PUMP NUMBER	PUMP NAME	CLASS	P&ID	SPEED	PRESSURE	FLOW RATE	VIBRATION	TEST INTERVAL
1AF01PA	Auxiliary Feedwater Pump (Motor Driven)	3	M-37	No	ΔP	Q	V	Quarterly
1AF01PB	Auxiliary Feedwater Pump (Diesel Driven)	3	M-37	Yes	ΔP	Q	V	Quarterly
2AF01PA	Auxiliary Feedwater Pump (Motor Driven)	3	M-122	No	ΔP	Q	V	Quarterly
2AF01PB	Auxiliary Feedwater Pump (Diesel Driven)	3	M-122	Yes	ΔP	Q	V	Quarterly
0CC01P	Component Cooling Pump	3	M-66-3A	No	ΔP	Q	V	Quarterly
1CC01PA	Component Cooling Pump	3	M-66-3A	No	ΔP	Q	V	Quarterly
1CC01PB	Component Cooling Pump	3	M-66-3A	No	ΔP	Q	V	Quarterly
2CC01PA	Component Cooling Pump	3	M-66-3A	No	ΔP	Q	V	Quarterly
2CC01PB	Component Cooling Pump	3	M-66-3A	No	ΔP	Q	V	Quarterly
1CS01PA	Containment Spray Pump	2	M-46-1A	No	ΔP	Q	V	Quarterly
1CS01PB	Containment Spray Pump	2	M-46-1A	No	ΔP	Q	V	Quarterly

			TEST PARAMETERS					
PUMP NUMBER	PUMP NAME	CLASS	P&ID	SPEED	PRESSURE	FLOW RATE	VIBRATION	TEST INTERVAL
2CS01PA	Containment Spray Pump	2	M-129-1A	No	ΔP	Q	V	Quarterly
2CS01PB	Containment Spray Pump	2	M-129-1A	No	ΔP	Q	V	Quarterly
1CV01PA	Centrifugal Charging Pump	2	M-64-3A	No	ΔP	Q	V	Quarterly
1CV01PB	Centrifugal Charging Pump	2	M-64-3A	No	ΔP	Q	V	Quarterly
2CV01PA	Centrifugal Charging Pump	2	M-138-3A	No	ΔP	Q	V	Quarterly
2CV01PB	Centrifugal Charging Pump	2	M-138-3A	No	ΔP	Q	V	Quarterly
1DO01PA	Diesel Oil Transfer Pump	3	M-50-1B	No	P,PR-1	Q	V	Quarterly
1DO01PB	Diesel Oil Transfer Pump	3	M-50-1A	No	P,PR-1	Q	V	Quarterly
1DO01PC	Diesel Oil Transfer Pump	3	M-50-1B	No	P,PR-1	Q	V	Quarterly
1DO01PD	Diesel Oil Transfer Pump	3	M-50-1A	No	P,PR-1	Q	V	Quarterly
2DO01PA	Diesel Oil Transfer Pump	3	M-130-1A	No	P,PR-1	Q	V	Quarterly

			TEST PARAMETERS					
PUMP NUMBER	PUMP NAME	CLASS	P&ID	SPEED	PRESSURE	FLOW RATE	VIBRATION	TEST INTERVAL
2DO01PB	Diesel Oil Transfer Pump	3	M-130-1B	No	P,PR-1	Q	V	Quarterly
2DO01PC	Diesel Oil Transfer Pump	3	M-130-1A	No	P,PR-1	Q	V	Quarterly
2DO01PD	Diesel Oil Transfer Pump	3	M-130-1B	No	P,PR-1	Q	V	Quarterly
1RH01PA	Residual Heat Removal Pump	2	M-62	No	ΔP	Q	V	Quarterly
1RH01PB	Residual Heat Removal Pump	2	M-62	No	ΔP	Q	V	Quarterly
2RH01PA	Residual Heat Removal Pump	2	M-137	No	ΔP	Q	V	Quarterly
2RH01PB	Residual Heat Removal Pump	2	M-137	No	ΔP	Q	V	Quarterly
1SI01PA	Safety Injection Pump	2	M-61-1A	No	ΔP	Q	V	Quarterly
1SI01PB	Safety Injection Pump	2	M-61-1A	No	ΔP	Q	V	Quarterly
2SI01PA	Safety Injection Pump	2	M-136-1	No	ΔP	Q	V	Quarterly
2SI01PB	Safety Injection Pump	2	M-136-1	No	ΔP	Q	V	Quarterly

			TEST PARAMETERS					
PUMP NUMBER	PUMP NAME	CLASS	P&ID	SPEED	PRESSURE	FLOW RATE	VIBRATION	TEST INTERVAL
0SX02PA	Essen. Service Water Makeup Pump (Diesel Driven)	3	M-42-6	Yes	ΔP	Q	V, PA-1	Quarterly
0SX02PB	Essen. Service Water Makeup Pump (Diesel Driven)	3	M-42-6	Yes	ΔP	Q	V, PA-1	Quarterly
1SX01PA	Essential Service Water Pump	3	M-42-1B	No	ΔP	Q	V	Quarterly
1SX01PB	Essential Service Water Pump	3	M-42-1A	No	ΔP	Q	V	Quarterly
2SX01PA	Essential Service Water Pump	3	M-42-1B	No	ΔP	Q	V	Quarterly
2SX01PB	Essential Service Water Pump	3	M-42-1A	No	ΔP	Q	V	Quarterly
1SX04P	1B AFW SX Booster Pump	3	M-42-3	Yes	ΔP	Q	V	Quarterly
2SX04P	2B AFW SX Booster Pump	3	M-126-1	Yes	ΔP	Q	V	Quarterly
0WO01PA	Control Room Chilled Water Pump	3	M-118-1	No	ΔP	Q	V	Quarterly
0WO01PB	Control Room Chiller Water Pump	3	M-118-1	No	ΔP	Q	V	Quarterly

SECTION 2.2

PUMP TECHNICAL POSITIONS

2.2.1 PUMP TECHNICAL POSITION SUMMARY

Number	Component(s)	Description
PA-01:	0SX02PA/B	Byron's position on collecting vibration data. The non-ASME vibration associated with gears meshing in the gearbox of these pumps have been factored out of the IST vibration monitoring data.
PA-02:	0/1/2AB03P	Gives basis for the exclusion of the Boric Acid Transfer Pumps from the IST Program. However, they will continue to be tested outside of the IST program.

PUMP TECHNICAL POSITION
PA-01

TITLE:

Method of Collecting Data for the Essential Service Water Makeup Pumps

PUMPS AFFECTED:

0SX02PA, 0SX02PB pumps

CODE REQUIREMENT(S)/DISCUSSION:

ANSI/ASME OMa-1988 Part 6: Table 3a Ranges for Test Parameters, Paragraph 4.6.4(a) Vibration Measurements, Paragraph 4.6.1.6 Frequency Response Range.

POSITION:

The Essential Service Water Makeup Pumps 0SX02PA & B are of a very unique design (see Fig. 1 and Fig. 2). The pump is attached to a horizontal diesel driver via a right angle gear drive, and the gear drive is located approximately 39 feet above the pump. This configuration assures pump operability during the design basis flooding of the Rock River.

The Essential Service Water Makeup Pumps 0SX02PA & B are classified as centrifugal pumps. ANSI/ASME OMa-1988 Part 6 Paragraph 4.6.4 (a) requires that for centrifugal pumps, vibration measurements are to be taken in two directions on each accessible pump bearing housing and in the axial direction on each accessible pump thrust bearing housing. The OM Code does not require vibration monitoring of the gear drive. For the Essential Service Water Makeup Pumps, however, the pump thrust bearings are physically located within the gearbox which houses the gear drive. This pump configuration is not addressed by OM Part 6. With this unique configuration, the only means of collecting vibration readings for the pump thrust bearing is to physically take the vibration measurements on the gearbox itself. The limitations of taking the vibration readings at this location is that the resultant vibration readings are not solely attributable to the pump thrust bearing. The vibration readings obtained are the result of other factors such as the vibration induced by the gear drive itself.

When recording vibration results based on a frequency response range to 2000 Hz., which has been the customary practice at Byron for these pumps, the gear drive significantly contributes to the vibration which is measured at the gearbox location. The vibration induced by the gear drive is largely due to the gears meshing. Taking into account the pump running speed and the number of gear teeth, Byron has calculated the gear mesh frequency and hence a vibration frequency attributable to the gear drive. This frequency was calculated to be

PUMP TECHNICAL POSITION
PA-01 (continued)

1080 Hz. By performing spectral analysis of the vibration data obtained at the gearbox locations, engineering personnel were able to identify the vibration which was attributable to the gear drive, as there was an easily identifiable peak within this 1080 Hz frequency range. This particular peak, associated with the gear mesh frequency, exceeded the acceptance criteria of Table 3a of OM Part 6. The OM Part 6 Table 3a acceptance criteria applies to pump bearings and pump thrust bearings, and not to gear drives which induce vibration due to the gears meshing. Additionally, Paragraph 4.6.1.6 of OM Part 6 states that the frequency response range of the vibration measuring transducers and their readout system shall be to at least 1000 Hz. The 1080 Hz gear mesh frequency goes beyond what is required for the frequency response range of the vibration measuring transducers and their readout system. As a result, for the gearbox locations on these pumps, Byron will apply the OM Part 6 Table 3a acceptance limits in the frequency range of one third minimum pump shaft rotational speed up to and including 1000 Hz, and will not apply the OM Part 6 acceptance limits to the gear drive frequencies above 1000 Hz. By applying a cutoff at 1000 Hz, the resulting peak reading is more applicable to the vibration from the pump thrust bearing. The 1000 Hz cutoff meets the requirements of OM Part 6 for frequency response range of the vibration measuring transducers and their readout system.

Additionally, vibration measurements will continue to be taken at the lowest accessible bushing on the pump shaft. These vibration readings will be subject to the OM Part 6 Table 3a acceptance criteria.

Both the A and B pumps have experienced vibration at the gearbox location in the vicinity of 0.4 - 0.45 in/sec since installation, at which time they were verified by the vendor to be operating properly. They have continued to display such vibration levels throughout their service life. In August of 1992, the gearbox for pump 0SX02PA was replaced. The replacement was performed due to repair work which was performed on the pump and was not attributable to a gearbox problem. It was felt that this was an opportunity to discover if a rebuilt gearbox would reduce the vibration levels. Replacement with a rebuilt gearbox did not significantly reduce vibration levels at the gearbox location. Additionally, an inspection of the original gearbox revealed that it was in an acceptable condition. Also, in 1995, the 0SX02PA gearbox was opened and visually inspected. It should be noted that the 0SX02PA pump has experienced slightly higher vibration levels at the gearbox location than the 0SX02PB pump. The gearbox of the 0SX02PA pump was found to be in excellent condition. ComEd's conclusions are that the vibration levels recorded at the gearbox locations do not have a detrimental affect on the gearbox or the pump, and that this vibration level is normal for such a pump configuration. Although the OM Code vibration limits will not be applied to the vibration levels attributed to the gear mesh frequencies, Byron will continue to monitor these vibration levels, and take action as appropriate.

PUMP TECHNICAL POSITION
PA-01 (continued)

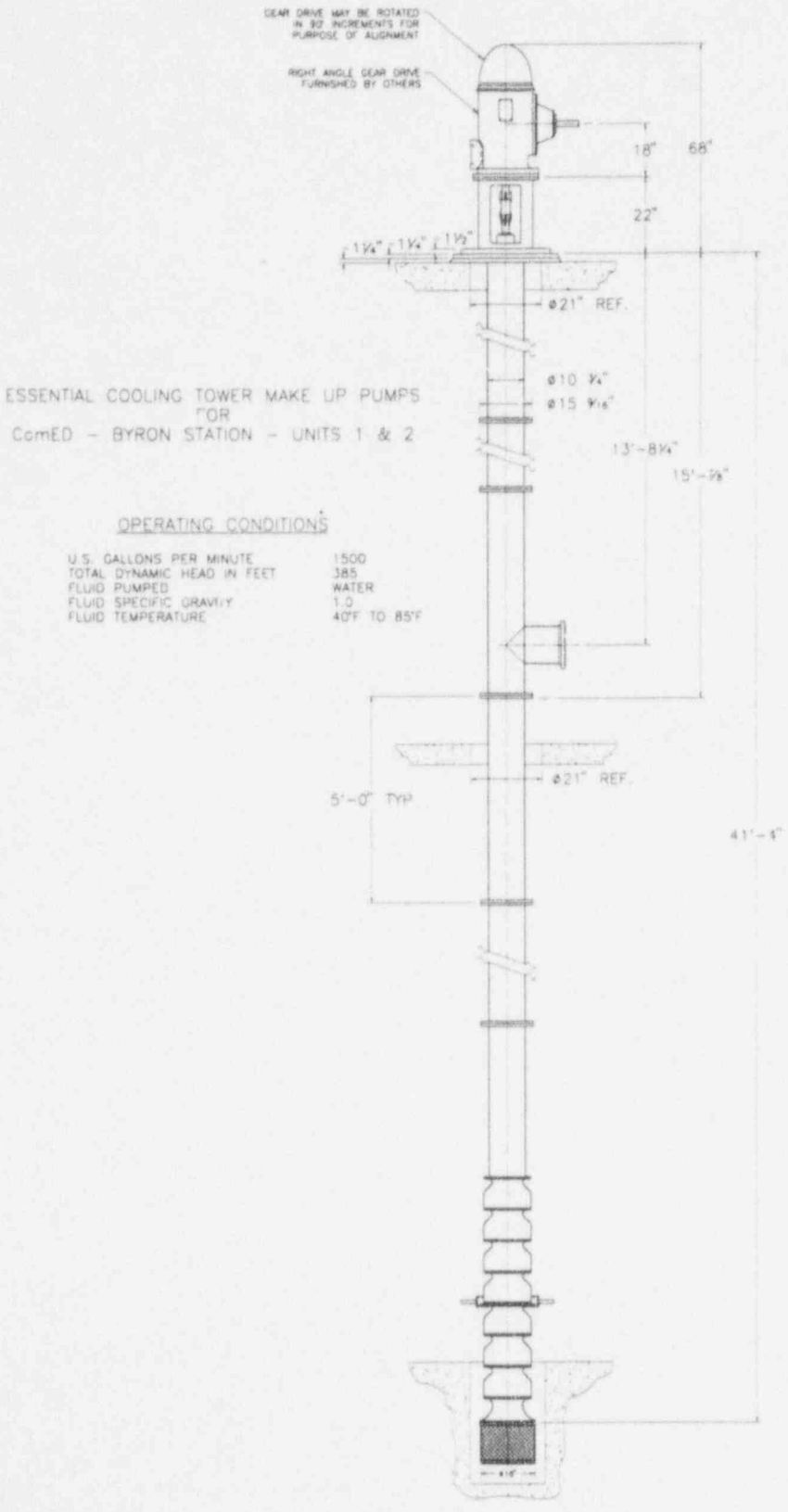

FIGURE 1

PUMP TECHNICAL POSITION
PA-01 (continued)

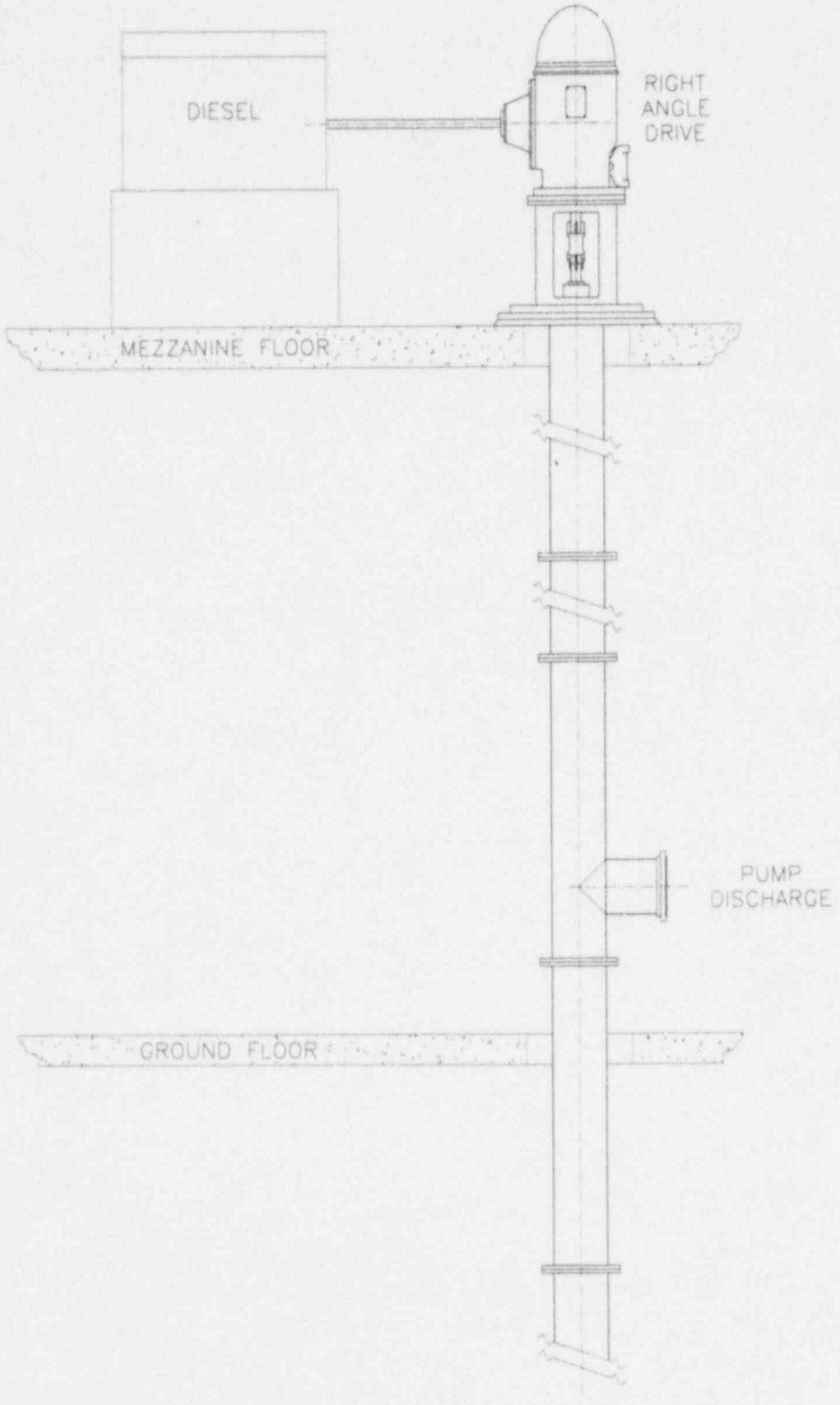

FIGURE 2

PUMP TECHNICAL POSITION
PA-02

PUMP NUMBER: 0AB03P, 1AB03P, 2AB03P

ASME CODE CLASS: 3

POSITION:

The Boric Acid Transfer Pumps fall outside the scope of the IST Pump Program statement of OMa-1988, Part 6 because they are not provided with an emergency power source, Byron Station is analyzed as a "hot shutdown" plant, and these pumps are not required to maintain hot shutdown conditions. Also, the RWST (Refueling Water Storage Tank) is a Seismic Category I Structure as described in the UFSAR, Table 3.2-1. Paragraph 3.2.1.1 states that Seismic Category I Structures are designed to withstand design basis accidents including tornadoes. Therefore, the Boric Acid Transfer Pumps are not required to be included in the IST Program to satisfy any Design Basis Accident. Engineering correspondence CHRON #161733 dated January 17, 1991 supports these conclusions. However, because of the operating significance of these pumps, Byron Station has developed a testing program for these pumps outside the IST Program.

SECTION 2.3

PUMP RELIEF REQUESTS

2.3.1 Relief Request Summary Sheet

Status: A = Approved
P = Pending NRC Approval
W = Withdrawn

Rev: Revision Submitted

Number	Status	Rev.	Component(s)	Summary:
PR-1	P	0	1/2DO01PA-PD	Requests approval to allow a tolerance of +/- 1 psig (>2%) on the set reference values of discharge pressure.

RELIEF REQUEST PR-1

TITLE: Diesel Oil Transfer Pump Discharge Pressure Tolerance Increase

PUMP NUMBER	CODE CLASS	DRAWING NUMBER	DRAWING COORDINATE
1/2DO01PA	3	M-50-1B(M-130-1A)	E4(C5)
1/2DO01PB	3	M-50-1A(M-130-1B)	E4(C5)
1/2DO01PC	3	M-50-1B(M-130-1A)	E4(C5)
1/2DO01PD	3	M-50-1A(M-130-1B)	E4(C5)

FUNCTION(S):

The 1/2DO01PA-PD pumps transfer diesel fuel oil from storage tanks to the diesel generator day tanks.

CODE REQUIREMENT(S):

1. Per OMa-1988, Part 6, paragraph 5.2, an inservice test shall be conducted with the pump operating at specified test reference conditions.

2. Per NUREG 1482, section 5.3, a total tolerance of +/-2 percent of the reference value is allowed without approval from the NRC.

BASIS FOR RELIEF:

The Diesel Oil Transfer pumps are positive displacement pumps which transfer diesel oil to the diesel generator day tanks. The discharge pressure (constant for positive displacement pumps) is considered the set value for the pumps and have indicated consistent values in the past. The lowest discharge pressure reference value for a specific Diesel Oil Transfer Pump is currently 23 psig and the highest reference value is 25.5 psig. Numbers this low allow only a small tolerance for the discharge pressure when applying the +/-2% tolerance (as noted in NUREG 1482, section 5.3). For instance, in considering a reference value of 23 psig, the +/-2% criteria allows only a +/- 0.46 psig tolerance. The pressure indicators are 0-60 psig analog gauges with increments of 0.5 psig, allowing readability to the nearest 0.25 psig (readings are acceptable to a degree of precision no greater than one-half the smallest increment). To be within the +/-2% criteria, only a readability range of +/- 0.25 psig would be possible (next higher reading of +/-0.5 psig would represent a tolerance > 2%). For the reference values of 25 psig or above, only a readability range of +/- 0.5 psig would be possible to remain within the +/-2% tolerance. History indicates that there would be a few "acceptable" data points that would fall outside of these tight ranges. Byron proposes a more practical acceptable range of +/- 1 psig.

RELIEF REQUEST PR-1 (continued)

Discharge pressure for these positive displacement pumps are considered to be constant. There are no throttling techniques or other methods available to adjust the discharge pressure. It would be impractical to set up strict ranges of +/-2% due to the small magnitude of the numbers involved. In addition, the readability of the gauges are limited. History has shown acceptable pump operation for values within the +/- 1 psig tolerance. The level of safety concerning the operation of these pumps will not be compromised by allowing a tolerance of +/-1 psig versus a strict +/-2% tolerance. Any deviations greater than 1 psig from the reference value would result in an investigation of the pump performance.

To encompass all the pumps on a consistent basis, a +/-1 psig tolerance on the discharge pressure reference value is requested, which would represent a tolerance of +/-3.9% to +/-4.3% of the existing reference values.

PROPOSED ALTERNATIVE TESTING:

Byron will use a discharge pressure tolerance of +/- 1 psig from the reference value when testing the Diesel Oil Transfer Pumps. The Flow will be compared to Table 3b of OM-6 to ensure the measured value is within the necessary acceptable limits.

APPROVAL STATUS:

1. Submitted with Revision 0 of Byron's 2nd Interval Program (December, 1995).

SECTION 2.4

PUMP REFERENCES

PUMP REFERENCE LIST

1. Title 10, Code of Federal Regulations, Part 50, Domestic Licensing of Production and Utilization Facilities, particularly Section 50.55a, Codes and Standards.

2. ASME Boiler and Pressure Vessel Code, Section XI, Rules for Inservice Inspection of Nuclear Power Plant Components, 1989 Edition.

3. ASME/ANSI OM-1987, Operation and Maintenance of Nuclear Power Plants, including 1988 Addenda, Part 6, Inservice Testing of Pumps in Light Water Reactor Power Plants.

4. U.S. Nuclear Regulatory Commission, Generic Letter 89-04, Guidance on Developing Acceptable Inservice Testing Programs.

5. US Nuclear Regulatory Commission, Generic Letter 89-04, Supplement 1, NUREG 1482 Guidance on Developing Acceptable Inservice Testing Programs.

6. Byron/Braidwood Station UFSAR, Section 3.9.6.1, Inservice Testing of Pumps.

7. Byron Station Technical Specification, 3/4.0 5, Generic ASME Program Requirement.

8. Byron Procedure, BVP 200-1, IST Requirements for Pumps.

SECTION 3.0

IST VALVE PLAN

3.1 VALVE COMPONENTS AND TESTING INFORMATION

3.1.1 Valve Table Descriptions

A. REVISION

The revision corresponds to the current revision of the program.

B. PAGE

The pages are numbered sequentially and show the total number of pages.

C. VALVE NUMBER

The valve number references the unique Byron Station equipment piece number (EPN). This specific valve number identifies the unit and system.

D. P&ID

The P&ID column references the specific P&ID number which the valves are located on. The Unit 2 P&ID number is given directly underneath the Unit 1 P&ID number, where applicable.

E. CLASS

The "class" refers to the safety-related ASME class 1, 2, or 3 assigned to the specific valve. A "NONE" generally indicates that the valve is non-safety and the test requirements are augmented tests.

F. VALVE CATEGORY

The valve category identifies the valve category defined in OMa-1988, Part 10, paragraph 1.4 as follows:

Category A - valves for which seat leakage is limited to a specific maximum amount in the closed position for fulfillment of their required function(s).

3.1.1 Valve Table Descriptions (continued)

F. VALVE CATEGORY (continued)

Category B - valves for which seat leakage in the closed position is inconsequential for fulfillment of the required function(s).

Category C - valves which are self-actuating in response to some system characteristic, such as pressure (relief valves) or flow direction (check valves) for fulfillment of the required function(s).

Category D - valves which are actuated by an energy source capable of only one operation, such as rupture disks or explosively actuated valves.

G. VALVE SIZE

The valve size lists the nominal pipe size of each valve in inches.

H. VALVE TYPE

The valve type categorizes the valve as to its valve design. The following abbreviations will be used to identify specific valve types:

Gate	GA
Globe	GL
Butterfly	BTF
Check	CK
Safety Valve	SV
Relief Valve	RV
Power Operated Relief Valve	PORV
Diaphragm Seated	D
Plug	P
Angle	AN

3.1.1 Valve Table Descriptions (continued)

I. ACT. TYPE

The actuator type identifies the valve actuator. The following abbreviations will be used to designate specific types of valve actuators:

Motor Operated	M.O.
Air Operated	A.O.
Hydraulic Operated	H.O.
Self Actuated	S.A.
Manual	M
Solenoid Operated	S.O.

J. NORMAL POSITION

Normal position identifies the normal operating position of a specific valve. O for open and C for closed.

K. STROKE DIRECTION

The stroke direction identifies the direction the valve actuator moves a specific valve stem to place the valve disc in a position to perform its designed safety function(s). O for open, and C for closed. This identifies the direction(s) the valve stem will move when tested.

Note: Exercising of a power operated valve will involve stroking the valve to both its open and closed position. The valve will only be timed, however, in the direction(s) designated to perform its safety function(s). Therefore, the program plan specifies only the direction(s) in which valves must be stroke timed.

3.1.1 Valve Table Descriptions(continued)

L. TEST METHOD

The test method column identifies specific tests which will be performed on specific valves to fulfill the requirements of OMa-1988, Part 10. The test and abbreviations used are as follows:

(Bt) Check Valve Back Flow Test

The check valve disc will be exercised to the closed position required to fulfill its safety function by verifying that the disc travels to the seat promptly on cessation or reversal of flow.

(Ct) Check Valve Full Stroke Test

The check valve disc will be exercised to the open position required to fulfill its safety function by verifying the maximum required accident flow through the valve. Alternatives to full flow testing, per NRC Generic Letter 89-04, Attachment 1, Positions 1 and 2, may also be used in specific cases.

(Fo) Fail Safe Test Open or (Fc) Fail Safe Test Closed

Valves with fail safe actuators will be tested to verify the valve operator moves the valve stem to the required fail safe position upon loss of actuating power, in accordance with OMa-1988, Part 10, paragraph 4.2.1.6.

In general, this will be accomplished during the normal stroking of the valve. Upon stroking a valve to its fail safe position, the solenoid operator is de-energized causing air to be vented which in turn allows the spring to move the valve to its fail safe position. This condition simulates loss of actuating power (Electric and/or Air) and hence satisfies the fail safe test requirements of OMa-1988, Part 10, paragraph 4.2.1.6.

3.1.1 Valve Table Description (continued)

L. TEST METHOD (continued)

(It) Position Indication Test

Valves which are identified to require a Position Indication Test will be inspected in accordance with OMa-1988, Part 10, paragraph 4.1.

(Lt) Seat Leakage Test

The seat leakage tests will meet the requirements of OMa-1988, Part 10, paragraph 4.2.2 for Category A valves. On these valves, seat leakage is limited to a specific maximum amount in the closed position for fulfillment of their safety function.

(Rt) Safety Valve Setpoint Test

Safety valve setpoints will be verified in accordance with OM-1, as referenced in OMa-1988, Part 10, Paragraph 4.3.1.

(St) Full Stroke Test (also called Stroke Time Test)

Valve exercising tests of Category A and B valves will be performed in accordance with OMa-1988, Part 10, paragraph 4.2. The test will include full stroke testing to verify operability in the direction required to fulfill the required safety function.

(Xt) Partial-Stroke Test

If only limited operation is practical during certain plant conditions, the valves shall be partial-stroke (Xt) exercised when plant conditions allow and full-stroke exercised when plant conditions allow in accordance with OMa-1988, Part 10, paragraph 4.2.1.2 or 4.3.2.2.

M. TEST FREQUENCY:

Denotes the frequency and plant condition necessary to perform a given test. The following abbreviations are used:

Quarterly (Q)

Tests designated "Q" will be performed a minimum of once every 92 days, except in those plant operating modes in which the valve is not required to be operable.

3.1.1 Valve Table Description (continued)

M. TEST FREQUENCY (continued)

Cold Shutdown (CS)

Valve testing will commence within 48 hours of achieving cold shutdown, with completion of cold shutdown valve testing not being a prerequisite to plant startup.

Per OMa-1988, Part 10, paragraph 4.2.1.2(g), for extended outages, testing need not be commenced in 48 hours provided all valves required to be tested during cold shutdown will be tested prior to plant startup. However, it is not the intent of this part to keep the plant in cold shutdown in order to complete this testing. In case of frequent cold shutdowns, valve testing need not be performed more often than once during any three-month period.

Tech Spec Cold Shutdown (CSTS)

Tests with this designation shall be tested during cold shutdowns in accordance with Byron Tech Specs.

Reactor Refueling (RR)

Tests with this designation will be conducted during reactor refueling outages only.

Eighteen Months (18m)

Tests with this designation will be conducted a minimum of once every eighteen months.

3.1.1 Valve Table Description (continued)

M. TEST FREQUENCY (continued)

Two Years (2Y)

Tests with this designation will be conducted a minimum of once every two years.

Five Years (5Y)

Tests with this designation, generally involving Class 1 pressure relief devices, will be tested a minimum of once every 5 years. Test expansions will be conducted in accordance with OM-1, where applicable.

Ten Years (10Y)

Tests with this designation, generally involving class 2 and 3 pressure relief devices, will be tested a minimum of once every 10 years. Test expansions will be conducted in accordance with OM-1, where applicable.

Sample Disassembly (SD)

Tests with this designation follow sample disassembly plans originated from GL 89-04. Refer to the appropriate Relief Request, Technical Position, or Refueling Outage Justification for specific details.

Appendix J Test Frequency

Tests with this designation will be conducted at a frequency consistent with the Appendix J leak test frequency.

N. NOTES

Notes provide a short explanation concerning a particular IST valve. All notes are included in Section 3.1.3.

O. TECHNICAL POSITIONS

Technical positions provide detailed discussions on a particular IST topic. All Technical positions are included in Section 3.2

3.1.1 Valve Table Description (continued)

P. COLD SHUTDOWN JUSTIFICATION

In accordance with paragraphs 4.2.1.2 or 4.3.2.2 of OMa-1988, Part 10, Byron Station will exercise certain valves during cold shutdowns if the valve cannot be exercised during normal operation. The technical justification for exercising a valve during cold shutdown rather than normal operation is provided in a cold shutdown justification. All cold shutdown justifications are included in section 3.3.

Q. REFUELING OUTAGE JUSTIFICATION

In accordance with paragraphs 4.2.1.2 and 4.3.2.2 of Part 10 of the code, Byron Station will exercise certain valves during reactor refueling outages if it is not practical for the valve to be exercised during normal operation or during cold shutdowns. The technical justification for exercising a valve during reactor refueling outages is provided in a refueling outage justification. The refueling outage justifications are included in Section 3.4

R. RELIEF REQUEST

Relief requests reference a specific request for relief from code requirements. All relief requests are included in Section 3.5

VALVE NUMBER	P&ID	CLASS	VALVE CATEGORY	VALVE SIZE (IN.)	VALVE TYPE	ACT. TYPE	NORMAL POSITION	STROKE DIRECT.	TEST METHOD	TEST FREQ.	NOTES	TECH. POS. (VA)	COLD SHUTDOWN JUST.	REFUELING OUTAGE JUST.	RELIEF REQUEST
1/2AF001A	M-37 M-122	3	C	6.0	CK	S.A.	C	O C	Xt/Ct Bt	Q/CS SD			VC-11		VR-4
1/2AF001B	M-37 M-122	3	C	6.0	CK	S.A.	C	O C	Xt/Ct Bt	Q/CS SD			VC-11		VR4
1/2AF003A	M-37 M-122	3	C	6.0	CK	S.A.	C	O	Xt/Ct	Q/CS			VC-11		
1/2AF003B	M-37 M-122	3	C	6.0	CK	S.A.	C	O	Xt/Ct	Q/CS			VC-11		
1/2AF006A	M-37 M-122	3	B	6.0	GA	M.O.	C	O	St It	Q 2Y		1,3 4			
1/2AF006B	M-37 M-122	3	B	6.0	GA	M.O.	C	O	St It	Q 2Y		1,3 4			
1/2AF013A	M-37 M-122	2	B	4.0	GL	M.O.	O	C	St It	Q 2Y		1,3 4			
1/2AF013B	M-37 M-122	2	B	4.0	GL	M.O.	O	C	St It	Q 2Y		1,3 4			
1/2AF013C	M-37 M-122	2	B	4.0	GL	M.O.	O	C	St It	Q 2Y		1,3 4			
1/2AF013D	M-37 M-122	2	B	4.0	GL	M.O.	O	C	St It	Q 2Y		1,3 4			
1/2AF013E	M-37 M-122	2	B	4.0	GL	M.O.	O	C	St It	Q 2Y		1,3 4			
1/2AF013F	M-37 M-122	2	B	4.0	GL	M.O.	O	C	St It	Q 2Y		1,3 4			
1/2AF013G	M-37 M-122	2	B	4.0	GL	M.O.	O	C	St It	Q 2Y		1,3 4			
1/2AF013H	M-37 M-122	2	B	4.0	GL	M.O.	O	C	St It	Q 2Y		1,3 4			
1/2AF014A	M-37 M-122	2	C	4.0	CK	S.A.	C	O C	Ct Bt	CS CS			VC-11 VC-11		
1/2AF014B	M-37 M-122	2	C	4.0	CK	S.A.	C	O C	Ct Bt	CS CS			VC-11 VC-11		
1/2AF014C	M-37 M-122	2	C	4.0	CK	S.A.	C	O C	Ct Bt	CS CS			VC-11 VC-11		
1/2AF014D	M-37 M-122	2	C	4.0	CK	S.A.	C	O C	Ct Bt	CS CS			VC-11 VC-11		
1/2AF014E	M-37 M-122	2	C	4.0	CK	S.A.	C	O C	Ct Bt	CS CS			VC-11 VC-11		
1/2AF014F	M-37 M-122	2	C	4.0	CK	S.A.	C	O C	Ct Bt	CS CS			VC-11 VC-11		

VALVE NUMBER	P&ID	CLASS	VALVE CATEGORY	VALVE SIZE (IN.)	VALVE TYPE	ACT. TYPE	NORMAL POSITION	STROKE DIRECT.	TEST METHOD	TEST FREQ.	NOTES	TECH. POS. (TA)	COLD SHUTDOWN JUST.	REFUELING OUTAGE JUST.	RELIEF REQUEST
1/2AF014G	M-37 M-122	2	C	4.0	CK	S.A.	C	O C	Ct Bt	CS CS			VC-11 VC-11		
1/2AF014H	M-37 M-122	2	C	4.0	CK	S.A.	C	O C	Ct Bt	CS CS			VC-11 VC-11		
1/2AF017A	M-37 M-122	3	B	6.0	GA	M.O.	C	O	St It	Q 2Y		1,3 4			
1/2AF017B	M-37 M-122	3	B	6.0	GA	M.O.	C	O	St It	Q 2Y		1,3 4			
1/2AF029A	M-37 M-122	3	C	6.0	CK	S.A.	C	O	Ct	CS			VC-11		
1/2AF029B	M-37 M-122	3	C	6.0	CK	S.A.	C	O	Ct	CS			VC-11		

VALVE NUMBER	P&ID	CLASS	VALVE CATEGORY	VALVE SIZE (IN.)	VALVE TYPE	ACT. TYPE	NORMAL POSITION	STROKE DIRECT.	TEST METHOD	TEST FREQ	NOTES	TECH. POS. (VA)	COLD SHUTDOWN JUST.	REFUELING OUTAGE JUST.	RELIEF REQUEST
1/2CC685	M-66-1A M-139-1	2	A	3.0	GA	M.O.	O	C	St It Lt	CS 2Y AJ	 1	1,3 4	VC-19		
1/2CC9412A	M-66-2 M-139-2	3	B	12.0	GA	M.O.	C	O	St It	Q 2Y		1,3 4			
1/2CC9412B	M-66-2 M-139-2	3	B	12.0	GA	M.O.	C	O	St It	Q 2Y		1,3 4			
1/2CC9413A	M-66-1A M-139-1	2	A	6.0	GA	M.O.	O	C	St It Lt	CS 2Y AJ	 1	1,3 4	VC-19		
1/2CC9414	M-66-1A M-139-1	2	A	6.0	GA	M.O.	O	C	St It Lt	CS 2Y AJ	 1	1,3 4	VC-19		
1/2CC9415	M-66-4D	3	B	16.0	GA	M.O.	O	C/O	St It	CS 2Y		1,3 4	VC-19		
1/2CC9416	M-66-1A M-139-1	2	A	6.0	GA	M.O.	O	C	St It Lt	CS 2Y AJ	 1	1,3 4	VC-19		
0CC9432	M-66-3A	3	C	0.75x1	RV	S.A.	C	C/O	Rt	10Y					
1/2CC9437A	M-66-1A M-139-1	2	B	3.0	GL	A.O.	C	C/O	St/Fc It	Q 2Y		1,2,3 4			
1/2CC9437B	M-66-1A M-139-1	2	B	3.0	GL	A.O.	O	C/O	St/Fc It	Q 2Y		1,2,3 4			
1/2CC9438	M-66-1A M-139-1	2	A	4.0	GA	M.O.	O	C	Lt It St	AJ 2Y CS	1	 4 1,3	 VC-19		
1/2CC9458	M-66-3B	3	B	16.0	GA	M	O	O/C	St	U-2 RR	6			ROJ-3	
1/2CC9459A	M-66-3A	3	B	16.0	GA	M	O	O/C	St	U-2 RR	6			ROJ-3	
1CC9459B	M-66-3A	3	B	16.0	GA	M	O	O/C	St	U-2 RR	6			ROJ-3	
2CC9459B	M-66-3A	3	B	16.0	GA	M	C	O/C	St	U-2 RR	6			ROJ-3	
1/2CC9463A	M-66-3B	3	C	12.0	CK	S.A.	C	O C	Ct/Bt	Q		3			
1/2CC9463B	M-66-3B	3	C	12.0	CK	S.A.	C	O C	Ct/Bt	Q		3			
0CC9464	M-66-3B	3	C	12.0	CK	S.A.	C	O C	Ct/Bt	Q		3			

VALVE NUMBER	P&ID	CLASS	VALVE CATEGORY	VALVE SIZE (IN.)	VALVE TYPE	ACT. TYPE	NORMAL POSITION	STROKE DIRECT.	TEST METHOD	TEST FREQ	NOTES	TECH. POS. (VA)	COLD SHUTDOWN JUST.	REFUELING OUTAGE JUST.	RELIEF REQUEST
1/2CC9467A	M-66-4D	3	B	16.0	GA	M	O	O/C	St	U-2 RR	6			ROJ-3	
1CC9467B	M-66-4D	3	B	16.0	GA	M	O	O/C	St	U-2 RR	6			ROJ-3	
2CC9467B	M-66-4D	3	B	16.0	GA	M	C	O/C	St	U-2 RR	6			ROJ-3	
1/2CC9467C	M-66-3B	3	B	16.0	GA	M	O	O/C	St	U-2 RR	6			ROJ-3	
1/2CC9473A	M-66-3B	3	B	16.0	GA	M.O.	C	C/O	St It	Q 2Y		1,3 4			
1/2CC9473B	M-66-3B	3	B	16.0	GA	M.O.	C	C/O	St It	Q 2Y		1,3 4			
1/2CC9486	M-66-1A M-139-1	2	AC	6.0	CK	S.A.	O	C	Lt/Bt	AJ	1				VR-1
1/2CC9495A	M-66-1B M-139-1	3	BC	2.00	CK	S.A.	O	C	Bt	RR				ROJ-13	
1/2CC9495B	M-66-1B M-139-1	3	BC	2.00	CK	S.A.	O	C	Bt	RR				ROJ-13	
1/2CC9495C	M-66-1B M-139-1	3	BC	2.00	CK	S.A.	O	C	Bt	RR				ROJ-13	
1/2CC9495D	M-66-1B M-139-1	3	BC	2.00	CK	S.A.	O	C	Bt	RR				ROJ-13	
1/2CC9518	M-66-1A M-139-1	2	AC	0.75	CK	S.A.	C	C O	Lt/Bt Ct	AJ AJ	1 6				VR-1 VR-1
1/2CC9534	M-66-1A M-139-1	2	AC	0.75	CK	S.A.	C	C O	Lt/Bt Ct	AJ AJ	1 8				VR-1 VR-1

VALVE NUMBER	P&ID	CLASS	VALVE CATEGORY	VALVE SIZE (IN.)	VALVE TYPE	ACT. TYPE	NORMAL POSITION	STROKE DIRECT.	TEST METHOD	TEST FREQ	NOTES	TECH. POS. (VA)	COLD SHUTDOWN JUST.	REFUELING OUTAGE JUST.	RELIEF REQUEST
1/2CS001A	M-61-4 M-136-4	2	B	14.0	GA	M.O.	O	C	St It	Q 2Y		1,3 4			
1/2CS001B	M-61-4 M-136-4	2	B	14.0	GA	M.O.	O	C	St It	Q 2Y		1,3 4			
1/2CS003A	M-46-1A M-129-1A	2	C	10.0	CK	S.A.	C	O	Xt Ct	Q SD					VR-2
1/2CS003B	M-46-1A M-129-1A	2	C	10.0	CK	S.A.	C	O	Xt Ct	Q SD					VR-2
1/2CS007A	M-46-1C M-129-1C	2	A	10.0	GA	M.O.	C	O/C	Lt St It	AJ Q 2Y	1	 1,3 4			
1/2CS007B	M-46-1C M-129-1C	2	A	10.0	GA	M.O.	C	O/C	Lt St It	AJ Q 2Y	1	 1,3 4			
1/2CS08MA/B	M-46-1B M-129-1B	2	C	1.0	RV	S.A.	C	O	Rt	10Y					
1/2CS008A	M-46-1C M-129-1C	2	AC	10.0	CK	S.A.	C	O C	Ct Bt/Lt	SD AJ	 1				VR-2 VR-1
1/2CS008B	M-46-1C M-129-1C	2	AC	10.0	CK	S.A.	C	O C	Ct Bt/Lt	SD AJ	 1				VR-2 VR-1
1/2CS009A	M-61-4 M-136-4	2	B	16.0	GA	M.O.	C	O	St It	Q 2Y		1,3 4			
1/2CS009B	M-61-4 M-136-4	2	B	16.0	GA	M.O.	C	O	St It	Q 2Y		1,3 4			
1/2CS011A	M-46-1A M-129-1A	2	C	6.0	CK	S.A.	C	O	Xt Ct	Q SD					VR-2
1/2CS011B	M-46-1A M-129-1A	2	C	6.0	CK	S.A.	C	O	Xt Ct	Q SD					VR-2
1/2CS019A	M-46-1B M-129-1B	2	B	3.0	GA	M.O.	C	O/C	St It	Q 2Y		1,3 4			
1/2CS019B	M-46-1B M-129-1B	2	B	3.0	GA	M.O.	C	O/C	St It	Q 2Y		1,3 4			
1/2CS020A	M-46-1B M-129-1A	2	C	3.0	CK	S.A.	C	O C	Xt/Ct Bt	SD Q					VR-2
1/2CS020B	M-46-1B M-129-1A	2	C	3.0	CK	S.A.	C	O C	Xt/Ct Bt	SD Q					VR-2

VALVE NUMBER	P&ID	CLASS	VALVE CATEGORY	VALVE SIZE (IN.)	VALVE TYPE	ACT. TYPE	NORMAL POSITION	STROKE DIRECT.	TEST METHOD	TEST FREQ.	NOTES	TECH. POS. (VA)	COLD SHUTDOWN JUST.	REFUELING OUTAGE JUST.	RELIEF REQUEST
1/2CV112B	M-64-4A M-138-4	2	B	4.0	GA	M.O.	O	C	St It	CS 2Y		1,3 4	VC-4		
1/2CV112C	M-64-4A M-138-4	2	B	4.0	GA	M.O.	O	C	St It	CS 2Y		1,3 4	VC-4		
1/2CV112D	M-64-4B M-138-4	2	B	8.0	GA	M.O.	C	O/C	St It	CS 2Y		1,3 4	VC-2		
1/2CV112E	M-64-4B M-138-4	2	B	8.0	GA	M.O.	C	O/C	St It	CS 2Y		1,3 4	VC-2		
1/2CV128	M-64-5 M-138-5A	2	B	2.0	GL	A.O.	C	C	St/Fc	Q	4	1,2,3			
1/2CV459	M-64-5 M-138-5B	1	B	3.0	GL	A.O.	O	C	St/Fc It	CS 2Y		1,2,3 4	VC-10		
1/2CV460	M-64-5 M-138-5B	1	B	3.0	GL	A.O.	O	C	St/Fc It	CS 2Y		1,2,3 4	VC-10		
1/2CV8100	M-64-2 M-138-2	2	A	2.0	GL	M.O.	O	C	St It Lt	CS 2Y AJ	1	1,3 4	VC-19		
1/2CV8104	M-64-4B M-138-4	2	B	3.0	GL	M.O.	C	O	St It	CS 2Y		1,3 4	VC-2		
1/2CV8105	M-64-3B M-138-3B	2	B	3.0	GA	M.O.	O	C	St It	CS 2Y		1,3 4	VC-4		
1/2CV8106	M-64-3B M-138-3B	2	B	3.0	GA	M.O.	O	C	St It	CS 2Y		1,3 4	VC-4		
1/2CV8110	M-64-3A M-138-3	2	B	2.0	GL	M.O.	O	C/O	St It	Q 2Y		1,3 4			
1/2CV8111	M-64-3A M-138-3	2	B	2.0	GL	M.O.	O	C/O	St It	Q 2Y		1,3 4			
1/2CV8112	M-64-2 M-138-2	2	A	2.0	GL	M.O.	O	C	St It Lt	CS 2Y AJ	1	1,3 4	VC-19		
1/2CV8113	M-64-2 M-138-2	2	AC	0.75	CK	S.A.	C	C O	Lt/Bt Ct	AJ AJ	1 8				VR-1 VR-1
1/2CV8114	M-64-3A M-138-3	2	B	2.0	GL	S.O.	O	C/O	St/Fo It	Q 2Y	5	1,3 4			
1/2CV8116	M-64-3A M-138-3	2	B	2.0	GL	S.O.	O	C/O	St/Fo It	Q 2Y	5	1,3 4			
1/2CV8117	M-64-5 M-138-5B	2	C	2.0x3.0	RV	S.A.	C	C/O	Rt	10Y					
1/2CV8118	M-64-3A M-138-3A	2	C	0.75x1.0	RV	S.A.	C	C/O	Rt	10Y					

VALVE NUMBER	P&ID	CLASS	VALVE CATEGORY	VALVE SIZE (IN.)	VALVE TYPE	ACT. TYPE	NORMAL POSITION	STROKE DIRECT.	TEST METHOD	TEST FREQ	NOTES	TECH. POS. (VA)	COLD SHUTDOWN JUST.	REFUELING OUTAGE JUST.	RELIEF REQUEST
1/2CV8121	M-64-2 M-138-2	2	C	2.0x3.0	RV	S.A.	C	C/O	Rt	10Y					
1/2CV8124	M-64-4B M-138-4	2	C	0.75x1.0	RV	S.A.	C	C/O	Rt	10Y					
1/2CV8149A	M-64-5 M-138-5B	2	B	3.0	GL	A.O.	C	C	St/Fc It	CS 2Y		1,2,3 4	VC-10		
1/2CV8149B	M-64-5 M-138-5B	2	B	3.0	GL	A.O.	O	C	St/Fc It	CS 2Y		1,2,3 4	VC-10		
1/2CV8149C	M-64-5 M-138-5B	2	B	3.0	GL	A.O.	C	C	St/Fc It	CS 2Y		1,2,3 4	VC-10		
1/2CV8152	M-64-5 M-138-5A	2	A	3.0	GL	A.O.	O	C	St It Fc Lt	CS 2Y CS AJ	 1	1,3 4 2	VC-4 VC-4		
1/2CV8153A	M-64-2 M-138-2	1	B	1.0	GL	A.O.	O	C	St/Fc It	O 2Y		1,2,3 4			
1/2CV8153B	M-64-2 M-138-2	1	B	1.0	GL	A.O.	C	C	St/Fc It	O 2Y		1,2,3 4			
1/2CV8160	M-64-5 M-138-5A	2	A	3.0	GL	A.O.	O	C	St It Fc Lt	CS 2Y CS AJ	 1	1,3 4 2	VC-4 VC-4		
1/2CV8348	M-64-3B M-138-3B	2	BC	2.0	CK	S.A.	C	C	Bt	RR				ROJ-11	
1/2CV8355A	M-64-1 M-138-1	2	B	2.0	GL	M.O.	O	C	St It	CS 2Y		1,3 4	VC-22		
1/2CV8355B	M-64-1 M-138-1	2	B	2.0	GL	M.O.	O	C	St It	CS 2Y		1,3 4	VC-22		
1/2CV8355C	M-64-2 M-138-2	2	B	2.0	GL	M.O.	O	C	St It	CS 2Y		1,3 4	VC-22		
1/2CV8355D	M-64-2 M-138-2	2	B	2.0	GL	M.O.	O	C	St It	CS 2Y		1,3 4	VC-22		
1/2CV8368A	M-64-1 M-138-1	2	BC	2.0	CK	S.A.	O	C	Bt	RR				ROJ-12	
1/2CV8368B	M-64-1 M-138-1	2	BC	2.0	CK	S.A.	O	C	Bt	RR				ROJ-12	
1/2CV8368C	M-64-2 M-138-2	2	BC	2.0	CK	S.A.	O	C	Bt	RR				ROJ-12	
1/2CV8368D	M-64-2 M-138-2	2	BC	2.0	CK	S.A.	O	C	Bt	RR				ROJ-12	

VALVE NUMBER	P&ID	CLASS	VALVE CATEGORY	VALVE SIZE (IN.)	VALVE TYPE	ACT. TYPE	NORMAL POSITION	STROKE DIRECT.	TEST METHOD	TEST FREQ	NOTES	TECH. POS. (VA)	COLD SHUTDOWN JUST.	REFUELING OUTAGE JUST.	RELIEF REQUEST
1/2CV8440	M-64-4B M-138-4B	2	C	4.0	CK	S.A.	O	C O	Bt Ct	CS Q			VC-16		
1/2CV8442	M-64-4B M-138-4	2	C	2.0	CK	S.A.	C	O	Ct	CS			VC-2		
1/2CV8480A	M-64-3A M-138-3	2	C	2.0	CK	S.A.	C	O C	Ct Bt	Q Q					
1/2CV8480B	M-64-3A M-138-3	2	C	2.0	CK	S.A.	C	O C	Ct Bt	Q Q					
1/2CV8481A	M-64-3A M-138-3A	2	C	4.0	CK	S.A.	C	O C	Ct/Xt Bt	RR/Q Q				ROJ-7	
1/2CV8481B	M-64-3A M-138-3A	2	C	4.0	CK	S.A.	C	O C	Ct/Xt Bt	RR/Q Q				ROJ-7	
1/2CV8546	M-64-4B M-138-4	2	C	8.0	CK	S.A.	C	O	Ct	RR				ROJ-7	
1/2CV8804A	M-64-4B M-138-4	2	B	8.0	GA	M.O.	C	O	St It	CS 2Y		1,3 4	VC-2		

VALVE NUMBER	P&ID	CLASS	VALVE CATEGORY	VALVE SIZE (IN.)	VALVE TYPE	ACT. TYPE	NORMAL POSITION	STROKE DIRECT.	TEST METHOD	TEST FREQ.	NOTES	TECH. POS. (VA)	COLD SHUTDOWN JUST.	REFUELING OUTAGE JUST.	RELIEF REQUEST
1/2DG5182A	M-152-20 (TYPICAL)	NONE	B	3.0	GA	S.O.	C	O	St	Q					VR-8
1/2DG5182B	M-152-20 (TYPICAL)	NONE	B	3.0	GA	S.O.	C	O	St	Q					VR-8
1/2DG5183A	M-152-20 (TYPICAL)	NONE	B	3.0	GA	S.O.	C	O	St	Q					VR-8
1/2DG5183B	M-152-20 (TYPICAL)	NONE	B	3.0	GA	S.O.	C	O	St	Q					VR-8
1/2DG5184A	M-152-20 (TYPICAL)	NONE	C	3.0	CK	S.A.	C	O	Ct	Q					VR-8
1/2DG5184B	M-152-20 (TYPICAL)	NONE	C	3.0	CK	S.A.	C	O	Ct	Q					VR-8
1/2DG5185A	M-152-20 (TYPICAL)	NONE	C	3.0	CK	S.A.	C	O	Ct	Q					VR-8
1/2DG5185B	M-152-20 (TYPICAL)	NONE	C	3.0	CK	S.A.	C	O	Ct	Q					VR-8

VALVE NUMBER	P&ID	CLASS	VALVE CATEGORY	VALVE SIZE (IN.)	VALVE TYPE	ACT. TYPE	NORMAL POSITION	STROKE DIRECT.	TEST METHOD	TEST FREQ	NOTES	TECH. POS. (VA)	COLD SHUTDOWN JUST.	REFUELING OUTAGE JUST.	RELIEF REQUEST
1/2DO003A	M-50-1B M-130-1A	3	C	1.5	CK	S.A.	C	O C	Ct Bt	Q Q					
1/2DO003B	M-50-1A M-130-1B	3	C	1.5	CK	S.A.	C	O C	Ct Bt	Q Q					
1/2DO003C	M-50-1B M-130-1A	3	C	1.5	CK	S.A.	C	O C	Ct Bt	Q Q					
1/2DO003D	M-50-1A M-130-1B	3	C	1.5	CK	S.A.	C	O C	Ct Bt	Q Q					
1/2DO020A	M-50-1B M-130-1A	3	C	1.5x2.5	RV	S.A.	C	C/O	Rt	10Y					
1/2DO020B	M-50-1A M-130-1B	3	C	1.5x2.5	RV	S.A.	C	C/O	Rt	10Y					
1/2DO020C	M-50-1A M-130-1B	3	C	1.5x2.5	RV	S.A.	C	C/O	Rt	10Y					
1/2DO020D	M-50-1A M-130-1B	3	C	1.5x2.5	RV	S.A.	C	C/O	Rt	10Y					

VALVE NUMBER	P&ID	CLASS	VALVE CATEGORY	VALVE SIZE (IN.)	VALVE TYPE	ACT. TYPE	NORMAL POSITION	STROKE DIRECT.	TEST METHOD	TEST FREQ	NOTES	TECH. POS. (VA)	COLD SHUTDOWN JUST.	REFUELING OUTAGE JUST.	RELIEF REQUEST
1/2FC009	M-63-1A	2	A	4.0	P	M	C	C	Lt	AJ	1				
1/2FC010	M-63-1A	2	A	4.0	P	M	C	C	Lt	AJ	1				
1/2FC011	M-63-1B M-63-1C	2	A	3.0	P	M	C	C	Lt	AJ	1				
1/2FC012	M-63-1B M-63-1C	2	A	3.0	P	M	C	C	Lt	AJ	1				

VALVE NUMBER	P&ID	CLASS	VALVE CATEGORY	VALVE SIZE (IN.)	VALVE TYPE	ACT. TYPE	NORMAL POSITION	STROKE DIRECT.	TEST METHOD	TEST FREQ	NOTES	TECH. POS. (VA)	COLD SHUTDOWN JUST.	REFUELING OUTAGE JUST.	RELIEF REQUEST
1/2FP010	M-52-1	2	B	4.0	GA	A.O.	O	C	St It Fc	O 2Y O		1,3 4 2			
1/2FP345	M-52-1	2	BC	8	CK	S.A.	C	C	Bt	RR				ROJ-10	

VALVE NUMBER	P&ID	CLASS	VALVE CATEGORY	VALVE SIZE (IN.)	VALVE TYPE	ACT. TYPE	NORMAL POSITION	STROKE DIRECT.	TEST METHOD	TEST FREQ	NOTES	TECH. POS. (VA)	COLD SHUTDOWN JUST.	REFUELING OUTAGE JUST.	RELIEF REQUEST
1/2FW009A	M-36-1C M-121-1B	2	B	16.0	GA	H.O.	O	C	St/Xt lt	CS/Q 2Y		1,3 4	VC-3		
1/2FW009B	M-36-1A M-121-1D	2	B	16.0	GA	H.O.	O	C	St/Xt lt	CS/Q 2Y		1,3 4	VC-3		
1/2FW009C	M-36-1D M-121-1A	2	B	16.0	GA	H.O.	O	C	St/Xt lt	CS/Q 2Y		1,3 4	VC-3		
1/2FW009D	M-36-1B M-121-1C	2	B	16.0	GA	H.O.	O	C	St/Xt lt	CS/Q 2Y		1,3 4	VC-3		
1/2FW034A	M-36-1C M-121-1B	NONE	B	2.0	GL	A.O.	O	C	Fc	RR		2		ROJ-14	
1/2FW034B	M-36-1A M-121-1D	NONE	B	2.0	GL	A.O.	O	C	Fc	RR		2		ROJ-14	
1/2FW034C	M-36-1D M-121-1A	NONE	B	2.0	GL	A.O.	O	C	Fc	RR		2		ROJ-14	
1/2FW034D	M-36-1B M-121-1C	NONE	B	2.0	GL	A.O.	O	C	Fc	RR		2		ROJ-14	
1/2FW035A	M-36-1C M-121-1B	2	B	3.0	GL	A.O.	O	C	St lt Fc	Q 2Y Q		1,3 4 2			
1/2FW035B	M-36-1A M-121-1D	2	B	3.0	GL	A.O.	O	C	St lt Fc	Q 2Y Q		1,3 4 2			
1/2FW035C	M-36-1D M-121-1A	2	B	3.0	GL	A.O.	O	C	St lt Fc	Q 2Y Q		1,3 4 2			
1/2FW035D	M-36-1B M-121-1C	2	B	3.0	GL	A.O.	O	C	St lt Fc	Q 2Y Q		1,3 4 2			
1/2FW036A	M-36-1C M-121-1B	2	C	3.0	CK	S.A.	O	C	Bt	CS			VC-20		
1/2FW036B	M-36-1A M-121-1A	2	C	3.0	CK	S.A.	O	C	Bt	CS			VC-20		
1/2FW036C	M-36-1D M-121-1C	2	C	3.0	CK	S.A.	O	C	Bt	CS			VC-20		
1/2FW036D	M-36-1B M-121-1C	2	C	3.0	CK	S.A.	O	C	Bt	CS			VC-20		

VALVE NUMBER	P&ID	CLASS	VALVE CATEGORY	VALVE SIZE (IN.)	VALVE TYPE	ACT. TYPE	NORMAL POSITION	STROKE DIRECT.	TEST METHOD	TEST FREQ.	NOTES	TECH. POS. (TA)	COLD SHUTDOWN JUST.	REFUELING OUTAGE JUST.	RELIEF REQUEST
1/2FW039A	M-36-1C M-121-1B	2	B	6.0	GA	A.O.	O	C	St It Fc	CS 2Y CS		1,3 4 2	VC-9 VC-9		
1/2FW039B	M-36-1A M-121-1B	2	B	6.0	GA	A.O.	O	C	St It Fc	CS 2Y CS		1,3 4 2	VC-9 VC-9		
1/2FW039C	M-36-1D M-121-1A	2	B	6.0	GA	A.O.	O	C	St It Fc	CS 2Y CS		1,3 4 2	VC-9 VC-9		
1/2FW039D	M-36-1B M-121-1C	2	B	6.0	GA	A.O.	O	C	St It Fc	CS 2Y CS		1,3 4 2	VC-9 VC-9		
1/2FW043A	M-36-1C M-121-1B	2	B	3.0	GL	A.O.	C	C	St It Fc	O 2Y O		1,3 4 2			
1/2FW043B	M-36-1A M-121-1D	2	B	3.0	GL	A.O.	C	C	St It Fc	O 2Y O		1,3 4 2			
1/2FW043C	M-36-1D M-121-1A	2	B	3.0	GL	A.O.	C	C	St It Fc	O 2Y O		1,3 4 2			
1/2FW043D	M-36-1B M-121-1C	2	B	3.0	GL	A.O.	C	C	St It Fc	O 2Y O		1,3 4 2			
1/2FW079A	M-36-1C M-121-1B	2	C	16.0	CK	S.A.	O	C	Bt	SD					VR-5
1/2FW079B	M-36-1A M-121-1D	2	C	16.0	CK	S.A.	O	C	Bt	SD					VR-5
1/2FW079C	M-36-1D M-121-1A	2	C	16.0	CK	S.A.	O	C	Bt	SD					VR-5
1/2FW079D	M-36-1B M-121-1C	2	C	16.0	CK	S.A.	O	C	Bt	SD					VR-5
1/2FW510	M-36-1C M-121-1	NONE	B	16.0	AN	A.O.	O	C	Fc	RR		2		ROJ-14	
1/2FW510A	M-36-1C M-121-1	NONE	B	4.0	GA	A.O.	C	C	Fc	RR		2		ROJ-14	
1/2FW520	M-36-1A M-121-1	NONE	B	16.0	AN	A.O.	O	C	Fc	RR		2		ROJ-14	
1/2FW520A	M-36-1A M-121-1	NONE	B	4.0	GA	A.O.	C	C	Fc	RR		2		ROJ-14	

VALVE NUMBER	P&ID	CLASS	VALVE CATEGORY	VALVE SIZE (IN.)	VALVE TYPE	ACT. TYPE	NORMAL POSITION	STROKE DIRECT.	TEST METHOD	TEST FREQ	NOTES	TECH. POS. (VA)	COLD SHUTDOWN JUST	REFUELING OUTAGE JUST.	RELIEF REQUEST
1/2FW530	M-36-1D M-121-1	NONE	B	16.0	AN	A.O.	O	C	Fc	RR		2		ROJ-14	
1/2FW530A	M-36-1D M-121-1	NONE	B	4.0	GA	A.O.	C	C	Fc	RR		2		ROJ-14	
1/2FW540	M-36-1B M-121-1	NONE	B	16.0	AN	A.O.	O	C	Fc	RR		2		ROJ-14	
1/2FW540A	M-36-1B M-121-1	NONE	B	4.0	GA	A.O.	C	C	Fc	RR		2		ROJ-14	

VALVE NUMBER	P&ID	CLASS	VALVE CATEGORY	VALVE SIZE (IN.)	VALVE TYPE	ACT. TYPE	NORMAL POSITION	STROKE DIRECT.	TEST METHOD	TEST FREQ	NOTES	TECH. POS. (VA)	COLD SHUTDOWN JUST.	REFUELING OUTAGE JUST.	RELIEF REQUEST
0GW9300A	M-69-1	3	C	1.0x2.0	RV	S.A.	C	O/C	Rt	10Y					
0GW9300B	M-69-1	3	C	1.0x2.0	RV	S.A.	C	O/C	Rt	10Y					
0GW9300C	M-69-1	3	C	1.0x2.0	RV	S.A.	C	O/C	Rt	10Y					
0GW9300D	M-69-1	3	C	1.0x2.0	RV	S.A.	C	O/C	Rt	10Y					
0GW9300E	M-69-1	3	C	1.0x2.0	RV	S.A.	C	O/C	Rt	10Y					
0GW9300F	M-69-1	3	C	1.0x2.0	RV	S.A.	C	O/C	Rt	10Y					

VALVE NUMBER	P&ID	CLASS	VALVE CATEGORY	VALVE SIZE (IN.)	VALVE TYPE	ACT. TYPE	NORMAL POSITION	STROKE DIRECT.	TEST METHOD	TEST FREQ	NOTES	TECH. POS. (TA)	COLD SHUTDOWN JUST.	REFUELING OUTAGE JUST.	RELIEF REQUEST
1/2IA065	M-55-4 M-55-5	2	A	3.0	GL	A.O.	O	C	Lt St Fc It	AJ RR RR 2Y	1	 1,3 2 4		 ROJ-5 ROJ-5	
1/2IA066	M-55-4 M-55-5	2	A	3.0	GL	A.O.	O	C/O	Lt St Fc It	AJ RR RR 2Y	1	 1,3 2 4		 ROJ-5 ROJ-5	
1/2IA091	M-55-4 M-55-5	2	AC	0.75	CK	S.A.	C	C O	Lt/Bt Ct	AJ RR	1			 ROJ-5	VR-1

VALVE NUMBER	P&ID	CLASS	VALVE CATEGORY	VALVE SIZE (IN.)	VALVE TYPE	ACT. TYPE	NORMAL POSITION	STROKE DIRECT.	TEST METHOD	TEST FREQ.	NOTES	TECH. POS. (VA)	COLD SHUTDOWN JUST.	REFUELING OUTAGE JUST.	RELIEF REQUEST
1/2MS001A	M-35-2 M-120-2A	2	B	30.25	GA	H.O.	O	C	St/Xt lt	CS/Q 2Y		1,3 4	VC-1		
1/2MS001B	M-35-1 M-120-1	2	B	32.75	GA	H.O.	O	C	St/Xt lt	CS/Q 2Y		1,3 4	VC-1		
1/2MS001C	M-35-2 M-120-2B	2	B	32.75	GA	H.O.	O	C	St/Xt lt	CS/Q 2Y		1,3 4	VC-1		
1/2MS001D	M-35-1 M-120-1	2	B	30.25	GA	H.O.	O	C	St/Xt lt	CS/Q 2Y		1,3 4	VC-1		
1/2MS013A	M-35-2 M-120-2A	2	C	6.0 x 10.0	SV	S.A.	C	O/C	Rt	10Y					
1/2MS013B	M-35-1 M-120-1	2	C	6.0 x 10.0	SV	S.A.	C	O/C	Rt	10Y					
1/2MS013C	M-35-2 M-120-2B	2	C	6.0 x 10.0	SV	S.A.	C	O/C	Rt	10Y					
1/2MS013D	M-35-1 M-120-1	2	C	6.0 x 10.0	SV	S.A.	C	O/C	Rt	10Y					
1/2MS014A	M-35-2 M-120-2A	2	C	6.0 x 10.0	SV	S.A.	C	O/C	Rt	10Y					
1/2MS014B	M-35-1 M-120-1	2	C	6.0 x 10.0	SV	S.A.	C	O/C	Rt	10Y					
1/2MS014C	M-35-2 M-120-2B	2	C	6.0 x 10.0	SV	S.A.	C	O/C	Rt	10Y					
1/2MS014D	M-35-1 M-120-1	2	C	6.0 x 10.0	SV	S.A.	C	O/C	Rt	10Y					
1/2MS015A	M-35-2 M-120-2A	2	C	6.0 x 10.0	SV	S.A.	C	O/C	Rt	10Y					
1/2MS015B	M-35-1 M-120-1	2	C	6.0 x 10.0	SV	S.A.	C	O/C	Rt	10Y					
1/2MS015C	M-35-2 M-120-2B	2	C	6.0 x 10.0	SV	S.A.	C	O/C	Rt	10Y					
1/2MS015D	M-35-1 M-120-1	2	C	6.0 x 10.0	SV	S.A.	C	O/C	Rt	10Y					
1/2MS016A	M-35-2 M-120-2A	2	C	6.0 x 10.0	SV	S.A.	O	O/C	Rt	10Y					
1/2MS016B	M-35-1 M-120-1	2	C	6.0 x 10.0	SV	S.A.	O	O/C	Rt	10Y					
1/2MS016C	M-35-2 M-120-2B	2	C	6.0 x 10.0	SV	S.A.	O	O/C	Rt	10Y					
1/2MS016D	M-35-1 M-120-1	2	C	6.0 x 10.0	SV	S.A.	O	O/C	Rt	10Y					

VALVE NUMBER	P&ID	CLASS	VALVE CATEGORY	VALVE SIZE (IN.)	VALVE TYPE	ACT. TYPE	NORMAL POSITION	STROKE DIRECT.	TEST METHOD	TEST FREQ.	NOTES	TECH. POS. (VA)	COLD SHUTDOWN JUST.	REFUELING OUTAGE JUST.	RELIEF REQUEST
1/2MS017A	M-35-2 M-120-2A	2	C	6.0 x 10.0	SV	S.A.	O	O/C	Rt	10Y					
1/2MS017B	M-35-1 M-120-1	2	C	6.0 x 10.0	SV	S.A.	O	O/C	Rt	10Y					
1/2MS017C	M-35-2 M-120-2B	2	C	6.0 x 10.0	SV	S.A.	O	O/C	Rt	10Y					
1/2MS017D	M-35-1 M-120-1	2	C	6.0 x 10.0	SV	S.A.	O	O/C	Rt	10Y					
1/2MS018A	M-35-2 M-120-2A	2	B	6.0 x 6.0	PORV	H.O.	C	C/O	St It Fc	Q 2Y Q		1,3 4 2			
1/2MS018B	M-35-1 M-120-1	2	B	6.0 x 6.0	PORV	H.O.	C	C/O	St It Fc	Q 2Y Q		1,3 4 2			
1/2MS018C	M-35-2 M-120-2B	2	B	6.0 x 6.0	PORV	H.O.	C	C/O	St It Fc	Q 2Y Q		1,3 4 2			
1/2MS018D	M-35-1 M-120-1	2	B	6.0 x 6.0	PORV	H.O.	C	C/O	St It Fc	Q 2Y Q		1,3 4 2			
1/2MS019A	M-35-2 M-120-2A	2	B	8.0	GA	M	O	C	St	Q	6				
1/2MS019B	M-35-1 M-120-1	2	B	8.0	GA	M	O	C	St	Q	6				
1/2MS019C	M-35-2 M-120-2B	2	B	8.0	GA	M	O	C	St	Q	6				
1/2MS019D	M-35-1 M-120-1	2	B	8.0	GA	M	O	C	St	Q	6				
1/2MS101A	M-35-2 M-120-2A	2	B	4.0	GA	A.O.	C	C	St It Fc	Q 2Y Q		1,3 4 2			
1/2MS101B	M-35-1 M-120-1	2	B	4.0	GA	A.O.	C	C	St It Fc	Q 2Y Q		1,3 4 2			
1/2MS101C	M-35-1 M-120-2B	2	B	4.0	GA	A.O.	C	C	St It Fc	Q 2Y Q		1,3 4 2			
1/2MS101D	M-35-1 M-120-1	2	B	4.0	GA	A.O.	C	C	St It Fc	Q 2Y Q		1,3 4 2			

VALVE NUMBER	P&ID	CLASS	VALVE CATEGORY	VALVE SIZE (IN.)	VALVE TYPE	ACT. TYPE	NORMAL POSITION	STROKE DIRECT.	TEST METHOD	TEST FREQ.	NOTES	TECH. POS. (VA)	COLD SHUTDOWN JUST.	REFUELING OUTAGE JUST.	RELIEF REQUEST
1/2OG057A	M-47-2 M-150-2	2	A	3.0	BTF	M.O.	C	C/O	Lt St It	AJ Q 2Y	1	 1,3 4			
00GJ059	M-47-2	2	B	2.0	BF	M.O.	C	O	St It	Q 2Y		1,3 4			
00G061	M-47-2	2	B	2.0	BF	M.O.	C	O	St It	Q 2Y		1,3 4			
00G062	M-47-2	2	B	2.0	BF	M.O.	C	O	St It	Q 2Y		1,3 4			
00G063	M-47-2	2	B	2.0	BF	M.O.	C	O	St It	Q 2Y		1,3 4			
00G064	M-47-2	2	B	2.0	BF	M.O.	C	O	St It	Q 2Y		1,3 4			
00G065	M-150-2	2	B	2.0	BF	M.O.	C	O	St It	Q 2Y		1,3 4			
1/2OG079	M-47-2 M-150-2	2	A	3.0	BTF	M.O.	C	C/O	Lt St It	AJ Q 2Y	1	 1,3 4			
1/2OG080	M-47-2 M-150-2	2	A	3.0	BTF	M.O.	C	C/O	Lt St It	AJ Q 2Y	1	 1,3 4			
1/2OG081	M-47-2 M-150-2	2	A	3.0	BTF	M.O.	C	C/O	Lt St It	AJ Q 2Y	1	 1,3 4			
1/2OG082	M-47-2 M-150-2	2	A	3.0	BTF	M.O.	C	C/O	Lt St It	AJ Q 2Y	1	 1,3 4			
1/2OG083	M-47-2 M-150-2	2	A	3.0	BTF	M.O.	C	C/O	Lt St It	AJ Q 2Y	1	 1,3 4			
1/2OG084	M-47-2 M-150-2	2	A	3.0	BTF	M.O.	C	C/O	Lt St It	AJ Q 2Y	1	 1,3 4			
1/2OG085	M-47-2 M-150-2	2	A	3.0	BTF	M.O.	C	C/O	Lt St It	AJ Q 2Y	1	 1,3 4			

VALVE NUMBER	P&ID	CLASS	VALVE CATEGORY	VALVE SIZE (IN.)	VALVE TYPE	ACT. TYPE	NORMAL POSITION	STROKE DIRECT.	TEST METHOD	TEST FREQ.	NOTES	TECH. POS. (VA)	COLD SHUTDOWN JUST.	REFUELING OUTAGE JUST.	RELIEF REQUEST
1/2PR001A	M-78-10 M-151-1	2	A	1.0	GL	A.O.	O	C	Lt Fc St It	AJ Q Q 2Y	1	 2 1,3 4			
1/2PR001B	M-78-10 M-151-1	2	A	1.0	GL	A.O.	O	C	Lt Fc St It	AJ Q Q 2Y	1	 2 1,3 4			
1/2PR002E	M-78-6	2	A	2.0	GL	M	C	C	Lt	AJ	1				
1/2PR002F	M-78-6	2	A	2.0	GL	M	C	C	Lt	AJ	1				
1/2PR002G	M-78-6	2	AC	2.0	CK	S.A.	C	C	Lt/Bt	AJ	1				VR-1
1/2PR002H	M-78-6	2	AC	2.0	CK	S.A.	C	C	Lt/Bt	AJ	1				VR-1
1/2PR032	M-78-10 M-151-1	2	AC	1.0	CK	S.A.	C	C	Lt/Bt	AJ	1				VR-1
1/2PR033A	M-78-6	2	A	2.0	GL	M	C	C	Lt	AJ	1				
1/2PR033B	M-78-6	2	A	2.0	GL	M	C	C	Lt	AJ	1				
1/2PR033C	M-78-6	2	A	2.0	GL	M	C	C	Lt	AJ	1				
1/2PR033D	M-78-6	2	A	2.0	GL	M	C	C	Lt	AJ	1				
1/2PR066	M-78-10 M-151-1	2	A	1.0	GL	A.O.	O	C	Lt Fc It St	AJ Q 2Y Q	1	 2 4 1,3			

VALVE NUMBER	P&ID	CLASS	VALVE CATEGORY	VALVE SIZE (IN.)	VALVE TYPE	ACT. TYPE	NORMAL POSITION	STROKE DIRECT.	TEST METHOD	TEST FREQ.	NOTES	TECH. POS. (VA)	COLD SHUTDOWN JUST.	REFUELING OUTAGE JUST.	RELIEF REQUEST
1/2PS228A	M-68-7 M-140-6	2	A	0.5	GL	S.O.	O	C/O	Lt St Fc It	AJ Q Q AJ	1 5	 1,3 2 4			 VR-1
1/2PS228B	M-68-7 M-140-6	2	A	0.5	GL	S.O.	O	C/O	Lt St Fo It	AJ Q Q AJ	1 5	 1,3 2 4			 VR-1
1/2PS229A	M-68-7 M-140-6	2	A	0.5	GL	S.O.	O	C/O	Lt St Fo It	AJ Q Q AJ	1 5	 1,3 2 4			 VR-1
1/2PS229B	M-68-7 M-140-6	2	A	0.5	GL	S.O.	O	C/O	Lt St Fc It	AJ Q Q AJ	1 5	 1,3 2 4			 VR-1
1/2PS230A	M-68-7 M-140-6	2	A	1.0	GL	S.O.	C	C/O	Lt St Fc It	AJ Q Q AJ	1 5	 1,3 2 4			 VR-1
1/2PS230B	M-68-7 M-140-6	2	A	1.0	GL	S.O.	C	C/O	Lt St Fc It	AJ Q Q AJ	1 5	 1,3 2 4			 VR-1
1/2PS231A	M-68-7 M-140-6	2	A/C	.75	CK	S.A.	C	C O	Lt/Bt Ct	AJ Q	1 2				VR-1
1/2PS231B	M-68-7 M-140-6	2	A/C	.75	CK	S.A.	C	C O	Lt/Bt Ct	AJ Q	1 2				VR-1
1/2PS9354A	M-68-1B M-140-1	2	A	1.0	GL	A.O.	C	C	St Lt It Fc	Q AJ 2Y Q	 1 	1,3 4 2			
1/2PS9354B	M-68-1B M-140-1	2	A	1.0	GL	A.O.	C	C	St Lt It Fc	Q AJ 2Y Q	 1 	1,3 4 2			

VALVE NUMBER	P&ID	CLASS	VALVE CATEGORY	VALVE SIZE (IN.)	VALVE TYPE	ACT. TYPE	NORMAL POSITION	STROKE DIRECT.	TEST METHOD	TEST FREQ.	NOTES	TECH. POS. (VA)	COLD SHUTDOWN JUST.	REFUELING OUTAGE JUST.	RELIEF REQUEST
1/2PS9355A	M-68-1B M-140-1	2	A	1.0	GL	A.O.	C	C	St Lt It Fc	Q AJ 2Y Q	1	1,3 4 2			
1/2PS9355B	M-68-1B M-140-1	2	A	1.0	GL	A.O.	C	C	St Lt It Fc	Q AJ 2Y Q	1	1,3 4 2			
1/2PS9356A	M-68-1A M-140-1	2	A	1.0	GL	A.O.	C	C	St Lt It Fc	Q AJ 2Y Q	1	1,3 4 2			
1/2PS9356B	M-68-1A M-140-1	2	A	1.0	GL	A.O.	C	C	St Lt It Fc	Q AJ 2Y Q	1	1,3 4 2			
1/2PS9357A	M-68-1B M-140-1	2	A	1.0	GL	A.O.	C	C	St Lt It Fc	Q AJ 2Y Q	1	1,3 4 2			
1/2PS9357B	M-68-1B M-140-1	2	A	1.0	GL	A.O.	C	C	St Lt It Fc	Q AJ 2Y Q	1	1,3 4 2			

VALVE NUMBER	P&ID	CLASS	VALVE CATEGORY	VALVE SIZE (IN.)	VALVE TYPE	ACT. TYPE	NORMAL POSITION	STROKE DIRECT.	TEST METHOD	TEST FREQ.	NOTES	TECH. POS. (VA)	COLD SHUTDOWN JUST.	REFUELING OUTAGE JUST.	RELIEF REQUEST
1/2RC014A	M-60-1B M-135-1B	1	B	1.0	GL	S.O.	C	O/C	St Fc It	CS CS 2Y	 5	1,3 2 4	VC-6 VC-6		
1/2RC014B	M-60-1B M-135-1B	1	B	1.0	GL	S.O.	C	O/C	St Fc It	CS CS 2Y	 5	1,3 2 4	VC-6 VC-6		
1/2RC014C	M-60-1B M-135-1B	1	B	1.0	GL	S.O.	C	O/C	St Fc It	CS CS 2Y	 5	1,3 2 4	VC-6 VC-6		
1/2RC014D	M-60-1B M-135-1B	1	B	1.0	GL	S.O.	C	O/C	St Fc It	CS CS 2Y	 5	1,3 2 4	VC-6 VC-6		

VALVE NUMBER	P&ID	CLASS	VALVE CATEGORY	VALVE SIZE (IN.)	VALVE TYPE	ACT. TYPE	NORMAL POSITION	STROKE DIRECT.	TEST METHOD	TEST FREQ	NOTES	TECH. POS. (VA)	COLD SHUTDOWN JUST.	REFUELING OUTAGE JUST.	RELIEF REQUEST
1/2RE1003	M-70-1 M-141-1	2	A	3.0	D	A.O.	C	C	St	Q		1,3			
									Lt	AJ	1				
									It	2Y		4			
									Fc	Q		2			
1/2RE9157	M-70-1 M-141-1	2	A	1.0	D	A.O.	O	C	St	Q		1,3			
									Lt	AJ	1				
									It	2Y		4			
									Fc	Q		2			
1/2RE9159A	M-70-1 M-141-1	2	A	.75	D	A.O.	O	C	St	Q		1,3			
									Lt	AJ	1				
									It	2Y		4			
									Fc	Q		2			
1/2RE9159B	M-70-1 M-141-1	2	A	.75	D	A.O.	C	C	St	Q		1,3			
									Lt	AJ	1				
									It	2Y		4			
									Fc	Q		2			
1/2RE9160A	M-70-1 M-141-1	2	A	1.0	D	A.O.	O	C	St	Q		1,3			
									Lt	AJ	1				
									It	2Y		4			
									Fc	Q		2			
1/2RE9160B	M-70-1 M-141-1	2	A	1.0	D	A.O.	O	C	St	Q		1,3			
									Lt	AJ	1				
									It	2Y		4			
									Fc	Q		2			
1/2RE9170	M-70-1 M-141-1	2	A	3.0	D	A.O.	O	C	St	Q		1,3			
									Lt	AJ	1				
									It	2Y		4			
									Fc	Q		2			

VALVE NUMBER	P&ID	CLASS	VALVE CATEGORY	VALVE SIZE (IN.)	VALVE TYPE	ACT. TYPE	NORMAL POSITION	STROKE DIRECT.	TEST METHOD	TEST FREQ	NOTES	TECH. POS. (VA)	COLD SHUTDOWN JUST.	REFUELING OUTAGE JUST.	RELIEF REQUEST
1/2RF026	M-48-6B	2	A	2.0	P	A.O.	O	C	St	Q		1,3			
									Lt	AJ	1				
									It	2Y		4			
									Fc	Q		2			
1/2RF027	M-48-6A	2	A	2.0	P	A.O.	O	C	St	Q		1,3			
									Lt	AJ	1				
									It	2Y		4			
									Fc	Q		2			

VALVE NUMBER	P&ID	CLASS	VALVE CATEGORY	VALVE SIZE (IN.)	VALVE TYPE	ACT. TYPE	NORMAL POSITION	STROKE DIRECT.	TEST METHOD	TEST FREQ.	NOTES	TECH. POS. (VA)	COLD SHUTDOWN JUST.	REFUELING OUTAGE JUST.	RELIEF REQUEST
1/2RH610	M-62 M-137	2	B	3.0	GA	M.O.	O	C/O	St It	Q 2Y		1,3 4			
1/2RH611	M-62 M-137	2	B	3.0	GA	M.O.	O	C/O	St It	Q 2Y		1,3 4			
1/2RH8701A	M-62 M-137	1	A	12.0	GA	M.O.	C	O/C	St It Lt	CS CSTS		1,3 4	VC-5 VC-15		
1/2RH8701B	M-62 M-137	1	A	12.0	GA	M.O.	C	O/C	St It Lt	CS 2Y CSTS		1,3 4	VC-5 VC-15		
1/2RH8702A	M-62 M-137	1	A	12.0	GA	M.O.	C	O/C	St It Lt	CS 2Y CSTS		1,3 4	VC-5 VC-15		
1/2RH8702B	M-62 M-137	1	A	12.0	GA	M.O.	C	O/C	St It Lt	CS 2Y CSTS		1,3 4	VC-5 VC-15		
1/2RH8705A	M-62 M-137	2	AC	.75	CK	S.A.	C	C O	Lt/Bt Ct	CSTS RR	8		VC-15	ROJ-9	
1/2RH8705B	M-62 M-137	2	AC	.75	CK	S.A.	C	C O	Lt/Bt Ct	CSTS RR	8		VC-15	ROJ-9	
1/2RH8708A	M-62 M-137	2	C	3.0 x 4.0	RV	S.A.	C	O C	Rt	10Y					
1/2RH8708B	M-62 M-137	2	C	3.0 x 4.0	RV	S.A.	C	O C	Rt	10Y					
1/2RH8716A	M-62 M-137	2	B	8.0	GA	M.O.	O	C/O	St It	CS 2Y		1,3 4	VC-18		
1/2RH8716B	M-62 M-137	2	B	8.0	GA	M.O.	O	C/O	St It	CS 2Y		1,3 4	VC-18		
1/2RH8730A	M-62 M-137	2	C	8.0	CK	S.A.	C	O C	Ct/Xt Bt	CS/Q CS			VC-7 VC-7		
1/2RH8730B	M-62 M-137	2	C	8.0	CK	S.A.	C	O C	Ct/Xt Bt	CS/Q CS			VC-7 VC-7		

VALVE NUMBER	P&ID	CLASS	VALVE CATEGORY	VALVE SIZE (IN.)	VALVE TYPE	ACT. TYPE	NORMAL POSITION	STROKE DIRECT.	TEST METHOD	TEST FREQ	NOTES	TECH. PGS. (VA)	COLD SHUTDOWN JUST.	REFUELING OUTAGE JUST.	RELIEF REQUEST
1/2RY030A	M-60-8 M-135-8	3	C	0.75x1.0	RV	S.A.	C	O/C	Rt	10Y					
1/2RY030B	M-60-8 M-135-8	3	C	0.75x1.0	RV	S.A.	C	O/C	Rt	10Y					
1/2RY075	M-2060-6 M-2135-6	2	A	0.5	GL	M	C	C	Lt	AJ	1				
1/2RY455A	M-60-5 M-135-5	1	B	3.0	PORV	A.O.	C	O/C	St It Fc	CS RR CS	12	1,3 4 2	VC-14 VC-14		
1/2RY456	M-60-5 M-135-5	1	B	3.0	PORV	A.O.	C	O/C	St It Fc	CS RR CS	12	1,3 4 2	VC-14 VC-14		
1/2RY8000A	M-60-5 M-135-5	1	B	3.0	GA	M.O.	O	C	St It	O RR	12	1,3 4			
1/2RY8000B	M-60-5 M-135-5	1	B	3.0	GA	M.O.	O	C	St It	O RR	12	1,3 4			
1/2RY8010A	M-60-5 M-135-5	1	C	6.0	SV	S.A.	C	O/C	Rt It	5Y RR	12	4			
1/2RY8010B	M-60-5 M-135-5	1	C	6.0	SV	S.A.	C	O/C	Rt It	5Y RR	12	4			
1/2RY8010C	M-60-5 M-135-5	1	C	6.0	SV	S.A.	C	O/C	Rt It	5Y RR	12	4			
1/2RY8025	M-60-6 M-135-6	2	A	.375	GL	A.O.	C	C	St Lt It Fc	O AJ RR O	1 12	1,3 4 2			
1/2RY8026	M-60-6 M-135-6	2	A	.375	GL	A.O.	O	C	St Lt It Fc	O AJ RR O	1 12	1,3 4 2			
1/2RY8028	M-60-6 M-135-6	2	A	.75	D	A.O.	O	C	St Lt It Fc	O AJ RR O	1 12	1,3 4 2			
1/2RY8033	M-60-6 M-135-6	2	A	0.8	D	A.O.	O	C	St Lt It Fc	O AJ RR O	1 12	1,3 4 2			
1/2RY8046	M-60-6 M-135-6	2	AC	3.0	CK	S.A.	C	C	Lt/Bt	AJ	1				VR-1

VALVE NUMBER	P&ID	CLASS	VALVE CATEGORY	VALVE SIZE (IN.)	VALVE TYPE	ACT. TYPE	NORMAL POSITION	STROKE DIRECT.	TEST METHOD	TEST FREQ.	NOTES	TECH. POS. (VA)	COLD SHUTDOWN JUST.	REFUELING OUTAGE JUST.	RELIEF REQUEST
1/2RY8047	M-60-6 M-135-6	2	AC	0.75	CK	S.A.	C	C	Lt/Bt	A.J	1				VR-1

VALVE NUMBER	P&ID	CLASS	VALVE CATEGORY	VALVE SIZE (IN.)	VALVE TYPE	ACT. TYPE	NORMAL POSITION	STROKE DIRECT.	TEST METHOD	TEST FREQ	NOTES	TECH. POS. (VA)	COLD SHUTDOWN JUST.	REFUELING OUTAGE JUST.	RELIEF REQUEST
1/2SA032	M-54-2	2	A	1.5	GA	A.O.	O	C	Lt St It Fc	AJ Q 2Y Q	1	 1,3 4 2			
1/2SA033	M-54-2	2	A	1.5	GA	A.O.	O	C	Lt St It Fc	AJ Q 2Y Q	1	 1,3 4 2			
1/2SA148A	M-54-4A M-54-4B	3	C	0.75	RV	S.A.	C	O/C	Rt	10Y	13				
1/2SA148B	M-54-4A M-54-4B	3	C	0.75	RV	S.A.	C	O/C	Rt	10Y	13				
1/2SA148C	M-54-4A M-54-4B	3	C	0.75	RV	S.A.	C	O/C	Rt	10Y	13				
1/2SA148D	M-54-4A M-54-4B	3	C	0.75	RV	S.A.	C	O/C	Rt	10Y	13				

VALVE NUMBER	P&ID	CLASS	VALVE CATEGORY	VALVE SIZE (IN.)	VALVE TYPE	ACT. TYPE	NORMAL POSITION	STROKE DIRECT.	TEST METHOD	TEST FREQ	NOTES	TECH. POS. (VA)	COLD SHUTDOWN JUST.	REFUELING OUTAGE JUST.	RELIEF REQUEST
1/2SD002A	M-48-5A/B	2	A	2.0	GL	A.O.	O	C	Lt	RR	11				
									St	Q		1,3			
									It	2Y		4			
									Fc	Q		2			
1/2SD002B	M-48-5A/B	2	A	2.0	GL	A.O.	O	C	Lt	RR	11				
									St	Q		1,3			
									It	2Y		4			
									Fc	Q		2			
1/2SD002C	M-48-5A/B	2	A	2.0	GL	A.O.	O	C	Lt	RR	11				
									St	Q		1,3			
									It	2Y		4			
									Fc	Q		2			
1/2SD002D	M-48-5A/B	2	A	2.0	GL	A.O.	O	C	Lt	RR	11				
									St	Q		1,3			
									It	2Y		4			
									Fc	Q		2			
1/2SD002E	M-48-5A/B	2	A	2.0	GL	A.O.	O	C	Lt	RR	11				
									St	Q		1,3			
									It	2Y		4			
									Fc	Q		2			
1/2SD002F	M-48-5A/B	2	A	2.0	GL	A.O.	O	C	Lt	RR	11				
									St	Q		1,3			
									It	2Y		4			
									Fc	Q		2			
1/2SD002G	M-48-5A/B	2	A	2.0	GL	A.O.	O	C	Lt	RR	11				
									St	Q		1,3			
									It	2Y		4			
									Fc	Q		2			
1/2SD002H	M-48-5A/B	2	A	2.0	GL	A.O.	O	C	Lt	RR	11				
									St	Q		1,3			
									It	2Y		4			
									Fc	Q		2			

VALVE NUMBER	P&ID	CLASS	VALVE CATEGORY	VALVE SIZE (IN.)	VALVE TYPE	ACT. TYPE	NORMAL POSITION	STROKE DIRECT.	TEST METHOD	TEST FREQ.	NOTES	TECH. POS. (VA)	COLD SHUTDOWN JUST.	REFUELING OUTAGE JUST.	RELIEF REQUEST
1/2SD005A	M-48-5A/B	2	A	0.375	GL	A.O.	O	C	St	Q		1,3			
									Lt	RR	11				
									It	2Y		4			
									Fc	Q		2			
1/2SD005B	M-48-5A/B	2	A	0.375	GL	A.O.	O	C	St	Q		1,3			
									Lt	RR	11				
									It	2Y		4			
									Fc	Q		2			
1/2SD005C	M-48-5A/B	2	A	0.375	GL	A.O.	O	C	St	Q		1,3			
									Lt	RR	11				
									It	2Y		4			
									Fc	Q		2			
1/2SD005D	M-48-5A/B	2	A	0.375	GL	A.O.	O	C	St	Q		1,3			
									Lt	RR	11				
									It	2Y		4			
									Fc	Q		2			
1SD054A	M-48-5A	2	B	2.0	GL	A.O.	O	C	St/Fc	CS	4	1,2,3	VC-23		
1/2SD054B	M-48-5A M-48-5B	2	B	2.0	GL	A.O.	O	C	St/Fc	CS	4	1,2,3	VC-23		
1SD054C	M-48-5A	2	B	2.0	GL	A.O.	O	C	St/Fc	CS	4	1,2,3	VC-23		
1/2SD054D	M-48-5A M-48-5B	2	B	2.0	GL	A.O.	O	C	St/Fc	CS	4	1,2,3	VC-23		
1SD054E	M-48-5A	2	B	2.0	GL	A.O.	O	C	St/Fc	CS	4	1,2,3	VC-23		
1/2SD054F	M-48-5A M-48-5B	2	B	2.0	GL	A.O.	O	C	St/Fc	CS	4	1,2,3	VC-23		
1SD054G	M-48-5A	2	B	2.0	GL	A.O.	O	C	St/Fc	CS	4	1,2,3	VC-23		
1/2SD054H	M-48-5A M-48-5B	2	B	2.0	GL	A.O.	O	C	St/Fc	CS	4	1,2,3	VC-23		

VALVE NUMBER	P&ID	CLASS	VALVE CATEGORY	VALVE SIZE (IN.)	VALVE TYPE	ACT. TYPE	NORMAL POSITION	STROKE DIRECT.	TEST METHOD	TEST FREQ.	NOTES	TECH. POS. (VA)	COLD SHUTDOWN JUST.	REFUELING OUTAGE JUST.	RELIEF REQUEST
1/2SI121A	M-61-4 M-136-4	2	C	0.75x1.0	RV	S.A.	C	O/C	Rt	10Y	14				
1/2SI121B	M-61-4 M-136-4	2	C	0.75x1.0	RV	S.A.	C	O/C	Rt	10Y	14				
1/2SI8801A	M-61-2 M-136-2	2	B	4.0	GA	M.O.	C	O/C	St lt	CS 2Y		1,3 4	VC-12		
1/2SI8801B	M-61-2 M-136-2	2	B	4.0	GA	M.O.	C	O/C	St lt	CS 2Y		1,3 4	VC-12		
1/2SI8802A	M-61-3 M-136-3	2	B	4.0	GA	M.O.	C	O/C	St lt	CS 2Y		1,3 4	VC-13		
1/2SI8802B	M-61-3 M-136-3	2	B	4.0	GA	M.O.	C	O/C	St lt	CS 2Y		1,3 4	VC-13		
1/2SI8804B	M-61-1A M-136-1	2	B	8.0	GA	M.O.	C	O	St lt	Q 2Y		1,3 4			
1/2SI8806	M-61-1A M-136-1	2	B	8.0	GA	M.O.	O	C	St lt	CS 2Y		1,3 4	VC-13		
1/2SI8807A	M-61-1A M-136-1	2	B	6.0	GA	M.O.	C	O	St lt	Q 2Y		1,3 4			
1/2SI8807B	M-61-1A M-136-1	2	B	6.0	GA	M.O.	C	O	St lt	Q 2Y		1,3 4			
1/2SI8808A	M-61-5 M-136-5	1	B	10.0	GT	M.O.	O	O/C	St lt	CS 2Y		1,3 4	VC-21		
1/2SI8808B	M-61-5 M-136-5	1	B	10.0	GT	M.O.	O	O/C	St lt	CS 2Y		1,3 4	VC-21		
1/2SI8808C	M-61-6 M-136-6	1	B	10.0	GT	M.O.	O	O/C	St lt	CS 2Y		1,3 4	VC-21		
1/2SI8808D	M-61-6 M-136-6	1	B	10.0	GT	M.O.	O	O/C	St lt	CS 2Y		1,3 4	VC-21		
1/2SI8809A	M-61-4 M-136-4	2	B	8.0	GA	M.O.	O	O/C	St lt	CS 2Y		1,3 4	VC-13		
1/2SI8809B	M-61-4 M-136-4	2	B	8.0	GA	M.O.	O	O/C	St lt	CS 2Y		1,3 4	VC-13		
1/2SI8811A	M-61-4 M-136-4	2	B	24.0	GA	M.O.	C	O/C	St lt	RR 2Y		1,3 4		ROJ-4	
1/2SI8811B	M-61-4 M-136-4	2	B	24.0	GA	M.O.	C	O/C	St lt	RR 2Y		1,3 4		ROJ-4	
1/2SI8812A	M-61-4 M-136-4	2	B	12.0	GA	M.O.	O	C	St lt	Q 2Y		1,3 4			
1/2SI8812B	M-61-4 M-136-4	2	B	12.0	GA	M.O.	O	C	St lt	Q 2Y		1,3 4			

VALVE NUMBER	P&ID	CLASS	VALVE CATEGORY	VALVE SIZE (IN.)	VALVE TYPE	ACT. TYPE	NORMAL POSITION	STROKE DIRECT.	TEST METHOD	TEST FREQ.	NOTES	TECH. POS. (VA)	COLD SHUTDOWN JUST.	REFUELING OUTAGE JUST.	RELIEF REQUEST
1/2SI8813	M-61-1B M-136-1	2	B	2.0	GL	M.O.	O	C	St It	CS 2Y		1,3 4	VC-13		
1/2SI8814	M-61-1A M-136-1	2	B	1.5	GL	M.O.	O	C	St It	O 2Y		1,3 4			
1/2SI8815	M-61-2 M-136-2	1	AC	3.0	CK	S.A.	C	O C	Ct Lt/Bt	RR CSTS			VC-15	ROJ-7	
1/2SI8818A	M-61-4 M-136-4	1	AC	6.0	CK	S.A.	C	O C	Ct Lt/Bt	CS CSTS	7		VC-8 VC-15		
1/2SI8818B	M-61-4 M-136-4	1	AC	6.0	CK	S.A.	C	O C	Ct Lt/Bt	CS CSTS	7		VC-8 VC-15		
1/2SI8818C	M-61-4 M-136-4	1	AC	6.0	CK	S.A.	C	O C	Ct Lt/Bt	CS CSTS	7		VC-8 VC-15		
1/2SI8818D	M-61-4 M-136-4	1	AC	6.0	CK	S.A.	C	O C	Ct Lt/Bt	CS CSTS	7		VC-8 VC-15		
1/2SI8819A	M-61-3 M-136-3	1	AC	2.0	CK	S.A.	C	O C	Lt/Bt Ct	CSTS RR	7		VC-15	ROJ-6	
1/2SI8819B	M-61-3 M-136-3	1	AC	2.0	CK	S.A.	C	O C	Lt/Bt Ct	CSTS RR	7		VC-15	ROJ-6	
1/2SI8819C	M-61-3 M-136-3	1	AC	2.0	CK	S.A.	C	O C	Lt/Bt Ct	CSTS RR	7		VC-15	ROJ-6	
1/2SI8819D	M-61-3 M-136-3	1	AC	2.0	CK	S.A.	C	O C	Lt/Bt Ct	CSTS RR	7		VC-15	ROJ-6	
1/2SI8821A	M-61-3 M-136-3	2	B	4.0	GA	M.O.	O	C/O	St It	O 2Y		1,3 4			
1/2SI8821B	M-61-3 M-136-3	2	B	4.0	GA	M.O.	O	C/O	St It	O 2Y		1,3 4			
1/2SI8835	M-61-3 M-136-3	2	B	4.0	GA	M.O.	O	C/O	St It	CS 2Y		1,3 4	VC-13		
1/2SI8840	M-61-3 M-136-3	2	B	12.0	GA	M.O.	C	C/O	St It	CS 2Y		1,3 4	VC-13		
1/2SI8841A	M-61-3 M-136-3	1	AC	8.0	CK	S.A.	C	C O	Lt/Bt Ct	CSTS RR			VC-15	ROJ-8	
1/2SI8841B	M-61-3 M-136-3	1	AC	8.0	CK	S.A.	C	C O	Lt/Bt Ct	CSTS RR			VC-15	ROJ-8	
1/2SI8842	M-61-3 M-136-3	2	C	0.75x1.0	RV	S.A.	C	O/C	Rt	10Y					
1/2SI8851	M-61-3 M-136-3	2	C	0.75x1.0	RV	S.A.	C	O/C	Rt	10Y					
1/2SI8853A	M-61-3 M-136-3	2	C	0.75x1.0	RV	S.A.	C	O/C	Rt	10Y					

VALVE NUMBER	P&ID	CLASS	VALVE CATEGORY	VALVE SIZE (IN.)	VALVE TYPE	ACT. TYPE	NORMAL POSITION	STROKE DIRECT.	TEST METHOD	TEST FREQ	NOTES	TECH. POS. (VA)	COLD SHUTDOWN JUST.	REFUELING OUTAGE JUST.	RELIEF REQUEST
1/2SI8853B	M-61-3 M-136-3	2	C	0.75x1.0	RV	S.A.	C	O/C	Rt	10Y					
1/2SI8855A	M-61-5 M-136-5	2	C	2.0x1.0	RV	S.A.	C	O/C	Rt	10Y					
1/2SI8855B	M-61-5 M-136-5	2	C	2.0x1.0	RV	S.A.	C	O/C	Rt	10Y					
1/2SI8855C	M-61-6 M-136-6	2	C	2.0x1.0	RV	S.A.	C	O/C	Rt	10Y					
1/2SI8855D	M-61-6 M-136-6	2	C	2.0x1.0	RV	S.A.	C	O/C	Rt	10Y					
1/2SI8856A	M-61-4 M-136-4	2	C	2.0x3.0	RV	S.A.	C	O/C	Rt	10Y					
1/2SI8856B	M-61-4 M-136-4	2	C	2.0x3.0	RV	S.A.	C	O/C	Rt	10Y					
1/2SI8858	M-61-1A M-136-1	2	C	1.0x0.75	RV	S.A.	C	O/C	Rt	10Y					
1/2SI8871	M-61-6 M-136-6	2	A	.75	GL	A.O.	C	C	St Lt It Fc	Q AJ 2Y Q	 1 	1,3 4 2			
1/2SI8880	M-61-6 M-136-6	2	A	1.0	GL	A.O.	C	C	St Lt It Fc	Q AJ 2Y Q	 1 	1,3 4 2			
1/2SI8888	M-61-3 M-136-3	2	A	.75	GL	A.O.	C	C	St Lt It Fc	Q AJ 2Y Q	 1 	1,3 4 2			
1/2SI8900A	M-61-2 M-136-2	1	AC	1.5	CK	S.A.	C	O C	Ct Lt/Bt	RR CSTS			VC-15	ROJ-7	
1/2SI8900B	M-61-2 M-136-2	1	AC	1.5	CK	S.A.	C	O C	Ct Lt/Bt	RR CSTS			VC-15	ROJ-7	
1/2SI8900C	M-61-2 M-136-2	1	AC	1.5	CK	S.A.	C	O C	Ct Lt/Bt	RR CSTS			VC-15	ROJ-7	
1/2SI8900D	M-61-2 M-136-2	1	AC	1.5	CK	S.A.	C	O C	Ct Lt/Bt	RR CSTS			VC-15	ROJ-7	
1/2SI8905A	M-61-3 M-136-3	1	AC	2.0	CK	S.A.	C	O C	Ct Lt/Bt	RR CSTS			VC-15	ROJ-6	
1/2SI8905B	M-61-3 M-136-3	1	AC	2.0	CK	S.A.	C	O C	Ct Lt/Bt	RR CSTS			VC-15	ROJ-6	

VALVE NUMBER	P&ID	CLASS	VALVE CATEGORY	VALVE SIZE (IN.)	VALVE TYPE	ACT. TYPE	NORMAL POSITION	STROKE DIRECT.	TEST METHOD	TEST FREQ	NOTES	TECH. POS. (VA)	COLD SHUTDOWN JUST.	REFUELING OUTAGE JUST.	RELIEF REQUEST
1/2SI8905C	M-61-3	1	AC	2.0	CK	S.A.	C	O	Ct	RR				ROJ-6	
	M-136-3							C	Lt/Bt	CSTS			VC-15		
1/2SI8905D	M-61-3	1	AC	2.0	CK	S.A.	C	O	Ct	RR				ROJ-6	
	M-136-3							C	Lt/Bt	CSTS			VC-15		
1/2SI8919A	M-61-1A	2	C	1.5	CK	S.A.	C	O	Ct	Q	9				
	M-136-1							C	Bt	Q					
1/2SI8919B	M-61-1A	2	C	1.5	CK	S.A.	O	O	Ct	Q	9				
	M-136-1							C	Bt	Q					
1/2SI8920	M-61-1A	2	B	1.5	GL	M.O.	O	C	St	Q		1,3			
	M-136-1								It	2Y		4			
1/2SI8922A	M-61-1A	2	C	4.0	CK	S.A.	C	O	Ct	RR				ROJ-6	
	M-136-1							C	Bt	Q					
1/2SI8922B	M-61-1A	2	C	4.0	CK	S.A.	C	O	Ct	RR				ROJ-6	
	M-136-1							C	Bt	Q					
1/2SI8924	M-61-1A	2	B	6.0	GA	M.O.	O	C/O	St	Q		1,3			
	M-136-1								It	2Y		4			
1/2SI8926	M-61-1A	2	C	8.0	CK	S.A.	C	O	Ct/Xt	RR/Q		3		ROJ-6	
	M-136-1														
1/2SI8948A	M-61-5	1	AC	10.0	CK	S.A.	C	C	Lt/Bt	CSTS	7		VC-15		
	M-136-5							O	Xt/Ct	CS/RR			VC-17	ROJ-2	
1/2SI8948B	M-61-5	1	AC	10.0	CK	S.A.	C	C	Lt/Bt	CSTS	7		VC-15		
	M-136-5							O	Xt/Ct	CS/RR			VC-17	ROJ-2	
1/2SI8948C	M-61-6	1	AC	10.0	CK	S.A.	C	C	Lt/Bt	CSTS			VC-15		
	M-136-6							O	Xt/Ct	CS/RR			VC-17	ROJ-2	
1/2SI8948D	M-61-6	1	AC	10.0	CK	S.A.	C	C	Lt/Bt	CSTS			VC-15		
	M-136-6							O	Xt/Ct	CS/RR			VC-17	ROJ-2	
1/2SI8949A	M-61-3	1	AC	6.0	CK	S.A.	C	C	Lt/Bt	CSTS			VC-15		
	M-136-3							O	Ct	RR				ROJ-8	
1/2SI8949B	M-61-3	1	AC	6.0	CK	S.A.	C	C	Lt/Bt	CSTS			VC-15		
	M-136-3							O	Ct	RR				ROJ-6	
1/2SI8949C	M-61-3	1	AC	6.0	CK	S.A.	C	C	Lt/Bt	CSTS			VC-15		
	M-136-3							O	Ct	RR				ROJ-8	
1/2SI8949D	M-61-3	1	AC	6.0	CK	S.A.	C	C	Lt/Bt	CSTS			VC-15		
	M-136-3							O	Ct	RR				ROJ-6	
1/2SI8956A	M-61-5	1	AC	10.0	CK	S.A.	C	C	Lt/Bt	CSTS			VC-15		
	M-136-5							O	Ct	RR				ROJ-2	
1/2SI8956B	M-61-5	1	AC	10.0	CK	S.A.	C	C	Lt/Bt	CSTS			VC-15		
	M-136-5							O	Ct	RR				ROJ-2	
1/2SI8956C	M-61-6	1	AC	10.0	CK	S.A.	C	C	Lt/Bt	CSTS			VC-15		
	M-136-6							O	Ct	RR				ROJ-2	

VALVE NUMBER	P&ID	CLASS	VALVE CATEGORY	VALVE SIZE (IN.)	VALVE TYPE	ACT. TYPE	NORMAL POSITION	STROKE DIRECT.	TEST METHOD	TEST FREQ.	NOTES	TECH. POS. (VA)	COLD SHUTDOWN JUST.	REFUELING OUTAGE JUST.	RELIEF REQUEST
1/2SI8956D	M-61-6 M-136-6	1	AC	10.0	CK	S.A.	C	C O	Lt/Bt Ct	CSTS RR			VC-15	ROJ-2	
1/2SI8958A	M-61-4 M-136-4	2	C	12.0	CK	S.A.	C	O C	Ct Bt	CS Q			VC-8		
1/2SI8958B	M-61-4 M-136-4	2	C	12.0	CK	S.A.	C	O C	Ct Bt	CS Q			VC-8		
1/2SI8964	M-61-6 M-136-6	2	A	.75	GL	A.O.	C	C	St Lt It Fc	Q AJ 2Y Q	1	1,3 4 2			
1/2SI8968	M-61-6 M-136-6	2	AC	1.0	CK	S.A.	C	C	Lt/Bt	AJ	1				VR-1

VALVE NUMBER	P&ID	CLASS	VALVE CATEGORY	VALVE SIZE (IN.)	VALVE TYPE	ACT. TYPE	NORMAL POSITION	STROKE DIRECT.	TEST METHOD	TEST FREQ	NOTES	TECH. POS. (VA)	COLD SHUTDOWN JUST.	REFUELING OUTAGE JUST.	RELIEF REQUEST
1/2SX002A	M-42-1B	3	C	36.0	CK	S.A.	C	O C	Ct Bt	Q Q					
1/2SX002B	M-42-1A	3	C	36.0	CK	S.A.	C	O C	Ct Bt	Q Q					
1/2SX005	M-42-1A	3	B	30.0	BF	M.O.	C	O	St It	Q 2Y		1,3 4			
0SX007	M-42-2A	3	B	24.0	BTF	M.O.	C	O	St It	Q 2Y		1,3 4			
1/2SX016A	M-42-5B M-126-3	2	B	16.0	BTF	M.O.	O	O/C	St It	Q 2Y		1,3 4			
1/2SX016B	M-42-5A M-126-3	2	B	16.0	BTF	M.O.	O	O/C	St It	Q 2Y		1,3 4			
1/2SX027A	M-42-5B M-126-3	2	B	16.0	BTF	M.O.	O	O/C	St It	Q 2Y		1,3 4			
1/2SX027B	M-42-5A M-126-3	2	B	16.0	BTF	M.O.	O	O/C	St It	Q 2Y		1,3 4			
0SX028A	M-42-6	3	C	8.0	CK	S.A.	C	O C	Ct Bt	Q 18m	10				VR-6
0SX028B	M-42-6	3	C	8.0	CK	S.A.	C	O C	Ct Bt	Q 18m	10				VR-6
1/2SX101A	M-42-3 M-126-1	3	B	1.5	GL	S.O.	C	O	St Fo	Q Q		 2			VR-3 VR-3
1/2SX112A	M-42-3 M-126-1	3	B	12.0	BTF	A.O.	O	C	St It Fc	Q 2Y Q		1,3 4 2			
1/2SX112B	M-42-3 M-126-1	3	B	12.0	BTF	A.O.	O	C	St It Fc	Q 2Y Q		1,3 4 2			
1/2SX114A	M-42-3 M-126-1	3	B	12.0	BTF	A.O.	O	C	St It Fc	Q 2Y Q		1,3 4 2			
1/2SX114B	M-42-3 M-126-1	3	B	12.0	BTF	A.O.	O	C	St It Fc	Q 2Y Q		1,3 4 2			
1/2SX116A	M-42-2B M-42-2B	3	C	3.0	CK	S.A.	O	O	Ct	Q					
1/2SX116B	M-42-2A M-42-2A	3	C	3.0	CK	S.A.	O	O	Ct	Q					

VALVE NUMBER	P&ID	CLASS	VALVE CATEGORY	VALVE SIZE (IN.)	VALVE TYPE	ACT. TYPE	NORMAL POSITION	STROKE DIRECT.	TEST METHOD	TEST FREQ	NOTES	TECH. POS. (VA)	COLD SHUTDOWN JUST.	REFUELING OUTAGE JUST.	RELIEF REQUEST
0SX127A	M-42-6	3	BC	8.0	CK	S.A.	C	O C	Ct Bt	18m RR				ROJ-1	VR-7
0SX127B	M-42-6	3	BC	8.0	CK	S.A.	C	O C	Ct Bt	18m RR				ROJ-1	VR-7
0SX143A	M-42-6	3	BC	8.0	CK	S.A.	O	C	Bt	RR				ROJ-1	
0SX143B	M-42-6	3	BC	8.0	CK	S.A.	O	C	Bt	RR				ROJ-1	
0SX146	M-42-2A	3	B	30.0	BTF	M.O.	C	O	St It	Q 2Y		1,3 4			
0SX147	M-42-2A	3	B	30.0	BTF	M.O.	C	O	St It	Q 2Y		1,3 4			
1/2SX147A	M-42-3 M-126-1	3	B	16.0	BTF	S.O.	N/A	O	St/Fo It	Q 2Y		1,2,3 4			
1/2SX147B	M-42-3 M-126-1	3	B	16.0	BTF	S.O.	N/A	O	St/Fo It	Q 2Y		1,2,3 4			
0SX162A	M-42-7	3	B	24.0	BF	M.O.	C	O/C	St It	Q 2Y		1,3 4			
0SX162B	M-42-7	3	B	24.0	BF	M.O.	C	O/C	St It	Q 2Y		1,3 4			
0SX162C	M-42-7	3	B	24.0	BF	M.O.	C	O/C	St It	Q 2Y		1,3 4			
0SX162D	M-42-7	3	B	24.0	BF	M.O.	C	O/C	St It	Q 2Y		1,3 4			
0SX163A	M-42-7	3	B	24.0	BF	M.O.	O	O/C	St It	Q 2Y		1,3 4			
0SX163B	M-42-7	3	B	24.0	BF	M.O.	O	O/C	St It	Q 2Y		1,3 4			
0SX163C	M-42-7	3	B	24.0	BF	M.O.	O	O/C	St It	Q 2Y		1,3 4			
0SX163D	M-42-7	3	B	24.0	BF	M.O.	O	O/C	St It	Q 2Y		1,3 4			
0SX163E	M-42-7	3	B	24.0	BF	M.O.	O	O/C	St It	Q 2Y		1,3 4			
0SX163F	M-42-7	3	B	24.0	BF	M.O.	O	O/C	St It	Q 2Y		1,3 4			
0SX163G	M-42-7	3	B	24.0	BF	M.O.	O	O/C	St It	Q 2Y		1,3 4			
0SX163H	M-42-7	3	B	24.0	BF	M.O.	O	O/C	St It	Q 2Y		1,3 4			

VALVE NUMBER	P&ID	CLASS	VALVE CATEGORY	VALVE SIZE (IN.)	VALVE TYPE	ACT. TYPE	NORMAL POSITION	STROKE DIRECT.	TEST METHOD	TEST FREQ	NOTES	TECH. POS. (VA)	COLD SHUTDOWN JUST.	REFUELING OUTAGE JUST.	RELIEF REQUEST
1/2SX169A	M-42-3 M-126-1	3	B	10.0	BTF	A.O.	C	O	St It Fo	Q 2Y Q		1,3 4 2			
1/2SX169B	M-42-3 M-126-1	3	B	10.0	BTF	A.O.	C	O	St It Fo	Q 2Y Q		1,3 4 2			
1/2SX173	M-42-3 M-126-1	3	B	6.0	GA	A.O.	C	O	St Fo	Q Q	4	1,3 2			
1/2SX174	M-42-3 M-126-1	3	C	6.0	CK	S.A.	C	O	Ct	Q					
1/2SX178	M-42-3 M-126-1	3	B	6.0	GA	A.O.	C	O	St Fo	Q Q	4	1,3 2			

VALVE NUMBER	P&ID	CLASS	VALVE CATEGORY	VALVE SIZE (IN.)	VALVE TYPE	ACT. TYPE	NORMAL POSITION	STROKE DIRECT.	TEST METHOD	TEST FREQ	NOTES	TECH. POS. (VA)	COLD SHUTDOWN JUST.	REFUELING OUTAGE JUST.	RELIEF REQUEST
1/2VF01M	M-61-1B M-136-1	None	C	6.0	RV	S.A.	C	O	Rt	10Y	3				

VALVE NUMBER	P&ID	CLASS	VALVE CATEGORY	VALVE SIZE (IN.)	VALVE TYPE	ACT. TYPE	NORMAL POSITION	STROKE DIRECT.	TEST METHOD	TEST FREQ.	NOTES	TECH. POS. (VA)	COLD SHUTDOWN JUST.	REFUELING OUTAGE JUST.	RELIEF REQUEST
1/2VQ001A	M-105-1 M-106-1	2	A	48.0	BTF	H.O.	C	C	Lt St It	AJ CS 2Y	1	 4	VC-24		
1/2VQ001B	M-105-1 M-106-1	2	A	48.0	BTF	H.O.	C	C	Lt St It	AJ CS 2Y	1	 4	VC-24		
1/2VQ002A	M-105-1 M-106-1	2	A	48.0	BTF	H.O.	C	C	Lt St It	AJ CS 2Y	1	 4	VC-24		
1/2VQ002B	M-105-1 M-106-1	2	A	48.0	BTF	H.O.	C	C	Lt St It	AJ CS 2Y	1	 4	VC-24		
1/2VQ003	M-105-1 M-106-1	2	A	8.0	BTF	A.O.	C	C	Lt St/Fc It	AJ Q 2Y	1	 1,2,3 4			
1/2VQ004A	M-105-1 M-106-1	2	A	8.0	BTF	A.O.	C	C	Lt St/Fc It	AJ Q 2Y	1	 1,2,3 4			
1/2VQ004B	M-105-1 M-106-1	2	A	8.0	BTF	A.O.	C	C	Lt St/Fc It	AJ Q 2Y	1	 1,2,3 4			
1/2VQ005A	M-105-1 M-106-1	2	A	8.0	BTF	A.O.	C	C	Lt St/Fc It	AJ Q 2Y	1	 1,2,3 4			
1/2VQ005B	M-105-1 M-106-1	2	A	8.0	BTF	A.O.	C	C	Lt St/Fc It	AJ Q 2Y	1	 1,2,3 4			
1/2VQ005C	M-105-1 M-106-1	2	A	8.0	BTF	A.O.	C	C	Lt St/Fc It	AJ Q 2Y	1	 1,2,3 4			
1/2VQ016	M-105-3	2	A	0.5	GL	M	C	C	Lt	AJ	1				
1/2VQ017	M-105-3	2	A	0.5	GL	M	C	C	Lt	AJ	1				
1/2VQ018	M-105-3	2	A	0.5	GL	M	C	C	Lt	AJ	1				
1/2VQ019	M-105-3	2	A	0.5	GL	M	C	C	Lt	AJ	1				

VALVE NUMBER	P&ID	CLASS	VALVE CATEGORY	VALVE SIZE (IN.)	VALVE TYPE	ACT. TYPE	NORMAL POSITION	STROKE DIRECT.	TEST METHOD	TEST FREQ	NOTES	TECH. POS. (VA)	COLD SHUTDOWN JUST.	REFUELING OUTAGE JUST.	RELIEF REQUEST
1/2WM190	M-49-1A M-49-1B	2	A	2.0	GL	M	C	C	Lt	AJ	1				
1/2WM191	M-49-1A M-49-1B	2	AC	2.0	CK	S.A.	C	C	Lt/Bt	AJ	1				VR-1

VALVE NUMBER	P&ID	CLASS	VALVE CATEGORY	VALVE SIZE (IN.)	VALVE TYPE	ACT. TYPE	NORMAL POSITION	STROKE DIRECT.	TEST METHOD	TEST FREQ	NOTES	TECH. POS. (TA)	COLD SHUTDOWN JUST.	REFUELING OUTAGE JUST.	RELIEF REQUEST
0W0002A	M-118-1	3	BC	3.0	CK	S.A.	O	O	Ct	Q					
0W0002B	M-118-1	3	BC	3.0	CK	S.A.	O	O	Ct	Q					
1/2W0006A	M-118-5 M-118-7	2	A	10.0	GA	M.O.	O	C	St Lt It	Q AJ 2Y	1	1,3 4			
1/2W0006B	M-118-5 M-118-7	2	A	10.0	GA	M.O.	O	C	St Lt It	Q AJ 2Y	1	1,3 4			
1/2W0007A	M-118-5 M-118-7	2	AC	10.0	CK	S.A.	C	C	Lt/Bt	AJ	1				VR-1
1/2W0007B	M-118-5 M-118-7	2	AC	10.0	CK	S.A.	C	C	Lt/Bt	AJ	1				VR-1
1/2W0020A	M-118-5 M-118-7	2	A	10.0	GA	M.O.	O	C	St Lt It	Q AJ 2Y	1	1,3 4			
1/2W0020B	M-118-5 M-118-7	2	A	10.0	GA	M.O.	O	C	St Lt It	Q AJ 2Y	1	1,3 4			
0W0028A	M-118-1	3	C	1.5x2.5	RV	S.A.	C	O/C	Rt	10Y					
0W0028B	M-118-1	3	C	1.5x2.5	RV	S.A.	C	O/C	Rt	10Y					
1/2W0056A	M-118-5 M-118-7	2	A	10.0	GA	M.O.	O	C	St Lt It	Q AJ 2Y	1	1,3 4			
1/2W0056B	M-118-5 M-118-7	2	A	10.0	GA	M.O.	O	C	St Lt It	Q AJ 2Y	1	1,3 4			

NOTE 1

The following category A valves, which are containment isolation valves, will be seat leakage tested (Lt) in accordance with Federal Regulation 10CFR50, Appendix J, per OMa-1988, part 10, paragraph 4.2.2.2 (unless otherwise directed by more conservative Technical Specifications).

	VALVE #		VALVE #		VALVE #
1)	1/2CC685	41)	1/2PR033B	82)	1/2SI8964
2)	1/2CC9413A	42)	1/2PR033C	83)	1/2SI8968
3)	1/2CC9414	43)	1/2PR033D	84)	1/2VQ001A
4)	1/2CC9416	44)	1/2PR066	85)	1/2VQ001B
5)	1/2CC9438	45)	1/2PS228A	86)	1/2VQ002A
6)	1/2CC9486	46)	1/2PS228B	87)	1/2VQ002B
7)	1/2CC9518	47)	1/2PS229A	88)	1/2VQ003
8)	1/2CC9534	48)	1/2PS229B	89)	1/2VQ004A
9)	1/2CS007A	49)	1/2PS230A	90)	1/2VQ004B
10)	1/2CS007B	50)	1/2PS230B	91)	1/2VQ005A
11)	1/2CS008A	51)	1/2PS231A	92)	1/2VQ005B
12)	1/2CS008B	52)	1/2PS231B	93)	1/2VQ005C
13)	1/2CV8100	53)	1/2PS9354A	94)	1/2VQ016
14)	1/2CV8112	54)	1/2PS9354B	95)	1/2VQ017
15)	1/2CV8113	55)	1/2PS9355A	96)	1/2VQ018
16)	1/2CV8152	56)	1/2PS9355B	97)	1/2VQ019
17)	1/2CV8160	57)	1/2PS9356A	98)	1/2WM190
18)	1/2FC009	58)	1/2PS9356B	99)	1/2WM191
19)	1/2FC010	59)	1/2PS9357A	100)	1/2WO006A
20)	1/2FC011	60)	1/2PS9357B	101)	1/2WO006B
21)	1/2FC012	61)	1/2RE1003	102)	1/2WO007A
22)	1/2IA065	62)	1/2RE9157	103)	1/2WO007B
23)	1/2IA066	63)	1/2RE9159A	104)	1/2WO020A
24)	1/2IA091	64)	1/2RE9159B	105)	1/2WO020B
25)	1/2OG057A	65)	1/2RE9160A	106)	1/2WO056A
26)	1/2OG079	66)	1/2RE9160B	107)	1/2WO056B
27)	1/2OG080	67)	1/2RE9170		
28)	1/2OG081	68)	1/2RF026		
29)	1/2OG082	69)	1/2RF027		
30)	1/2OG083	70)	1/2RY075		
31)	1/2OG084	71)	1/2RY8025		
32)	1/2OG085	72)	1/2RY8026		
33)	1/2PR001A	73)	1/2RY8028		
34)	1/2PR001B	74)	1/2RY8033		
35)	1/2PR002E	75)	1/2RY8046		
36)	1/2PR002F	76)	1/2RY8047		
37)	1/2PR002G	77)	1/2SA032		
38)	1/2PR002H	78)	1/2SA033		
39)	1/2PR032	79)	1/2SI8871		
40)	1/2PR033A	80)	1/2SI8880		
		81)	1/2SI8888		

NOTE 2

Per NRC request, the post-accident hydrogen monitoring system check valves 1/2PS231A and 1/2PS231B will be stroke exercised open on a quarterly frequency to verify operability.

NOTE 3

The 1/2VF01M are vacuum relief devices located on the Refueling Water Storage Tanks (RWST). Their function in the open direction is to prevent a collapse of the RWST and/or prevent drawing vacuum in the tank. The successful operation of these devices would ensure that the net positive suction head for the ECCS pumps is maintained. Although these devices are non-safety and are considered to fall outside the scope of the IST Program, they will be listed in the IST tables and tested in accordance with OM-1 due to their safety significance.

NOTE 4

The following valves are stroke timed locally and do not require a position indication test (see Technical Position VA-4 for more details).

1/2CV128	1/2SX173
1SD054A-H	1/2SX178
2SD054B,D,F,H	

NOTE 5

The remote position indicator for these valves cannot be observed directly due to the encapsulated design of the solenoid valve body. During the indication test, indirect evidence of the necessary valve disk movement shall be used, in accordance with OM-10, paragraph 4.1. The valves affected are listed below:

1CV8114	1PS230A/B	2PS228A/B
1CV8116	1RC014A-D	2PS229A/B
1PS228A/B	2CV8114	2PS230A/B
1PS229A/B	2CV8116	2RC014A-D

NOTE 6

The following valves are manually stroked locally and do not require a position indication test (see Technical Position VA-4 for more details).

1/2CC9458	1/2CC9467A-C
1/2CC9459A, B	1/2MS019A-D

NOTE 7

1/2SI8818A-D, 1/2SI8819A-D, and 1/2SI8948A/B are Event V check valves, which are defined as two check valves in series at a low pressure/RCS interface whose failure may result in a LOCA that bypasses containment. They are individually leak-tested in accordance with NRC generic letter 89-04, position #4b.

NOTE 8

1/2CC9518, 1/2CC9534, 1/2CV8113, and 1/2RH8705A/B are check valves designed to relieve pressure between two containment isolation valves. The full flow limiting value is zero, since the safety function of these valves in the open direction is to relieve pressure only.

NOTE 9

The 1/2SI8919A/B check valves are the Safety Injection Pump mini-flow recirculation line valves which open to allow recirculation flow during IST Surveillances. Since full stroking these valves will depend on the reference point of testing, acceptable full stroke will be verified whenever the recorded mini-recirculation flowrate is greater than the minimum allowed flowrate given in the surveillance.

NOTE 10

The Essential Service Water (SX) and Make-Up Pump discharge check valves (0SX028A/B) open to permit make-up water flow from the Rock River to the SX System Basin. These check valves are downstream of the pump discharge tap-off to the SX Make-Up Jacket Water Heat Exchanger and Gear Oil Cooler. Since this tap-off line is orificed, the flowrate through this line, and therefore the flowrate through pump discharge check valves 0SX028A/B, will depend on the reference point of testing. Acceptable 0SX028A/B full stroke will be verified whenever the recorded total pump flow minus the tap-off line flow is greater than the minimum allowed flow contained in the ASME pump surveillance.

NOTE 11

Per Byron Technical Specifications Amendment, valves 1/2SD002A-H,and 1/2SD005A-D have been removed from the list of valves to be tested under 10CFR50 Appendix J and will now be tested per ASME Code Section XI, IWV-3420. However, Byron Station has committed to the NRC to continue to perform a category A leak test on these valves. Refer to Chron #114244.

NOTE 12

Valves 1/2RY8025, 1/2RY8026, 1/2RY8028, 1/2RY8010A, 1/2RY8010B, 1/2RY8010C, 1/2RY8033, 1/2RY8000A, 1/2RY8000B, 1/2RY455A and 1/2RY456 will receive position indication tests on a refuel frequency per Generic Letter 90-06.

NOTE 13

For the purposes of the IST Program, the starting air receiver overpressurization relief valves, 1/2SA148A-D, will be conservatively classified as safety category I, quality group "C" (ASME Class 3) valves, rather than safety category I, quality group "G" (Non-ASME) valves, as noted in P&ID M-54-4A, Note 3. They will be tested in accordance with the IST Program.

NOTE 14

The 1/2SI121A/B Relief Valves will be installed to prevent pressure locking of the 1/2SI8811A/B containment sump valves due to pressure buildup in the 1/2SI8811A/B valve bonnets. The U-1 valves are scheduled to be installed during B1R07 (Spring of 1996) and the U-2 valves are scheduled to be installed during B2R06 (Fall of 1996).

SECTION 3.2

VALVE TECHNICAL

POSITIONS

3.2.1 Valve Technical Position Summary

Number	Component(s)	Description
VA-1	All Power-Operated Valves	Method of Stroke Timing Valves
VA-2	Valves with Fail-Safe Actuators	Method of Fail-Safe Testing Valves
VA-3	All Power-Operated Valves	Method of Establishing Acceptance Criteria for Power-Operated Valves
VA-4	Valves with Remote Position Indicators	Method of Position Indication Testing

VALVE TECHNICAL POSITION
VA-1

TITLE:

Method of Stroke Timing Valves

VALVES AFFECTED:

Power Operated Valves Requiring Stroke Time Testing

CODE REQUIREMENT(S)/DISCUSSION:

The use of the control board open and closed lights to determine the stroke time of power-operated valves is the issue discussed in this Technical Position. Paragraph 1.3 of OMa-1988, Part 10, defines "full-stroke time" as "the time interval from initiation of the actuating signal to the indication of the end of the operating stroke." It is common industry practice to measure stroke time as the time interval between placing the operator switch on the control board in the "close" or "open" position and indication that the valve is open or closed on the control board (switch to light).

POSITION:

The way in which the limit switches that operate the remote position indicator lights are set may result in "closed" or "open" indication before the valve obturator has actually completed its travel. This is not considered to be a problem, as the purpose of the test is to determine if degradation of the valve operator system is occurring, which is determined by observing changes in stroke time relative to the reference stroke time. Stroke time measurements may be rounded to the nearest tenth (0.1) of a second. Standard rounding techniques are to be used when rounding stop watch readings during valve stroke time testing (e.g., 10.45 rounds to 10.5 and 10.44 rounds to 10.4). Reference values will be established to the nearest tenth of a second although stroke times may be recorded to the hundredths place (0.01). This technique satisfies OM-10, paragraph 4.2.1.4(b), in that all power operated valves will be measured to at least the nearest second.

For those specific cases in which a valve must be stroke timed locally, the stroke timing will begin with the initiation of the actuating signal and end with the completion of valve movement in the field.

VALVE TECHNICAL POSITION
VA-2

TITLE:

Method of Fail Safe Testing Valves.

VALVES AFFECTED:

See IST Valve Tables (Fc = Fail Safe Test closed; Fo = Fail Safe Test open)

CODE REQUIREMENT(S)/ISSUE DISCUSSION:

Paragraph 4.2.1.6 of OM-10 states that "Valves with fail-safe actuators shall be tested by observing the operation of the actuator upon loss of valve actuator power in accordance with the exercising frequency of paragraph 4.2.1.1 of OM-10.

POSITION:

Most valves with fail-safe positions have actuators that use the fail-safe mechanism to stroke the valve to the fail-safe position during normal operation. For example, an air-operated valve that fails closed may use air to open the valve against spring pressure. When the actuator is placed in the closed position, air is vented from the diaphragm and the spring moves the obturator to the closed position.

In the cases where normal valve operator action moves the valve to the closed position by de-energizing the operator electrically, by venting air or both (e.g., an electric solenoid in the air system of a valve operator moves to the vent position on loss of power), no additional fail-safe testing is required. Valves with fail-safe actuators that do not operate as part of normal actuator operation must be tested by other means.

Using a valve remote position indicator as verification of proper fail-safe operation is acceptable, provided the indicator is periodically verified to be operating properly as required by OM-10, paragraph 4.1.

The fail-safe test is generally performed at the same frequency as the stroke time exercise test. Where the exercise test is performed less frequent than every 3 months, a cold shutdown justification, refueling outage justification, or relief request has been written. The same justifications for the stroke timing would also apply to the fail-safe tests.

VALVE TECHNICAL POSITION
VA-3

TITLE:

Method of Establishing Acceptance Criteria for Power-Operated Valves.

VALVES AFFECTED:

Power Operated Valves Requiring Stroke Time Testing

CODE REQUIREMENT(S)/ISSUE DISCUSSION:

The IST Program requires that reference values be established in accordance with paragraphs 3.3, 3.4, or 3.5 of OM-10. Per paragraph 1.3 of OM-10, a reference value is "one or more values of test parameters measured or determined when the equipment is known to be operating acceptably." Acceptable bands are determined based on these reference values in accordance with paragraph 4.2.1.8 of OM-10.

Per paragraph 4.2.1.4(a) of OM-10, "The limiting value(s) of full-stroke time of each power-operated valve shall be specified by the Owner." According to NRC Generic Letter 89-04, the limiting value should be a reasonable deviation from this reference stroke time based on the valve size, valve type, and actuator type. The deviation should not be so restrictive that it results in a valve being declared inoperable due to reasonable stroke time variations. However, the deviation used to establish the limit should be such that corrective action would be taken for a valve that may not perform its intended function. When the calculated limiting value for a full-stroke is greater than a Technical Specification (TS) or safety analysis limit, the TS or safety analysis limit should be used as the limiting value of full-stroke time.

POSITION:

Table VA-3.1 will be used to establish the Acceptable Ranges (per paragraph 4.2.1.8) and Limiting Values (determined by Byron Station) for power-operated valves subject to the Notes listed as follows:

1. T_{REF} is the reference value in seconds of a valve when it is known to be operating acceptably.

VALVE TECHNICAL POSITION
VA-3 (continued)

2. Reference values will be rounded off to the nearest tenth of a second. Acceptable Ranges will be rounded off to the nearest tenth of a second. Calculated IST limiting values will be rounded off to the nearest whole number. Standard rounding techniques are to be used when rounding (e.g., 10.45 rounds to 10.5, and 10.44 rounds to 10.4 seconds).

3. The most conservative limiting value between the IST Calculated limit (as determined from Table VA-3.1, below), UFSAR limit, Tech Spec Limit or manufacturer limit should be used as the Maximum/Limiting stroke time. Any deviations from this criteria will be evaluated and documented in writing.

4. When a valve or its control system has been replaced, repaired, or has undergone maintenance that could affect the valve's performance, a new reference value shall be determined or the previous value reconfirmed by an inservice test run prior to the time it is returned to service.

TABLE VA-3.1

Valve Operator	Reference Stroke Time (sec.)	Acceptable Range (sec.)	Maximum/Limiting Stroke Time (sec.)
Motor	$T_{REF} > 10$	$0.85T_{REF} - 1.15T_{REF}$	[1] $1.25T_{REF}$
	$T_{REF} \leq 10$	[2] $0.75T_{REF} - 1.25T_{REF}$	$1.50T_{REF}$
Other	$T_{REF} > 10$	$0.75T_{REF} - 1.25T_{REF}$	[3] $1.75T_{REF}$
	$T_{REF} \leq 10$	$0.50T_{REF} - 1.5T_{REF}$	$2.0T_{REF}$
All (Optional)	[4] $T_{REF} < 2$	≤ 2.0	2.0

[1] or T_{REF} + 20, whichever is more conservative (lower)
[2] or T_{REF} ± 1sec, whichever is greater, when compared to reference value
[3] or T_{REF} + 20, whichever is more conservative (lower)
[4] In general, a valve with a reference value of 1.2 seconds or below will use this option

VALVE TECHNICAL POSITION
VA-4

TITLE:

Method of Position Indication Testing

VALVES AFFECTED:

All valves with Remote Position Indicators

CODE REQUIREMENT(S) / DISCUSSION:

OMa-1988, Part 10, paragraph 4.1, states that "valves with remote position indicators shall be observed at least once every 2 years to verify that valve operation is accurately indicated."

POSITION:

In reference to Steven Weinman (Boiler and Pressure Vessel Committee) reply letter to Russell J. Tamminga (ComEd), dated November 14, 1988, concerning Inquiry number IN88-015, the following question was answered:

> Question: Is it the intent of Section XI, IWV-3300 that for valves having remote position indicators at multiple locations (such as in the control room and also on a remote shutdown panel and/or sampling panel) that only the remote position indicator at the location utilized in exercising the valve (IWV-3412) and timing the stroke of the valve (IWV-3413) be verified that the valve operation is accurately indicated?
>
> Reply: Yes

This Inquiry also applies to the applicable sections in OMa-1988, Part 10:
1. Paragraph 4.1, Valve Position Verification
2. Paragraph 4.2.1, Valve Exercising Test
3. Paragraph 4.2.1.4, Power-Operated Valve Stroke Testing

In summary, the remote position indicator utilized during valve exercising (OM-10, paragraph 4.2.1) and stroke timing (OM-10, paragraph 4.2.1.4) is the indicator which is used to verify that valve operation is accurately indicated (OM-10, paragraph 4.1). However, if a valve is stroke time tested locally or manually exercised locally, a remote position indication test is not required.

VALVE TECHNICAL POSITION
VA-4 (continued)

The remote position indication test is to be performed as follows:

An individual is dispatched to the valve to locally observe the valve movement and he/she establishes communication with an individual at the remote position indicator. As the valve is exercised in both directions, the individual at the remote position indicator verifies that the indicator shows the proper position by communicating with the local observer, who is observing the valve stem movement. When the valve stem movement cannot be directly observed, indirect means may be employed to verify the change in valve position. These may include observations such as changes in system pressure or establishment/cessation of flow.

Note: Byron Station's conversion from the 1983 Edition of Section XI of the ASME Code to the 1989 Edition of Section XI of the ASME Code, which references OMa-1988, Part 10, for valves, has not been interpreted as requiring an expansion of scope for the sole purpose of performing an indication test on a valve (reference Table 1 of OM-10). It is Byron's interpretation that the intent of OM-10 was not to expand the scope of the IST Program due to position indication testing alone. A joint, "living" bases document between Byron/Braidwood has been created to maintain the bases for inclusion/exclusion of valves in the IST Program.

SECTION 3.3

VALVE COLD SHUTDOWN

JUSTIFICATIONS

3.3.1 Valve Cold Shutdown Justification Summary

Number	Component(s)	Description
VC-1	1/2MS001A-D	Stroke Time Test (St) During Cold Shutdown and Partial Stroke (Xt) Quarterly
VC-2	1/2CV8104; 1/2CV8442 1/2CV8804A; 1/2CV112D; 1/2CV112E	Full Stroke Test (Ct) of 1/2CV8442 and Stroke Time Test (St) of Remaining Valves During Cold Shutdown
VC-3	1/2FW009A-D	Stroke Time Test (St) During Cold Shutdown and Partial Stroke Test (Xt) Quarterly
VC-4	1/2CV112B; 1/2CV112C 1/2CV8105; 1/2CV8106 1/2CV8152; 1/2CV8160	Stroke Time Test (St) During Cold Shutdown and Fail Safe Test Closed (Fc) of 1/2CV8152 and 1/2CV8160 During Cold Shutdown
VC-5	1/2RH8701A/B	Stroke Time Test (St) During Cold Shutdown
VC-6	1/2RC014A-D	Stroke Time Test (St) / Fail Safe Test Closed (Fc) During Cold Shutdown
VC-7	1/2RH8730A/B	Full Stroke Test (Ct) / Backflow Test (Bt) During Cold Shutdown and Partial Stroke Test (Xt) Quarterly
VC-8	1/2SI8818A-D 1/2SI8958A/B	Full Stroke Test (Ct) During Cold Shutdown
VC-9	1/2FW039A-D	Stroke Time Test (St) and Fail Safe Test Closed (Fc) During Cold Shutdown
VC-10	1/2CV459; 1/2CV460 1/2CV8149A-C	Stroke Time Test (St) and Fail Safe Test Closed (Fc) During Cold Shutdown
VC-11	1/2AF001A/B; 1/2AF003A/B 1/2AF014A-H; 1/2AF029A/B	Full Stroke Test (Ct) of all valves During Cold Shutdown, Partial Stroke Test (Xt) Quarterly for 1/2AF001A/B and 1/2AF003A/B and Backflow Test (Bt) During Cold Shutdown for 1/2AF014A-H
VC-12	1/2SI8801A/B	Stroke Time Test (St) During Cold Shutdown.
VC-13	1/2SI8802A/B; 1/2SI8806 1/2SI8809A/B; 1/2SI8813 1/2SI8835; 1/2SI8840	Stroke Time Test (St) During Cold Shutdown

3.3.1 Valve Cold Shutdown Justification Summary (continued)

Number	Component(s)	Description
VC-14	1/2RY455A; 1/2RY456	Stroke Time Test (St) and Fail Safe Test Closed (Fc) During Cold Shutdown
VC-15	Pressure Isolation Valves (PIVS) and 1/2RH8705A/B Valves	Leak Test (Lt) During Cold Shutdown for all Per Technical Specifications and Backflow Test (Bt) for Check Valves at the Same Frequency
VC-16	1/2CV8440	Backflow Test (Bt) During Cold Shutdown.
VC-17	1/2SI8948A-D	Partial Stroke Test (Xt) During Cold Shutdown
VC-18	1/2RH8716A/B	Stroke Time Test (St) During Cold Shutdown
VC-19	1/2CC685; 1/2CC9413A 1/2CC9414; 1/2CC9415 1/2CC9416; 1/2CC9438 1/2CV8100; 1/2CV8112	Stroke Time Test (St) During Cold Shutdown
VC-20	1/2FW036A-D	Backflow Test (Bt) During Cold Shutdown
VC-21	1/2SI8808A-D	Stroke Time Test (St) During Cold Shutdown
VC-22	1/2CV8355A-D	Stroke Time Test (St) During Cold Shutdown
VC-23	1SD054A-H; 2SD054B,D,F,H	Stroke Time Test (St) and Fail Safe Test Closed (Fc) During Cold Shutdown
VC-24	1/2VQ001A,B 1/2VQ002A,B	Stroke Time Test (St) During Cold Shutdown or as Required to Declare Operability

COLD SHUTDOWN JUSTIFICATION
VC-1

VALVE NUMBER	CATEGORY	CODE CLASS	DRAWING NUMBER	DRAWING COORDINATE
1/2MS001A	B	2	M-35-2 (120-2A)	C4(D5)
1/2MS001B	B	2	M-35-1 (120-1)	E5(E5)
1/2MS001C	B	2	M-35-2 (120-2B)	E4(D5)
1/2MS001D	B	2	M-35-1 (120-1	B5(B5)

FUNCTION(S):

These are the Main Steam Isolation Valves (MSIVs). In the normally open position, steam is supplied to the turbine. The valves are required to close to isolate the main steam line to prevent: reverse flow into containment during a main steam line break, Steam Generator Blowdown during a major steamline break outside of containment, and secondary system contamination from a Steam Generator tube rupture.

JUSTIFICATION:

Closure of the main steam isolation valves 1MS001A-D or 2MS001A-D during unit operation would result in reactor trip and safety injection actuation. To avoid this transient, these valves will be partially stroked every three months. Stroke Time testing will be completed during cold shutdown as conditions allow, in accordance with OM-10, paragraph 4.2.1.2.

COLD SHUTDOWN JUSTIFICATION
VC-2

VALVE NUMBER	CATEGORY	CODE CLASS	DRAWING NUMBER	DRAWING COORDINATE
1/2CV8104	B	2	M-64-4B(138-4A)	C3 (C2)
1/2CV8442	C	2	M-64-4B(138-4A)	B3 (B2)
1/2CV8804A	B	2	M-64-4B(138-4A)	C7 (C7)
1/2CV112D	B	2	M-64-4B(138-4A)	B5 (B5)
1/2CV112E	B	2	M-64-4B(138-4A)	A5 (A5)

FUNCTION(S):

These are the emergency boration flowpath valves. The 1/2CV8104 is the emergency boration valve and the 1/2CV8442 is the emergency boration header check valve. The 1/2CV8804A is the RH heat exchanger 1A to charging pumps suction isolation valve required to be open for Post LOCA recovery. The 1/2CV112D and 1/2CV112E are the RWST to charging pumps suction isolation valves which are in the emergency boration flowpath when the RWST is the Boration Source.

JUSTIFICATION:

The testing of any emergency boration flowpath valves during unit operation is not practical. Stroke testing the Boric Acid injection isolation valve 1/2CV8104 and check valve 1/2CV8442, the RH to CV pump suction isolation valve 1/2CV8804A, or the RWST to CV pump suction isolation valves 1/2CV112D/E could result in boration of the RCS, resulting in a cooldown transient. Aligning the system in this configuration even for a short duration is, therefore, unacceptable. These valves will be stroke tested during cold shutdown, in accordance with OM-10, paragraph 4.2.1.2 and 4.3.2.2.

COLD SHUTDOWN JUSTIFICATION
VC-3

VALVE NUMBER	CATEGORY	CODE CLASS	DRAWING NUMBER	DRAWING COORDINATE
1/2FW009A	B	2	M-36-1C (121-1B)	C5 (C5)
1/2FW009B	B	2	M-36-1A (121-1D)	C5 (C5)
1/2FW009C	B	2	M-36-1D (121-1A)	C5 (C5)
1/2FW009D	B	2	M-36-1B (121-1C)	C5 (C5)

FUNCTION(S):

These are the main feedwater isolation valves (FWIVs). They are open during normal operation to allow flow to the Steam Generator (non-IST function). They are required to close for Feedwater Isolation and Containment Isolation.

JUSTIFICATION:

The main feedwater isolation valves cannot be fully stroked during operation as feedwater would be terminated causing a reactor trip. They will, however, be partially stroke tested during operation as well as full stroke tested during cold shutdown, in accordance with OM-10, paragraph 4.2.1.2

COLD SHUTDOWN JUSTIFICATION
VC-4

VALVE NUMBER	CATEGORY	CODE CLASS	DRAWING NUMBER	DRAWING COORDINATE
1/2CV112B	B	2	M-64-4A (138-4B)	B4 (C3)
1/2CV112C	B	2	M-64-4A (138-4B)	B3 (C3)
1/2CV8105	B	2	M-64-3B (138-3B)	E6 (E6)
1/2CV8106	B	2	M-64-3B (138-3B)	E5 (E5)
1/2CV8152	A	2	M-64-5 (138-5A)	E4 (E7)
1/2CV8160	A	2	M-64-5 (138-5A)	F5 (E8)

FUNCTION(S):

The 1/2CV112B & C are the volume control tank outlet isolation/charging pump suction valves. The 1/2CV8105 and 1/2CV8106 are the normal charging path containment isolation valves. The 1/2CV8152 and the 1/2CV8160 are the letdown line containment isolation valves. These valves are part of the chemical and volume control system (CVCS).

JUSTIFICATION:

Closure of these letdown and charging makeup valves 1/2CV112B/C, 1/2CV8105, 1/2CV8106, 1/2CV8152, and 1/2CV8160 during normal unit operation would cause a loss of charging flow which would result in a reactor coolant inventory transient, and possibly, a subsequent reactor trip. These valves will be stroke time tested during cold shutdown in accordance with OM-10, paragraph 4.2.1.2 (also covers fail-safe tests for 1/2CV8152 and 1/2CV8160).

COLD SHUTDOWN JUSTIFICATION
VC-5

VALVE NUMBER	CATEGORY	CODE CLASS	DRAWING NUMBER	DRAWING COORDINATE
1/2RH8701A	A	1	M-62 (137	E2 (E7)
1/2RH8701B	A	1	M-62 (137)	E1 (E8)
1/2RH8702A	A	1	M-62 (137)	D2 (D6)
1/2RH8702B	A	1	M-62 (137)	D1 (D8)

FUNCTION(S):

The 1RH8701A/B, 2RH8701A/B, and 2RH8702A/B valves are the isolation boundary between the Residual Heat Removal Pumps and the Reactor Coolant System. The RH8701 valves isolate the "A" loop of the RCS from the "A" RHR pump suction. The RH8702 valves isolate the "C" loop of the RCS from the "B" RHR pump suction.

JUSTIFICATION:

Opening one of these valves during unit operation will leave only one valve isolating RHR from the high RCS pressure. This would place the plant in an undesirable and unsafe condition. Therefore, these valves will be full stroke tested during cold shutdown, in accordance with OM-10, paragraph 4.2.1.2.

COLD SHUTDOWN JUSTIFICATION
VC-6

VALVE NUMBER	CATEGORY	CODE CLASS	DRAWING NUMBER	DRAWING COORDINATE
1/2RC014A	B	1	M-60-1B (135-1B)	F3 (F2)
1/2RC014B	B	1	M-60-1B (135-1B)	E3 (E2)
1/2RC014C	B	1	M-60-1B (135-1B)	E3 (E2)
1/2RC014D	B	1	M-60-1B (135-1B)	E3 (E2)

FUNCTION(S):

These are the reactor head vent valves and are used to vent the reactor of hydrogen or other post-accident gases. They serve as a pressure isolation valve in the closed position.

JUSTIFICATION:

The Reactor Pressure Vessel Vent Valves 1RC014A-D and 2RC014A-D cannot be stroked during unit operation, as they provide a pressure boundary between the Reactor Coolant system and containment atmosphere. Failure of one of these valves in the open position would result in leaving only one valve as the high pressure boundary. These valves will be full stroke/fail safe exercised when the RCS pressure is at a minimum during cold shutdown, in accordance with OM-10, paragraph 4.2.1.2.

COLD SHUTDOWN JUSTIFICATION
VC-7

VALVE NUMBER	CATEGORY	CODE CLASS	DRAWING NUMBER	DRAWING COORDINATE
1/2RH8730A	C	2	M-62 (137	E4 (E5)
1/2RH8730B	C	2	M-62 (137)	C4 (C5)

FUNCTION(S):

These are the RHR pump discharge check valves. The open function of these valves is to provide an RHR pump flowpath. The closure function is to prevent back leakage while the opposite train is in question in post-accident situations.

JUSTIFICATION:

The Residual Heat Removal Pump discharge check valves 1RH8730A/B and 2RH8730A/B cannot be full stroke exercised during unit operation due to the RCS pressure being greater than the RH pumps are capable of putting out. These check valves will be partial stroke tested, however, on a quarterly basis during the mini-flow recirculation RHR pump tests and full stroke exercised during cold shutdown. This is in accordance with OM-10, paragraph 4.3.2.2.

Additionally, it would be impractical to backflow test these valves during unit operation. The methodology for testing these valves involves closing the mini-flow valve on the train being tested and having the opposite train provide pressure against the check valve being tested. The test is satisfied by verifying that the pump on the same train as the check valve is not rotating backwards. However, this testing would put the plant in an undesirable condition as both trains of RH would be considered inoperable. During cold shutdowns, the train running on shutdown cooling may be used to pressurize against the opposite train's check valve. For this reason, these valves will be backflow tested during cold shutdown in accordance with OM-10, paragraph 4.3.2.2.

COLD SHUTDOWN JUSTIFICATION
VC-8

VALVE NUMBER	CATEGORY	CODE CLASS	DRAWING NUMBER	DRAWING COORDINATE
1/2SI8818A	AC	1	M-61-4 (136-4)	F7 (F2)
1/2SI8818B	AC	1	M-61-4 (136-4	D7 (D2)
1/2SI8818C	AC	1	M-61-4 (136-4)	D7 (D2)
1/2SI8818D	AC	1	M-61-4 (136-4)	E7 (E2)
1/2SI8958A	C	2	M-61-4 (136-4)	C4 (C7)
1/2SI8958B	C	2	M-61-4 (136-4)	B4 (B7)

FUNCTION(S):

The SI8818 valves are the safety injection RCS Loop 1 cold leg upstream check valves located in the flowpath from the Residual Heat Removal (RHR) pumps. The SI8958 valves are the safety injection RWST outlet check valves to the RHR pumps.

JUSTIFICATION:

Due to the high RCS pressure during unit operation (2235 psi), these valves cannot be full or partial stroke exercised during quarterly testing. The 1/2SI8958A/B check valves, although located at the suction of the RHR pumps, are not in the recirculation flow path to allow partial stroking each quarter. These valves will be full stroke exercised during cold shutdown, in accordance with OM-10, paragraph 4.3.2.2.

COLD SHUTDOWN JUSTIFICATION
VC-9

VALVE NUMBER	CATEGORY	CODE CLASS	DRAWING NUMBER	DRAWING COORDINATE
1/2FW039A	B	2	M-36-1C (121-1B)	C4 (C4)
1/2FW039B	B	2	M-36-1A (121-1D	C4 (D4)
1/2FW039C	B	2	M-36-1D (121-1A)	C4 (D4)
1/2FW039D	B	2	M-36-1B (121-1C)	C4 (C4)

FUNCTION(S):

These are the steam generator feedwater preheater bypass downstream isolation valves. They provide for Feedwater/Containment isolation in the closed position. They are normally open air operated valves located on the cross-tie lines connecting the main FW line to the tempering line.

JUSTIFICATION:

It is not practical for the 1FW039A-D and 2FW039A-D valves to be stroke tested during normal operation as closure of these valves would require a power reduction from full power to less than 80%. Stroking these valves closed above 80% would result in undesirable preheater tube vibrations within the Steam Generators. These valves will be stroke time/fail safe tested during cold shutdown, in accordance with OM-10, paragraph 4.2.1.2.

COLD SHUTDOWN JUSTIFICATION
VC-10

VALVE NUMBER	CATEGORY	CODE CLASS	DRAWING NUMBER	DRAWING COORDINATE
1(2)CV459	B	1	M 64-5(138-5B)	E7 (F5)
1(2)CV460	B	1	M 64-5(138-5B)	F8 (F7)
1(2)CV8149A	B	2	M 64-5(138-5B)	F6 (E2)
1(2)CV8149B	B	2	M 64-5(138-5B)	F6 (E3)
1(2)CV8149C	B	2	M 64-5(138-5B)	F5 (F2)

FUNCTION(S):

CV459 & 460 valves are normally OPEN with the Unit at power, allowing letdown flow to occur. The valves auto close on low Pressurizer level and on letdown isolation due to an interlock with the orifice isolation valves.

CV8149 Orifice Isolation Valves are interlocked with CV459/460 to Close on Phase A Containment Isolation signal. One or more of these valves are normally OPEN to maintain letdown flow.

JUSTIFICATION:

It is impractical to exercise and stroke time the above listed valves on a quarterly basis. Due to the interlocks between the 459, 460, & the 8149 valves, exercising these valves during normal operation results in (multiple) total letdown flow isolation events. The affect of a letdown isolation with the Unit at power is a thermal transient to the letdown lines, heat exchangers, and other components. A letdown isolation also results in some amount of pressurizer level fluctuation until equilibrium letdown and makeup is re-established. While the piping and components are designed for thermal transients, each cycle presents some additional stress to all of the affected equipment. It is prudent to minimize the number of transients the equipment is required to undergo to prevent premature failures.

Due to the above, these valves will be tested in Cold Shutdowns of sufficient duration in accordance with OM-10, paragraph 4.2.1.2.

COLD SHUTDOWN JUSTIFICATION
VC-11

VALVE NUMBER	CATEGORY	CODE CLASS	DRAWING NUMBER	DRAWING COORDINATE
1/2AF001A	C	3	M-37 (122)	D2(E7)
1/2AF001B	C	3	M-37 (122)	B2(B7)
1/2AF003A	C	3	M-37 (122)	D5 (E5)
1/2AF003B	C	3	M-37 (122)	B5 (C5)
1/2AF029A	C	3	M-37 (122)	C5 (E5)
1/2AF029B	C	3	M-37 (122)	B5 (C4)
1/2AF014A	C	2	M-37 (122)	D8 (D2)
1/2AF014B	C	2	M-37 (122)	A8 (B2)
1/2AF014C	C	2	M-37 (122)	E8 (E2)
1/2AF014D	C	2	M-37 (122)	B8 (C2)
1/2AF014E	C	2	M-37 (122)	D8 (E2)
1/2AF014F	C	2	M-37 (122)	B8 (B2)
1/2AF014G	C	2	M-37 (122)	E8 (F2)
1/2AF014H	C	2	M-37 (122)	C8 (D2)

FUNCTION(S):

The AF001 valves are the AFW pump suction check valve from the condensate storage tanks. The AF003 valves are the AFW pump discharge check valves. The AF029 valves are the AFW pump header check valves downstream to the mini-flow recirculation line. The AF014 valves are the individual header check valves to the steam generators. All these valves are required to open to provide a flowpath to the Steam Generators.

Also covered in this cold shutdown justification is the closure function for the 1/2AF014A-H valves. These valves are required to close in order to prevent Steam Generator inventory loss, prevent steam binding of the AFW pumps, and provide containment isolation during a steam generator tube rupture.

JUSTIFICATION:

The Auxiliary Feedwater check valves 1/2AF001A/B, 1/2AF003A/B, 1/2AF014A-H, and 1/2AF029A/B cannot be full stroke tested during unit operation, as this would induce potentially damaging thermal stresses in the upper feedwater nozzle piping. The 1/2AF001A/B and 1/2AF003A/B valves will be partially stroke tested during operation, and all valves full stroke tested during cold shutdown, in accordance with OM-10, paragraph 4.3.2.2.

COLD SHUTDOWN JUSTIFICATION
VC-11 (continued)

Check valves 1/2AF014A-H are verified to be closed each shift by the Operating Department, by verifying that the temperature at 1/2AF005A-H is ≤ 130°F, per BOP 199-EA A1 and BOP 199-EA A2. If the temperature is > 130°F at any 1/2AF005 valve, then abnormal operating procedure 1/2BOA SEC-7, "Auxiliary Feedwater Check Valve Leakage", is entered to isolate and cool down the affected lines. This shiftly monitoring of 1/2AF014A-H in the closed position adequately monitors the status of these valves during unit operation. However, at the NRC's request, the official IST backflow test will be performed following the full flow test during cold shutdowns in the same procedure, in accordance with OM-10, paragraph 4.3.2.2.

COLD SHUTDOWN JUSTIFICATION
VC-12

VALVE NUMBER	CATEGORY	CODE CLASS	DRAWING NUMBER	DRAWING COORDINATE
1/2SI8801A	B	2	M-61-2 (136-2)	D3 (D6)
1/2SI8801B	B	2	M-61-2 (136-2)	C3 (C6)

FUNCTION(S):

These are the charging pumps to RCS cold leg isolation valves. They are required to open to provide a flow path for the high head safety injection portion of ECCS. They are required to close for containment isolation.

JUSTIFICATION:

The High Head Injection Isolation Valves 1SI8801A/B and 2SI8801A/B cannot be stroke tested during unit operation. These valves isolate the CV system from the RCS. Opening them during operation would enable charging flow to pass directly into the RCS, bypassing the regenerative heat exchanger. The temperature difference of the charging flow and the RCS could result in damaging thermal stresses to the cold leg nozzles as well as cause a reactivity change which would, in turn, cause a plant transient. These valves will be stroke time tested during cold shutdown in accordance with OM-10, paragraph 4.2.1.2

COLD SHUTDOWN JUSTIFICATION
VC-13

VALVE NUMBER	CATEGORY	CODE CLASS	DRAWING NUMBER	DRAWING COORDINATE
1/2SI8802A	B	2	M-61-3 (136-3)	E3 (E6)
1/2SI8802B	B	2	M-61-3 (136-3)	D3 (D6)
1/2SI8806	B	2	M-61-1A (136-1)	D2 (C6)
1/2SI8809A	B	2	M-61-4 (136-4)	E4 (E5)
1/2SI8809B	B	2	M-61-4 (136-4)	D4 (D5)
1/2SI8813	B	2	M-61-1B (136-1)	D7 (E4)
1/2SI8835	B	2	M-61-3 (136-3)	C4 (C5)
1/2SI8840	B	2	M-61-3 (136-3)	B4 (B5)

FUNCTION(S):

The SI8802 valves are the Safety Injection to the Reactor Coolant System (RCS) hot leg (1A/1D, 1B/1C) isolation valves. The SI8806 valves are the A and B train SI pump suction isolation valves from the RWST. The SI8809 valves are the Residual Heat Removal (RHR) pumps to RCS cold leg isolation valves. The SI8813 valves are the SI pumps common mini-flow recirculation isolation valves. The SI8835 valves are the SI pumps cold leg isolation valves. The SI8840 valves are the RHR to RCS hot legs 1A/1D isolation valves.

JUSTIFICATION:

The safety injection system SVAG (Spurious Valve Actuation Group) valves 1/2SI8802A/B, 1/2SI8806, 1/2SI8809A/B, 1/2SI8813, 1/2SI8835, and 1/2SI8940 cannot be stroke tested during unit operation. These valves are required by Technical Specification 4.5.2 to be de-energized in their proper positions during unit operation. Stroking them would be a violation of the Technical Specifications as well as defeating the de-energized SVAG valve principle. These valves will be stroke tested during cold shutdown when they are not required to be de-energized. This is in accordance with OM-10, paragraph 4.2.1.2.

COLD SHUTDOWN JUSTIFICATION
VC-14

VALVE NUMBER	CATEGORY	CODE CLASS	DRAWING NUMBER	DRAWING COORDINATE
1/2RY455A	B	1	M-60-5(135-5)	C8(C8)
1/2RY456	B	1	M-60-5(135-5)	D8(D8)

FUNCTION(S):

Pressurizer Power Operated Relief Valves are required to open for low temperature overpressure protection. The closed function is for pressure isolation.

JUSTIFICATION:

PORV's 1/2RY455A and 1/2RY456 will be stroke/fail safe tested on a cold shutdown frequency per Generic Letter 90-06. This recommendation comes from Enclosure A to Generic Letter 90-06, which addresses the NRC staff positions concerning PORV and Block Valve Reliability. Item number 3.1.2 states that the "Stroke testing of PORVs should only be performed during mode 3 (HOT STANDBY) or mode 4 (HOT SHUTDOWN) and in all cases prior to establishing conditions where the PORVs are used for low-temperature overpressure protection. Stroke testing of the PORV's should not be performed during power operation." For this reason, these valves will be stroke time tested/fail-safe tested during cold shutdowns in accordance with OM-10, paragraph 4.2.1.2 and Generic Letter 90-06.

COLD SHUTDOWN JUSTIFICATION NUMBER:
VC-15

VALVE NUMBER	CATEGORY	CODE CLASS	DRAWING NUMBER	DRAWING COORDINATE
1/2RH8701A	A	1	M-62(M-137)	E1(E7)
1/2RH8701B	A	1	M-62(M-137)	E1(E8)
1/2RH8702A	A	1	M-62(M-137)	C1(C7)
1/2RH8702B	A	1	M-62(M-137)	C1(C8)
1/2RH8705A	AC	2	M-62(M-137)	D1(D8)
1/2RH8705B	AC	2	M-62(M-137)	C1(C8)
1/2SI8815	AC	1	M-61-2(M-136-2)	D5(D4)
1/2SI8818A	AC	1	M-61-4(M-136-4)	F7(F2)
1/2SI8818B	AC	1	M-61-4(M-136-4)	D7(D2)
1/2SI8818C	AC	1	M-61-4(M-136-4)	D7(D2)
1/2SI8818D	AC	1	M-61-4(M-136-4)	E7(E2)
1/2SI8819A	AC	1	M-61-3(M-136-3)	A5(B4)
1/2SI8819B	AC	1	M-61-3(M-136-3)	A7(B2)
1/2SI8819C	AC	1	M-61-3(M-136-3)	A6(B2)
1/2SI8819D	AC	1	M-61-3(M-136-3)	A6(B3)
1/2SI8841A	AC	1	M-61-3(M-136-3)	E4(E4)
1/2SI8841B	AC	1	M-61-3(M-136-3)	C7(C2)
1/2SI8900A	AC	1	M-61-2(M-136-2)	E7(E2)
1/2SI8900B	AC	1	M-61-2(M-136-2)	D7(D2)
1/2SI8900C	AC	1	M-61-2(M-136-2)	C7(C2)
1/2SI8900D	AC	1	M-61-2(M-136-2)	B7(B2)
1/2SI8905A	AC	1	M-61-3(M-136-3)	E4(E4)
1/2SI8905B	AC	1	M-61-3(M-136-3)	D7(D2)
1/2SI8905C	AC	1	M-61-3(M-136-3)	C7(C2)
1/2SI8905D	AC	1	M-61-3(M-136-3)	E4(E5)
1/2SI8948A	AC	1	M-61-5(M-136-5)	B7(B2)
1/2SI8948B	AC	1	M-61-5(M-136-5)	B4(B5)
1/2SI8948C	AC	1	M-61-6(M-136-6)	A8(B1)
1/2SI8948D	AC	1	M-61-6(M-136-6)	A5(B4)
1/2SI8949A	AC	1	M-61-3(M-136-3)	E8(E1)
1/2SI8949B	AC	1	M-61-3(M-136-3)	D8(D1)
1/2SI8949C	AC	1	M-61-3(M-136-3)	C8(C1)
1/2SI8949D	AC	1	M-61-3(M-136-3)	E8(E1)
1/2SI8956A	AC	1	M-61-5(M-136-5)	B7(B3)
1/2SI8956B	AC	1	M-61-5(M-136-5)	B4(B6)
1/2SI8956C	AC	1	M-61-6(M-136-6)	A8(B2)
1/2SI8956D	AC	1	M-61-6(M-136-6)	A5(B4)

COLD SHUTDOWN JUSTIFICATION NUMBER:
VC-15 (continued)

FUNCTION(S):

The listed valves have been identified as intersystem LOCA valves. Only the closed function of these valves will be addressed in this justification. These valves form a pressure boundary between the RCS and the other essential components in order to protect these components from damage.

JUSTIFICATION:

These valves will be leak tested in accordance with Byron's Technical Specification 4.4.6.2.2(b). If Byron is in cold shutdown for 72 hours or more and the valves have not been tested in the past nine months, they will be leak tested prior to entry into mode 2. All of these valves are considered pressure isolation valves (PIVs) per the Technical specifications, except for the 1/2RH8705A/B valves, which will be tested on the same frequency since they are tested in conjunction with the 1/2RH8701/2 valves. The performance of the leak test also satisfies the backflow test required for check valves by NRC Generic Letter 89-04. These valves will be backflow/leak tested during cold shutdowns, per Technical Specification 4.4.6.2.2(b), in accordance with OM-10, paragraph 4.2.1.2 and 4.3.2.2.

COLD SHUTDOWN JUSTIFICATION:
VC-16

VALVE NUMBER	CATEGORY	CODE CLASS	DRAWING NUMBER	DRAWING COORDINATE
1/2CV8440	C	2	M-64-4B(M-138-4B)	F6(D5)

FUNCTION(S):

These check valves allow flow from the Volume Control Tank (VCT) to the suction of the CV pumps. During the injection phase of an accident, these valves prevent pump deadheading by allowing a pump mini-flow flow path. During the hot leg recirculation phase of a safety injection, these valves close to prevent diversionary flow back to the VCT via the seal water heat exchanger relief valve, which could potentially lead to an unfiltered release of radioactivity to the environment. The closed function is the subject of this cold shutdown justification.

JUSTIFICATION:

These valves may only be tested closed during cold shutdowns, when all 4 RCPs and charging pumps are off. Isolation at power would isolate flow to the suction of the CV pumps, which, in turn would isolate charging flow and flow to the RCP seals. Refer to CHRON #0117821, dated November 23, 1992. Closure testing of these check valves will be performed during cold shutdowns, using non-intrusive techniques (as conditions allow), in accordance with OM-10, paragraph 4.3.2.2.

COLD SHUTDOWN JUSTIFICATION
VC-17

VALVE NUMBER	CATEGORY	CODE CLASS	DRAWING NUMBER	DRAWING COORDINATE
1/2SI8948A	AC	1	M-61-5(M-136-5)	B7(B2)
1/2SI8948B	AC	1	M-61-5(M-136-5)	B4(B5)
1/2SI8948C	AC	1	M-61-6(M-136-6)	A8(B1)
1/2SI8948D	AC	1	M-61-6(M-136-6)	A5(B4)

FUNCTION(S):

Only the open position of these valves will be addressed in this justification (see VC-15 for closed function). These valves are one of the safety injection accumulator discharge check valves required to open to permit the injection of borated water into the reactor vessel cold legs during the passive injection phase of a safety injection (accumulator discharge check valves). They are also required for cold leg recirculation.

JUSTIFICATION:

These valves will be full stroke tested during refueling outages per ROJ-2. As mentioned in ROJ-2, these valves cannot be full or partial stroke tested during unit operation without depressurizing the RCS to 1600 psig (to stroke using Safety Injection Pumps) or to 200 psig (to use the Residual Heat Removal Pumps). The full stroke testing is accomplished using accumulators, acoustic monitoring, etc. as discussed in ROJ-2. However, since alternate flowpaths exist to allow the partial stroking of these valves with the SI or RH pumps, then these valves will be partial stroke tested during cold shutdowns in accordance with OM-10, paragraph 4.3.2.2.

COLD SHUTDOWN JUSTIFICATION
VC-18

VALVE NUMBER	CATEGORY	CODE CLASS	DRAWING NUMBER	DRAWING COORDINATE
1/2RH8716A	B	2	M-62(M-137)	D8(E1)
1/2RH8716B	B	2	M-62(M-137)	C8(D1)

FUNCTION(S):

These valves are the Residual Heat Removal system cross connect valves that are normally open to allow injection into all four RCS loops. Both A and B valves are required to be open for train operability of either train of RHR. The valves are required to be closed during cold leg recirculation and open during hot leg recirculation.

JUSTIFICATION:

Per Byron Station Technical Specification Interpretation Number 3/4.5.2-1, Revision 2, entitled "RH System Operability," while in modes 1,2, and 3, 1/2RH8716A and 1/2RH8716B may not be closed, as neither RH train can discharge into all four cold legs. Hence, these valves may only be stroke timed in modes 4, 5, or 6. These valves will be stroke timed closed and open during cold shutdowns in accordance with OM-10, paragraph 4.2.1.2.

COLD SHUTDOWN JUSTIFICATION
VC-19

VALVE NUMBER	CATEGORY	CODE CLASS	DRAWING NUMBER	DRAWING COORDINATE
1/2CC685	A	2	M-66-1A(M-139-1)	B4(B6)
1/2CC9413A	A	2	M-66-1A(M-139-1)	E3(E7)
1/2CC9414	A	2	M-66-1A(M-139-1)	A4(B6)
1/2CC9415	B	3	M-66-4D	C6(C3)
1/2CC9416	A	2	M-66-1A(M-139-1)	A6(B6)
1/2CC9438	A	2	M-66-1A(M-139-1)	B6(B6)
1/2CV8100	A	2	M-64-2(M-138-2)	F1(F1)
1/2CV8112	A	2	M-64-2(M-138-2)	F2(F2)

FUNCTION(S):

Motor Operated Valves 1/2CC685 and 1/2CC9438 are located on the Component Cooling return line from the Reactor Coolant Pump (RCP) thermal barrier cooling coils. The safety function of these valves in the closed direction is to provide a leak-tight barrier between the containment atmosphere and the environment during post accident conditions after a postulated rupture of the thermal barrier heat exchanger. The function of these valves in the open direction is to provide Component Cooling water return from the Reactor Coolant Pump thermal barriers.

Motor Operated Valves 1/2CC9413A are located on the Component Cooling supply line to the Reactor Coolant Pumps (RCPs). The safety function of these valves in the closed direction is to provide a leak-tight barrier between the containment atmosphere and the environment during accident conditions. The open function of these valves is to supply Component Cooling water to the Reactor Coolant Pumps.

Motor Operated Valves 1/2CC9414 and 1/2CC9416 are located on the Component Cooling return line from the Reactor Coolant Pump (RCP) upper and lower motor bearing coolers. The safety function of these valves in the closed direction is to provide a leak-tight barrier between the containment atmosphere and the environment during accident conditions. The open function of these valves is to provide Component Cooling water return from the Reactor Coolant Pumps upper and lower motor bearing coolers.

Motor Operated Valves 1/2CC9415 are in the supply line to the RCPs and other non-essential Component Cooling Water loads. They close to isolate non-essential loads from essential loads during accident conditions. Additionally, these valves may need to be reopened to cool the Excess Letdown HX to maintain control of pressurizer level during a post accident scenario.

COLD SHUTDOWN JUSTIFICATION
VC-19 (continued)

Motor Operated Valves 1/2CV8100 and 1/2CV8112 are located in the Reactor Coolant Pump seal water return lines. The safety function of these valves in the closed direction is to provide a leak-tight barrier between the containment atmosphere and the environment during accident conditions. The open function of these valves is to permit seal water return flow from the Reactor Coolant Pumps to the seal water heat exchanger.

JUSTIFICATION:

These valves cannot be stroked during normal operations because they would isolate flow to the Reactor Coolant Pumps. Failure of one of the CC valves in a closed position during an exercise test would result in a loss of cooling flow to the pumps and eventual pump damage and/or trip. Failure of a CV valve in the closed direction would result in seal water return flow being diverted to the Pressurizer Relief Tank (PRT) by lifting a relief valve (1/2CV8121) upstream of the isolation valves. Therefore, these valves will be stroke tested during cold shutdowns, provided all of the RCPs may be shutdown (and seal leak-off may be isolated for 1/2CV8100 and 1/2CV8112), in accordance with OM-10, paragraph 4.2.1.2. This test frequency will adequately maintain these valves in a state of operational readiness by testing them as often as safely possible.

COLD SHUTDOWN JUSTIFICATION
VC-19 (continued)

Motor Operated Valves 1/2CV8100 and 1/2CV8112 are located in the Reactor Coolant Pump seal water return lines. The safety function of these valves in the closed direction is to provide a leak-tight barrier between the containment atmosphere and the environment during accident conditions. The open function of these valves is to permit seal water return flow from the Reactor Coolant Pumps to the seal water heat exchanger.

JUSTIFICATION:

These valves cannot be stroked during normal operations because they would isolate flow to the Reactor Coolant Pumps. Failure of one of the CC valves in a closed position during an exercise test would result in a loss of cooling flow to the pumps and eventual pump damage and/or trip. Failure of a CV valve in the closed direction would result in seal water return flow being diverted to the Pressurizer Relief Tank (PRT) by lifting a relief valve (1/2CV8121) upstream of the isolation valves. Therefore, these valves will be stroke tested during cold shutdowns, provided all of the RCPs may be shutdown (and seal leak-off may be isolated for 1/2CV8100 and 1/2CV8112), in accordance with OM-10, paragraph 4.2.1.2. This test frequency will adequately maintain these valves in a state of operational readiness by testing them as often as safely possible.

COLD SHUTDOWN JUSTIFICATION
VC-20

VALVE NUMBER	CATEGORY	CODE CLASS	DRAWING NUMBER	DRAWING COORDINATE
1/2FW036A	C	2	M-36-1C(M-121-1B)	E3(E3)
1/2FW036B	C	2	M-36-1A(M-121-1A)	E3(E3)
1/2FW036C	C	2	M-36-1D(M-121-1C)	E3(E3)
1/2FW036D	C	2	M-36-1B(M-121-1C)	E3(E3)

FUNCTION(S):

The feedwater tempering flow check valves (1/2FW036A-D) are open during full/high power operation to ensure the S/G upper nozzle subcooled margin is maintained above the 75°F minimum. They also open to allow tempering flow during shutdown and startup. The IST function is to close to provide an immediate isolation during a feedwater line break accident to mitigate a loss of secondary make-up and/or inventory.

JUSTIFICATION:

The 1/2FW036A-D are 3" swing type check valves with no position indication. Flow through this line at full/high power cannot be stopped for longer than one minute while in mode 1. Also, flow/pressure is always toward the Steam Generators during operation, making it impractical to perform a back leakage or back pressure test to prove valve closure. These check valves will be tested during cold shutdowns using non-intrusive techniques to prove valve closure in accordance with OM-10, paragraph 4.3.2.2.

COLD SHUTDOWN JUSTIFICATION
VC-21

VALVE NUMBER	CATEGORY	CODE CLASS	DRAWING NUMBER	DRAWING COORDINATE
1(2)SI8808A	B	1	M 61(136)-5	C6 (C3)
1(2)SI8808B	B	1	M 61(136)-5	C4 (C6)
1(2)SI8808C	B	1	M 61(136)-6	C7 (D2)
1(2)SI8808D	B	1	M 61(136)-6	C5 (D4)

FUNCTION(S):

The 1/2SI8808A-D valves are Motor Operated Safety Injection Accumulator Discharge Isolation Valves. These valves are OPEN with Power Removed for Modes 1, 2, and 3 with Pressurizer Pressure above 1000 psig. These valves were included in the IST Program for their need to be closed after all of the water in the Accumulator has been injected into the RCS. Closure of these valves would prevent injection of a Nitrogen bubble into the RCS. These valves are included in the IST Program for testing in both OPEN and CLOSED directions.

JUSTIFICATION:

Technical Specification 3/4.5.1.a requires "The (Accumulator) isolation valve open and power removed." while in Modes 1, 2 or 3 (with pressurizer pressure above 1000 psig).

Since the Technical Specifications require these valves to be OPEN with power to their motor operators removed during periods when pressurizer pressure is above 1000 psig, the valves cannot be exercised every three months. In lieu of stroke time testing the valves every three months, these valves will be tested during heatup or cooldown (the pressure transition between 800 and 1000 psig pressurizer pressure) or, they will be tested with the RCS depressurized and the associated accumulator vented and drained. This cold shutdown testing frequency is in accordance with OM-10, paragraph 4.2.1.2.

COLD SHUTDOWN JUSTIFICATION
VC-22

VALVE NUMBER	CATEGORY	CODE CLASS	DRAWING NUMBER	DRAWING COORDINATE
1(2)CV8355A	B	2	M 64(138)-1	B8 (B8)
1(2)CV8355B	B	2	M 64(138)-1	B4 (B4)
1(2)CV8355C	B	2	M 64(138)-2	B8 (B8)
1(2)CV8355D	B	2	M 64(138)-2	B5 (B5)

FUNCTION(S):

The CV8355 valves are Motor Operated Isolation valves in the seal injection line to the Reactor Coolant Pumps. Additionally, the CV8355s are designated Containment Isolation valves but are exempt from Local Leak Rate Testing of 10 CFR 50, Appendix J. The CV8355s have no automatic closure function as part of Containment Isolation.

JUSTIFICATION:

Reactor Coolant Pumps (RCPs) are required to be in operation in Mode 1, Power Operation. Seal injection flow must be maintained when the RCPs are running. Interruption of seal injection flow with the RCPs in operation, even for a short duration, is detrimental to the RCP seals. The above listed valves are Seal Injection Inlet valves and are designated Containment Isolation valves (CIVs).

The 1/2CV8355A-D valves are exempt from Local Leakage Rate testing of 10 CFR 50, Appendix J, but due to their designation as CIVs, they will be tested per ASME Code in the Closed direction. Due to the above, these valves will not be exercised during plant operation, but they will be exercised during Cold Shutdown WHEN THE RCPs ARE NOT RUNNING. Short duration forced outages to Cold Shutdown seldom require shutdown of RCPs as they are part of the normal heat removal loop. It is NOT the intent of this justification to require RCP shutdown only to perform the exercise tests for these valves. It is anticipated that these valves may not normally be tested more often than once per refueling outage. However, these valves will be tested during cold shutdowns in which the RCPs are secured for sufficient time to perform the tests, which is in accordance with OM-10, paragraph 4.2.1.2.

COLD SHUTDOWN JUSTIFICATION NUMBER
VC-23

VALVE NUMBER	CATEGORY	CODE CLASS	DRAWING NUMBER	DRAWING COORDINATE
1SD054A	B	2	M 48-5A	D8
1(2)SD054B	B	2	M 48-5A(5B)	D7 (D8)
1SD054C	B	2	M 48-5A	D6
1(2)SD054D	B	2	M 48-5A(5B)	D6 (D6)
1SD054E	B	2	M 48-5A	D5
1(2)SD054F	B	2	M 48-5A(5B)	D4 (D4)
1SD054G	B	2	M 48-5A	D3
1(2)SD054H	B	2	M 48-5A(5B)	D2 (D2)

FUNCTION(S):

The SD054 valves are normal Steam Generator Blowdown throttle control valves. An additional function of the Unit 1, (A through H valves) and the Unit 2, (B train valves [B, D, F, & H]) is to isolate Blowdown for High Energy Line Break (HELB).

JUSTIFICATION:

It is impractical to exercise and stroke time the above listed valves on a quarterly basis. The valves have no Open / Closed handswitch. They are normally operated by means of a potentiometer which ultimately controls an air signal to a positioner. Attainment of repeatable stroke time results requires the valves to be stroked by causing (or simulating) HELB relay actuation. This method of closure causes multiple valve actuations resulting in complete steam generator blowdown isolation. Furthermore, the remote position indicator, (a 0-100% indicator - not based on limit switch operation) may lag actual valve position. Therefore the only repeatable method of stroke timing these valves involves stationing personnel locally at the valve(s) to witness actual valve movement.

Full stroke exercising the valves is a Unit operation concern in that closure of these valves during normal operation presents a thermal transient to the downstream piping and components including the blowdown condenser. While the valves, piping, and components are designed to withstand this thermal transient, each transient produces stress which may lead to premature failure of the affected components. It is prudent to minimize the number of thermal transients that these high energy lines are required to undergo.

COLD SHUTDOWN JUSTIFICATION
VC-23 (continued)

Personnel safety concerns exist with this stroking exercise during normal operation in that the valves are physically located in the Main Steam Isolation (MSIV) Valve House. This room contains the MSIVs, Feedwater Isolation Valves (FWIVs), Main Steam Safety Valves, Main Steam PORVs, and other miscellaneous piping and valves. The normal ambient temperature in this room with the Unit at power is greater than 110 'F. Almost all of the piping (most of which is insulated) and instrument tubing in the room are normally at temperatures of approximately 500 'F or more. The SD054 valves are located above the floor some 16 to 20 feet and are not visible from the floor being obscured by Main Steam and Feedwater Piping. Since personnel must be stationed locally at the valve to witness actual valve movement, it is necessary to climb around very hot piping in a hot and very noisy ambient atmosphere. In some cases it may be necessary to erect scaffolding to conduct this test with the Unit in normal operation.

Due to the above, these valves will be stroke time/fail safe tested during Cold Shutdowns of sufficient duration to allow safe access to the valves, including the erection of scaffolding, if required. This testing frequency is in accordance with OM-10, paragraph 4.2.1.2.

COLD SHUTDOWN JUSTIFICATION
VC-24

VALVE NUMBER	CODE CATEGORY	DRAWING CLASS	DRAWING NUMBER	COORDINATE
1/2VQ001A	A	2	M-105-1 (M-106-1)	E5(E5)
1/2VQ001B	A	2	M-105-1 (M-106-1)	E6(E6)
1/2VQ002A	A	2	M-105-1 (M-106-1)	E4(E4)
1/2VQ002B	A	2	M-105-1 (M-106-1)	E3(E3)

FUNCTION(S):

The 1/2VQ001A/B valves are the containment purge supply isolation valves. The 1/2VQ002A/B valves are the containment purge exhaust isolation valves. They were designed to purge containment under normal shutdown conditions. The IST function of closure is for containment isolation.

JUSTIFICATION:

The Primary Containment Purge Supply and Exhaust Valves, 1/2VQ001A/B and 1/2VQ002A/B, cannot be stroke time tested during unit operation. These 48-inch valves are the only isolation points between the containment atmosphere and the environment. Stroking these valves at any time other than modes 5 or 6 would be a violation of Byron Technical Specification 3.6.1.7(a), in which it states that in modes 1-4, the valves "..shall be closed and power removed." Administratively, these valves are maintained Out of Service Closed.

As a containment isolation valve, the closure function is considered to be operable. The valves are leak tested in accordance with Appendix J and a monthly verification is performed to verify that these valves are closed and power is removed. The monthly verification is completed by verifying the closed indication of the Group 6 monitor lights in the control room and that each power supply is off. However, if re-positioning this valve is necessary and the valve needs to be considered operable in association with exercising capabilities of it, then the IST stroke time testing and remote position indication testing will be completed prior to declaring the valve operable per OM-10, paragraph 4.3.2.5. It is anticipated that the necessary stroke time testing of these valves will be very infrequent, if at all, in the future.

TEST FREQUENCY:

The 1/2VQ001A/B and 1/2VQ002A/B valves will be stroke time tested during cold shutdowns, as necessary, to declare the valve exercising capabilities operable, in accordance with OM-10, paras. 4.2.1.2 and 4.3.2.5.

SECTION 3.4

VALVE REFUELING OUTAGE

JUSTIFICATIONS

3.4.1 Valve Refueling Outage Justification Summary

Number	Component	Description
ROJ-1	OSX127A/B; OSX143A/B	Backflow Test (Bt) during Refueling Outages (U-1 and U-2)
ROJ-2	1/2SI8948A-D; 1/2SI8956A-D	Full Stroke Test (Ct) during Refueling (verified with Sampling Acoustic Testing), and Partial Stroke Test (Xt) of 1/2SI8948A-D during Cold Shutdown (see VC-17)
ROJ-3	1/2CC9458; 1/2CC9459A/B; 1/2CC9467A-C	All Valves Manually Stroke Tested (St)in preparation/ during each U-2 Refueling.
ROJ-4	1/2SI8811A/B	Stroke Time Tested (St) during Refueling
ROJ-5	1/2IA065; 1/2IA066; 1/2IA091	Stroke Time Test (St) and Fail Safe Test Closed (Fc) of 1/2IA065 and 1/2IA066 during Refueling, and Full Stroke Test (Ct) of 1/2IA091 during Refueling
ROJ-6	1/2SI8819A-D; 1/2SI8905A-D; 1/2SI8922A/B; 1/2SI8926; 1/2SI8949B,D	All Valves Full Stroke Tested (Ct) during Refueling, and the 1/2SI8926 Valves are Partial Stroke Tested (Xt) Quarterly
ROJ-7	1/2CV8481A/B; 1/2CV8546; 1/2SI8815; 1/2SI8900A-D	All Valves Full Stroke Tested (Ct) during Refueling, and the 1/2CV8481A/B Valves are Partial Stroke Tested (Xt) Quarterly.
ROJ-8	1/2SI8841A/B; 1/2SI8949A,C	Full Stroke Test (Ct) during Refueling
ROJ-9	1/2RH8705A/B	Full Stroke Test (Ct) during Refueling
ROJ-10	1/2FP345	Backflow Test (Bt) during Refueling
ROJ-11	1/2CV8348	Backflow Test (Bt) during Refueling
ROJ-12	1/2CV8368A-D	Backflow Test (Bt) during Refueling

3.4.1 Valve Refueling Outage Justification Summary (continued)

Number	Component	Description
ROJ-13	1/2CC9495A-D	Backflow Test (Bt) during Refueling
ROJ-14	1/2FW510A; 1/2FW520A; 1/2FW530A; 1/2FW540A; 1/2FW510; 1/2FW520; 1/2FW530; 1/2FW540; 1/2FW034A-D	Augmented Fail-Safe Test Closed (Fc) during Refueling per Byron Technical Specifications

REFUELING OUTAGE JUSTIFICATION
ROJ-1

VALVE NUMBER	CATEGORY	CODE CLASS	DRAWING NUMBER	DRAWING COORDINATE
0SX127A/B	BC	3	M-42-6	B2(B4)
0SX143A/B	BC	3	M-42-6	B2(B4)

FUNCTION(S):

a. 0SX127A,B: These valves are the Deep Well Pump Discharge Check Valves, which are in the flow path to the Essential Service Water Cooling Towers. These check valves open (not covered in this justification) to provide a flow path for Deep Well Water to the Ultimate Heat Sink as a backup to the Emergency Makeup Pumps. In addition, these check valves are required to close to prevent loss of required Emergency Makeup water flow into the Deep Wells and not to the Ultimate Heat Sink when required.

b. 0SX143A,B: These valves are the Circ Water Pump Makeup Discharge Check Valves, which are in the flowpath to the Essential Service Water Cooling Towers. These check valves are required to close to prevent backflow into the Circ Water Makeup (non-safety) supply line to the SX towers. These valves are located at the safety related/non-safety related boundary.

JUSTIFICATION:

The 0SX127A/B and 0SX143A/B check valves were thoroughly investigated for possible closure testing, and it was determined that the only way to determine closure would be through nonintrusive techniques. Traditional methods of measuring leakage, etc. were not possible. The initial testing on these valves occurred in March of 1995 (prior to the end date of B2R05). Initially, acoustic testing was investigated using various system lineups with limited results. Alternate testing methods, which would establish future repeatable tests, were investigated. Both radiography and UT testing were attempted. UT testing produced a weak backwall signal and is inadequate at this time. Radiography produced the most conclusive test results concerning valve closure. Subsequent test results with radiography have confirmed that it is the most conclusive and repeatable.

Performing the radiography on these valves requires the use of outside contractor personnel. This is costly and impractical to perform on a quarterly basis or cold shutdown frequency. It is much more practical and less costly to perform the radiography on these valves during refueling outages, when radiography crews are available and on site performing other radiography associated with the refueling outage. This justification for deferral of testing to refueling is in accordance with OM-10, paragraph 4.3.2.2

REFUELING OUTAGE JUSTIFICATION
ROJ-1 (continued)

TEST FREQUENCY:

The 0SX127A/B and 0SX143A/B backflow radiography tests will be completed during each refueling outage (U-1 and U-2)in accordance with OM-10, paragraph 4.3.2.2.

REFUELING OUTAGE JUSTIFICATION
ROJ-2

VALVE NUMBER	CATEGORY	CODE CLASS	DRAWING NUMBER	DRAWING COORDINATE
1/2SI8948A	AC	1	M-61-5(M-136-5)	B7(B2)
1/2SI8948B	AC	1	M-61-5(M-136-5)	B4(B5)
1/2SI8948C	AC	1	M-61-6(M-136-6)	A8(B1)
1/2SI8948D	AC	1	M-61-6(M-136-6)	A5(B4)
1/2SI8956A	AC	1	M-61-5(M-136-5)	B7(B3)
1/2SI8956B	AC	1	M-61-5(M-136-5)	B4(B6)
1/2SI8956C	AC	1	M-61-6(M-136-6)	A8(B2)
1/2SI8956D	AC	1	M-61-6(M-136-6)	A5(B4)

FUNCTION(S):

The 1/2SI8948A-D and 1/2SI8956A-D check valves are located inside the containment building missile barrier on the lines from the accumulator tanks to the Reactor Coolant System (RCS) cold legs. These 10" check valves have safety functions in both the open and closed directions. This Refueling Outage Justification will address the check valve open test only. The open direction function of these check valves is to permit the injection of borated water into the reactor vessel cold legs during the passive injection phase of a safety injection.

JUSTIFICATION:

Check valves 1/2SI8956A-D cannot be full or partial tested during unit operation due to the pressure differential between the accumulators (650 psig) and the reactor coolant system (2235 psig). Full or partial stroke exercising of these valves could occur only with a rapid depressurization of the reactor coolant system.

Check valves 1/2SI8948A-D cannot be full or partial stroke tested during unit operation without depressurizing the RCS to 1600 psig (to stroke using Safety Injection pumps) or to 200 psig (to use the Residual Heat Removal pumps).

REFUELING OUTAGE JUSTIFICATION
ROJ-2 (continued)

Full stroking these valves during cold shutdowns, routine or forced, would impose hardship with no compensating increase in plant safety. To perform this test, the reactor coolant system (RCS) must be at approximately 40 psi with all 4 reactor pumps (RCPs) off and accumulator pressure at approximately 100 psi over RCS pressure. The full stroke test is accomplished by opening the flowpath to the RCS by stroking the respective SI8808 valve open, and then closed. During this "burping" of the accumulators, strip chart recorders are used to obtain data that will be used to calculate the pressurizer level increase with time and verify that the flow that passed through the respective SI8956 and SI8948 check valves is greater than a calculated full flow value for the check valves. In addition, nonintrusive testing, which has proven the full stroke for each valve in the past, is performed on one valve from each group, consistent with NUREG 1482, section 4.1.2 (this also eliminates high radiation exposures associated with the nonintrusive testing of all valves).

A concern with testing is that at or near end-of-core life, the boron concentration of the RCS is low compared to the approximate 2000 ppm concentration of the accumulators. This injection test requires that approximately 8 thousand gallons of this boron concentrated water be injected into the RCS. This would result in a considerable increase in the boron concentration of the RCS. The feed and bleed process required to restore desired RCS boron concentration would result in considerable increases in restoration time and in amounts of radioactive water rejected from the site.

The partial stroke exercising of the 1/2SI8948 valves will be completed during cold shutdowns using the RH or SI pumps since there are alternate flowpaths available and it can be done with little or no effect on the RCS system (see VC-17). Partial stroking of the 1/2SI8956 valves will not be completed during cold shutdowns because the same test methodology used for the full stroke test would be required to perform the partial test.

This justification is consistent with OM-10, paragraph 4.3.2.2, in which deferral of testing to refueling is allowed without relief.

TEST FREQUENCY:

Byron Station will full stroke exercise (CT) the 1/2SI8948A-D and 1/2SI8956A-D check valves during each respective U-1 or U-2 refueling outage and partially stroke the 1/2SI8948 valves during cold shutdowns (See VC-17) in accordance with OM-10, paragraph 4.3.2.2

REFUELING OUTAGE JUSTIFICATION
ROJ-2 (continued)

The 1SI8948A-D, 1SI8956A-D, 2SI8948A-D, and 2SI8956A-D valves each represent their own sampling group since each set of valves are of the same size, model number and system function. Under the sampling program, one valve will be nonintrusively tested per group (one SI8948 valve and one SI8956 valve per outage), on a rotating schedule, while the balance of the plant groups will be flow tested with less than accident flow. If a problem is found with the nonintrusively tested valve, then the remaining three valves in that particular group will be checked using nonintrusives during the same outage.

REFUELING OUTAGE JUSTIFICATION
ROJ-3

VALVE NUMBER	CATEGORY	CODE CLASS	DRAWING NUMBER	DRAWING COORDINATE
1/2CC9458	B	3	M-66-3B	C6(C3)
1/2CC9459A	B	3	M-66-3A	D6(D3)
1/2CC9459B	B	3	M-66-3A	D5(D4)
1/2CC9467A	B	3	M-66-4D	C6(C3)
1/2CC9467B	B	3	M-66-4D	C5(C3)
1/2CC9467C	B	3	M-66-3B	D6(D2)

FUNCTION(S):

1/2CC9458: CC pump Discharge Header Manual Isolation Valves which may provide for train separation in a post accident situation.

1/2CC9459A: CC Pump Suction Header Crosstie Manual Isolation valves which may provide for separation/isolation of the CC system into two redundant trains during recirculation phase of RHR operation during a LOCA and other applicable accident modes.

1/2CC9459B: CC Pump Suction Header Crosstie Manual Isolation valves which may provide for separation/isolation of Unit 1 and Unit 2 CC systems during normal cooldown and recirculation phase of RHR operation.

1/2CC9467A: CC heat exchanger Outlet Header Crosstie Manual Isolation Valves which provide for possible manual isolation of flow to the unit normal plant loads if the respective CC9415 valve fails open.

1/2CC9467B: CC Heat Exchanger Header Crosstie Manual Isolation Valves which may provide for train separation while the subject unit undergoes Post LOCA cooldown. Provides separation/isolation of Unit 1 and Unit 2 CC systems during normal cooldown and recirculation phase of RHR operation.

1/2CC9467C: CC Supply Header Crosstie Manual Isolation Valve which may need to be called upon due to a single failure within the CC system configuration.

REFUELING OUTAGE JUSTIFICATION
ROJ-3 (continued)

JUSTIFICATION:

General Information:

In general, the 1(2)CC9459B and 1(2)CC9467B CC manual valves are safety significant valves that belong in the IST Program, as identified in the Region III NRC Inspection Report, dated February 18, 1994. This refueling outage justification will address these valves in great detail. The remaining valves in this refueling outage justification (CC9458, CC9459A, CC9467A,B) are much less significant within the CC system. None of these remaining valves would function as a primary means of mitigating an accident, and none of them are considered "active" valves per UFSAR table 3.9.16. The reason for their inclusion is the possibility that they may be called upon following a single failure within the CC system. In addition, there are several other "maintenance" type valves that would also be available for isolation purposes. In a post accident situation, there are no specific directions taken within the CC system. If a malfunction were to occur, operators would be dispatched and the problem isolated as required. Byron conservatively added these valves to the program due to the uniqueness of the CC system and to address possible concerns about the valves' ability to isolate. In addition, Byron will be exercising these valves on the same frequency as the CC9459B and CC9467B valves. There would be no value added and it would be impractical to exercise them on a more frequent basis. The following is specific information concerning the valves in this refueling outage justification.

Specific Information

a. 1/2CC9459B and 1/2CC9467B

Manual valves 1/2CC9459B and 1/2CC9467B are used to provide train separation and/or isolation of the Component Cooling Water (CCW) System. More specifically, they are aligned to place the Unit 0 Heat Exchanger and Pump on the Unit 1 or Unit 2 side of CCW to ensure adequate cooling during shutdowns and/or Post-Accident.

REFUELING OUTAGE JUSTIFICATION
ROJ-3 (continued)

Exercising these valves presents a concern for the equipment cooled by the CCW System. The CCW system is a delicately balanced system that has the potential for becoming upset upon swapping the Unit 0 Heat Exchanger and Pump from one unit to the other. History has shown that stroking these valves will cause oscillation in the lines, disrupt flow balancing due to D/P differences throughout the system, and would place the normal loads at risk for adequate cooling. For instance, the CC685 valve, which is the Reactor Coolant Pump (RCP) thermal barrier Component Cooling Water return valve, autocloses on high flow, which would result in a loss of flow to the RCP thermal barriers. The CC685 valve could potentially close during the exercising of the CC manual valves, due to the upset flow conditions. Exercising the CC manual valves quarterly is impractical for the reasons presented above.

The normal alignment of the CCW System is to have the Unit 0 heat exchanger and Unit 0 Pump aligned to Unit 1. It would be impractical due to the reasons presented previously (flow concerns, etc) to exercise the CC manual valves during a Unit 1 refueling outage or cold shutdown since the Unit 0 heat exchanger and Unit 0 pump would normally already be aligned in the desired position for the Unit 1 outage or cold shutdown. However, before entering a Unit 2 refueling outage or before a planned U-2 cold shutdown (or just after a forced U-2 cold shutdown), the 2CC9459B and 2CC9467B CC manual valves would be exercised open and the respective U-1 valves would be exercised closed to align the Unit 0 heat exchanger and Unit 0 Pump to Unit 2 to ensure adequate cooling is available. Despite this necessity to fulfill plant operations, it would be impractical to routinely return the valves to their original position during a U-2 cold shutdown (following RH cooling as the plant is ascending to mode 1) due to the fact that it may interfere with other outage activities. These valves require very careful plant monitoring and a considerable amount of time to physically exercise.

Due to the above justification, in accordance with OM-10, paragraph 4.2.1.2, Byron will exercise the 1(2)CC9459B and 1(2)CC9467B manual valves in the following manner: In preparation for a Unit 2 refueling outage, the 2CC9459B and 2CC9467B Component Cooling manual valves would be exercised open and the respective U-1 valves will be exercised closed to align the Unit 0 heat exchanger and pump to Unit 2. Prior to entry into mode 1, the valves would be exercised in the opposite direction to re-align the Unit 0 heat exchanger and pump to their normal alignment for Unit 1.

REFUELING OUTAGE JUSTIFICATION
ROJ-3 (continued)

To further support this refueling outage justification, a review of maintenance history dating back to 1983 was performed at Byron. The 1CC9459B and 1CC9467B valves were repacked with graphoil in 1983 and the 2CC9459B was repacked with graphoil in 1986. In addition, the 1CC9459B had a small leak repaired by tightening bolts in 1985, had a limit switch adjustment made in 1987, and was repacked in 1994. The 2CC9467B valve had valve packing adjusted in 1986 and a gearbox oil leak repaired in 1995. This review showed that there has been no evidence of valve exercising malfunctions for these valves from 1983 to the present.

b. 1/2CC9467A

Exercising these valves quarterly is impractical. One function of these valves is to serve as another means of isolating flow to the normal plant loads in a post-accident situation in the event that the respective CC9415 valve were to fail open. Due to its function, it is an undesirable practice to exercise these manual valves during normal operations. When the plant is in its normal lineup, closing the 2CC9467A valve would interrupt flow to the normal plant loads. For Unit 1, if the 1CC9467A valve was exercised closed, CC flow would need to be diverted through the Unit 0 heat exchanger, which may cause disruptions within the CC system.
In addition, a maintenance history search at Byron indicates that both valves were repacked with graphoil in 1984, and the U-2 valve had screws tightened on the gear housing due to a minor grease leak in 1990. There is no evidence of valve exercising malfunctions.

It is impractical to induce the disruptions described above during normal operations. Additionally, finding an appropriate window to stroke these valves during a cold shutdown could possibly result in an extension of the cold shutdown and there would be no compensated increase in plant safety. The most practical alternative method is to exercise these valves at the same frequency (within the same procedure) as valves 1/2CC9459B and 1/2CC9467B.

c. 1/2CC9458, 1/2CC9459A, and 1/2CC9467C

If these manual valves were exercised during a valve lineup which varied from the normal lineup, there are possibilities of disrupting the CC system. There would be instances in which pumps may need to be swapped, or further re-routing of flow may be necessary due to other misc. work being performed throughout the system.

REFUELING OUTAGE JUSTIFICATION
ROJ-3 (continued)

Maintenance history since 1983 at Byron indicates that there have not been problems associated with manual exercising these valves. There are no indications of binding or other trouble. The work on them has consisted of the following: the U-1 valves were all repacked with graphoil in 1983 and all of the U-2 valves were repacked with graphoil in 1986; the 1CC9458 valve had a limit switch adjustment in 1992 and 1993; the 1CC9459A valve had the ground strap reattached for the limit switch in 1991; and the 1CC9467C valve had broken seal-tite repaired in 1984.

For reasons justified in the general section and throughout this refueling outage justification, it is more practical to exercise these manual valves at the same frequency as described for the manual valves in Part a and Part b of this refueling outage justification. A U-2 refueling outage frequency is more than sufficient for monitoring degradation on these valves.

Conclusions:

To conclude, the most practical method of exercising all the CC manual valves included in this justification is to test all of them under the same procedure, under carefully controlled conditions, to ensure that all necessary precautions/actions are taken. To test them in a different manner would be impractical.

TEST FREQUENCY:

The 1(2)CC9459B and 1(2)CC9467B valves will normally be exercised in one direction in preparation for a Unit 2 refueling outage, and then exercised in the opposite direction prior to entry into mode 1. The remaining valves in this refueling outage justification will normally be exercised within the same procedure. The executing procedure, containing documentation of all Component Cooling manual valve strokes, will be tracked as a U-2 refueling outage activity with the Work Planning Department. This testing is being deferred to every U-2 Refueling outage in accordance with OM-10, paragraph 4.2.1.2(e).

REFUELING OUTAGE JUSTIFICATION
ROJ-4

VALVE NUMBER	CATEGORY	CODE CLASS	DRAWING NUMBER	DRAWING COORDINATE
1/2SI8811A	B	2	M-61-4(M-136-4)	B5(B6)
1/2SI8811B	B	2	M-61-4(M-136-4)	A5(A6)

FUNCTION(S):

These normally closed motor operated gate valves are located on the Containment Recirculation Sump discharge line. The valves are required to be closed during the injection phase of ECCS along with functioning as a containment isolation valve. These valves are required to open during the recirculation phase of ECCS.

JUSTIFICATION:

The stroke time testing of the 1/2SI8811A/B valves require the suctions of the Residual Heat Removal Pumps to be drained, thus rendering the train that is being tested inoperable. The stroke time testing of these valves during unit operation would be clearly impractical due to the extensive activities required to perform this testing, along with rendering a subsystem of ECCS (RHR) inoperable for an extended period of time (placing the plant in an undesirable condition).

The routine testing of these valves during cold shutdowns is also impractical for the following reasons:

1. For a cold shutdown in which the Reactor Coolant Loops remain filled and there is one train of Residual Heat Removal declared inoperable, Byron Station's Technical Specification 3.4.1.4.1 requires the secondary side narrow range water level of at least two steam generators to be greater than 41% for Unit 1 (18% for Unit 2). However, if the cold shutdown was necessitated by a problem requiring draining of the secondary side of the Steam Generators (i.e. tube leaks), Byron Station's Technical Specification 3.4.1.4.1 would preclude the testing of the containment sump outlet isolation valves until such time as the affected steam generators had been refilled.

2. For Cold Shutdown operations with the Reactor Coolant Loops not filled (i.e., drained down to support Reactor Vessel Incore Seal Table, Loop Stop Valve, Reactor Coolant Pump and Seal Maintenance or primary leakage), Byron Station's Technical Specification 3.4.1.4.2 would preclude the testing of the Containment Sump Outlet Isolation Valves as it mandates that "two residual heat removal (RHR) Loops shall be operable and at least one RHR Loop shall be in operation".

REFUELING OUTAGE JUSTIFICATION
ROJ-4 (continued)

3. The full stroke testing of the 1/2SI8811A, B valves; in conjunction with system draining, filling and venting of each train, accounts for an additional six days (3 days per train) of scheduling requirements and increased radiation dose to operators and radiological control personnel. Processing of thousands of gallons of containment water, and subsequent required liquid effluent discharges would also result from the draining, refilling and venting of the RHR system. This time duration required to perform the surveillance testing of the Containment Sump Outlet Isolation Valves during Cold Shutdown activities, could, as a result, cause a violation of the action requirements for Byron Station's Technical Specifications 3.4.1.4.1 and 3.4.1.4.2. The violations would occur since these action statements require (as noted in their respective foot note sections) the return of the inoperable residual heat removal loop to service within 2 hours, if such loop was removed for surveillance testing provided the other RHR Loop is operable and in operation.

4. In addition, NRC Generic Letter 88-17, Loss of Decay Heat Removal, highlights the consequences of a loss of RH during reduced Reactor Coolant System inventory (below three feet below the reactor vessel flange). If the operating RH pump is lost due to air entrainment, and the other train is inoperable for the stroke test, then the "operable" train must be vented to restore decay heat removal. Under worst conditions, boiling in the core would occur in approximately 10 minutes, the core would be uncovered in approximately 30 minutes, and fuel damage would occur in approximately 1 hour.

   Given the apparent disparity between the Technical Specification time requirements for an inoperable RHR Loop return to service (2 hours) and the time required to perform surveillance stroke testing of the Containment Sump Outlet Isolation valves (3 days) during Cold Shutdown, the alter.. testing frequency of refueling outage periodicity will adequatel. maintain the system in a state of operational readiness, while not imposing undue hardships or sacrificing the safety of the plant.

TEST FREQUENCY:

The 1/2SI8811A/B valves will be stroke timed during refueling outages in accordance with OM-10, paragraph 4.2.1.2.

REFUELING OUTAGE JUSTIFICATION
ROJ-5

VALVE NUMBER	CATEGORY	CODE CLASS	DRAWING NUMBER	DRAWING COORDINATE
1/2IA065	A	2	M-55-4(M-55-5)	D3(E6)
1/2IA066	A	2	M-55-4(M-55-5)	D6(E4)
1/2IA091	AC	2	M-55-4(M-55-5)	E5(E5)

FUNCTION(S):

Air Operated Valves 1/2IA065 and 1/2IA066 are the outboard and inboard (respectively) containment isolation valves for Instrument Air supply lines to containment. The closed safety function of these valves is to provide a leak-tight barrier between the containment atmosphere and the environment during accident conditions.

Check Valves 1/2IA091 are located on the air supply lines to the 1/2IA066 valves (inboard containment isolation valves). The safety function of the 1/2IA091 valves in the closed direction is to provide a leak-tight barrier between the containment atmosphere and the environment during accident conditions (see Note 1 and VR-12). The function in the open direction is to supply control air to the 1/2IA066 valves. The open full stroke test of the 1/2IA091 valves is satisfied by the open stroke test of the 1/2IA066 valves.

JUSTIFICATION:

Stroke/fail-safe testing of the 1/2IA065 and 1/2IA066 valves (and full stroke testing of the 1/2IA091 valves upon re-opening of the 1/2IA066 valves) during plant operation or cold shutdowns would, by design, isolate the air to air operated instruments inside the containment building. This would introduce the possibility of major operating perturbations and/or personnel safety concerns should these valves fail to re-open during testing activities. This would result in scenarios such as:

1. Loss of Pressurizer Pressure Control -

   The pressurizer spray valves 1/2RY455B & C and the pressurizer auxiliary spray valve 1/2CV8145 would fail closed and not be available for pressurizer pressure control.

REFUELING OUTAGE JUSTIFICATION
ROJ-5 (continued)

2. Loss of Chemical Volume Control System Letdown Flow (both normal and excess) and Charging Flow -

The loss of instrument air would cause a disruption in the unit letdown flow paths resulting in pressurizer level increases. Such valves as the letdown orifice containment outlet header isolation valve 1/2CV8160, the letdown line isolation valves 1/2CV459 and 1/2CV460, the letdown orifice outlet isolation valves 1/2CV8149A, B & C, the excess letdown heat exchanger inlet isolation valves 1/2CV8153A & B, and the regenerative heat exchanger letdown inlet isolation valves 1/2CV8389A & B would go to their fail closed positions. Additionally, the ability to normally make-up reactor coolant inventory and adjust the reactor chemical shim (i.e. normal boration/dilution) would also be lost as the regenerative heat exchanger inlet isolation valves 1/2CV8324A & B would fail to their respective closed positions.

3. Loss of Component Cooling to Containment Penetrations -

The loss of instrument air supply would cause the penetration cooling supply flow control valve 1/2CC053 to go to its fail closed position. The loss of penetration cooling would result in elevated temperatures being imposed on the penetrations being supported by the component cooling system.

4. Loss of Personnel Breathing Air -

The loss of Instrument Air supply to the Service Air downstream isolation valve 1/2SA033 would cause this valve to go to its fail close position. This loss of Service Air in the containment building would eliminate the normal source of supplied breathing air needed to support numerous maintenance and component inspection activities in a contaminated environment.

TEST FREQUENCY:

Air Operated Valves 1/2IA065 and 1/2IA066 will be stroke tested and fail safe tested (and subsequently 1/2IA091 full stroke tested with the open stroke time test of the 1/2IA066 valves) during refueling outages on the respective unit in accordance with OM-10, paragraphs 4.2.1.2 and 4.3.2.2.

REFUELING OUTAGE JUSTIFICATION
ROJ-6

VALVE NUMBER	CATEGORY	CODE CLASS	DRAWING NUMBER	DRAWING COORDINATE
1/2SI8819A	AC	1	M-61-3(M-136-3)	A5(B4)
1/2SI8819B	AC	1	M-61-3(M-136-3)	A7(B2)
1/2SI8819C	AC	1	M-61-3(M-136-3)	A6(B2)
1/2SI8819D	AC	1	M-61-3(M-136-3)	A6(B3)
1/2SI8905A	AC	1	M-61-3(M-136-3)	E4(E4)
1/2SO8905B	AC	1	M-61-3(M-136-3)	D7(D2)
1/2SI8905C	AC	1	M-61-3(M-136-3)	C7(C2)
1/2SI8905D	AC	1	M-61-3(M-136-3)	E4(E5)
1/2SI8922A	C	2	M-61-1A(M-136-1)	E7(D4)
1/2SI8922B	C	2	M-61-1A(M-136-1)	C7(B4)
1/2SI8926	C	2	M-61-1A(M-136-1)	D2(C6)
1/2SI8949B	AC	1	M-61-3(M-136-3)	D8(D1)
1/2SI8949D	AC	1	M-61-3(M-136-3)	E8(E1)

FUNCTION(S):

All of the "AC" category valves in this refueling outage justification are pressure isolation valves (PIVs) and will be leak tested (and backflow tested) per Byron Station Tech Specs (see VC-15). This refueling outage justification will only include the open functions of all the check valves listed above.

Check valves 1/2SI8819A-D are located in the lines going from the Safety Injection pumps to the reactor vessel cold legs. Their safety function in the open direction is to permit flow of coolant to the reactor vessel cold legs during a safety injection.

Check valves 1/2SI8905A-D and 1/2SI8949B/D are located in the lines going from the Safety Injection pumps to the reactor vessel hot legs. Their safety function in the open direction is to permit flow of coolant to the reactor vessel hot legs during the Hot Leg Recirculation portion of a safety injection.

Check valves 1/2SI8922A/B are located on the Safety Injection pumps discharge line. They are required to open for ECCS injection and recirculation phases.

Check valves 1/2SI8926 are located on the SI pumps' suction line from the RWST. They are required to open for the ECCS injection phase.

REFUELING OUTAGE JUSTIFICATION
ROJ-6 (continued)

JUSTIFICATION:

These valves cannot be full stroke exercised during operation as the shut-off head of the Safety Injection pumps is lower than the reactor coolant system pressure. These valves cannot be full stroke exercised during routine mode 5 cold shutdowns due to Byron Station Technical Specification 3/4.5.3 requirement that all Safety Injection pumps and all but one Charging pump be inoperable during modes 4, 5, and 6 (temperature less than 350 F), except when the reactor vessel head is removed (mode 6 refueling outages only). This requirement minimizes the possibility of low temperature overpressurization (LTOP) of the Reactor Coolant System (RCS). The alternate method of protecting against over-pressurization by partially draining the RCS to provide a surge volume is not considered a safe practice due to concerns of maintaining adequate water level above the reactor core. Full stroke exercising of these valves may only be safely performed in Mode 6 with the Reactor vessel head removed.

TEST FREQUENCY:

These valves will be full stroke exercised during refueling outages in accordance with OM-10, paragraph 4.3.2.2. Additionally, the 1/2SI8926 check valves will be partial stroke tested quarterly during the Safety Injection mini-flow recirculation pump runs.

REFUELING OUTAGE JUSTIFICATION
ROJ-7

VALVE NUMBER	CATEGORY	CODE CLASS	DRAWING NUMBER	DRAWING COORDINATE
1/2CV8481A	C	2	M-64-3A(M-138-3A)	D6(D6)
1/2CV8481B	C	2	M-64-3A(M-138-3A)	C6(C7)
1/2CV8546	C	2	M-64-4B(M-138-4)	B5(A5)
1/2SI8815	AC	1	M-61-2(M-136-2)	D5(D4)
1/2SI8900A	AC	1	M-61-2(M-136-2)	E7(E2)
1/2SI8900B	AC	1	M-61-2(M-136-2)	D7(D2)
1/2SI8900C	AC	1	M-61-2(M-136-2)	C7(C2)
1/2SI8900D	AC	1	M-61-2(M-136-2)	B7(B2)

FUNCTION(S):

All of the "AC" category valves in this refueling outage justification are pressure isolation valves (PIVs) and will be leak tested (and backflow tested) per Byron Station Tech Specs (see VC-15). This refueling outage justification will only include the open functions of all the check valves listed above.

Check valves 1/2SI8815 are located in the lines from the Chemical and Volume Control (CV) Centrifugal Charging pump. Their safety function in the open direction is to permit flow of coolant from the centrifugal charging pumps to the four lines which branch off and provide flow to the reactor vessel cold legs during the high pressure injection phase of a safety injection.

Check Valves 1/2SI8900A-D are in the four lines which branch off from the lines containing the 1/2SI8815 valves. their safety function in the open direction is to permit flow of coolant from the chemical and volume Control Centrifugal Charging Pumps to the reactor vessel cold legs during the high pressure injection phase of a safety injection.

Check valves 1/2CV8481A/B are located at the discharge of the Chemical and volume Control charging pumps. They are required to open to permit flow of coolant during a safety injection.

Check valves 1/2CV8546 are located on the CV pumps' suction line from the RWST. They are required to open to permit flow of coolant when the charging pumps take suction from the RWST during a safety injection.

JUSTIFICATION:

The full stroke exercising of check valves 1/2SI8815 and 1/2SI8900A-D associated with the Emergency Core Cooling System during operation would induce thermal stresses on their respective reactor vessel nozzles as the Reactor coolant System (maintained at greater than 500°F) is injected with water from the Refueling Water Storage Tank (maintained at approximately 65°F). The 1/2CV8481A/B and 1/2CV8546 check valves are in series and cannot be full stroke exercised without causing stroking of 1/2SI8815 and 1/2SI8900A-D check valves.

REFUELING OUTAGE JUSTIFICATION
ROJ-7 (continued)

These valves cannot be full stroke exercised during routine mode 5 cold shutdowns due to Byron Station Technical Specifications 3/4.5.3 and 3/4.5.4.1 requirements that all Safety Injection pumps and all but one Charging pump be inoperable during modes 4, 5, and 6, except when the reactor vessel head is removed (mode 6 of refueling outages only). This requirement minimizes the possibility of low temperature overpressurization (LTOP) of the Reactor coolant System (RCS). The alternate method of protecting against over-pressurization by partially draining the RCS to provide a surge volume is not considered a safe practice due to concerns of maintaining adequate water level above the reactor core. In addition, injecting large quantities of highly borated water from the RWST would likely delay reactor start up and the cost of processing the reactor coolant to restore the optimum boron concentration is consequential. Full stroke exercising of these valves may only be safely performed in Mode 6 with the Reactor vessel head removed.

TEST FREQUENCY:

These valves will be full stroke exercised during refueling outages in accordance with OM-10, paragraph 4.3.2.2. Additionally, the 1/2CV8481A/B check valves will be partial stroke tested quarterly during the A and B train CV mini-flow recirculation pump runs.

REFUELING OUTAGE JUSTIFICATION
ROJ-8

VALVE NUMBER	CATEGORY	CODE CLASS	DRAWING NUMBER	DRAWING COORDINATE
1/2SI8841A	AC	1	M-61-3(M-136-3)	E4(E4)
1/2SI8841B	AC	1	M-61-3(M-136-3)	C7(C2)
1/2SI8949A	AC	1	M-61-3(M-136-3)	E8(E1)
1/2SI8949C	AC	1	M-61-3(M-136-3)	C8(C1)

FUNCTION(S):

All of the "AC" category valves in this refueling outage justification are pressure isolation valves (PIVs) and will be leak tested (and backflow tested) per Byron Station Tech Specs (see VC-15). This refueling outage justification will only include the open functions of all the check valves listed above.

Check valves 1/2SI8841A/B are located in the lines from the Residual Heat Removal (RHR) pumps to the "A" and "C" Reactor Coolant System hot legs. Their safety function in the open direction is to permit flow of coolant from the RHR pumps to the reactor vessel hot legs during the Hot Leg Recirculation phase of a safety injection.

Check Valves 1/2SI8949A/C are located in an ECCS line to the RCS "A" and "C" hot legs. They are required to open to permit flow of makeup water upon a safety injection from: (1) the Safety Injection Pumps during the high pressure safety injection phase, or (2) the RHR pumps during the Hot Leg Recirculation phase, to the reactor vessel hot legs.

JUSTIFICATION:

The full stroke exercising of check valves 1/2SI8841A/B and 1/2SI8949A/C, associated with the Emergency Core Cooling System (ECCS) and the Residual Heat Removal (RHR) System cannot be accomplished during normal reactor operation because the low head developed by the RHR pumps (less than 250 psi) is not great enough to inject into the RCS (2235 psi). Similarly, the 1/2SI8949A/C check valves cannot be partial stroke tested during normal reactor operation with the Safety Injection (SI) pumps since the RCS pressure cannot be overcome by the SI pump developed head (1500 psi).

Full or partial stroke testing of these valves during cold shutdowns would induce thermal stresses on their respective reactor vessel nozzles as the Reactor Coolant System (maintained at approximately 180 F) is injected with water from the Refueling Water Storage Tank (maintained at approximately 65 F). Additionally, the margin of safety is reduced for brittle fracture prevention and an unacceptable reactivity excursion could be created (high boron concentration and low temperature water).

REFUELING OUTAGE JUSTIFICATION
ROJ-8 (continued)

Finally, during cold shutdowns in which the Technical Specification leak rate testing is not to be performed, the partial or full stroking of these valves would necessitate the requirement to perform the leak test on these check valves, causing a delay in returning the plant to power in addition to causing unnecessary radiation exposure to test personnel.

TEST FREQUENCY:

These valves will be full stroke exercised during refueling outages in accordance with OM-10, paragraph 4.3.2.2.

REFUELING OUTAGE JUSTIFICATION
ROJ-9

VALVE NUMBER	CATEGORY	CODE CLASS	DRAWING NUMBER	DRAWING COORDINATE
1/2RH8705A	AC	2	M-62(M-137)	D1(D8)
1/2RH8705B	AC	2	M-62(M-137)	C1(C8)

FUNCTION(S):

These check valves are leak tested in conjunction with pressure isolation valves (PIVs) 1/2RH8701B and 1/2RH8702B and will be leak tested (and backflow tested) at the same frequency as the 1/2RH8702B valves (see VC-15). This refueling outage justification will only include the open functions of the check valves listed above.

These valves are located on the 3/4" branch line between the 1/2RH8701A/B and 1/2RH8702A/B suction isolation valves. Their safety function in the open direction is to relieve excess pressure due to thermal expansion back to the RCS when both suction isolation valves are closed in order to prevent over pressurization of the piping between the two valves.

JUSTIFICATION:

These valves are simple spring loaded lift check valves and are not equipped with an external operator or disk position indicator. The only way to verify operability in the open direction is by verifying that the piping between the suction isolation valves is able to be depressurized through the applicable valve via a field test. It would be impractical to perform this testing during unit operation due to the necessity to enter containment, hookup a pressurized water source to the piping via a test/vent valve, and slowly increase the pressure until the check valve opens to relieve the pressure. Additionally, the RCS must be depressurized in order to perform this test.

It would be impractical to perform this test during cold shutdowns as it requires placing the standby train of Residual Heat Removal (RHR) in an inoperable condition and the RCS must be depressurized (requires all reactor coolant pumps to be stopped). Then, due to the extensive field work involved, there is a potential for delaying reactor start up and return to power. Additionally, taking away the backup/redundant train of RHR reduces both the plant decay removal capability and the available safety margin regarding shutdown risk assessment.

Testing these valves each refueling, in mode 6, is adequate to maintain this portion of RHR in a state of operational readiness, while not sacrificing the safety of the plant.

REFUELING OUTAGE JUSTIFICATION
ROJ-9 (continued)

TEST FREQUENCY:

These valves will be full stroke exercised during refueling outages in accordance with OM-10, paragraph 4.3.2.2.

REFUELING OUTAGE JUSTIFICATION
ROJ-10

VALVE NUMBER	CATEGORY	CODE CLASS	DRAWING NUMBER	COORDINATE
1/2FP345	BC	2	M-52-1(M-52-1)	E7(E2)

FUNCTION(S):

These check valves are in the line from the Fire Protection System to Containment. The open function allows Fire Protection Water to reach the Containment building (non-IST). The closed function (the subject of this justification), is for containment isolation.

JUSTIFICATION:

These valves are exempt from Local Leakage Rate testing of 10 CFR 50, Appendix J, but due to their designation as CIVs, they shall be tested in the Closed direction. The valves are physically located inside containment. Even though personnel access to the containment (outside the biological shield) while the reactor is operating is allowed, it is not a routine practice. There is no flow through these valves during periods when the associated reactor is at power, and there is very seldom any flow through these valves during any mode of operation. This valve is as passive as a check valve can be in the closed position. Testing these valves more frequently than each associated refueling outage adds no additional confidence in the valve's closure capability but it does add to the occupational radiation exposure of those personnel required to perform the test.

Testing these valves on a frequency of every three months during normal operation adds undue hardship without a compensating increase in the level of safety. Testing the valves every three months or on a cold shutdown basis adds to the occupational radiation exposure of the personnel required to perform the test. There is normally no flow through this valve to result in the valve disc leaving the seat, therefore the valve remains passively closed during periods of normal operation. No additional confidence in the ability of the valve to close is gained by subjecting this valve to quarterly or cold shutdown testing versus testing on a refueling outage frequency.

TEST FREQUENCY:

These valves will be tested on a refueling outage frequency to verify closure in accordance with OM-10, paragraph 4.3.2.2.

REFUELING OUTAGE JUSTIFICATION
ROJ-11

VALVE NUMBER	CATEGORY	CODE CLASS	DRAWING NUMBER	DRAWING COORDINATE
1/2CV8348	BC	2	M-64-3B(M-138-3B)	E2(E2)

FUNCTIONS:

The above listed valves are Reactor Coolant Loop Fill Check valves in the Chemical and Volume Control System (CV) and are designated Containment Isolation valves (CIVs). These valves are normally closed and are required to remain closed for containment isolation.

JUSTIFICATION:

These valves are exempt from Local Leakage Rate testing of 10 CFR 50, Appendix J, but due to their designation as CIVs, they shall be tested in the Closed direction. The valves are physically located inside containment approximately 14 feet above the floor, requiring scaffolding for access. Even though personnel access to the containment (outside the biological shield) while the reactor is operating is allowed, it is not a routine practice. There is no flow through these valves during periods when the associated reactor is at power, and there is very seldom any flow through these valves during any mode of operation. This valve is as passive as a check valve can be in the closed position. Testing these valves more frequently than every associated refueling outage adds no additional confidence on the valves closure capability but it does add to the occupational radiation exposure of those personnel required to perform the test.

Testing these valves on a frequency of every three months during normal operation adds to the occupational radiation exposure of the personnel required to perform the test. Erection of scaffolding inside containment while at power presents unique hazards and requires extensive analysis and evaluation. There is normally no flow through this valve to result in the valve disc leaving the seat, therefore the valve remains passively closed during periods of normal operation. No additional confidence in the ability of the valve to close is gained by subjecting this valve to quarterly or cold shutdown testing versus testing on a refueling outage frequency.

TEST FREQUENCY:

The above listed valves will be tested on a refueling outage frequency to verify closure in accordance with OM-10, paragraph 4.3.2.2.

REFUELING OUTAGE JUSTIFICATION
ROJ-12

VALVE NUMBER	CATEGORY	CODE CLASS	DRAWING NUMBER	DRAWING COORDINATE
1/2CV8368A	BC	2	M-64(138)-1	B7(B7)
1/2CV8368B	BC	2	M-64(138)-1	C4(C4)
1/2CV8368C	BC	2	M-64(138)-2	B8(B8)
1/2CV8368D	BC	2	M-64(138)-2	B5(B5)

FUNCTION(S):

The 1/2CV8368A-D check valves are in the seal injection line to the Reactor Coolant Pumps. Additionally, they are designated as containment isolation valves, but are exempt from local leak rate testing in accordance with 10CFR50, Appendix J.

JUSTIFICATION:

These valves are exempt from local leak rate testing, but due to their designation as Containment Isolation Valves, they will be conservatively tested per the ASME code in the closed direction. Reactor Coolant Pumps (RCPs) are required to be in operation in Mode 1, power operation. Seal injection flow must be maintained when the RCPs are running. Seal injection flow stoppage with the RCPs in operation, even for a short duration, is detrimental to the RCP seals. Therefore, these valves cannot be tested at power.

It would appear that the 1/2CV8368A-D valves would be candidates for cold shutdown testing with all the RCPs off. However, these particular check valves are difficult to test in the closed direction. Traditional methods of measuring leakage and/or closure are not sufficient for these valves. Non-intrusive techniques are required to test these valves adequately. For this type of check valve (2" Kerotest), UT methods at Byron are still in the experimental stage with an adequate degree of uncertainty. Hence, radiography, which has proven very effective in other IST applications, will be used to verify closure.

Performing radiography requires the use of outside contractor personnel, which are onsite during refueling outages (not for cold shutdowns). Also, to safely perform the required non-intrusive testing on these valves (UT or RT), scaffolding will be required. Additionally, cold shutdown testing would add to the occupational radiation exposure of the personnel required to complete the test, with the test duration possibly holding up a cold shutdown. For these reasons, it would be costly and impractical to perform this testing on a cold shutdown frequency. Testing these valves for closure at a refueling outage frequency is sufficient for maintaining these valves in a state of operational readiness.

REFUELING OUTAGE JUSTIFICATION
ROJ-12 (continued)

TEST FREQUENCY:

These check valves will be tested for closure during refueling outages in accordance with OM-10, paragraph 4.3.2.2.

REFUELING OUTAGE JUSTIFICATION
ROJ-13

VALVE NUMBER	CATEGORY	CODE CLASS	DRAWING NUMBER	DRAWING COORDINATE
1/2CC9495A	BC	3	M-66-1B(M-139-1)	E2(E5)
1/2CC9495B	BC	3	M-66-1B(M-139-1)	D2(D5)
1/2CC9495C	BC	3	M-66-1B(M-139-1)	C2(C5)
1/2CC9495D	BC	3	M-66-1B(M-139-1)	B2(C5)

FUNCTION(S):

The 1/2CC9495A-D check valves are the component cooling water supply check valves to the Reactor Coolant Pump (RCP) Thermal Barriers. These valves are required to close to isolate the component cooling system in the event of a thermal barrier tube failure.

JUSTIFICATION:

These valves cannot be verified for closure during unit operation. In order to verify these valves are closed, the corresponding RCP must be off and cooling flow isolated. Isolating Component Cooling Water flow to the RCP during unit operation would result in eventual pump damage and/or trip. Additionally, these valves are located in the containment building, inside the missile barrier, where entry at power is very rare and generally only possible at low power levels due to the high radiation levels. Test personnel would also receive unnecessary radiation exposure during cold shutdowns.

Byron plans to investigate various test methods during the next refueling outage for each unit (B1R07 for U-1 and B2R06 for U-2). It is anticipated that a nonintrusive technique will be utilized to verify closure, but other possible test methods will also be investigated. As a last resort, Byron would utilize Generic Letter 89-04, Position 2, concerning sample disassembly of these valves. Due to the necessity of moving test equipment locally into place, high radiation levels, and operational constraints, it would be impractical to verify closure of these valves during unit operation or cold shutdowns.

TEST FREQUENCY:

These check valves will be tested for closure during refueling outages in accordance with OM-10, paragraph 4.3.2.2.

REFUELING OUTAGE JUSTIFICATION
ROJ-14

VALVE NUMBER	CATEGORY	CODE CLASS	DRAWING NUMBER	DRAWING COORDINATE
1/2FW510A	B	None	M-36-1C(M-121-1B)	C2(C2)
1/2FW520A	B	None	M-36-1A(M-121-1D)	C2(C2)
1/2FW530A	B	None	M-36-1D(M-121-1A)	C2(C2)
1/2FW540A	B	None	M-36-1B(M-121-1C)	C2(C2)
1/2FW510	B	None	M-36-1C(M-121-1B)	D2(D2)
1/2FW520	B	None	M-36-1A(M-121-1D)	D2(D2)
1/2FW530	B	None	M-36-1D(M-121-1A)	D2(D2)
1/2FW540	B	None	M-36-1B(M-121-1C)	D2(D2)
1/2FW034A	B	None	M-36-1C(M-121-1B)	E2(E2)
1/2FW034B	B	None	M-36-1A(M-121-1D)	E2(E2)
1/2FW034C	B	None	M-36-1D(M-121-1A)	E2(E2)
1/2FW034D	B	None	M-36-1B(M-121-1C)	E2(E2)

FUNCTION(S):

The Feedwater Regulating Bypass Valves (1FW510A. 1FW520A, 1FW530A, and 1FW540A), the Feedwater Regulating Valves (1FW510, 1FW520, 1FW530, and 1FW540) and the Feedwater Tempering Flow Control Valves (1FW034A-D) are non-safety related valves which perform a backup function to isolate Feedwater. These valves are not considered to be Containment Isolation Valves per the Byron Station Technical Specifications, and are considered only Feedwater Control Valves that, additionally, serve as backup Feedwater Isolation Valves. They are not considered to be in the scope of the IST Program (per OM-10, paragraph 1.1). This has always been Byron's position on these valves. However, since they do receive a Feedwater Isolation signal, an augmented test to verify the fail-safe test will be tracked within the IST Program.

JUSTIFICATION:

A commitment was made to only perform an augmented Fail-Safe on these valves in Byron's original program. These valves are all part of the surveillance (1/2BOS 3.2.1-13) executed to satisfy Tech Spec 3.3.2 (Table 4.3-2, item #1a), which manually simulates an SI signal, causing these valves to fail closed. These valves will be fail-safe tested to satisfy the requirements of this Technical Specification (Refueling Outage Frequency).

Additionally, the closure of the Main Feedwater Regulating Bypass Valves (1/2FW510A, 1/2FW520A, 1/2FW530A, and 1/2FW540A) during unit operation would require the Main Feedwater Regulating Valves to correct for bypassed flow and could result in a plant transient with a possible reactor trip as a result. The closure of the Main Feedwater Regulating Valves (1/2FW510, 1/2FW520,

REFUELING OUTAGE JUSTIFICATION
ROJ-14 (continued)

1/2FW530, 1/2FW540) during unit operation would cause a loss of feedwater to the steam generators, resulting in a plant transient with a possible reactor trip as a result. Finally, it would be impractical to fail-safe test any of these augmented valves on a more frequent basis than required by the Technical Specifications.

TEST FREQUENCY:

These valves will be fail-safe tested closed (Fc) outside of the IST Program during refueling outages in accordance with Byron Station Technical Specifications.

SECTION 3.5

VALVE RELIEF

REQUESTS

3.5.1 Valve Relief Request Summary

Status: A = Approved
P = Pending NRC Approval
W = Withdrawn

Rev: Revision Submitted

Number	Status	Rev	Component(s)	Description
VR-1	P	0	Misc.	Requests an "Appendix J" Test Frequency for Testing Performed in LLRT Surveillances
VR-2	P	0	1/2CS003A/B 1/2CS008A/B 1/2CS011A/B 1/2CS020A/B	Sample Disassmebly of the 3s, 11s, and 20s on an 18 month frequency and the 8s per GL 89-04, position 2, to satisfy Full Stroke Testing (Ct); proposes using Tech Spec Flow Test in lieu of Disassembly for 11s, and 20s when performed (approx. every 5 years)
VR-3	P	0	1/2SX101A	Verify to open during quarterly Motor Driven Auxiliary Feedwater Pump Surveillance (encapsulated design)
VR-4	A	0	1/2AF001A/B	Sample Disassembly per GL 89-04, position 2 to satisfy the Backflow Test (Bt); Note: Successful Acoustics on both valves during an Outage would be considered Acceptable Testing (would become a Refueling Outage Justification); Approved per GL 89-04
VR-5	A	0	1/2FW079A-D	Disassembly per GL 89-04, Position 2, to satisfy the Backflow Test (Bt); Approved per GL 89-04
VR-6	P	0	0SX028A/B	Requests an 18 Month Frequency for the Acoustic Backflow Test (Bt)
VR-7	P	0	0SX127A/B	Requests an 18 Month Frequency for the Full Stroke Test (Ct)
VR-8	A	0	1/2DG5182A/B 1/2DG5183A/B 1/2DG5184A/B 1/2DG5185A/B	Non-IST Alternative Testing for Diesel Air Start Valves; NRC Prior Approval Not Required

RELIEF REQUEST VR-1

TITLE: Appendix J Test Frequency for Tests Other Than Leakage Tests

VALVE NUMBER	CATEGORY	CODE CLASS	DRAWING NUMBER	DRAWING COORDINATE
1/2CC9486	AC	2	M-66-1A(M-139-1)	E6(E6)
1/2CC9518	AC	2	M-66-1A(M-139-1)	B6(B6)
1/2CC9534	AC	2	M-66-1A(M-139-1)	B6(A6)
1/2CS008A	AC	2	M-46-1C(M-129-1C)	D6(D3)
1/2CS008B	AC	2	M-46-1C(M-129-1C)	B6(B3)
1/2CV8113	AC	2	M-64-2(M-138-2)	F2(F2)
1/2IA091	AC	2	M-55-4(M-55-5)	E5(E5)
1/2PR002G	AC	2	M-78-6	C4(C4)
1/2PR002H	AC	2	M-78-6	C4(C4)
1/2PR032	AC	2	M-78-10(M-151-1)	E1(E1)
1/2PS228A	A	2	M-68-7(M-140-6)	E7(E7)
1/2PS228B	A	2	M-68-7(M-140-6)	C7(C7)
1/2PS229A	A	2	M-68-7(M-140-6)	E6(E6)
1/2PS229B	A	2	M-68-7(M-140-6)	C6(C6)
1/2PS230A	A	2	M-68-7(M-140-6)	D7(D7)
1/2PS230B	A	2	M-68-7(M-140-6)	A7(A7)
1/2PS231A	AC	2	M-68-7(M-140-6)	D8(D8)
1/2PS231B	AC	2	M-68-7(M-140-6)	A8(A8)
1/2RY8046	AC	2	M-60-6(M-135-6)	E3(E3)
1/2RY8047	AC	2	M-60-6(M-135-6)	E3(E3)
1/2SI8968	AC	2	M-61-6(M-136-6)	F4(F5)
1/2WM191	AC	2	M-49-1A(M-49-1B)	E6(E3)
1/2WO007A	AC	2	M-118-5(M-118-7)	E5(E5)
1/2WO007B	AC	2	M-118-5(M-118-7)	B4(B4)

FUNCTION(S):

1/2CC9486:	Closed:	Containment Isolation; Isolates "CC" flow to the RCPs
1/2CC9518:	Closed:	Containment Isolation; Isolates bypass flowpath around CC9438
	Open:	Provides pressure equalization path between CC9438 and CC685
1/2CC9534:	Closed:	Containment Isolation; Isolates bypass flowpath around CC9416
	Open:	Relieves pressure between CC9416 and CC9414
1/2CS008A/B:	Closed:	Containment Isolation; Isolates flow to Spray Nozzles
1/2CV8113:	Closed:	Containment Isolation; Isolates Bypass flowpath around CV8112
	Open:	Prevents pressure buildup between CV8112 and CV8100
1/2IA091:	Closed:	Containment Isolation; Isolates Instrument Air to Containment

RELIEF REQUEST VR-1 (continued)

1/2PR002G:	Closed:	Containment Isolation; Isolates containment air sampling capabilities
1/2PR002H:	Closed:	Containment Isolation; Isolates containment air sampling capabilities
1/2PR032:	Closed:	Containment Isolation; Isolates containment air sampling capabilities
1/2PS228A/B: [229A/B & 230A/B]	Closed:	Containment Isolation; Isolates containment hydrogen monitoring capabilities
	Open:	Provides flowpath for post-accident containment sampling of hydrogen
1/2PS231A/B:	Closed:	Containment Isolation; Isolates containment hydrogen monitoring capabilities
1/2RY8046:	Closed:	Containment Isolation; Isolates Primary Water to Pressurizer Relief Tank (PRT)
1/2RY8047:	Closed:	Containment Isolation; Isolates N2 to PRT
1/2SI8968:	Closed:	Containment Isolation; Isolates N2 to accumulator
1/2WM191:	Closed:	Containment Isolation; Isolates Demin Water to Containment
1/2WO007A/B:	Closed:	Containment Isolation; Isolates Chilled Water to Chilled Water Coils

CODE REQUIREMENT(S):

Per OMa-1988, Part 10, paragraph 4.3.2.1, Check valves shall be exercised nominally every 3 months, except as provided by paragraph 4.3.2.2, 4.3.2.3, 4.3.2.4, and 4.3.2.5.

Per OMa-1988, Part 10, paragraph 4.1, all valves with remote position indicators shall be observed locally at least once every 2 years to verify that the valve operation is accurately indicated.

BASIS FOR RELIEF:

All of the category "AC" check valve containment isolation valves listed in this relief request and the category "A" solenoid operated containment isolation valves will be leak tested in accordance with Federal Regulation 10CFR50, Appendix J (see note 1) per paragraph 4.2.2.2 of OM-10. Paragraph 4.3.2.1 of OM-10, however, requires that the category "C" check valves be exercised nominally every 3 months (open and/or closed, depending on the safety function(s)) in addition to the leak test, and paragraph 4.1 requires that a position indication test be performed on the Process Sampling (PS) solenoid Operated valves.

RELIEF REQUEST VR-1 (continued)

The check valves in this relief request do not have remote or local position indication devices to indicate the position of the check valve. Additionally, the 1/2CC9518, 1/2CC9534 and 1/2CV8113 check valves are containment isolation valves, but are also designed to open to relieve pressure between two other containment isolation valves. The Process Sampling solenoid valves are completely encapsulated so that local position verification cannot be observed.

The most practical method for verifying closure for the check valves in this relief request, verifying proper indication for the Process Sampling solenoid valve indication testing, and for the full stroke testing of the CC check valves, is through the execution of the Appendix J local leak rate testing methods. The closure test for these check valves is identical to the Appendix J local leak rate test. The indication testing for the Process Sampling encapsulated valves is determined through local leak rate testing flow measurements when the valves are leak tested, and opened, with corresponding remote verification of valve position in the control room. Finally, full flow is passed through the 1/2CC9518, 1/2CC9534, and 1/2CV8113 check valves during the local leak rate testing of their respective penetration (check valves are located between two other containment isolation valves).

The testing in this relief request would not be practical to perform routinely at power or during cold shutdowns. The same test equipment and testing methodology would be used to satisfy the testing in this relief request as for the Appendix J leak test, which involves a considerable amount of planning and set up, in addition to taking containment penetrations out of service. First, in considering the test equipment, the test rig and air supply lines would need to be ran throughout the containment building and the penetration area. Secondly, the testing would involve determining plant conditions which would allow the test to take place, isolating boundary valves for each penetration affected, taking the boundary valves out of service (generally), draining between the boundary valves at a minimum (water-filled systems), performing the test, filling and venting the system (water systems), and returning to service any out of services which were previously placed.

In many cases, plant conditions at power would not allow this testing to be performed. For those cases in which the testing could be performed at power, routine quarterly testing would result in numerous containment entries, resulting in unnecessary exposure to neutron radiation in addition to the normal gamma and beta radiation. Testing these valves during cold shutdowns could result in unnecessary delays in unit startup and unnecessary accumulation of radiation dose.

RELIEF REQUEST VR-1 (continued)

Byron's Appendix J containment isolation leak testing program will soon be going to a performance-based testing program in which the frequency of testing may exceed a refueling outage frequency if the valves in question have experienced consistently good results in the past. The Appendix J Program will require an evaluation and justification for any valve in which an alternative to a refueling outage frequency is used. Since the closure testing in this relief request is identical to the Appendix J leak test, and the remaining tests in this relief request are completed during the execution of each valve's respective leak testing, it is practical to perform this testing at a frequency justified by Byron's Appendix J Program, which is in accordance with Federal Regulation 10CFR50, Appendix J. The testing frequencies set by the Appendix J Program will ensure an acceptable level of quality and safety for any category A leak test and for the testing included in this relief request.

PROPOSED ALT[illegible] TESTING:

The closure testing of all the category "AC" check valves, the full stroke testing associated with the 1/2CC9518, 1/2CC9534 and 1/2CV8113 check valves, and the position indication testing of the 1/2PS228A/B, 1/2PS229A/B, and 1/2PS230A/B solenoid operated valves will all be completed at the same frequency as the leak test is completed for each respective valve as determined by Byron's Appendix J Program.

APPROVAL STATUS:

1. Submitted with Revision 0 of Byron's 2nd Interval Program (Dec., 1995).

RELIEF REQUEST VR-2

TITLE: Disassembly of Containment Spray Check Valves

VALVE NUMBER	CATEGORY	CODE CLASS	DRAWING NUMBER	DRAWING COORDINATE
1/2CS003A	C	2	M-46-1A(M-129-1A)	E6(E3)
1/2CS003B	C	2	M-46-1A(M-129-1A)	C6(C3)
1/2CS008A	AC	2	M-46-1C(M-129-1C)	D6(D3)
1/2CS008B	AC	2	M-46-1C(M-129-1C)	B6(B3)
1/2CS011A	C	2	M-46-1A(M-129-1A)	D2(D8)
1/2CS011B	C	2	M-46-1A(M-129-1A)	B2(B8)
1/2CS020A	C	2	M-46-1B(M-129-1A)	B2(D5)
1/2CS020B	C	2	M-46-1B(M-129-1B)	B5(A5)

FUNCTION(S):

1/2CS003A/B:	Open:	Supply water to the Spray Nozzles
1/2CS008A/B:	Open:	Provides flowpath to Spray Nozzles
	Closed:	Containment Isolation (see VR-1)
1/2CS011A/B:	Open:	Supplies NaOH to suction of the CS pump (Eductor Outlet)
1/2CS020A/B:	Open:	Supplies NaOH to suction of the CS pump (Eductor Inlet/Discharge of Spray Add Tank
	Closed:	Prevents backflow to the spray additive tank (quarterly test)

CODE REQUIREMENT(S):

Per OMa-1988, Part 10, paragraph 4.3.2.1, check valves shall be exercised nominally every 3 months, except as provided by paras. 4.3.2.2, 4.3.2.3, 4.3.2.4, and 4.3.2.5.

BASIS FOR RELIEF:

General: Currently, full flow recirculation flow paths do not exist for the Containment Spray pumps. Extensive modifications to the existing plant design would be required to accommodate full flow testing of the 1/2CS003A,B and 1/2CS008A/B check valves, including the penetration of containment integrity. Additionally, NaOH in the spray additive tank limits the stroking of the 1/2CS011A,B and 1/2CS020A/B valves. Finally, the use of nonintrusive techniques, such as acoustic monitoring and magnetics, have not been successful in proving full stroking on this type of valve (dual disk).

RELIEF REQUEST VR-2 (continued)

The purpose of this relief request is to establish a basis for performing disassemblies on these valves as established in Generic Letter 89-04, position 2, "Alternative to Full Flow Testing of Check Valves," but not necessarily on a refueling outage basis. It is desirable to perform the disassemblies on the 1/2CS003A,B, 1/2CS011A,B and 1/2CS020A,B valves during any mode (the 1/2CS008A/B valves will remain during outages due to their physical location in containment).

Per NUREG 1482, Appendix A, "Positions, Questions, Responses, and Current Considerations Regarding Generic Letter 89-04," Question Group 14 considers the question of disassembling valves during a non-refueling outage schedule. Under "Current Considerations" for this question group, it states that "If it is practical to disassemble and inspect the selected valves at a frequency not determined by refueling outages, the licensee may establish a schedule for these valves that does not conform to a refueling outage schedule. However, ...entry into an LCO to perform the activity may not be acceptable (See Section 3.1.2)." Byron Station feels that the entry into the Containment Spray LCO to perform these check valve inspections would not create a significant safety or equipment problem which would discourage this activity. Per Byron Technical Specifications 3.6.2.1 and 3.6.2.2, there is a 7 day LCO to restore an inoperable Containment Spray System. If this could not be met, then the shutdown process would begin. However, the work involved with these check valves is easily completed within the 7 day LCO. Additionally, having a Containment Spray Train inoperable is low in risk significance when considering Byron's PRA analysis. Byron Station feels that it would be practical to disassemble and inspect these valves during nonoutage time periods.

This proposal is predominantly based upon the results of previous inspections at Byron and Braidwood stations, in which there has been no evidence of degradation or physical impairment which would inhibit the valves from performing their safety function. These valves are not expected to experience degradation or impairment since the valves are infrequently actuated. A company wide check valve evaluation addressing the "EPRI Application guidelines for Check Valves in Nuclear Power Plants" revealed that the location, orientation and application of these valves are not conducive to the type of wear or degradation correlated with SOER 86-03 type problems. An 18 month frequency is being requested for the 1/2CS003A/B, 1/2CS011A/B, and 1/2CS020A/B valves to be consistent with Byron's current refueling outage frequency of 18 months.

RELIEF REQUEST VR-2 (continued)

Because of the significant work involved with the isolation, draining, maintenance, inspections, and partial stroke testing of the valves, along with the superior results of past inspections, it is clearly impractical and burdensome to perform disassemblies as frequently as quarterly or during cold shutdowns. Additionally, it would not be consistent with Generic Letter 89-04.

Additional technical support in justification for this relief request is provided for each set of valves in parts A-D of this section.

A. 1/2CS008A,B: With the existing plant configuration, these valves cannot be full flow or partial flow tested during unit operation, cold shutdown or refueling, as water from the CS pumps would be discharged through the CS ring headers, causing undesirable effects on system components inside containment. Additionally, it is impractical to erect temporary large bore piping from the CS line to the reactor cavity, during cold shutdowns or refueling outages, in order to perform a full stroke test on these valves. The filling of the cavity would require the removal of the reactor vessel head to preclude equipment damage from borated water and the construction of the temporary piping would take an estimated nine to twelve shifts (or longer) to complete. There would be even more time involved with the draining and removal of the piping from containment following the completion of the test.

   Partial stroking of these valves using air during unit operation, cold shutdown, or refueling does not provide adequate assurance of valve operability and may be detrimental for the following reasons:

   a. There is no correlation between air flow and angle of disc movement.

   b. Venting and draining the required portion of piping to perform this test may cause deposition of boric acid residue which could in turn promote binding of the check valve internals.

B. 1/2CS003A,B: These valves cannot be full stroke tested due to the existing plant configurations, as previously discussed for the 1/2CS008A,B valves. However, these valves are partially stroked quarterly since they are in the flowpath of their respective Containment Spray pump runs.

C. 1/2CS011A,B: These valves cannot be full stroke tested (130 gpm eductor flow plus 55 gpm NaOH flow) during unit operation or cold shutdown as NaOH from the spray additive tank would be discharged throughout the CS system causing undesirable chemical effects on the reactor makeup supply (RWST) and associated systems. Additionally, personnel safety would also be a factor. However, these valves are partially stroked quarterly during respective Containment Spray Pump runs in which the eductor flow passes through the valve, but the spray additive tank is isolated, eliminating the NaOH flow required for the full stroke.

RELIEF REQUEST VR-2 (continued)

Full flow testing of these valves (and the CS020A/B valves) is accomplished a minimum of once every 5 years through the use of a temporary test hook-up in which flushing of the system is necessitated. Performing this testing on a more frequent basis is undesirable due to the accumulation of nearly two 55 gallon drums of potentially radioactive/toxic mixed waste that requires either recycling or disposal. Additionally, the handling of this material poses a significant safety hazard to personnel, resulting in eye damage and/or chemical burns if splashed or spilled. This testing, currently performed every five years per Technical Specification 4.6.2.2, would be impractical and burdensome to perform on a more frequent basis.

Non-intrusive techniques (acoustics and magnetics) have been attempted with unsuccessful results since the amount of flow required to full stroke the disks (critical velocity of 10 ft/sec) cannot be obtained based on current system design.

D. 1/2CS020A,B: These valves cannot be full stroked or partial stroked during unit operation, or cold shutdowns, for the same reasons as stated for the full flow testing of the 1/2CS011A,B valves. The Spray Additive tank is isolated during pump runs, so no flow is passed through the 1/2CS020A/B valves during this testing.

Additionally, the Tech Spec full flow test, performed a minimum of once every five years, would apply to these check valves in addition to the 1/2CS011A/B valves. The hardship involved with the hazardous mixed waste disposal and handling caustic material with regards to personnel safety does not provide a compensated increase in safety of the CS system equipment (in regards to performing the test more than once every five years). The five year frequency on this Tech Spec test in conjunction with the disassemblies performed, will more than adequately ensure operability of these valves.

RELIEF REQUEST VR-2 (continued)

PROPOSED ALTERNATIVE TESTING:

Per Generic Letter 89-04, position 2, "...valve disassembly and inspection can be used as a positive means of determining that a valve's disk will full stroke exercise open..." The provisions of this position may be used in the case of the CS check valves for the open direction as follows:

The A and B train valves for each valve number are of the same design (manufacturer, size, model number, and materials construction) and have the same service conditions, including orientation, and, therefore, form sample disassembly groups.

Group 1 (U-1)	Group 2 (U-1)	Group 3 (U-1)	Group 4 (U-1)
1CS003A	1CS008A	1CS011A	1CS020A
1CS003B	1CS008B	1CS011B	1CS020B

Group 1 (U-2)	Group 2 (U-2)	Group 3 (U-2)	Group 4 (U-2)
2CS003A	2CS008A	2CS011A	2CS020A
2CS003B	2CS008B	2CS011B	2CS020B

Group numbers 1, 3, and 4: One valve from each group, on a per unit basis, will be disassembled on an eighteen month frequency during any plant mode. If the disassembled valve is not capable of being full-stroked exercised or if there is binding or failure of valve internals, the remaining valve on the affected unit will be inspected soon after the repair or replacement of the problem valve (within 30 days of the return to service date). Additionally, following re-installation, the 1/2CS003A,B and 1/2CS011A,B valves will be partial stroke tested using the CS pumps and the 1/2CS020A,B valves will be partial stroke tested using an alternate water source (Note: the 1/2CS020A,B test for the closed position is currently performed quarterly during the execution of the respective CS019 stroke time test). When the Technical Specification full stroke testing of the respective CS020 and CS011 valves is completed, it may be used to satisfy the full stroke testing in lieu of the disassembly plan (if within the 18 month frequency guidelines established).

RELIEF REQUEST VR-2 (continued)

Group number 2: One valve from each group, on a per unit basis, will be disassembled on a refueling outage frequency. If the disassembled valve is not capable of being full-stroke exercised or if there is binding or failure of valve internals, the remaining valve on the affected unit will be inspected prior to startup. This methodology is consistent with Generic Letter 89-04, position 2. Prior NRC approval is not required. Additionally, following re-installation, the 1/2CS008A/B valves will be leak tested per its Category A Appendix J leak rate test. In addition to the leak test to verify proper installation, the valve inspection procedure requires a post-installation visual examination of the check valves (as it does for all disassemblies), with dual verification, to insure that the pin is oriented properly and that the flow direction is correct. This will ensure the correct installation of the valve.

APPROVAL STATUS:

1. Submitted with Revision 0 of Byron's 2nd Interval Program (Dec., 1995).

RELIEF REQUEST VR-3

TITLE: Motor Driven Auxiliary Feedwater Pump Essential Service Water Lube Oil Cooler Outlet Isolation Valve Stroke Test

VALVE NUMBER	CATEGORY	CODE CLASS	DRAWING NUMBER	DRAWING COORDINATE
1/2SX101A	B	3	M-42-3(M-126-1)	E3(E6)

FUNCTION(S):

The 1/2SX101A valves are the Essential Service (SX) Water outlet isolation valves for the Unit 1 and 2 motor driven Auxiliary Feedwater Pump lube oil coolers. These valves are required to open to provide a flow path for Essential Service Water through the motor driven AFW pump oil coolers.

CODE REQUIREMENT(S):

Stroke Time testing per OM-10, paragraph 4.2.1.4, development of stroke time acceptance criteria per OM-10, paragraph 4.2.1.8, corrective actions per OM-10, paragraph 4.2.1.9 and fail-safe testing per OM-10, paragraph 4.2.1.6.

BASIS FOR RELIEF:

Both of these valves are completely encapsulated per design and do not have local or remote position indicators which could be used to time the valve stroke.

The 1/2SX101A valves are pilot operated globe type solenoid valves which are energized to close. Upon de-energizing (pump start), the valve opens with the aid of a spring force against the plunger, and differential pressure across the main disk. Upon energizing, the valve closes by the magnetic force of the coil pulling the plunger down and pressure buildup above the main disk. In the absence of any pressure differential across the main disk, the spring or magnetic force is sufficient to open or close the valve, respectively.

Per the code requirements, these valves cannot be tested by the traditional means of stopwatch and indicating lights. The proposed alternative testing will adequately maintain the system in a state of operational readiness, while not sacrificing the safety of the plant.

PROPOSED ALTERNATIVE TESTING:

The 1/2SX101A solenoid valves will be verified to open during each quarterly ASME surveillance of the motor driven Auxiliary Feedwater Pumps. In addition, these valves are stroked monthly during Auxiliary Feedwater Pump surveillances required by Byron Station Technical Specifications.

APPROVAL STATUS:

1. Submitted with Revision 0 of Byron's 2nd Interval Program (Dec., 1995).

RELIEF REQUEST VR-4

TITLE: Disassembly and/or Acoustic Testing of the 1/2AF001A/B Check Valves

VALVE NUMBER	CATEGORY	CODE CLASS	DRAWING NUMBER	DRAWING COORDINATE
1/2AF001A	C	3	M-37(M-122)	D2(E7)
1/2AF001B	C	3	M-37(M-122)	B2(B7)

FUNCTION(S):

The open function of these check valves is covered under cold shutdown justification VC-11. The closure function of these valves (covered in this relief request) is to maintain adequate suction to the Auxiliary Feedwater Pump and to prevent loss of SX water to the CST when SX is used as the water source.

CODE REQUIREMENT(S):

Check valves shall be exercised nominally every 3 months, except as provided by paras. 4.3.2.2, 4.3.2.3, 4.3.2.4, and 4.3.2.5.

BASIS FOR RELIEF:

Performing a pressure test (by attaching a pump or other pressure source to a test connection and pressurizing the line) to verify closure is impractical due to the system configuration. Adequate closure capabilities of these check valves cannot be verified due to the multiple potential leakage paths (valves, pump seal, and instrument lines). This configuration makes it impossible to assign any observed leakage to any individual component.

Since there are no conventional ways to verify closure of these check valves, acoustic monitoring has been investigated. First, it was attempted to verify closure during the Operating Department Cold Shutdown full stroke test of the 1/2AF001A/B valves in which only a single train of AFW is ran at a time. With an AFW pump running on mini-flow recirculation, flow is initiated to each S/G and increased on a gradual basis, while simultaneously reducing Feedwater flow. As soon as the required flow data is obtained, AFW flow is gradually reduced, while simultaneously increasing Feedwater flow. This is done to minimize Feedwater perturbations to the S/Gs. Due to this gradual change in flow, the open and closed acoustical impacts cannot be detected with acoustical equipment.

However, the acoustic data taken during the 18 month dual pump injection test has provided Byron with a limited amount of success in detecting closure of the 1/2AF001A/B check valves. This test is only performed on refueling outage frequencies due to the large transient placed on Feedwater flow and the thermal stresses imposed on the Steam Generators. This technique may continue to be pursued in future outages.

RELIEF REQUEST VR-4 (continued)

However, until this method, or an alternative nonintrusive method indicates a high level of confidence in repeatability, Byron will continue to carry out the sample disassembly program, in accordance with Generic Letter 89-04.

The removal of these valves for disassembly requires that the system be taken out of service for an extended period of time. Due to Safety System Performance, Probabilistic Risk Assessment (PRA) analysis, and availability concerns involving the Auxiliary Feedwater System, it is clearly impractical to remove these valves from the system on a quarterly basis.

Maintenance history and previous inspections of these valves at both Byron and Braidwood Stations have shown no evidence of degradation or physical impairments. Industry experience, as documented in NPRDS, has shown no history of problems with these valves. A company wide check valve evaluation addressing the "EPRI Application Guidelines for Check Valves in Nuclear Power Plants" revealed that the location, orientation, and application of these check valves are not conducive to the type of wear or degradation correlated with SOER 86-03 type problems.

PROPOSED ALTERNATIVE TESTING:

The A train and the B train valves are of the same design (manufacturer, size, model number, and materials construction) and have the same service conditions, including orientation, and therefore form a sample disassembly group.

Group 1	Group 2
1AF001A 1AF001B	2AF001A 2AF001B

Per Generic Letter 89-04, position 2, one valve from each group, on a per unit basis, will be tested each refueling outage. If the disassembled valve is not capable of being full stroke exercised or if there is binding or failure of the valve internals, the remaining valve on the affected unit will be inspected prior to startup.

However, if acoustic testing clearly indicates that both of the 1/2AF001A/B check valves indicate closed in a particular outage, then the valve set to be inspected for a particular outage may be omitted for that outage. In this case, this relief request becomes a refueling outage justification for the closure testing of the 1/2AF001A/B check valves in accordance with OM-10, paragraph 4.3.2.2.

APPROVAL STATUS:

1. Submitted with Revision 0 of Byron's 2nd Interval Program (Dec., 1995).
2. Relief granted per GL 89-04 (Dec., 1995).

RELIEF REQUEST VR-5

TITLE: Disassembly of the Main Feedwater Header Check Valves

VALVE NUMBER	CATEGORY	CODE CLASS	DRAWING NUMBER	DRAWING COORDINATE
1/2FW079A	C	2	M-36-1C(M-121-1B)	C4(C4)
1/2FW079B	C	2	M-36-1A(M-121-1D)	C4(C4)
1/2FW079C	C	2	M-36-1D(M-121-1A)	C4(C4)
1/2FW079D	C	2	M-36-1B(M-121-1C)	C4(C4)

FUNCTION(S):

1/2FW079A-D: Closed: Isolate Steam Generators from an upstream pipe break

CODE REQUIREMENT(S):

Per OMa-1988, Part 10, paragraph 4.3.2.1, check valves shall be exercised nominally every 3 months, except as provided by paras. 4.3.2.2, 4.3.2.3, 4.3.2.4, and 4.3.2.5.

BASIS FOR RELIEF:

The main feedwater header flow check valves are 16-inch tilting disk check valves built with a vertical piston and rod assembly that serves as an anti-slam mechanism; the valves do not have external position indicators. The valves are designed to have a delayed closure time of 2 to 3 seconds to isolate flow during a feedwater line break accident without inducing significant water hammer transients. Their closed safety functions are to 1) mitigate a loss of secondary inventory and/or make-up, and 2) provide pressure integrity between the safety and non-safety related portions of piping.

These valves cannot be exercised to their closed position during power operations because feed flow to a steam generator would be isolated, causing loss of Steam Generator water inventory and a subsequent low S/G level Reactor Trip.

Non-intrusive testing during cold shutdowns has been attempted at Braidwood and Byron Stations with still unproven results. Specifically, ultrasonic examination of the piston rod position has not conclusively demonstrated valve closure: The anti-slam mechanism prevents the disk from travelling completely to its seat after cessation of forward flow. In fact, during normal feedwater system shutdown evolutions, the valves routinely come to rest at a partial open position -- substantial reverse flow or reverse differential pressure would be required to bring the disk into contact with the seat.

RELIEF REQUEST VR-5 (continued)

Traditional backflow testing methods were considered, but it has been determined that reverse flow and/or differential pressure sufficient to close the valve cannot be obtained without major modification to the existing plant configuration. Clearly, acoustic testing techniques which require contact noise between disk and seat cannot be used for this application, either.

Full-stroke exercising these valves by performing complete disassembly and inspection of each valve during cold shutdown conditions is undesirable and impractical because:

1) The main feedwater system would have to be drained. This would both delay reactor start-up and eliminate a method of reactor decay heat removal. The latter, in particular, could adversely affect shutdown safety.

2) Complete disassembly often requires machining activities that remove metal from the valve walls which may jeopardize minimum wall thickness. If minimum wall thickness is approached, then costly and difficult weld overlay techniques and associated machining would be required.

3) Scaffolding must be built and removed to allow examination of these valves.

Full-stroke exercising these valves by performing partial disassembly (i.e. removing only the actuator bonnets) of all four valves on a refueling or cold shutdown frequency is burdensome because of the system draining necessary and the potential wall material loss associated with disassembly and inspection work.

Because major plant modifications would be required to establish enough reverse flow/pressure to fully close the valves, in-service testing in accordance with NRC Generic Letter 89-04 is justified. The Generic Letter allows valves of similar design, service conditions, etcetera to be classified in sample disassembly and inspection groups of up to four members with testing of one valve in the group during each refueling outage.

In-service testing of the valves that close on a feedwater isolation signal, including the safety-related feedwater containment isolation valves (FW009A-D), the non-safety-related feedwater regulating valves (FW510, 520, 530, 540), and the feedwater regulating bypass valves (FW510A, 520A,...) helps ensure that the power operated valves and the system are capable of safely responding to an initiating feedwater line break accident regardless of FW079 check valve position.

RELIEF REQUEST VR-5 (continued)

The alternate test method is sufficient to ensure operability of these valves and is consistent with Generic Letter 89-04 sample disassembly and inspection program. The alternate test method in conjunction with other existing in-service testing of feedwater valves is more than sufficient to ensure the system's ability to safely respond to a feedwater line break accident.

PROPOSED ALTERNATIVE TESTING:

The four valves on each unit are of the same design (manufacturer, size, model number, and materials of construction) and have the same service conditions, including orientation; therefore, they form a sample disassembly group.

One valve from each group, on a per unit basis, will be fully disassembled and examined each refueling outage. If the initial disassembled valve is not capable of being full stroke exercised or if there is binding or failure of internals, subsequent disassembly and inspection of the remaining three group members will be commensurate with the initial valve's failure mode.

This means that the remaining three valves may be "partially" disassembled, which refers to the removal of the actuator [upper] bonnet for inspection of the piston, piston seal ring, mating surfaces, and also for manual full stroke closing. A "fully" disassembled valve (minimum of one per outage) would additionally include removal of the valve body [lower] bonnet, giving access to the disk and seating surfaces. The subsequent disassembly requirements would be satisfied through either "partial" or "full" disassemblies depending on what is found with the initial disassembled valve. This will both satisfy the testing requirements to demonstrate all four valves' ability to perform their safety function and minimize the potential concerns regarding minimum wall thickness discussed earlier. This approach is consistent with Generic Letter 89-04, position 2.

A partial stroke test following complete installation will not be required for these check valves since an "as left" stroke is performed prior to the installation of the actuator bonnet; installation of the actuator bonnet does not affect the stroke of the valve. In addition, the plant operates with these valves in the open position and open stroke problems would be readily identified during plant startup.

APPROVAL STATUS:

1. Submitted with Revision 0 of Byron's 2nd Interval Program (Dec., 1995).
2. Relief granted per Generic Letter 89-04 (Dec., 1995).

RELIEF REQUEST VR-6

TITLE: Eighteen Month Frequency for the Essential Service Water (SX) Makeup Pump Discharge Check Valve Closure Test

VALVE NUMBER	CATEGORY	CODE CLASS	DRAWING NUMBER	DRAWING COORDINATE
0SX028A/B	C	3	M-42-6	B7(B6)

FUNCTION(S):

0SX028A/B: Closed: These check valves need to close to prevent piping drain down from the basins to the river screen house.

Open: Provides a flowpath for Essential Service Water makeup to the basins (full flow tested quarterly)

CODE REQUIREMENT(S):

Per OMa-1988, Part 10, paragraph 4.3.2.1, check valves shall be exercised nominally every 3 months, except as provided by paras. 4.3.2.2, 4.3.2.3, 4.3.2.4, and 4.3.2.5.

BASIS FOR RELIEF

The backflow test for the 0SX028A/B check valves was added to the IST Valve Program in Rev 12 of the First Ten Year IST Interval Program due to their closure function to prevent piping drain down from the basins to the river screen house. Since their incorporation into the program, the 0SX028A and 0SX028B check valves have been successfully tested for closure using acoustics during the respective A or B makeup pump runs a minimum of once each quarter. Each valve has successfully been tested 7 consecutive times without any signs of degradation or failure.

Nonintrusive techniques are considered to be "other positive means" in accordance with ASME Section XI IWV-3522. As described in NUREG 1482, nonintrusive techniques may be used to verify the capability [of check valves] to open, close, and fully stroke.

The acoustic testing of both of these valves on an eighteen month frequency (at approximately the same time period) is justified for the following reasons:

RELIEF REQUEST VR-6 (continued)

Byron Response:

a. Low Risk Significance Associated with the Check Valves Failing to Close:

The failure of these check valves to close is considered a non-risk significant event due to the redundant equipment available to ensure that the basins will retain their inventory and receive makeup cooling water, as required. The failure of these check valves to close is not specifically modeled in the PRA. When evaluating risk, all safety and non-safety related equipment available for mitigating the event, is reviewed. If one of these valves fails to close and backleakage occurs, the line could be isolated from the basin by closure of a manual valve next to the check valve (not tested by IST) or MOVs near the entry into the basin (not tested by IST). An alternate way to overcome the leakage would be to start up the pump on the line with the defective valve. Finally, there are alternate ways to makeup to the SX basins, which include the non-safety related Circulating Water makeup lines or the non-safety related, but seismically qualified, Deep Well Water makeup lines. During normal operation, Circulating Water is the preferred method of makeup to the basin. Additionally, the two SX basins overflow into each other at a level of 64%.

b. Low Safety Significance Associated with the Check Valves Failing to Close:

The safety significance of these check valves failing to close would result in a potential for piping drain down from the basins to the river screen house, approximately 5 miles away from the plant. The safety-related SX makeup pumps are the emergency source of makeup to the basins. If an SX pump is called upon to operate in a post-accident situation, it is desirable to avoid the potential delay involved in transporting water to the basin to ensure that the ultimate heat sink analysis remains valid. The ultimate heat sink consists of the two essential service water mechanical draft cooling towers and the makeup system to these cooling towers. The elevation difference of approximately 200 feet between the river and the SX basins make this a possibility.

The SX basins should not be drained to a point of concern even if one of the makeup check valves did fail. During normal operations, the SX "A" and "B" basin levels are maintained at approximately 82%, with makeup generally coming from the non-safety related Circulating Water pumps At 64% level, the SX basins overflow into one another. If the level in one basin reaches 56%, an alarm is received in the Control Room and automatic makeup from the respective SX makeup pump begins at 53% level. Even if the alarms and automatic makeup failed, the SX makeup lines enter the basin at a level near the Technical Specification limit of 50%, ensuring that significant levels will remain in the basins.

RELIEF REQUEST VR-6 (continued)

Additionally, either train of SX makeup would be capable of supplying the basins with enough water to satisfy the ultimate heat sink analysis.

In the unlikely event that the downstream piping of an SX Makeup Pump were to completely drain, the pump suction at the river would have enough suction head to allow the refilling of the downstream piping and establishment of makeup to the SX basin without extraordinary operator actions or damage to the SX Makeup Pump. The failure of one of these check valves to close would be minimal and easily overcome.

c. Performing the acoustic test on both valves on an eighteen month frequency will ensure the operational readiness of the valves. These valves have been in operation for approximately 10 years without failure and have successfully passed their acoustic testing for seven tests in a row since being added to the IST program.

Byron's assessment of this valve is solely based on the testing performed on the valve. The open valve position is tested quarterly with full flow during each pump run. An acoustic test is used to prove closure. This test is currently performed quarterly, during the same surveillance, when the pump is shut down. Due to the elevation differences between the piping discharging into the basin and the much lower elevation of the river screen house (location of the SX makeup pump discharge check valves), a good signal is recorded for the closure of these check valves.

A maintenance history review of these SX discharge check valves has indicated that maintenance has been nonexistent since startup on these valves. There are no past or present work requests for them. However, due to the corrosive nature of the SX system, Byron plans on beginning a program to disassemble and inspect a series of SX check valves associated with maintaining the ultimate heat sink water inventory (included are the "A" and "B" train IST check valves for isolating Circulating Water makeup, "A" and "B" train IST check valves for isolating the Deep Well Water makeup, and the SX makeup check valves discussed in this relief request). Byron currently has internal parts for the first valve disassembly, but is waiting for a valve body to arrive. This would allow a quick disassembly and replacement necessitated by LCOAR time requirements. If a rebuild is required, maintenance personnel could do this without the time pressures involved with the LCOAR. This program will begin shortly after the arrival of the valve body (replacement would most likely occur during the 1st quarter of 1996). Following the inspection of these valves, the results will be reviewed to determine an optimum disassembly interval. Based on the good test results obtained for the SX discharge check valves for closure and the fact that they have not failed in over 10 years, these check valves may be inspected last in the rotation. These disassembly and inspections

RELIEF REQUEST VR-6 (continued)

will be highly dependent on the availability of parts and appropriate plant conditions, but completion of this rotation would be expected within the next few years.

d. The A and B SX makeup pump surveillances will continue to be executed for IST on a quarterly basis. During this testing, the check valve will be experiencing the same evolution as it does when the backflow acoustic test is completed. The check valve will be opened and then closed on cessation of flow. The full flow test will be completed quarterly, verifying operability in the forward flow direction.

e. In addition, this eighteen month frequency will reduce the amount of manhours required in performing the acoustics at the river screen house a few miles from the Byron plant on the Rock River. For each test (8 times a year), approximately one full day (8 days a year) is expended by the qualified acoustic monitoring individual to transfer the equipment to the river screen house, set up the equipment, record the data, transfer the equipment back to the station, evaluate the data, and complete surveillances.

A typical test day would begin down at the river screen house, setting up, coordinating with Operations and the System Engineer for running the test. The afternoon would typically be spent evaluating the data and completing the surveillances.

Byron's Check Valve Program resides in the Site Engineering Programs group. Individuals within this group generally have multiple responsibilities assigned to them. One responsibility of the Check Valve Coordinator is to perform acoustic tests on check valves, where applicable. In addition, this individual is responsible for maintaining a Check Valve Program of over 500 valves (with plans to review another 2000 balance of plant check valves). Additional tasks of the individual who has recently become the Check Valve Coordinator includes the ASME Pressure Test Program. Byron does not have an individual who is totally dedicated to acoustic monitoring. The individual who performs this testing will always have other collateral duties which will consume a considerable amount of time. Hence, it is desired to test components such as these check valves at a frequency which is commensurate to their level of safety to ensure all activities receive the appropriate level of attention.

PROPOSED ALTERNATIVE TESTING:

Byron proposes to complete both of the 0SX028A/B backflow acoustic tests at a minimum of once per 18 months.

APPROVAL STATUS:

1. Submitted with Revision 0 of Byron's 2nd Internal Program (Dec., 1995).

RELIEF REQUEST VR-7

TITLE: Eighteen Month Frequency for the Full Stroke Test of the Deep Well Pump Discharge Check Valves

VALVE NUMBER	CATEGORY	CODE CLASS	DRAWING NUMBER	DRAWING COORDINATE
0SX127A/B	BC	3	M-42-6	B2(B4)

FUNCTION(S):

0SX127A/B: Closed: These check valves need to close to prevent a loss of required emergency makeup water flow into the Deep Wells rather than to the Ultimate Heat Sink (see ROJ-1)

Open: These check valves are required to open to provide a flow path for Deep Well Water to the Ultimate Heat Sink as a backup to the Emergency Makeup Pumps.

CODE REQUIREMENT(S):

Per OMa-1988, Part 10, paragraph 4.3.2.1, check valves shall be exercised nominally every 3 months, except as provided by paras. 4.3.2.2, 4.3.2.3, 4.3.2.4, and 4.3.2.5.

BASIS FOR RELIEF:

The 0SX127A and 0SX127B check valves open to provide a flow path for Deep Well Water to the Ultimate Heat Sink as a backup to the Emergency Makeup Pumps. The nonsafety related, seismically qualified, Deep Well Pumps (0WW01PA/0WW01PB) are physically inaccessible and were not designed or installed in accordance with ASME code and are not required as long as the Emergency SX Makeup Pumps are available. Although the pumps do not fit the requirements of the IST Program, they do have significant importance and are tested outside of the IST Program as required per Tech Spec 3/4.7.5. The safety related check valves referenced in this relief request were conservatively added to the IST Program in the open direction to acknowledge the importance of ensuring the deep well flow path is capable of transferring water to the ultimate heat sink.

In reference to the deep well pumps, per Tech Spec 4.7.5, the Ultimate Heat Sink shall be determined operable: at least once per 31 days by starting each deep well pump, operating it for at least 15 minutes and verifying that each valve (manual, power-operated, or automatic) in the flow path is in its correct position and; at least once per 18 months by verifying each deep well pump will provide at least 550 gpm flow rate.

RELIEF REQUEST VR-7 (continued)

Byron proposes to complete a full stroke test for check valves 0SX127A and 0SX127B at a minimum of once every eighteen months, as required by Technical Specifications. Testing on a more frequent basis would be completed in accordance with station commitments. This test will be accomplished by executing the Byron Station deep well surveillance in which, first, the "A" pump is lined up to the "A" basin and an ultrasonic flowmeter is attached to the makeup line (following the removal of a security barrier). The demand (throttling) valve is opened until a minimum flow reading of at least 550 gpm is obtained through the line (and check valve 0SX127A). In addition, the amperage of the pump is recorded. Then, the "A" pump is shut down and the valves are re-aligned to the "B" Basin, in which there is no accessible piping of adequate length to attach an ultrasonic flowmeter. However, the same "A" pump is restarted and set to an amperage greater than or equal to the amps just recorded for the A basin flowpath. Byron Station trends flow versus amps for the Deep Well Pumps to help track degradation with the pumps, as required through a station commitment to the NRC. This should assure a full stroke test for the 0SX127B check valve (using other "positive means"). In addition, the A and B basins overflow into each other at 64% level, minimizing the importance of knowing the exact flow through the "B" makeup line (although it should be the same as just recorded through the "A" makeup line). Finally, the "B" pump is verified to generate an output greater than 550 gpm through the "A" train makeup line to satisfy the Tech Spec requirement.

In addition to the above testing, Byron will ensure operability of the Deep Well Pumps by executing an operating surveillance monthly in which the "A" pump is lined up to the "A" basis and the "B" pump is lined up to the "B" basin. In each case the demand for each pump will be at or near 100%, which should assure a full stroke of each check valve every month. However, since flow is not measured, it will be considered a partial stroke each month.

The alternative testing requirements will not compromise the level of quality and safety when compared to quarterly code testing for the following reasons:

a. Byron Tech Specs are being satisfied through the eighteen month Deep Well Pump procedure and the monthly operating procedure. This testing will satisfy the operability requirements for the Deep Well Pumps and the flowpaths to the SX basin. In addition, the same or more flow is transferred through the check valves each month than during the procedure executed every eighteen months. The flowrates would be verified during the eighteen month procedure.

b. An ultrasonic flowmeter cannot be used on the "B" basin makeup line due to the lack of accessible piping available. In addition, at this time, inconclusive acoustic results were obtained for the full stroke testing on these valves. Finally, flow versus amps is trended to help aid in determining any degradation in the Deep Well Pumps.

RELIEF REQUEST VR-7 (continued)

PROPOSED ALTERNATE TESTING:

These valves will be tested in accordance with Byron Tech Specs. The full stroke test for check valves OSX127A and OSX127B will be completed on an eighteen month frequency in addition to a monthly flowpath verification (considered partical stroke).

APPROVAL STATUS:

1. Submitted with Revision 0 of Byron's 2nd Interval Program (Dec., 1995).

RELIEF REQUEST VR-8

TITLE: Non-IST Monthly Test of Diesel Generator Air Start System Valves

VALVE NUMBER	CATEGORY	CODE CLASS	DRAWING NUMBER	DRAWING COORDINATE
1/2DG5182A	B	N/A	M-152-20	B5(B5)
1/2DG5182B	B	N/A	M-152-20	B5(B5)
1/2DG5183A	B	N/A	M-152-20	E5(E5)
1/2DG5183B	B	N/A	M-152-20	E5(E5)
1/2DG5184A	C	N/A	M-152-20	B6(B6)
1/2DG5184B	C	N/A	M-152-20	B6(B6)
1/2DG5185A	C	N/A	M-152-20	F6(F6)
1/2DG5185B	C	N/A	M-152-20	F6(F6)

FUNCTION(S):

This relief request covers the open function of these valves only. They are required to open in order to supply starting air to the Diesel Generators.

CODE REQUIREMENT(S):

These valves are not within the scope of the IST Program per 10CFR50.55 (a). However, the requirements for stroke timing and trending of the valves associated with the Diesel Air Start System are being mandated by the NRC as an augmented testing requirement pursuant to 10CFR50.55 (6)(ii).

Therefore, valves associated with the Diesel Air Start System shall be exercised to the position required to fulfill their function per OM-10, Paragraphs 4.2.1.1 and 4.3.2.2. Additionally, the stroke testing of power operated valves shall be measured to the nearest second and such stroke times compared to the initial reference valves to document continued valve operational readiness per OM-10, paras. 4.2.1.4(b), 4.2.1.8, and 4.2.1.9.

BASIS FOR RELIEF:

The monthly Diesel Generator testing program, outlined in Byron Station's Technical Specifications and implemented by station operating procedures, exceeds the intent of the quarterly valve testing program which would be required by OM-10, Paragraph 4.2.1.2. Additionally, the stroke timing of solenoid operated valves associated with the Diesel Air Start System is impractical due to the fast actuation of these valves.

Proper valve operation will be demonstrated on a monthly basis by the verification of diesel generator air start capability. Such verification will compare the air pressures contained in the receiver tanks both before and after the diesel generator start, thus verifying the operability of the air start control valves. The proposed testing methodology at the increased frequency satisfies the intent of the Section XI requirements without posing undue hardships or difficulties.

RELIEF REQUEST VR-8

TITLE: Non-IST Monthly Test of Diesel Generator Air Start System Valves

VALVE NUMBER	CATEGORY	CODE CLASS	DRAWING NUMBER	DRAWING COORDINATE
1/2DG5182A	B	N/A	M-152-20	B5(B5)
1/2DG5182B	B	N/A	M-152-20	B5(B5)
1/2DG5183A	B	N/A	M-152-20	E5(E5)
1/2DG5183B	B	N/A	M-152-20	E5(E5)
1/2DG5184A	C	N/A	M-152-20	B6(B6)
1/2DG5184B	C	N/A	M-152-20	B6(B6)
1/2DG5185A	C	N/A	M-152-20	F6(F6)
1/2DG5185B	C	N/A	M-152-20	F6(F6)

FUNCTION(S):

This relief request covers the open function of these valves only. They are required to open in order to supply starting air to the Diesel Generators.

CODE REQUIREMENT(S):

These valves are not within the scope of the IST Program per 10CFR50.55 (a). However, the requirements for stroke timing and trending of the valves associated with the Diesel Air Start System are being mandated by the NRC as an augmented testing requirement pursuant to 10CFR50.55 (6)(ii).

Therefore, valves associated with the Diesel Air Start System shall be exercised to the position required to fulfill their function per OM-10, Paragraphs 4.2.1.1 and 4.3.2.2. Additionally, the stroke testing of power operated valves shall be measured to the nearest second and such stroke times compared to the initial reference valves to document continued valve operational readiness per OM-10, paras. 4.2.1.4(b), 4.2.1.8, and 4.2.1.9.

BASIS FOR RELIEF:

The monthly Diesel Generator testing program, outlined in Byron Station's Technical Specifications and implemented by station operating procedures, exceeds the intent of the quarterly valve testing program which would be required by OM-10, Paragraph 4.2.1.2. Additionally, the stroke timing of solenoid operated valves associated with the Diesel Air Start System is impractical due to the fast actuation of these valves.

Proper valve operation will be demonstrated on a monthly basis by the verification of diesel generator air start capability. Such verification will compare the air pressures contained in the receiver tanks both before and after the diesel generator start, thus verifying the operability of the air start control valves. The proposed testing methodology at the increased frequency satisfies the intent of the Section XI requirements without posing undue hardships or difficulties.

RELIEF REQUEST VR-8 (continued)

PROPOSED ALTERNATIVE TESTING:

The performance of Byron Station's Diesel Generator operability monthly surveillance will verify the operational readiness of the valves associated with the Diesel Air Start System.

This surveillance testing will require the recording of the air pressures contained in both trains A & B of the Diesel Generator Air Start Receiver Tanks both before and immediately after diesel generator start.

By the comparison of these valves between trains, the satisfactory operation of the power operated and self-actuated check valves associated with the Diesel Air Start System can be adequately demonstrated.

APPROVAL STATUS:

1. Submitted with Revision 0 of Byron's 2nd Interval Program (Dec., 1995)
2. Relief granted due to involvement of Non-IST Components (Dec., 1995)

SECTION 3.6

VALVE REFERENCES

VALVE REFERENCE LIST

1. Title 10, Code of Federal Regulations, Part 50, Domestic Licensing of Production and Utilization Facilities, particularly Section 50.55a, Codes and Standards.

2. ASME Boiler and Pressure Vessel Code, Section XI, Rules for Inservice Inspection of Nuclear Power Plant Components, 1989 Edition.

3. ASME/ANSI OM-1987, Operation and Maintenance of Nuclear Power Plants, including 1988 Addenda, Part 10, Inservice Testing of Valves in Light Water Reactor Power Plants.

4. U.S. Nuclear Regulatory Commission, Generic Letter 89-04, Guidance on Developing Acceptable Inservice Testing Programs.

5. US Nuclear Regulatory Commission, Generic Letter 89-04, Supplement 1, NUREG 1482 Guidance on Developing Acceptable Inservice Testing Programs.

6. Byron/Braidwood Station UFSAR, Section 3.9.6.2, Inservice Testing of Valves.

7. Byron Station Technical Specification, 3/4.0.5, Generic ASME Program Requirement.

8. Byron Technical Staff Procedure, BVP 200-2, IST Requirements for Valves.