Tennessee Valley Authority, Post Office Box 2000, Spring City, Tennessee 37381-2000

JUN 30 2006

10 CFR 50.50.55a

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

Gentlemen:

In the Matter of) Docket No. 50-390
Tennessee Valley Authority)

WATTS BAR NUCLEAR PLANT (WBN) UNIT 1 - INSERVICE TEST (IST) PROGRAM UPDATE AND ASSOCIATED RELIEF REQUESTS FOR SECOND TEN-YEAR INTERVAL

The purpose of this letter is to provide WBN's updated IST Program and the associated Requests for Relief, PV-01, PV-02, PV-03, and PV-04 for WBN's Second 10-Year Inspection Interval for pumps and valves. The requests for relief are being submitted to NRC for review and approval in accordance with 10 CFR 50.55a.

The IST Program is provided in the Enclosure. The pump test program contains two requests for relief:

PV-01 - Reference Values for Vibration Points on Pumps
PV-02 - Measuring Pump Flow Rates of the Screen Wash Pumps.

Both of these Requests for Relief were approved in WBN's First Ten Year Testing Interval in WBN's Supplemental Safety Evaluation Report (SSER) 14, (NUREG-0847) as PV-01 and PV-04, respectively.

The valve test program also contains two requests for relief:

PV-03 - Reactor Coolant System Head Vent Stroke Time
PV-04 - Essential Raw Cooling Water Isolation Valves Stroke Times.

Both of these Requests for Relief were approved in WBN's First Ten Year Testing Interval. PV-03 was originally designated as

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PV-15, Revision 1, in the First Ten Year Testing Interval. PV-04 as originally designated as PV-16 in the First Ten Year Testing Interval. Both of these request were approved by NRC letter dated March 22, 2000.

The updated IST Program has been developed to the American Society of Mechanical Engineers (ASME) Code for Operation and Maintenance (OM) Code 2001 Edition, through the 2003 Addenda with the Errata provided in the enclosed Program. Several errors, primarily editorial, have been identified in the 2003 Addenda which have since been corrected in the ASME 2005 Addenda. However, the 2005 Addenda has not been endorsed by NRC. Therefore, TVA's program for WBN was developed to the ASME OM Code 2001 Edition through the 2003 Addenda as corrected by the list in Appendix E of the enclosed Program.

The Updated IST Program also conflicts with the WBN Technical Specifications Section 5.7.2.11. TVA has requested a License Amendment, WBN-TS-06-04, to update the technical specifications to the ASME OM Code. This License Amendment Request was submitted June 16, 2006.

There are no regulatory commitments associated with this submittal. If you have any questions concerning this matter, please call me at (423) 365-1824.

Sincerely,

P. L. Pace
Manager, Site Licensing
and Industry Affairs

Enclosure
Cc: See Page 3

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TENNESSEE VALLEY AUTHORITY

WATTS BAR NUCLEAR PLANT

PO Box 2000
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SECOND INSERVICE INTERVAL
INSERVICE TESTING PROGRAM FOR PUMPS AND VALVES

Unit 1

Commercial Service -- May 27, 1996

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1.0 INTRODUCTION

The rules for the Inservice Testing of pumps and valves for the Second Ten Year Interval, are contained in the ASME OM Code 2001 Edition, through the 2003 Addenda with corrections. The 2003 Addenda included several editorial errors that were corrected in the 2005 Addenda. These are tabulated in Appendix E. The Second Ten Year Interval for the Watts Bar Nuclear Plant (WBN) starts on December 27, 2006 and will end on December 26, 2016. Title 10, Part 50, Section 55a of the Code of Federal Regulations (10CFR50.55a) and the Watts Bar Technical Specifications (TS) require that Inservice Testing be met throughout the service life of the nuclear power plant and updated at each 10 year interval. This program provides the technical requirements for implementing the Inservice Testing (IST) Program for WBN. The intent of this program is to identify pump and valve degradation and ensure that the proper corrective action is taken such that operational readiness is maintained at all times.

This Summary Description identifies the pumps and valves for which IST will be performed at WBN Unit 1 to comply with the requirements of 10CFR50.55a. The testing required by this program will be accomplished through the WBN Surveillance Testing Program.

2.0 PUMP INSERVICE TESTING PROGRAM

Except for relief requested under the provisions of 10CFR50.55a, the IST Program for pumps shall be conducted in accordance with ASME OM Code, ISTB, 2001 Edition with Addenda through 2003. Table 1 summarizes the IST Program for pumps at WBN. Each Inservice Test Quantity to be measured and reference to related relief requests is listed. Specific details of the relief requests are provided in Appendix B.

2.1 Pump Groups

A. **Group A Pumps** - The OM Code defines Group A pumps as those pumps that are operated continuously or routinely during normal operation, cold shutdown, or refueling operations. Watts Bar considers the following pumps to be Group A pumps along with the basis for grouping:

1. Charging Pumps - The CCPs are utilized during plant operation for normal charging and letdown activities.

2. Motor Driven Auxiliary Feedwater Pumps – The MD AFW pumps are utilized during startup from refueling outages to fill the steam generators and to maintain steam generator level prior to initiation of normal feedwater.

3. Boric Acid Transfer Pumps - The BAT pumps are in service for recirculation of the boric acid tanks during normal operation.

4. Component Cooling System Pumps - The CCS pumps operate continuously during normal plant operation to supply cooling water to essential and non-essential heat loads as well as cooling water to the RCP motor bearings and thermal barriers.

5. Chilled Water Pumps - The Chilled Water pumps are in service during normal operation to supply cooling to various loads.

6. Residual Heat Removal Pumps - The RHR pumps are required to operate when maintaining the plant in a cold shutdown condition.

7. ERCW Pumps - The ERCW pumps are vertical line shaft pumps that operate continuously during normal plant operation and during shutdown conditions to supply cooling water to essential and non-essential heat loads.

8. ERCW Screen Wash Pumps - The ERCW Screen Wash Pumps are vertical line shaft pumps that operate intermittently during normal plant operation and during shutdown conditions to maintain the ERCW Traveling Water Screens clean.

B. **Group B Pumps** - The OM Code defines Group B pumps as those pumps in standby systems that are not operated routinely except for testing. WBN considers the following pumps Group B pumps:

1. Turbine Driven Auxiliary Feedwater Pump - This pump is not utilized during any plant operating evolution. The pump remains in standby during all operating Modes and is required to operate only during accident or transient conditions in which it is credited for accident mitigation.

2. Containment Spray Pumps - The Containment Spray pumps are not utilized during any plant operating evolution. The pumps remain in standby during all operating Modes. The pumps are required to operate only during a loss-of-coolant accident (LOCA) or main steam line break (MSLB) inside containment for containment heat removal and pressure suppression.

3. Safety Injection System (SIS) Pumps - The SIS pumps remain in standby during all operating Modes, except during testing. These pumps are required to operate only during a loss-of-coolant accident (LOCA) to provide cooling to the reactor.

2.2 Test Frequency

A. Tech Spec frequency shall not be superseded by ASME frequency. The provisions of Tech Spec 3.0.2 allowing the use of a ±25% tolerance to specified test frequencies of 2 years or less listed in the Tech Spec may be applied.

B. When plant conditions restrict the availability of some components for testing, testing may be delayed until plant conditions are made available.

C. Components tested during power ascension due to maintenance performed during the outage shall be considered inoperable until the post maintenance tests are completed.

D. ASME Inservice pump testing (in the as found condition where practical) shall be conducted quarterly (at least once every 92 days).

E. A comprehensive pump test is performed every 2 years.

F. ASME pumps lacking required fluid inventory shall be tested at least once every two years (at least once every 24 months).

G. Pump testing shall continue through shutdown periods on operable equipment.

H. Pump performance may require increasing the test frequency to twice per quarter.

I. Pumps in systems out of service for an extended period of time are not required to be tested but will be tested within the last 92 days of the outage or prior to being returned to service or entry into an operational mode which requires the pump to be OPERABLE unless technical specifications allow otherwise.

K. Pump testing is required prior to returning to service following maintenance activities which could affect pump performance.

L. Pumps that are discovered to be out of frequency shall be subject to the requirements of TS Surveillance Requirement 3.0.3 and Regulatory Issue Summary (RIS) 2005-020.

3.0 VALVE INSERVICE TESTING PROGRAM

Except for relief requested under the provisions of 10CFR50.55a, the IST Program for valves shall be conducted in accordance with ASME OM Code, ISTC, 2001 Edition with Addenda through 2003. Valves in WBN's safety related systems were reviewed and categorized. Valves which were categorized as active in any category and passive valves categorized in Category A or B are listed in Table 2. Justifications for testing at a frequency other than quarterly are listed numerically in Appendix A. Relief Requests are listed numerically in Appendix B.

3.1 Containment Isolation Valves (CIV)

Valve leakage rates shall be subject to the analysis and corrective action of OM Code (ISTC-3600). This is also required by 10CFR50.55a(b)(2)(vii) for Containment Isolation Valves. Category A valves or valve combinations shall have a permissible leakage rate specified by the owner. Valves or valve combinations with leakage rates exceeding the permissible rate shall be declared inoperable and either repaired or replaced. A retest demonstrating satisfactory performance shall be performed prior to declaring the valve operable. This requirement is satisfied within the Appendix J program for containment isolation valves.

All Appendix J valves are also included in the IST Program. Frequency of testing will be based on performance since WBN is an Option B plant.

3.2 Pressure Isolation Valves (PIV)

A. These valves must be tested at least once per 18 months.

B. Testing must be performed prior to entering MODE 2 whenever the plant has been in MODE 5 for 7 days or more and if leakage testing has not been performed in the previous 9 months.

C. Testing must be performed within 24 hours following valve actuation due to automatic or manual action or flow through the valve. The 24 hour clock will start after the flow through the valve(s) has been stopped. Surveillance Requirements and the associated bases allow delay when plant conditions needed for testing are not available in MODES 3 or 4.

D. Testing should be performed during startup after coming off RHR to eliminate multiple performances due to RHR flow through Cold Leg Primary and Secondary check valves.

E. Testing at low RCS pressure will minimize personnel hazard and provide a conservative leak rate which provides early indication of potential problems.

F. Testing must be performed prior to returning to MODE 2 following maintenance, repair, or replacement work that could affect valve seating.

A listing of PIVs is provided in Appendix D.

3.3 Fail Safe Actuators

Valves which have a fail safe actuator are exercised using that actuator. In most cases, the nature of the control circuitry used to stroke the valve is such that normal testing causes the fail safe actuator to operate the valve. Thus, the fail safe actuator is regularly tested when the valve is tested. In those cases where the fail safe actuator is not the normal source for operation of the valve, valve testing is performed using both the normal means of operation and the fail safe actuator.

3.4 Passive Valves

As specified in ISTC Table ISTC-3500-1, passive valves have no testing requirements other than verification of the accuracy of remote position indicators for valves so equipped and/or seat leakage testing if categorized as A-Passive. The attached testing program provides for verification of the accuracy of the remote position indicators of passive valves which are in a flow path which is required to perform a safety function in order to mitigate the consequences of an accident, achieve the cold shutdown condition, or maintain the cold shutdown condition. Provisions are also included for seat leakage testing of Category A-Passive valves. Passive valves which are within a non-safety related flow path are considered to be outside the scope the IST program and are not tested as part of this program.

WBN also has valves in the Essential Raw Cooling Water and Component Cooling System that were originally equipped with remote position indicators and which are within or provide a flow boundary for a safety related flow path. These valves have been placed in their required safety position and administratively locked in place with the power supply breaker locked open. This action was taken to mitigate potential non-conservative action by the valves in the event of a fire (10CFR50 Appendix R). None of these locked valves are required to change position to achieve or maintain the cold shutdown condition or to mitigate the consequences of an accident. Since locking open the power breaker for these valves also disables the remote position indication, these valves are considered to be passive manual valves not equipped with remote position indicators. Consequently the disabled indicators are not tested for accuracy of position indication.

3.5 Testing of Category C-Active and AC-Active Check Valves

A. Each check valve shall be exercise tested to both the open and closed position, regardless of safety direction.

B. Open and closed tests need only be performed at an interval when it is practicable to perform both tests.

C. Test order shall be determined by the Owner.

D. Open and closed tests are not required to be performed at the same time if they are performed in the same interval. However, if a check valve is exercised more often in one direction than may occur in the opposite direction, the more frequent testing may continue to be performed. For example, pump discharge checks may be tested open quarterly in conjunction with the pump test, while the closure test may be performed during refueling.

E. If two check valves are in a series configuration without provisions to verify individual reverse flow closure and the plant safety analysis assumes closure of either valve but not both, the valve pair may be tested as a unit. If the plant safety analysis assumes that a specific valve or both valves of the pair close to perform the safety function(s), the valve(s) shall be tested to demonstrate individual valve closure.

F. The use of a mechanical exerciser to move the obturator is also an acceptable test.

G. Disassembly inspection or Non-intrusive testing (NIT) may be used to document acceptable valve performance.

3.6 Check Valve Condition Monitoring Program (CMP)

A. As an alternative to the testing methods listed in Section 3.5 above, the owner may establish a Check Valve Condition Monitoring Program per ISTC-5222 of the OM Code. The WBN Condition Monitoring Program will be contained in WBN Technical Instruction TI-100.013.

B. The purpose of this program is to both (a) improve check valve performance and (b) optimize testing, examination, and preventive maintenance activities in order to maintain the continued acceptable performance of a select group of check valves. WBN may implement this program on a valve or a group of similar valves.

C. In general, valves that are grouped for disassembly inspection or NIT are included in the Condition Monitoring Program. Also, valves that credit Appendix J leak tests for the closure test are included to document and justify the extended frequency of testing. The CMP group is identified in the Alternate Frequency Justification column of the valve test table.

3.7 Thermal Expansion Check Valves

Several containment penetrations have been fitted with normally closed check valves designed to open to pass flow created by thermal expansion of fluid in the penetration. The quantity of thermal expansion flow is so small that any opening of the check valve will allow it to pass its maximum required accident flow. Open testing will be performed by verifying the ability to pass any amount of flow. Flow will not be quantified.

3.8 Safety and Relief Valves

Requirements are developed from OMb-2003 Appendix I of the OM Code.

A. Set point verification is determined from test actuation using as the test median the fluid to which the valve is subject under operating conditions. Specific acceptance values are identified in implementing instructions.

B. Seat leakage verification is determined by measuring actual leakage through the valve seat during testing. Specific acceptance values are identified in implementing instructions.

The relief valves are grouped for testing. At least 20 percent of each group must be tested within any 48 month period for Class 2 and 3 relief valves. Class 1 valves and Class 2 valve that are tested to Class 1 requirements [MSSVs] must have at least 20 percent tested within any 24 month period. Failures result in additional testing of other valves within the group. Relief valve groups are identified in Appendix C.

3.9 Thermal Relief Valves

Some safety related systems, particularly those containing heat exchangers, have been provided with thermal relief valves (TRV). These TRVs are small capacity relief valves intended to relieve pressure due to thermal expansion of fluid in an isolated component. The function of these valves is to protect equipment that is in a standby mode, that is, the equipment is not actively in service for accident mitigation or shutdown.

A. Tests shall be performed on all Class 2 and 3 relief devices used in a thermal relief application every 10 years, unless performance data indicate more frequent testing is necessary.

B. In lieu of setpoint testing, the relief devices may be replaced at a frequency of every 10 years, unless performance data indicate more frequent replacements are necessary.

C. The group percentage requirements do not apply to pressure relief devices that are used in a thermal relief application. All may be tested or replaced during the same outage.

3.10 Testing of Solenoid Actuated Pilot Valves

Many WBN diaphragm actuated line valves are operated by a solenoid actuated pilot valve that cycles either to supply air to or to vent air from the diaphragm actuator. Such pilot valves are considered part of the actuator and their function is adequately demonstrated when the line valve is exercised. Such pilot valves are not individually exercised or stroke timed independent of the diaphragm actuated line valve. Where multiple trains of actuation exist [i.e., multiple solenoid actuated pilot valves performing redundant operation of a single line valve] the line valve is tested using each train of actuation independently. This ensures that each solenoid actuated pilot valve is challenged by the line valve test.

3.11 Emergency Diesel Generator Air Start and Fuel Oil Systems

The inservice operability testing of pumps and valves associated with the emergency diesel generator air start and fuel oil systems are excluded from the ASME Inservice Testing Program since they are not Code Class components. These components are an integral part of the emergency diesel generator system and are functionally tested monthly. Thus, the functional operability testing of most of these components is performed at a frequency greater than that required by ISTB or ISTC for either pumps or valves. Additionally, those diesel generator air start system valves whose function is not adequately challenged by the diesel generator testing program are included in an Augmented Inservice Testing (AIST) Program which utilizes requirements similar to those contained in ISTC. Failure of these components to perform their intended function will be identified either by the failure of the associated emergency diesel generator to meet its operability testing requirements or by the testing performed as part of the AIST Program.

3.12 Testing in Conjunction with Cold Shutdowns

For valves in which testing is deferred to cold shutdown, testing will commence within 48 hours after cold shutdown is achieved and will continue until all tests are complete or the plant is ready to return to power. The unit will not be kept in cold shutdown solely to complete cold shutdown testing. Any testing not completed at one shutdown will be performed at subsequent cold shutdowns. For planned shutdowns in which sufficient time exists to complete the testing of all the valves identified to be tested at cold shutdown, exception may be taken to the 48 hour rule, provided all of the valves are tested prior to startup. As a minimum, all cold shutdown valves will be tested each refueling outage. For outages greater than 92 days, all cold shutdown testing shall be completed in the last 92 days of the outage. For valves that fail their associated acceptance criteria during cold shutdown testing and which can only be tested at cold shutdown, corrective action shall be performed prior to restart.

Additionally, some tests identified to be performed in conjunction with cold shutdowns can not be performed during MODE 5 operation. These tests are performed in operational MODE 3 or 4 either while shutting the unit down or while returning the unit to power operation. Although these tests are not performed in MODE 5 (cold shutdown), they are considered to be tests performed in conjunction with cold shutdown because they cannot be performed unless the unit is removed from MODE 1, power operation.

4.0 ABBREVIATIONS AND SYSTEM NUMBERS

4.1 Abbreviations

Pump Table Abbreviations	
DP	Differential Pressure
Q	Quarterly Group A or Group B test
CPT	Comprehensive Pump Test

Valve Table Abbreviations		
SYS	TVA system identification number. See 4.2 following for system numbers and corresponding names.	
CLASS	ASME Code Class	
COORD	Drawing coordinates where valve/pump is located	
CAT	Valve category; A, B, C, active or passive	
SIZE	Nominal valve diameter in inches	
TYPE	Valve type	
	ANG	Angle body valve
	BTFY	Butterfly valve
	BYV	Bypass Valve
	CKV	Check valve
	FCV	Flow Control Valve
	FSV	Flow Solenoid Valve
	GATE	Gate valve
	GLOBE	Globe valve
	ISV	Isolation Valve
	SFV	Safety or relief valve
ACTR	Valve Actuator	
	DIAPH	Diaphragm
	CYL	Air, hydraulic or other high pressure fluid cylinder actuator
	MAN	Manual
	MOV	Motor operated actuator
	SELF	Self actuating (check or relief)
	SOL	Solenoid actuator
NPOSI	Position in which a valve is assumed to be prior to being called upon to perform its function. This may not be the position in which a valve is shown on the TVA Flow Diagrams (47W800 series drawings). O-Open, C-Closed, B-Both, E-Either	
APOSI	The position to which a valve must travel to fulfill its specific function. This is the position to which valves are exercised during their exercising test. O-Open, C-Closed, B-Both	
TESTS		
	BDC	Check Valve Bi-directional Closed (not a safety function)
	BDO	Check Valve Bi-directional Open (not a safety function)
	CMP	Check Valve Condition Monitoring Program
	CVC	Check Valve Closure
	CVO	Check Valve Open
	ET	Exercise test (no timing)
	FSC	Fail Safe Closed (same frequency as the exercise)
	FSO	Fail Safe Open (same frequency as the exercise)

TESTS	(Continued)	
	LK	Leak Test other than App J or PIV
	MS	Manual Stroke (frequency is 2 YR)
	RPI	Remote Position Indication (frequency is 2 YR)
	SLTJ	Seat Leakage Test in accordance with Appendix J
	SLTP	Seat Leakage Test for pressure isolation (Tech Spec frequency) includes CVC
	STC	Exercise and stroke time closed
	STO	Exercise and stroke time open
	RV	Relief Valve Test
	TRV	Thermal Relief Valve Test
Frequency		
	Q	Quarterly
	CSD	Cold Shutdown
	RO	Refuel Outage
	DIF	Disassemble Inspection Frequency by Group
	NO	Normal Operations – at least once during the cycle

4.2 System Identification Numbers

System Number	System Name
01	Main Steam
03	Feedwater
26	High Pressure Fire Protection
30	Ventilation
31	Chilled Water
32	Control Air
33	Service Air
43	Sampling
52	System Test Facility
59	Demineralized Water
61	Ice Condenser Containment
62	Chemical and Volume Control
63	Safety Injection
67	Essential Raw Cooling Water
68	Reactor Coolant
70	Component Cooling
72	Containment Spray
74	Residual Heat Removal
77	Waste Disposal
78	Spent Fuel Cooling
81	Primary Water
84	Flood Mode Boration
90	Radiation Monitoring

Table 1, Summary Listing of Pumps
Page 1 of 2

Pump UNID	Pump Group	Drawing	ASME Code Class	Pump Type	Diff Press Dp		Flow Rate		Vib (Vel)		Pump Speed (Note 1)	Relief Requests
					Q	CPT	Q	CPT	Q	CPT		
Auxiliary Feed Water (Motor) 1-PMP-3-118-A 1-PMP-3-128-B	A	1-47W803-2	3	Centrifugal	Q	2Y	Q	2Y	Q	2Y	NR	1
Auxiliary Feed Water (Steam) 1-PMP-3-1A-S	B	1-47W803-2	3	Centrifugal	Q	2Y	Q	2Y	NR	2Y	Q	1
Chilled Water 0-PMP-31-80-A 0-PMP-31-96A-B 0-PMP-31-128/1-A 0-PMP-31-129/1-B 0-PMP-31-36/1-A 0-PMP-31-49/1-B	A	1-47W865-3 1-47W865-7 1-47W865-8	N	Centrifugal	Q	2Y	Q	2Y	Q	2Y	NR	1
Centrifugal Charging 1-PMP-62-108-A 1-PMP-62-104-B	A	1-47W809-1	2	Centrifugal	Q	2Y	Q	2Y	Q	2Y	NR	1
Boric Acid Transfer 1-PMP-62-230-A 1-PMP-62-232-B	A	1-47W809-5	3	Centrifugal	Q	2Y	Q	2Y	Q	2Y	NR	1
Safety Injection 1-PMP-63-10-A 1-PMP-63-15-B	B	1-47W811-1	2	Centrifugal	Q	2Y	Q	2Y	NR	2Y	NR	1

Table 1, Summary Listing of Pumps
Page 2 of 2

Pump UNID	Pump Group	Drawing	ASME Code Class	Pump Type	Diff Press Dp Q	Diff Press Dp CPT	Flow Rate Q	Flow Rate CPT	Vib (Vel) Q	Vib (Vel) CPT	Pump Speed (Note 1)	Relief Requests
Essential Raw Cooling Water 0-PMP-67-28-A 0-PMP-67-32-A 0-PMP-67-36-A 0-PMP-67-40-A 0-PMP-67-47-B 0-PMP-67-51-B 0-PMP-67-55-B 0-PMP-67-59-B	A	1-47W845-1	3	Vertical Line Shaft	Q	2Y	Q	2Y	Q	2Y	NR	1
ERCW Screen Wash 1-PMP-67-431-A 1-PMP-67-440-B 2-PMP-67-437-A 2-PMP-67-447-B	A	1-47W845-1	N	Vertical Line Shaft	Q	2Y	Q	2Y	Q	2Y	NR	1, 2
Component Cooling 1-PMP-70-46-A 1-PMP-70-38-A 0-PMP-70-51-S	A	1-47W859-1	3	Centrifugal	Q	2Y	Q	2Y	Q	2Y	NR	1
Containment Spray 1-PMP-72-27-A 1-PMP-72-10-B	B	1-47W812-1	2	Centrifugal	Q	2Y	Q	2Y	NR	2Y	NR	1
Residual Heat Removal 1-PMP-74-10-A 1-PMP-74-20-B	A	1-47W810-1	2	Centrifugal	Q	2Y	Q	2Y	Q	2Y	NR	1

Notes:
(1) Per ISTB-3530 and Table ISTB-3000-1, rotational speed measurements are only required for variable speed pumps. Pumps marked NR are powered by synchronous or induction motors.

Table 2, Summary Listing of Valves

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VALVE NUMBER	SYS	CLASS	COORD	CAT	SIZE	TYPE	ACTR	NPOSI	APOSI	TESTS	ALT. FREQ. JUST.	REL. REQ. NUM.
Drawing Number 1-47W801-1												
1-FCV-1-4-T	1	2	C-3	B-Act	32	GLOBE	CYL	O	C	STC/RO FSC RPI	AF-01	None
1-FCV-1-11-T	1	2	E-3	B-Act	32	GLOBE	CYL	O	C	STC/RO FSC RPI	AF-01	None
1-FCV-1-22-T	1	2	F-3	B-Act	32	GLOBE	CYL	O	C	STC/RO FSC RPI	AF-01	None
1-FCV-1-29-T	1	2	C-3	B-Act	32	GLOBE	CYL	O	C	STC/RO FSC RPI	AF-01	None
1-FCV-1-147-A	1	2	C-3	B-Act	2	GLOBE	DIAPH	O	C	STC/CSD FSC RPI	AF-03	None
1-FCV-1-148-B	1	2	E-3	B-Act	2	GLOBE	DIAPH	O	C	STC/CSD FSC RPI	AF-03	None
1-FCV-1-149-A	1	2	F-3	B-Act	2	GLOBE	DIAPH	O	C	STC/CSD FSC RPI	AF-03	None
1-FCV-1-150-B	1	2	A-3	B-Act	2	GLOBE	DIAPH	O	C	STC/CSD FSC RPI	AF-03	None
1-PCV-1-5-T	1	2	C-2	B-Act	6	GLOBE	DIAPH	C	B	STO/RO STC/RO FSC RPI	None	None
1-PCV-1-12-T	1	2	D-2	B-Act	6	GLOBE	DIAPH	C	B	STO/RO STC/RO FSC RPI	None	None
1-PCV-1-23-T	1	2	F-2	B-Act	6	GLOBE	DIAPH	C	B	STO/RO STC/RO FSC RPI	None	None
1-PCV-1-30-T	1	2	A-2	B-Act	6	GLOBE	DIAPH	C	B	STO/RO STC/RO FSC RPI	None	None
1-ISV-1-619	1	2	C-2	B-Act	6	GATE	MAN	O	C	MS	None	None
1-ISV-1-620	1	2	D-2	B-Act	6	GATE	MAN	O	C	MS	None	None
1-ISV-1-621	1	2	F-2	B-Act	6	GATE	MAN	O	C	MS	None	None
1-ISV-1-622	1	2	A-2	B-Act	6	GATE	MAN	O	C	MS	None	None
1-SFV-1-512	1	2	F-2	C-Act	6x10	SFV	SELF	C	O	RV	None	None
1-SFV-1-513	1	2	F-2	C-Act	6x10	SFV	SELF	C	O	RV	None	None
1-SFV-1-514	1	2	F-2	C-Act	6x10	SFV	SELF	C	O	RV	None	None
1-SFV-1-515	1	2	F-2	C-Act	6x10	SFV	SELF	C	O	RV	None	None
1-SFV-1-516	1	2	F-2	C-Act	6x10	SFV	SELF	C	O	RV	None	None
1-SFV-1-517	1	2	D-2	C-Act	6x10	SFV	SELF	C	O	RV	None	None
1-SFV-1-518	1	2	D-2	C-Act	6x10	SFV	SELF	C	O	RV	None	None
1-SFV-1-519	1	2	D-2	C-Act	6x10	SFV	SELF	C	O	RV	None	None
1-SFV-1-520	1	2	D-2	C-Act	6x10	SFV	SELF	C	O	RV	None	None

Table 2, Summary Listing of Valves

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VALVE NUMBER	SYS	CLASS	COORD	CAT	SIZE	TYPE	ACTR	NPOSI	APOSI	TESTS	ALT. FREQ. JUST.	REL. REQ. NUM.
Drawing Number 1-47W801-1 (continued)												
1-SFV-1-521	1	2	D-2	C-Act	6x10	SFV	SELF	C	O	RV	None	None
1-SFV-1-522	1	2	B-2	C-Act	6x10	SFV	SELF	C	O	RV	None	None
1-SFV-1-523	1	2	B-2	C-Act	6x10	SFV	SELF	C	O	RV	None	None
1-SFV-1-524	1	2	B-2	C-Act	6x10	SFV	SELF	C	O	RV	None	None
1-SFV-1-525	1	2	B-2	C-Act	6x10	SFV	SELF	C	O	RV	None	None
1-SFV-1-526	1	2	B-2	C-Act	6x10	SFV	SELF	C	O	RV	None	None
1-SFV-1-527	1	2	A-2	C-Act	6x10	SFV	SELF	C	O	RV	None	None
1-SFV-1-528	1	2	A-2	C-Act	6x10	SFV	SELF	C	O	RV	None	None
1-SFV-1-529	1	2	A-2	C-Act	6x10	SFV	SELF	C	O	RV	None	None
1-SFV-1-530	1	2	A-2	C-Act	6x10	SFV	SELF	C	O	RV	None	None
1-SFV-1-531	1	2	A-2	C-Act	6x10	SFV	SELF	C	O	RV	None	None
Drawing Number 1-47W801-2												
1-FCV-1-7-B	1	2	D-4	B-Act	4	GATE	SOL	O	C	STC/Q FSC RPI	None	None
1-FCV-1-14-A	1	2	E-4	B-Act	4	GATE	SOL	O	C	STC/Q FSC RPI	None	None
1-FCV-1-25-B	1	2	G-4	B-Act	4	GATE	SOL	O	C	STC/Q FSC RPI	None	None
1-FCV-1-32-A	1	2	B-4	B-Act	4	GATE	SOL	O	C	STC/Q FSC RPI	None	None
1-FCV-1-181-A	1	2	D-2	B-Act	4	GATE	SOL	O	C	STC/Q FSC RPI	None	None
1-FCV-1-182-B	1	2	F-2	B-Act	4	GATE	SOL	O	C	STC/Q FSC RPI	None	None
1-FCV-1-183-A	1	2	H-2	B-Act	4	GATE	SOL	O	C	STC/Q FSC RPI	None	None
1-FCV-1-184-B	1	2	B-2	B-Act	4	GATE	SOL	O	C	STC/Q FSC RPI	None	None
Drawing Number 1-47W803-1												
1-CKV-3-508	3	2	F-2	C-Act	16	CKV	SELF	O	C	CVC/CSD BDO/NO	AF-05	None
1-CKV-3-509	3	2	E-2	C-Act	16	CKV	SELF	O	C	CVC/CSD BDO/NO	AF-05	None
1-CKV-3-510	3	2	C-2	C-Act	16	CKV	SELF	O	C	CVC/CSD BDO/NO	AF-05	None
1-CKV-3-511	3	2	B-2	C-Act	16	CKV	SELF	O	C	CVC/CSD BDO/NO	AF-05	None

Table 2, Summary Listing of Valves

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VALVE NUMBER	SYS	CLASS	COORD	CAT	SIZE	TYPE	ACTR	NPOSI	APOSI	TESTS	ALT. FREQ. JUST.	REL. REQ. NUM.
Drawing Number 1-47W803-1 (continued)												
1-CKV-3-638	3	2	A-3	C-Act	6	CKV	SELF	O	C	CVC/RO BDO/NO	CKV-CMP	None
1-CKV-3-644	3	2	A-1	C-Act	6	CKV	SELF	O	C	CVC/RO BDO/NO	CKV-CMP	None
1-CKV-3-645	3	2	A-1	C-Act	6	CKV	SELF	O	C	CVC/RO BDO/NO	CKV-CMP	None
1-CKV-3-652	3	2	C-2	C-Act	6	CKV	SELF	O	C	CVC/RO BDO/NO	CKV-CMP	None
1-CKV-3-655	3	2	C-1	C-Act	6	CKV	SELF	O	C	CVC/RO BDO/NO	CKV-CMP	None
1-CKV-3-656	3	2	C-1	C-Act	6	CKV	SELF	O	C	CVC/RO BDO/NO	CKV-CMP	None
1-CKV-3-669	3	2	D-2	C-Act	6	CKV	SELF	O	C	CVC/RO BDO/NO	CKV-CMP	None
1-CKV-3-670	3	2	D-1	C-Act	6	CKV	SELF	O	C	CVC/RO BDO/NO	CKV-CMP	None
1-CKV-3-678	3	2	E-2	C-Act	6	CKV	SELF	O	C	CVC/RO BDO/NO	CKV-CMP	None
1-CKV-3-679	3	2	F-1	C-Act	6	CKV	SELF	O	C	CVC/RO BDO/NO	CKV-CMP	None
1-FCV-3-33-A	3	2	C-3	B-Act	16	GATE	MOV	O	C	STC/RO RPI	AF-06	None
1-FCV-3-35	3	*	C-4	B-Act	16	ANG	DIAPH	O	C	STC/RO FSC RPI	AF-06	None
1-FCV-3-35A	3	N	C-4	B-Act	6	GLOBE	DIAPH	O	C	STC/RO FSC RPI	AF-06	None
1-FCV-3-47-B	3	2	E-3	B-Act	16	GATE	MOV	O	C	STC/RO RPI	AF-06	None
1-FCV-3-48	3	*	E-4	B-Act	16	ANG	DIAPH	O	C	STC/RO FSC RPI	AF-06	None
1-FCV-3-48A	3	N	D-4	B-Act	6	GLOBE	DIAPH	O	C	STC/RO FSC RPI	AF-06	None
1-FCV-3-87-A	3	2	F-3	B-Act	16	GATE	MOV	O	C	STC/RO RPI	AF-06	None
1-FCV-3-90	3	*	F-4	B-Act	16	ANG	DIAPH	O	C	STC/RO FSC RPI	AF-06	None
1-FCV-3-90A	3	N	F-4	B-Act	6	GLOBE	DIAPH	O	C	STC/RO FSC RPI	AF-06	None
1-FCV-3-100-B	3	2	B-3	B-Act	16	GATE	MOV	O	C	STC/RO RPI	AF-06	None
1-FCV-3-103	3	*	B-4	B-Act	16	ANG	DIAPH	O	C	STC/RO FSC RPI	AF-06	None
1-FCV-3-103A	3	N	A-4	B-Act	6	GLOBE	DIAPH	O	C	STC/RO FSC RPI	AF-06	None
1-FCV-3-236	3	2	C-3	B-Act	6	GATE	DIAPH	O	C	STC/RO FSC RPI	AF-06	None
1-FCV-3-239	3	2	D-3	B-Act	6	GATE	DIAPH	O	C	STC/RO FSC RPI	AF-06	None
1-FCV-3-242	3	2	E-3	B-Act	6	GATE	DIAPH	O	C	STC/RO FSC RPI	AF-06	None

* ASME Section III, Class 3 valve installed in a non-ASME Code Class piping system.

Table 2, Summary Listing of Valves

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VALVE NUMBER	SYS	CLASS	COORD	CAT	SIZE	TYPE	ACTR	NPOSI	APOSI	TESTS	ALT. FREQ. JUST.	REL. REQ. NUM.
Drawing Number 1-47W803-1 (continued)												
1-FCV-3-245	3	2	A-3	B-Act	6	GATE	DIAPH	O	C	STC/RO FSC RPI	AF-06	None
Drawing Number 1-47W803-2												
1-CKV-1-891-S	1	2	C-8	C-Act	4	CKV	SELF	C	B	CVC/DIF CVO/RO	CKV-CMP	None
1-CKV-1-892-S	1	2	A-8	C-Act	4	CKV	SELF	C	B	CVC/DIF CVO/RO	CKV-CMP	None
1-FCV-1-15-A	1	2	C-8	B-Act	4	GATE	MOV	O	C	STC/Q RPI	None	None
1-FCV-1-16-A	1	2	A-8	B-Act	4	GATE	MOV	C	O	STO/Q RPI	None	None
1-FCV-1-17-A	1	3	C-7	B-Act	4	GATE	MOV	O	C	STC/CSD RPI	AF-02	None
1-FCV-1-18-B	1	3	C-7	B-Act	4	GATE	MOV	O	C	STC/CSD RPI	AF-02	None
1-FCV-1-51-S	1	N	H-6	B-Act	4	GATE	Note 1	B	B	STO/Q STC/Q RPI	None	None
1-CKV-3-805-A	3	3	F-5	C-Act	8	CKV	SELF	B	B	CVO/RO CVC/Q	AF-07	None
1-CKV-3-806-B	3	3	F-6	C-Act	8	CKV	SELF	B	B	CVO/RO CVC/Q	AF-07	None
1-CKV-3-810-S	3	3	G-3	C-Act	10	CKV	SELF	B	B	CVO/RO CVC/Q	AF-07	None
1-CKV-3-814-A	3	3	G-5	C-Act	1.5	CKV	SELF	B	B	CVO/Q CVC/Q	None	None
1-CKV-3-815-B	3	3	G-6	C-Act	1.5	CKV	SELF	B	B	CVO/Q CVC/Q	None	None
1-CKV-3-818-S	3	3	G-6	C-Act	1.5	CKV	SELF	B	B	CVO/Q CVC/Q	None	None
1-CKV-3-830-B	3	2	G-8	C-Act	4	CKV	SELF	B	B	CVC/RO CVO/RO	CKV-CMP	None
1-CKV-3-831-A	3	2	E-8	C-Act	4	CKV	SELF	B	B	CVC/RO CVO/RO	CKV-CMP	None
1-CKV-3-832-A	3	2	D-8	C-Act	4	CKV	SELF	B	B	CVC/RO CVO/RO	CKV-CMP	None
1-CKV-3-833-B	3	2	B-8	C-Act	4	CKV	SELF	B	B	CVC/RO CVO/RO	CKV-CMP	None
1-CKV-3-861-B	3	2	G-10	C-Act	4	CKV	SELF	B	B	CVC/RO CVO/RO	CKV-CMP	None
1-CKV-3-862-A	3	2	E-10	C-Act	4	CKV	SELF	B	B	CVC/RO CVO/RO	CKV-CMP	None
1-CKV-3-864-S	3	3	H-6	C-Act	6	CKV	SELF	C	O	CVO/RO BDC/RO	AF-07	None

Note 1: This valve has a motor operator for normal open/close functions and a spring actuator for trip closure.

Table 2, Summary Listing of Valves

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VALVE NUMBER	SYS	CLASS	COORD	CAT	SIZE	TYPE	ACTR	NPOSI	APOSI	TESTS	ALT. FREQ. JUST.	REL. REQ. NUM.
Drawing Number 1-47W803-2 (continued)												
1-CKV-3-871-S	3	2	F-8	C-Act	4	CKV	SELF	B	B	CVC/RO CVO/RO	CKV-CMP	None
1-CKV-3-872-S	3	2	E-8	C-Act	4	CKV	SELF	B	B	CVC/RO CVO/RO	CKV-CMP	None
1-CKV-3-873-S	3	2	C-8	C-Act	4	CKV	SELF	B	B	CVC/RO CVO/RO	CKV-CMP	None
1-CKV-3-874-S	3	2	A-8	C-Act	4	CKV	SELF	B	B	CVC/RO CVO/RO	CKV-CMP	None
1-CKV-3-921-B	3	2	G-10	C-Act	4	CKV	SELF	B	B	CVC/RO CVO/RO	CKV-CMP	None
1-CKV-3-922-A	3	2	F-10	C-Act	4	CKV	SELF	B	B	CVC/RO CVO/RO	CKV-CMP	None
1-FCV-3-355	3	3	E-5	B-Act	2	GLOBE	DIAPH	O	C	STC/Q FSC RPI	None	None
1-FCV-3-359	3	3	E-6	B-Act	2	GLOBE	DIAPH	O	C	STC/Q FSC RPI	None	None
1-FCV-3-116A-A	3	3	F-5	B-Act	4	GATE	MOV	C	O	STO/Q RPI	None	None
1-FCV-3-116B-A	3	3	F-5	B-Act	4	GATE	MOV	C	O	STO/Q RPI	None	None
1-FCV-3-126A-B	3	3	F-7	B-Act	4	GATE	MOV	C	O	STO/Q RPI	None	None
1-FCV-3-126B-B	3	3	F-7	B-Act	4	GATE	MOV	C	O	STO/Q RPI	None	None
1-FCV-3-136A-A	3	3	H-4	B-Act	6	GATE	MOV	C	O	STO/Q RPI	None	None
1-FCV-3-136B-A	3	3	H-4	B-Act	6	GATE	MOV	C	O	STO/Q RPI	None	None
1-FCV-3-179A-B	3	3	H-4	B-Act	6	GATE	MOV	C	O	STO/Q RPI	None	None
1-FCV-3-179B-B	3	3	H-4	B-Act	6	GATE	MOV	C	O	STO/Q RPI	None	None
1-LCV-3-148-B	3	3	G-8	B-Act	4	GLOBE	DIAPH	C	O	STO/Q STC/Q FSO RPI	None	None
1-LCV-3-148A-B	3	3	G-8	B-Act	2	ANG	DIAPH	C	O	STO/Q STC/Q FSC RPI	None	None
1-LCV-3-156-A	3	3	E-8	B-Act	4	GLOBE	DIAPH	C	O	STO/Q STC/Q FSO RPI	None	None
1-LCV-3-156A-A	3	3	E-8	B-Act	2	ANG	DIAPH	C	O	STO/Q STC/Q FSC RPI	None	None
1-LCV-3-164-A	3	3	D-8	B-Act	4	GLOBE	DIAPH	C	O	STO/Q STC/Q FSO RPI	None	None
1-LCV-3-164A-A	3	3	C-8	B-Act	2	ANG	DIAPH	C	O	STO/Q STC/Q FSC RPI	None	None
1-LCV-3-171-B	3	3	B-8	B-Act	4	GLOBE	DIAPH	C	O	STO/Q STC/Q FSO RPI	None	None
1-LCV-3-171A-B	3	3	B-8	B-Act	2	ANG	DIAPH	C	O	STO/Q STC/Q FSC RPI	None	None
1-LCV-3-172-A	3	3	F-8	B-Act	3	GLOBE	DIAPH	C	O	STO/Q STC/Q FSC RPI	None	None

Table 2, Summary Listing of Valves

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VALVE NUMBER	SYS	CLASS	COORD	CAT	SIZE	TYPE	ACTR	NPOSI	APOSI	TESTS	ALT. FREQ. JUST.	REL. REQ. NUM.
Drawing Number 1-47W803-2 (continued)												
1-LCV-3-173-B	3	3	E-8	B-Act	3	GLOBE	DIAPH	C	O	STO/Q STC/Q FSC RPI	None	None
1-LCV-3-174-B	3	3	C-8	B-Act	3	GLOBE	DIAPH	C	O	STO/Q STC/Q FSC RPI	None	None
1-LCV-3-175-A	3	3	B-8	B-Act	3	GLOBE	DIAPH	C	O	STO/Q STC/Q FSC RPI	None	None
1-PCV-3-122	3	3	F-5	B-Act	4	GLOBE	DIAPH	C	O	STO/Q	None	None
1-PCV-3-132	3	3	F-6	B-Act	4	GLOBE	DIAPH	C	O	STO/Q	None	None
Drawing Number 1-47W850-9												
1-CKV-26-1260	26	2	B-9	AC-Act	4	CKV	SELF	C	C	CVC/CSD BDO/RO SLTJ	CKV-CMP	None
1-CKV-26-1296	26	2	B-3	AC-Act	4	CKV	SELF	C	C	CVC/CSD BDO/RO SLTJ	CKV-CMP	None
1-FCV-26-240-A	26	2	B-9	A-Act	4	GATE	MOV	O	C	STC/Q RPI SLTJ	None	None
1-FCV-26-243-A	26	2	B-3	A-Act	4	GATE	MOV	O	C	STC/Q RPI SLTJ	None	None
Drawing Number 1-47W866-1												
1-FCV-30-7-A	30	2	C-1	A-Act	24	BTFY	CYL	O	C	STC/Q FSC RPI SLTJ	None	None
1-FCV-30-8-B	30	2	C-2	A-Act	24	BTFY	CYL	O	C	STC/Q FSC RPI SLTJ	None	None
1-FCV-30-9-B	30	2	C-1	A-Act	24	BTFY	CYL	O	C	STC/Q FSC RPI SLTJ	None	None
1-FCV-30-10-A	30	2	C-2	A-Act	24	BTFY	CYL	O	C	STC/Q FSC RPI SLTJ	None	None
1-FCV-30-14-A	30	2	E-1	A-Act	24	BTFY	CYL	O	C	STC/Q FSC RPI SLTJ	None	None
1-FCV-30-15-B	30	2	E-2	A-Act	24	BTFY	CYL	O	C	STC/Q FSC RPI SLTJ	None	None
1-FCV-30-16-B	30	2	E-1	A-Act	24	BTFY	CYL	O	C	STC/Q FSC RPI SLTJ	None	None
1-FCV-30-17-A	30	2	E-2	A-Act	24	BTFY	CYL	O	C	STC/Q FSC RPI SLTJ	None	None
1-FCV-30-19-B	30	2	G-1	A-Act	12	BTFY	CYL	O	C	STC/Q FSC RPI SLTJ	None	None
1-FCV-30-20-A	30	2	G-2	A-Act	12	BTFY	CYL	O	C	STC/Q FSC RPI SLTJ	None	None
1-FCV-30-37-B	30	2	D-10	A-Act	8	BTFY	CYL	O	C	STC/Q FSC RPI SLTJ	None	None
1-FCV-30-40-A	30	2	D-9	A-Act	8	BTFY	CYL	O	C	STC/Q FSC RPI SLTJ	None	None
1-FCV-30-50	30	2	C-9	A-Act	24	BTFY	CYL	O	C	STC/Q FSC RPI SLTJ	None	None
1-FCV-30-51	30	2	C-10	A-Act	24	BTFY	CYL	O	C	STC/Q FSC RPI SLTJ	None	None
1-FCV-30-52	30	2	C-9	A-Act	24	BTFY	CYL	O	C	STC/Q FSC RPI SLTJ	None	None

Table 2, Summary Listing of Valves

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VALVE NUMBER	SYS	CLASS	COORD	CAT	SIZE	TYPE	ACTR	NPOSI	APOSI	TESTS	ALT. FREQ. JUST.	REL. REQ. NUM.
Drawing Number 1-47W866-1 (continued)												
1-FCV-30-53	30	2	C-10	A-Act	24	BTFY	CYL	O	C	STC/Q FSC RPI SLTJ	None	None
1-FCV-30-56	30	2	E-9	A-Act	24	BTFY	CYL	O	C	STC/Q FSC RPI SLTJ	None	None
1-FCV-30-57	30	2	E-10	A-Act	24	BTFY	CYL	O	C	STC/Q FSC RPI SLTJ	None	None
1-FCV-30-58	30	2	G-9	A-Act	12	BTFY	CYL	O	C	STC/Q FSC RPI SLTJ	None	None
1-FCV-30-59	30	2	G-10	A-Act	12	BTFY	CYL	O	C	STC/Q FSC RPI SLTJ	None	None
1-FSV-30-134-B	30	2	F-9	A-Act	0.5	GATE	SOL	O	C	STC/Q FSC RPI SLTJ	None	None
1-FSV-30-135-A	30	2	F-10	A-Act	0.5	GATE	SOL	O	C	STC/Q FSC RPI SLTJ	None	None
Drawing Number 1-47W865-3												
0-CKV-31-2193	31	N	E-8	C-Act	6	CKV	SELF	C	O	CVO/Q BDC/Q	None	None
0-CKV-31-2235	31	N	E-3	C-Act	6	CKV	SELF	C	O	CVO/Q BDC/Q	None	None
0-RFV-31-2210	31	N	C-8	C-Act	1x1	SFV	SELF	C	O	RV	None	None
0-RFV-31-2252	31	N	C-3	C-Act	1x1	SFV	SELF	C	O	RV	None	None
Drawing Number 1-47W865-5												
1-CKV-31-3378	31	2	F-7	AC-Act	0.5	CKV	SELF	C	B	CVO/RO CVC/RO SLTJ	CKV-CMP	None
1-CKV-31-3392	31	2	E-7	AC-Act	0.5	CKV	SELF	C	B	CVO/RO CVC/RO SLTJ	CKV-CMP	None
1-CKV-31-3407	31	2	C-7	AC-Act	0.5	CKV	SELF	C	B	CVO/RO CVC/RO SLTJ	CKV-CMP	None
1-CKV-31-3421	31	2	B-7	AC-Act	0.5	CKV	SELF	C	B	CVO/RO CVC/RO SLTJ	CKV-CMP	None
1-FCV-31-305-B	31	2	B-7	A-Act	2	GLOBE	DIAPH	O	C	STC/Q FSC RPI SLTJ	None	None
1-FCV-31-306-A	31	2	B-7	A-Act	2	GLOBE	DIAPH	O	C	STC/Q FSC RPI SLTJ	None	None
1-FCV-31-308-A	31	2	C-7	A-Act	2	GLOBE	DIAPH	O	C	STC/Q FSC RPI SLTJ	None	None
1-FCV-31-309-B	31	2	C-7	A-Act	2	GLOBE	DIAPH	O	C	STC/Q FSC RPI SLTJ	None	None
1-FCV-31-326-A	31	2	E-7	A-Act	2	GLOBE	DIAPH	O	C	STC/Q FSC RPI SLTJ	None	None
1-FCV-31-327-B	31	2	E-7	A-Act	2	GLOBE	DIAPH	O	C	STC/Q FSC RPI SLTJ	None	None
1-FCV-31-329-B	31	2	F-7	A-Act	2	GLOBE	DIAPH	O	C	STC/Q FSC RPI SLTJ	None	None
1-FCV-31-330-A	31	2	F-7	A-Act	2	GLOBE	DIAPH	O	C	STC/Q FSC RPI SLTJ	None	None

Table 2, Summary Listing of Valves

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VALVE NUMBER	SYS	CLASS	COORD	CAT	SIZE	TYPE	ACTR	NPOSI	APOSI	TESTS	ALT. FREQ. JUST.	REL. REQ. NUM.
Drawing Number 1-47W865-7												
0-CKV-31-2307	31	N	F-8	C-Act	6	CKV	SELF	C	O	CVO/Q BDC/Q	None	None
0-CKV-31-2364	31	N	F-3	C-Act	6	CKV	SELF	C	O	CVO/Q BDC/Q	None	None
0-RFV-31-2326	31	N	D-8	C-Act	1X1	SFV	SELF	C	O	RV	None	None
0-RFV-31-2383	31	N	D-3	C-Act	1X1	SFV	SELF	C	O	RV	None	None
Drawing Number 1-47W865-8												
0-CKV-31-2607	31	N	E-8	C-Act	6	CKV	SELF	C	O	CVO/Q BDC/Q	None	None
0-CKV-31-2649	31	N	E-2	C-Act	6	CKV	SELF	C	O	CVO/Q BDC/Q	None	None
0-RFV-31-2623	31	N	D-10	C-Act	1X1	SFV	SELF	C	O	RV	None	None
0-RFV-31-2665	31	N	D-4	C-Act	1X1	SFV	SELF	C	O	RV	None	None
Drawing Number 1-47W848-1												
1-BYV-32-288	32	2	A-9	A-Pas	2	GLOBE	MAN	C	C	SLTJ	None	None
1-BYV-32-298-A	32	2	C-9	A-Pas	2	GLOBE	MAN	C	C	SLTJ	None	None
1-BYV-32-308-B	32	2	D-9	A-Pas	2	GLOBE	MAN	C	C	SLTJ	None	None
1-CKV-32-293	32	2	A-9	AC-Act	2	CKV	SELF	O	C	BDO/NO CVC/CSD SLTJ	AF-09	None
1-CKV-32-303-A	32	2	C-9	AC-Act	2	CKV	SELF	O	C	BDO/NO CVC/CSD SLTJ	AF-09	None
1-CKV-32-313-B	32	2	D-9	AC-Act	2	CKV	SELF	O	C	BDO/NO CVC/CSD SLTJ	AF-09	None
1-FCV-32-80-A	32	2	C-9	A-Act	2	GLOBE	DIAPH	O	C	STC/CSD FSC RPI SLTJ	AF-09	None
1-FCV-32-102-B	32	2	D-9	A-Act	2	GLOBE	DIAPH	O	C	STC/CSD FSC RPI SLTJ	AF-09	None
1-FCV-32-110-A	32	2	A-9	A-Act	2	GLOBE	DIAPH	O	C	STC/CSD FSC RPI SLTJ	AF-09	None
Drawing Number 1-47W848-5												
0-ISV-32-1013	32	N	E-3	B-Act	4	GATE	MAN	O	C	MS	None	None
Drawing Number 1-47W846-2												
1-ISV-33-713	33	2	F-5	A-Pas	2	DIAPH	MAN	C	C	SLTJ	None	None
1-ISV-33-714	33	2	F-6	A-Pas	2	DIAPH	MAN	C	C	SLTJ	None	None

Table 2, Summary Listing of Valves

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VALVE NUMBER	SYS	CLASS	COORD	CAT	SIZE	TYPE	ACTR	NPOSI	APOSI	TESTS	ALT. FREQ. JUST.	REL. REQ. NUM.
Drawing Number 1-47W625-1												
1-FCV-43-2-B	43	2	D-3	A-Act	0.375	GATE	SOL	O	C	STC/Q FSC RPI SLTJ	None	None
1-FCV-43-3-A	43	2	D-5	A-Act	0.375	GATE	DIAPH	O	C	STC/Q FSC RPI SLTJ	None	None
1-FCV-43-11-B	43	2	B-2	A-Act	0.375	GATE	SOL	O	C	STC/Q FSC RPI SLTJ	None	None
1-FCV-43-12-A	43	2	B-4	A-Act	0.375	GATE	SOL	O	C	STC/Q FSC RPI SLTJ	None	None
1-FCV-43-22-B	43	2	F-5	A-Act	0.375	GATE	SOL	O	C	STC/Q FSC RPI SLTJ	None	None
1-FCV-43-23-A	43	2	D-5	A-Act	0.375	GATE	SOL	O	C	STC/Q FSC RPI SLTJ	None	None
Drawing Number 1-47W625-2												
1-FCV-43-34-B	43	2	B-2	A-Act	0.375	GATE	SOL	O	C	STC/Q FSC RPI SLTJ	None	None
1-FCV-43-35-A	43	2	C-4	A-Act	0.375	GATE	DIAPH	O	C	STC/Q FSC RPI SLTJ	None	None
1-FCV-43-54D-B	43	2	C-7	B-Act	0.375	GATE	DIAPH	O	C	STC/Q FSC RPI	None	None
1-FCV-43-55-A	43	2	C-6	B-Act	0.375	GATE	DIAPH	O	C	STC/Q FSC RPI	None	None
1-FCV-43-56D-B	43	2	C-7	B-Act	0.375	GATE	DIAPH	O	C	STC/Q FSC RPI	None	None
1-FCV-43-58-A	43	2	C-6	B-Act	0.375	GATE	DIAPH	O	C	STC/Q FSC RPI	None	None
1-FCV-43-59D-B	43	2	D-8	B-Act	0.375	GATE	DIAPH	O	C	STC/Q FSC RPI	None	None
1-FCV-43-61-A	43	2	D-7	B-Act	0.375	GATE	DIAPH	O	C	STC/Q FSC RPI	None	None
1-FCV-43-63D-B	43	2	E-9	B-Act	0.375	GATE	DIAPH	O	C	STC/Q FSC RPI	None	None
1-FCV-43-64-A	43	2	E-8	B-Act	0.375	GATE	DIAPH	O	C	STC/Q FSC RPI	None	None
Drawing Number 1-47W625-7												
1-FCV-43-75-B	43	2	E-7	A-Act	0.375	GATE	SOL	O	C	STC/Q FSC RPI SLTJ	None	None
1-FCV-43-77-A	43	2	E-8	A-Act	0.375	GATE	DIAPH	O	C	STC/Q FSC RPI SLTJ	None	None
Drawing Number 1-47W625-11												
1-FCV-43-201-A	43	2	F-5	A-Act	0.375	GATE	SOL	C	O	STO/Q RPI SLTJ	None	None
1-FCV-43-202-A	43	2	F-5	A-Act	0.375	GATE	SOL	C	O	STO/Q RPI SLTJ	None	None
1-FCV-43-207-B	43	2	D-6	A-Act	0.375	GATE	SOL	C	O	STO/Q RPI SLTJ	None	None
1-FCV-43-208-B	43	2	C-6	A-Act	0.375	GATE	SOL	C	O	STO/Q RPI SLTJ	None	None
1-FCV-43-433-A	43	2	F-4	A-Act	0.375	GATE	SOL	C	O	STO/Q RPI SLTJ	None	None

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VALVE NUMBER	SYS	CLASS	COORD	CAT	SIZE	TYPE	ACTR	NPOSI	APOSI	TESTS	ALT. FREQ. JUST.	REL. REQ. NUM.
Drawing Number 1-47W625-11 (continued)												
1-FCV-43-434-A	43	2	F-4	A-Act	0.375	GATE	SOL	C	O	STO/Q RPI SLTJ	None	None
1-FCV-43-435-B	43	2	D-5	A-Act	0.375	GATE	SOL	C	O	STO/Q RPI SLTJ	None	None
1-FCV-43-436-B	43	2	C-5	A-Act	0.375	GATE	SOL	C	O	STO/Q RPI SLTJ	None	None
Drawing Number 1-47W625-15												
1-CKV-43-834	43	2	H-5	AC-Pas	0.375	CKV	SELF	C	C	SLTJ	None	None
1-CKV-43-841	43	2	A-10	AC-Pas	0.375	CKV	SELF	C	C	SLTJ	None	None
1-CKV-43-883	43	2	G-5	AC-Pas	0.375	CKV	SELF	C	C	SLTJ	None	None
1-CKV-43-884	43	2	A-9	AC-Pas	0.375	CKV	SELF	C	C	SLTJ	None	None
1-FSV-43-250-A	43	2	D-1	A-Pas	0.375	GATE	SOL	C	C	RPI SLTJ	None	None
1-FSV-43-251-A	43	2	C-1	A-Pas	0.375	GATE	SOL	C	C	RPI SLTJ	None	None
1-FSV-43-287-A	43	2	B-8	A-Pas	0.375	GATE	SOL	C	C	RPI SLTJ	None	None
1-FSV-43-288-A	43	2	B-8	A-Pas	0.375	GATE	SOL	C	C	RPI SLTJ	None	None
1-FSV-43-307-A	43	2	B-9	A-Pas	0.375	GATE	SOL	C	C	RPI SLTJ	None	None
1-FSV-43-309-B	43	2	D-2	A-Pas	0.375	GATE	SOL	C	C	RPI SLTJ	None	None
1-FSV-43-310-B	43	2	C-2	A-Pas	0.375	GATE	SOL	C	C	RPI SLTJ	None	None
1-FSV-43-318-B	43	2	B-9	A-Pas	0.375	GATE	SOL	C	C	RPI SLTJ	None	None
1-FSV-43-319-B	43	2	B-9	A-Pas	0.375	GATE	SOL	C	C	RPI SLTJ	None	None
1-FSV-43-325-B	43	2	B-10	A-Pas	0.375	GATE	SOL	C	C	RPI SLTJ	None	None
1-FSV-43-341-B	43	2	H-6	A-Pas	0.375	GATE	SOL	C	C	RPI SLTJ	None	None
1-FSV-43-342-A	43	2	G-6	A-Pas	0.375	GATE	SOL	C	C	RPI SLTJ	None	None
Drawing Number 47W331-3												
1-ISV-52-500	52	2	H-2	A-Pas	0.75	GATE	MAN	C	C	SLTJ	None	None
1-ISV-52-501	52	2	H-2	A-Pas	0.75	GATE	MAN	C	C	SLTJ	None	None
1-ISV-52-502	52	2	H-2	A-Pas	0.75	GATE	MAN	C	C	SLTJ	None	None
1-ISV-52-503	52	2	H-2	A-Pas	0.75	GATE	MAN	C	C	SLTJ	None	None
1-ISV-52-504	52	2	H-2	A-Pas	0.75	GATE	MAN	C	C	SLTJ	None	None

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VALVE NUMBER	SYS	CLASS	COORD	CAT	SIZE	TYPE	ACTR	NPOSI	APOSI	TESTS	ALT. FREQ. JUST.	REL. REQ. NUM.
Drawing Number 47W331-3 (continued)												
1-ISV-52-505	52	2	H-2	A-Pas	0.75	GATE	MAN	C	C	SLTJ	None	None
1-ISV-52-506	52	2	H-2	A-Pas	0.75	GATE	MAN	C	C	SLTJ	None	None
1-ISV-52-507	52	2	H-2	A-Pas	0.75	GATE	MAN	C	C	SLTJ	None	None
Drawing Number 1-47W856-1												
1-ISV-59-522	59	2	F-2	A-Pas	2	BALL	MAN	C	C	SLTJ	None	None
1-ISV-59-698	59	2	F-2	A-Pas	2	DIAPH	MAN	C	C	SLTJ	None	None
Drawing Number 1-47W814-2												
1-CKV-61-533	61	2	B-7	AC-Act	0.375	CKV	SELF	C	B	CVO/RO CVC/RO SLTJ	CKV-CMP	None
1-CKV-61-658	61	N	D-12	C-Act	12	CKV	SELF	C	O	CVO/RO BDC/RO	AF-10	None
1-CKV-61-659	61	N	D-12	C-Act	12	CKV	SELF	C	O	CVO/RO BDC/RO	AF-10	None
1-CKV-61-660	61	N	D-12	C-Act	12	CKV	SELF	C	O	CVO/RO BDC/RO	AF-10	None
1-CKV-61-661	61	N	D-12	C-Act	12	CKV	SELF	C	O	CVO/RO BDC/RO	AF-10	None
1-CKV-61-662	61	N	D-12	C-Act	12	CKV	SELF	C	O	CVO/RO BDC/RO	AF-10	None
1-CKV-61-663	61	N	D-12	C-Act	12	CKV	SELF	C	O	CVO/RO BDC/RO	AF-10	None
1-CKV-61-664	61	N	D-12	C-Act	12	CKV	SELF	C	O	CVO/RO BDC/RO	AF-10	None
1-CKV-61-665	61	N	D-12	C-Act	12	CKV	SELF	C	O	CVO/RO BDC/RO	AF-10	None
1-CKV-61-666	61	N	D-12	C-Act	12	CKV	SELF	C	O	CVO/RO BDC/RO	AF-10	None
1-CKV-61-667	61	N	D-12	C-Act	12	CKV	SELF	C	O	CVO/RO BDC/RO	AF-10	None
1-CKV-61-668	61	N	D-12	C-Act	12	CKV	SELF	C	O	CVO/RO BDC/RO	AF-10	None
1-CKV-61-669	61	N	D-12	C-Act	12	CKV	SELF	C	O	CVO/RO BDC/RO	AF-10	None
1-CKV-61-670	61	N	D-12	C-Act	12	CKV	SELF	C	O	CVO/RO BDC/RO	AF-10	None
1-CKV-61-671	61	N	D-12	C-Act	12	CKV	SELF	C	O	CVO/RO BDC/RO	AF-10	None
1-CKV-61-672	61	N	D-12	C-Act	12	CKV	SELF	C	O	CVO/RO BDC/RO	AF-10	None
1-CKV-61-673	61	N	D-12	C-Act	12	CKV	SELF	C	O	CVO/RO BDC/RO	AF-10	None
1-CKV-61-674	61	N	D-12	C-Act	12	CKV	SELF	C	O	CVO/RO BDC/RO	AF-10	None

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VALVE NUMBER	SYS	CLASS	COORD	CAT	SIZE	TYPE	ACTR	NPOSI	APOSI	TESTS	ALT. FREQ. JUST.	REL. REQ. NUM.
Drawing Number 1-47W814-2 (continued)												
1-CKV-61-675	61	N	D-12	C-Act	12	CKV	SELF	C	O	CVO/RO BDC/RO	AF-10	None
1-CKV-61-676	61	N	D-12	C-Act	12	CKV	SELF	C	O	CVO/RO BDC/RO	AF-10	None
1-CKV-61-677	61	N	D-12	C-Act	12	CKV	SELF	C	O	CVO/RO BDC/RO	AF-10	None
1-CKV-61-680	61	2	B-7	AC-Act	0.375	CKV	SELF	C	B	CVO/RO CVC/RO SLTJ	CKV-CMP	None
1-CKV-61-692	61	2	F-11	AC-Act	0.375	CKV	SELF	C	B	CVO/RO CVC/RO SLTJ	CKV-CMP	None
1-CKV-61-745	61	2	G-9	AC-Act	0.375	CKV	SELF	C	B	CVO/RO CVC/RO SLTJ	CKV-CMP	None
1-FCV-61-96-A	61	2	E-11	A-Act	2	DIAPH	DIAPH	O	C	STC/Q FSC RPI SLTJ	None	None
1-FCV-61-97-B	61	2	E-11	A-Act	2	DIAPH	DIAPH	O	C	STC/Q FSC RPI SLTJ	None	None
1-FCV-61-110-A	61	2	G-9	A-Act	2	DIAPH	DIAPH	O	C	STC/Q FSC RPI SLTJ	None	None
1-FCV-61-122-B	61	2	G-9	A-Act	2	DIAPH	DIAPH	O	C	STC/Q FSC RPI SLTJ	None	None
1-FCV-61-191-A	61	2	A-6	A-Act	4	DIAPH	DIAPH	O	C	STC/Q FSC RPI SLTJ	None	None
1-FCV-61-192-B	61	2	A-7	A-Act	4	DIAPH	DIAPH	O	C	STC/Q FSC RPI SLTJ	None	None
1-FCV-61-193-A	61	2	B-6	A-Act	4	DIAPH	DIAPH	O	C	STC/Q FSC RPI SLTJ	None	None
1-FCV-61-194-B	61	2	B-7	A-Act	4	DIAPH	DIAPH	O	C	STC/Q FSC RPI SLTJ	None	None
Drawing Number 1-47W809-1												
1-CKV-62-504-S	62	2	H-10	C-Act	8	CKV	SELF	C	B	CVO/RO CVC/RO	AF-11	None
1-CKV-62-523-A	62	2	G-9	AC-Act	2	CKV	SELF	C	B	CVO/Q CVC/Q LK	None	None
1-CKV-62-525-A	62	2	G-9	AC-Act	4	CKV	SELF	O	B	CVO/RO CVC/Q LK	AF-11	None
1-CKV-62-530-B	62	2	F-9	AC-Act	2	CKV	SELF	C	B	CVO/Q CVC/Q LK	None	None
1-CKV-62-532-B	62	2	F-9	AC-Act	4	CKV	SELF	O	B	CVO/RO CVC/Q LK	AF-11	None
1-CKV-62-560-S	62	1	F-6	C-Act	2	CKV	SELF	O	C	BDO/NO CVC/RO	CKV-CMP	None
1-CKV-62-561-S	62	1	F-6	C-Act	2	CKV	SELF	O	C	BDO/NO CVC/RO	CKV-CMP	None
1-CKV-62-562-S	62	1	H-6	C-Act	2	CKV	SELF	O	C	BDO/NO CVC/RO	CKV-CMP	None
1-CKV-62-563-S	62	1	H-6	C-Act	2	CKV	SELF	O	C	BDO/NO CVC/RO	CKV-CMP	None
1-CKV-62-576-S	62	1	E-4	C-Act	2	CKV	SELF	O	C	BDO/NO CVC/RO	CKV-CMP	None

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VALVE NUMBER	SYS	CLASS	COORD	CAT	SIZE	TYPE	ACTR	NPOSI	APOSI	TESTS	ALT. FREQ. JUST.	REL. REQ. NUM.
Drawing Number 1-47W809-1 (continued)												
1-CKV-62-577-S	62	1	E-2	C-Act	2	CKV	SELF	O	C	BDO/NO CVC/RO	CKV-CMP	None
1-CKV-62-578-S	62	1	G-2	C-Act	2	CKV	SELF	O	C	BDO/NO CVC/RO	CKV-CMP	None
1-CKV-62-579-S	62	1	G-4	C-Act	2	CKV	SELF	O	C	BDO/NO CVC/RO	CKV-CMP	None
1-CKV-62-638-S	62	1	A-2	C-Act	3	CKV	SELF	O	C	BDO/NO CVC/RO	CKV-CMP	None
1-CKV-62-639-S	62	2	C-7	AC-Act	0.75	CKV	SELF	C	B	CVO/RO CVC/RO SLTJ	CKV-CMP	None
1-CKV-62-640-S	62	1	A-1	C-Act	3	CKV	SELF	O	C	BDO/NO CVC/RO	CKV-CMP	None
1-CKV-62-659-S	62	1	A-2	C-Act	3	CKV	SELF	O	C	BDO/NO CVC/RO	CKV-CMP	None
1-CKV-62-660-S	62	1	A-1	C-Act	3	CKV	SELF	O	C	BDO/NO CVC/RO	CKV-CMP	None
1-CKV-62-661-S	62	1	B-2	C-Act	3	CKV	SELF	E	C	BDO/RO CVC/RO	CKV-CMP	None
1-FCV-62-61-B	62	2	B-7	A-Act	4	GATE	MOV	O	C	STC/CSD RPI SLTJ	AF-14	None
1-FCV-62-63-A	62	2	B-8	A-Act	4	GATE	MOV	O	C	STC/CSD RPI SLTJ	AF-14	None
1-FCV-62-69-S	62	1	A-2	B-Act	3	GLOBE	DIAPH	C	C	STC/CSD FSC RPI	AF-15	None
1-FCV-62-70-S	62	1	A-2	B-Act	3	GLOBE	DIAPH	C	C	STC/CSD FSC RPI	AF-15	None
1-FCV-62-72-A	62	2	A-5	A-Act	2	GLOBE	DIAPH	O	C	STC/Q FSC RPI SLTJ	None	None
1-FCV-62-73-A	62	2	A-4	A-Act	2	GLOBE	DIAPH	O	C	STC/Q FSC RPI SLTJ	None	None
1-FCV-62-74-A	62	2	A-4	A-Act	2	GLOBE	DIAPH	O	C	STC/Q FSC RPI SLTJ	None	None
1-FCV-62-76-A	62	2	A-5	A-Act	2	GLOBE	DIAPH	O	C	STC/Q FSC RPI SLTJ	None	None
1-FCV-62-77-B	62	2	A-7	A-Act	2	GLOBE	DIAPH	O	C	STC/CSD FSC RPI SLTJ	AF-15	None
1-FCV-62-83	62	2	A-8	B-Pas	2	GLOBE	DIAPH	O	C	RPI	None	None
1-FCV-62-84-A	62	1	B-2	B-Act	3	GLOBE	DIAPH	E	B	STC/CSD STO/CSD FSC RPI	AF-08	None
1-FCV-62-90-A	62	2	D-8	B-Act	3	GATE	MOV	O	C	STC/CSD RPI	AF-15	None
1-FCV-62-91-B	62	2	D-8	B-Act	3	GATE	MOV	O	C	STC/CSD RPI	AF-15	None
1-FCV-62-1228-A	62	2	C-10	B-Act	1	GLOBE	DIAPH	O	C	STC/CSD FSC RPI	AF-16	None
1-FCV-62-1229-B	62	2	C-10	B-Act	1	GLOBE	DIAPH	O	C	STC/CSD FSC RPI	AF-16	None
1-LCV-62-132-A	62	2	D-10	B-Act	4	GATE	MOV	O	C	STC/CSD RPI	AF-16	None

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VALVE NUMBER	SYS	CLASS	COORD	CAT	SIZE	TYPE	ACTR	NPOSI	APOSI	TESTS	ALT. FREQ. JUST.	REL. REQ. NUM.
Drawing Number 1-47W809-1 (continued)												
1-LCV-62-133-B	62	2	D-10	B-Act	4	GATE	MOV	O	C	STC/CSD RPI	AF-16	None
1-LCV-62-135-A	62	2	H-10	B-Act	8	GATE	MOV	C	O	STO/CSD RPI	AF-16	None
1-LCV-62-136-B	62	2	H-10	B-Act	8	GATE	MOV	C	O	STO/CSD RPI	AF-16	None
1-RFV-62-505-S	62	2	F-10	C-Act	0.75x1	SFV	SELF	C	O	RV	None	None
1-RFV-62-636-S	62	2	B-6	C-Act	2x3	SFV	SELF	C	O	RV	None	None
1-RFV-62-649-S	62	2	C-9	C-Act	2x3	SFV	SELF	C	O	RV	None	None
1-RFV-62-662-S	62	2	A-3	AC-Act	2x3	SFV	SELF	C	O	RV SLTJ	None	None
1-RFV-62-675-S	62	2	B-10	C-Act	2x3	SFV	SELF	C	O	RV	None	None
1-RFV-62-1221	62	2	G-10	C-Act	0.75x1	SFV	SELF	C	O	RV	None	None
1-RFV-62-1222	62	2	E-9	C-Act	0.75x1	SFV	SELF	C	O	RV	None	None
Drawing Number 1-47W809-2												
1-CKV-62-930	62	3	B-4	C-Act	3	CKV	SELF	C	O	CVO/RO BDC/RO	AF-13	None
1-FCV-62-138-B	62	3	A-4	B-Act	3	GLOBE	MOV	C	O	STO/Q RPI	None	None
Drawing Number 1-47W809-3												
1-RFV-62-955	62	2	C-11	C-Act	0.75x1	SFV	SELF	C	O	RV	None	None
1-RFV-62-1079	62	2	C-12	C-Act	4	SFV	SELF	C	O	RV	None	None
2-RFV-62-955	62	2	C-7	C-Act	0.75x1	SFV	SELF	C	O	RV	None	None
2-RFV-62-1079	62	2	C-7	C-Act	4	SFV	SELF	C	O	RV	None	None
Drawing Number 1-47W809-5												
1-CKV-62-1052-A	62	3	F-8	C-Act	2	CKV	SELF	B	B	CVO/Q CVC/Q	None	None
1-CKV-62-1052-B	62	3	F-7	C-Act	2	CKV	SELF	B	B	CVO/Q CVC/Q	None	None
Drawing Number 1-47W811-1												
1-CKV-63-502-S	63	2	F-10	C-Act	12	CKV	SELF	C	O	CVO/RO CVC/CSD	AF-18	None
1-CKV-63-510-S	63	2	D-10	C-Act	8	CKV	SELF	C	B	CVO/RO CVC/RO	AF-11	None
1-CKV-63-524-A	63	2	F-8	AC-Act	4	CKV	SELF	C	B	CVO/RO CVC/Q LK	AF-11	None
1-CKV-63-526-B	63	2	D-8	AC-Act	4	CKV	SELF	C	B	CVO/RO CVC/Q LK	AF-11	None

Table 2, Summary Listing of Valves

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VALVE NUMBER	SYS	CLASS	COORD	CAT	SIZE	TYPE	ACTR	NPOSI	APOSI	TESTS	ALT. FREQ. JUST.	REL. REQ. NUM.
Drawing Number 1-47W811-1 (Continued)												
1-CKV-63-528-A	63	2	F-8	AC-Act	0.75	CKV	SELF	C	B	CVO/Q CVC/Q LK	None	None
1-CKV-63-530-B	63	2	D-8	AC-Act	0.75	CKV	SELF	C	B	CVO/Q CVC/Q LK	None	None
1-CKV-63-543-A	63	1	F-3	AC-Act	2	CKV	SELF	C	B	CVO/RO SLTP	AF-11	None
1-CKV-63-545-A	63	1	F-3	AC-Act	2	CKV	SELF	C	B	CVO/RO SLTP	AF-11	None
1-CKV-63-547-B	63	1	E-3	AC-Act	2	CKV	SELF	C	B	CVO/RO SLTP	AF-11	None
1-CKV-63-549-B	63	1	E-3	AC-Act	2	CKV	SELF	C	B	CVO/RO SLTP	AF-11	None
1-CKV-63-551-S	63	1	H-1	AC-Act	2	CKV	SELF	C	B	CVO/RO SLTP	AF-11	None
1-CKV-63-553-S	63	1	H-3	AC-Act	2	CKV	SELF	C	B	CVO/RO SLTP	AF-11	None
1-CKV-63-555-S	63	1	G-3	AC-Act	2	CKV	SELF	C	B	CVO/RO SLTP	AF-11	None
1-CKV-63-557-S	63	1	G-2	AC-Act	2	CKV	SELF	C	B	CVO/RO SLTP	AF-11	None
1-CKV-63-558-B	63	1	E-2	AC-Act	6	CKV	SELF	C	B	CVO/RO SLTP	AF-11	None
1-CKV-63-559-B	63	1	E-1	AC-Act	6	CKV	SELF	C	B	CVO/RO SLTP	AF-11	None
1-CKV-63-560-S	63	1	F-1	AC-Act	10	CKV	SELF	C	B	CVO/RO SLTP	CKV-CMP	None
1-CKV-63-561-S	63	1	D-1	AC-Act	10	CKV	SELF	C	B	CVO/RO SLTP	CKV-CMP	None
1-CKV-63-562-S	63	1	E-2	AC-Act	10	CKV	SELF	C	B	CVO/RO SLTP	CKV-CMP	None
1-CKV-63-563-S	63	1	F-2	AC-Act	10	CKV	SELF	C	B	CVO/RO SLTP	CKV-CMP	None
1-CKV-63-581-S	63	1	C-6	AC-Act	3	CKV	SELF	C	O	CVO/RO SLTP	AF-11	None
1-CKV-63-586-S	63	1	E-1	AC-Act	1.5	CKV	SELF	C	O	CVO/RO SLTP	AF-11	None
1-CKV-63-587-S	63	1	D-2	AC-Act	1.5	CKV	SELF	C	O	CVO/RO SLTP	AF-11	None
1-CKV-63-588-S	63	1	E-2	AC-Act	1.5	CKV	SELF	C	O	CVO/RO SLTP	AF-11	None
1-CKV-63-589-S	63	1	F-2	AC-Act	1.5	CKV	SELF	C	O	CVO/RO SLTP	AF-11	None
1-CKV-63-622-S	63	1	D-1	AC-Act	10	CKV	SELF	C	B	CVO/RO SLTP	CKV-CMP	None
1-CKV-63-623-S	63	1	D-1	AC-Act	10	CKV	SELF	C	B	CVO/RO SLTP	CKV-CMP	None
1-CKV-63-624-S	63	1	D-3	AC-Act	10	CKV	SELF	C	B	CVO/RO SLTP	CKV-CMP	None
1-CKV-63-625-S	63	1	D-3	AC-Act	10	CKV	SELF	C	B	CVO/RO SLTP	CKV-CMP	None

Table 2, Summary Listing of Valves

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VALVE NUMBER	SYS	CLASS	COORD	CAT	SIZE	TYPE	ACTR	NPOSI	APOSI	TESTS	ALT. FREQ. JUST.	REL. REQ. NUM.
Drawing Number 1-47W811-1 (continued)												
1-CKV-63-632-A	63	1	H-2	AC-Act	6	CKV	SELF	C	B	CVO/RO SLTP	AF-18	None
1-CKV-63-633-B	63	1	G-1	AC-Act	6	CKV	SELF	C	B	CVO/RO SLTP	AF-18	None
1-CKV-63-634-A	63	1	G-3	AC-Act	6	CKV	SELF	C	B	CVO/RO SLTP	AF-18	None
1-CKV-63-635-B	63	1	G-1	AC-Act	6	CKV	SELF	C	B	CVO/RO SLTP	AF-18	None
1-CKV-63-640-S	63	1	G-3	AC-Act	8	CKV	SELF	C	B	CVO/RO SLTP	AF-18	None
1-CKV-63-641-S	63	1	F-1	AC-Act	6	CKV	SELF	C	B	CVO/RO SLTP	AF-18	None
1-CKV-63-643-S	63	1	F-3	AC-Act	8	CKV	SELF	C	B	CVO/RO SLTP	AF-18	None
1-CKV-63-644-S	63	1	D-2	AC-Act	6	CKV	SELF	C	B	CVO/RO SLTP	AF-18	None
1-CKV-63-725	63	2	E-8	C-Act	2	CKV	SELF	C	B	CVO/DIF CVC/DIF	CKV-CMP	None
1-FCV-63-1-A	63	2	E-10	B-Act	14	GATE	MOV	O	C	STC/CSD RPI	AF-19	None
1-FCV-63-3-A	63	2	E-8	B-Act	2	GLOBE	MOV	O	C	STC/CSD RPI	AF-20	None
1-FCV-63-4-B	63	2	E-8	B-Act	2	GLOBE	MOV	O	C	STC/Q RPI	None	None
1-FCV-63-5-B	63	2	D-10	B-Act	6	GATE	MOV	O	C	STC/CSD RPI	AF-19	None
1-FCV-63-6-B	63	2	F-10	B-Act	4	GATE	MOV	C	O	STO/Q RPI	None	None
1-FCV-63-7-A	63	2	F-10	B-Act	4	GATE	MOV	C	O	STO/Q RPI	None	None
1-FCV-63-8-A	63	2	H-9	B-Act	8	GATE	MOV	C	O	STO/RO RPI	AF-21	None
1-FCV-63-11-B	63	2	H-9	B-Act	8	GATE	MOV	C	O	STO/RO RPI	AF-21	None
1-FCV-63-22-B	63	2	E-6	B-Act	4	GATE	MOV	O	C	STC/CSD RPI	AF-22	None
1-FCV-63-23-B	63	2	E-7	A-Act	1	GLOBE	DIAPH	O	C	STC/Q FSC RPI SLTJ	None	None
1-FCV-63-25-B	63	2	B-7	B-Act	4	GATE	MOV	C	O	STO/CSD RPI	AF-23	None
1-FCV-63-26-A	63	2	B-7	B-Act	4	GATE	MOV	C	O	STO/CSD RPI	AF-23	None
1-FCV-63-47-A	63	2	E-10	B-Act	6	GATE	MOV	O	C	STC/Q RPI	None	None
1-FCV-63-48-B	63	2	E-10	B-Act	6	GATE	MOV	O	C	STC/Q RPI	None	None
1-FCV-63-67-B	63	1	B-5	B-Act	10	GATE	MOV	O	C	STC/RO RPI	AF-24	None
1-FCV-63-71-A	63	2	D-6	A-Act	0.75	GLOBE	DIAPH	O	C	STC/Q FSC RPI SLTJ	None	None

Table 2, Summary Listing of Valves

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VALVE NUMBER	SYS	CLASS	COORD	CAT	SIZE	TYPE	ACTR	NPOSI	APOSI	TESTS	ALT. FREQ. JUST.	REL. REQ. NUM.
Drawing Number 1-47W811-1 (continued)												
1-FCV-63-72-A	63	2	H-7	B-Act	18	GATE	MOV	C	O	STO/RO RPI	AF-25	None
1-FCV-63-73-B	63	2	H-7	B-Act	18	GATE	MOV	C	O	STO/RO RPI	AF-25	None
1-FCV-63-80-A	63	1	B-4	B-Act	10	GATE	MOV	O	C	STC/RO RPI	AF-24	None
1-FCV-63-84-B	63	2	C-6	A-Act	0.75	GLOBE	DIAPH	O	C	STC/Q FSC RPI SLTJ	None	None
1-FCV-63-93-A	63	2	G-7	B-Act	8	GATE	MOV	O	C	STC/CSD RPI	AF-26	None
1-FCV-63-94-B	63	2	G-7	B-Act	8	GATE	MOV	O	C	STC/CSD RPI	AF-26	None
1-FCV-63-98-B	63	1	B-3	B-Act	10	GATE	MOV	O	C	STC/RO RPI	AF-24	None
1-FCV-63-118-A	63	1	B-1	B-Act	10	GATE	MOV	O	C	STC/RO RPI	AF-24	None
1-FCV-63-152-A	63	2	F-7	B-Act	4	GATE	MOV	O	C	STC/Q RPI	None	None
1-FCV-63-153-B	63	2	E-7	B-Act	4	GATE	MOV	O	C	STC/Q RPI	None	None
1-FCV-63-156-A	63	2	F-6	B-Act	4	GATE	MOV	C	O	STO/Q RPI	None	None
1-FCV-63-157-B	63	2	D-6	B-Act	4	GATE	MOV	C	O	STO/Q RPI	None	None
1-FCV-63-172-B	63	2	F-6	B-Act	12	GATE	MOV	C	O	STO/CSD RPI	AF-26	None
1-FCV-63-175-B	63	2	E-8	B-Act	2	GLOBE	MOV	O	C	STC/Q RPI	None	None
1-FCV-63-177	63	2	F-10	B-Pas	4	GATE	MOV	O	O	RPI	None	None
1-FCV-63-185	63	2	E-6	B-Act	0.75	GLOBE	DIAPH	O	C	STC/Q FSC RPI	None	None
1-RFV-63-28	63	2	D-6	AC-Act	0.75x1	SFV	SELF	C	O	RV SLTJ	None	None
1-RFV-63-511-S	63	2	E-10	C-Act	0.75x1	SFV	SELF	C	O	RV	None	None
1-RFV-63-534-A	63	2	E-7	C-Act	0.75x1	SFV	SELF	C	O	RV	None	None
1-RFV-63-535-S	63	2	E-7	C-Act	0.75x1	SFV	SELF	C	O	RV	None	None
1-RFV-63-536-B	63	2	D-7	C-Act	0.75x1	SFV	SELF	C	O	RV	None	None
1-RFV-63-577-S	63	2	A-7	C-Act	0.75x1	SFV	SELF	C	O	RV	None	None
1-RFV-63-602-S	63	2	A-2	C-Act	0.75x1	SFV	SELF	C	O	RV	None	None
1-RFV-63-603-S	63	2	A-3	C-Act	0.75x1	SFV	SELF	C	O	RV	None	None
1-RFV-63-604-S	63	2	A-4	C-Act	0.75x1	SFV	SELF	C	O	RV	None	None

Table 2, Summary Listing of Valves

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VALVE NUMBER	SYS	CLASS	COORD	CAT	SIZE	TYPE	ACTR	NPOSI	APOSI	TESTS	ALT. FREQ. JUST.	REL. REQ. NUM.
Drawing Number 1-47W811-1 (continued)												
1-RFV-63-605-S	63	2	A-6	C-Act	0.75x1	SFV	SELF	C	C	RV	None	None
1-RFV-63-626-A	63	2	G-7	C-Act	2x3	SFV	SELF	C	C	RV	None	None
1-RFV-63-627-B	63	2	F-7	C-Act	2x3	SFV	SELF	C	C	RV	None	None
1-RFV-63-637-S	63	2	F-7	C-Act	0.75x1	SFV	SELF	C	C	RV	None	None
1-RFV-63-835	63	2	E-10	C-Act	0.75x1	SFV	SELF	C	C	RV	None	None
Drawing Number 1-47W830-6												
1-FCV-63-64-A	63	2	B-6	A-Act	1	GATE	DIAPH	O	C	STC/Q FSC RPI SLTJ	None	None
1-FCV-68-305-A	68	2	G-7	A-Act	0.75	GLOBE	DIAPH	O	C	STC/Q FSC RPI SLTJ	None	None
1-CKV-68-849	68	2	G-7	AC-Act	1	CKV	SELF	O	C	CVC/CSD BDO/NO SLTJ	AF-30	None
1-CKV-63-868	63	2	B-7	AC-Act	1	CKV	SELF	O	C	CVC/CSD BDO/NO SLTJ	AF-30	None
Drawing Number 1-47W845-1												
0-CKV-67-502A-A	67	3	E-8	C-Act	2	CKV	SELF	B	B	CVO/Q CVC/Q	None	None
0-CKV-67-502B-A	67	3	E-6	C-Act	2	CKV	SELF	B	B	CVO/Q CVC/Q	None	None
0-CKV-67-502C-A	67	3	F-6	C-Act	2	CKV	SELF	B	B	CVO/Q CVC/Q	None	None
0-CKV-67-502D-A	67	3	F-8	C-Act	2	CKV	SELF	B	B	CVO/Q CVC/Q	None	None
0-CKV-67-502E-B	67	3	F-4	C-Act	2	CKV	SELF	B	B	CVO/Q CVC/Q	None	None
0-CKV-67-502F-B	67	3	F-6	C-Act	2	CKV	SELF	B	B	CVO/Q CVC/Q	None	None
0-CKV-67-502G-B	67	3	E-6	C-Act	2	CKV	SELF	B	B	CVO/Q CVC/Q	None	None
0-CKV-67-502H-B	67	3	E-4	C-Act	2	CKV	SELF	B	B	CVO/Q CVC/Q	None	None
0-CKV-67-503A-A	67	3	E-8	C-Act	20	CKV	SELF	B	B	CVO/Q CVC/Q	None	None
0-CKV-67-503B-A	67	3	D-7	C-Act	20	CKV	SELF	B	B	CVO/Q CVC/Q	None	None
0-CKV-67-503C-A	67	3	F-7	C-Act	20	CKV	SELF	B	B	CVO/Q CVC/Q	None	None
0-CKV-67-503D-A	67	3	F-8	C-Act	20	CKV	SELF	B	B	CVO/Q CVC/Q	None	None
0-CKV-67-503E-B	67	3	F-4	C-Act	20	CKV	SELF	B	B	CVO/Q CVC/Q	None	None
0-CKV-67-503F-B	67	3	F-5	C-Act	20	CKV	SELF	B	B	CVO/Q CVC/Q	None	None
0-CKV-67-503G-B	67	3	E-5	C-Act	20	CKV	SELF	B	B	CVO/Q CVC/Q	None	None

Table 2, Summary Listing of Valves

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VALVE NUMBER	SYS	CLASS	COORD	CAT	SIZE	TYPE	ACTR	NPOSI	APOSI	TESTS	ALT. FREQ. JUST.	REL. REQ. NUM.
Drawing Number 1-47W845-1 (continued)												
0-CKV-67-503H-B	67	3	E-4	C-Act	20	CKV	SELF	B	B	CVO/Q CVC/Q	None	None
1-CKV-67-508A-A	67	3	C-10	C-Act	8	CKV	SELF	O	C	CVC/DIF BDO/NO	CKV-CMP	None
1-CKV-67-508B-B	67	3	C-5	C-Act	8	CKV	SELF	O	C	CVC/DIF BDO/NO	CKV-CMP	None
1-CKV-67-940A-A	67	N	H-6	C-Act	3	CKV	SELF	C	O	CVO/Q BDC/RO	CKV-CMP	None
1-FCV-67-9A-A	67	3	G-9	B-Act	4	BALL	MOV	C	O	STO/Q	None	None
1-FCV-67-9B-A	67	3	H-9	B-Act	4	BALL	MOV	C	O	STO/Q	None	None
1-FCV-67-10A-B	67	3	F-3	B-Act	4	BALL	MOV	C	O	STO/Q	None	None
1-FCV-67-10B-B	67	3	F-3	B-Act	4	BALL	MOV	C	O	STO/Q	None	None
1-RFV-67-509A-A	67	3	B-4	C-Act	0.75x1	SFV	SELF	C	O	TRV	None	None
1-RFV-67-509B-B	67	3	B-4	C-Act	0.75x1	SFV	SELF	C	O	TRV	None	None
1-RFV-67-514A-A	67	3	B-4	C-Act	0.75x1	SFV	SELF	C	O	TRV	None	None
1-RFV-67-514B-B	67	3	B-4	C-Act	0.75x1	SFV	SELF	C	O	TRV	None	None
1-RFV-67-1042A-A	67	3	B-4	C-Act	0.75x1	SFV	SELF	C	O	TRV	None	None
1-RFV-67-1042B-B	67	3	B-4	C-Act	0.75x1	SFV	SELF	C	O	TRV	None	None
2-CKV-67-508A-A	67	3	C-5	C-Act	8	CKV	SELF	O	C	CVC/DIF BDO/NO	CKV-CMP	None
2-CKV-67-508B-B	67	3	C-10	C-Act	8	CKV	SELF	O	C	CVC/DIF BDO/NO	CKV-CMP	None
2-CKV-67-935B-B	67	N	H-6	C-Act	3	CKV	SELF	C	O	CVO/Q BDC/RO	CKV-CMP	None
2-FCV-67-9A-A	67	3	G-9	B-Act	4	BALL	MOV	C	O	STO/Q	None	None
2-FCV-67-9B-B	67	3	F-9	B-Act	4	BALL	MOV	C	O	STO/Q	None	None
2-FCV-67-10A-B	67	3	G-3	B-Act	4	BALL	MOV	C	O	STO/Q	None	None
2-FCV-67-10B-B	67	3	H-3	B-Act	4	BALL	MOV	C	O	STO/Q	None	None
2-RFV-67-509A-A	67	3	B-4	C-Act	0.75x1	SFV	SELF	C	O	TRV	None	None
2-RFV-67-509B-B	67	3	B-4	C-Act	0.75x1	SFV	SELF	C	O	TRV	None	None
2-RFV-67-514A-A	67	3	B-4	C-Act	0.75x1	SFV	SELF	C	O	TRV	None	None
2-RFV-67-514B-B	67	3	B-4	C-Act	0.75x1	SFV	SELF	C	O	TRV	None	None
2-RFV-67-1043A-A	67	3	B-4	C-Act	0.75x1	SFV	SELF	C	O	TRV	None	None
2-RFV-67-1043B-B	67	3	B-4	C-Act	0.75x1	SFV	SELF	C	O	TRV	None	None

Table 2, Summary Listing of Valves

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VALVE NUMBER	SYS	CLASS	COORD	CAT	SIZE	TYPE	ACTR	NPOSI	APOSI	TESTS	ALT. FREQ. JUST.	REL. REQ. NUM.
Drawing Number 1-47W845-2												
0-FCV-67-144	67	3	C-6	B-Act	16	GLOBE	MOV	O	C	STC/Q RPI	None	None
0-FCV-67-152-B	67	3	C-6	B-Act	24	BTFY	MOV	B	B	STO/Q STC/Q RPI	None	None
0-RFV-67-550-B	67	3	C-6	C-Act	0.75x1	SFV	SELF	C	O	TRV	None	None
0-RFV-67-1021A-A	67	3	A-10	C-Act	0.75x1	SFV	SELF	C	O	TRV	None	None
0-RFV-67-1021B-B	67	3	B-9	C-Act	0.75x1	SFV	SELF	C	O	TRV	None	None
1-FCV-67-123-B	67	3	D-9	B-Act	18	BTFY	MOV	C	O	STC/RO RPI	AF-12	None
1-FCV-67-124-B	67	3	E-8	B-Act	18	BTFY	MOV	C	O	STC/RO RPI	AF-12	None
1-FCV-67-125-A	67	3	C-9	B-Act	18	BTFY	MOV	C	O	STC/RO RPI	AF-12	None
1-FCV-67-126-A	67	3	D-7	B-Act	18	BTFY	MOV	C	O	STC/RO RPI	AF-12	None
1-FCV-67-143-A	67	3	C-8	B-Act	12	GLOBE	MOV	B	B	STO/Q STC/Q RPI	None	None
1-ISV-67-523B-B	67	3	F-10	B-Act	10	BTFY	MAN	O	C	MS	None	None
1-RFV-67-539A-A[5]	67	3	D-8	C-Act	2x2	SFV	SELF	C	O	RV	None	None
1-RFV-67-539B-B[5]	67	3	D-8	C-Act	2x2	SFV	SELF	C	O	RV	None	None
1-RFV-67-550	67	3	C-7	C-Act	0.75x1	SFV	SELF	C	O	TRV	None	None
1-RFV-67-1020A-A	67	3	F-8	C-Act	0.75x1	SFV	SELF	C	O	TRV	None	None
1-RFV-67-1020B-B	67	3	E-8	C-Act	0.75x1	SFV	SELF	C	O	TRV	None	None
1-RFV-67-1022-A	67	3	B-11	C-Act	0.75x1	SFV	SELF	C	O	TRV	None	None
2-RFV-67-550-A	67	3	B-5	C-Act	0.75x1	SFV	SELF	C	O	TRV	None	None
2-RFV-67-1044-B	67	3	B-3	C-Act	0.75x1	SFV	SELF	C	O	TRV	None	None
Drawing Number 1-47W845-3												
1-CKV-67-575A-A	67	2	H-7	AC-Act	0.5	CKV	SELF	C	B	CVO/RO CVC/RO SLTJ	CKV-CMP	None
1-CKV-67-575B-B	67	2	E-7	AC-Act	0.5	CKV	SELF	C	B	CVO/RO CVC/RO SLTJ	CKV-CMP	None
1-CKV-67-575C-A	67	2	G-7	AC-Act	0.5	CKV	SELF	C	B	CVO/RO CVC/RO SLTJ	CKV-CMP	None
1-CKV-67-575D-B	67	2	D-7	AC-Act	0.5	CKV	SELF	C	B	CVO/RO CVC/RO SLTJ	CKV-CMP	None
1-CKV-67-580A-A	67	2	C-7	AC-Act	2	CKV	SELF	O	C	CVC/Q BDO/NO SLTJ	None	None

Table 2, Summary Listing of Valves

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VALVE NUMBER	SYS	CLASS	COORD	CAT	SIZE	TYPE	ACTR	NPOSI	APOSI	TESTS	ALT. FREQ. JUST.	REL. REQ. NUM.
Drawing Number 1-47W845-3 (continued)												
1-CKV-67-580B-B	67	2	B-7	AC-Act	2	CKV	SELF	O	C	CVC/Q BDO/NO SLTJ	None	None
1-CKV-67-580C-A	67	2	B-7	AC-Act	2	CKV	SELF	O	C	CVC/Q BDO/NO SLTJ	None	None
1-CKV-67-580D-B	67	2	A-7	AC-Act	2	CKV	SELF	O	C	CVC/Q BDO/NO SLTJ	None	None
1-CKV-67-585A-A	67	2	D-7	AC-Act	0.5	CKV	SELF	C	B	CVO/RO CVC/RO SLTJ	CKV-CMP	None
1-CKV-67-585B-B	67	2	B-7	AC-Act	0.5	CKV	SELF	C	B	CVO/RO CVC/RO SLTJ	CKV-CMP	None
1-CKV-67-585C-A	67	2	C-7	AC-Act	0.5	CKV	SELF	C	B	CVO/RO CVC/RO SLTJ	CKV-CMP	None
1-CKV-67-585D-B	67	2	A-7	AC-Act	0.5	CKV	SELF	C	B	CVO/RO CVC/RO SLTJ	CKV-CMP	None
1-CKV-67-1054A-A	67	2	H-7	AC-Act	0.5	CKV	SELF	C	B	CVO/RO CVC/RO SLTJ	CKV-CMP	None
1-CKV-67-1054B-B	67	2	E-7	AC-Act	0.5	CKV	SELF	C	B	CVO/RO CVC/RO SLTJ	CKV-CMP	None
1-CKV-67-1054C-A	67	2	G-7	AC-Act	0.5	CKV	SELF	C	B	CVO/RO CVC/RO SLTJ	CKV-CMP	None
1-CKV-67-1054D-B	67	2	D-7	AC-Act	0.5	CKV	SELF	C	B	CVO/RO CVC/RO SLTJ	CKV-CMP	None
1-FCV-67-83-A	67	2	H-8	A-Act	6	BTFY	MOV	O	C	STC/CSD RPI SLTJ	AF-29	None
1-FCV-67-87-A	67	2	H-7	A-Act	6	BTFY	MOV	O	C	STC/CSD RPI SLTJ	AF-29	None
1-FCV-67-88-B	67	2	H-8	A-Act	6	BTFY	MOV	O	C	STC/CSD RPI SLTJ	AF-29	None
1-FCV-67-89-B	67	2	H-7	A-Act	6	BTFY	MOV	O	C	STC/CSD RPI SLTJ	AF-29	None
1-FCV-67-91-A	67	2	G-8	A-Act	6	BTFY	MOV	O	C	STC/CSD RPI SLTJ	AF-29	None
1-FCV-67-95-A	67	2	F-7	A-Act	6	BTFY	MOV	O	C	STC/CSD RPI SLTJ	AF-29	None
1-FCV-67-96-B	67	2	F-8	A-Act	6	BTFY	MOV	O	C	STC/CSD RPI SLTJ	AF-29	None
1-FCV-67-97-B	67	2	G-7	A-Act	6	BTFY	MOV	O	C	STC/CSD RPI SLTJ	AF-29	None
1-FCV-67-99-A	67	2	F-8	A-Act	6	BTFY	MOV	O	C	STC/CSD RPI SLTJ	AF-29	None
1-FCV-67-103-B	67	2	E-7	A-Act	6	BTFY	MOV	O	C	STC/CSD RPI SLTJ	AF-29	None
1-FCV-67-104-A	67	2	E-8	A-Act	6	BTFY	MOV	O	C	STC/CSD RPI SLTJ	AF-29	None
1-FCV-67-105-A	67	2	F-7	A-Act	6	BTFY	MOV	O	C	STC/CSD RPI SLTJ	AF-29	None
1-FCV-67-107-A	67	2	E-8	A-Act	6	BTFY	MOV	O	C	STC/CSD RPI SLTJ	AF-29	None
1-FCV-67-111-B	67	2	D-7	A-Act	6	BTFY	MOV	O	C	STC/CSD RPI SLTJ	AF-29	None

Table 2, Summary Listing of Valves

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VALVE NUMBER	SYS	CLASS	COORD	CAT	SIZE	TYPE	ACTR	NPOSI	APOSI	TESTS	ALT. FREQ. JUST.	REL. REQ. NUM.
Drawing Number 1-47W845-3 (continued)												
1-FCV-67-112-A	67	2	D-8	A-Act	6	BTFY	MOV	O	C	STC/CSD RPI SLTJ	AF-29	None
1-FCV-67-113-A	67	2	E-7	A-Act	6	BTFY	MOV	O	C	STC/CSD RPI SLTJ	AF-29	None
1-FCV-67-130-A	67	2	C-8	A-Act	2	PLUG	MOV	O	C	STC/Q RPI SLTJ	None	None
1-FCV-67-131-B	67	2	C-8	A-Act	2	PLUG	MOV	O	C	STC/Q RPI SLTJ	None	None
1-FCV-67-133-A	67	2	B-8	A-Act	2	PLUG	MOV	O	C	STC/Q RPI SLTJ	None	None
1-FCV-67-134-B	67	2	C-8	A-Act	2	PLUG	MOV	O	C	STC/Q RPI SLTJ	None	None
1-FCV-67-138-B	67	2	B-8	A-Act	2	PLUG	MOV	O	C	STC/Q RPI SLTJ	None	None
1-FCV-67-139-A	67	2	B-8	A-Act	2	PLUG	MOV	O	C	STC/Q RPI SLTJ	None	None
1-FCV-67-141-B	67	2	A-8	A-Act	2	PLUG	MOV	O	C	STC/Q RPI SLTJ	None	None
1-FCV-67-142-A	67	2	A-8	A-Act	2	PLUG	MOV	O	C	STC/Q RPI SLTJ	None	None
1-FCV-67-295-A	67	2	C-7	A-Act	2	PLUG	MOV	O	C	STC/Q RPI SLTJ	None	None
1-FCV-67-296-A	67	2	C-7	A-Act	2	PLUG	MOV	O	C	STC/Q RPI SLTJ	None	None
1-FCV-67-297-B	67	2	B-7	A-Act	2	PLUG	MOV	O	C	STC/Q RPI SLTJ	None	None
1-FCV-67-298-B	67	2	A-7	A-Act	2	PLUG	MOV	O	C	STC/Q RPI SLTJ	None	None
1-RFV-67-566A-A	67	3	H-5	C-Act	0.75x1	SFV	SELF	C	O	TRV	None	None
1-RFV-67-566B-B	67	3	F-5	C-Act	0.75x1	SFV	SELF	C	O	TRV	None	None
1-RFV-67-566C-A	67	3	G-5	C-Act	0.75x1	SFV	SELF	C	O	TRV	None	None
1-RFV-67-566D-B	67	3	E-5	C-Act	0.75x1	SFV	SELF	C	O	TRV	None	None
1-RFV-67-573A-A	67	3	G-6	C-Act	0.75x1	SFV	SELF	C	O	TRV	None	None
1-RFV-67-573B-B	67	3	E-6	C-Act	0.75x1	SFV	SELF	C	O	TRV	None	None
1-RFV-67-573C-A	67	3	F-6	C-Act	0.75x1	SFV	SELF	C	O	TRV	None	None
1-RFV-67-573D-B	67	3	D-6	C-Act	0.75x1	SFV	SELF	C	O	TRV	None	None
1-RFV-67-582A-A	67	3	C-3	C-Act	0.75x1	SFV	SELF	C	O	TRV	None	None
1-RFV-67-582B-B	67	3	B-3	C-Act	0.75x1	SFV	SELF	C	O	TRV	None	None
1-RFV-67-582C-A	67	3	B-3	C-Act	0.75x1	SFV	SELF	C	O	TRV	None	None

Table 2, Summary Listing of Valves

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VALVE NUMBER	SYS	CLASS	COORD	CAT	SIZE	TYPE	ACTR	NPOSI	APCSI	TESTS	ALT. FREQ. JUST.	REL. REQ. NUM.
Drawing Number 1-47W845-3 (continued)												
1-RFV-67-582D-B	67	3	A-3	C-Act	0.75x1	SFV	SELF	C	C	TRV	None	None
1-RFV-67-1022A-A	67	3	H-4	C-Act	0.75x1	SFV	SELF	C	C	TRV	None	None
1-RFV-67-1022B-B	67	3	F-4	C-Act	0.75x1	SFV	SELF	C	C	TRV	None	None
1-RFV-67-1022C-A	67	3	G-4	C-Act	0.75x1	SFV	SELF	C	C	TRV	None	None
1-RFV-67-1022D-B	67	3	D-4	C-Act	0.75x1	SFV	SELF	C	C	TRV	None	None
1-RFV-67-1024A-A	67	3	H-3	C-Act	0.75x1	SFV	SELF	C	C	TRV	None	None
1-RFV-67-1024B-B	67	3	F-3	C-Act	0.75x1	SFV	SELF	C	C	TRV	None	None
1-RFV-67-1024C-A	67	3	G-3	C-Act	0.75x1	SFV	SELF	C	C	TRV	None	None
1-RFV-67-1024D-B	67	3	D-3	C-Act	0.75x1	SFV	SELF	C	C	TRV	None	None
1-RFV-67-1025A-A	67	3	H-6	C-Act	0.75x1	SFV	SELF	C	C	TRV	None	None
1-RFV-67-1025B-B	67	3	F-6	C-Act	0.75x1	SFV	SELF	C	C	TRV	None	None
1-RFV-67-1025C-A	67	3	G-6	C-Act	0.75x1	SFV	SELF	C	C	TRV	None	None
1-RFV-67-1025D-B	67	3	D-6	C-Act	0.75x1	SFV	SELF	C	C	TRV	None	None
1-RFV-67-1026A-A	67	3	C-3	C-Act	0.75x1	SFV	SELF	C	C	TRV	None	None
1-RFV-67-1026B-B	67	3	B-3	C-Act	0.75x1	SFV	SELF	C	C	TRV	None	None
1-RFV-67-1026C-A	67	3	B-3	C-Act	0.75x1	SFV	SELF	C	C	TRV	None	None
1-RFV-67-1026D-B	67	3	A-3	C-Act	0.75x1	SFV	SELF	C	C	TRV	None	None
Drawing Number 1-47W845-4												
0-RFV-67-671-A	67	3	B-10	C-Act	0.75x1	SFV	SELF	C	C	RV	None	None
0-RFV-67-1039A-A	67	3	H-4	C-Act	0.75x1	SFV	SELF	C	C	TRV	None	None
0-RFV-67-1039B-B	67	3	H-6	C-Act	0.75x1	SFV	SELF	C	C	TRV	None	None
1-FCV-67-162	67	3	B-4	B-Act	2	GLOBE	DIAPH	C	C	STO/Q FSO RPI	None	None
1-FCV-67-164	67	3	B-6	B-Act	2	GLOBE	DIAPH	C	C	STO/Q FSO RPI	None	None
1-FCV-67-176	67	3	D-4	B-Act	1.5	GLOBE	DIAPH	C	C	STO/Q FSO RPI	None	None
1-FCV-67-182	67	3	D-6	B-Act	1.5	GLOBE	DIAPH	C	C	STO/Q FSO RPI	None	None
1-FCV-67-184	67	3	D-4	B-Act	1.5	GLOBE	DIAPH	C	C	STO/Q FSO RPI	None	None
1-FCV-67-186	67	3	D-6	B-Act	1.5	GLOBE	DIAPH	C	C	STO/Q FSO RPI	None	None

Table 2, Summary Listing of Valves

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VALVE NUMBER	SYS	CLASS	COORD	CAT	SIZE	TYPE	ACTR	NPOSI	APOSI	TESTS	ALT. FREQ. JUST.	REL. REQ. NUM.
Drawing Number 1-47W845-4 (continued)												
1-FCV-67-213	67	3	A-4	B-Act	1.5	GLOBE	DIAPH	C	O	STO/Q FSO RPI	None	None
1-FCV-67-215	67	3	B-6	B-Act	1.5	GLOBE	DIAPH	C	O	STO/Q FSO RPI	None	None
1-FCV-67-342	67	3	G-4	B-Act	2	GLOBE	DIAPH	C	O	STO/Q FSO RPI	None	None
1-FCV-67-344	67	3	G-6	B-Act	2	GLOBE	DIAPH	C	O	STO/Q FSO RPI	None	None
1-FCV-67-346	67	3	F-4	B-Act	1.5	GLOBE	DIAPH	C	O	STO/Q FSO RPI	None	None
1-FCV-67-348	67	3	F-6	B-Act	1.5	GLOBE	DIAPH	C	O	STO/Q FSO RPI	None	None
1-FCV-67-350	67	3	F-4	B-Act	1.5	GLOBE	DIAPH	C	O	STO/Q FSO RPI	None	None
1-FCV-67-352	67	3	F-6	B-Act	1.5	GLOBE	DIAPH	C	O	STO/Q FSO RPI	None	None
1-FCV-67-354	67	3	G-4	B-Act	1.5	GLOBE	DIAPH	C	O	STO/Q FSO RPI	None	None
1-FCV-67-356	67	3	G-6	B-Act	1.5	GLOBE	DIAPH	C	O	STO/Q FSO RPI	None	None
0-FSV-67-1221-A	67	3	B-12	B-Act	1	GATE	SOL	C	O	STO/Q FSO	None	PV-04
1-RFV-67-1027A-A	67	3	B-4	C-Act	0.75x1	SFV	SELF	C	O	TRV	None	None
1-RFV-67-1027B-B	67	3	B-7	C-Act	0.75x1	SFV	SELF	C	O	TRV	None	None
1-RFV-67-1028A-A	67	3	B-3	C-Act	0.75x1	SFV	SELF	C	O	TRV	None	None
1-RFV-67-1028B-B	67	3	C-7	C-Act	0.75x1	SFV	SELF	C	O	TRV	None	None
1-RFV-67-1029A-A	67	3	C-2	C-Act	0.75x1	SFV	SELF	C	O	TRV	None	None
1-RFV-67-1029B-B	67	3	C-8	C-Act	0.75x1	SFV	SELF	C	O	TRV	None	None
1-RFV-67-1030B	67	3	C-8	C-Act	0.75x1	SFV	SELF	C	O	TRV	None	None
1-RFV-67-1031A-A	67	3	D-2	C-Act	0.75x1	SFV	SELF	C	O	TRV	None	None
1-RFV-67-1031B-B	67	3	D-6	C-Act	0.75x1	SFV	SELF	C	O	TRV	None	None
1-RFV-67-1032A-A	67	3	D-2	C-Act	0.75x1	SFV	SELF	C	O	TRV	None	None
1-RFV-67-1032B-B	67	3	D-8	C-Act	0.75x1	SFV	SELF	C	O	TRV	None	None
1-RFV-67-1033A-A	67	3	E-2	C-Act	0.75x1	SFV	SELF	C	O	TRV	None	None
1-RFV-67-1033B-B	67	3	E-8	C-Act	0.75x1	SFV	SELF	C	O	TRV	None	None
1-RFV-67-1034A-A	67	3	F-2	C-Act	0.75x1	SFV	SELF	C	O	TRV	None	None

Table 2, Summary Listing of Valves

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VALVE NUMBER	SYS	CLASS	COORD	CAT	SIZE	TYPE	ACTR	NPOSI	APOSI	TESTS	ALT. FREQ. JUST.	REL. REQ. NUM.
Drawing Number 1-47W845-4 (continued)												
1-RFV-67-1034B-B	67	3	F-8	C-Act	0.75x1	SFV	SELF	C	O	TRV	None	None
1-RFV-67-1035A-A	67	3	F-3	C-Act	0.75x1	SFV	SELF	C	O	TRV	None	None
1-RFV-67-1035B-B	67	3	F-8	C-Act	0.75x1	SFV	SELF	C	O	TRV	None	None
1-RFV-67-1036A-A	67	3	F-2	C-Act	0.75x1	SFV	SELF	C	O	TRV	None	None
1-RFV-67-1036B-B	67	3	G-8	C-Act	0.75x1	SFV	SELF	C	O	TRV	None	None
1-RFV-67-1038A-A	67	3	G-2	C-Act	0.75x1	SFV	SELF	C	O	TRV	None	None
1-RFV-67-1038B-B	67	3	G-8	C-Act	0.75x1	SFV	SELF	C	O	TRV	None	None
Drawing Number 1-47W845-5												
0-FCV-67-205-A	67	3	H-2	B-Act	4	BTFY	MOV	O	C	STC/Q RPI	None	None
0-FCV-67-208-B	67	3	H-3	B-Act	4	BTFY	MOV	O	C	STC/Q RPI	None	None
Drawing Number 1-47W845-7												
0-RFV-67-672-B	67	3	B-12	C-Act	0.75x1	SFV	SELF	C	O	RV	None	None
0-FSV-67-1223-B	67	3	A-10	B-Act	1	GATE	SOL	C	O	STO/Q FSO	None	PV-04
2-FCV-67-217	67	3	C-4	B-Act	2	GLOBE	DIAPH	C	O	STO/Q FSO RPI	None	None
2-FCV-67-219	67	3	C-6	B-Act	2	GLOBE	DIAPH	C	O	STO/Q FSO RPI	None	None
2-FCV-67-336	67	3	A-4	B-Act	1	GLOBE	DIAPH	C	O	STO/Q FSO RPI	None	None
2-FCV-67-338	67	3	A-6	B-Act	1	GLOBE	DIAPH	C	O	STO/Q FSO RPI	None	None
2-FCV-67-354	67	3	F-4	B-Act	1.5	GLOBE	DIAPH	C	O	STO/Q FSO RPI	None	None
2-FCV-67-356	67	3	F-6	B-Act	1.5	GLOBE	DIAPH	C	O	STO/Q FSO RPI	None	None
2-RFV-67-1037A-A	67	3	G-2	C-Act	0.75x1	SFV	SELF	C	O	TRV	None	None
2-RFV-67-1037B-B	67	3	G-8	C-Act	0.75x1	SFV	SELF	C	O	TRV	None	None
2-RFV-67-1040A-A	67	3	B-3	C-Act	0.75x1	SFV	SELF	C	O	TRV	None	None
2-RFV-67-1040B-B	67	3	B-7	C-Act	0.75x1	SFV	SELF	C	O	TRV	None	None
2-RFV-67-1041A-A	67	3	A-2	C-Act	0.75x1	SFV	SELF	C	O	TRV	None	None
2-RFV-67-1041B-B	67	3	A-8	C-Act	0.75x1	SFV	SELF	C	O	TRV	None	None

Table 2, Summary Listing of Valves

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VALVE NUMBER	SYS	CLASS	COORD	CAT	SIZE	TYPE	ACTR	NPOSI	APOSI	TESTS	ALT. FREQ. JUST.	REL. REQ. NUM.
Drawing Number 1-47W625-8												
1-FCV-68-307-A	68	2	G-2	A-Act	0.375	GATE	DIAPH	O	C	STC/Q FSC RPI SLTJ	None	None
1-FCV-68-308-B	68	2	F-1	A-Act	0.375	GATE	DIAPH	O	C	STC/Q FSC RPI SLTJ	None	None
Drawing Number 1-47W813-1												
1-CKV-68-559-S	68	2	H-4	C-Act	4	CKV	SELF	C	B	CVC/DIF CVO/DIF	CKV-CMP	None
1-FCV-68-22	68	2	B-8	B-Pas	0.375	GLOBE	DIAPH	O	O	RPI	None	None
1-FCV-68-332-B	68	1	C-2	B-Act	3	GATE	MOV	O	C	STC/Q RPI	None	None
1-FCV-68-333-A	68	1	B-2	B-Act	3	GATE	MOV	O	C	STC/Q RPI	None	None
1-FSV-68-394-A	68	2	F-7	B-Act	1	GLOBE	SOL	C	O	STO/CSD STC/CSD FSC RPI	AF-28	None
1-FSV-68-395-B	68	2	G-7	B-Act	1	GLOBE	SOL	C	O	STO/CSD STC/CSD FSC RPI	AF-28	None
1-FSV-68-396-B	68	2	F-5	B-Act	1	GLOBE	SOL	C	O	ET/CSD FSC RPI	AF-28	PV-03
1-FSV-68-397-A	68	2	G-6	B-Act	1	GLOBE	SOL	C	O	ET/CSD FSC RPI	AF-28	PV-03
1-PCV-68-334-B	68	1	C-1	B-Act	3	GLOBE	SOL	C	B	STO/RO STC/RO FSC RPI	None	None
1-PCV-68-340A-A	68	1	B-1	B-Act	3	GLOBE	SOL	C	B	STO/RO STC/RO FSC RPI	None	None
1-RFV-68-563-S	68	1	A-3	C-Act	6x6	SFV	SELF	C	O	RV	None	None
1-RFV-68-564-S	68	1	A-2	C-Act	6x6	SFV	SELF	C	O	RV	None	None
1-RFV-68-565-S	68	1	A-2	C-Act	6x6	SFV	SELF	C	O	RV	None	None
Drawing Number 1-47W859-1												
0-CKV-70-504-B	70	3	D-7	C-Act	16	CKV	SELF	B	B	CVO/Q CVC/Q	None	None
0-FCV-70-197-A	70	3	B-5	B-Act	20	BTFY	MOV	O	C	STC/Q RPI	None	None
0-RFV-70-527A	70	3	H-4	C-Act	0.75x1	SFV	SELF	C	O	TRV	None	None
0-RFV-70-527B	70	3	H-6	C-Act	0.75x1	SFV	SELF	C	O	TRV	None	None
1-CKV-70-504A-A	70	3	B-7	C-Act	16	CKV	SELF	B	B	CVO/Q CVC/Q	None	None
1-CKV-70-504B-S	70	3	C-7	C-Act	16	CKV	SELF	B	B	CVO/Q CVC/Q	None	None
1-FCV-70-66	70	3	E-3	B-Act	2	ANG	DIAPH	O	C	STC/Q FSC RPI	None	None
1-ISV-70-516	70	3	B-5	B-Act	8	BTFY	MAN	O	C	MS	None	None
1-RFV-70-538-S	70	3	E-3	C-Act	3x4	SFV	SELF	C	O	RV	None	None

Table 2, Summary Listing of Valves

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VALVE NUMBER	SYS	CLASS	COORD	CAT	SIZE	TYPE	ACTR	NPOSI	APOSI	TESTS	ALT. FREQ. JUST.	REL. REQ. NUM.
Drawing Number 1-47W859-1 (continued)												
1-RFV-70-539-S	70	3	E-3	C-Act	3	SFV	SELF	C	O	RV	None	None
1-RFV-70-521	70	3	A-10	C-Act	0.75x1	SFV	SELF	C	O	TRV	None	None
2-FCV-70-66	70	3	E-3	B-Act	2	ANG	DIAPH	O	C	STC/Q FSC RPI	None	None
2-RFV-70-521	70	3	A-1	C-Act	0.75x1	SFV	SELF	C	O	TRV	None	None
Drawing Number 1-47W859-2												
1-CKV-70-679	70	2	H-3	AC-Act	3	CKV	SELF	O	C	CVC/CSD BDO/NO SLTJ	AF-29	None
1-CKV-70-681A	70	3	G-8	C-Act	2	CKV	SELF	O	C	CVC/RO BDO/NO	CKV-CMP	None
1-CKV-70-681B	70	3	F-8	C-Act	2	CKV	SELF	O	C	CVC/RO BDO/NO	CKV-CMP	None
1-CKV-70-681C	70	3	F-8	C-Act	2	CKV	SELF	O	C	CVC/RO BDO/NO	CKV-CMP	None
1-CKV-70-681D	70	3	H-8	C-Act	2	CKV	SELF	O	C	CVC/RO BDO/NO	CKV-CMP	None
1-CKV-70-682A	70	3	G-8	C-Act	2	CKV	SELF	O	C	CVC/RO BDO/NO	CKV-CMP	None
1-CKV-70-682B	70	3	F-8	C-Act	2	CKV	SELF	O	C	CVC/RO BDO/NO	CKV-CMP	None
1-CKV-70-682C	70	3	E-8	C-Act	2	CKV	SELF	O	C	CVC/RO BDO/NO	CKV-CMP	None
1-CKV-70-682D	70	3	H-9	C-Act	2	CKV	SELF	O	C	CVC/RO BDO/NO	CKV-CMP	None
1-CKV-70-687	70	2	H-9	AC-Act	0.75	CKV	SELF	C	B	CVO/RO CVC/RO SLTJ	CKV-CMP	None
1-CKV-70-698	70	2	E-9	AC-Act	0.75	CKV	SELF	C	B	CVO/RO CVC/RO SLTJ	CKV-CMP	None
1-CKV-70-790	70	2	G-3	AC-Act	0.75	CKV	SELF	C	B	CVO/RO CVC/RO SLTJ	CKV-CMP	None
1-FCV-70-85-B	70	2	D-10	A-Act	6	BTFY	DIAPH	O	C	STC/Q RPI SLTJ	None	None
1-FCV-70-87-B	70	2	H-9	A-Act	3	GATE	MOV	O	C	STC/CSD RPI SLTJ	AF-29	None
1-FCV-70-89-B	70	2	E-9	A-Act	6	BTFY	MOV	O	C	STC/CSD RPI SLTJ	AF-29	None
1-FCV-70-90-A	70	2	F-10	A-Act	3	GATE	MOV	O	C	STC/CSD RPI SLTJ	AF-29	None
1-FCV-70-92-A	70	2	E-10	A-Act	6	BTFY	MOV	O	C	STC/CSD RPI SLTJ	AF-29	None
1-FCV-70-100-A	70	2	G-3	A-Act	6	BTFY	MOV	O	C	STC/CSD RPI SLTJ	AF-29	None
1-FCV-70-133-A	70	3	H-3	B-Act	3	GATE	MOV	O	C	STC/CSD RPI	AF-29	None
1-FCV-70-134-B	70	2	H-3	A-Act	3	GATE	MOV	O	C	STC/CSD RPI SLTJ	AF-29	None

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VALVE NUMBER	SYS	CLASS	COORD	CAT	SIZE	TYPE	ACTR	NPOSI	APOSI	TESTS	ALT. FREQ. JUST.	REL. REQ. NUM.
Drawing Number 1-47W859-2 (continued)												
1-FCV-70-140-B	70	2	G-3	A-Act	6	BTFY	MOV	O	C	STC/CSD RPI SLTJ	AF-29	None
1-FCV-70-143-A	70	2	E-3	A-Act	6	BTFY	MOV	O	C	STC/Q RPI SLTJ	None	None
1-FCV-70-183-A	70	3	C-9	B-Act	3	GATE	MOV	O	C	STC/Q RPI	None	None
1-FCV-70-215-A	70	3	A-8	B-Act	3	GATE	MOV	O	C	STC/Q RPI	None	None
1-ISV-70-700	70	3	E-11	B-Act	6	BTFY	MAN	O	C	MS	None	None
1-RFV-70-703	70	2	E-5	AC-Act	3x4	SFV	SELF	C	O	RV SLTJ	None	None
1-RFV-70-578	70	3	A-7	C-Act	0.75x1	SFV	SELF	C	O	RV	None	None
1-RFV-70-835	70	3	H-6	C-Act	0.75	SFV	SELF	C	O	RV	None	None
1-RFV-70-584	70	3	B-6	C-Act	0.75x1	SFV	SELF	C	O	TRV	None	None
1-RFV-70-683A	70	3	G-8	C-Act	0.75x1	SFV	SELF	C	O	TRV	None	None
1-RFV-70-683B	70	3	F-8	C-Act	0.75x1	SFV	SELF	C	O	TRV	None	None
1-RFV-70-683C	70	3	E-8	C-Act	0.75x1	SFV	SELF	C	O	TRV	None	None
1-RFV-70-683D	70	3	H-8	C-Act	0.75x1	SFV	SELF	C	O	TRV	None	None
1-RFV-70-694	70	3	F-4	C-Act	0.75x1	SFV	SELF	C	O	TRV	None	None
Drawing Number 1-47W859-4												
1-FCV-70-156-A	70	3	F-4	B-Act	18	BTYF	MOV	C	O	STO/Q RPI	None	None
1-RFV-70-551A-A[5]	70	3	E-5	C-Act	1.5x2	SFV	SELF	C	O	RV	None	None
1-RFV-70-551B-B[5]	70	3	E-2	C-Act	1.5x2	SFV	SELF	C	O	RV	None	None
1-RFV-70-556A-A[5]	70	3	A-4	C-Act	0.75x1	SFV	SELF	C	O	RV	None	None
1-RFV-70-556B-B[5]	70	3	A-2	C-Act	0.75x1	SFV	SELF	C	O	RV	None	None
1-RFV-70-565A-A[5]	70	3	C-4	C-Act	0.75x1	SFV	SELF	C	O	RV	None	None
1-RFV-70-565B-B[5]	70	3	C-2	C-Act	0.75x1	SFV	SELF	C	O	RV	None	None
1-RFV-70-561A	70	3	B-4	C-Act	0.75x1	SFV	SELF	C	O	TRV	None	None
1-RFV-70-561B	70	3	B-3	C-Act	0.75x1	SFV	SELF	C	O	TRV	None	None
1-RFV-70-570A	70	3	D-4	C-Act	0.75x1	SFV	SELF	C	O	TRV	None	None

Table 2, Summary Listing of Valves

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VALVE NUMBER	SYS	CLASS	COORD	CAT	SIZE	TYPE	ACTR	NPOSI	APOSI	TESTS	ALT. FREQ. JUST.	REL. REQ. NUM.
Drawing Number 1-47W859-4 (continued)												
1-RFV-70-570B	70	3	D-3	C-Act	0.75x1	SFV	SELF	C	O	TRV	None	None
2-RFV-70-551A	70	3	E-11	C-Act	0.75x1	SFV	SELF	C	O	TRV	None	None
2-RFV-70-556A	70	3	H-11	C-Act	0.75x1	SFV	SELF	C	O	TRV	None	None
Drawing Number 1-47W812-1												
1-CKV-72-506-A	72	2	C-10	C-Act	12	CKV	SELF	C	O	CVO/Q CVC/Q	CKV-CMP	None
1-CKV-72-507-B	72	2	B-10	C-Act	12	CKV	SELF	C	O	CVO/DIF CVC/Q	CKV-CMP	None
1-CKV-72-524-A	72	2	D-6	C-Act	10	CKV	SELF	C	O	CVO/Q BDC/Q	CKV-CMP	None
1-CKV-72-525-B	72	2	A-6	C-Act	10	CKV	SELF	C	O	CVC/DIF CVO/DIF	CKV-CMP	None
1-CKV-72-548-A	72	2	D-2	C-Act	10	CKV	SELF	C	O	CVO/DIF CVC/DIF	CKV-CMP	None
1-CKV-72-549-B	72	2	A-2	C-Act	10	CKV	SELF	C	O	CVO/DIF CVC/DIF	CKV-CMP	None
1-CKV-72-562-A	72	2	F-2	C-Act	8	CKV	SELF	C	O	CVO/DIF CVC/DIF	CKV-CMP	None
1-CKV-72-563-B	72	2	E-2	C-Act	8	CKV	SELF	C	O	CVO/DIF CVC/DIF	CKV-CMP	None
1-FCV-72-2-B	72	2	A-3	A-Act	10	GATE	MOV	C	O	STO/Q RPI SLTJ	None	None
1-FCV-72-13-B	72	2	B-6	B-Act	2	GLOBE	MOV	C	O	STO/Q RPI	None	None
1-FCV-72-21-B	72	2	B-10	B-Act	12	GATE	MOV	O	C	STC/Q RPI	None	None
1-FCV-72-22-A	72	2	C-10	B-Act	12	GATE	MOV	O	C	STC/Q RPI	None	None
1-FCV-72-34-A[3]	72	2	C-6	B-Act	2	GLOBE	MOV	C	O	STO/Q RPI	None	None
1-FCV-72-39-A	72	2	C-3	A-Act	10	GATE	MOV	C	O	STO/Q RPI SLTJ	None	None
1-FCV-72-40-A	72	2	F-3	A-Act	8	GATE	MOV	C	O	STO/RO RPI SLTJ	AF-04	None
1-FCV-72-41-B	72	2	E-3	A-Act	8	GATE	MOV	C	O	STO/RO RPI SLTJ	AF-04	None
1-FCV-72-44-A	72	2	G-3	B-Act	12	GATE	MOV	C	O	STO/RO RPI	AF-25	None
1-FCV-72-45-B	72	2	H-3	B-Act	12	GATE	MOV	C	O	STO/RO RPI	AF-25	None
1-RFV-72-40	72	2	F-3	AC-Act	0.75x1	SFV	SELF	C	O	RV SLTJ	None	None
1-RFV-72-41	72	2	E-3	AC-Act	0.75x1	SFV	SELF	C	O	RV SLTJ	None	None
1-RFV-72-508-A	72	2	C-9	C-Act	0.75x1	SFV	SELF	C	O	RV	None	None
1-RFV-72-509-B	72	2	A-9	C-Act	0.75x1	SFV	SELF	C	O	RV	None	None

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VALVE NUMBER	SYS	CLASS	COORD	CAT	SIZE	TYPE	ACTR	NPOSI	APOSI	TESTS	ALT. FREQ. JUST.	REL. REQ. NUM.
Drawing Number 1-47W810-1												
1-CKV-74-514-A	74	2	F-8	C-Act	8	CKV	SELF	C	B	CVO/RO CVC/RO	AF-18	None
1-CKV-74-515-B	74	2	C-8	C-Act	8	CKV	SELF	C	B	CVO/RO CVC/RO	AF-18	None
1-CKV-74-544-A	74	2	F-5	C-Act	8	CKV	SELF	C	B	CVO/RO CVC/Q	AF-18	None
1-CKV-74-545-B	74	2	C-5	C-Act	8	CKV	SELF	C	B	CVO/RO CVC/Q	AF-18	None
1-FCV-74-1-A	74	1	G-2	A-Act	14	GATE	MOV	C	O	STO/CSD SLTP RPI	AF-17	None
1-FCV-74-2-B	74	1	G-3	A-Act	14	GATE	MOV	C	O	STO/CSD SLTP RPI	AF-17	None
1-FCV-74-3-A	74	2	F-9	B-Act	14	GATE	MOV	O	C	STC/Q RPI	None	None
1-FCV-74-8-A	74	1	G-3	A-Act	10	GATE	MOV	C	O	STO/CSD SLTP RPI	AF-17	None
1-FCV-74-9-B	74	1	G-2	A-Act	10	GATE	MOV	C	O	STO/CSD SLTP RPI	AF-17	None
1-FCV-74-12-A	74	2	G-7	B-Act	3	GLOBE	MOV	O	B	STC/Q STO/Q RPI	None	None
1-FCV-74-21-B	74	2	C-9	B-Act	14	GATE	MOV	O	C	STC/Q RPI	None	None
1-FCV-74-24-B	74	2	B-6	B-Act	3	GLOBE	MOV	O	B	STC/Q STO/Q RPI	None	None
1-FCV-74-33-A	74	2	E-4	B-Act	8	GATE	MOV	O	C	STC/CSD RPI	AF-26	None
1-FCV-74-35-B	74	2	C-4	B-Act	8	GATE	MOV	O	C	STC/CSD RPI	AF-26	None
1-RFV-74-505-S	74	2	H-3	C-Act	3x4	SFV	SELF	C	O	RV	None	None
Drawing Number 1-47W830-1												
1-FCV-77-9-B	77	2	D-1	A-Act	3	DIAPH	DIAPH	O	C	STC/Q FSC RPI SLTJ	None	None
1-FCV-77-10-A	77	2	E-1	A-Act	3	DIAPH	DIAPH	O	C	STC/Q FSC RPI SLTJ	None	None
1-FCV-77-16-B	77	2	B-5	A-Act	0.75	DIAPH	DIAPH	O	C	STC/Q FSC RPI SLTJ	None	None
1-FCV-77-17-A	77	2	B-6	A-Act	0.75	DIAPH	DIAPH	O	C	STC/Q FSC RPI SLTJ	None	None
1-FCV-77-18-B	77	2	B-5	A-Act	1	DIAPH	DIAPH	O	C	STC/Q FSC RPI SLTJ	None	None
1-FCV-77-19-A	77	2	B-5	A-Act	1	DIAPH	DIAPH	O	C	STC/Q FSC RPI SLTJ	None	None
1-FCV-77-20-A	77	2	C-5	A-Act	1	DIAPH	DIAPH	O	C	STC/Q FSC RPI SLTJ	None	None

Table 2, Summary Listing of Valves

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VALVE NUMBER	SYS	CLASS	COORD	CAT	SIZE	TYPE	ACTR	NPOSI	APOSI	TESTS	ALT. FREQ. JUST.	REL. REQ. NUM.
Drawing Number 1-47W851-1												
1-FCV-77-127-B	77	2	F-7	A-Act	2	PLUG	DIAPH	O	C	STC/Q FSC RPI SLTJ	None	None
1-FCV-77-128-A	77	2	F-7	A-Act	2	PLUG	DIAPH	O	C	STC/Q FSC RPI SLTJ	None	None
1-RFV-77-2875	77	2	F-7	AC-Act	2	SFV	SELF	C	B	RV SLTJ	None	None
Drawing Number 1-47W855-1												
1-ISV-78-557	78	2	G-7	A-Pas	4	DIAPH	MAN	C	C	SLTJ	None	None
1-ISV-78-558	78	2	G-8	A-Pas	4	DIAPH	MAN	C	C	SLTJ	None	None
1-ISV-78-560	78	2	H-8	A-Pas	6	DIAPH	MAN	C	C	SLTJ	None	None
1-ISV-78-561	78	2	H-7	A-Pas	6	DIAPH	MAN	C	C	SLTJ	None	None
Drawing Number 1-47W819-1												
1-CKV-81-502	81	2	F-4	AC-Act	3	CKV	SELF	O	C	CVC/CSD BDO/NO SLTJ	AF-27	None
1-FCV-81-12-A	81	2	F-4	A-Act	3	DIAPH	DIAPH	O	C	STC/Q FSC RPI SLTJ	None	None
Drawing Number 1-47W809-7												
1-ISV-84-530-S	84	2	F-7	A-Pas	1	GLOBE	MAN	C	C	SLTJ	None	None
Drawing Number 1-47W610-90-3												
1-FCV-90-107-A	90	2	A-9	A-Act	1.5	GATE	DIAPH	O	C	STC/Q FSC RPI SLTJ	None	None
1-FCV-90-108-B	90	2	C-8	A-Act	1.5	GATE	DIAPH	O	C	STC/Q FSC RPI SLTJ	None	None
1-FCV-90-109-B	90	2	C-8	A-Act	1.5	GATE	DIAPH	O	C	STC/Q FSC RPI SLTJ	None	None
1-FCV-90-110-B	90	2	C-8	A-Act	1.5	GATE	DIAPH	O	C	STC/Q FSC RPI SLTJ	None	None
1-FCV-90-111-A	90	2	D-9	A-Act	1.5	GATE	DIAPH	O	C	STC/Q FSC RPI SLTJ	None	None
1-FCV-90-113-A	90	2	A-5	A-Act	1.5	GATE	DIAPH	O	C	STC/Q FSC RPI SLTJ	None	None
1-FCV-90-114-B	90	2	C-4	A-Act	1.5	GATE	DIAPH	O	C	STC/Q FSC RPI SLTJ	None	None
1-FCV-90-115-B	90	2	C-4	A-Act	1.5	GATE	DIAPH	O	C	STC/Q FSC RPI SLTJ	None	None
1-FCV-90-116-B	90	2	C-4	A-Act	1.5	GATE	DIAPH	O	C	STC/Q FSC RPI SLTJ	None	None
1-FCV-90-117-A	90	2	D-5	A-Act	1.5	GATE	DIAPH	O	C	STC/Q FSC RPI SLTJ	None	None

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ALTERNATIVE FREQUENCY JUSTIFICATIONS

AF-01

I. **Affected Component(s)** - 1-FCV-1-4-T, 1-FCV-1-11-T, 1-FCV-1-22-T, 1-FCV-1-29-T (1-47W801-1)

II. **Function of Affected Component(s)** - Closes to interrupt loss of SG inventory through a ruptured main steam line. Provides flow boundary isolation between the seismically qualified and non-seismically qualified portions of the main steam system.

III. **Basis for Alternative Frequency** - Closing these valves causes a loss of main steam flow from one steam generator which in turn causes a steam generator level transient, either of which could cause a unit trip and safety injection. Valves are equipped with part stroke capability, however, even a part stroke exercise increases the risk of an inadvertent valve closure when the unit is operating (Reference NUREG-1482, Revision 1, Section 4.2.6, Note 1). In accordance with the manufacturer's recommendation, these valves should only be stroke time tested with steam on the valve. Therefore, stroke time testing can only be performed during MODE 3 operation, which is during the startup or shutdown sequence.

IV. **Proposed Alternative Frequency** - Full stroke exercise and stroke time to the closed position each refueling outage.

AF-02

I. **Affected Component(s)** - 1-FCV-1-17-A, 1-FCV-1-18-B (1-47W803-2)

II. **Function of Affected Component(s)** - Closes to prevent blowdown of main steam in the event of failure of the steam driven auxiliary feedwater pump or of the main steam piping to the pump.

III. **Basis for Alternative Frequency** - Testing these valves to close completely isolates the steam driven auxiliary feedwater pump from its source of steam. Failure of either valve to reopen will cause a complete loss of auxiliary feedwater for the loss of all AC power or station blackout accidents.

IV. **Proposed Alternative Frequency** - Full stroke exercise to the closed position in conjunction with cold shutdown, not to exceed once per quarter in the event of frequent cold shutdowns.

AF-03

I. **Affected Component(s)** - 1-FCV-1-147-A, 1-FCV-1-148-B, 1-FCV-1-149-A, 1-FCV-1-150-B (1-47W801-1)

II. **Function of Affected Component(s)** - Closes to interrupt loss of SG inventory through a ruptured main steam line and to provide flow boundary isolation between the seismically qualified and non-seismically qualified portions of the main steam system during the startup phase of plant operation when the valves are open to provide steam line warming.

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III. **Basis for Alternative Frequency** - The control circuitry for these valves has been modified to require the valves to be de-energized when unit startup is complete. The valves are then maintained in the de-energized and closed condition during power operation. This modification was made to alleviate 10CFR50 Appendix R fire interactions from causing the valves to come open in a spurious fashion. Since the only time period in which these valves serve an active function is during startup, it is not prudent to restore power to the valve and place the valve, which is normally maintained in its fail safe condition, in other than its safe condition.

IV. **Proposed Alternative Frequency** - Full stroke exercise to the closed position in conjunction with cold shutdowns, not to exceed once per quarter in the event of frequent cold shutdowns.

AF-04

I. **Affected Component(s)** - 1-FCV-72-40-A, 1-FCV-72-41-B (1-47W812-1)

II. **Function of Affected Component(s)** - Opens to admit RHR pump flow to the RHR Spray Headers

III. **Basis for Alternative Frequency** - These valves are electrically interlocked with containment sump valves 1-FCV-63-72-A and 1-FCV-63-73-B in such a manner that the sump valves must be opened to allow the spray valves to open. Opening the containment sump valves during operation requires either draining an extensive portion of the RHR system or allowing it to drain to the containment sump. Draining and refilling these lines requires a considerable amount of time and could extend forced outage duration. Allowing the affected piping to drain to the sump requires extensive cleanup time. Therefore testing during forced outages is not practical.

V. **Proposed Alternative Frequency** - Full stroke exercise to the open position during refueling outages.

AF-05

I. **Affected Component(s)** - 1-CKV-3-508, 1-CKV-3-509, 1-CKV-3-510, 1-CKV-3-511 (1-47W803-1)

II. **Function of Affected Component(s)** - Closes to interrupt main feedwater to prevent a rapid primary side cooldown in the event of a main steam line break and or to prevent loss of steam generator water inventory in the event of a break in the main feedwater line before the isolation valve.

III. **Basis for Alternative Frequency** - Exercising these valves during power operation causes a loss of feedwater to the Steam Generator they supply which in turn causes a steam generator level transient, either of which could result in unit trip and safety injection.

IV. **Proposed Alternative Frequency** - Full stroke exercise the CKVs to the closed position in conjunction with cold shutdowns, not to exceed once per quarter in the event of frequent cold shutdowns. Bi-directional open test is verified during normal operations.

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AF-06

I. **Affected Component(s)** - 1-FCV-3-33-A, 1-FCV-3-35, 1-FCV-3-35A, 1-FCV-3-47-B, 1-FCV-3-48, 1-FCV-3-48A, 1-FCV-3-87-A, 1-FCV-3-90, 1-FCV-3-90A, 1-FCV-3-100-B, 1-FCV-3-103, 1-FCV-3-103A, 1-FCV-3-236, 1-FCV-3-239, 1-FCV-3-242, 1-FCV-3-245 (1-47W803-1)

II. **Function of Affected Component(s)** - Closes to interrupt main feedwater to prevent a rapid primary side cool down in the event of a main steam line break and or to prevent loss of steam generator water inventory in the event of a break in the main feedwater line before the isolation valve.

III. **Basis for Alternative Frequency** - Exercising these valves during power operation causes a change of feedwater flow to the Steam Generator they supply which in turn causes a steam generator level transient, either of which could result in unit trip and safety injection. Stroke time testing of the FCVs is normally performed in MODE 3 during shutdown for a refueling when isolation of feedwater is performed. The test procedure is written to allow performance during MODEs 5 and/or 6, but performance in these modes requires extensive lifting/re-landing of permanent wiring and installation/removal of jumpers and test switches to allow testing of individual valves. MODEs 5 and 6 performance is only used for Post Maintenance Testing purposes on a valve-by-valve bases. Therefore, testing during forced outages is not practical.

IV. **Proposed Alternative Frequency** - Full stroke exercise and stroke time the FCVs to the closed position each refueling.

AF-07

I. **Affected Component(s)** - 1-CKV-3-805-A, 1-CKV-3-806-B, 1-CKV-3-810-S, 1-CKV-3-864-S (1-47W803-2)

II. **Function of Affected Component(s)** - Open to admit auxiliary feedwater to the steam generators during loss of main feedwater. Valves 1-CKV-3-805-A, 1-CKV-3-806-B and 1-CKV-3-810-S also close when the Condensate Storage Tank is exhausted to provide a flow boundary for ERCW going to the pump suction.

III. **Basis for Alternative Frequency** - Exercising these valves to their safeguard position requires operating the AFW pumps at full flow to the steam generators while the steam generators are pressurized. The resulting introduction of cold water into the steam generator will cause undesirable thermal fatigue cycles on the feedwater piping and SG feedwater nozzles and will cause level transients due to SG shrink that could result in unit trip and unnecessary actuation of the safety injection system. Testing the valves during return to power operation during mid-cycle shutdowns would delay startup of the plant because the test is performed in MODE 3 in order to flow to the steam generators at full steam generator pressure. Valves 1-CKV-3-805-A, 1-CKV-3-806-B and 1-CKV-3-810-S can be back-seated quarterly.

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IV. **Proposed Alternative Frequency** - Full stroke exercise the valves to the open position during refueling outages. Full stroke exercise valves 1-CKV-3-805-A, 1-CKV-3-806-B, and 1-CKV-3-810-S to the closed position quarterly.

AF-08

I. **Affected Component(s)** - 1-FCV-62-84-A

II. **Function of Affected Component(s)** – Valve 1-FCV-62-84-B closes to prevent the loss of reactor coolant system inventory through a break in the Code Class 2 piping behind it and opens to provide auxiliary spray during certain reactor transients.

III. **Basis for Alternative Frequency** - Exercising this valve during power operation results in initiation of auxiliary RCS spray. This causes a quenching effect on the pressurizer steam volume, resulting in a drop in RCS pressure and an increase in pressurizer level. Actuation of auxiliary spray flow also adversely impacts the fatigue evaluation, which accounts for and limits the number of thermal stress cycles to be experienced by the nozzles associated with auxiliary spray.

IV. **Proposed Alternative Frequency** - Full stroke exercise 1-FCV-62-84 in conjunction with cold shutdowns, not to exceed once per quarter in the event of frequent cold shutdowns.

AF-09

I. **Affected Component(s)** - 1-CKV-32-293, 1-CKV-32-303-A, 1-CKV-32-313-B, 1-FCV-32-80-A, 1-FCV-32-102-B, 1-FCV-32-110-A (1-47W848-1)

II. **Function of Affected Component(s)** - Closes to provide containment isolation

III. **Basis for Alternative Frequency** - Exercising these valves to the closed position interrupts the air supply to a number of critical instruments and valves inside containment. Failure of these valves to reopen could cause unstable operation and unit trip by allowing all of the valves and instruments to assume their failed condition.

IV. **Proposed Alternative Frequency** - Full stroke exercise to the closed position in conjunction with cold shutdowns, not to exceed once per quarter in the event of frequent cold shutdowns. Bi-directional open test of the check valves is verified during normal operations.

AF-10

I. **Affected Component(s)** - 1-CKV-61-658, 1-CKV-61-659, 1-CKV-61-660, 1-CKV-61-661, 1-CKV-61-662, 1-CKV-61-663, 1-CKV-61-664, 1-CKV-61-665, 1-CKV-61-666, 1-CKV-61-667, 1-CKV-61-668, 1-CKV-61-669, 1-CKV-61-670, 1-CKV-61-671, 1-CKV-61-672, 1-CKV-61-673, 1-CKV-61-674, 1-CKV-61-675, 1-CKV-61-676, 1-CKV-61-677 (1-47W814-2)

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II. **Function of Affected Component(s)** - Opens during ice melt portion of an accident to drain water into lower compartment to prevent water level in the ice storage compartment from interfering with the operation of the lower inlet doors.

III. **Basis for Alternative Frequency** - Valves are installed on the end of the ice condenser drains inside the biological shield in the lower compartment. Radiation levels in this area during operation prevent entry. The drains are located some distance from the floor, requiring the construction of scaffolding to reach. Therefore it is impractical to try to test the valves during a cold shutdown.

IV. **Proposed Alternative Frequency** - Full stroke exercise the valve open and closed manually during refueling outages.

AF-11

I. **Affected Component(s)** - 1-CKV-62-504-S, 1-CKV-62-525-A, 1-CKV-62-532-B (1-47W809-1) 1-CKV-63-510-S, 1-CKV-63-524-A, 1-CKV-63-526-B, 1-CKV-63-543-A, 1-CKV-63-545-A, 1-CKV-63-547-B, 1-CKV-63-549-B, 1-CKV-63-551-S, 1-CKV-63-553-S, 1-CKV-63-555-S, 1-CKV-63-557-S, 1-CKV-63-558-B, 1-CKV-63-559-B, 1-CKV-63-581-S, 1-CKV-63-586-S, 1-CKV-63-587-S, 1-CKV-63-588-S, 1-CKV-63-589-S (1-47W811-1)

II. **Function of Affected Component(s)** - Valves are part of the Emergency Core Cooling System (ECCS). Open to admit flow from the refueling water storage tank through their respective ECCS pumps to the reactor vessel during accidents involving loss of primary system inventory. Several of the valves also close to provide a flow boundary (i.e., prevent reverse flow through a shutdown pump or provide second isolation to RWST during recirculation phase operation).

III. **Basis for Alternative Frequency** - The centrifugal charging pumps cannot be run at full flow through their associated valves without causing undesirable RCS temperature and/or boron concentration changes resulting in changes in reactivity during operations which could result in a plant trip and subsequent safety injection actuation or causing undesirable thermal cyclic stresses which would eventually use all of the design basis for thermal cycles due to a Safety Injection. The safety injection pumps do not develop sufficient head to deliver to the reactor vessel during normal operation. Letdown capacity precludes testing during MODE 5 without compromising cold over pressure protection provisions. Full stroke exercising 1-CKV-62-504-S or 1-CKV-63-510-S to the closed position renders both trains of their respective systems inoperable.

IV. **Proposed Alternative Frequency** - Full stroke exercise to the open position at refueling. Full stroke exercise valves 1-CKV-62-504-S and 1-CKV-63-510-S to the closed position at refueling.

AF-12

I. **Affected Component(s)** - 1-FCV-67-123-B, 1-FCV-67-124-B, 1-FCV-67-125-A, 1-FCV-67-126-A (1-47W845-2)

II. **Function of Affected Component(s)** - Opens to allow ERCW flow to the Containment Spray [CS] Heat Exchangers. Valve is normally closed to provide a boundary between the river water in ERCW and the chemically treated water maintained in the CS Heat Exchangers as a corrosion inhibitor.

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III. **Basis for Alternative Frequency** - Opening these valves allows river water from ERCW to enter the heat exchangers. As a result, the lay-up water chemistry [such as chloride content] cannot be maintained without draining and refilling the heat exchangers followed by recirculating the water through a portable demineralizer.

IV. **Proposed Alternative Frequency** - Full stroke exercise to the open position in conjunction with cold shutdowns, not to exceed once per quarter in the event of frequent cold shutdowns.

AF-13

I. **Affected Component(s)** - 1-CKV-62-930 (1-47W809-2)

II. **Function of Affected Component(s)** - Opens to pass emergency boration flow to the CCP suction.

III. **Basis for Alternative Frequency** - Passing emergency boration flow through this valve during operation results in undesirable boration of the RCS. This could cause undesirable changes in rod position to compensate for the negative reactivity insertion. Testing during mid-cycle cold shutdown would also cause a negative reactivity insertion which could adversely affect the length of time required to dilute to an operating boron concentration or adversely impact the reactivity balance during shutdown conditions.

IV. **Proposed Alternative Frequency** - Full stroke exercise to the open position once per refueling cycle.

AF-14

I. **Affected Component(s)** - 1-FCV-62-61-B, 1-FCV-62-63-A (1-47W809-1)

II. **Function of Affected Components** - Closes to provide containment isolation.

III. **Basis for Alternative Frequency** - Exercising valves during operation would cause loss of seal water return to and potentially damage the reactor coolant pump seals, resulting in high seal losses with resultant maintenance, contamination and clean up problems.

IV. **Proposed Alternative Frequency** - Full stroke exercise to the closed position in conjunction with cold shutdowns, not to exceed once per quarter in the event of frequent cold shutdowns.

AF-15

I. **Affected Component(s)** - 1-FCV-62-69-S, 1-FCV-62-70-S, 1-FCV-62-77-B, 1-FCV-62-90-A, 1-FCV-62-91-B (1-47W809-1)

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II. **Function of Affected Components** - 1-FCV-62-69 and 1-FCV-62-70 close in response to a low pressurizer level, prior to receipt of a reactor trip to isolate the Code Class 2 piping behind them. 1-FCV-62-90-A and 1-FCV-62-91-B close to isolate the normal charging and letdown lines during a safety injection. 1-FCV-62-77-B closes to provide containment isolation.

III. **Basis for Alternative Frequency** - Exercising these valves to the position required to fulfill their safety function causes a loss of flow in either the charging or letdown portions of the Chemical and Volume Control System. As described in the Westinghouse letter to TVA, WAT-D-8347 (RIMS T33 911231 810), isolation of the charging and letdown lines during operation can result in a thermal transient at the charging nozzle of from 500 degrees F to 70 degrees F in a two to five minute period. This results in an increase in the fatigue usage factor beyond that assumed for the original design analysis of these systems.

IV. **Proposed Alternative Frequency** - Full stroke exercise the valves to the closed position in conjunction with cold shutdowns, not to exceed once per quarter in the event of frequent cold shutdowns.

AF-16

I. **Affected Component(s)** - 1-FCV-62-1228-A, 1-FCV-62-1229-B, 1-LCV-62-132-A, 1-LCV-62-133-B, 1-LCV-62-135-A, 1-LCV-62-136-B (1-47W809-1)

II. **Function of Affected Component(s)** - The LCVs change position to realign charging pump suction from the Volume Control Tank to the RWST during safety injection. The FCVs are normally open to vent hydrogen from the charging pump suction but change position to provide a flow boundary during safety injection.

III. **Basis for Alternative Frequency** - Cycling these valves during operation results in the charging pumps taking suction from the RWST for normal charging requirements. This will result in addition of borated water which has a different boron concentration than that in the reactor coolant system since the likelihood of both the RWST and the RCS being at the same boron concentration at the same time is very small. The change in boron concentration in the RCS caused by charging from the RWST during testing would cause unstable unit operation, especially if any of the valves fail to return to their normal position. The FCVs are electrically interlocked with the LCVs in such a manner that if they are stroked independently of the LCVs, position indication and consequently the ability to time the valves is lost.

IV. **Proposed Alternative Frequency** - Full stroke exercise 1-FCV-62-1228-A, 1-FCV-62-1229-B, 1-LCV-62-132-A and 1-LCV-62-133-B to the closed position and 1-LCV-62-135-A and 1-LCV-62-136-B to the open position in conjunction with cold shutdowns, not to exceed once per quarter in the event of frequent cold shutdowns.

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AF-17

I. **Affected Component(s)** - 1-FCV-74-1-A, 1-FCV-74-2-B, 1-FCV-74-8-A, 1-FCV-74-9-B (1-47W810-1)

II. **Function of Affected Component(s)** - Opens to provide decay heat removal for cooling to the cold shutdown condition.

III. **Basis for Alternative Frequency** - Exercising the valve during operation would result in over pressurizing the RHR piping, causing a loss of both trains of a safety system.

IV. **Proposed Alternative Frequency** - Full stroke exercise to the open position in conjunction with cold shutdowns, not to exceed once per quarter in the event of frequent cold shutdowns.

AF-18

I. **Affected Component(s)** - 1-CKV-63-502-S, 1-CKV-63-632-A, 1-CKV-63-633-B, 1-CKV-63-634-A, 1-CKV-63-635-B, 1-CKV-63-640-S, 1-CKV-63-641-S, 1-CKV-63-643-S, 1-CKV-63-644-S (1-47W811-1)
1-CKV-74-514-A, 1-CKV-74-515-B, 1-CKV-74-544-A, 1-CKV-74-545-B (1-47W810-1)

II. **Function of Affected Component(s)** - Opens to admit flow from the RHR pumps to the reactor during LOCA or post LOCA recovery. Valves 1-CKV-74-544-A and 1-CKV-74-545-B also close to prevent dead heading the weaker pump when at minimum flow (i.e., when RCS pressure is at or near the pressure available during minimum flow operation) during all modes except shutdown cooling. Valves 1-CKV-74-514-A and 1-CKV-74-515-B also close to prevent recirculation of RHR flow through a tripped pump during the shutdown cooling mode when both trains are in service.

III. **Basis for Alternative Frequency** - The RHR pumps do not develop sufficient head to open the valves during power operation. With the RHR pump suction being supplied from the normal loop 4 suction path during shutdown and discharging to a closed vessel, the pumps cannot develop sufficient flow to satisfy the full flow requirements for the check valves. In order to achieve full flow, the vessel must be open and the pump suction taken from the RWST. Valves 1-CKV-74-514-A and 1-CKV-74-515-B cannot be exposed to the pressure of a running RHR pump during plant operation without opening 1-HCV-74-36 and 1-HCV-74-37. Opening these valves or back-seating 1-CKV-63-502S adversely affects both trains of a safety system. Valves 1-CKV-74-544-A and 1-CKV-74-545-B can only be back seated during operation. While in shut down conditions, the valve alignments necessary to back-seat these valves adversely affects both trains of a safety system.

IV. **Proposed Alternative Frequency** - Full stroke exercise to the open position during refueling outages. Full stroke exercise 1-CKV-74-544-A and 1-CKV-74-545-B to the closed position quarterly during operation. Full stroke exercise 1-CKV-63-502-S to the closed position in conjunction with cold shutdowns, not to exceed once per quarter in the event of frequent cold shutdowns. Full stroke exercise 1-CKV-74-514-A and 1-CKV-74-515-B to the closed position during refueling outages.

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AF-19

I. **Affected Component(s)** - 1-FCV-63-1-A, 1-FCV-63-5-B (1-47W811-1)

II. **Function of Affected Component(s)** - Closes when the associated pump suction (either RHR or SIS) is transferred from the RWST to the containment sump following a LOCA.

III. **Basis for Alternative Frequency** - Exercising valve during operation results in losing suction from RWST to both trains of a safety system. If valve fails to reopen both trains of the affected safety system would be made inoperable.

IV. **Proposed Alternative Frequency** - Full stroke exercise to the closed position in conjunction with cold shutdowns, not to exceed once per quarter in the event of frequent cold shutdowns.

AF-20

I. **Affected Component(s)** - 1-FCV-63-3-A (1-47W811-1)

II. **Function of Affected Component(s)** - Valve is closed to prevent flow to the RWST during the recirculation phase of a LOCA.

III. **Basis for Alternative Frequency** - Exercising valve during operation results in isolating the recirculation line to both trains of safety injection pumps. Failure of the valve to reopen would make both trains of a safety system inoperable.

IV. **Proposed Alternative Frequency** - Full stroke exercise to the closed position in conjunction with cold shutdowns, not to exceed once per quarter in the event of frequent cold shutdowns.

AF-21

I. **Affected Component(s)** - 1-FCV-63-8-A, 1-FCV-63-11-B (1-47W811-1)

II. **Function of Affected Component(s)** - Opened to establish suction flow path from the RHR pumps to safety injection and/or centrifugal charging pumps during the recirculation phase of a LOCA.

III. **Basis for Alternative Frequency** - Both valves are electrically interlocked with the safety injection pump recirculation isolation valves 1-FCV-63-3-A, 1-FCV-63-4-B and 1-FCV-63-175-B in such a manner that both trains of the Safety Injection System will have their minimum flow recirculation path isolated to cycle either valve. Isolation of these recirculation paths adversely affects both trains of a safety system and could cause failure of both trains. Additionally, the valves are interlocked with the containment sump suction valves in such a manner that they must be fully open to allow these valves to operate. Opening the containment sump valves during operation requires either draining an extensive portion of the RHR system or allowing it to drain to the containment sump. Draining and refilling these lines requires a considerable amount of time and could extend forced outage duration. Allowing the affected piping to drain to the sump requires extensive cleanup time. Therefore testing during forced outages is not practical.[See also AF-25]

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IV. **Proposed Alternative Frequency** - Full stroke exercise to the open position during refueling outages.

AF-22

I. **Affected Component(s)** - 1-FCV-63-22-B (1-47W811-1)

II. **Function of Affected Component(s)** - Closed when safety injection pumps are placed on hot leg recirculation after a LOCA.

III. **Basis for Alternative Frequency** - Exercising valve during operation isolates both trains of safety injection from their normal flow path to the cold legs. Failure of the valve to reopen results in total loss of system function.

IV. **Proposed Alternative Frequency** - Full stroke exercise to the closed position in conjunction with cold shutdowns, not to exceed once per quarter in the event of frequent cold shutdowns.

AF-23

I. **Affected Component(s)** - 1-FCV-63-25-B, 1-FCV-63-26-A (1-47W811-1)

II. **Function of Affected Component(s)** - Valves are part of the Emergency Core Cooling System (ECCS) and open to admit flow from the centrifugal charging pumps to the reactor vessel during accidents involving loss of primary system pressure.

III. **Basis for Alternative Frequency** - Charging header pressure during normal operation exceeds the pressure downstream of the check valves associated with these FCVs. If the FCVs are opened for testing, the pressure in the charging header will initiate flow through the high head safety injection system piping. This will:

1. Cause pressurizer level transients, due to the additional water being added to the RCS, which will cause unstable operation and may result in unit trip and subsequent initiation of the entire safety injection system.

2. Cause a thermal stress transient in the associated piping which will have to be counted as one of the limited number of safety injection system actuations permitted during the design life of the plant.

IV. **Proposed Alternative Frequency** - Full stroke exercise to the open position in conjunction with cold shutdowns, but not more often than once per quarter in the event of frequent cold shutdowns.

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AF-24

I. **Affected Component(s)** - 1-FCV-63-67-B, 1-FCV-63-80-A, 1-FCV-63-98-B, 1-FCV-63-118-A (1-47W811-1)

II. **Function of Affected Component(s)** - Valves are normally open and allow the cold leg accumulators to function as a passive component. However, during accidents which do not involve loss of primary system integrity, the valves must close to isolate the cold leg accumulators from the RCS so that the RCS can be depressurized to the RHR cut-in pressure for continued cool down to the cold shutdown condition without discharging the cold leg accumulators.

III. **Basis for Alternative Frequency** - WBN is not analyzed for operation with a Cold Leg Accumulator isolated. Thus, closing any one of these valves during power operation results in placing the plant in an unanalyzed condition. This test can only be performed in a very narrow window, as RCS pressure nears 1000 psig. This condition occurs during the startup and shutdown sequence and cannot be duplicated in MODE 5 [Cold Shutdown] without discharging the associated Cold Leg Accumulator to the Reactor Coolant System. At the time the valves would be available for testing during non-RFO related, forced shutdowns, the plant is either in the process of shutting down to allow repairs to be made or of returning to power operation.

IV. **Proposed Alternative Frequency** - Full stroke exercise and stroke time to the closed position each refueling outage.

AF-25

I. **Affected Component(s)** - 1-FCV-63-72-A, 1-FCV-63-73-B (1-47W811-1)
1-FCV-72-44-A, 1-FCV-72-45-B (1-47W812-1)

II. **Function of Affected Component(s)** - Opens to allow safety related systems to take suction from containment sump.

III. **Basis for Alternative Frequency** - Opening the containment sump isolation valves during operation requires either draining an extensive portion of the RHR and CS systems or allowing it to drain to the containment sump. Draining and refilling these lines requires a considerable amount of time and could extend forced outage duration. Allowing the affected piping to drain to the sump requires extensive cleanup time. Therefore testing during forced outages is not practical. [See also AF-22]

IV. **Proposed Alternative Frequency** - Full stroke exercise to the open position each refueling outage.

AF-26

I. **Affected Component(s)** - 1-FCV-63-93-A, 1-FCV-63-94-B, 1-FCV-63-172-B (1-47W811-1)
1-FCV-74-33-A, 1-FCV-74-35-B (1-47W810-1)

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II. **Function of Affected Component(s)** - All except 1-FCV-63-172-B are open during ECCS injection mode to allow either train of RHR to provide injection flow to all four RHR injection lines. The valves are closed to establish the flow boundary during the hot leg recirculation phase of a LOCA. 1-FCV-63-172B is normally closed and remains closed during the injection phase of a LOCA but opens to initiate hot leg recirculation.

III. **Basis for Alternative Frequency** - Closing any one of the four normally open valves causes operation in an unanalyzed condition by isolating two of the four cold legs from the RHR pumps. Opening 1-FCV-63-172-B would require closure of 1-FCV-74-33-A and 1-FCV-63-35-B to avoid having RHR aligned to hot leg injection and cold leg injection simultaneously. Since these valves cannot be closed without affecting both trains of RHR, 1-FCV-63-172-B cannot be opened.

IV. **Proposed Alternative Frequency** - Full stroke exercise 1-FCV-63-93-A, 1-FCV-63-94-B, 1-FCV-74-33-A, and 1-FCV-74-35-B to the closed position and 1-FCV-63-172-B to the open position in conjunction with cold shutdowns, not to exceed once per quarter in the event of frequent cold shutdowns.

AF-27

I. **Affected Component(s)** - 1-CKV-81-502 (1-47W819-1)

II. **Function of Affected Component(s)** - Closes to provide Containment Isolation

III. **Basis for Alternative Frequency** - Cycling this valve results in loss of primary water to the RCP stand pipes and PRT. Also this valve is physically located in the number 4 accumulator room in the reactor building. Access to this area will be limited during operation due to radiation exposures.

IV. **Proposed Alternative Frequency** - Full stroke exercise to the closed position in conjunction with cold shutdowns, not to exceed once per quarter in the event of frequent cold shutdowns.

AF-28

I. **Affected Component(s)** - 1-FSV-68-394-A, 1-FSV-68-395-B, 1-FSV-68-396-B, 1-FSV-68-397-A, (1-47W813-1)

II. **Function of Affected Component(s)** - These FSVs open to provide a reactor head vent and close to terminate a reactor head vent.

III. **Basis for Alternative Frequency** - These valves are solenoid to open and spring to close. With any single valve open for stroke time testing, the remaining valves are required to seat against full RCS pressure upstream with the downstream pressure at Pressurizer Relief Tank pressure. If the valves that remain closed are not well seated, stroking of a single valve to the open position while at power could result in leakage from the RCS in excess of the TS limits or depressurization of the RCS. Failure of any single valve to reclose would leave a single valve to prevent leakage from the RCS.

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IV. **Proposed Alternative Frequency** - Full stroke exercise to the open position in conjunction with cold shutdowns, not to exceed once per quarter in the event of frequent cold shutdowns.

AF-29

I. **Affected Component(s)** - 1-FCV-67-83-A, 1-FCV-67-87-A, 1-FCV-67-88-B, 1-FCV-67-89-B, 1-FCV-67-91-A, 1-FCV-67-95-A, 1-FCV-67-96-B, 1-FCV-67-97-B, 1-FCV-67-99-A, 1-FCV-67-103-B, 1-FCV-67-104-A, 1-FCV-67-105-A, 1-FCV-67-107-A, 1-FCV-67-111-B, 1-FCV-67-112-A, 1-FCV-67-113-A (1-47W845-3)
1-CKV-70-679, 1-FCV-70-87-B, 1-FCV-70-89-B, 1-FCV-70-90-A, 1-FCV-70-92-A, 1-FCV-70-100-A, 1-FCV-70-133-A, 1-FCV-70-134-B, 1-FCV-70-140-B (1-47W859-2)

II. **Function of Affected Component(s)** - 1-FCV-70-133-A closes to provide a second train of isolation to interrupt a potential source of dilution water to the containment sump. The remaining valves are containment isolation valves.

III. **Basis for Alternative Frequency** - Exercising these valves during operation causes a loss of flow to the associated equipment (Lower Compartment Coolers, Control Rod Drive Mechanism Coolers, Reactor Coolant Pump [RCP] Motor Coolers, RCP oil coolers, and/or RCP Thermal Barrier Coolers). In many cases [i.e., RCP Pump Oil Coolers or RCP Thermal Barrier Coolers] loss of flow to the associated equipment for even a brief period of time could easily result in failure of the associated equipment, unit trip, and potentially even a safety injection. Failure of the remaining valves to reopen would cause a sustained loss of flow to the associated equipment and would result in the same consequences.

IV. **Proposed Alternative Frequency** - Full stroke exercise the valves to the closed position in conjunction with cold shutdowns, not to exceed once per quarter in the event of frequent cold shutdowns.

AF-30

I. **Affected Component(s)** - 1-CKV-68-849, 1-CKV-63-868 (1-47W830-6)

II. **Function of Affected Component(s)** - Closes to provide Containment Isolation

III. **Basis for Alternative Frequency** - Cycling these valves during power operation interrupts the nitrogen supply inside containment to a number of components and systems. Additionally personnel radiation exposure and valve inaccessibility prohibit quarterly exercising of these valves.

IV. **Proposed Alternative Frequency** - Full stroke exercise to the closed position in conjunction with cold shutdowns, not to exceed once per quarter in the event of frequent cold shutdowns.

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REQUESTS FOR RELIEF

Tennessee Valley Authority
Watts Bar Nuclear Plant, Unit 1
Second 10-Year Interval
Request for Relief Number PV-01

I. Systems/Components For Which Relief Is Requested

Affected components are identified by their Unique Identification Number (UNID) in Table P-1.

II. Code Requirements

ASME OM Code, ISTB-3300(a), "Initial reference values shall be determined from the results of testing meeting the requirements of ISTB-3100, Preservice Testing, or from the results of the first inservice test." The ASME OM Code of Record for the Second Inservice Interval is 2001 Edition with Addenda through 2003.

III. Code Requirement From Which Relief Is Requested

Relief is being requested from establishing reference values solely on the basis of the data collected during preservice or inservice testing for those vibration points that have unusually low levels of vibration. This request applies only to reference values associated with vibration testing.

IV. Basis for Relief

The pumps listed in Table P-1 have at least one vibration reference value (V_R) that is currently less than 0.05 inches per second (ips). Small values for V_R produce small acceptable ranges for pump operation. The acceptable ranges are defined in Tables ISTB-5100-1 and ISTB-5200-1, as less than or equal to $2.5V_R$. Based on a small acceptable range, a smooth running pump could be subject to unnecessary corrective action caused by numerically small changes in vibration levels.

For very small reference values, hydraulic noise and instrument error can be a significant portion of the reading and affect the repeatability of subsequent measurements. Also, experience gathered from the preventive maintenance program has shown that changes in vibration levels in the range of 0.05 ips do not normally indicate significant degradation in pump performance.

To avoid unnecessary corrective action, a minimum value for V_R of 0.05 ips has been established for velocity measurements. This minimum value will be applied to individual vibration locations for the pumps listed in Table P-1 where the measured reference value is less than 0.05 ips.

When new reference values are established per ISTB-3310, ISTB-3320 or ISTB-6200(c), the measured parameters will be evaluated for each location to determine if the provisions of this relief request still apply. If the measured V_R is greater than 0.05 ips, the requirements of ISTB-3300 will be applied even if the pump is listed in Table P-1. Conversely, if the measured V_R is less than 0.05 ips, a minimum value of 0.05 ips will be used for V_R even if the pump is not currently listed in Table P-1.

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In addition to the requirements of ISTB, the pumps in the ASME Inservice Testing Program are included in the Predictive Maintenance Program. The Predictive Maintenance Program currently employs the following predictive monitoring techniques on an as applicable and as needed basis:

1. vibration monitoring and analysis beyond that required by ISTB,
2. oil sampling and analysis, and
3. thermographic analysis.

Bearing temperature trending is available for some components through the plant process computer system.

If the measured parameters are discovered to be outside the normal operating range or to be trending toward an unacceptable degraded state, appropriate actions are taken that may include:

1. increased monitoring to establish rate of change,
2. review of component specific information to identify cause, and
3. removal of the pump from service to perform maintenance.

It should be noted that all of the pumps in the IST Program will remain in the Predictive Maintenance Program even if certain pumps have very low vibration readings and are considered to be smooth running pumps. This alternative to the requirements of ISTB-3300 provides an acceptable level of quality and safety.

V. Alternative Examinations

Pumps with a measured reference value below 0.05 ips for a particular vibration measurement location shall have subsequent test results for that location compared to an acceptable range based on 0.05 ips. In addition to the Code requirements, all pumps in the IST Program are included in and will remain in the Predictive Maintenance Program regardless of their smooth running status.

VI. Justification for the Granting of Relief

Using the provisions of this relief request as an alternative to the specific requirements of ISTB-3300 identified above will provide adequate indication of pump performance and continue to provide an acceptable level of quality and safety. Therefore, pursuant to 10 CFR 50.55a(a)(3)(i) we request relief from the specific ISTB Code requirements identified in this relief request.

This relief request was approved for the First Ten Year Interval using 0.10 as a minimum instead of 0.05. Change to 0.05 is more conservative and consistent with the industry.

VII. Implementation Schedule

Relief is requested for the Second Inservice Interval, which is described in Section 1.0 of the Program Description.

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Table P-1

Pump UNID Number	Vibration Points	System	**Code Class**	OM Group	Description
0-PMP-67-28-A 0-PMP-67-32-A 0-PMP-67-36-A 0-PMP-67-40-A 0-PMP-67-47-B 0-PMP-67-51-B 0-PMP-67-55-B 0-PMP-67-59-B	A-A, B-H, B-V A-A, B-H, B-V A-A, B-V All All but A-H All but A-H All but B-V A-A, B-H	ERCW	3	A	Essential Raw Cooling Water Pumps
1-PMP-67-431-A 1-PMP-67-440-B 2-PMP-67-437-A 2-PMP-67-447-B	All A-A, B-H, B-V All All	ERCW	3	A	ERCW Screen Wash Pumps
1-PMP-70-46-A 1-PMP-70-38-A 0-PMP-70-51-S	All All All	Component Cooling	3	A	Component Cooling Pumps
0-PMP-31-80-A 0-PMP-31-96A-B	All but B-V All	Chilled Water	3	A	Main Control Room Chilled Water Pumps
0-PMP-31-128/1-A 0-PMP-31-129/1-B	A-V, B-V, B-A All	Chilled Water	3	A	Electric Board Room Chilled Water Pumps
0-PMP-31-36/1-A 0-PMP-31-49/1-B	B-V. B-A A-V, B-H, B-A	Chilled Water	3	A	Shutdown Board Room Chilled Water Pumps
1-PMP-62-230-A 1-PMP-62-232-B	All but B-V A-H, A-A, B-H	Chemical and Volume Control	3	A	Boric Acid Transfer Pumps
1-PMP-63-10-A 1-PMP-63-15-B	All A-H	Safety Injection	2	A	Safety Injection Pump

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Tennessee Valley Authority
Watts Bar Nuclear Plant, Unit 1
Second 10-Year Interval
Request for Relief Number PV-02

I. Systems/Components For Which Relief Is Requested

ERCW Screen Wash Pumps (1-PMP-67-431-A, 1-PMP-67-440-B, 2-PMP-67-437-A, 2-PMP-67-447-B) (1-47W845-1)

II. Code Requirement

ASME OM Code, ISTB-5121(b), "The resistance of the system shall be varied until the flow rate equals the reference point. The differential pressure shall then be determined and compared to its reference value. Alternatively, the flow rate shall be varied until the differential pressure equals the reference point and the flow rate determined and compared to the reference flow rate value." The ASME OM Code of Record for the Second Inservice Interval is 2001 Edition with Addenda through 2003.

III. Code Requirement From Which Relief Is Requested

Relief is being requested from measuring the pump flow rate during Inservice Testing of the Screen Wash Pumps.

IV. Basis for Relief

No in-line instrumentation exists to measure flow and the physical configuration of the pump and piping does not allow the use of portable flow measuring equipment such as ultrasonics. Piping from the discharge of the screen wash pumps is open-ended to the spray nozzles at the traveling screen and is relatively short with multiple elbows, reducers, and valves in different planes. The physical configuration of this piping system is such that no portion of the piping meets the requirements for adequate installation of a permanent flow measuring device. Therefore, measured flow readings from an installed device may not be repeatable nor representative of actual pump flow. Significant system modifications, such as piping rerouting and support redesign, would be required to obtain a configuration that would provide reliable flow readings.

Flow is not the critical parameter for these pumps. The nature of their operation is to ensure that sufficient pressure is maintained at the spray nozzles during flushing operations of the traveling water screens to ensure that sufficient force is exerted on the debris accumulated on the screen to remove it. This can be verified by verifying the effectiveness of the flushing operation.

V. Alternative Examinations

Verify that the flow delivered through the spray nozzles in the traveling water screens provides coverage of the screen spray area and adequately flushes away debris present on the screen. Pressure and vibration data for the pumps will be collected and analyzed in accordance with ISTB.

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The pumps will be tested in this manner for both the quarterly Group A test and the biennial Comprehensive test.

VI. Justification for the Granting of Relief

Based upon the above discussion, the alternative test provides an acceptable level of quality and safety. Authorization to implement the proposed alternative is requested in accordance with 10CFR50.55a(3)(i).

This relief request was approved for the First Ten Year Interval.

VII. Implementation Schedule

Relief is requested for the Second Inservice Interval, which is described in Section 1.0 of the Program Description.

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Tennessee Valley Authority
Watts Bar Nuclear Plant, Unit 1
Second 10-Year Interval
Request for Relief Number PV-03

I. Systems/Components For Which Relief Is Requested

1-FSV-68-396-B, 1-FSV-68-397-A (1-47W813-1)

II. Code Requirement

ASME OM Code, ISTC-151(a), "Active valves shall have their stroke times measure when exercised in accordance with ISTC-3500."

ASME OM Code, ISTC-5151(b), "The limiting value of full stroke time of each valve shall be specified by the Owner."

ASME OM Code, ISTC-5151(c), "Stroke time shall be measured to at least the nearest second."

The ASME OM Code of Record for the Second Inservice Interval is 2001 Edition with Addenda through 2003.

III. *Code Requirement From Which Relief Is Requested*

Relief is being requested from measuring and assessing the stroke time of the Reactor Coolant System Head Vent throttle valves.

IV. Basis for Relief

The Reactor Coolant System Head Vent throttle valves are throttled open manually by Main Control Room operator action to (1) provide a reactor vessel head vent path; (2) vent non-condensables from the head during an accident to promote natural circulation; and (3) prevent gases from impeding reactor coolant circulation flow through the core. These valves are totally enclosed [seal welded bonnet], one-inch Target Rock solenoid valves, with thumb wheel actuated controllers that permit remote positioning of the valves. Valve opening and closing speed, and consequently valve opening and closing stroke time, is controlled by the rate at which the thumbwheel controller is moved, not upon valve condition. Design requirements impose a minimum stroke time limitation on these valves of not faster than 5 seconds. Restricting the stroke time to not less than 5 seconds effectively prohibits stroke timing the valve because the valve is capable of stroking considerably faster than the 5 second limit. Even if the 5 second limit did not exist, stroke timing of the valve using its thumb-wheel actuated controller would result in timing the ability of the operator to turn the thumb-wheel and not the ability of the valve to move.

An enhanced maintenance program of disassembly and inspection of valve internal parts was evaluated. This method was not considered appropriate for the following reasons:

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[1] Frequent disassembly can lead to distortion of the valve parts caused by the repetitive welding process to reinstall the seal weld. This distortion could cause unacceptable operational seat leakage, binding of internal parts, and other operational problems.

[2] The physical appearance of the internal parts does not always provide clear and evident verification of acceptable valve operation.

V. Alternative Examinations

TVA proposes to utilize an enhanced maintenance program based on the following attributes:

[1] Periodic replacement of critical valve parts [i.e., the linear voltage differential transformer (LVDT) that provides valve position indication feedback, the coil that operates the valve, and the valve's electrical terminal board] is in accordance with TVA's environmental qualification binder for the valve. The current schedule for valve part replacement is every 132 months for the LVDT, every 294 months for the coil, and every 432 months for the valve terminal board.

[2] Calibration of the valve's position control system is performed each refueling outage. This calibration involves utilizing the valve controller to position the valve at various positions and utilizing the LVDT to determine the valve stem position. These are compared to ensure valve operation is as expected.

In addition to the enhanced maintenance program, tests will be conducted as follows to provide positive verification of the valve's ability to fulfill its specific function:

[1] Full stroke exercise of each valve is performed during shutdowns. This test consists of cycling the valve controller through one complete cycle and verifying [using the valve position indicator operated by the LVDT attached to the valve stem] that the valve cycles through one full cycle in response to the valve controller.

[2] During refueling outages, in addition to cycling the controller through one complete cycle and using the valve position indicator to verify valve travel, supplement the verification of valve travel by (a) ensuring no detectable flow is present through the valves with the valves closed, (b) ensuring that with each valve open flow is present, and (c) ensuring that when each valve is returned to the closed position no detectable flow is present. The presence or absence of flow is verified by monitoring a change in a process perimeter either the valve tail pipe temperature for an increase/decrease or the pressurizer relief tank [to which the valves discharge] for a temperature increase/decrease or level increase/no change. This additional verification which is consistent with ISTC-3520, Valve Obturator Movement, ensures the valve disk is still attached to the stem and is capable of controlling flow.

VI. Justification for the Granting of Relief

Based upon the above discussion, the alternative test provides an acceptable level of quality and safety. Authorization to implement the proposed alternative is requested in accordance with 10CFR50.55a(3)(i).

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This relief request was approved for the First Ten Year Interval.

VII. Implementation Schedule

Relief is requested for the Second Inservice Interval, which is described in Section 1.0 of the Program Description.

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Tennessee Valley Authority
Watts Bar Nuclear Plant, Unit 1
Second 10-Year Interval
Request for Relief Number PV-04

I. Systems/Components For Which Relief Is Requested

0-FSV-67-1221-A (1-47W845-4) 0-FSV-67-1223-B (1-47W845-7)

II. Code Requirement

ASME OM Code, ISTC-151(a), "Active valves shall have their stroke times measure when exercised in accordance with ISTC-3500."

ASME OM Code, ISTC-5151(b), "The limiting value of full stroke time of each valve shall be specified by the Owner."

ASME OM Code, ISTC-5151(c), "Stroke time shall be measured to at least the nearest second."

The ASME OM Code of Record for the Second Inservice Interval is 2001 Edition with Addenda through 2003.

III. Code Requirement From Which Relief Is Requested

Relief is being requested from measuring and assessing the stroke time of the ERCW isolation valves to the Auxiliary Air Compressors.

IV. Basis for Relief

These solenoid valves are mounted on the auxiliary air compressor skid. They are totally enclosed, solenoid actuated valves manufactured by Target Rock and have no remote position indication capability. The inability to see any moving parts of the valve combined with the lack of remote position indication capability prevents visual confirmation of valve position, thus preventing direct measurement of the stroke time of the valve.

Additionally, the air compressors have a thermostatic valve, installed in series with these solenoid valves, that modulates in response to system temperature. The thermostatic valve does not start opening until air compressor temperatures are elevated. Until air compressor temperatures have risen sufficiently to open the thermostat, no cooling water flow exists to the compressor, even though the solenoid valves are open. Although a flow element is provided in the cooling water line, the presence of the thermostatic valve prevents use of the onset of flow as an indirect indication of solenoid valve stroke time.

As discussed in NUREG-1482 Rev 1," Guidelines for Inservice Testing at Nuclear Power Plants," Section 3.4, "Skid-Mounted Components and Component Subassemblies," when an individual component cannot be tested to the requirements of the ISTC, testing of the larger component [in this case, the auxiliary air compressor] ensures that the subcomponent is functioning properly. Demonstration of the ability of the auxiliary air compressors to operate without overheating will

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provide an adequate means for assuring operational readiness of cooling water supply valves 0-FSV-67-1221-A and 0-FSV-67-1223-B.

V. Alternative Examinations

Exercise the valves to the open position quarterly by operating the auxiliary air compressor and observing the discharge air and jacket water temperatures during compressor operation to ensure the temperatures are maintained at acceptable levels. This verifies that the cooling water supply solenoid valves operate to supply ERCW cooling water to the auxiliary air compressors.

VI. Justification for the Granting of Relief

Based upon the above discussion, the alternative test provides an acceptable level of quality and safety. Authorization to implement the proposed alternative is requested in accordance with 10CFR50.55a(3)(i).

This relief request was approved for the first ten year interval.

VII. Implementation Schedule

Relief is requested for the Second Inservice Interval, which is described in Section 1.0 of the Program Description.

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Relief Valve Groups

Class 1			
Test Group 1 - Pressurizer Safety Valves			
1-RFV-68-563	1-RFV-68-564	1-RFV-68-565	
Class 2 Valves Tested to Class 1 Requirements			
Main Steam Safety Valves (MSSVs)			
1-SFV-1-512	1-SFV-1-517	1-SFV-1-522	1-SFV-1-527
1-SFV-1-513	1-SFV-1-518	1-SFV-1-523	1-SFV-1-528
1-SFV-1-514	1-SFV-1-519	1-SFV-1-524	1-SFV-1-529
1-SFV-1-515	1-SFV-1-520	1-SFV-1-525	1-SFV-1-530
1-SFV-1-516	1-SFV-1-521	1-SFV-1-526	1-SFV-1-531
Class 2 and 3			
Test Group 2			
1-RFV-70-551A	1-RFV-70-551B	1-RFV-70-835	1-RFV-77-2875
Test Group 3			
1-RFV-63-602	1-RFV-63-603	1-RFV-63-604	1-RFV-63-605
Test Group 4			
1-RFV-62-636	1-RFV-62-675	1-RFV-62-626-A	
1-RFV-62-649	1-RFV-62-955	1-RFV-63-627-B	
1-RFV-62-662	2-RFV-62-955	1-RFV-74-505	
Test Group 5			
0-RFV-67-671	0-RFV-67-672	1-RFV-70-556A	
Test Group 6			
1-RFV-62-505-S	1-RFV-63-28	1-RFV-63-535-S	1-RFV-63-637-S
1-RFV-62-1221	1-RFV-63-511	1-RFV-63-536-B	1-RFV-63-835
1-RFV-62-1222	1-RFV-63-534-A	1-RFV-63-577	1-RFV-72-508-A
1-RFV-72-509-B			
Test Group 7			
1-RFV-70-538	1-RFV-70-703		
Test Group 8			
1-RFV-70-556B	1-RFV-70-565A	1-RFV-70-565B	
Test Group 9			
1-RFV-62-1079	2-RFV-62-1079	1-RFV-70-539	

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Test Group 10			
0-RFV-31-2623		0-RFV-31-2665	
Test Group 11			
0-RFV-31-2210	0-RFV-31-2252	0-RFV-31-2326	0-RFV-31-2383
Test Group 12			
1-RFV-67-539A	1-RFV-67-539B	1-RFV-70-578	
1-RFV-72-40		1-RFV-72-41	

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Pressure Isolation Valve Listing

1-CKV-63-543, HOT LEG 1 SAFETY INJECTION SECONDARY CHECK.
1-CKV-63-545, HOT LEG 3 SAFETY INJECTION SECONDARY CHECK.
1-CKV-63-547, HOT LEG 2 SAFETY INJECTION SECONDARY CHECK.
1-CKV-63-549, HOT LEG 4 SAFETY INJECTION SECONDARY CHECK.
1-CKV-63-551, COLD LEG 1 SAFETY INJECTION SECONDARY CHECK.
1-CKV-63-553, COLD LEG 2 SAFETY INJECTION SECONDARY CHECK.
1-CKV-63-555, COLD LEG 3 SAFETY INJECTION SECONDARY CHECK.
1-CKV-63-557, COLD LEG 4 SAFETY INJECTION SECONDARY CHECK.

1-CKV-63-581, BORON INJECTION LINE CHECK.

1-CKV-63-561, COLD LEG 2 INJECTION HEADER CHECK
1-CKV-63-562, COLD LEG 3 INJECTION HEADER CHECK
1-CKV-63-632, COLD LEG 2 INJECTION HEADER CHECK
1-CKV-63-634, COLD LEG 3 INJECTION HEADER CHECK
1-CKV-63-560, COLD LEG 1 INJECTION HEADER CHECK
1-CKV-63-563, COLD LEG 4 INJECTION HEADER CHECK
1-CKV-63-633, COLD LEG 1 INJECTION HEADER CHECK
1-CKV-63-635, COLD LEG 4 INJECTION HEADER CHECK

1-CKV-63-640, HOT LEG 4 RHR INJECTION SECONDARY CHECK.
1-CKV-63-643, HOT LEG 2 RHR INJECTION SECONDARY CHECK.

1-CKV-63-558, HOT LEG 4 SAFETY INJECTION PRIMARY CHECK.
1-CKV-63-559, HOT LEG 2 SAFETY INJECTION PRIMARY CHECK.
1-CKV-63-586, COLD LEG 1 BORON INJECTION PRIMARY CHECK.
1-CKV-63-587, COLD LEG 2 BORON INJECTION PRIMARY CHECK.
1-CKV-63-588, COLD LEG 3 BORON INJECTION PRIMARY CHECK.
1-CKV-63-589, COLD LEG 4 BORON INJECTION PRIMARY CHECK.
1-CKV-63-640, HOT LEG 1 RHR INJECTION SECONDARY CHECK.
1-CKV-63-644, HOT LEG 3 SIS/RHR INJECTION PRIMARY CHECK.

1-CKV-63-622, ACCUMULATOR 1 OUTLET CHECK.
1-CKV-63-623, ACCUMULATOR 2 OUTLET CHECK.
1-CKV-63-624, ACCUMULATOR 3 OUTLET CHECK.
1-CKV-63-625, ACCUMULATOR 4 OUTLET CHECK

1-FCV-74-1, LOOP 4 HOT LEG TO RHR SUCTION
1-FCV-74-2, LOOP 4 HOT LEG TO RHR SUCTION
1-FCV-74-8, 1-FCV-74-2 BYPASS RHR SUCTION
1-FCV-74-9, 1-FCV-74-1 BYPASS RHR SUCTION

Appendix E
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Editorial Errors in the 2003 Addenda

2003 Paragraph	Reference	2005 Paragraph	Reference	Comments
ISTB-9200	ISTA-3120	ISTB-9200	ISTA-3110	ISTB-9200 contains requirements for records keeping. The reference in the 2003 Code is to a paragraph dealing with establishing the Inservice Interval. The correct reference is to ISTA-3110 which does address records keeping requirements.
ISTB-9200	ISTA-3170	ISTB-9200	ISTA-3160	The referenced paragraph in the 2003 Code does not exist. The correct reference is to ISTA-3160
Table ISTC-3500-1, Note 1	ISTC-3500	Table ISTC-3500-1, Note 1	ISTC-3560	Note 1 addresses requirements for fail safe actuator testing, which are contained in ISTC-3560 as referenced by the 2005 Code rather than ISTC-3500 as referenced by the 2003 Code..
ISTC-3510	ISTC-3560	ISTC-3510	ISTC-3570	ISTC-3510 addresses valve exercising frequency requirements and contains a list of exceptions. ISTC-3560, as referenced in the 2003 Code, deals with testing requirements for fail safe actuators, not exercising frequency requirements. The correct reference is to ISTC-3570, as contained in the 2005 Code.
ISTC-3620	10CFR50 Nonmandatory Appendix J	ISTC-3620	10CFR50 Appendix J	ISTC-3620 discusses leak testing requirements. The 2003 Code refers to 10CFR50 Nonmandatory Appendix J, which is incorrect. The reference should be to 10CFR50 Appendix J. Nonmandatory Appendix J in the 2003 Code discusses post maintenance check valve testing, not containment leak rate testing.
ISTC-3630	10CFR50 Nonmandatory Appendix J	ISTC-3630	10CFR50 Appendix J	ISTC-3630 discusses leak testing requirements. The 2003 Code refers to 10CFR50 Nonmandatory Appendix J, which is incorrect. The reference should be to 10CFR50 Appendix J. Nonmandatory Appendix J in the 2003 Code discusses post maintenance check valve testing, not containment leak rate testing.
ISTC-3630(b)(4)	"valve"	ISTC-3630(b)(4)	"value"	The 2003 Code contains a misspelled word that was corrected in the 2005 Code.
ISTC-5114(c)	ISTC-5115(b)	ISTC-5114(c)	ISTC-5114(b)	ISTC-5114(c) establishes an exemption for fast acting power operated relief valves. The exemption in the 2003 Code is not consistent with the exemption for other type valves. As written in the 2003 Code, fast acting power operated relief valves are exempted from the retest requirements of ISTC-5115(b) but not the acceptance criteria requirements of ISTC-5114(b). The correct reference, which is consistent with other type valves, is to paragraph ISTC-5114(b), as referenced in the 2005 Code, which addresses acceptance criteria rather than retest requirements.

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2003 Paragraph	Reference	2005 Paragraph	Reference	Comments
ISTC-5115(a)	ISTC-5114(b)	ISTC-5115(a)	ISTC-5113(b)	ISTC-5115(a) addresses actions to be taken when a valve stroke time exceeds the limiting value of full stroke time [i.e., not capable of fulfilling its safety function]. ISTC-5114(b), as referenced in the 2003 Code, does not address limiting stroke times. It addresses potentially degraded stroke times. ISTC-5115(b) addresses the actions to be taken for potentially degraded stroke times. The correct reference for ISTC-5115(a) is to ISTC-5113(b), as shown in the 2005 Code, which does address limiting values of full stroke time.
ISTC-5115(b)	ISTC-5114(b)	ISTC-5115(b)	ISTC-5114	ISTC-5115(b) addresses the actions required when a potentially degraded stroke time is encountered. As referenced in the 2003 Code, it would only apply to valves with a reference stroke time less than or equal to 10 seconds. The correct reference, as shown in the 2005 Code, is to paragraph ISTC-5114, not subparagraph ISTC-5114(b). This correctly applies the provisions of ISTC-5115(b) to all valves.
ISTC-5222	-	ISTC-5222	ISTC-3530	The 2003 Code omitted reference to valve obturator movement requirements, which should also be implemented if a check valve is removed from a condition monitoring program. This omission was corrected in the 2005 Code by adding the appropriate paragraph reference.
ISTC-9110(d)	-	ISTC-9110(d)	ISTC-5113(b)	The 2003 Code omitted reference to limiting values of full stroke time for power operated relief valves in ISTC-9110(d). This was corrected in the 2005 Code by adding the appropriate paragraph reference for power operated relief valves.
ISTC-9200	ISTA-3120	ISTC-9200	ISTA-3110	ISTC-9200 contains requirements for records keeping. The reference in the 2003 Code is to a paragraph dealing with establishing the Inservice Interval. The correct reference is to ISTA-3110 which does address records keeping requirements.
ISTC-9200(d)	ISTC-5522	ISTC-9200(D)	ISTC-5223	ISTC-9200(d) contains records keeping requirements for the basis for testing series valves as a unit. The 2003 Code references a paragraph that deals with the check valve condition monitoring program. The correct reference is to the paragraph that establishes the requirements for testing series valves as a unit, ISTC-5223, as contained in the 2005 Code.

The following paragraphs are from Mandatory Appendix I

I-7300	-	I-7300	I-1370, I-1380, and I-1390	I-7300 contains a reference to other paragraphs that establish the frequency requirements for testing relief devices. The 2003 Code failed to tabulate all the necessary references. This was corrected in the 2005 Code by the addition of these three references.
I-7370	I-1350	I-7370	I-1360	I-7370 in the 2003 refers to periodic replacement of nonreclosing relief devices but refers to a paragraph for Class 2 and 3 relief valves. The correct reference, as listed in the 2005 Code, is to paragraph I-1360, which does establish the frequency for replacement of nonreclosing relief devices.

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2003 Paragraph	Reference	2005 Paragraph	Reference	Comments
I-7470	I-1350	I-7470	I-1360	I-7470 in the 2003 refers to disposition after maintenance of nonreclosing relief devices but refers to a paragraph for Class 2 and 3 relief valves. The correct reference, as listed in the 2005 Code, is to paragraph I-1360, which does address nonreclosing relief devices.
I-8320(a)	I-1340(C)	I-8320(a)	I-1350(c)	I-8320(a) addresses increasing sample size based on valve setpoint failures. However, the 2003 Code references a paragraph that does not include provisions for sample expansion. This was corrected in the 2005 Code to reference paragraph I-1350(c), which does include provisions for sample expansion.