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August 31, 1988

Document Control Desk
U. S. Nuclear Regulatory Commission
Washington, D. C. 20555

SUBJECT: Virgil C. Summer Nuclear Station
Docket No. 50/395
Operating License No. NPF-12
Inservice Test Program

Gentlemen:

South Carolina Electric and Gas Company (SCE&G), acting for itself and as agent for South Carolina Public Service Authority, hereby submits for your approval the attached revisions to the Virgil C. Summer Nuclear Station Inservice Testing Program and a list of responses to questions and concerns in chronological order. The Inservice Testing Program has been revised to incorporate comments from the Safety Evaluation Report, dated April 19, 1988, and from the review of the December 23, 1987 Inservice Testing Program submittal. The action items list addresses the summary of relief request (SER Table 1), the Inservice Testing Program anomalies (TER Appendix C), and the Inservice Testing Program major concerns and comments (NRC letter dated May 26, 1988).

All program revisions and procedures will be in effect as soon as possible before April 1, 1989 except for the E.3 pump relief request. This relief request is discussed further in Attachment I, SCE&G item number 80. A table of contents has been included in order to provide clarity for locating the appropriate documents

Should there be any questions, please call us at your convenience.

Very truly yours,

O. S. Bradham

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SCE&G RESPONSE TO NRC SAFETY EVALUATION
ON IST PROGRAM

INTRODUCTION

The attached package is being provided to answer questions, provide revised relief requests, and to respond to the NRC concerning the Inservice Test Program (IST) for Summer Nuclear Station. In order to provide some consistency and ease in review, an IST action item number system which references relief request numbers, TER sections, and follow up question numbers is being provided. Attachment I is a tabulated response identifying each item number. The discussion on each item number references each respective attachment. For introductory purposes the following is a list of those attachments.

Attachment I	Action Item List of SCE&G Responses
Attachment II	General Test Procedure, GTP-301
Attachment III	Valve Test Tables
Attachment IV	Relief Request Cross Reference Index
Attachment V	Valve Test Relief Requests
Attachment VI	Pump Test Relief Requests
Attachment VII	Valve Test Cold Shutdown Bases

Attachments V and VI are a complete set of V.C. Summer relief requests for valves and pumps. These attachments supersede all previous relief request submittals. Some relief requests have been revised per our discussions and correspondence. Attachment IV provides a historical cross reference of 1983, 1987, and current relief request status. Please recognize that many relief requests have been withdrawn and that valve relief requests E.1 and E.2 are new per our conversations. Many relief requests have been converted into Cold Shutdown Justifications. Attachment VII provides an index and copy of each justification.

RESPONSES TO QUESTIONS AND CONCERNS

ITEM #	DESCRIPTION	REQUIRED ACTION
1	A.1/2.2.1 DG Fuel Oil Transfer Pumps XPP-141A,B XPP-4A,B IWP-3100 Measure Bearing Temp.(approved) Inlet Pressure (approved) Differential Pressure (approved) Vibration Amplitude(denied)	Relief Request A.1 has been revised to include vibration parameter as alternate and establish minimum flow rate.
2	B.1/2.3.1 Service Water Booster Pumps XPP-45A,B IWP-3100 Measure Flow (denied)	Relief Request B.1 has been withdrawn. We will full flow test these pumps on a quarterly basis.
3	B.2/2.4.1	Relief Request granted.
4	C.1/2.5.1 Boric Acid Transfer XPP-13A,B IWP-3100 Measure Flow Rate (denied) Vibration (denied) Bearing Temperature (approved)	Relief Request C.1 has been revised to include flow rate during cold shutdown and vibration will be measured quarterly.
5	D.1/2.6.1 Charging Pumps XPP-43A,B,C IWP-3100 Measure Flow (denied)	Relief Request D.1 has been revised to perform all tests except flow on a quarterly basis. Full flow tests will be conducted at refueling outages.
6	E.1/2.1.1 IWP-3220 Analyze test data in 96 hours (denied)	Relief Request E.1 has been withdrawn. Test data will be analyzed within the required 96 hours.
7	F.1/2.7.1 Chilled Water Pumps Bearing Temperature Vibration	Relief Request F.1 has been withdrawn. We will monitor bearing temperature and vibration as required.

RESPONSES TO QUESTIONS AND CONCERNS

ITEM #	DESCRIPTION	ACTION TAKEN
8	A.1/Appendix A	It was pointed out in our meetings with the NRC that IWV-3412 already allows the full stroke exercise test at cold shutdown for valves which cannot be full stroke tested at power. As such, specific relief requests are not required. Table 1 of the SE designated these relief requests as "agree". SCE&G has withdrawn these types of relief requests and converted them into cold shutdown justifications.
9	A.6/3.9.1 Component Cooling Surge Tank Vent Valve IWV-3417 Stroke Time	Relief Request A.6 was withdrawn in the December 1987 submittal. The valve is now characterized as Category B passive. Engineering safety evaluation and 10CFR50.59 assessment describes the valve's function as venting air from the CC Surge Tank. Its intended operation is to close on a high radiation signal from a non-safety, non-1E radiation monitors, RM-L2A and RM-L2B. This vent line is an insignificant source of potential radiation. The gaseous release is bounded by limiting events analysis of Regulatory Guide 1.70 (FSAR Chapter 15). This valve is no longer included in the ISI Program.
10	B.1/App. A LCV-115C, E	Relief Request withdrawn. Reference Cold Shutdown Basis CVCS-1.
11	B.2/3.2.1 XVC-8481A,B,C IWV-3521	Relief Request was granted.
12	B.7/App. A XVC-8442	Relief Request withdrawn. Reference Cold Shutdown Basis CVCS-2.
	B.8, App. A XVT-8152	Relief Request withdrawn. Reference Cold Shutdown Basis CVCS-3.
	B.9/App. A XVC-8381	Relief Request withdrawn. Reference Cold Shutdown Basis CVCS-4.
	B.10, App. A XVG-8107 XVG-8108	Relief Request withdrawn. Reference Cold Shutdown Basis CVCS-5.
	B.11/App. A XVT-8100 XVT-8112	Relief Request withdrawn. Reference Cold Shutdown Basis CVCS-6.

RESPONSES TO QUESTIONS AND CONCERNS

ITEM #	DESCRIPTION	ACTION TAKEN
13	B.12/3.9.1 XVG-8107 B.13/3.9.1 XVG-8108 B.14/3.9.1 LCV-115C, E B.15/3.9.1 XVT-8104 IWV-3417 Trending Valve (denied) Stroke times	These relief requests have been withdrawn. SCE&G will analyze stroke time to the requirements of our Section XI Code of Record, except as noted by Relief Request E.1 regarding fast acting power operated valves.
14	C.1/App. A XVC-1039A C.2/App. A C.3/App. A C.4/App. A	These relief requests have been converted into Cold Shutdown justifications EF-1 through EF-4.
15	C.5/App. A XVC-1016	The NRC action on this relief request was to "agree". The relief request has been converted into cold shutdown justification CS-EF-5.
16	C.6/App. A	This relief request has been converted into a Cold Shutdown justification.
17	C.7/3.3.1	Relief request was granted. Please recognize the historical numbering changes as identified in Attachment IV.
18	C.8/App. A D.1/App. A	These relief requests have been converted into Cold Shutdown justifications EF-8, EF-7 and FW-1. Please recognize the numbering changes as identified in Attachment IV.
19	D.2/3.9.1 XVG-1611A,B,C IWV-3417	Relief request withdrawn. Will analyze stroke times to code requirements.
20	D.4, D.5/App. A IFV-478 IFV-488 IFV-498 IFV-3321 IFV-3331 IFV-3341	Relief request withdrawn. Reference code shutdown basis FW-2 and FW-3.

RESPONSES TO QUESTIONS AND CONCERNS

ITEM #	DESCRIPTION	ACTION TAKEN
21	F.1/3.4.1.1 XVG-2660 F.2/App. A F.3/3.4.1.2 XVG-2662A,B	The SE dated April, 1988 denied relief requests F.1 and F.3 and "agreed" with relief request F.2. These relief requests have been withdrawn and converted into cold shutdown justifications CS-IA-1.
22	G.1/App. A XVG-2801A,B, C	Relief request withdrawn. Reference Cold Shutdown Basis CS-MS-1.
23	G.3/3.9.1 XVG-2801A,B,C IWV-3417	Relief request withdrawn. Will analyze stroke times to code requirements except as noted in Relief Request E.1.
24	G.4/3.9.1 XVG-2869A,B,C IWV-3417	Relief request withdrawn. Will analyze stroke times to code requirements except as noted in Relief Request E.1.
25	J.1/App. A XVC-2998A,B, C	Relief request withdrawn. Reference Cold Shutdown Basis CS-SI-1.
26	J.2/3.5.2.1 XVC-8997A,B,C J.3/3.5.2.2 XVC-8995A,B,C J.6/3.5.2.3 XVC-8990A,B,C J.7/3.5.2.4 XVC-8992A,B,C IWV-3521	These Relief Requests were approved. However, they were combined in 1987 submittal as Relief Request J.2. Please recognize the historical numbering changes as identified in Attachment IV.
27	J.4/App. A XVC-8988A,B J.5/App.A XVC-8993A,B	Relief requests withdrawn. Reference Cold Shutdown Basis CS-SI-2 and CS-SI-3, respectively. Please recognize the historical numbering changes as identified in Attachment IV.

RESPONSES TO QUESTIONS AND CONCERNS

ITEM #	DESCRIPTION	ACTION TAKEN
28	J.8/3.5.2.5	The April, 1988 SE granted relief on this request to disassemble and inspect. The December, 1987 submittal revised the approach for meeting the stroke test requirement. Relief Request J.5 was submitted to perform a flow test of the accumulator check valves at refueling outages. The test we are performing is at a reduced pressure. The NRC has questioned the validity of this test to verify full stroke of the valves. SCE&G has reviewed the STP and determined that an adequate means of verifying check valve performance is achievable through this method.SCE&G will verify by acoustic means that these check valves achieve their full open state while performing a flow test at reduced accumulator pressure. The concept of acoustic methods is not new. The acoustic flow monitoring system on pressurizer reliefs and the RCS loose parts monitoring system are two examples recognized and required by our technical specifications. We recognize that a positive acoustic indication that a check valve opens may not demonstrate that hinge and disc are intact. A subsequent leak check to close the valve and measure its leakage will however provide this assurance. SCE&G considers this methodology to be an alternate positive means in conformance with IWV-3522. Relief Request J.5 has been revised to provide more explanation.
29	J.9/App. A XVG-8808A,B,C J.11/App. A XVC-8973A,B,C XVC-8974A,B J.13/App. A XVG-8884 XVG-8885 XVG-8886	Relief requests withdrawn. Reference Cold Shutdown Basis CS-SI-4, CS-SI-5 and CS-SI-6, respectively.
30	J.12/3.5.4	This Relief Request was approved.
31	J.14/App. A XVG-8803A,B	Relief Request withdrawn. Boron Injection Tank and these valves have been removed from the SI System.
32	J.15/3.5.2.6 XVC-8993C IWV-3521	Relief Request J.15 was granted in the April, 1988 SE. Relief Request J.15 was changed to J.10 in the 1987 submittal.

RESPONSES TO QUESTIONS AND CONCERNS

ITEM #	DESCRIPTION	ACTION TAKEN
33	J.16/3.5.1.1 XVG-8801A,B	Relief Request J.16 was approved in the April, 1988 SE. Relief Request J.16 was changed to J.11 in the 1987 submittal.
34	J.17/3.5.1.2 XVG-8888A,B J.18/3.5.3 XVG-8809A,B IWV-3411	Relief Request withdrawn. Valves to be tested quarterly.
35	J.19 XVG-8801A,B J.20 XVG-8885 J.21 XVG-8884 J.22 XVG-8886 J.23 XVG-8945A,B J.24 XVG-8942 J.25 XVG-8803A,B IWV-3417	Relief Request withdrawn. Will analyze stroke times to code requirements, except as noted in Relief Request E.1.
36	J.26/3.5.1.3. IWV-3300 XVG-8811A, B	Relief Request withdrawn. Remote position indication to be performed at least once each 2 years to code requirements.
37	K.1/3.6.2 XVC-3009A, B K.3/3.6.3 XVC-3013A, B	Relief Requests were granted.
38	K.2/App. A XVG-3002A, B	Relief Request withdrawn. Reference Cold Shutdown Basis CS-SP-1.
39	K.4/3.6.1 XVG-3004A, B IWV-3300	Relief Request withdrawn. Remote position indication to be performed at least once each 2 years to code requirements.
40	L.1/App. A XVG-3107A, B IWV-3300	This Relief Request was "agreed" upon by the April 1988 SE. However, Relief Request has now been withdrawn. These valves will be tested quarterly along with the Service Water Booster Pumps.
41	L.2/3.9.1 XVT-3164, 3165, 3169 IWV-3417	Relief Request withdrawn. Will analyze stroke times to code requirements, except as noted in Relief Request E.1.
42	M.1/App. A XVG-7501, 7502, 7503, 7504	Relief Request withdrawn. Reference Cold Shutdown Basis CS-AC-1.

RESPONSES TO QUESTIONS AND CONCERNS

ITEM #	DESCRIPTION	ACTION TAKEN
43	N.1/App. A XVB-0001A, B XVB-0002A, B N.2/App. A	Relief request withdrawn. Reference cold shutdown basis CS-AH-1. Relief Request N.2 regarding stroke times withdrawn.
44	P.1/3.1.1 IWV-3421 thru IWV-3427	Containment Isolation Valves. Relief Request withdrawn. Will analyze leakage rates to code requirements.
45	Q.1/App. PCV-444B, PCV-445A, B	Relief Request withdrawn. Will exercise valves quarterly.
46	Q.2 - PCV-444B, PCV-445A Q.3 - PCV-445B Q.4 - XVG-8000A,B,C R.1 - XVX-6050A, XVX-6054 R.2 - XVG-6056, XVG-6057 R.3 - XVG-6066, XVG-6067 S.1 - FCV-0602A,B S.2 - XVG-8706A,B T.1 - MVT-6412A,B MVT-6490A,B T.2 - MVT-6384A,B MVT-6385A,B T.3 - XVG-6516, XVG-6517, XVG-6518, XVG-6519	Relief Requests withdrawn. Will analyze stroke times to code requirements, except as noted in Relief Request E.1.
47	R.4/3.7.1 IWV-3300 XVX-6050A, XVX-6054 U.1/3.8.1 IWV-3300 XVX-9339, XVX-9341, XVX-9356A,B XVX-9357, XVX-9364B,C XVX-9365B,C, XVX-9387 XVX-9398A,B,C	Relief Requests withdrawn. Remote position indication to be performed at least once each two years to code requirements.

RESPONSES TO QUESTIONS AND CONCERNS

ITEM #	APPENDIX C TER ANOMALY #	REQUIRED ACTION
48	1	The anomaly was in regard to our exception of holidays and weekends from the 96 hour time clock. Relief Request E.1 has been withdrawn.
49	2	Reference Item 1 response. Vibration will be measured.
50	3	Reference Item 2 response. Flow rate will be measured.
51	4	Reference Item 4 response. Flow rate will be measured during cold shutdown, vibration will be measured quarterly.
52	5	Reference Item 5 response. Flow rate will be measured each refueling outage. All other parameters will be measured quarterly.
53	6	Reference Item 7 response. Vibration now being measured.
54	7	Reference Item 44 response. Relief Request P.1 has been withdrawn.
55	8 & 9	Reference Item 21 response. The Relief Requests have been withdrawn and converted into cold shutdown justifications with an enhanced evaluation.
56	10	Reference Item 33 response. Valves will be tested quarterly.
57	11	Reference Item 35 response. Relief Request withdrawn.
58	12	Reference Item 34 response. Valves will be tested quarterly.
59	13	Reference Item 39 response. Relief Request withdrawn.
60	14 & 15	Reference Item 47 response Relief Request withdrawn.
61	16	The anomaly involved the request for relief of stroke time testing on many valves. Each valve has been addressed in the discussion of their individual relief request. Stroke time testing will be performed per code requirements except for fast acting valves. Reference Relief Request E.1
62	17	This was a typographical error and has been corrected.
63	18	The LHSI valves have been included in the ISI Program.

RESPONSES TO QUESTIONS AND CONCERNS

ITEM #	APPENDIX C TER ANOMALY #	REQUIRED ACTION
64	19	The Diesel Air Starting System and Cooling Water System have been reviewed with the following results. The air receiver inlet check valves, the air start solenoid valves, and fuel rack solenoid valves will be included in the ISI Program.
65	20	XVT-8102A,B,C are Category B valves. Nuclear Sampling Valves, XVT-9386A,B,C are located inside containment. These valves are not connected to the Reactor Building atmosphere or the Reactor Coolant System, and an outside containment isolation valve is in the same line, therefore Appendix J test requirements are not applicable.
66	21	Reference Cold Shutdown Basis CS-FW-2 and CS-FW-3. These valves receive a feedwater isolation signal, thus providing a feedwater isolation function.

RESPONSES TO QUESTIONS AND CONCERNS

SCE&G ITEM #	QUESTION #	DECEMBER 1987 SUBMITTAL DISCUSSION "RESPONSE"
67	1	Originally, the Pump and Valve Test Program was submitted based on ASME Code Section XI 1977 Edition through and including the Summer 1978 addenda. In 1983, the Pump Program was resubmitted based on the 1980 Edition through and including the Winter 1980 Addenda. GTP-301 submitted at that time references the 1980 Edition, Winter 1980 Addenda. This update is permitted by 10CFR50.55a. The Valve Program code of record remains as 1977 Edition through Summer 1978 Addenda.
68	2	The Pump Table is contained in GTP-301. The Valve Table has been revised and is enclosed as Attachment III of this response.
69	3	All Appendix J, Type C tested valves have been re-categorized as A or A/C and are to be appropriately included in the ISI Program.
70	4	Prior Relief Requests for all valves having stroke times < 10 seconds have been withdrawn. One relief request, E.1, has been developed which limits the maximum stroke time to 2 seconds with no increasing deviation requirement for valves which actually stroke in less than 2 seconds.
71	5	The following response will clarify GTP-302 in regard to the process for determining the maximum allowed stroke time on a valve. As discussed in Attachment VII of the procedure, the maximum stroke time for a valve is derived from the Technical Specifications, FSAR, Bill of Material or site vendor documents. In many cases, the maximum stroke time is the direct result of an accident analysis response time requirement. The valves having greater safety significance are generally specified in this manner. In order to prevent maximum stroke times from being set too high, Table C is used. If the maximum stroke time derived from the Technical Specifications, etc. is greater than the value specified by Table C, the lower value is used as the administrative limit. Table C is also used to establish maximum stroke times for valves where maximum limits can be obtained from no other source. Your example of the 31 second stroke time was mentioned to argue the point that Table C allows too high of a maximum limit. The statement that this valve could reach torque limit or breaker overload limit trip before reaching the maximum stroke time is subjective. The relationship between increasing stroke time and the limits at which torque switches, etc. render a valve inoperable cannot be generically defined. Table C has been established as a reasonable limit given no other smaller restriction. If a motor operated valve begins to exhibit signs of degradation resulting in increased stroke time, our MOVATS testing will identify it such that repair can be affected long before valve failure.
72	6	The system for analyzing stroke times has been withdrawn. The baseline performance factor will no longer be used. ASME Section XI Code IWV-3417 will be used to analyze stroke time.

RESPONSES TO QUESTIONS AND CONCERNS

SCE&G ITEM #	QUESTION #	DECEMBER 1987 SUBMITTAL DISCUSSION "RESPONSE"
73	7	GTP-302 will be revised to include requirements for submitting a relief request when using "broad band" baseline data. Relief Request G.1 and B.3 are included.
74	8	GMP-103.001 is used for trending of test data. This is in addition to the code requirements which specifies analysis of the test. Each Surveillance Test Procedure (STP) contains the acceptance criteria for each pump. The review and analysis of the test data is completed within 96 hours and recorded on the STP signoff sheet. Trending of the test data is completed as specified in GMP-103.001. GMP-103.001 will be revised to clarify this point.
75	9	The corrective action to be taken for "alert" and "required action" ranges is specified in GTP-301 and each STP. GMP-103.001 is used for tabulating and visual scanning of the test data.
76	10.a	This item relates to exercising of the accumulator check valves and is discussed in Item 28.
77	10.b	Relief Request J.8 has been reworded to partial flow test during cold shutdown and full flow test during refueling outage shutdowns. The discussion regarding concern for cold overpressure has been added back into the relief request.
78	10.c	Maximum full flow cannot be established at power. Relief Request B.2 restated to partial flow test each three months and full flow testing each refueling outage shutdown.

SCE&G ITEM #	QUESTION #	RELIEF REQUEST	VALVES	ACTION
79	10.d	A.5	XVG-9627A XVG-9627B	Relief Request A.5 withdrawn. Cold Shutdown justification CS-CC-1 initiated.
		A.6	XVC-9680A XVC-9680B	A.6 revised to include more technical detail.
		B.11	XVT-8102A XVT-8102B XVT-8102C	B.11 withdrawn. CS-CVCS-7 initiated.
		C.5	XVC-1016	Reference CS-EF-5.
	10.d	F.2	XVC-2661	F.2 withdrawn. CS-IA-1 initiated.
		G.4	XVC-2876A XVC-2876B	G.4 withdrawn. CS-MS-2 initiated.
		K.3	XVC-3006A, XVC-3006B, XVC-3013A, XVC-3013B	This relief request has been revised. Valves, XVC-3006A and B can be full flow tested quarterly.
		N.3 T.6	XVB-0001A, XVB-0001B, XVB-0002A, XVB-0002B XVX-6524A, XVX-6524B, XVX-6524C	N.3 revised. T.6 withdrawn. We are able to verify remote position indication by alternate means.

SCE&G ITEM #	QUESTION #	RELIEF REQUEST	PUMPS	ACTION
80	11.a	E.2	ALL	The Relief Request relates to establishing broader flow and differential pressure alert and required action ranges. Relief Request E.2 has been revised to be applicable to the Service Water Pumps only.
		C.3	ALL	This Relief Request relates to vibration measurement accuracy and it is not included with this submittal. SCE&G is currently performing an evaluation to determine if the instrumentation with the required accuracy is available. Prior to January 1, 1989, SCE&G will provide the NRC with the results of the evaluation to this issue stating the instrumentation to be purchased and the schedule for full compliance regarding vibration measurement.
		E.4	ALL	This Relief Request has been revised to provide accuracy limits of digital temperature measuring devices.
81	11.b	E.1, A.1 B.1, B.2 C.1, D.1	Several	Each Relief Request is addressed under the applicable item number in the TER response.

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ATTACHMENT II

SOUTH CAROLINA ELECTRIC & GAS COMPANY

VIRGIL C. SUMMER NUCLEAR STATION

NUCLEAR OPERATIONS

GENERAL TEST PROCEDURE

GTP-301

GENERAL PROCEDURE FOR INSERVICE TESTING OF PUMPS

REVISION 3

SAFETY RELATED

DISCIPLINE SUPERVISOR _____ DATE _____

APPROVAL AUTHORITY _____ DATE _____

RECORD OF CHANGES

CHANGE NO.	TYPE CHANGE	EFFECTIVE DATE	DATE CANCELLED	CHANGE NO.	TYPE CHANGE	EFFECTIVE DATE	DATE CANCELLED

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ATTACHMENTS

Attachment I - Implementing STP List

Attachment II - Symbols

Attachment III - Allowable Ranges of ISI Test Quantities

Attachment IV - Corrective Measures Summary

Attachment V - Pump Test Parameter Matrix

Attachment VI - Code to STP Cross Reference

Attachment VII - ISI Pump Test Non-Radioactive Flow Orifices

1.0 PURPOSE

1.1 The purpose of this procedure is to define the general rules and requirements for testing of safety related ASME Code Class 1, 2, and 3 pumps which are provided with an emergency power source.

1.2 The pumps are tested in accordance with ASME Section XI Code except as otherwise noted in this procedure or the applicable STP as modified by relief requests.

2.0 REFERENCES AND GLOSSARY

2.1 References

2.1.1 ASME Boiler and Pressure Vessel Code, Section XI, 1980 Edition through Winter 1980 addenda.

2.1.2 Virgil C. Summer Nuclear Station Technical Specifications.

2.1.3 Control of Station Surveillance Test Activities, SAP-134.

2.1.4 Procedure Development, Review, Approval and Control, SAP-139.

2.1.5 Inservice Inspection Program, SAP-145

2.1.6 Removal, Inspection and Reinstallation of Orifice Plates, MMP-300.027.

2.2 Glossary

2.2.1 ANII - Authorized Nuclear Inservice Inspector

2.2.2 SAP - Station Administrative Procedure

2.3 CHAMPS - Computerized History and Maintenance Planning System

2.2.4 GTP - General Test Procedures

2.2.5 ICP - Instrument Calibration Procedure

2.2.6 ISI - Inservice Inspection

2.2.7 SOP - System Operating Procedure

2.2.8 STP - Surveillance Test Procedure

2.2.9 STTS - Surveillance Test Task Sheet

2.2.10 Symbols - the various symbols used in this procedure to define pump parameters are listed on Attachment II.

2.2.11 Inservice Test - A special test to obtain information through observation or measurement to determine the operability of a pump.

2.2.12 Normal Plant Operations - The conditions of startup, hot standby, operation within the normal power range, or cooldown and shutdown of the power plant.

2.2.13 Operability - The capability of the pump to fulfill its function.

2.2.14 Inservice Life - The period of time from installation and acceptance of a pump until retired from service.

2.2.15 Routine Servicing - The performance of planned, preventative maintenance which does not require disassembly of the pump or replacement of pump parts, such as changing oil, flushing the cooling system, adjusting packing, adding packing rings, adding oil, venting the pump, or mechanical seal maintenance.

3.0 RESPONSIBILITIES

3.1 The Welding/ISI Group may perform ASME Section XI evaluations in accordance with standard engineering practices and initiate corrective action for those pumps having unacceptable test results. Evaluations of test results will be conducted per Section 6 of this procedure.

3.2 The Shift Supervisor or Shift Engineer may review, analyze and sign completed pump test data when the ISI Coordinator or his designee is not on-site.

3.3 Other responsibilities for implementation of this procedure are delineated and described in SAP-145.

4.0 GENERAL

NOTES: 1) Attachment I to this procedure lists those pumps which are included in the scope of the Inservice Inspection Program. The list was developed in accordance with ASME Section XI Code with guidance from Branch Technical Position M.E.B. No. 2.

2) The detailed steps necessary for the Inservice testing of these pumps are outlined in separate Surveillance Test Procedures. Attachment I lists the Surveillance Test Procedures that are applicable for each type of pump.

3) The performance of Inservice Testing shall be in addition to any other specified surveillance requirements.

4) Less restrictive requirements contained in ASME Section XI Code shall not be construed to supersede the requirements of plant Technical Specifications.

5) Attachment VI provides a cross reference along with modifying notes, between applicable ASME Section XI Code Requirements and each of the applicable pump STPs.

4.1 Components

4.1.1 Only those pumps described in Section I of this procedure are required to be tested.

4.2 Reference Values

4.2.1 Reference values will be used as a basis of comparison for all subsequent testing. Significant deviations from these reference values are indicative of mechanical and hydraulic change. Abnormal deviation may indicate a need for corrective action or further tests. Section 6 of this procedure describes the method(s) used for pump performance analysis.

4.2.2 Reference values, where applicable, shall be obtained during the Preservice Inspection Program (PSI) at points of operation easily duplicated during power operation or separate baseline reference established utilizing Surveillance Test Procedures.

4.2.3 The reference values shall be clearly marked and filed as part of the pump record. If new reference values are established in accordance with the code, the new reference values should be clearly marked and the previous reference values retained as part of the pump record. If new reference values are established, the reason for doing so shall be justified and documented on the appropriate pump data sheet.

4.3 Scope of Tests

4.3.1 Each ISI test shall include measurement or observation of all quantities specified on the Pump Data Sheet, except applicable pump bearing temperatures which shall be recorded at least once per year on the appropriate pump data sheet.

4.3.2 When bearing temperature measurement is not required each pump shall be run for at least 5 minutes. At the end of that period at least one measurement or observation of the quantities specified in the STP shall be made and recorded on the Pump Data Sheets provided in the appropriate test procedure.

4.3.3 When testing bearing temperature, run the pump until the bearing temperature stabilizes. Bearing temperature shall be considered stable when three successive readings taken at 10 minute intervals do not vary by more than 3%. After bearing temperature stabilization, the quantities specified on the Surveillance Test Procedure shall be measured or observed and recorded on the data sheets provided in the appropriate test procedure.

4.4 Frequency

4.4.1 All Quantities specified in the applicable Surveillance Test Procedure, except bearing temperature, shall be measured or observed and recorded for each pump every 92 days during normal plant operation unless a more restrictive frequency is specified by Technical Specifications.

NOTE: It is recommended that the above test frequency be maintained, if possible, during plant shutdown to minimize accumulation of additional tests. If the tests are not conducted during plant shutdown the pump shall be tested within one week after the plant is returned to normal operation, unless otherwise specified by Plant Technical Specifications as Mode Entry prerequisites.

NOTE: The test frequency may be increased as a result of deviations in test quantities in comparison to reference values. This increased frequency testing method is described in Section 6 of this procedure.

4.4.2 Pumps which are normally operated more frequently than every 3 months may be tested during normal operation, without stopping the pump, provided the Pump Data Sheets show each such pump was operated at acceptable reference values in the required

flow path and the required quantities specified in the STP were measured, observed, analyzed and recorded on the applicable Pump Data Sheets.

NOTE: Refer to Attachment V and the applicable Surveillance Test Procedure for the required parameters to be measured.

4.4.3 If required, bearing temperature shall be measured once per year.

4.4.4 Each pump's Inservice test shall be performed at the specified time interval with:

A. A maximum allowable extension not to exceed 25% of the Surveillance Interval.

B. A total maximum combined interval for any three (3) consecutive surveillance intervals is not to exceed 3.25 times the specified surveillance interval.

4.5 Measurement Methods

4.5.1 All instruments used for Inservice Tests may have nominal errors within the following limits and the range of each instrument shall not exceed three (3) times the reference value.

NOMINAL MAXIMUM INSTRUMENT ERRORS

Pressure	± 2% of Full Scale
Differential Pressure	± 2% of Full Scale
Flowrate	± 2% of Full Scale
Speed	± 2% of Full Scale
Temperature	± 5% of Full Scale
Vibration Amplitude	± 5% of Full Scale

NOTE: V. C. Summer calibrated Field Test Equipment and/or Process Instruments satisfy these accuracy requirements.

4.5.2 All instruments (together with their transmitters, if required) excluding flow orifices used in measuring the inservice test quantities listed in the STP during Inservice testing shall be calibrated in accordance with the appropriate calibration STPs or ICPs.

NOTE: Thermocouples and associated equipment will be accuracy verified where used.

4.5.3 Instruments, in which the readings are position sensitive, i.e., vibration amplitude, shall be permanently mounted or provisions made in the Preoperational/Functional testing procedures and the STPs to duplicate position for each test.

4.5.4 Symmetrical damping devices or averaging techniques may be used to reduce instrument fluctuations to within ± 2% of the observed reading. Hydraulic readings may be damped by using gage snubbers or by throttling small valves in instrument lines. If throttling of small valves is used, the operator should alternately open and close the valve several times to verify unobstructed pressure communication, while observing the instrument reading.

4.5.5 The following instructions refer to pressure measurement during the test.

A. Gage Lines: If a gage line is such that the presence or absence of liquid could produce a difference of more than 1/4% in the indicated value of the measured pressure, means shall be provided in the STP to assure or determine the presence or absence of liquid as required for the static correction used.

B. Pressure Taps: Pressure taps shall be located in a section of the flow path that is expected to have reasonably stable flow as close as practical to the pump. Any line valves between inlet and discharge pressure taps shall be in a fully open position during the test.

C. Differential Pressure: The differential pressure across a pump shall be determined by use of either a differential pressure gage or differential pressure transmitter that provides direct measurement of pressure difference, or by taking the difference between the pressure at a point in the inlet pipe, and the pressure at a point in the discharge pipe.

NOTE: Where applicable, Pump Inlet Pressure shall be measured and recorded both before and during Pump Operation.

4.5.6 The following instructions refer to temperature measurement during the test.

A. Bearing Temperature: The temperature of all centrifugal pump bearings outside the main flow path shall be measured at points selected to be responsive to changes in the temperature of the bearing. These points will be used for subsequent measurements. Lubricant temperature, when measured prior to a cooler, shall be considered the bearing temperature.

B. Where applicable, either installed instrumentation or a contact pyrometer on the pump bearing housing may be used. When using a contact pyrometer on the bearing housing the location at which the reference value is established will be marked and utilized for subsequent measurements.

4.5.7 The following instructions refer to vibration measurement during the test.

A. At least one displacement vibration amplitude (peak-to-peak composite) shall be read during each inservice test. The direction of displacement shall be measured in a plane approximately perpendicular to the rotating shaft, and in the horizontal or vertical direction that has the largest deflection for the particular pump installation.

B. The location shall generally be on a bearing housing, or its structural support, provided it is not separated from the pump by any resilient mounting. On a pump coupled to the driver, the measurement shall be taken on the bearing housing hear the pump coupling, the measurement point shall be as close as possible to the inboard bearing.

C. Where applicable, each pump is marked in order to identify the location and plane for vibration readings. The markings shall be specified in the applicable STPs.

4.5.8 The following instructions refer to Flow Measurement during the test.

A. Flow rate shall be measured using a rate or quantity meter installed in the pump test circuit. The meter may be in any class that provides an overall readout repeatability within the accuracy limits of 4.5.1.

B. Where the meter does not indicate the flow rate directly, the record shall include the method to reduce the data. Example of one typical method is as follows:

1. When using flow meter(s) to measure flow in inches of H_2O the following formula may be used to calculate flow in gallons per minute where:

Q = Flow (gallons per minute)
X = Constant for type and size of orifice and system resistance
Y = dP in inches of water $Q = X\sqrt{Y}$

4.6 Personnel Qualifications

4.6.1 Auxiliary Operator Training sufficient to qualify for watch standing at V. C. Summer Station meets a comparable level of competency as required by the Code for VT-4 pump testing.

5.0 RECORDS

5.1 Records will be maintained for each pump covered by the ISI Program. The file will include the following items and must be retained for the lifetime of the component.

5.1.1 A Pump Data Sheet listing reference values.

NOTE: If a new set of reference values are established as permitted by the code, the file will contain documentation of the reasons for establishing additional set of reference values. In addition, the previous reference values may be maintained to indicate they have been superseded or maintained as a separate set of reference values.

5.1.2 Pump Data Sheets for each test which has been performed.

5.1.3 The name of the pump manufacturer, manufacturer's serial number, manufacturer's model number and the equipment identification number.

5.1.4 A copy of the Manufacturer's Acceptance Test, if any, or a summary thereof.

5.1.5 A copy of the ISI Pump Data Sheet Acceptance Criteria and a record of corrective action, if applicable, for each test which has been performed.

5.1.6 Any additional data which would enhance the ability of plant personnel to analyze trends and assess operational readiness.

5.2 Where applicable, methods utilized to determine flow from indirect measurement shall be included with pump surveillance test data.

5.3 Relief from certain test requirements may be requested where such test requirements are impractical to perform.

5.4 Relief requests, if any, shall be referenced on Attachment V. Such relief requests shall be indexed, stored and maintained under separate cover. Relief requests may be recalled from SSNORR through the record title "Pump Test Relief Request".

6.0 RESULTS

6.1 All test data must be analyzed within 96 hours of test completion.

6.2 The Acceptable, Alert, and Required Action Ranges of ISI test quantities are tabulated on Attachment III. The ranges are expressed as a percentage of the reference values. If the ISI Test Quantities deviate from the Acceptable Range, the following corrective action shall be initiated immediately.

6.2.1 If the ISI Test Quantities fall within the Alert Range double the test frequency. If the quantities fall within the required action range mark test unsatisfactory, declare pump inoperable and calibrate the affected instruments or obtain different instruments. If still in the required action range after retest, declare the pump inoperable. Repair, replace or write NCN to obtain analysis of pump safety function capability.

6.2.2 When unacceptable pump test results cannot be readily explained or otherwise justified, consideration will be given to degraded pump flow orifices.

6.2.3 Attachment VII specifies all non-radioactive flow orifices affected. A visual inspection of a particular flow orifice possibly affecting pump performance will be inspected if suspect, in determining cause and/or pump test acceptance.

A visual inspection of one orifice in each non-radioactive system (included in the 1st Program) will be performed once every ten years on a staggered test basis such that not more than one orifice will be inspected every refueling outage.

6.3 Special test procedures, in lieu of code acceptance values, may be developed and approved for use in evaluating test results for the applicable pump(s). Results of such special test procedures should be included as part of the appropriate STP and identified in a relief request.

6.4 The Shift Supervisor will review the test data immediately upon completion of the test and compare it to the acceptable ranges as shown on Attachment III or other approved acceptance values. If the results are unsatisfactory, he shall initiate corrective action, including any Limiting Condition for Operations, as required by V. C. Summer Technical Specification.

NOTE: Surveillance requirements and limits will be referenced in the STP for those pumps whose inoperability requires Limiting Condition for Operation (LCO) actions.

6.5 Evaluation of unacceptable test results to determine causes and corrective action will include, but not be limited to,

6.5.1 Pressure and Flowrate

A. Instrument Types and Calibration (Accuracy)

B. Instrument Location or Relocation

C. Flow Diversion

D. System Fouling or Degradation

E. Recent Modifications

F. Flow Orifice Fouling or Degradation

G. Driver

H. Pump Degradation

I. Operator

6.5.2 Bearing Temperature

A. Instrument Types and Calibration (Accuracy)

B. Instrument Location or Relocation

C. Pump Modification (e.g. Bearing Material, Impeller Size)

D. Lubricant Type and Flow (Level)

E. Lubricating System Modifications

F. Oil Type and Filter

G. Chemistry of Pumped Liquid

H. Temperature of Pumped Liquid

I. Pump Speed

J. Operator Error

6.5.3 Vibration

A. Instrument Types and Calibration (Accuracy)

B. Instrument Location or Relocation

C. Vibration Frequency (Harmonics)

D. Warm-up Time (Oil Temperature and Close Operating Clearances)

E. Oil Type (As Applicable)

F. Oil Filter Cleanliness

G. Pump Load and Maintenance

H. Suction Pressure

I. System Modifications

J. Structural Modifications

K. Operator Error

6.5.4 Speed

A. Instrument Types and Calibration (Accuracy)

B. Steam Control Valves and Pressure

C. Exhaust Alignment and Pressure

D. Driver Modifications

E. Driver Maintenance

F. Operator Error

6.5.5 Previous Recorded Data

A. Trending Direction and Magnitude

6.6 Complimentary to this procedure, trending of ISI pump data will be performed in accordance with GMP-103.001; Pump and Valve Trending.

6.7 A Corrective Measures Summary (Attachment IV) shall be completed for each pump having results in the Alert and Required Action Range(s).

7.0 ATTACHMENTS

7.1 Attachment I - Implementing STP List

7.2 Attachment II - Symbols

7.3 Attachment III- Allowable Ranges of ISI Test Quantities

7.4 Attachment IV - Corrective Measures Summary

7.5 Attachment V - Pump Test Parameter Matrix.

7.6 Attachment VI - Code to STP Cross Reference.

7.7 Attachment VII- ISI Pump Test Non-Radioactive Flow Orifices

IMPLEMENTING STP LIST

SYSTEM	PUMP NUMBER # (P.3)	PUMP DESCRIPTION	DRAWING NUMBER	CO-ORD	REMARKS
CC	XPP-0001A	MOTOR DRIVEN "A" CENTRIFUGAL COMPONENT COOLING WATER PUMP	302-611	G-8	STP-122.002
CC	XPP-0001B	MOTOR DRIVEN "B" CENTRIFUGAL COMPONENT COOLING WATER PUMP	302-611	G-4	STP-122.002
CC	XPP-0001C	MOTOR DRIVEN "C" CENTRIFUGAL COMPONENT COOLING WATER PUMP	302-611	H-6	STP-122.002
CS	XPP-0013A	MOTOR DRIVEN "A" CENTRIFUGAL BORIC ACID TRANSFER PUMP	302-677	F-10	STP-104.005
CS	XPP-0013B	MOTOR DRIVEN "B" CENTRIFUGAL BORIC ACID TRANSFER PUMP	302-677	H-10	STP-104.005
CS	XPP-0043A	MOTOR DRIVEN "A" CENTRIFUGAL CHARGING AND SAFETY INJECTION PUMP	302-675	F-10	STP-105.001
CS	XPP-0043B	MOTOR DRIVEN "B" CENTRIFUGAL CHARGING AND SAFETY INJECTION PUMP	302-675	H-10	STP-105.001
CS	XPP-0043C	MOTOR DRIVEN "C" CENTRIFUGAL CHARGING AND SAFETY INJECTION PUMP	302-675	G-10	STP-105.001
DG	XPP-0094B	MOTOR DRIVEN POS. DISPLACE "B" DIESEL GENERATOR FUEL OIL TRANSFER PUMP (ROTARY SCREW)	302-351	G-3	STP-125.002
DG	XPP-0141A	MOTOR DRIVEN POS. DISPLACE "A" DIESEL GENERATOR FUEL OIL TRANSFER PUMP (ROTARY SCREW)	302-351	G-14	STP-125.002
DG	XPP-0141B	MOTOR DRIVEN POS. DISPLACE "B" DIESEL GENERATOR FUEL OIL TRANSFER PUMP (ROTARY SCREW)	302-351	G-2	STP-125.002

IMPLEMENTING STP LIST

SYSTEM	PUMP NUMBER 9 (P.3)	PUMP DESCRIPTION	DRAWING NUMBER	CO-ORD	REMARKS
DG	XPP-0004A	MOTOR DRIVEN POS. DISPLACE "A" DIESEL GENERATOR FUEL OIL TRANSFER PUMP (ROTARY SCREW)	302-351	G-12	STP-125.002
EF	XPP-0021A	MOTOR DRIVEN "A" CENTRIFUGAL EMERGENCY FEED WATER PUMP	302-085	D-7	STP-120.001
EF	XPP-0021B	MOTOR DRIVEN "B" CENTRIFUGAL EMERGENCY FEED WATER PUMP	302-085	F-6	STP-120.001
EF	XPP-0008	TURBINE DRIVEN CENTRIFUGAL EMERGENCY FEED WATER PUMP	302-085	H-6	STP-120.002
RH	XPP-0031A	MOTOR DRIVEN "A" CENTRIFUGAL RESIDUAL HEAT REMOVAL PUMP	302-641	C-7	STP-105.004
RH	XPP-0031B	MOTOR DRIVEN "B" CENTRIFUGAL RESIDUAL HEAT REMOVAL PUMP	302-641	E-7	STP-105.004
SP	XPP-0038A	MOTOR DRIVEN "A" CENTRIFUGAL REACTOR BUILDING SPRAY PUMP	302-661	D-6	STP-112.002
SP	XPP-0038B	MOTOR DRIVEN "B" CENTRIFUGAL REACTOR BUILDING SPRAY PUMP	302-661	E-6	STP-112.002
SW	XPP-0039A	MOTOR DRIVEN "A" CENTRIFUGAL SERVICE WATER PUMP	302-221	C-2	STP-123.002
SW	XPP-0039B	MOTOR DRIVEN "B" CENTRIFUGAL SERVICE WATER PUMP	302-221	C-10	STP-123.002
SW	XPP-0039C	MOTOR DRIVEN "C" CENTRIFUGAL SERVICE WATER PUMP	302-221	C-6	STP-123.002

IMPLEMENTING STP LIST

SYSTEM	PUMP NUMBER # (P.3)	PUMP DESCRIPTION	DRAWING NUMBER	CO-ORD	REMARKS
SW	XPP-0045A	MOTOR DRIVEN "A" CENTRIFUGAL SERVICE WATER BOOSTER PUMP	302-222	C-6	STP-123.002
SW	XPP-0045B	MOTOR DRIVEN "B" CENTRIFUGAL SERVICE WATER BOOSTER PUMP	302-222	C-6	STP-123.002
VU	XPP-0048A	MOTOR DRIVEN HVAC SYSTEM "A" CENTRIFUGAL CHILLED WATER PUMP	302-841	E-10	STP-129.001
VU	XPP-0048B	MOTOR DRIVEN HVAC SYSTEM "B" CENTRIFUGAL CHILLED WATER PUMP	302-841	E-5	STP-129.001
VU	XPP-0048C	MOTOR DRIVEN HVAC SYSTEM "C" CENTRIFUGAL CHILLED WATER PUMP	302-841	E-8	STP-129.001

SYMBOLS

SYMBOLS	QUANTITIES	UNITS	UNIT ABBREVIATION
M, 1	Exponents	--	--
dP	Differential Pressure across Pump	Pounds per square inch	psid
Pi	Inlet Pressure	Pounds per square inch gage	psig
Pd	Discharge Pressure	Pounds per square inch gage	psig
Q	Flow Rate	Gallons per minute	gpm
		Inches of Water	"H_2O"
r	Subscript denotes reference quantity	--	--
N	Rotative Speed	Revolutions per minute	rpm
T_b	Bearing Temp.	Deg. Fahrenheit	°F
T_p	Fluid Temp.	Deg. Fahrenheit	°F
V	Vibration amplitude (Peak-to-Peak)	Thousandths of an inch	mil
L	Lubricating Level	Fraction of Maximum	
>	Greater Than	--	--
<	Less Than	--	--
$\geq$	Greater Than or Equal to	--	--
$\leq$	Less Than or Equal to	--	--

ALLOWABLE RANGES OF ISI TEST QUANTITIES

Test Quantity	Acceptable Range(5)	CORRECTIVE ACTION: Alert Range (3) (5) (6) Low Values	Alert Range (3) (5) (6) High Values	Required Action Range (3) (5) (6) Low Values	Required Action Range (3) (5) (6) High Values
Pi (Note 1) (Note 4)					
Pd (Notes)					
dP (Pd-Pi)	(.93 to 1.02) Pr	(.90 to .93) Pr	(1.02 to 1.03) Pr	<.90 Pr	> 1.03 Pr
Q	(.94 to 1.02) Qr	(.90 to .94) Qr	(1.02 to 1.03) Qr	<.90 Qr	> 1.02 Qr
V When 0 ≤ Vr ≤ 0.5 mil	0 to 1 mil	none	1 < V ≤ 1.5 mil	none	V > 1.5 mil
V When 0.5 mil < Vr ≤ 2.0 mil	V(0 to 2)Vr mil	none	2 Vr mil to 3 Vr mil	none	> 3 Vr mil
V When 2.0 mil < Vr ≤ 5.0 mil	0 to (2+Vr) mil	none	(2+Vr) mil to (4+Vr) mil	none	> (4+Vr) mil
V When Vr > 5.0 mil	(0 to 1.4)Vr mil	none	1.4 Vr mil to 1.8 Vr mil	none	> 1.8 Vr mil
Tb (Note 2)					

NOTES:

1) P_i - The static and running pump inlet pressure limits will be specified in the applicable STPs.

2) T_b - The bearing temperature limits will be specified in the applicable STPs.

3) Refer to Section 6.0 of this procedure.

4) Refer to paragraph 4.5.5 (C) Note.

5) Acceptance, alert and required action range values are included on each STP Data Sheet.

6) Reference Relief Request E.2 for some specified alternate high alert and high required action range values.

PUMP NO. _____ _____

CORRECTION MEASURES SUMMARY

STP- _____-_____

STTS	MWR	SUMMARY - ACTION TAKEN -	INITIALS	DATE

PUMP TEST PARAMETER MATRIX

PUMP NO.	TP	Q	Pi	Pd	dP	L	Tb	Vh	Vv	N	RELIEF REQUEST NO.
XPP-0021A	YES	YES	YES	YES	YES	YES	YES(7)	YES	YES	N/A	(7) E.4
XPP-0021B	YES	YES	YES	YES	YES	YES	YES(7)	YES	YES	N/A	(7) E.4
XPP-0008	YES	YES	YES	YES	YES	YES	YES(7)	YES	YES	YES	(7) E.4
XPP-0039A	YES	YES(1)	YES	YES	YES(1)	N/A	NO(1)	NO(1)	N/A	N/A	(1) R.R. B.2, B.3, E.2
XPP-0039B	YES	YES(1)	YES	YES	YES(1)	N/A	NO(1)	NO(1)	N/A	N/A	(1) R.R. B.2, B.3, E.2
XPP-0039C	YES	YES(1)	YES	YES	YES(1)	N/A	NO(1)	NO(1)	N/A	N/A	(1) R.R. B.2, B.3, E.2
XPP-0045A	YES	YES	YES	YES	YES	YES	YES(7)	YES	YES	N/A	(7) E.4
XPP-0045B	YES	YES	YES	YES	YES	YES	YES(7)	YES	YES	N/A	(7) E.4
XPP-0141A	NO(3)	YES	NO(3)	NO(3)	NO(3)	NO(3)	NO(3)	YES	YES	N/A	(3) RR A.1
XPP-0141B	NO(3)	YES	NO(3)	NO(3)	NO(3)	NO(3)	NO(3)	YES	YES	N/A	(3) RR A.1
XPP-0004A	NO(3)	YES	NO(3)	NO(3)	NO(3)	NO(3)	NO(3)	YES	YES	N/A	(3) RR A.1
XPP-0004B	NO(3)	YES	NO(3)	NO(3)	NO(3)	NO(3)	NO(3)	YES	YES	N/A	(3) RR A.1
XPP-0001A	YES	YES	YES	YES	YES	YES	YES(7)	YES	YES	N/A	(7) E.4
XPP-0001B	YES	YES	YES	YES	YES	YES	YES(7)	YES	YES	N/A	(7) E.4
XPP-0001C	YES	YES	YES	YES	YES	YES	YES(7)	YES	YES	N/A	(7) E.4
XPP-0031A	YES	YES	YES	YES	YES	N/A	N/A	YES*	N/A	N/A	
XPP-0031B	YES	YES	YES	YES	YES	N/A	N/A	YES*	N/A	N/A	

* MOTOR ONLY

PUMP TEST PARAMETER MATRIX

PUMP NO	TP	Q	P_s	Pd	dP	L	Th	Vh	Vv	N	RELIEF REQUEST NO.
XPP-0048A	YES	YES(6)	YES	YES	YES(6)	YES	YES(7)	YES	YES	N/A	(6) F.1 (7) E.4
XPP-0048B	YES	YES(6)	YES	YES	YES(6)	YES	YES(7)	YES	YES	N/A	(6) F.1 (7) E.4
XPP-0048C	YES	YES(6)	YES	YES	YES(6)	YES	YES(7)	YES	YES	N/A	(6) F.1 (7) E.4
XPP-0013A	YES	YES(4)	YES	YES	YES	N/A	NO(4)	YES	YES	N/A	(4) RR C.1
XPP-0013B	YES	YES(4)	YES	YES	YES	N/A	NO(4)	YES	YES	N/A	(4) RR C.1
XPP-0038A	YES	YES	YES	YES	YES	YES	YES(7)	YES	YES	N/A	(7) E.4
XPP-0038B	YES	YES	YES	YES	YES	YES	YES(7)	YES	YES	N/A	(7) E.4
XPP-0043A	YES	YES(5)	YES	YES	YES	YES	YES(7)	YES	YES	N/A	(5) RR D.1 (7) E.4
XPP-0043B	YES	YES(5)	YES	YES	YES	YES	YES(7)	YES	YES	N/A	(5) RR D.1 (7) E.4
XPP-0043C	YES	YES(5)	YES	YES	YES	YES	YES(7)	YES	YES	N/A	(5) RR D.1 (7) E.4

CODE TO STP CROSS REFERENCE

Y - YES

ITEM NO PUMP NO	IWP 1100	IWP 1200	IWP 1300	IWP 1400	IWP 1500	IWP 2100	IWP 3100	IWP 3110	IWP 3111	IWP 3001	IWP 3112	IWP 3002	IWP 3210	IWP 3220	IWP 3230	IWP 3300	IWP 3400	IWP 3500	IWP 4110	IWP 4120
STP-120-001 XPP-0021 A, B	Y	Y	Y	Y	Y	2.a	Y	Y	Y	5.a	6.a	7.a	Y	Y	Y	Y	Y	Y	Y	Y
STP-120-002 XPP-0008	Y	Y	Y	Y	Y	2.a	Y	Y	Y	5.a	6.a	7.a	Y	Y	Y	Y	Y	Y	Y	Y
STP-123-002 XPP-0039 A, B, C	Y	Y	1.a	N/A	Y	2.a	3.a	Y	Y	5.a	6.a	7.a	8.a	Y	Y	9.a	Y	Y	10.b	10.b
STP-123-002 XPP-0045 A, B	Y	Y	1.b	N/A	Y	2.a	Y	Y	Y	5.a	6.a	7.a	Y	Y	Y	9.b	Y	Y	Y	Y
STP-125-002 XPP-0141 A, B	Y	Y	1.c	N/A	Y	2.a	3.c	4.a	Y	5.e	6.a	7.b	8.c	Y	Y	9.c	Y	Y	10.a	10.a
STP-125-002 XPP-0004 A, B	Y	Y	1.c	N/A	Y	2.a	3.c	4.e	Y	5.a	6.a	7.b	8.c	Y	Y	9.c	Y	Y	10.a	10.a
STP-122-002 XPP-0001 A, B, C	Y	Y	Y	N/A	Y	2.a	Y	Y	Y	5.a	6.a	7.a	Y	Y	Y	Y	Y	Y	Y	Y
STP-105-004 XPP-0031 A, B	Y	Y	1.d	Y	Y	2.a	Y	Y	Y	5.a	6.a	7.a	Y	Y	Y	9.d	Y	Y	Y	Y
STP-129-001 XPP-0048 A, B, C	Y	Y	Y	N/A	Y	2.a	3.a	Y	Y	5.a	6.a	7.a	8.a	Y	Y	Y	Y	Y	Y	Y
STP-104-005 XPP-0013 A, B	Y	Y	1.e	N/A	Y	2.a	3.b	Y	Y	5.a	6.a	7.b	8.d	Y	Y	9.e	Y	Y	Y	Y
STP-112-002 XPP-0038 A, B	Y	Y	Y	Y	Y	2.a	Y	Y	Y	5.a	6.a	7.a	Y	Y	Y	Y	Y	Y	Y	Y
STP-105-001 XPP-0043 A, B, C	Y	Y	1.f	Y	Y	2.a	3.b	Y	Y	5.a	6.a	7.b	8.b	Y	Y	9.f	Y	Y	Y	Y

CODE TO STP CROSS REFERENCE

Y - YES

STP NO PUMP NO	IWP4130	IWP4140	IWP4150	IWP41101	IWP4160	IWP4210	IWP4220	IWP4230	IWP4240	IWP4310	IWP4320	IWP4400	IWP4510	IWP4520	IWP4600	IWP5210	IWP6220	IWP6230	IWP6240	IWP62506	IWP6260
STP 120 001 XPP 0021 A B	Y	11 a	Y	Y	Y	Y	12 a	Y	Y	Y	Y	N/A	Y	Y	Y	Y	14 a	Y	Y	15 a	16 a
STP 120 002 XPP 0008	Y	11 a	Y	Y	Y	Y	12 a	Y	Y	Y	Y	Y	Y	Y	Y	Y	14 a	Y	Y	15 a	16 a
STP 123 002 XPP 0039 A B C	9 b	11 a	Y	Y	Y	Y	12 a	Y	Y	13 a	Y	N/A	13 a	13 a	Y	Y	14 a	Y	Y	15 a	16 a
STP 123 002 XPP 0645 A B	Y	11 a	Y	Y	Y	Y	12 a	Y	Y	Y	Y	N/A	Y	Y	1 b	Y	14 a	Y	Y	15 a	16 a
STP 125 002 XPP 0141 A B	9 a	11 a	Y	Y	Y	Y	8 c	8 c	8 c	8 c	8 c	N/A	Y	Y	1 c	Y	14 a	Y	Y	15 a	16 a
STP 125 002 XPP 0004 A B	9 a	11 a	Y	Y	Y	Y	8 c	8 c	8 c	8 c	8 c	N/A	Y	Y	1 c	Y	14 a	Y	Y	15 a	16 a
STP 122 002 XPP 0001 A B C	Y	15 a	Y	Y	Y	Y	12 a	Y	Y	Y	Y	N/A	Y	Y	Y	Y	14 a	Y	Y	15 a	16 a
STP 105 004 XPP 0031 A B	Y	11 a	Y	Y	Y	Y	12 a	Y	Y	13 c	Y	N/A	9 d	N/A	Y	Y	14 a	Y	Y	15 a	16 a
STP 129 001 XPP 0048 A B C	Y	11 a	Y	Y	Y	Y	12 a	Y	Y	Y	Y	N/A	Y	Y	3 a	Y	14 a	Y	Y	15 a	16 a
STP 104 005 XPP 0013 A B	Y	11 a	Y	Y	Y	Y	12 a	Y	Y	13 b	Y	N/A	1 e	N/A	1 e	Y	14 a	Y	Y	15 a	16 a
STP 112 002 XPP 0038 A B	Y	11 a	Y	Y	Y	Y	12 a	Y	Y	Y	Y	N/A	Y	Y	Y	Y	14 a	Y	Y	15 a	16 a
STP 105 001 XPP 0043 A B C	Y	11 a	Y	Y	Y	Y	12 a	Y	Y	Y	Y	N/A	Y	Y	1 f	Y	14 a	Y	Y	15 a	16 a

CODE TO STP CROSS REFERENCE NOTES

1. IWP-1300 and as described on Page 2, Attachment VI. (Responsibility)

   a. Water ccoled and water lubricated bearings installed in test circuit. Bearing temperature and lubricating level indication not required per IWP-4310.

   b. Flow rate measurement instrumentation not installed in normal test circuit. Flow rate measured through RBCU(s).

   c. Flow rate, pressure, temperature and lubricating level instrumentation not installed. Flow rate calculated from level change in day tank.

   d. No bearings installed on this pump, mechanical seals only. Lubricating level and temperature indicators not required.

   e. Flow rate each cold shutdown when BAT(S) levels can be changed to accommodate test. Temperature indicators and lubricating level indicators not required per IWP-4310.

   f. Flow through seal injection lines, letdown and charging are not representative of pump performance during operation and cold shutdown. Flow measured each RFO.

2. IWP-2100 (Definitions)

   a. Definitions are identified in GTP-301 glossary.

3. IWP-3100 and as described on Page 2, Attachment VI. (ISI Procedure)

   a. Site developed hydraulic pump test curve (Q and AP) used for these pumps.

   b. Flow rate instruments not installed in normal operations test circuit. Adjustment of dP to reference value would not be indicative of pump performance without the use of flow instrumentation for comparison. Flow rate measurement per 1.e.

   c. Positive displacement pumps, no flow rate instrumentation installed, discharge pressure is not indicative of pump performance. Calculated flow rate based upon changing level in day tank.

4. IWP-3110 (Reference Values)

   a. Flow rate reference values not utilized for these positive displacement pumps. Flow rate must be $\geq$ 9 GPM based upon day tank level change.

5. Table IWP-3100-1 (Inservice Test Quantities)

   a. Identified in Attachment V.

6. IWP-3112 (Additional Reference Values)

   a. As described in GTP-301 Section 4.2.

7. Table IWP-3100-2 (Allowable Ranges of Test Quantities)

   a. As specified in each STP data sheet.

   b. Calculated flow rate only. Acceptance Criteria in STP.

8. IWP-3210 and as described on Attachment VI, Page 2 (Allowable Ranges of Inservice Test Quantities)

   a. dP and flow rate may be determined by the affected pumps hydraulic test curve identified in the STP.

   b. Flowrate not measured during normal operations nor cold shutdown. Flowrate measured each RFO.

   c. Flow rate measured through day tank level change.

   d. Bearing temperature not measured. Flowrate measured each cold shutdown.

9. IWP-3300 (Scope of Tests)

   a. Pump bearing temperature and lubricating level not required. Reference Note 1.a this attachment. Vibration measured on motor bearings.

   b. Flow rate measured. Reference Note 1.b this attachment.

   c. Flow rate and vibration measured. Reference 1.c this attachment. Bearing temperature not applicable for this pump.

   d. Bearing temperature and lubricating level not applicable for this pump. Reference 1.d this attachment. Vibration measured on motor bearings.

e. Flow rate measured each cold shutdown. Reference 1.e this attachment. Bearing temperature measurement not required.

f. Flow rate measured each RFO. Reference 1.f this attachment.

10. IWP-4110, IWP-4120, IWA-4130. (Instrument quality, range, location)

a. Level indicators on respective tanks used for flow.

b. Suction pressure based upon lake level.

11. IWP-4140.

a. Instruments are calibrated in accordance with I&C procedures.

12. IWP-4220 (Pressure Tap Construction)

a. Pressure taps are installed in accordance with ASME Code Section III.

13. IWP-4310, IWP-4510 and IWP-4520 (Bearings, Vibration and Vibration Instruments)

a. Pump and bearings are submerged under water, vibration measurements taken on motor.

b. Bearing located in pump flow path. Temperature not required.

c. No bearings installed in this pump, mechanical seals only

14. IWP-6220 (Pump Records)

a. Maintained by Document Reference Center.

15. IWP-6250 (Record of Corrective Action)

a. Corrective measures summary listed per Attachment IV and applicable STP's.

16. IWP-6260 (Record Access)

a. Inservice Test Plans are contained in GTP-301 and the applicable STP. Inservice Test Results are located as described in QA Records and Retention Chart.

ISI PUMP TEST
NON RADIOACTIVE FLOW ORIFICES

PUMP NO.	STP	SYSTEM	ORIFICE NO.	FLOW DRAWING LOCATION
XPP-0001A	122.002	CC	IFE-7030	302-611 F-7
XPP-0001B	122.002	CC	IFE-7040	302-611 F-5
XPP-0001C	122.002	CC	IFE-7030, 7040	302-611 F-5, F-7
XPP-0008	120.002	EF	IFE-3525	302-085 H-7
XPP-0021A	120.001	EF	IFE-3508	302-085 B-7
XPP-0021B	120.001	EF	IFE-3518	302-085 F-7
XPP-0039A	123.002	SW	FM-4460 4461 4462	302-221, 222 B-8, D-8, A-7, E-8 H-8, F-8, J-8, E-8
XPP-0039B	123.002	SW	4463 4490 4491	
XPP-039C	123.002	SW	4492 4493	
XPP-0048A	129.001	VU	IFE-9015A	302-841 B-10
XPP-0048B	129.001	VU	IFE-9015B	302-841 B-4
XPP-0048C	129.001	VU	IFE-9035	302-841 B-7

VALVE LEGEND

VALVE TYPE

GT - GATE
CH - CHECK
BF - BUTTERFLY
GL - GLOBE
RL - RELIEF
SN - SOLENOID
GB - GLOBE/BALL
VB - VACUUM BREAKER

TYPE ACTUATOR

1. MOTOR
2. AIR
3. SOLENOID
4. AIR/HYDRAULIC
5. AIR/DIAPHRAGM

TEST TYPE

FS - FULL STROKE TEST
CT - CHECK VALVE TEST
PI - REMOTE POSITION INDICATOR
JL - APPENDIX J LEAK TEST
PST - PARTIAL STROKE TEST
LT - LEAK TEST PRESSURE ISOLATION
OP - OPEN TEST
RT - RELIEF VALVE TEST
30 - 30 DAY WATER SEAL
PT - PUSH TEST
JL-A - APPENDIX J, TYPE A

TEST FREQUENCY

1. QUARTERLY
2. COLD SHUTDOWN (E 2 RELIEF REQUEST)
3. REFUELING SHUTDOWN ($\leq$ 24 MONTHS)
4. MONTHLY
5. TESTED PER TABLE IWV3510-1
6. $\geq$ 3 FOR EACH 10 YEAR INTERVAL

NORMAL AND SAFETY POSITIONS

O - OPEN
C - CLOSED
E - EITHER
B - BOTH

NOTES:

(1) ALL COLD SHUTDOWN BASIS PREFIXED WITH CS.

(2) DRAWINGS PREFIXED WITH 302 UNLESS OTHERWISE NOTED.

(3) FULL STROKE TEST FOR POWER OPERATED GATE AND GLOBE VALVES INCLUDE STROKE TIMING.

SYSTEM	VALVE NO.	DWG. & COORDINATES	VALVE TYPE	VALVE SIZE	ACTUATOR TYPE	CODE CLASS	CATEGORY	ACTIVE PASSIVE	NORMAL POS.	SAFETY POS.	TESTS PERFORMED	TEST FREQUENCY	RELIEF REQUEST	C.S. BASIS NOTE (1)	NOTES REMARKS
AC	7501	852 E-11	GT	6"	1	2	A	A	O	C	FS, JL PI	2, 3 3	N.A	AC-1	
AC	7502	852 D-11	GT	6"	1	2	A	A	O	C	FS, JL PI	2, 3 3	N.A	AC-1	
AC	7503	852 D-11	GT	6"	1	2	A	A	O	C	FS, JL PI	2, 3 3	N.A	AC-1	
AC	7504	852 E-11	GT	6"	1	2	A	A	O	C	FS, JL PI	2, 3 3	N.A	AC-1	
AC	7541	852 D-11	CH	3-4"	N.A	2	A, C	A	C	B	JL, CT	3, 2-3	N.A	AC-2	
AC	7544	852 D-11	CH	3-4"	N.A	2	A,C	A	C	B	JL, CT	3, 2-3	N.A	AC-2	
AH	0001A	103 D-6	BF	36"	2	2	A	A,P	C	C	FS, JL PI	2, 6 3	N.3	AH-1	** *
AH	0001B	103 D-4	BF	36"	2	2	A	A,P	C	C	FS, JL PI	2, 6 3	N.3	AH-1	** *
AH	0002A	103 G-10	BF	36"	2	2	A	A,P	C	C	FS, JL PI	2, 6 3	N.3	AH-1	** *
AH	0002B	103 H-12	BF	36"	2	2	A	A, P	C	C	FS, JL PI	2, 6 3	N.3	AH-1	** *
BD	503A	781 C-9	GT	4"	2	2	B	A	O	C	FS, PI	1, 3	N.A	N.A	
BD	503B	781 F-9	GT	3"	2	2	B	A	O	C	FS, PI	1, 3	N.A	N.A	
BD	503C	781 H-9	GT	3"	2	2	B	A	O	C	FS, PI	1, 3	N.A	N.A	
CC	9681B	611 E-04	BF	16"	1	3	B	A	E	B	FS, PI	1, 3	N.A	N.A	

* PASSIVE WHEN ACTUATOR IS REMOVED.

** DRAWINGS PREFIXED WITH 912.

SYSTEM	VALVE NO.	DWG. & COORDINATES	VALVE TYPE	VALVE SIZE	ACTUATOR TYPE	CODE CLASS	CATEGORY	ACTIVE/PASSIVE	NORMAL POS.	SAFETY POS.	TESTS PERFORMED	TEST FREQUENCY	RELIEF REQUEST	C.S. BASIS NOTE (1)	NOTES REMARKS
CC	9503A	611 B-7	BF	20"	1	3	B	A	E	O	FS, PI	1, 3	N.A.	N.A.	
CC	9503B	611 B-5	BF	20"	1	3	B	A	E	O	FS, PI	1, 3	N.A.	N.A.	
CC	9524A	611 C-07	BF	16"	1	3	B	A	E	B	FS, PI	1, 3	N.A.	N.A.	
CC	9524B	611 C-06	BF	16"	1	3	B	A	E	B	FS, PI	1, 3	N.A.	N.A.	
CC	9525A	611 C-07	BF	16"	1	3	B	A	E	B	FS, PI	1, 3	N.A.	N.A.	
CC	9525B	611 C-05	BF	16"	1	3	B	A	E	B	FS, PI	1, 3	N.A.	N.A.	
CC	9526A	611 E-08	BF	16"	1	3	B	A	E	B	FS, PI	1, 3	N.A.	N.A.	
CC	9526B	611 E-04	BF	16"	1	3	B	A	E	B	FS, PI	1, 3	N.A.	N.A.	
CC	9568	612 H-11	GT	8"	1	2	A	A	O	C	FS, JL, PI	2, 3, 3	N.A.	CC-2	
CC	9570	612 G-13	CH	8"	N.A.	2	AC	A	O	C	CT, JL	2, 3	N.A.	CC-1	
CC	9600	612 F-02	GT	3"	1	2	A	A	O	C	FS, JL, PI	2, 3, 3	N.A.	CC-2	
CC	9602	612 F-01	CH	3"	N.A.	2	A, C	A	O	C	JL, CT	3, 2	N.A.	CC-1	
CC	9605	612 G-12	GT	8"	1	2	A	A	O	C	FS, PI, JL	2, 3, 3	N.A.	CC-2	
CC	9606	612 H-12	GT	8"	1	2	A	A	O	C	FS, PI, JL	2, 3, 3	N.A.	CC-2	

SYSTEM	VALVE NO.	DWG & COORDINATES	VALVE TYPE	VALVE SIZE	ACTUATOR TYPE	CODE CLASS	CATEGORY	ACTIVE PASSIVE	NORMAL POS.	SAFETY POS.	TEST PERFORMED	TEST FREQUENCY	RELIEF REQUEST	C.S. BASIS NOTE (1)	NOTES REMARKS
CC	9625	612 J-12	GT	8"	1	3	B	A	O	C	FS, PI	2, 3	N.A	CC-3	
CC	9626	612 J-12	GT	8"	1	3	B	A	O	C	FS, PI	2, 3	N.A	CC-3	
CC	9627A	611 J-12	GT	4"	2	3	B	A	C	O	FS, PI	2, 3	N.A	CC-5	
CC	09627B	611 J-12	GT	4"	2	3	B	A	C	O	FS, PI	2, 3	N.A	CC-5	
CC	9632	612 J-12	CH	8"	N.A	3	C	A	O	C	CT	2	N.A	CC-4	
CC	9633	612 J-12	CH	8"	N.A	3	C	A	O	C	CT	2	N.A	CC-4	
CC	9680A	611 J-11	CH	4"	N.A	3	C	A	C	B	CT	2	A-1	N.A	
CC	9680B	611 J-11	CH	4"	N.A	3	C	A	C	B	CT	2	A-1	N.A	
CC	9682A	611 G-07	CH	24"	N.A	3	C	A	C	B	CT	1	N.A	N.A	
CC	9682B	611 G-05	CH	24"	N.A	3	C	A	C	B	CT	1	N.A	N.A	
CC	9682C	611 G-06	CH	24"	N.A	3	C	A	C	B	CT	1	N.A	N.A	
CC	9687A	611 E-08	BF	16"	1	3	B	A	E	B	FS, PI	1, 3	N.A	N.A	
CC	9689	612 G-11	CH	3-6"	N.A	2	A,C	P	C	C	FL	3	N.A	N.A	
CS	LCV 115B	675 G-07	GT	8"	1	2	B	A	C	O	FS, PI	1, 3	N.A	N.A	
CS	LCV 115C	675 E-08	GT	4"	1	2	B	A	O	C	FS, PI	2, 3	N.A	CVCS-1	

SYSTEM	VALVE NO.	DWG. & COORDINATES	VALVE TYPE	VALVE SIZE	ACTUATOR TYPE	CODE CLASS	CATEGORY	ACTIVE PASSIVE	NORMAL POS.	SAFETY POS.	TESTS PERFORMED	TEST FREQUENCY	REF. REQUEST	C.S. BASIS NOTE (1)	NOTES REMARKS
CS	LCV-115D	675 H-08	GT	8"	1	2	B	A	C	O	FS, PI	1, 3	N.A.	N.A.	
CS	LCV-115E	675 E-08	GT	4"	1	2	B	A	O	C	FS, PI	2, 3	N.A.	CVCS-1	
CS	LCV-459	673 A-13	GL	3"	2	1	B	A	O	C	FS, PI	2, 3	N.A.	CVCS-9	
CS	LCV-460	673 A-14	GL	3"	2	1	B	A	O	C	FS, PI	2, 3	N.A.	CVCS-9	
CS	8100	673 C-03	GL	2"	1	2	A	A	O	C	FS, PI JL	2, 3 3	N.A.	CVCS-6	
CS	8102A	671 H-15	GL	1.5"	1	2	B	A	O	OC	FS, PI 30	2, 3, 3	N.A.	CVCS-7	
CS	8102B	671 H-15	GL	1.5"	1	2	B	A	O	OC	FS, PI 30	2, 3, 3	N.A.	CVCS-7	
CS	8102C	673 H-15	GL	1.5"	1	2	B	A	O	OC	FS, PI 30	2, 3, 3	N.A.	CVCS-7	
CS	8103	673 C-04	CH	3/4"	N.A.	2	A, C	P	C	C	JL	3	NA	N.A.	
CS	8104	672 H-15	GL	2"	1	2	B	A	C	N.A.	FS, PI	1, 3	N.A.	N.A.	
CS	8106	675 E-14	GT	3"	1	2	B	A	O	C	FS, PI	1, 3	N.A.	N.A.	
CS	8107	675 F-15	GT	3"	1	2	A	A	O	C	FS, PI	2, 3	N.A.	CVCS-5	
CS	8108	675 F-15	GT	3"	1	2	B	A	O	C	FS, PI	2, 3	N.A.	CVCS-5	
CS	8109A	675 E-11	GL	2"	1	2	B	A	O	C	FS, PI	1, 3	N.A.	N.A.	

SYSTEM	VALV' NO.	DWG. & COORDINATES	VALVE TYPE	VALVE SIZE	ACTUATOR TYPE	CODE CLASS	CATEGORY	ACTIVE PASSIVE	NORMAL POS.	SAFETY POS.	TESTS PERFORMED	TEST FREQUENCY	RELIEF REQUEST	CS BASIS NOTE (1)	NOTES REMARKS
CS	8109B	675 G-11	GL	2"	1	2	B	A	O	C	FS, PI	1, 3	N.A.	N.A.	
CS	8109C	675 F-11	GL	2"	1	2	B	A	O	C	FS, PI	1, 3	N.A.	N.A.	
CS	8112	673 C-04	GL	2"	1	2	A	A	O	C	FS, PI JL	2, 3 3	N.A.	CVCS-6	
CS	8117	673 A-10	RL	2"	N.A.	2	AC	A	C	B	JL, RT	3, 5	N.A.	N.A.	
CS	8130A	675 F-08	GT	8"	1	2	B	A	O	B	FS, PI	1, 3	N.A.	N.A.	
CS	8130B	G-08 675	GT	8"	1	2	B	A	O	B	FS, PI	1, 3	N.A.	N.A.	
CS	8131A	675 G-08	GT	8"	1	2	B	A	O	B	FS, PI	1, 3	N.A.	N.A.	
CS	8131B	675 G-08	GT	8"	1	2	B	A	O	B	FS, PI	1, 3	N.A.	N.A.	
CS	8132A	675 F-12	GT	4"	1	2	B	A	O	B	FS, PI	1, 3	N.A.	N.A.	
CS	8132B	675 F-12	GT	4"	1	2	B	A	O	B	FS, PI	1, 3	N.A.	N.A.	
CS	8133A	675 G-12	GT	4"	1	2	B	A	O	B	FS, PI	1, 3	N.A.	N.A.	
CS	8133B	675 G-12	GT	4"	1	2	B	A	O	B	FS, PI	1, 3	N.A.	N.A.	
CS	8145	673 B-14	GL	2"	2	1	B	A	C	B	FS, PI	2, 3	N.A.	CVCS-8	
CS	8146	673 B-13	GL	3"	2	2	B	A	C	O	FS, PI	1, 3	N.A.	N.A.	

SYSTEM	VALVE NO.	DWG & COORDINATES	VALVE TYPE	VALVE SIZE	ACTUATOR TYPE	CODE CLASS	CATEGORY	ACTIVE PASSIVE	NORMAL POS.	SAFETY POS.	TESTS PERFORMED	TEST FREQUENCY	RELIEF REQUEST	C.S. BASIS NOTE (1)	NOTES REMARKS
CS	8147	673 A-13	GL	3"	2	2	B	A	E	O	FS, PI	1, 3	N.A	N.A	
CS	8149A	673 A-09	GL	2"	2	2	A	A	E	C	FS, PI, JL	1, 3 3	N.A	N.A	
CS	8149B	673 A-09	GL	2"	2	2	A	A	E	C	FS, PI JL	1, 3 3	N.A	N.A	
CS	8149C	673 A-08	GL	2"	2	2	A	A	E	C	FS, PI JL	1, 3 3	N.A	N.A	
CS	8152	673 A-03	GL	3"	2	2	A	A	O	C	FS, PI JL	2, 3 3	N.A	CVCS-3	
CS	8153	673 B-09	GL	1"	2	1	B	A	C	C	FS, PI	1, 2	N.A	N.A	
CS	8154	673 B-09	GL	1"	2	1	B	A	C	C	FS, PI	1, 3	N.A	N.A	
CS	8314A	677 H-11	CH	2"	N.A	3	C	A	C	C	CT	1	N.A	N.A	
CS	8314B	677 H-11	CH	2"	N.A	3	C	A	C	C	CT	1	N.A	N.A	
CS	8346	673 A-14	CH	3"	N.A	1	C	A	E	C	CT	1	N.A	N.A	
CS	8347	673 B-14	CH	3"	N.A	1	C	A	E	C	CT	1	N.A	N.A	
CS	8348A	671 F-15	CH	1.5"	N.A	1	C	A	O	O	CT	1	N.A	N.A	
CS	8348B	672 F-14	CH	1.5"	N.A	1	C	A	O	O	CT	1	N.A	N.A	
CS	8348C	672 G-14	CH	1.5"	N.A	1	C	A	O	O	CT	1	N.A	N.A	

SYSTEM	VALVE NO.	DWG & COORDINATES	VALVE TYPE	VALVE SIZE	ACTUATOR TYPE	CODE CLASS	CATEGORY	ACTIVE PASSIVE	NORMAL POS.	SAFETY POS.	TESTS PERFORMED	TEST FREQUENCY	RELIEF REQUEST	C.S. BASIS NOTE (1)	NOTES REMARKS
CS	8367A	671 G-15	CH	1 1/2"	N.A.	1	C	A	O	O	CT	1	N.A.	N.A.	
CS	8367B	672 G-15	CH	1 1/2"	N.A.	1	C	A	O	O	CT	1	N.A.	N.A.	
CS	8367C	673 G-15	CH	1 1/2"	N.A.	1	C	A	O	O	CT	1	N.A.	N.A.	
CS	8368A	671 G-15	CH	1 1/2"	N.A.	2	C	A	O	O	CT, 30	1, 3	N.A.	N.A.	
CS	8368B	672 G-15	CH	1 1/2"	N.A.	2	C	A	O	O	CT, 30	1, 3 3	N.A.	N.A.	
CS	8368C	673 G-15	CH	1 1/2"	N.A.	2	C	A	O	O	CT, 30	1, 3	N.A.	N.A.	
CS	8378	673 B-15	CH	3"	N.A.	1	C	A	E	O	CT	1	N.A.	N.A.	
CS	8379	673 A-15	CH	3"	N.A.	1	C	A	E	O	CT	1	N.A.	N.A.	
CS	8381	673 A-04	CH	3"	N.A.	2	C	A	O	C	CT	2	N.A.	CVCS-4	
CS	8442	675 G-04	CH	2"	N.A.	2	C	A	C	O	CT	2	N.A.	CVCS-2	
CS	8480A	675 E-11	CH	2"	N.A.	2	C	A	E	B	CT	1, 2	N.A.	CVCS-10	
CS	8480B	675 F-11	CH	2"	N.A.	2	C	A	E	B	CT	1, 2	N.A.	CVCS-10	
CS	8480C	675 G-11	CH	2"	N.A.	2	C	A	E	B	CT	1, 2	N.A.	CVCS-10	
CS	8481A	675 F-11	CH	3"	N.A.	2	C	A	E	B	CT	1, 3	B.2	N.A.	
CS	8440	675 E-8	CH	4"	N.A.	2	C	A	O	C	CT	1	N.A.	N.A.	

SYSTEM	VALVE NO.	DWG & COORDINATES	VALVE TYPE	VALVE SIZE	ACTUATOR TYPE	CODE CLASS	CATEGORY	ACTIVE PASSIVE	NORMAL POS.	SAFETY POS.	TESTS PERFORMED	TEST FREQUENCY	RELIEF REQUEST	C.S. BASIS NOTE (1)	NOTES REMARKS
CS	8881B	675 H-11	CH	3"	N.A	2	C	A	E	B	CT	1,3	R.2	N.A	
CS	8881C	675 G-11	CH	3"	N.A	2	C	A	E	B	CT	1,3	R.2	N.A	
DG	970A	351 G-12	Ch	2"	N.A	3	C	A	C	B	CT	4	N.A	N.A	
DG	970B	351 G-03	CH	2"	N.A	3	C	A	C	B	CT	4	N.A	N.A	
DG	971A	351 G-11	CH	3"	N.A	3	C	A	C	O	CT	4	N.A	N.A	
DG	971D	351 G-4	CH	3"	N.A	3	C	A	C	O	CT	4	N.A	N.A	
DG	972A	351 G-14	CH	2"	N.A	3	C	A	C	B	CT	4	N.A	N.A	
DG	972B	351 G-02	CH	2"	N.A	3	C	A	C	B	CT	4	N.A	N.A	
DG	10971A		CH	3/4"	N.A	N.A	C	A	C	B	CT	1	N.A	N.A	*
DG	10971B		CH	3/4"	N.A	N.A	C	A	C	B	CT	1	N.A	N.A	*
DG	10978A		CH	3/4"	N.A	N.A	C	A	C	B	CT	1	N.A	N.A	*
DG	10978B		CH	3/4"	N.A	N.A	C	A	C	B	CT	1	N.A	N.A	*
DG	10998A		SN	3/8"	3	N.A	B	A	C	O	OP	1	N.A	N.A	*
DG	10998B		SN	3/8"	3	N.A	B	A	C	O	OP	1	N.A	N.A	*
DG	10999A		SN	3/8"	3	N.A	B	A	C	O	OP	1	N.A	N.A	*
DG	10999B		SN	3/8"	3	N.A	B	A	C	O	OP	1	N.A	N.A	*

*DRAWING NO. 1MS-22-006

SYSTEM	VALVE NO.	DWG. & COORDINATES	VALVE TYPE	VALVE SIZE	ACTUATOR TYPE	CODE CLASS	CATEGORY	ACTIVE PASSIVE	NORMAL POS.	SAFETY POS.	TESTS PERFORMED	TEST FREQUENCY	RELIEF REQUEST	C.S. BASIS NOTE (1)	NOTES REMARKS
DG	20950A		SN	3/8"	3	N.A	B	A	C	O	OP	1	N.A	N.A	*
DG	109508		SN	3/8"	3	N.A	B	A	C	O	OP	1	N.A	N.A	*
DN	8767	715 D-10	GT	1"	N.A	2	A	P	C	C	PL	3	N.A	N.A	
DN	8768	715 D-11	GT	1"	N.A	2	A	P	C	C	PL	3	N.A	N.A	
EF	1001A	085 D-5	GT	6"	1	3	B	A	C	O	FS, PI	2,3	N.A	EF-3	
EF	1001B	085 G-05	GT	6"	1	3	B	A	C	O	FS, PI	2,3	N.A	EF-3	
EF	1002	085 J-05	GT	8"	1	3	B	A	C	O	FS, PI	2,3	N.A	EF-4	
EF	1008	085 J-06	GT	8"	1	3	B	A	C	O	FS, PI	2,3	N.A	EF-4	
EF	1009A	085 F-12	CH	4"	2	2	C	A	C	O	CT,PI	1,3	N.A	N.A	
EF	1009B	085 D-12	CH	4"	2	2	C	A	C	O	CT,PI	1,3	N.A	N.A	
EF	1009C	085 G-12	CH	4"	2	2	C	A	C	O	CT,PI	1,3	N.A	N.A	
EF	1013A	085 D-06	CH	6"	N.A	3	C	A	C	B	CT	2	N.A	EF-6	
EF	1013B	085 F-04	CH	6"	N.A	3	C	A	C	B	CT	2	N.A	EF-6	
EF	1014	085 H-05	CH	8"	N.A	3	C	A	C	B	CT	2	N.A	EF-6	

*DRAWING NO. 1M5-22-006

SYSTEM	VALVE NO.	DWG & COORDINATES	VALVE TYPE	VALVE SIZE	ACTUATOR TYPE	CODE CLASS	CATEGORY	ACTIVE PASSIVE	NORMAL POS.	SAFETY POS.	TESTS PERFORMED	TEST FREQUENCY	RELIEF REQUEST	C.S. BASIS NOTE (1)	NOTES REMARKS
EF	1015A	085 A-08	CH	6"	N/A	3	C	A	C	B	CT	2	N/A	EF-2	
EF	1015B	085 F-08	CH	6"	N/A	3	C	A	C	B	CT	2	N/A	EF-2	
EF	1016	085 H-09	CH	6"	N/A	3	C	A	C	B	CT	2	N/A	EF-5	
EF	1019A	08_ A-10	CH	6"	N/A	3	C	A	C	B	CT	2	N/A	EF-8	
EF	1019B	085 D-10	CH	6"	N/A	3	C	A	C	B	CT	2	N/A	EF-8	
EF	1019C	085 F-10	CH	6"	N/A	3	C	A	C	B	CT	2	N/A	EF-8	
EF	1020A	085 B-10	CH	6"	N/A	3	C	A	C	B	CT	2	N/A	EF-7	
EF	1020B	085 E-10	CH	6"	N/A	3	C	A	C	B	CT	2	N/A	EF-7	
EF	1020C	085 G-10	CH	6"	N/A	3	C	A	C	B	CT	2	N/A	EF-7	
EF	1021A	085 -06	CH	8"	N/A	3	C	A	C	D	CT	3	C-7	N/A	
EF	1022B	085 H-06	CH	8"	N/A	3	C	A	C	D	CT	3	C-7	N/A	
EF	1023A	085 A-07	CH	2"	N/A	3	C	A	C	D	CT	4	N/A	N/A	
EF	1023B	085 F-07	CH	2"	N/A	3	C	A	C	D	CT	4	N/A	N/A	
EF	1024	085 H-30	CH	3"	N/A	3	C	A	C	D	CT	4	N/A	N/A	

SYSTEM	VALVE NO.	DWG. COORDINATES	VALVE TYPE	VALVE SIZE	ACTUATOR TYPE	CODE CLASS	CATEGORY	ACTIVE PASSIVE	NORMAL POS.	SAFETY POS.	TESTS PERFORMED	TEST FREQUENCY	RELIEF REQUEST	CS BASIS NOTE (1)	NOTES REMARKS
EJ	10344	063 D-05	CH	6"	N/A	2	C	A	C	R	CT	2	C-8	N/A	
EJ	10348	063 F-05	CH	6"	N/A	2	C	A	C	R	CT	2	C-8	N/A	
EJ	10374	063 F-02	GT	8"	1	2	B	A	C	O	FS,PI	2,3	N/A	EJ-4	
EJ	10378	063 G-02	GT	8"	1	2	B	A	C	O	FS,PI	2,3	N/A	EJ-4	
EJ	1038A	063 C-12	CH	4"	N/A	2	C	A	C	O	CT	2	N/A	EJ-1	
EJ	10388	063 E-12	CH	4"	N/A	2	C	A	C	O	CT	2	N/A	EJ-1	
EJ	1038C	063 H-12	CH	4	N/A	2	C	A	C	O	CT	2	N/A	EJ-1	
EJ	1039A	063 C-12	CH	4"	N/A	2	C	A	C	O	CT	2	N/A	EJ-1	
EJ	10398	063 E-12	CH	4"	N/A	2	C	A	C	O	CT	2	N/A	EJ-1	
EJ	1039C	063 G-12	CH	4"	N/A	2	C	A	C	O	CT	2	N/A	EJ-1	
EJ	8531	063 A-05	GL	3"	2	2	B	A	O	R	FS,PI	1,3	N/A	N/A	
EJ	8536	063 B-09	GL	3"	2	2	B	A	O	R	FS,PI	1,3	N/A	N/A	
EJ	8541	063	GL	3"	2	2	B	A	O	R	FS,PI	1,3	N/A	N/A	
EJ	8546	063 E-09	GL	3"	2	2	B	A	O	R	FS,PI	1,3	N/A	N/A	

SYSTEM	VALVE NO.	DWG. & COORDINATES	VALVE TYPE	VALVE SIZE	ACTUATOR TYPE	CODE CLASS	CATEGORY	ACTIVE PASSIVE	NORMAL POS.	SAFETY POS.	TESTS PERFORMED	TEST FREQUENCY	RELIEF REQUEST	C.S. BASIS NOTE (1)	NOTES REMARKS
EF	3551	085 F-09	GL	3"	2	3	B	A	O	B	FS, PI	1, 3	N/A	N/A	
EF	3556	085 G-09	GL	3"	2	3	B	A	O	B	FS, PI	1, 3	N/A	N/A	
FS	6772	231 D-06	GT	4"	N/A	2	A	P	C	C	JL	3	N/A	N/A	
FS	6773	231 D-06	GT	4"	N/A	2	A	P	C	C	JL	3	N/A	N/A	
FS	6797	231 D-06	GT	4"	1	2	A	A	C	C	FS, PI JL	1, 3 3	N/A	N/A	
FS	6799	231 D-06	CH	4"	N/A	2	A	P	C	C	JL	3	N/A	N/A	
FW	478	083 B-02	GL	16"	2	N/A	N/A	A	O	C	FS, PI	2, 3	N/A	FW-2	*
FW	488	083 E-03	GL	16"	2	N/A	N/A	A	O	C	FS, PI	2, 3	N/A	FW-2	*
FW	498	083 G-02	GL	16"	2	N/A	N/A	A	O	C	FS, PI	2, 3	N/A	FW-2	*
FW	1611A	083 B-06	GT	18"	4	2	B	A	O	C	FS, PI	2, 3	N/A	FW-1	
FW	1611B	083 E-06	GT	18"	4	2	B	A	O	C	FS, PI	2, 3	N/A	FW-1	
FW	1611C	083 G-06	GT	18"	4	2	B	A	O	C	FS, PI	2, 3	N/A	FW-1	
FW	1633A	083 B-09	CH	1 1/2"	1	2	C	A	O	C	FS, PI	1, 3	N/A	N/A	
FW	1633B	083 D-09	CH	1 1/2"	1	2	C	A	O	C	FS, PI	1, 3	N/A	N/A	

*ANGLE GLOBE FLOW CONTROL VALVE.

SYSTEM	VALVE NO	DWG. & COORDINATES	VALVE TYPE	VALVE SIZE	ACTUATOR TYPE	CODE CLASS	CATEGORY	ACTIVE PASSIVE	NORMAL POS.	SAFETY POS.	TEST PERFORMED	TEST FREQUENCY	RELIEF REQUEST	C.S. BASIS NOTE (1)	NOTES REMARKS
FW	1633C	083 G-09	CH	1 1/2"	1	2	B	A	O	C	ST, PI	1, 3	N.A.	N.A.	
FW	1678A	083 A-05	GL	3"	2	2	B	A	C	C	FS, PI	1, 3	N.A.	N.A.	
FW	1678B	083 D-05	GL	3"	2	2	B	A	C	C	FS, PI	1, 3	N.A.	N.A.	
FW	1678C	083 F-05	GL	3"	2	2	B	A	C	C	FS, PI	1, 3	N.A.	N.A.	
FW	1684A	083 B-05	CH	18"	N.A.	2	C	A	O	C	CT	2	N.A.	FW-4	
FW	1684B	083 E-05	CH	18"	N.A.	2	C	A	O	C	CT	2	N.A.	FW-4	
FW	1684C	083 G-05	CH	18"	N.A.	2	C	A	O	C	CT	2	N.A.	FW-4	
FW	3321	083 A-02	GL	6"	2	N.A.	N.A.	A	C	C	FS, PI	2, 3	N.A.	FW-3	*
FW	3331	083 C-02	GL	6"	2	N.A.	N.A.	A	C	C	FS, PI	2, 3	N.A.	FW-3	*
FW	3341	083 F-02	GL	6"	2	N.A.	N.A.	A	C	C	FS, PI	2, 3	N.A.	FW-3	*
HR	6050A	861 C-12	GL	3/8"	3	2	A	A	O	C	FS, PI JL	1, 3 3	N.A.	N.A.	
HR	6050B	861 F-12	GL	3/8"	3	2	A	A	C	B	FS, PI JL	1, 3 3	N.A.	N.A.	
HR	6051A	861 B-11	GL	3/8"	3	2	A	A	O	B	FS, PI JL	1, 3 3	N.A.	N.A.	
HR	6051B	861 E-12	GL	3/8"	3	2	A	A	C	B	FS, PI JL	1, 3 3	N.A.	N.A.	

*FLOW CONTROL GLOBE VALVE

SYSTEM	VALVE NO	DWG. & COORDINATES	VALVE TYPE	VALVE SIZE	ACTUATOR TYPE	CODE CLASS	CATEGORY	ACTIVE PASSIVE	NORMAL POS.	SAFETY POS.	TESTS PERFORMED	TEST FREQUENCY	RELIEF REQUEST	C.S. BASIS NOTE (1)	NOTES REMARKS
R	6051C	861 A-11	GL	3/8"	3	2	A	A	C	B	FS, PI JL	1, 3 3	N/A	N/A	
HR	6052A	861 C-10	GL	3/8"	3	2	A	A	C	B	FS, PI JL	1, 3 3	N/A	N/A	
HR	6052B	861 F-10	GL	3/8"	3	2	A	A	C	B	FS, PI JL	1, 3 3	N/A	N/A	
HR	6053A	861 B-10	GL	3/8"	3	2	A	A	C	B	FS, PI JL	1, 3 3	N/A	N/A	
HR	6053B	861 E-10	GL	3/8"	3	2	A	A	C	B	FS, PI JL	1, 3 3	N/A	N/A	
JR	6054	861 D-10	GL	3/8"	3	2	A		O	C	FS, PI JL	1, 3 3	N/A	MN/A	
HR	6056	861 G-11	GT	6"	2	2	A	A	C	C	FS, PI JL	1, 3 3	N/A	N/A	
HR	6057	861 G-10	GT	3"	2	2	A	A	C	C	FS, PI JL	1, 3 3	N/A	N/A	
HR	6066	861 K-11	GT	6"	2	2	A	A	C	C	FS, PI JL	1, 3 3	N/A	N/A	
HR	6067	861 K-10	GT	6"	2	2	A	A	C	C	FS, PI JL	1, 3 3	N/A	N/A	
IA	2660	273 G-04	GL	2"	2	2	A	A	O	C	FS, PI JL	2, 3 3	N/A	IA-1	
IA	2661	273 G-03	CH	2"	N/A	2	A, C	A	O	C	CT, JL	2, 3	N/A	IA-1	
IA	2662A	273 B-05	GL	6"	2	2	A	A	O	C	FS, PI JL	2, 3 3	N/A	IA-1	
IA	2662B	273 3-03	GL	6"	2	2	A	A	O	C	FS, PI JL	2, 3 3	N/A	IA-1	

*Passive when actuator is removed.

**Drawings prefixed with 912.

SYSTEM	VALVE NO.	DWG. & COORDINATES	VALVE TYPE	VALVE SIZE	ACTUATOR TYPE	CODE CLASS	CATEGORY	ACTIVE PASSIVE	NORMAL POS.	SAFETY POS.	TESTS PERFORMED	TEST FREQUENCY	RELIEF REQUEST	CS BASIS NOTE (1)	NOTES REMARKS
IA	2679	274 E-04	GL	2"	N.A	2	A	P	C	C	FL	3	N.A	N.A	
IA	2680	274 C-04	GL	2"	N.A	2	A	P	C	C	FL	3	N.A	N.A	
MS	2000	011 B-07	GL	8"	2	2	B	A	C	O	FS, PI	1, 3	N.A	N.A	*
MS	2010	011 E-08	GL	8"	2	2	B	A	C	O	FS, PI	1, 3	N.A	N.A	*
MS	2020	011 G-07	GL	8"	2	2	B	A	C	O	FS, PI	1, 3	N.A	N.A	*
MS	2030	011 E-04	GL	4"	2	3	B		C	O	FS, PI	1, 3	N.A	N.A	
MS	2801A	011 B-04	GL	32"	2	2	B	A	O	C	PST, FS, PI	1, 2, 3	N.A	MS-1	
MS	2801B	011 D-03	GL	32"	2	2	B	A	O	C	PST, FS, PI	1, 2, 3	N.A	MS-1	
MS	2801C	011 G-05	GL	32"	2	2	B	A	O	C	PST, FS, PI	1, 2, 3	N.A	MS-1	
MS	2802A	011 E-08	GT	4"	1	2	B	A	O	B	FS, PI	1, 3	N.A	N.A	
MS	2802B	011 F-05	GT	4"	1	2	B	A	O	B	FS, PI	1, 3	N.A	N.A	
MS	2806A	011 B-07	RL	6"	N.A	2	C	A	C	O	RT	5	N.A	N.A	
MS	2806B	011 B-06	RL	6"	N.A	2	C	A	C	O	RT	5	N.A	N.A	
MS	2806C	011 B-06	RL	6"	N.A	2	C	A	C	O	RT	5	N.A	N.A	

*POWER RELIEF GLOBE VALVE.

SYSTEM	VALVE NO.	DWG. & COORDINATES	VALVE TYPE	VALVE SIZE	ACTUATOR TYPE	CODE CLASS	CATEGORY	ACTIVE PASSIVE	NORMAL POS.	SAFETY POS.	TESTS PERFORMED	TEST FREQUENCY	RELIEF REQUEST	C.S. BASIS NOTE (1)	NOTES REMARKS
MS	2806D	011 B-06	RL	6"	N.A.	2	C	A	C	O	RT	S	N.A.	N.A.	
MS	2806E	011 B-05	RL	6"	N.A.	2	C	A	C	O	RT	S	N.A.	N.A.	
MS	2806F	011 D-07	RL	6"	N.A.	2	C	A	C	O	RT	S	N.A.	N.A.	
MS	2806G	011 D-07	RL	6"	N.A.	2	C	A	C	O	RT	S	N.A.	N.A.	
MS	2806H	011 D-07	RL	6"	N.A.	2	C	A	C	O	RT	S	N.A.	N.A.	
MS	2806I	011 D-06	RL	6"	N.A.	2	C	A	C	O	RT	S	N.A.	N.A.	
MS	2806J	011 D-05	RL	6"	N.A.	2	C	A	C	O	RT	S	N.A.	N.A.	
MS	2806K	011 G-07	RL	6"	N.A.	2	C	A	C	O	RT	S	N.A.	N.A.	
MS	2806L	011 G-07	RL	6"	N.A.	2	C	A	C	O	RT	S	N.A.	N.A.	
MS	2806M	011 G-06	RL	6"	N.A.	2	C	A	C	O	RT	S	N.A.	N.A.	
MS	2806N	011 G-05	RL	6"	N.A.	2	C	A	C	O	RT	S	N.A.	N.A.	
MS	2806P	011 G-05	RL	6"	N.A.	2	C	A	C	O	RT	S	N.A.	N.A.	
MS	2813	011 H-03	GL	11.2"	1	3	B	A	O	C	FS, PI	1, 3	N.A.	N.A.	
MS	2843A	011 C-05	GL	11.2"	2	2	B	A	O	C	FS, PI	1, 3	N.A.	N.A.	

SYSTEM	VALVE NO.	DWG. & COORDINATES	VALVE TYPE	VALVE SIZE	ACTUATOR TYPE	CODE CLASS	CATEGORY	ACTIVE PASSIVE	NORMAL POS.	SAFETY POS.	TESTS PERFORMED	TEST FREQUENCY	RELIEF REQUEST	C.S. BASIS NOTE (1)	NOTES REMARKS
MS	2843B	011 C-04	GL	1 1/2"	2	2	B	A	O	C	FS, PI	1, 3	N.A.	N.A.	
MS	2843C	011 H-05	GL	1 1/2"	2	2	B	A	O	C	FS, PI	1, 3	N.A.	N.A.	
MS	2869A	011 B-04	GL	4"	2	2	B	A	C	C	FS, PI	1, 3	N.A.	N.A.	
MS	2869B	011 E-03	GL	4"	2	2	B	A	.	C	FS, PI	1, 3	N.A.	N.A.	
MS	2869C	011 G-04	GL	4"	2	2	B	A	C	C	FS, PI	1, 3	N.A.	N.A.	
MS	2876A	011 E-05	CH	4"	N.A.	3	C	A	C	B	CT	2	N.A.	MS-2	
MS	2876B	011 F-05	CH	4"	N.A.	3	C	A	C	B	CT	2	N.A.	MS-2	
MS	2877A	011 C-09	GL	1 1/2"	2	2	B	A	O	C	FS, PI	1, 3	N.A.	N.A.	
MS	2877B	011 H-09	GL	1 1/2"	2	2	B	A	O	C	FS, PI	1, 3	N.A.	N.A.	
MU	1920A	791 G-05	GT	4"	2	3	B	A	O	C	FS, PI	1, 3	N.A.	N.A.	
MU	1920B	791 G-05	GT	4"	2	3	B	A	O	C	FS, PI	1, 3	N.A.	N.A.	
ND	6242A	821 A-09	GT	3"	2	2	A	A	C	C	FS, PI JL	1, 3 3	N.A.	N.A.	
ND	6242B	821 B-08	GT	3"	2	2	A	A	C	C	FS, PI JL	1, 3 3	N.A.	N.A.	
NG	6587	311 B-12	GL	1"	N.A.	2	A	P	C	C	JL	3	N.A.	N.A.	

SYSTEM	VALVE NO.	DWG. & COORDINATES	VALVE TYPE	VALVE SIZE	ACTUATOR TYPE	CODE CLASS	CATEGORY	ACTIVE PASSIVE	NORMAL POS.	SAFETY POS.	TESTS PERFORMED	TEST FREQUENCY	RELIEF REQUEST	C.S. BASIS NOTE (1)	NOTES REMARKS
NG	6588	311 B-13	CH	1"	N.A	2	A, C	P	C	C	JL	3	N.A	N.A	
RC	4448	602 E-15	GL	3"	2	1	B	P	C	N.A	FS, PI	1, 3	N.A	N.A	*
RC	445A	602 D-15	GL	3"	2	1	B	P	C	N.A	FS, PI	1, 3	N.A	N.A	*
RC	445B	602 E-15	GL	3"	2	1	B	P	C	N.A	FS, PI	1, 3	N.A	N.A	*
RC	8000A	602 D-15	GT	3"	1	1	B	A	O	C	FS, PI	1, 3	N.A	N.A	
RC	8000B	602 E-15	GT	3"	1	1	B	A	O	C	FS, PI	1, 3	N.A	N.A	
RC	8000C	602 D-15	GT	3"	1	1	B	A	O	C	FS, PI	1, 3	N.A	N.A	
RC	8010A	602 D-11	RL	6"	N.A	1	C	A	C	O	RT	5	N.A	N.A	
RC	8010B	602 D-12	RL	6"	N.A	1	C	A	C	O	RT	5	N.A	N.A	
RC	8010C	602 D-14	RL	6"	N.A	1	C	A	C	O	RT	5	N.A	N.A	
RC	8028	602 B-04	GT	3"	2	2	A	A	C	C	FS, PI JL	1, 2 3	N.A	N.A	
RC	8033	602 A-06	GT	1"	2	2	A	A	O	C	FS, PI JL	1, 3 3	N.A	N.A	
RC	8046	602 B-04	CH	3"	N.A	2	A, C	A	C	C	CT, JL	1, 3	N.A	N.A	
RC	8047	602 B-06	GT	1"	2	2	A	A	O	C	FS, PI JL	1, 3, 3	N.A	N.A	

*PORV GLOBE RELIEF

SYSTEM	VALVE NO.	DWG. & COORDINATES	VALVE TYPE	VALVE SIZE	ACTUATOR TYPE	CODE CLASS	CATEGORY	ACTIVE PASSIVE	NORMAL POS.	SAFETY POS.	TESTS PERFORMED	TEST FREQUENCY	RELIEF REQUEST	C.S. / ASME NOTE (1)	NOTES REMARKS
RC	8095A	601 F-08	GL	2"	1	1	B	A	E	B	FS, PI	1, 3	N/A	N/A	
RC	8095B	601 E-06	GL	2"	1	1	B	A	E	B	FS, PI	1, 3	N/A	N/A	
RC	8096A	601 F-06	GL	2"	1	1	B	A	E	B	FS, PI	1, 3	N/A	N/A	
RC	8096B	601 E-08	GL	2"	1	1	B	A	E	B	FS, PI	1, 3	N/A	N/A	
RH	602A	641 E-12	GT	3"	1	2	B	A	O	B	FS, PI	1, 3	N/A	N/A	
RH	602B	641 E-12	GT	3"	1	2	B	A	O	B	FS, PI	1, 3	N/A	N/A	
RH	8701A	641 H-15	GT	12"	1	1	A	A	C	O	FS, PI LT	2, 3 3	N/A	RH-1	
RH	8701B	641 F-15	GT	12"	1	1	A	A	C	O	FS, PI LT	2, 3 3	N/A	RH-1	
RH	8702A	641 H-15	GT	12"	1	1	A	A	C	O	FS, PI LT	2, 3 3	N/A	RH-1	
RH	8702B	641 F-15	GT	12"	1	1	A	A	C	O	FS, PI LT	2, 3 3	N/A	RH-1	
RH	8703A	641 H-15	CH	3/4"	N/A	2	A, C	P	B	C	LT	3	N/A	O/A	
RH	8703B	641 F-15	CH	3/4"	N/A	2	A, C	P	B	C	LT	3	N/A	N/A	
RH	8706A	641 B-08	GT	8"	1	2	B	A	C	O	FS, PI	1, 3	N/A	N/A	
RH	8706B	641 D-08	GT	8"	1	2	B	A	C	O	FS, PI	1, 3	N/A	N/A	

SYSTEM	VALVE NO.	DWG. & COORDINATES	VALVE TYPE	VALVE SIZE	ACTUATOR TYPE	CODE CLASS	CATEGORY	ACTIVE PASSIVE	NORMAL POS.	SAFETY POS.	TESTS PERFORMED	TEST FREQUENCY	RELIEF REQUEST	C.S. BASIS NOTE (1)	NOTES REMARKS
RH	8708A	641 H-07	RL	3"	N/A	2	C	A	C	O	RT	5	N/A	N/A	
RH	8708B	641 F-07	RL	3"	N/A	2	C	A	C	O	RT	5	N/A	N/A	
RH	8716A	641 B-12	CH	10"	N/A	2	C	A	C	B	CT	1	N/A	N/A	
RH	8716B	641 C-12	CH	10"	N/A	2	C	A	C	B	CT	1	N/A	N/A	
SA	2912	241 B-10	GL	2"	N/A	2	A	P	C	C	JL	3	N/A	N/A	
SA	2913	241 B-11	GL	2"	N/A	2	A,C	P	C	C	JL	3	N/A	N/A	
SF	6671	651 H-12	GT	3"	5	2	A	P	C	C	JL	3	N/A	N/A	
SF	6672	651 G-11	GT	3"	5	2	A	P	C	C	JL	3	N/A	N/A	
SF	6697	651 B-12	GT	3"	5	2	A	P	C	C	JL	3	N/A	N/A	
SF	6698	651 H-12	GT	3"	5	2	A	P	C	C	JL	3	N/A	N/A	
SI	8801A	691 D-15	GT	3"	1	2	B	A	C	O	FS, PI 30	3, 3 3	J-11	N/A	
SI	8801B	691 D-16	GT	3"	1	2	B	A	C	O	FS, PI 30	3, 3 3	J-11	N/A	
SI	8808A	692 B-10	GT	12"	1	2	B	A	O	O	FS, PI	2, 3	N/A	SI-4	*
SI	8808B	692 E-10	GT	12"	1	2	B	A	O	O	FS, PI	2, 3	N/A	SI-4	*

*POWER SUPPLY DE ENERGIZED DURING NORMAL OPERATION AND DURING COLD SHUTDOWN EXCEPT DURING COLD SHUTDOWN TESTING

SYSTEM	VALVE NO.	DWG. & COORDINATES	VALVE TYPE	VALVE SIZE	ACTUATOR TYPE	CODE CLASS	CATEGORY	ACTIVE PASSIVE	NORMAL POS.	SAFETY POS.	TESTS PERFORMED	TEST FREQUENCY	RELIEF REQUEST	C.S. BASIS NOTE (1)	NOTES REMARKS
SI	8808C	692 G-10	GT	12"	1	2	B	A	O	O	FS, PI	2, 3	N.A.	SI-4	*
SI	8809A	693 F-05	GT	14"	1	2	B	A	O	C	FS, PI	1, 3	N.A.	N.A.	
SI	8809B	693 F-05	GT	14"	1	2	B	A	O	C	FS, PI	1, 3	N.A.	N.A.	
SI	8811A	693 J-11	GT	14"	1	2	A	A	C	O	FS, PI JL	1, 3 3	N.A.	N.A.	
SI	8811B	693 H-11	GT	14"	1	2	A	A	C	O	FS, PI JL	1, 3 3	N.A.	N.A.	
SI	8812A	693 J-10	GT	14"	1	2	B	A	C	O	FS, PI	1, 3	N.A.	N.A.	
SI	8812B	693 H-10	GT	14"	1	2	B	A	C	O	FS, PI	1, 3	N.A.	N.A.	
SI	8860	692 G-05	GL	1"	2	2	A	A	C	C	FS, PI JL	1, 3 3	N.A.	N.A.	
SI	8861	692 G-05	CH	1"	N.A.	2	A, C	A	C	C	CT, LJ	1, 3	N.A.	N.A.	
SI	8871	692 B-14	GL	3/4"	2	2	A	P	C	C	JL	3	N.A.	N.A.	
SI	8880	692 A-05	GL	1"	2	2	A	A	C	C	FS, PI JL	1, 3 3	N.A.	N.A.	
SI	8884	691 C-06	GT	3"	1	2	B	A	C	B	FS, PI 10	2, 3 3	N.A.	SI-6	
SI	8835	691 C-09	GT	3"	1	2	B	A	C	B	FS, PI 10	2, 3 3	N.A.	SI-6	
SI	8886	691 C-08	GT	3"	1	2	B	A	C	B	FS, PI 10	2, 3 3	N.A.	SI-6	

*POWER SUPPLY DENERGIZED DURING NORMAL OPERATION AND DURING COLD SHUTDOWN EXCEPT DURING COLD SHUTDOWN TESTING

SYSTEM	VALVE NO	DWG & COORDINATES	VALVE TYPE	VALVE SIZE	ACTUATOR TYPE	CODE CLASS	CATEGORY	ACTIVE PASSIVE	NORMAL POS.	SAFETY POS.	TESTS PERFORMED	TEST FREQUENCY	RELIEF REQUEST	I.S. P&ID NOTE (1)	NOTES REMARKS
SI	8887A	693 E-12	GT	10"	1	2	B	A	O	B	FS, PI	1, 3	N.A.	N.A.	
SI	8887B	693 F-12	GT	10"	1	2	B	A	O	B	FS, PI	1, 3	N.A.	N.A.	
SI	8888A	693 E-13	GT	10"	1	2	A	A	O	B	FS, PI JL	1, 3 3	N.A.	N.A.	
SI	8888B	693 F-13	GT	10"	1	2	A	A	O	B	FS, PI JL	1, 3 3	N.A.	N.A.	
SI	8889	693 C-13	GT	10"	1	2	A	A	C	B	FS, PI JL	1, 3 3	N.A.	N.A.	
SI	8926	693 D-05	CH	8"	N.A.	2	C	A	C	O	CT	2, 3	J.8	N.A.	
SI	8947	692 A-05	CH	1"	N.A.	2	A, C	A	C	C	CT, JL	1, 3	N.A.	N.A.	
SI	8948A	692 C-16	CH	12"	N.A.	1	A, C	A	C	B	CT, LT	3, 3	J.5	N.A.	
SI	8948B	692 E-16	CH	12"	N.A.	1	A, C	A	C	B	CT, LT	3, 3	J.5	N.A.	
SI	8948C	692 G-16	CH	12"	N.A.	1	A, C	A	C	B	CT, LT	3, 3	J.5	N.A.	
SI	8956A	692 C-14	CH	12"	N.A.	1	A, C	A	C	B	CT, LT	3, 3	J.5	N.A.	
SI	8956B	692 E-14	CH	12"	N.A.	1	A, C	A	C	B	CT, LT	3, 3	J.5	N.A.	
SI	8956C	692 G-14	CH	12"	N.A.	1	A, C	A	C	B	CT, LT	3, 3	J.5	N.A.	
SI	8958A	693 E-06	CH	14"	N.A.	2	C	A	C	B	CT	2	N.A.	SI-7	

SYSTEM	VALVE NO.	DWG. & COORDINATES	VALVE TYPE	VALVE SIZE	ACTUATOR TYPE	CODE CLASS	CATEGORY	ACTIVE PASSIVE	NORMAL POS.	SAFETY POS.	TESTS PERFORMED	TEST FREQUENCY	RELIEF REQUEST	C.S. BASIS NOTE (1)	NOTES REMARKS
SI	8958B	693 F-06	CH	14"	N.A	2	C	A	C	B	CT	2	N.A	SI-7	
SI	8961	692 B-15	GL	3.4"	2	2	A	P	C	C	JL	3	N.A	N.A	
SI	8973A	693 E-15	CH	6"	N.A	1	A, C	A	C	O	CT, LT	2, 3	N.A	SI-5	
SI	8973B	693 F-15	CH	6"	N.A	1	A, C	A	C	O	CT, LT	2, 3	N.A	SI-5	
SI	8973C	693 F-15	CH	6"	N.A	1	A, C	A	C	O	CT, LT	2, 3	N.A	SI-5	
SI	8974A	693 E-14	CH	10"	N.A	2	A, C	A	C	O	CT, LT	2, 3	N.A	SI-5	
SI	8974B	693 F-14	CH	10"	N.A	2	A, C	A	C	O	CT, LT	2, 3	N.A	SI-5	
SI	8988A	691 A-08	CH	6"	N.A	1	A, C	A	C	O	CT, LT	2, 3	N.A	SI-2	
SI	8988B	691 A-08	CH	6"	N.A	1	A, C	A	C	O	CT, LT	2, 3	N.A	SI-2	
SI	8990A	691 B-08	CH	2"	N.A	1	A, C	A	C	O	CT, LT 30	3, 3 3	J.2	N.A	
SI		691 B-08	CH	2"	N.A	1	A, C	A	C	O	CT, LT 30	3, 3 3	J.2	N.A	
SI	8990C	691 B-07	CH	2"	N.A	1	A, C	A	C	O	CT, LT 30	3, 3 3	J.2	N.A	
SI	8992A	691 B-06	CH	2"	N.A	1	A, C	A	C	O	CT, LT 30	3, 3 3	J.2	N.A	
SI	8992B	691 B-05	CH	2"	N.A	1	A, C	A	C	O	CT, LT 30	3, 3 3	J.2	N.A	

SYSTEM	VALVE NO.	DWG. & COORDINATES	VALVE TYPE	VALVE SIZE	ACTUATOR TYPE	CODE CLASS	CATEGORY	ACTIVE PASSIVE	NORMAL POS.	SAFETY POS.	TESTS PERFORMED	TEST FREQUENCY	RELIEF REQUEST	C.S. BASIS NOTE (1)	NOTES REMARKS
SI	8992C	691 B-05	CH	2"	N.A	1	A, C	A	C	O	CT, LT 30	3, 3 3	J.2	N.A	
SI	8993A	691 B-04	CH	6"	N.A	1	A, C	A	C	O	CT, LT	2, 3	N.A	S.I-3	
SI	8993B	691 A-04	CH	6"	N.A	1	A, C	A	C	O	CT, LT	2, 3	N.A	SI-3	
SI	8993C	691 A-04	CH	6"	N.A	1	A, C	A	C	O	CT, LT	3, 3	J.10	N.A	
SI	8995A	691 B-13	CH	2"	N.A	1	A, C	A	C	O	CT, LT 30	3, 3 3	J.2	N.A	
SI	8995B	691 B-12	CH	2"	N.A	1	A, C	A	C	O	CT, LT 30	3, 3 3	J.2	N.A	
SI	8995C	691 B-11	CH	2"	N.A	1	A, C	A	C	O	CT, LT 30	3, 3 3	J.2	N.A	
SI	8997A	691 B-15	CH	2"	N.A	1	A, C	A	C	O	CT, LT 30	3, 3 3	J.2	N.A	
SI	8997B	691 B-14	CH	2"	N.A	1	A, C	A	C	O	CT, LT 30	3, 3 3	J.2	N.A	
SI	8997C	691 B-14	CH	2"	N.A	1	A, C	A	C	O	CT, LT 30	3, 3 3	J.2	N.A	
SI	8998A	691 A-15	CH	6"	N.A	1	A, C	1	C	O	CT, LT	2, 3	N.A	SI-1	
SI	8998B	691 A-15	CH	6"	N.A	1	A, C	A	C	O	CT, LT	2, 3	N.A	SI-1	
SI	8998C	691 B-15	CH	6"	N.A	1	A, C	A	C	O	CT, LT	2, 3	N.A	SI-1	
SP	3001A	661 D-04	GT	12"	1	2	B	A	O	O	FS, PI	1, 3	N.A	N.A	

SYSTEM	VALVE NO.	DWG. & COORDINATES	VALVE TYPE	VALVE SIZE	ACTUATOR TYPE	CODE CLASS	CATEGORY	ACTIVE PASSIVE	NORMAL POS.	SAFETY POS.	TESTS PERFORMED	TEST FREQUENCY	RELIEF REQUEST	C.S. BASIS NOTE (1)	NOTES REMARKS
SP	3001B	661 D-03	GT	12"	1	2	B	A	O	O	FS, PI	1, 3	N.A	N.A	
SP	3002A	661 G-03	GT	3"	1	2	B	A	C	O	FS, PI	2, 3	N.A	SP-1	
SP	3002B	661 H-03	GT	3"	1	2	B	A	C	O	FS, PI	2, 3	N.A	SP-1	
SP	3003A	661 E-10	GT	10"	1	2	A	A	C	O	FS, PI JL	1, 3 3	N.A	N.A	
SP	3003B	661 E-10	GT	10"	1	2	A	A	C	O	FS, PI JL	1, 3 3	N.A	N.A	
SP	3004A	661 F-10	GT	12"	1	2	A	A	C	O	FS, PI JL	1, 3 3	N.A	N.A	
SP	3004B	661 H-10	GT	12"	1	2	A	A	C	O	FS, PI JL	1, 3 3	N.A	N.A	
SP	3005A	661 F-09	GT	12"	1	2	B	A	C	O	FS, PI	1, 3	N.A	N.A	
SP	3005B	661 H-09	GT	12"	1	2	B	A	C	O	FS, PI	1, 3	N.A	N.A	
SP	3006A	661 D-04	CH	12"	N.A	2	C	A	C	O	CT	1	N.A	N.A	
SP	3006B	661 E-03	CH	12"	N.A	2	C	A	C	O	CT	1	N.A	N.A	
SP	3009A	661 E-11	CH	10"	N.A	2	A, C	A	C	O	CT, JL	3, 3	K-1	N.A	
SP	3009B	661 E-11	CH	10"	N.A	2	A, C	A	C	O	CT, JL	3, 3	K-1	N.A	
SP	1013A	661 F-03	CH	3"	N.A	2	C	A	C	B	CT	3	K-3	N.A	

SYSTEM	VALVE NO.	DWG. & COORDINATES	VALVE TYPE	VALVE SIZE	ACTUATOR TYPE	CODE CLASS	CATEGORY	ACTIVE PASSIVE	NORMAL POS.	SAFETY POS.	TESTS PERFORMED	TEST FREQUENCY	RELIEF REQUEST	C.S. BASIS NOTE (1)	NOTES REMARKS
SP	3013B	661 F-04	CH	3"	N/A	2	C	A	C	B	CT	3	K.3	N.A.	
SP	3014A	661 D-02	VB	2"	N/A	2	C	A	C	E	PT	1	N.A.	N.A.	
SP	3014B	661 D-02	VB	2"	N/A	2	C	A	C	E	PT	1	N.A.	N.A.	
SS	9311A	771 D-13	GB	1"	2	2	A	A	O	C	FS, PI L	1, 3 3	N.A.	N.A.	
SS	9311B	771 D-14	GB	1"	2	2	A	A	O	C	FS, PI JL	1, 3 3	N.A.	N.A.	
SS	9312A	771 E-13	GB	1"	2	2	A	A	O	C	FS, PI JL	1, 3 3	N.A.	N.A.	
SS	9312B	771 E-14	GB	1"	2	2	A	A	O	C	FS, PI JL	1, 3 3	N.A.	N.A.	
SS	9339	772 J-3	GL	3/8"	3	2	A	A	C	C	FS, PI JL	1, 3 3	N.A.	N.A.	
SS	9341	772 J-3	GL	3/8"	3	2	A	A	C	C	FS, PI JL	1, 3 3	N.A.	N.A.	
SS	9356A	771 B-12	GL	1"	3	2	A	A	C	C	FS, PI JL	1, 3 3	N.A.	N.A.	
SS	9356B	771 C-12	GL	1"	3	2	A	A	C	C	FS, PI JL	1, 3 3	N.A.	N.A.	
SS	9357	771 C-10	GL	1"	3	2	A	A	C	C	FS, PI JL	1, 3 3	N.A.	N.A.	
SS	9364B	771 D-11	GL	3/8"	3	2	A	A	C	C	FS, PI JL	1, 3 3	N.A.	N.A.	
SS	9364C	771 E-11	GL	3/8"	3	2	A	A	C	C	FS, PI JL	1, 3 3	N.A.	N.A.	

SYSTEM	VALVE NO.	DWG. & COORDINATES	VALVE TYPE	VALVE SIZE	ACTUATOR TYPE	CODE CLASS	CATEGORY	ACTIVE PASSIVE	NORMAL POS.	SAFETY POS.	TESTS PERFORMED	TEST FREQUENCY	RELIEF REQUEST	C.S. BASIS NOTE (1)	NOTES REMARKS
SS	9365B	771 D-10	GL	3/8"	3	2	A	A	C	C	FS, PI JL	1, 3 3	N.A	N.A	
SS	9365C	771 E-10	GL	3/8"	3	2	A	A	C	C	FS, PI JL	1, 3 3	N.A	N.A	
SS	9387	771 J-10	GL	3/8"	3	2	A	A	C	C	FS, PI JL	1, 3 3	N.A	N.A	
SS	9398A	771 F-10	GL	1"	3	2	B	A	O	C	FS, PI	1, 3	N.A	N.A	
SS	9398B	771 G-09	GL	1"	3	2	B	A	O	C	FS, PI	1, 3	N.A	N.A	
SS	9398C	771 H-10	GL	1"	3	2	B	A	O	C	FS, PI	1, 3	N.A	N.A	
SW	3103A	222 C-02	GT	16"	1	2	A	A	O	C	FS, PI JL-A	1, 3 6	N.A	N.A	
SW	3103B	222 G-02	GT	16"	1	2	A	A	O	C	FS, PI JL-A	1, 3 6	N.A	N.A	
SW	3105A	222 B-08	GT	4"	2	3	B	A	C	O	FS, PI	1, 3	N.A	N.A	
SW	3105B	222 J-10	GT	4"	2	3	B	A	C	O	FS, PI	1, 3	N.A	N.A	
SW	3106A	222 C-05	BF	16"	1	2	A	B	C	O	FS, PI JL-A	1, 3 6	N.A	N.A	
SW	3106B	222 G-05	BF	16"	1	2	A	B	C	O	FS, PI JL-A	1, 3 6	N.A	N.A	
SW	3107A	222 C-01	GT	16"	1	3	B	A	C	O	FS, PI	1, 3	N.A	N.A	
SW	3107B	222 G-01	GT	16"	1	3	B	A	C	O	FS, PI	1, 3	N.A	N.A	

SYSTEM	VALVE NO.	DWG. & COORDINATES	VALVE TYPE	VALVE SIZE	ACTUATOR TYPE	CODE CLASS	CATEGORY	ACTIVE PASSIVE	NORMAL POS.	SAFETY POS.	TESTS PERFORMED	TEST FREQUENCY	RELIEF REQUEST	C.S. BASIS NOTE (1)	NOTES REMARKS
SW	3108A	222 B-04	GT	10"	1	3	B	A	O	B	FS, PI	1, 3	N.A.	N.A.	
SW	3108B	222 D-04	GT	10"	1	3	B	A	O	B	FS, PI	1, 3	N.A.	N.A.	
SW	3108C	222 F-03	GT	10"	1	3	B	A	O	B	FS, PI	1, 3	N.A.	N.A.	
SW	3108D	222 H-04	GT	10"	1	3	B	A	O	B	FS, PI	1, 3	N.A.	N.A.	
SW	3109A	222 B-03	GT	10"	1	2	B	A	O	B	FS, PI	1, 3	N.A.	N.A.	
SW	3109B	222 D-03	GT	10"	1	2	B	A	O	B	FS, PI	1, 3	N.A.	N.A.	
SW	3109C	222 F-03	GT	10"	1	2	B	A	O	B	FS, PI	1, 3	N.A.	N.A.	
SW	3109D	222 H-03	GT	10"	1	2	B	A	O	B	FS, PI	1, 3	N.A.	N.A.	
SW	3110A	222 B-05	BF	12"	1	2	A	A	O	C	FS, PI JL-A	1, 3 6	N.A.	N.A.	
SW	3110B	222 H-05	BF	12"	1	2	A	A	O	C	FS, PI JL-A	1, 3 6	N.A.	N.A.	
SW	3111A	222 B-02	GT	12"	1	3	B	A	O	C	FS, PI	1, 3	N.A.	N.A.	
SW	3111B	222 F-02	GT	12"	1	3	B	A	O	C	FS, PI	1, 3	N.A.	N.A.	
SW	3112A	222 B-02	GT	12"	1	3	B	A	O	C	FS, PI	1, 3	N.A.	N.A.	
SW	3112B	222 E-02	GT	12"	1	3	B	A	O	C	FS, PI	1, 3	N.A.	N.A.	

SYSTEM	VALVE NO.	DWG. & COORDINATES	VALVE TYPE	VALVE SIZE	ACTUATOR TYPE	CODE CLASS	CATEGORY	ACTIVE PASSIVE	NORMAL POS.	SAFETY POS.	TESTS PERFORMED	TEST FREQUENCY	RELIEF REQUEST	C.S. BASIS NOTE (1)	NOTES REMARKS
SW	3115A	221 F-02	CH	24"	N.A	3	C	A	E	B	CT	1	N.A	N.A	
SW	3115B	221 F-10	CH	24"	N.A	3	C	A	E	B	CT	1	N.A	N.A	
SW	3115C	221 G-06	CH	24"	N.A	3	C	A	E	B	CT	1	N.A	N.A	
SW	3116A	221 G-02	BF	24"	1	3	B	A	E	O	FS, PI	1, 3	N.A	N.A	
SW	3116B	221 G-10	BF	24"	1	3	B	A	E	O	FS, PI	1, 3	N.A	N.A	
SW	3116C	221 H-06	BF	24"	1	3	B	A	E	O	FS, PI	1, 3	N.A	N.A	
SW	3119A	222 A-10	CH	8"	N.A	3	C	A	O	B	CT	1	N.A	N.A	
SW	3119B	222 J-10	CH	8"	N.A	3	C	A	O	B	CT	1	N.A	N.A	
SW	3126A	222 D-11	BF	6"	1	3	B	A	E	O	FS, PI	1, 3	N.A	N.A	
SW	3126B	222 F-11	BF	6"	1	3	B	A	E	O	FS, PI	1, 3	N.A	N.A	
SW	3128A	222 E-11	BF	6"	1	3	B	A	E	O	FS, PI	1, 3	N.A	N.A	
SW	3128C	222 E-11	BF	6"	1	3	B	A	E	O	FS, PI	1, 3	N.A	N.A	
SW	3130A	222 A-05	CH	30	N.A	3	C	A	O	O	CT	1	N.A	N.A	
SW	3130B	222 J-07	CH	30"	N.A	3	C	A	O	O	CT	1	N.A	N.A	

SYSTEM	VALVE NO.	DWG & COORDINATES	VALVE TYPE	VALVE SIZE	ACTUATOR TYPE	CODE CLASS	CATEGORY	ACTIVE PASSIVE	NORMAL POS.	SAFETY POS.	TESTS PERFORMED	TEST FREQUENCY	RELIEF REQUEST	C.S. BASIS NOTE (1)	NOTES REMARKS
SW	3135A	222 C-05	CH	16"	N.A	3	C	A	C	B	CT	1	N.A	N.A	
SW	3135B	222 G-05	CH	16"	N.A	3	C	A	C	B	CT	1	N.A	N.A	
SW	3137A	222 C-04	CH	16"	N.A	2	C	A	O	O	CT	1	N.A	N.A	
SW	3137B	222 G-04	CH	16"	N.A	2	C	A	O	O	CT	1	N.A	N.A	
SW	3162A	222 D-13	CH	1.5"	N.A	3	C	A	O	C	CT	1	N.A	N.A	
SW	3162B	222 B-13	CH	1.5"	N.A	3	C	A	O	C	CT	1	N.A	N.A	
SW	3164	222 F-14	GL	2"	2	3	B	A	O	C	FS, PI	1, 3	N.A	N.A	
SW	3165	222 G-14	GL	2"	2	3	B	A	O	C	FS, PI	1, 3	N.A	N.A	
SW	3168	222 H-14	CH	2"	N.A	3	C	A	O	C	CT	2	N.A	SW-1	
SW	3169	222 J-14	GL	2"	2	3	B	A	O	C	FS, PI	1, 3	N.A	N.A	
SW	3120A	222 B-09	CH	4"	N.A	3	C	A	C	B	CT	1	N.A	N.A	
SW	3120B	222 J-10	CH	4"	N.A	3	C	A	C	B	CT	1	N.A	N.A	
SW	3136A	222 B-05	CH	12"	N.A	3	C	A	O	B	CT	1	N.A	N.A	
SW	3136B	222 J-05	CH	12"	N.A	3	C	A	O	B	CT	1	N.A	N.A	

SYSTEM	VALVE NO.	DWG. & COORDINATES	VALVE TYPE	VALVE SIZE	ACTUATOR TYPE	CODE CLASS	CATEGORY	ACTIVE PASSIVE	NORMAL POS.	SAFETY POS.	TESTS PERFORMED	TEST FREQUENCY	RELIEF REQUEST	C.S. BASIS NOTE (1)	NOTES REMARKS
VU	6384A	842 G-03	GL	2"	2	3	B	A	O	C	FS, PI	1, 3	N.A.	N.A.	
VU	6384B	843 G-03	GL	2"	2	3	B	A	O	C	FS, PI	1, 3	N.A.	N.A.	
VU	6385A	842 G-03	GL	2"	2	3	B	A	O	C	FS, PI	1, 3	N.A.	N.A.	
VU	6385B	843 H-03	GL	2"	2	3	B	A	O	C	FS, PI	1, 3	N.A.	N.A.	
VU	6387A	842 H-07	CH	2"	N.A.	3	C	A	O	C	CT	1	N.A.	N.A.	
VU	6387B	843 H-07	CH	2"	N.A.	3	C	A	O	C	CT	1	N.A.	N.A.	
VU	6388A	842 H-07	CH	2"	N.A.	3	B	A	O	C	CT	1	N.A.	N.A.	
VU	6388B	843 H-07	CH	2"	N.A.	3	B	A	O	C	CT	1	N.A.	N.A.	
VU	6410A	842 F-08	CH	3"	N.A.	3	C	A	O	C	CT	1	N.A.	N.A.	
VU	6410B	843 C-08	CH	3"	N.A.	3	C	A	O	C	CT	1	N.A.	N.A.	
VU	6412A	842 F-13	GL	3"	2	3	B	A	O	C	FS, PI	1, 3	N.A.	N.A.	
VU	6412B	843 C-12	GL	3"	2	3	B	A	O	C	FS, PI	1, 3	N.A.	N.A.	
VU	6461A	841 E-19	CH	6"	N.A.	3	C	A	E	B	CT	1	N.A.	N.A.	
VU	6461B	841 E-05	CH	6"	N.A.	3	C	A	E	B	CT	1	N.A.	N.A.	

SYSTEM	VALVE NO.	DWG. & COORDINATES	VALVE TYPE	VALVE SIZE	ACTUATOR TYPE	CODE CLASS	CATEGORY	ACTIVE PASSIVE	NORMAL POS.	SAFETY POS.	TESTS PERFORMED	TEST FREQUENCY	RELIEF REQUEST	C.S. BASIS NOTE (1)	NOTES REMARKS
VU	6461C	841 E-07	CH	6"	N.A	3	C	A	E	B	CT	1	N.A	N.A	
VU	6489A	842 F-08	CH	3"	N.A	3	C	A	O	C	CT	1	N.A	N.A	
VU	6489B	843 C-03	CH	3"	N.A	3	C	A	O	C	CT	1	N.A	N.A	
VU	6490A	842 E-12	GL	3"	2	3	B	A	O	C	FS, IN	1, 3	N.A	N.A	
VU	6490B	843 C-12	GL	3"	2	3	B	A	O	C	FS, PI	1, 3	N.A	N.A	
VU	6516	842 H-14	GT	1.5"	1	3	B	A	E	O	FS, PI	1, 3	N.A	N.A	
VU	6517	842 J-13	GT	1.5"	1	3	B	A	E	O	FS, PI	1, 3	N.A	N.A	
VU	6518	843 J-13	GT	1.5"	1	3	B	A	E	O	FS, PI	1, 3	N.A	N.A	
VU	6519	843 J-11	GT	1.5"	1	3	B	A	E	O	FS, PI	1, 3	N.A	N.A	
VU	6524A	842 C-05	GL	1"	3	3	B	A	E	O	FS, PI	1, 3	N.A	N.A	
VU	6524B	843 B-05	GL	1"	3	3	B	A	E	O	FS,PI	1, 3	N.A	N.A	
VU	6524C	842 B-05	GL	1"	3	3	B	A	E	O	FS, PI	1, 3	N.A	N.A	
WL	1003	735 C-05	GL	3"	2	2	A	A	O	C	FS, PI JL	1, 3 3	N.A	N.A	
WL	7124	735 C-13	GT	3/4"	5	2	A	A	O	C	FS, PI JL	1, 3 3	N.A	N.A	

SYSTEM	VALVE NO.	DWG & COORDINATES	VALVE TYPE	VALVE SIZE	ACTUATOR TYPE	CODE CLASS	CATEGORY	ACTIVE PASSIVE	NORMAL POS.	SAFETY PO	TESTS PERFORMED	TEST FREQUENCY	RELIEF REQUEST	C.S. BASIS NOTE (1)	NOTES REMARKS
WL	7135	735 C-04	GT	3"	N/A	2	A	P	C	C	JL	3	N/A	N/A	
WL	7136	735 C-05	GT	3"	S	2	A	A	O	C	FS, PI JL	1, 3 3	N/A	N/A	
WL	7150	735 B-12	GT	3/4"	S	2	A	A	O	C	FS, PI JL	1,3 3	N/A	N/A	

ISI PUMP TEST RELIEF REQUEST CROSS REFERENCE				
RELIEF REQUEST NUMBERS			TECHNICAL BASIS AND/OR ALTERNATE TEST REVISED	
PRIOR TO 1987	1987 SUBMITTAL	1988 SUBMITTAL	YES	NO
A.1	A.1	A.1	X	
B.1	B.1	withdrawn	N/A	N/A
B.2	B.2	B.2		X
C.1	C.1	C.1	X	
D.1	D.1	D.1	X	
E.1	E.1	withdrawn	N/A	N/A
N/A	E.2	E.2		X
N/A	E.3	withdrawn	N/A	N/A
N/A	E.4	E.4	X	
N/A	N/A	B.3	N/A	N/A
F.1	N/A	withdrawn	N/A	N/A
N/A	N/A	G.1	N/A	N/A

ISI VALVE TEST RELIEF REQUEST AND COLD SHUTDOWN CROSS REFERENCE				
RELIEF REQUEST NUMBERS			TECHNICAL BASIS AND/OR ALTERNATE TEST REVISED	
PRIOR TO 1987	1987 SUBMITTAL	1988 SUBMITTAL (1)	YES	NO
A.1	A.1	CS-CC-1	N/A	N/A
A.2	A.2	CS-CC-1	N/A	N/A
A.3	A.3	CS-CC-2	N/A	N/A
A.5	A.4	CS-CC-2	N/A	N/A
A.6	withdrawn	N/A	N/A	N/A
N/A	A.6	A.5	X	
N/A	A.5	CS-CC-1	N/A	N/A
N/A	A.7	CS-CC-3	N/A	N/A
N/A	A.8	CS-CC-4	N/A	N/A
B.1	B.1	CS-CVCS-1	N/A	N/A
B.2	N/A	B.2	X	
B.7	B.2	CS-CVCS-2	N/A	N/A
B.8	B.3	CS-CVCS-3	N/A	N/A
B.9	B.4	CS-CVCS-4	N/A	N/A
B.10	B.5	CS-CVCS-5	N/A	N/A
B.11	B.6	CS-CVCS-6	N/A	N/A
B.12	B.7	withdrawn	N/A	N/A
B.13	B.8	withdrawn	N/A	N/A
B.14	B.9	withdrawn	N/A	N/A
B.15	B.10	withdrawn	N/A	N/A
N/A	B.11	CS-CVCS-7	N/A	N/A
N/A	B.12, B.13, B.14	withdrawn	N/A	N/A
N/A	B.15	CS-CVCS-8	N/A	N/A

(1) COLD SHUTDOWN NUMBERS PREFIXED WITH CS.

ISI VALVE TEST RELIEF REQUEST AND COLD SHUTDOWN CROSS REFERENCE				
RELIEF REQUEST NUMBERS			TECHNICAL BASIS AND/OR ALTERNATE TEST REVISED	
PRIOR TO 1987	1987 SUBMITTAL	1988 SUBMITTAL (1)	YES	NO
N/A	B.16,B.17, B.18	Withdrawn	N/A	N/A
N/A	B.19	CS-CVCS-9	N/A	N/A
N/A	B.20,B.21	withdrawn	N/A	N/A
N/A	B.22	CS-CVCS-10	N/A	N/A
C.1	C.1	CS-EF-1	N/A	N/A
C.2	C.2	CS-EF-2	N/A	N/A
C.3	C.3	CS-EF-3	N/A	N/A
C.4	C.4	CS-EF-4	N/A	N/A
C.5	C.5	CS-EF-5	N/A	N/A
C.6	C.6	CS-EF-6	N/A	N/A
C.7	C.7,C.8	C.7,C.8	X	
C.8	C.9,C.10	CS-EF-7,CS-EF-8	N/A	N/A
D.1	D.1	CS-FW-1	N/A	N/A
D.2	D.2	withdrawn	N/A	N/A
N/A	D.3	withdrawn	N/A	N/A
N/A	D.4	CS-FW-2	N/A	N/A
N/A	D.5	CS-FW-3	N/A	N/A
N/A	D.6	CS-FW-4	N/A	N/A
F.1	F.1	CS-IA-1	N/A	N/A
F.2	F.2	CS-IA-1	N/A	N/A
F.3	F.3	CS-IA-1	N/A	N/A
N/A	F.4,F.5	withdrawn	N/A	N/A
G.1	G.1	CS-MS-1	N/A	N/A

(1) COLD SHUTDOWN NUMBERS PREFIXED WITH CS.

ISI VALVE TEST RELIEF REQUEST AND COLD SHUTDOWN CROSS REFERENCE				
RELIEF REQUEST NUMBERS			TECHNICAL BASIS AND/OR ALTERNATE TEST REVISED	
PRIOR TO 1987	1987 SUBMITTAL	1988 SUBMITTAL	YES	NO
G.3	G.2	withdrawn	N/A	N/A
G.4	G.3	withdrawn	N/A	N/A
N/A	G.4	CS-MS-2	N/A	N/A
N/A	G.5	withdrawn	N/A	N/A
J.1	J.1	CS-SI-1	N/A	N/A
J.2	J.2	J.2	X	
J.3	J.2	J.2	X	
J.4	J.3	CS-SI-2	N/A	N/A
J.5	J.4	CS-SI-3	N/A	N/A
J.6	J.2	J.2	X	
J.7	J.2	J.2	X	
J.8	J.5	J.5		X
J.9	J.6	CS-SI-4	N/A	N/A
J.11	J.7	CS-SI-5	N/A	N/A
J.12	J.8	J.8	X	
J.13	J.9	CS-SI-6	N/A	N/A
J.14	withdrawn (BIT removed)	N/A	N/A	N/A
J.15	J.10	J.10		X
J.16	J.11	J.11		X
J.17	withdrawn	N/A	N/A	N/A
J.18	J.13	withdrawn	N/A	N/A
J.19,J.20	J.14	withdrawn	N/A	N/A
J.21,J.22	J.14	withdrawn	N/A	N/A

(1) COLD SHUTDOWN NUMBERS PREFIXED WITH CS.

ISI VALVE TEST RELIEF REQUEST AND COLD SHUTDOWN CROSS REFERENCE				
RELIEF REQUEST NUMBERS			TECHNICAL BASIS AND/OR ALTERNATE TEST REVISED	
PRIOR TO 1987	1987 SUBMITTAL	1988 SUBMITTAL (1)	YES	NO
J.23,J.24	withdrawn	N/A	N/A	N/A
J.25,J.26	withdrawn	N/A	N/A	N/A
N/A	J.12	CS-SI-7	N/A	N/A
N/A	J.15,J.16	withdrawn	N/A	N/A
N/A	J.17,J.18	withdrawn	N/A	N/A
K.1	K.1	K.1		X
K.2	K.2	CS-SP-1	N/A	N/A
K.3	K.3	K.3		X
K.4	K.4	withdrawn	N/A	N/A
L.1	L.1	withdrawn	N/A	N/A
L.2	withdrawn	N/A	X	
N/A	L.2	CS-SW-1	N/A	N/A
N/A	L.3	withdrawn	N/A	N/A
N/A	L.4	withdrawn	N/A	N/A
M.1	M.1	CS-AC-1	N/A	N/A
N/A	M.2	CS-AC-2	N/A	N/A
N.1	N.1	CS-AH-1	N/A	N/A
N.2	N.2	withdrawn	N/A	N/A
N/A	N.3	N.3		X
P.1	withdrawn	N/A	N/A	N/A
Q.1	withdrawn	N/A	N/A	N/A
Q.2,Q.3,Q.4	Q.2,Q.3	withdrawn	N/A	N/A
N/A	Q.1	withdrawn	N/A	N/A

(1) COLD SHUTDOWN NUMBERS PREFIXED WITH CS.

ISI VALVE TEST RELIEF REQUEST AND COLD SHUTDOWN CROSS REFERENCE				
RELIEF REQUEST NUMBERS			TECHNICAL BASIS AND/OR ALTERNATE TEST REVISED	
PRIOR TO 1987	1987 SUBMITTAL	1988 SUBMITTAL (1)	YES	NO
R.1,R.2,R.3,R.4	R.1,R.2,R.3	withdrawn	N/A	N/A
S.1,S.2	S.1,S.2	withdrawn	N/A	N/A
N/A	S.3	CS-RH-1	N/A	N/A
T.1,T.2,T.3	T.1,T.2,T.3	withdrawn	N/A	N/A
N/A	T.4,T.5,T.6	withdrawn	N/A	N/A
U.1	U.1	withdrawn	N/A	N/A
N/A	U.2,U.3,U.4	withdrawn	N/A	N/A
N/A	V.1	withdrawn	N/A	N/A
N/A	W.1	withdrawn	N/A	N/A
N/A	X.1	withdrawn	N/A	N/A
N/A	Y.1	withdrawn	N/A	N/A
N/A	N/A	E.1		X
N/A	N/A	E.2		X

(1) COLD SHUTDOWN NUMBERS PREFIXED WITH CS.

ISI VALVE TEST RELIEF REQUEST INDEX

ATTACHMENT V

SYSTEM	R.R./Page No.	VALVE No.	REVISION
CC	A.5	XVC9680A,B	1
CVCS	B.2	XVC8481A,B,C	1
EF	C.7	XVC1022A,B	2
EF	C.8	XVC1034A,B	2
ALL	E.1	Power Operated, Active, Fast-Acting	0
ALL	E.2	Cold Shutdown Valves	0
SI	J.2	XVC8997A,B,C XVC8995A,B,C XVC8992A,B,C XVC8990A,B,C	1
SI	J.5	XVC8948A,B,C XVC8956A,B,C	2
SI	J.8	XVC8926	2
SI	J.10	XVC8993C	2
SI	J.11	XVG8801A,B	2
SP	K.1	XVC3009A,B	2
SP	K.3	XVC3013A,B	2
AH	N.3	XVB0001A,B XVB0002A,B	1

A.5

System:	Component Cooling
Valves:	XVC-9680A, XVC-9680B
Category:	A/C
Class:	3
Function:	Prevent backflow of chromated component cooling water into Service Water System. Open to admit service water to CC System.
Test Requirement:	Exercise valves (full stroke) every three 3) months.
Basis for Relief:	Flow testing these valves during plant operation would inject raw Service Water into Component Cooling Water System. This causes chemistry control problems in the CC System. Flushing and chemistry control recovery during cold shutdown will delay restart a minimum of (48) hours.
Alternate Test:	Valves will be tested during Refueling shutdown when time will permit subsequent flushing to clean the tested portions of the CC system.

PREPARED BY: Gary B. Cullen FOX

APPROVED BY: Gary Moffatt DATE 8-11-82

B.2

System:	Chemical and Volume Control
Valves:	XVC-8481A, XVC-8481B, XVC-8481C
Category:	B
Class:	2
Function:	Charging/SI Pump Discharge Check Valves. Permit forward flow, restrict reverse flow.
Test Requirements:	Exercise check valves to the position required to fulfill their function every three (3) months.
Basis for Relief:	Exercising valves during normal operations would require establishing flow to the RCS which would inject boron and shut down the plant. Exercising these valves during cold shutdown could cause cold temperature overpressurization of the Reactor Coolant System and/or the Reactor Pressure Vessel.
Alternate Test:	These valves will be partial exercised each quarter and full flow exercised each refueling outage when the vessel head is removed.

PREPARED BY: Lay B. Callen RWK

APPROVED BY: Gary Moffatt DATE 6-4-88

C.7

Valve:	XVC-1022A, XVC-1022B
Category:	C
Class:	3
Function:	Restrict reverse flow of condensate and service water into the opposite train service water supply lines for the turbine driven emergency feedwater pump.
Test Requirement:	Check valves will be exercised to the position required to fulfill their function every three (3) months.
Basis for Relief:	Testing these valves during plant operations or cold shutdown could introduce service water into the Emergency Feedwater System and eventually into the steam generators causing severe chemistry control problems.
Alternate Test:	Valves will be disassembled and inspected each refueling shutdown.

PREPARED BY: Gary B. Collins RWK

APPROVED BY: Gary Moffatt DATE 8-4-88

C.8

Valves:	XVC-1034A, XVC-1034B
Category:	C
Class:	3
Function:	Restrict reverse flow of emergency feedwater from the condensate storage tank into the service water supply lines for the motor driven emergency feedwater pumps.
Test Requirement:	Check valves will be exercised to the position required to fulfill their function every three (3) months.
Basis for Relief:	Testing these valves during plant operations or cold shutdown could introduce service water into the Emergency Feedwater System and eventually into the steam generators causing severe chemistry control problems.
Alternate Test:	Valves will be disassembled and inspected each refueling shutdown.

PREPARED BY: Jay B. Collins PWR

APPROVED BY: Gary Moffatt DATE 8-4-88

E.1

System:	All
Valve:	Power Operating, Active, Fast-acting
Category:	A and B
Class:	1, 2 and 3
Function(s):	Performs a specific function in shutting down the plant to cold shutdown or in mitigating consequences of an accident.
Test Requirement:	Valves with stroke times < 10 seconds are limited to a 50% increase deviation from the previous test.
Basis for Relief:	Valves with stroke times ≤ 2 seconds may exceed the 50% increase limitation from the previous test due to normal manual response error.
Alternate Test:	Exercise valves full stroke to the nearest second not to exceed a maximum stroke time of 2 seconds.

PREPARED BY: Gary B. Collins BWK

APPROVED BY: Gary Moffatt DATE 6-4-88

E.2

Valve:	All Active
Category:	A, B and C
Class:	1, 2 and 3
Function(s):	Performs a specific function in shutting down the plant to cold shutdown or in mitigating consequences of an accident.
Test Requirement:	Valves which cannot be tested at power will be tested at cold shutdown.
Basis for Relief:	The cold shutdown schedule may be a very short duration and returning to power schedule may preclude system alignment activities required to perform cold shutdown testing.
Alternate Test:	Initiate cold shutdown testing within 48 hours of attaining mode 3, 4, or 5. Continue testing until all testing is complete or ready to return to power, whichever occurs first. Complete all cold shutdown testing each RFO.

PREPARED BY: Larry B. Calbin Jr. PWR

APPROVED BY: Darry Moffatt DATE 8-8-88

J.2

System:	Safety Injection (SI)
Valves:	XVC-8997A, XVC-8997B, XVC-8997C, XVC-8995A, XVC-8995B, XVC-8995C, XVC-8992A, XVC-8992B, XVC-8992C, XVC-8990A, XVC-8990B, XVC-8990C
Category:	A/C
Class:	1
Function(s):	Restrict reverse flow from the reactor coolant system to the high head safety injection system.
Test Requirement:	Exercise check valves to the position required to fulfill their function every three (3) months.
Basis for Relief:	Testing these valves during plant operations will require establishing charging flow into the Reactor Coolant Loop, placing unnecessary thermal stresses on the high head injection piping and reactor coolant piping branch nozzles. Testing these valves during cold shutdown also requires establishing charging flow through the high head injection lines. With the RCS at such a low pressure and temperature, there could be an uncontrolled injection of a large volume of water which could cause a pressure spike in the system and exceed the pressure-temperature limits.
Alternate Test:	These valves will be tested during each refueling when the vessel head is removed and the refueling pool can be used to contain the large volume of water.

PREPARED BY: Larry B. Allen RWK

APPROVED BY: Doug Moffatt DATE 6-4-88

J.5

Valves:	XVC-8948A, XVC-8948B, XVC-8948C, XVC-8956A, XVC-8956B, XVC-8956C
Category:	A/C
Class:	1
Function:	Restrict reverse flow from the reactor coolant system to the high head safety injection (SI) accumulators.
Test Requirement:	Exercise check valves to the position required to fulfill their function every three (3) months.
Basis for Relief:	Testing these valves during plant operations will require initiating flow from the SI Accumulators to the Reactor Coolant System (RCS). The SI Accumulators do not have the required pressure to overcome normal Reactor Coolant System pressure; therefore, flow could not be established. During cold shutdown, injecting an additional large concentration of boron contained in the SI Accumulators into RCS would require a large volume of reactor makeup water to dilute the boron concentration in the RCS. This would be inconsistent with normal startup procedures.
Alternate Test:	Valves will be excercised to the position required to fulfull their function during each refueling shutdown. Nitrogen pressure $\leq$ .5 PSI will be used as the moving force for SI accumulator water. An acoustic method will be used in conjunction with a local leak rate test to qualify the opening and closing of each valve.

PREPARED BY: Leigh B. Fuller FWK

APPROVED BY: Gary Moffatt DATE 6-9-88

J.8

Valve:	XVC-8926
Category:	C
Class:	2
Function:	Restrict reverse flow from the Charging Pump Suction/VCT to the Refueling Water Storage Tank.
Test Requirement:	Check valves will be exercised to the position required to fulfill their function every three (3) months.
Basis for Relief:	Full flow testing this valve during normal plant operations would cause an inadvertant boration due to the high concentration of boric acid in the RWST, thus a plant shutdown. Full flow testing this valve during cold shutdown could cause low temperature over pressurization due to insufficient discharge expansion volume in the Reactor Coolant System.
Alternate Test:	The valve will be partially flow tested during cold shutdown, and full flow tested during each refueling when the refueling cavity can be used to contain the large volume of water.

PREPARED BY: Jay B. Collins RWK

APPROVED BY: Doug Moffett DATE 8-4-88

J.10

Valve:	XVC-8993C
Category:	A/C
Class:	1
Function:	Restrict reverse flow from the Reactor Coolant System to the hot leg injection lines.
Test Requirement:	Exercise check valves to the position required to fulfill their function every three (3) months.
Basis for Relief:	Since suction for the charging pumps would be shifted to the RWST to perform this test, testing this valve would cause an inadvertant boration due to the high concentration of boric acid in the RWST, thus a plant shutdown. In addition, testing this valve during normal operation would cause excessive thermal shock to the safety injection to RCS piping. During cold shutdown, the RCS does not have the volume to contain the large amount of water required to test the valve, thus having a potential for exceeding the maximum pressure for these low temperatures.
Alternate Test:	Valve will be tested during each refueling outage when the vessel head is removed and refueling pool can be used to contain the large volume of water.

PREPARED BY: Guy B. Collins BWK

APPROVED BY: Doug Moffatt DATE 6-1-88

J.11

Valves:	XVG-8801A, XVG-8801B
Category:	B
Class:	2
Function:	High head to cold leg injection isolation valves.
Test Requirement:	Exercise valves (full stroke) for operability every three (3) months.
Basis for Relief:	Testing these valves during normal plant operation could inject high concentration of boric acid into the high head injection lines and thus into the RCS causing an inadvertant boration and plant shutdown. During cold shutdown, exercising these valves could cause migration of the high concentration of boric acid into the high head injection lines, which are not heat traced, causing solidification and blockage of these lines.
Alternate Test:	Valves will be exercised during refueling shutdown.

PREPARED BY: Jay B. Collins Jr

APPROVED BY: Doug Moffatt DATE 8-4-88

ISI VALVE TEST RELIEF REQUESTS
REVISION 2

K.1

System:	Reactor Building Spray System (SP)
Valves:	XVC-3009A, XVC-3009B
Category:	A/C
Class:	2
Function:	Restrict reverse flow from the reactor containment into the Reactor Building Spray System.
Test Requirement:	Check valves will be exercised to the position equired to fulfill their function every three (3) months.
Basis for Relief:	Flow testing these valves during normal operations or cold shutdown would require placing the Reactor Building Spray System in operation which would result in dousing the containment and filters.
Alternate Test:	Valves will be disassembled and inspected for operability during each refueling shutdown.

PREPARED BY: Greg B. Callen RWK

APPROVED BY: Gary Moffatt DATE 8-4-88

K.3

Valves:	XVC-3013A, XVC-3013B
Category:	C
Class:	2
Function:	Restrict reverse flow from the Reactor Building Spray System into the NaOH Tank.
Test Requirement:	Check valves will be exercised to the position required to fulfill their function every three (3) months.
Basis for Relief:	Testing these valves during plant operation or cold shutdown would result in dousing the containment and filters or pumping sodium hydroxide to the RWST.
Alternate Test:	Valves will be disassembled and inspected for operability during each refueling shutdown.

PREPARED BY: Guy B. Callen RWK

APPROVED BY: Gary Moffatt DATE 6-4-88

N.3

System:	Air Handling (AH)
Valves:	XVB-0001A, XVB-0001b, XVB-0002A, XVB-0002B
Category:	A
Class:	2
Function:	Isolate Reactor Building Purge Supply and Exhaust.
Test Requirement:	Leak test at least once every two years. Any valve indicating an increasing leakage trend which reduces the remaining permissible leakage rate by 50%, double the test frequency and any valve which is projected to exceed 1.1 (3620) at next test, repair or replace.
Basis for Relief:	The leakage rate for each of these valves and test frequency are specified by Technical Specification a. 3620 cc/min and six months, respectively. The specif. frequency is twice as often as the doubled test frequency.
Alternate Test:	Leak test these valves once per six months and limit combined valve leakage (one penetration) to 3620 cc/min.

PREPARED BY: Gary B. Collins RVK

APPROVED BY: Gary Moffatt DATE 8-4-88

ISI PUMP TEST RELIEF REQUEST INDEX

ATTACHMENT VI

SYSTEM	R.R./Page No.	VALVE No.	REVISION
DG	A.1	XPP-141A XPP-141B XPP-4A XPP-4B	1
SW	B.2	XPP-39A XPP-39B XPP-39C	0
SW	B.3	XPP-39A XPP-39B XPP-39C	0
CVCS	C.1	XPP-13A XPP-13B	1
CVCS	D.1	XPP-43A XPP-43B XPP-43C	1
SW	E.2	XPP-39A XPP-39B XPP-39C	1
ALL	E.4	ISI Pump Temperature Measuring Instrumentation	1
VU	G.1	XPP-0048A XPP-0048B XPP-0048C	0

ISI PUMP TEST RELIEF REQUEST
REVISION 1

A.1

System: Diesel Generator (DG)

Pumps: XPP-141A, XPP-141B, XPP-4A, XPP-4B

Class: 3

Function: Diesel Fuel Oil Transfer Pumps

Test Requirement: Inservice test includes measurement of inlet pressure (Pi), differential pressure (ΔP), flow rate (Q), vibration amplitude (V) and bearing temperature (Tb) and observation of lubricant level)

Relief Request:

1) Relief is requested from measuring (Pi), (ΔP), (Tb) and from observing lubricant level.

2) Relief is requested from flow rate acceptance criteria .9 to 1.03r), where r is reference.

Basis:

1) These pumps are positive displacement (rotary screw) with inaccessible, self lubricated internal bearings. Flow and vibration are indicative of pump performance.

2) Technical specification requires 5 GPM minimum flow rate from each pump for diesel operation. Measured flow rate for each of these pumps is ≈ 12 gpm, 140% above minimum required for diesel operation. However, the level instruments in the day tank used in the flow calculations can experience a ± 2% acceptable deviation. This deviation amount may provide results on the low flow rate pumps which is outside the code requirements, but within the diesel safety function acceptance criteria.

Alternate Test:

1) Flow rate measurement and vibration measurement will be performed during normal diesel testing, one/month.

2) Establish an administrative minimum limit of 9 gpm, which is 80% above minimum required for diesel operation. For flow rates between 5 and 9 gpm, evaluate pump safety function performance before returning to service. Declare pump inoperable ≤ 5 gpm flow rate.

PREPARED BY: Larry B. Collins RWK

APPROVED BY: Doug Moffett DATE 8-9-88

ISI PUMP TEST RELIEF REQUEST
REVISION 0

B.2

Pumps:	XPP-0039A, XPP-0039B, XPP-0039C
Class:	3
Function:	Service Water Pumps
Test Requirement:	Each Inservice test shall include measurement and/or observation of the following quantities: Inlet Pressure (Pi) Differential Pressure (ΔP) Flow Rate (Q) Vibration Amplitude (V) Lubricant Level and Bearing Temperature (Tb)
Relief Request:	Relief is requested from ASME Code Section XI requirements for measuring vibration and bearing temperature.
Basis for Vibration Relief:	These pumps are vertical pumps with the pumping units housed in a column below the floor structure of the Service Water Pump House. The bearings are inaccessible for measurement of vibration.
Alternate Test:	Vibration measurement will be taken on the motor inboard and outboard bearings.
Basis for Bearing Temperature Relief:	These pumps are vertical pumps with the pumping unit housed in a column below the floor structure of the Service Water Pump House. The bearings are inaccessible for measurement of bearing temperature.
Alternate Test:	The fluid temperature of the water being pumped will be measured.

PREPARED BY: Lyle B. Collins RWK

APPROVED BY: Doug Moffatt 8-3-88
Date

ISI PUMP TEST RELIEF REQUEST
REVISION 0

B.3

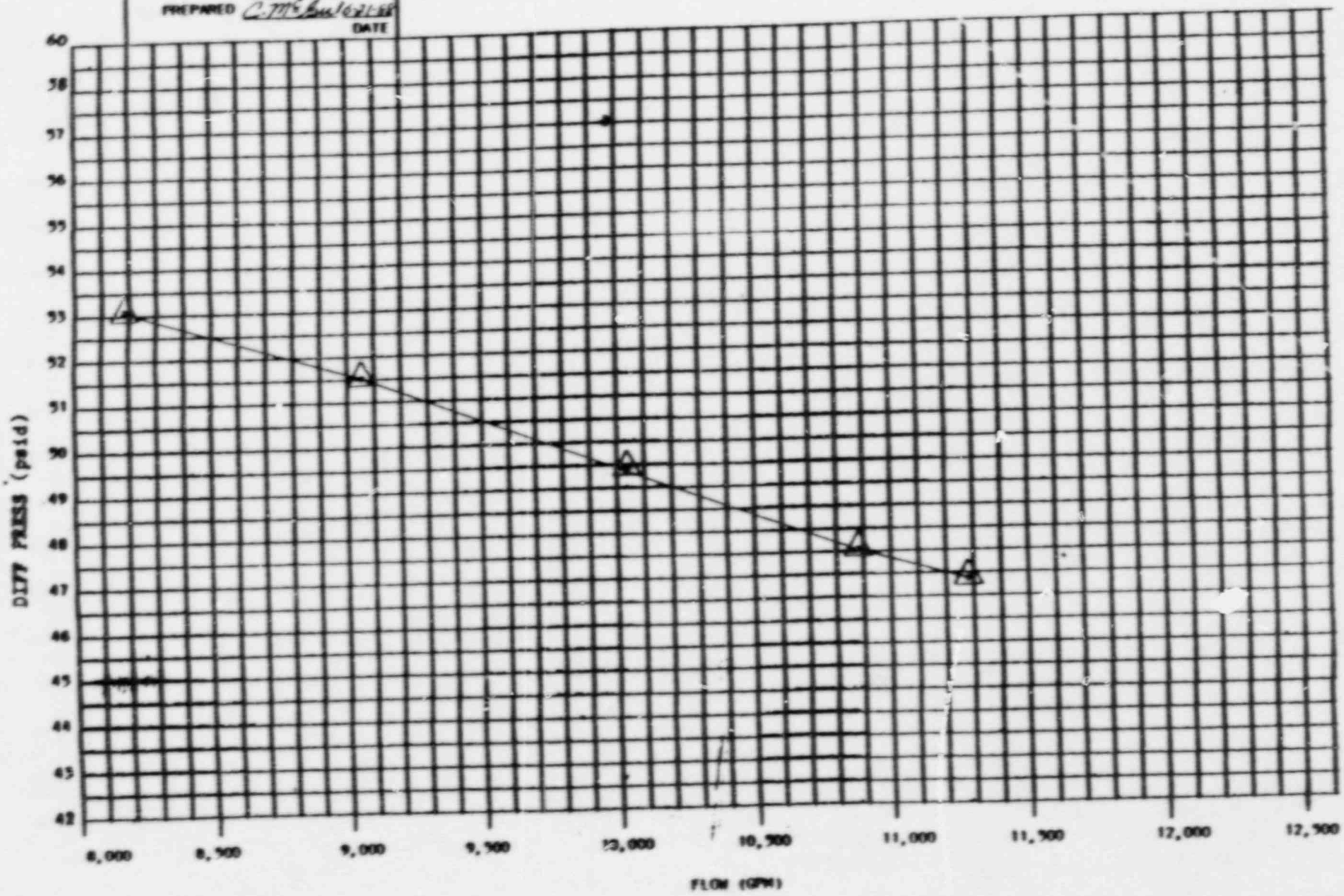
System:	Service Water (SW)
Pumps:	XPP-39A, XPP-39B, XPP-39C
Class:	3
Function:	Service Water Pumps
Test Requirement:	Inservice test includes measurement of flow rate (Q) and differential pressure (ΔP) criteria after adjusting either to its single point reference value.
Relief Request:	Relief is requested from adjusting Q or ΔP to single point reference value.
Basis:	The Service Water System provides raw cooling water to many safety related systems and essential equipment. Adjusting Q or ΔP to a single point reference value would interrupt service water flow rate to much of this equipment, thus providing a potential for system safety function degradation.
Alternate Test:	Use individual insitu pump test curves by plotting minimum and maximum ΔP alert and required action ranges on each test curve. Record Q and verify ΔP results within acceptance limits of pump test curve.

PREPARED BY: Jay B Collins BJX

APPROVED BY: Gary Moffatt 8-9-88
Date

FAST SPEED
RPP0039 ☑ A ☐ B ☐ C
TEST DATE 5-17-86
PREPARED C. Mc Bullock
DATE

△ REFERENCE



ISI PUMP TEST RELIEF REQUEST
REVISION 1

C.1

System: Chemical and Volume Control System (CVCS)

Pumps: XPP-13A, XPP-13B

Class: 2

Function: Boric Acid Transfer Pumps

Test Requirement: Each Inservice test includes measurement of inlet differential pressure (Pi), differential pressure (ΔP), flow rate (Q), vibration amplitude (V) and bearing temperature (Tb) and observe lubricant level.

Relief Request:

1) Relief is requested from measuring flow once/quarter.

2) Relief is requested from mesuring bearing temperature annually and observation of lubricant level quarterly.

Basis:

1) The Boric Acid Tanks are normally kept at 90% capacity. The remaining 10% is insufficient volume to conduct the flow rate test due to the incremental sensitivity of the level instrumentation which are used to measure flow rate.

2) The bearings are self lubricated and are inaccessible for temperature measurement. The lubricant is the pumped fluid and cannot be directly visually observed. Normal flow rate indicates lubricant level is satisfactory.

Alternate Test:

1) Initiate flow rate test within 48 hours of attaining mode 5 (cold shutdown) at which time BAT(s) fluid levels can be adjusted to provide the space needed to contain the large volume of test water.

2) The pumped fluid temperature will be measured.

PREPARED BY: Gary B. Collins RWK

APPROVED BY: Gary Moffatt 8-9-88
Date

ISI PUMP TEST RELIEF REQUEST
REVISION 1

D.1

System:	Chemical and Volume Control System (CVCS)
Pumps:	XPP-43A, XPP-43B, XPP-43C
Class:	2
Function:	Charging/Safety Injection Pumps
Test Requirement:	Inservice test includes measurement of inlet pressure (Pi), differential pressure (ΔP), bearing temperature (Tb), vibration amplitude (V) and flow rate (Q).
Relief Request:	Relief is requested from measuring flow rate once/quarter and during cold shutdown.
Basis:	During normal operations and cold shutdown partial flow testing would require 3 separate groups of flow elements to be considered. These are the charging, seal injection and letdown flow elements. Combined instrument inaccuracy could be 12%. Full flow testing during normal operations would thermally shock the safety injection nozzles. Full flow testing during cold shutdown would require initiating flow into the RC System. The volume available in the pressurizer would provide only 6-7 minutes to record all readings. This is not enough time to record all ISI required readings. In addition, the lack of volume in the pressurizer during cold shutdown may cause cold temperature overpressurization of the Reactor Coolant System.
Alternate Test:	Perform all required tests through the miniflow recirculation line once each quarter, except flow. Perform all tests, including flow, each RFO when the reactor vessel head is removed and the refueling cavity can be used to contain the large volume of water required for flow testing.

PREPARED BY: Greg B. Calla BWK

APPROVED BY: Don Moffatt 8-9-88
Date

ISI PUMP TEST RELIEF REQUEST
REVISION 1

E.2

System: Service Water System (SW)

Pumps: XPP-0039A, XPP-0039B, XPP-0039C

Class: 3

Function: Pumps raw cooling water to essential equipment required for shutting down the reactor or mitigating consequences of an accident.

Test Requirement: Article IWP-3000, specifically Table IWP-3100-2, specifies the high alert and required action ranges for pumps. Flow rate and differential pressure alert range is established between 1.02 and 1.03 times the reference value and the required action range is established > 1.03 times the reference value.

Basis for Relief: When testing these centrifugal pumps, minute increases in differential pressure and flow are not significant. However, acceptable instrument/transmitter error ($\pm$ 2% full range), total instrument range ($\leq$ 3 times the reference value), water density and/or personnel visual acuity could be the cause for recording ΔP and Q values which fall outside the acceptable range.

Recognition of the present "alert range" requires the affected pump be subjected to an increased frequency of testing. This increased test frequency lends the pump to additional unavailability while unnecessary pump cycling may, in fact, reduce pump reliability.

The present "required action range" specifies that the pump be declared inoperable until corrective action has been taken. Corrective action can take the form of replacement, repair or analysis to demonstrate operability and function. Again, minute increases due to acceptable instrument error and range, water density, etc. can lead to additional testing, replacement, repair or analysis activities. These activities can further reduce pump availability and reliability. Reference E.2 Attachment 1 for instrument error details.

Alternate Requirements: To provide a method to diagnose and correct significant and meaningful problems, yet permit a sufficient range to prevent unnecessary testing and unavailability, specify the high "alert range" and high "required action range" for Q and ΔP to be consistent with OM-6.

1) Alert Range -- 1.08 to 1.10 r *
2) Required Action Range -- > 1.10r *

* r is the reference value

PREPARED BY: Greg B. Collins BGC

APPROVED BY: Gary Moffatt 6-8-88
Date

PUMP TEST RELIEF REQUEST

E.2 FLOW INSTRUMENT DATA SHEET

	A	B	C	D	E	F		G
	SWP "A" INST. NO	SWP "B" INST. NO	SWP "C" INST. NO	PER CENT RANGE	FLOW RATE RANGE (GPM)	INSTRUMENT INCREMENTS		CODE CALIBRATIONS ACCURACY (±)
						PER CENT	GPM	
CCW	FM4460	FM4490	*	0-100	0-10,000	2	200	2% 200 GPM
Chiller A	FM4461	FM4491	*	0-100	0-1,200	2	24	2% 24 GPM
DG Cooler	FM4462	FM4492	*	0-100	0-1,200	2	24	2% 24 GPM
Chiller C	FM4463	FM4493	*	0-100	0-1,200	2	24	2% 24 GPM

*All instruments listed under SWP "A" or all instruments listed under SWP "B" are used for testing SWP "C", depending upon train of operation.

When testing any one of the three pumps with each of the flow instruments out of calibration by that margin permitted by column "G" under flow instrument data the typical flow rates might be observed as follows.

	OBSERVED FLOW RATE (PERCENT)	OBSERVED FLOW RATE (GPM)	PERCENT OUT OF CAL	FLOW RATE OUT OF CAL (GPM)
	74	7,400	+ 2	+ 200
	100	1,200	+ 2	+ 24
	75	900	+ 2	+ 24
	80	960	+ 2	+ 24
TOTAL	XXXXXXX	10,460	XXXXXX	+ 272

At the total observed flow rate reference value of 10,460 GPM all four instruments may indicate a total of 272 gallons higher than they should. The % inaccuracy of the observed flow rate is:

$$\frac{272}{10,460} = .025974 = +2.6\%$$

II.2

The actual flowrate is (10,460 - 272) = 10,188 GPM. Typical differential pressure across the pump at a flow rate of 10,460 GPM would be 45 psi.

Since the actual flow rate is 10,188 GPM, due to acceptable instrument inaccuracy, the differential pressure reading would be expected to be higher than 45 psi.

The expected differential pressure can be calculated as follows:

Q_1 = 10,188 GPM (Actual Flow Rate)
Q_2 = 10,460 GPM (Reference Value Flow Rate)
dp_1 = 45 PSI (Reference Value Differential Pressure)
dp_2 = Expected or Observed Differential Pressure

The differential pressure across the pump is proportional to the square of flow rate therefore:

$$\frac{dp_1}{dp2} = \frac{(Q_1)2}{(Q_2)2}, \quad dp_2 = \frac{(dp_1)(Q_2)2}{(Q_1)^2} = \frac{(45)(10,469)^2}{(10,188)^2} = 47.43\ PSI$$

The code dp upper limit for the alert range would be 1.02(45) to 1.03(45) or between 45.9 PSI and 46.35 PSI. The code dp maximum limit for the required action range would be > 1.03 (45) or > 46.35 PSI. This is only .9 to 1.35 PSI above the reference value.

The experienced dp (47.43) divided by the reference value (45 psi) would be an increase:

$$\frac{47.43}{45} = 1.054 \text{ or } 5.4\% \text{ above the dp reference value.}$$

When using a pressure gage(s) within code accuracy and test requirements, normally 0-100 PSI range, the gage could be acceptable but out of calibration as much as 2 PSI. This would add as much as 4.4% to the 5.4% bringing the total inaccuracy to 9.8%. This acceptable inaccuracy would require that the pump be placed in the "Required Action Range".

When adjusting the dp to the Reference Value (45 PSI) the pressure gage(s) could be acceptable and +2 PSI out of calibration. The actual dp could be 43 PSI [45-(+2)]. The experienced flow rate (expected flow rate) would increase and be calculated as follows:

Q_2 = 10,460 GPM (Reference Value Flow Rate)
Q_1 = Expected or Observed Flow Rate
dp_1 = 45 PSI (Reference Value Differential Pressure)
dp_2 = 43 PSI (Actual Differential Pressure)

$$\left(\frac{Q_1}{Q_2}\right)^2 = \frac{dp_1}{dp_2}, \quad Q_1 = \sqrt{\frac{(Q_2)2\,(dp_1)}{dp_2}} = \sqrt{\frac{(10,460)^2(45)}{43}} = 10,700.5\ (240.5\ GPM\ Increase\ Above\ the\ Reference\ Value)$$

PUMP TEST RELIEF REQUEST

E.2

The code flow rate maximum limit is 1.02 r to 1.03 r for the alert range and >1.03 r for the required action range, where r is the code flow rate reference value.

The alert range would be between 1.02 (10,460) and 1.03 (10,460) or between 10,669 GPM and 10,773 GPM. The required action range would be > 10,733 GPM.

The actual flow rate (10,700.5) at 43 PSI dp divided by the reference value flow rate would be an increase of:

$$\frac{10,700.5}{10,460} = 1.02299 \text{ or } 2.3\%$$

When using flow instruments within code accuracy requirements, as outlined under flow instrument data, they could be acceptable and out of calibration as much as 272 GPM. This situation would add 2.6% inaccuracy to the 2.3% bringing the total inaccuracy to 4.9%. These acceptable instrument inaccuracies would result in placing the pump in the "required action range" thus declaring the affected pump inoperable.

In addition water density can change as much as .2% between 80°F and 50°F. Since the water level in the service water pond is the method used for determining the pump inlet pressure the differential pressure can vary an additional .29% depending upon service water inlet temperature.

Individual visual acuity can only detect to the nearest 1% on the flow instruments. In effect an additional .5% inaccuracy could actually exist for any given pump test.

The total acceptable inaccuracy for service water pump testing subjects the pumps to additional testing and additional unavailability.

ISI PUMP TEST RELIEF REQUEST
REVISION 1

E.4

System: All

Components: ISI Pump Temperature Measuring Instrumentation

Test Requirement: The full scale range of each bearing temperature measuring and indicating instrument shall be three times the reference value or less.

Basis for Relief: Some temperature measuring and indicating devices are digital electronic by design, thus inherently more accurate and sensitive. This feature permits the LED readout full range scale to be as much as 25 times the reference value with improved sensitivity and accuracy.

Alternate Requirements: Electronic digital temperature measuring and indicating devices having an accuracy within code requirements (± 2%) at the temperature measured may be used and substituted for non-digital devices where physical configuration permits.

PREPARED BY: Gary A. Collins RVK

APPROVED BY: Gary Moffatt 8-3-88
Date

ISI PUMP TEST RELIEF REQUEST
REVISION 0

G.1

System:	Chilled Water (VU)
Pumps:	XPP-0048A, XPP-0048B, XPP-0048C
Class:	3
Function:	Chilled water pumps.
Test Requirement:	Inservice test includes measurement of flow rate (Q) and differential pressure (ΔP) criteria after adjusting either to its single point reference value.
Relief Request:	Relief is requested from adjusting Q or ΔP single point reference value.
Basis for Relief:	The chilled water system provides cooling water to other safety related systems and essential equipment. Adjusting Q or ΔP to a single point reference value would interrupt chilled water flow rate to much of this equipment, thus providing potential for system safety function degradation.
Alternate Test:	Use individual Insitu pump test curves by plotting minimum and maximum ΔP alert and required action ranges on each test curve. Record Q and verify ΔP results are within acceptance limits of pump test curve.

PREPARED BY: Greg B. Callen RWK

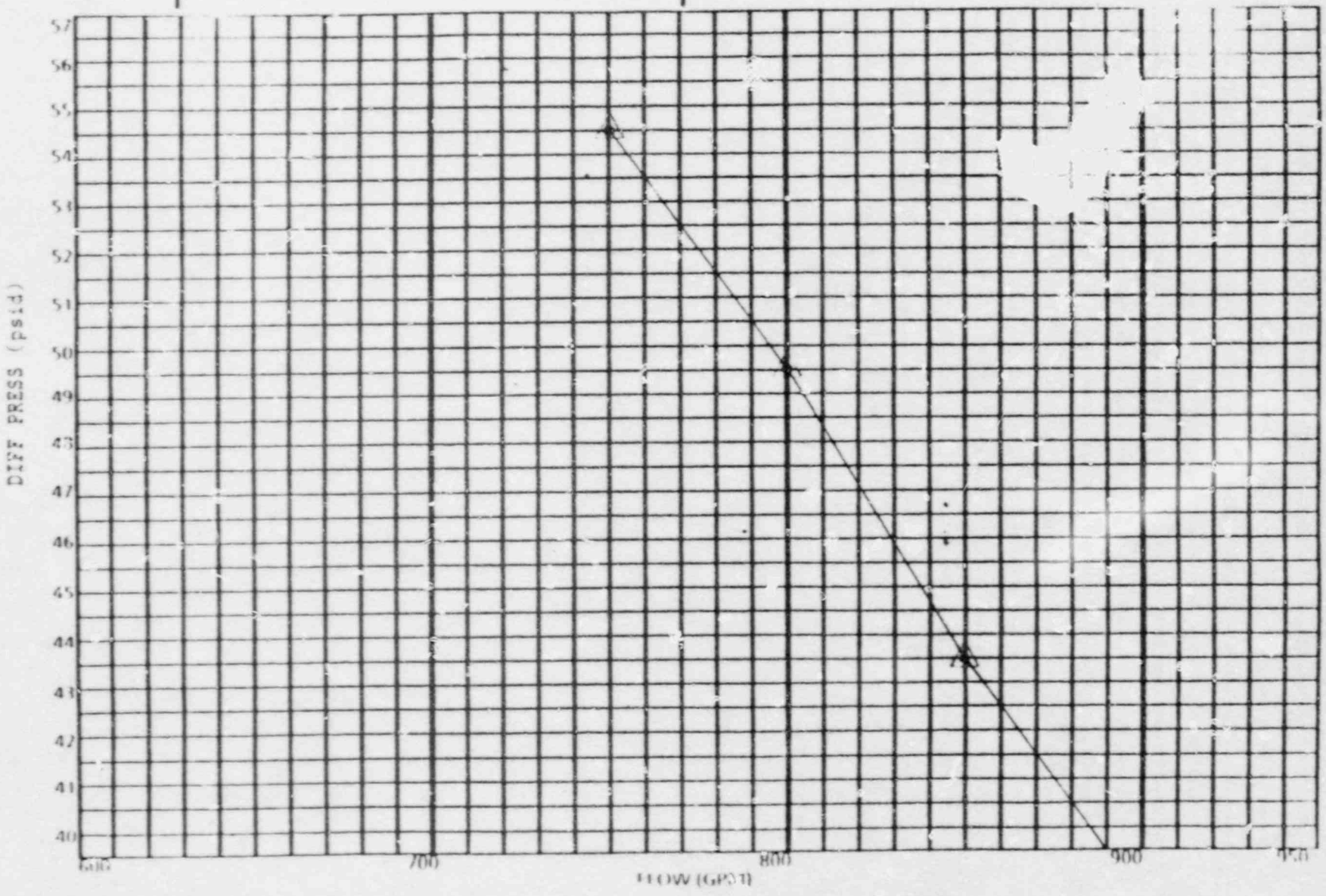
APPROVED BY: Dan Moffatt 8-9-88
Date

XMP0048 | | A | X | B | | C

REFERENCE △

TEST DATE 4-13-88

PREPARED [signature] DATE 2-5-88



ISI COLD SHUTDOWN TESTING BASIS INDEX

SYSTEM	Page No.	VALVE No.	REVISION
AC	AC-1	XVG-7501 XVG-7502 XVG-7503 XVG-7504	0
AC	AC-2	XVC-7451 XVC-7544	0
AH	AH-1	XVB-0001A XVB-0001B XVB-0002A XVB-0002B	0
CC	CC-1	XVC-9570 XVC-9602	0
CC	CC-2	XVG-9600 XVG-9605 XVG-9606 XVG-9568	0
CC	CC-3	XVG-9625 XVG-9626	0
CC	CC-4	XVC-9632 XVC-9633	0
CC	CC-5	XVG-9627A XVG-9627B	0
CVCS	CVCS-1	LCV-115C LCV-115E	0
CVCS	CVCS-2	XVC-8442	0
CVCS	CVCS-3	XVT-8152	0
CVCS	CVCS-4	XVC-8381	0
CVCS	CVCS-5	XVG-8107 XVG-8108	0
CVCS	CVCS-6	XVT-8100 XVT-8112	0
CVCS	CVCS-7	XVT-8102A XVT-8102B XVT-8102C	0
CVCS	CVCS-8	XVT-8145	0
CVCS	CVCS-9	LCV-459 LCV-460	0

ISI COLD SHUTDOWN TESTING BASIS INDEX

SYSTEM	Page No.	VALVE No.	REVISION
CVCS	CVCS-10	XVC-8480A XVC-8480B XVC-8480C	0
EF	EF-1	XVC-1038A XVC-1038B XVC-1038C XVC-1039A XVC-1039B XVC-1039C	0
EF	EF-2	XVC-1015A XVC-1015B	0
EF	EF-3	XVG-1001A XVG-1001B	0
EF	EF-4	XVG-1002 XVG-1008 XVG-1037A XVG-1037B	0
EF	EF-5	XVC-1016	0
EF	EF-6	XVC-1013A XVC-1013B XVC-1014	0
EF	EF-7	XVK-1020A XVK-1020B XVK-1020C	0
EF	EF-8	XVK-1019A XVK-1019B XVK-1019C	0
FW	FW-1	XVG-1611A XVG-1611B XVG-1611C	0
FW	FW-2	IFV-478 IFV-488 IFV-498	0
FW	FW-3	IFV-3321 IFV-3331 IFV-3341	0
FW	FW-4	XVC-1684A XVC-1684B XVC-1684C	0
IA	IA-1	XVT-2660 XVC-2661 XVT-2662A XVT-2662B	0

ISI COLD SHUTDOWN TESTING BASIS INDEX

SYSTEM	Page No.	VALVE No.	REVISION
MS	MS-1	XVG-2801A XVG-2801B XVG-2801C	0
MS	MS-2	XVC-2876A XVC-2876B	0
RH	RH-1	XVG-8701A XVG-8701B XVG-8702A XVG-8702B	0
SI	SI-1	XVC-8998A XVC-8998B XVC-8998C	
SI	SI-2	XVC-8988A XVC-8988B	0
SI	SI-3	XVC-8993A XVC-8993B	0
SI	SI-4	XVG-8808A XVG-8808B XVG-8808C	0
SI	SI-5	XVC-8973A XVC-8973B XVC-8973C XVC-8974A XVC-8974B	0
SI	SI-6	XVG-8884 XVC-8885 XVC-8886	0
SI	SI-7	XVC-8958A XVC-8958B	0
SP	SP-1	XVG-3002A XVG-3002B	0
SW	SW-1	XVC-3168	0

COLD SHUTDOWN ISI VALVE TESTING

AIR HANDLING (AH)

CS-AH-1

Valves:	XVB-0001A, XVB-0001B, XVB-0002A, XVB-0002B
Category:	A
Class:	2
Function:	Isolate the Reactor Building purge supply and exhaust.
Test Requirement:	Exercise valves (full stroke) for operability every three (3) months.
Basis for CS Test:	During normal plant operation these valves are locked closed and required by Technical Specifications to remain closed.

PREPARED BY: Larry B. Collier RWK

APPROVED BY: Gary Moffatt DATE 8-3-88

COLD SHUTDOWN ISI VALVE TESTING

Component Cooling Water System (CC)

C3-CC-1

Valve:	XVC-9570, XVC-9602
Category:	A/C
Class:	2
Function:	Restrict reverse flow from the reactor containment to the component cooling water system.
Test Requirement:	Check valves will be exercised to the positions required to fulfill their function every three (3) months.
Basis for CS Test:	Testing this valve would require securing cooling water to the reactor coolant pumps thermal barriers and oil coolers. During plant operation this could damage the pumps seals resulting in a loss of coolant accident or overheat the pump bearings. This may initiate an automatic trip or require immediate shutdown. Valve will be tested when RC pumps are shutdown at RC System half pipe fill conditions.

PREPARED BY: Larry B. Collier RWX

APPROVED BY: Gary McMoffatt DATE 8-3-88

COLD SHUTDOWN ISI VALVE TESTING

CS-CC-2

Valve:	(1)XVG-9600, (2)XVG-9605, XVG-9606, XVG-9568
Category:	A
Class:	2
Function:	(1) Isolates component cooling water to the reactor containment from the component cooling water booster pumps. (2) Isolates component cooling water to RB containment.
Test Requirement:	Exercise valve (full stroke) for operability every three (3) months.
Basis for CS Test:	Testing these valves would require securing cooling water to the reactor coolant pumps. During plant operation this could damage the pump seals resulting in a loss of coolant accident or overheat the pump bearings. This may initiate an automatic trip or require immediate shutdown. Valves will be tested when RC pumps are shutdown at RC System half pipe fill conditions.

PREPARED BY: Gary B. Calder RWK

APPROVED BY: Gary Moffatt DATE 8-3-88

COLD SHUTDOWN ISI VALVE TESTING

CS-CC-3

Valves:	XVG-9625 and XVG-9626
Category:	B
Class:	3
Function:	Provide flow isolation between essential CC loops (RHR Heat Exchangers) and non-essential CC lines inside Reactor Building.
Test Requirement:	Exercise valves (full stroke) for operability every three (3) months.
Basis for CS Test:	Testing these valves would require securing cooling water to the Reactor Coolant Pumps. During normal plant operations this could cause damage to the RCP pump seals resulting in a loss of coolant accident or overheat the pump bearings. This may initiate an automatic trip or require immediate shutdown. Valves will be tested when RC pumps are shutdown at RC System half pipe fill conditions.

PREPARED BY: Lay B. Callen RWK

APPROVED BY: Gary Moffatt DATE 8-3-88

CS-CC-4

Valves:	XVC-9632, XVC-9633
Category:	C
Class:	2
Function:	Provide backflow isolation between essential CC loops (RHR Heat Exchangers) and non-essential CC lines inside Reactor Building.
Test Requirements:	Exercise check valves to the position required to fulfill their function.
Basis for CS Test:	Testing these valves would require securing cooling water to the Reactor Coolant Pumps. During normal plant operations this could cause damage to the RCP pump seals resulting in a loss of coolant accident or overheat the pump bearings. This may initiate an automatic trip or require immediate shutdown. Valves will be tested when RC pumps are shutdown at RC System half pipe fill conditions.

PREPARED BY: Larry O. Collier RWK

APPROVED BY: Gary Moffatt DATE 8-3-88

COLD SHUTDOWN ISI VALVE TESTING

CS-CC-5

Valves:	XVG-9627A, XVG-9627B
Category:	B
Class:	3
Function:	Opens on low level surge tank signal to permit Service Water makeup to CC System.
Test Requirement:	Exercise valves (full stroke) every three (3) months.
Basis for CS Test:	Stroking these valves during normal operation would require securing the affected service water train to preclude injecting service water into Component Cooling Water System. Service water entering the CC System causes severe chemistry control water problems in the CC System. Securing service water would also make the following train related emergency safeguards equipment inoperable. Chilled water chillers, CC water heat exchanger, diesel generator coolers, RHR heat exchanger, charging pump cooler, emergency feedwater pump room, Reactor Building cooling units, RHR pump seal heat exchanger, Control Room ventilation. Securing this equipment places the plant in a severely degraded position for response to emergency safeguard function.

PREPARED BY: Larry B. Collins RWK

APPROVED BY: Gary Moffatt DATE 6-3-88

COLD SHUTDOWN ISI VALVE TESTING

Chemical and Volume Control System (CVCS)

CS-CVCS-1

Valves:	LCV-115C, LCV-115E
Category:	B
Class:	2
Function:	Volume control tank to Charging/SI Pump Isolation Valves.
Test Requirement:	Exercise valves (full stroke) for operability every three (3) months.
Basis for CS Test:	Testing these valves during plant operations would require shifting charging pump suction from the VCT to the RWST. This could cause an inadvertant boration resulting in power reduction and maybe plant shutdown.

PREPARED BY: Gary B. Callen RWK

APPROVED BY: Gary Moffatt DATE 8-3-88

COLD SHUTDOWN ISI VALVE TESTING

CS-CVCS-2

Valves:	XVC-8442
Category:	C
Class:	2
Function:	Emergency Borate Check Valve.
Test Requirement:	Check valve will be exercised to the position required to fulfill their function every three (3) months.
Basis for CS Test:	Testing this valve during plant operations would inject high concentrated boric acid into the suction of the charging pump causing an inadvertant boration resulting in power reduction and maybe plant shutdown.

PREPARED BY: Gary B. Collier RWK

APPROVED BY: Gary Moffatt DATE 8-3-88

COLD SHUTDOWN ISI VALVE TESTING

CS-CVCS-3

Valves:	XVT-8152
Category:	A
Class:	2
Function:	Letdown flow containment isolation.
Test Requirement:	Exercise valve (full stroke) for operability every three (3) months.
Basis for CS Test:	Testing this valve during normal plant operation would isolate letdown which could cause thermal shock to charging RCS connection. Testing this valve will also cause lifting of letdown relief (XVR-8117). Failure of XVR-8117 to reseat would exceed allowed plant leakage resulting in plant shutdown.

PREPARED BY: Larry B. Callis RVK

APPROVED BY: Gary Moffatt DATE 8-3-88

COLD SHUTDOWN ISI VALVE TESTING

CS-CVCS-4

Valves:	XVC-8381
Category:	C
Class:	2
Function:	Isolation check valve for normal alternate charging.
Test Requirement:	Check valves will be exercised to the position required to fulfill their function every three (3) months.
Basis for CS Test:	Testing this valve during plant operation would require securing charging and letdown flow which could result in a loss of volume control and pressurizer level causing a reactor trip.

PREPARED BY: Jay B. Collier RWK

APPROVED BY: Jay Moffatt DATE 8-3-88

COLD SHUTDOWN ISI VALVE TESTING

CS-CVCS-5

Valves:	XVG-8107, XVG-8108
Category:	A (XVG-8108 B)
Class:	2
Function:	Isolate charging flow to RCS.
Test Requirement:	Exercise valves (full stroke) for operability every three (3) months.
Basis for CS Test:	Testing these valves during normal plant operations would require securing charging and letdown flow which could result in a loss of volume control and pressurizer level causing a reactor trip.

PREPARED BY: Ray B. Calder RWK

APPROVED BY: Gary Moffatt DATE 8-3-88

COLD SHUTDOWN ISI VALVE TESTING

CS-CVCS-6

Valves:	XVT-8100, XVT-8112
Category:	A
Class:	2
Function:	Containment isolation valves for seal water return from the Reactor Coolant Pump seals.
Test Requirement:	Exercise valves (full stroke) every three (3) months.
Basis for CS Test:	Flow testing these valves during normal plant operations would interrupt flow from the Reactor Coolant Pump seal return system. This flow disruption would cause the differential pressure across #2 seals to potentially result in a failure of the #1 RCP seal, thus requiring plant shutdown.

PREPARED BY: Larry B. Cullen RWK

APPROVED BY: Gary Moffatt DATE 6-3-88

COLD SHUTDOWN ISI VALVE TESTING

CS-CVCS-7

Valves:	XVT-8102A, XVT-8102B, XVT-8102C
Category:	B
Class:	2
Function:	Containment penetration 408, 229 and 221 isolation valves for seal water injection flow to Reactor Coolant Pump seals.
Test Requirement:	Exercise valves (full stroke) for operability every three (3) months.
Basis for CS Test:	Testing these valves during normal plant operations would interrupt seal injection and cooling flow to the Reactor Coolant Pump seals. This flow disruption could cause failure of these pump seals, loss of RC Pumps and loss of coolant accident. This may initiate an automatic trip or require immediate shutdown. Valves will be tested when RC Pumps are shutdown at half pipe fill conditions.

PREPARED BY: Jay B. Collier RWK

APPROVED BY: Gary Moffatt DATE 8-4-88

COLD SHUTDOWN ISI VALVE TESTING

CS-CVCS-8

Valves:	XVT-8145
Category:	B
Class:	1
Function:	Spray line isolation valve from Chargeing/Safety Injection Pump(s).
Test Requirement:	Exercise valves (full stroke) for operability every three (3) months.
Basis for CS Test:	Testing this valve during normal plant operations causes pressure perturbations in the Reactor Coolant System which could result in a reactor trip and/or loss of pressurizer pressure control.

PREPARED BY: Larry B. Collins RWK

APPROVED BY: Gary Moffatt DATE 8-4-88

COLD SHUTDOWN ISI VALVE TESTING

CS-CVCS-9

Valves:	LCV-459, LCV-460
Category:	B
Class:	1
Function:	Isolation between Reactor Coolant System and Chemical Volume Control System in letdown line.
Test Requirement:	Exercise valves (full stroke) every three (3) months.
Basis for CS Test:	Closing and opening these valves during normal operations causes thermal perturbations downstream of the regenerative heat exchanger resulting in lifting of relief valve, XVR-8117. Allowed leakage through XVR-8117 would be exceeded requiring plant shutdown.

PREPARED BY: Larry B. Collier RWK

APPROVED BY: Gary McGatt DATE 8-4-88

COLD SHUTDOWN ISI VALVE TESTING

CS-CVCS-10

Valves:	XVC-8480A, XVC-8480B, XVC-8480C
Category:	B
Class:	2
Function:	Charging/SI Pumps Miniflow Recirculation Check Valves.
Test Requirement:	Exercise valves to their safety function position every three (3) months.
Basis for CS Test:	Testing these valves during normal operation would require aligning the suction side of the pumps to the RWST. This would cause inadvertant boration of the RCS resulting in power reduction and maybe plant shutdown.

PREPARED BY: Larry B. Collier BJK

APPROVED BY: Gary Moffatt DATE 6-3-88

COLD SHUTDOWN ISI VALVE TESTING

Emergency Feedwater System (EF)

CS-EF-1

Valves:	XVC-1039A, XVC-1039B, XVC-1039C, XVC-1038A, XVC-1038B, XVC-1038C
Category:	C
Class:	2
Function:	Restrict reverse flow from the steam generator into the Emergency Feedwater System during normal operations. Permit forward flow during EF conditions.
Test Requirement:	Check valves will be exercised to the position required to fulfill their function every three (3) months.
Basis for CS Test:	Testing any one of these valves during plant operation would introduce cold auxiliary feedwater to the steam generator inducing unnecessary thermal stress on the Emergency Feedwater Piping and Steam Generator nozzles. This could result in premature aging and failure of the nozzles and/or connecting piping.

PREPARED BY: Larry B. Collins RWK

APPROVED BY: Gary Moffatt DATE 8-4-88

COLD SHUTDOWN ISI VALVE TESTING

CS-EF-2

Valves:	XVC-1015A, XVC-1015B
Category:	C
Class:	3
Function:	Restricts reverse flow in the discharge lines from motor driven emergency feedwater pumps A and B and provides open flow path to the Steam Generators.
Test Requirement:	Check valves will be exercised to the position required to fulfill their function every three (3) months.
Basis for CS Test:	Testing these valves open during plant operation will require establishing emergency feedwater flow to the associated steam generator placing unnecessary thermal stress on the feedwater piping and steam generator nozzles. This could result in premature aging and failure of the nozzles and/or connecting piping. Testing these valves closed during normal operation causes pressure spiking in the pumps suction piping encroaching upon the yield point of the piping. Valves are disassembled during cold shutdown.

PREPARED BY: Jay B. Collier BWK

APPROVED BY: Gary Moffatt DATE 8-4-88

COLD SHUTDOWN ISI VALVE TESTING

CS-EF-3

Valves:	XVG-1001A, XVG-1001B
Category:	B
Class:	3
Function:	Backup service water supply to motor driven emergency feedwater pumps A and B.
Test Requirement:	Exercise valves (full stroke) for operability every three (3) months.
Basis for CS Test:	Testing these valves during normal plant operation would introduce service water into the emergency feedwater pump suction lines and eventually cause chemistry control problems in the steam generator.

PREPARED BY: Jay B. Collins BOK

APPROVED BY: Gary Moffatt DATE 8-4-88

COLD SHUTDOWN ISI VALVE TESTING

CS-EF-4

Valves:	XVG-1002, XVG-1008, XVG-1037A, XVG-1037B
Category:	B
Class:	3
Function:	Backup service water supply to Motor Driven A and B and Turbine Driven Emergency Feedwater Pumps.
Test Requirement:	Exercise valves (full stroke) for operability every three (3) months.
Basis for CS Test:	Testing these valves during normal plant operation would introduce service water into the emergency feedwater pump suction lines and eventually cause chemistry control problems in the steam generator.

PREPARED BY: Larry A. Collier RWK

APPROVED BY: Larry Moffatt DATE 8-4-88

COLD SHUTDOWN ISI VALVE TESTING

CS-EF-5

Valves:	XVC-1016
Category:	C
Class:	3
Function:	Restrict reverse flow in the discharge line from the turbine driven Emergency Feedwater Pump.
Test Requirement:	Check valves will be exercised to the position required to fulfill their function every three (3) months.
Basis for CS Test:	Testing this valve open during plant operation will require establishing emergency feedwater flow to a steam generator placing unnecessary thermal stress on the feedwater piping and the steam generator nozzles. This could cause premature aging and failure of the S/G nozzle/piping connections. Testing this valve closed during normal operation causes pressure spiking in the pump suction piping encroaching upon the yield point of the piping. Valve will be disassembled during cold shutdown.

PREPARED BY: Larry B. Collins RVK

APPROVED BY: Gary Moffatt DATE 8-4-88

COLD SHUTDOWN ISI VALVE TESTING

CS-EF-6

Valves:	XVC-1013A, XVC-1013B, XVC-1014
Category:	C
Class:	3
Function:	Permit forward flow of condensate into the emergency feedwater supply lines from the condensate storage tank; secondary non-safety function: restrict SW flow to CST.
Test Requirement:	Check valves will be exercised to the position required to fulfill their function every three (3) months.
Basis for CS Test:	Check valves will be partial stroke exercised monthly during the EFW Pump Test. Full flow testing during normal plant operation would require establishing emergency feedwater flow to the steam generators placing unnecessary thermal stress on the emergency feedwater piping and the Steam Generator nozzles. This could cause premature aging and failure of the S/G nozzle/piping connections.

PREPARED BY: Larry B. Collier BWK

APPROVED BY: Doug McGrath DATE 8-4-88

COLD SHUTDOWN ISI VALVE TESTING

CS-EF-7

Valves:	XVK-1020A, XVK-1020B, XVK-1020C
Category:	C
Class:	3
Function:	Restrict reverse flow from the discharge of the motor driven emergency feedwater pumps into the discharge lines of the turbine driven emergency feedwater pump.
Test Requirement:	Check valves will be exercised to the position required to fulfill their function every three (3) months.
Basis for CS Test:	Testing these valves during normal operations would require establishing feedwater flow to the steam generators placing unnecessary thermal stress on the feedwater piping and the steam generator nozzles. This could cause premature aging and failure of the S/G nozzle/piping connections.

PREPARED BY: Lay B. Collier RWK

APPROVED BY: Gary Moffatt DATE 6-4-88

COLD SHUTDOWN ISI VALVE TESTING

CS-FF-8

Valves:	XVK-1019A, XVK-1019B, XVK-1019C
Category:	C
Class:	3
Function:	Restrict reverse flow from the discharge of the turbine driven emergency feedwater pump into the discharge lines of the motor driven emergency feedwater pumps.
Test Requirement:	Check valves will be exercised to the position required to fulfill their function every three (3) months
Basis for CS Test:	Testing these valves during normal operations would require establishing feedwater flow to the steam generators placing unnecessary thermal stress on the feedwater piping and steam generator nozzles. This could cause premature aging and failure of the S/G nozzle/piping connections.

PREPARED BY: Larry B. Collins PWR

APPROVED BY: Gary Moffatt DATE 8-4-88

COLD SHUTDOWN ISI VALVE TESTING

MAIN Feedwater System (FW)

CS-FW-1

Valves:	XVG-1611A, XVG-1611B, XVG-1611C
Category:	B
Class:	2
Function:	Isolate Feedwater supply to the Steam Generators.
Test Requirement:	Exercise valves (full stroke) for operability every three (3) months.
Basis for CS Test:	Testing these valves during plant operation would isolate feedwater to the associated steam generator which would result in a reactor trip.

PREPARED BY: Larry B. Collier BDK

APPROVED BY: Doug Moffatt DATE 8-4-88

COLD SHUTDOWN ISI VALVE TESTING

CS-FW-2

Valves:	IFV-41[illegible], IFV-488, IFV-498
Category:	N/A
Class:	Non ASME Code
Function:	Controls feedwater flow from the main feedwater pumps to the associated steam generator. Receives feedwater isolation signal.
Test Requirement:	Exercise valves (full stroke) for operability every three (3) months.
Basis for CS Test:	Testing these valves during plant operation would isolate feedwater to the associated steam generator which would result in a reactor trip.

PREPARED BY: Gary B. Collins RWK

APPROVED BY: Gary Moffett DATE 8-4-88

COLD SHUTDOWN ISI VALVE TESTING

CS-FW-3

Valves:	IFV-3321, IFV-3331, IFV-3341
Category:	N/A
Class:	Non ASME Code
Function:	Controls feedwater flow to the steam generators at power levels less than 25%. Receives feedwater isolation signal.
Test Requirement:	Exercise valves (full stroke) for operability every three (3) months.
Basis for CS Test:	These valves are closed during power operation above 25% and their required safeguards position is also closed. These valves are only open and controlling feedwater flow during plant startup to 25% power level and are then closed. Testing these valves during plant operation would cause a perturbation in the associated steam generator level which could result in a reactor trip.

PREPARED by: Jerry B. Collier RWK

APPROVED BY: Doug Moffatt DATE 6-4-88

COLD SHUTDOWN ISI VALVE TESTING

CS-FW-4

Valves:	XVC-1684A, XVC-1684B, XVC-1684C
Category:	B
Class:	2
Function:	Restrict reverse flow from the associated Steam Generator to Main Feedwater Header.
Test Requirement:	Exercise valves (full stroke) for operability every three (3) months.
Basis for CS Test:	Testing these valves would require shutting down the plant.

PREPARED BY: Gary B. Collins RWK

APPROVED BY: Gary Moffatt DATE 8-4-88

COLD SHUTDOWN ISI VALVE TESTING

INSTRUMENT AIR SYSTEM (IA)

CS-IA-1

Valves:	XVT-2660, XVC-2661, XVT-2662A, XVT-2662B
Category:	A
Class:	2
Function:	Provides a flow path to and from Reactor Containment Instrument Air.
Test Requirement:	Exercise valve (full stroke) for operability every three (3) months.
Basis for CS Test:	Testing these valves during plant operation would isolate Reactor Building Instrument Air, therefore rendering several Instrument Air dependent systems inoperable. This could cause several valves to fail-safe resulting in a reactor trip. These valves are:

1. RC Spray System - closed
2. Letdown System - closed
3. Normal Charging System - closed
4. PORV(s) - closed

PREPARED BY: Gary B. Zellers RWK

APPROVED BY: Gary Moffatt DATE 6-3-88

COLD SHUTDOWN ISI VALVE TESTING

MAIN STEAM SYSTEM (MS)

CS-MS-1

Valves:	XVG-2801A, XVG-2801B, XVG-2801C
Category:	B
Class:	2
Function:	Main Steam, Steam Generator Isolation.
Test Requirement:	Exercise valves (full stroke) for operability every three (3) months.
Basis for CS Test:	Full stroke testing these valves during plant operation would isolate the associated steam generator from the main steam line header which would result in a reactor trip.

PREPARED BY: Gary B. Collins RWK

APPROVED BY: Gary Moffatt DATE 6-4-88

COLD SHUTDOWN ISI VALVE TESTING

CS-MS-2

Valves:	XVC-2876A, XVC-2876B
Category:	B
Class:	3
Function:	Limit backflow to faulted Steam Generator Main Steam Line during DBA.
Test Requirement:	Exercise valves (full stroke) for operability every three (3) months.
Basis for CS Test:	Upon closing the upstream isolation valves for testing, a small amount of steam leaking through the isolation valve and small reverse leakage quickly equalizes pressure therefore differential pressure cannot be used to indicate valve closure. In addition, venting a high pressure, high energy system to obtain differential pressure would be a safety hazard to test personnel. Valves will be disassembled during cold shutdown.

PREPARED BY: Lay B. Allen RWK

APPROVED BY: Dary Moffatt DATE 8-4-88

COLD SHUTDOWN ISI VALVE TESTING

RESIDUAL HEAT REMOVAL SYSTEM (RH)

CS-RH-1

Valves:	XVG-8701A, XVG-8701B, XVG-8702A, XVG-8702B
Category:	A
Class:	1
Function:	RCS to RHR Pump Inlet Isolation.
Test Requirement:	Exercise valves (full stroke) for operability every three (3) months.
Basis for CS Test:	Valves are interlocked with RCS pressure and cannot be opened unless RCS pressure is less than 425 PSI.

PREPARED BY: Gary B. Callen BWX

APPROVED BY: Gary Moffatt DATE 8-4-88

COLD SHUTDOWN ISI VALVE TESTING

Safety Injection System (SI)

CS-SI-1

Valves:	XVC-8998A, XVC-8998B, XVC-8998C
Category:	A/C
Class:	1
Function:	RESTRICT reverse flow from the reactor coolant system to the low pressure safety injection system.
Test Requirement:	Exercise check valves to the position required to fulfil their function every three (3) months.
Basis for CS Test:	Testing these valves during plant operation will require establishing flow from the low head safety injection system. The RHR pumps do not develop sufficient head to overcome RCS pressure and open the check valves.

PREPARED BY: Larry B. Collins RWK

APPROVED BY: Gary Moffatt DATE 8-1-86

CS-SI-2

Valves:	XVC-8988A, XVC-8988B
Category:	A/C
Class:	1
Function:	Restrict reverse flow from the reactor coolant system to the residual heat removal system.
Test Requirement:	Exercise check valves to the position required to fulfill their function every three (3) months.
Basis for CS Test:	Testing these valves during plant operations will require initiating flow, using the RHR pumps, into the reactor coolant system. RCS pressure will be higher than RHR pump discharge pressure precluding flow into the RC system.

PREPARED BY: Gary B. Collins RWK

APPROVED BY: Gary Moffatt DATE 8-4-88

COLD SHUTDOWN ISI VALVE TESTING

CS-SI-3

Valves:	XVC-8993A, XVC-8993B
Category:	A/C
Class:	1
Function:	Restrict reverse flow from the reactor coolant system to the low head safety injection system.
Test Requirement:	Exercise check valves to the position required to fulfill their function every three (3) months.
Basis for CS Test:	Testing these valves during plant operations will require establishing RHR flow into the RCS. The RHR pumps (low head safety injection) do not develop enough head to overcome RCS pressure and establish flow.

PREPARED BY: Lay B. Callen RWK

APPROVED BY: Day Moffett DATE 8-4-88

CS-SI-4

Valves:	XVG-8808A, XVG-8808B, XVG-8808C
Category:	B
Class:	2
Function:	Isolate the Safety Injection Accumulator from the reactor coolant loops.
Test Requirement:	Exercise valves (full stroke) for operability every three (3) months.
Basis for CS Test:	Valves are required by Technical Specifications to remain open during normal plant operation.

PREPARED BY: Jay B. Collins RVK

APPROVED BY: Gary Moffatt DATE 6-4-68

CS-SI-5

Valves:	(1) XVC-8973A, XVC-8973B and XVC-8973C (2) XVC-8974A, XVC8974B
Category:	A/C
Class:	1 and 2
Function:	Restrict reverse flow from the Reactor Coolant System to the low pressure Safety Injection System.
Test Requirement:	Check valves will be exercised to the position required to fulfill their function every three (3) months.
Basis for CS Test:	These valves cannot be tested during plant operations because the low pressure safety injection pumps do not develop sufficient discharge head to establish a flow path to the Reactor Coolant System.

PREPARED BY: Larry B. Callen RWK

APPROVED BY: Doug Moffatt DATE 8-4-88

COLD SHUTDOWN ISI VALVE TESTING

CS-SI-6

Valves:	XVG-8884, XVG-8885, XVG-8886
Category:	B
Class:	2
Function:	High Head Hot Leg Injection Isolation Valves.
Test Requirement:	Exercise valves (full stroke) for operability every three (3) months.
Basis for CS Test:	Testing these valves during normal plant operation will place charging flow through the high pressure safety injection line placing unnecessary thermal stress on the safety injection piping and reactor coolant branch connections. In addition, concentrated boric acid would be injected into the RCS causing power reduction toward shutdown.

PREPARED BY: Jay B. Allen RWK

APPROVED BY: Gary Moffatt DATE 8-4-88

COLD SHUTDOWN ISI VALVE TESTING

CS-SI-7

Valves:	XVC-8958A, XVC-8958B
Category:	C
Class:	2
Function:	Limit reverse flow to RWST.
Test Requirement:	Exercise valves (full stroke) to the position required to fulfill their function every three (3) months.
Basis for CS Test:	Testing these valves closed would require aligning system to the RCS. Since RCS is above 350°F, this alignment would be in violation of design criteria.

PREPARED BY: Gary S. Cacka RWK

APPROVED BY: Doug Moffatt DATE 8-4-88

COLD SHUTDOWN ISI VALVE TESTING

CS-SP-1

REACTOR BUILDING SPRAY SYSTEM (SP)

Valves:	XVG-3002A, XVG-3002B
Category:	B
Class:	2
Function:	NaOH to spray pump suction isolations.
Test Requirement:	Exercise valves (full stroke) for operability every three (3) months.
Basis for CS Test:	Testing these valves during normal plant operations would require closing the upstream manual isolation valve to restrict migration of NaOH to the R.B. Spray System. Closing the upstream valve would not totally prevent migration of NaOH to the R. B. Spray System. The frequency for normal operation testing would result in 80% - 85% increase in NaOH in the R.B. Spray System and ultimately in the R.C. System via RWST and CVCS. Higher radiation levels in the RB due to radioactivated sodium is not conducive for ALARA and maintenance practices.

PREPARED BY: Larry A. Callen RWK

APPROVED BY: Gary Moffatt DATE 9-4-38

COLD SHUTDOWN ISI VALVE TESTING

SERVICE WATER SYSTEM (SW)

CS-SW-1

Valves:	XVC-3168
Category:	C
Class:	3
Function:	Limit Service Water backflow through DRPI Cooling Unit.
Test Requirement:	Exercise valve to the position required to fulfill its function every three (3) months.
Basis for CS Test:	Testing this valve closed every three months would require entry into the Reactor Building, thus exposing personnel to unnecessary radiation and heat. In addition, cooling water to the DRPI cabinets would be isolated resulting in possible overheating of rod position indication, thus requiring plant shutdown.

PREPARED BY: Larry B. Callen RWK

APPPOVED BY: Gary Wolfatt DATE 5-4-88

COLD SHUTDOWN ISI VALVE TESTING

CRDM COOLING SYSTEM (AC)

CS-AC-1

Valves:	XVG-7501, XVG-7502, XVG-7503, XVG-7504
Category:	A
Class:	2
Function:	Containment isolation valves for the CRDM System.
Test Requirement:	Valves will be exercised (full stroke) for operability every three (3) months.
Basis for CS Test:	Closing these valves results in tripping the CRDM pumps on high discharge pressure. This allows containment penetration to heat up which actuates a temperature switch preventing the valves from re-opening. This could result in overheating the CRDMs, loss of rod position indication, requiring an immediate plant shutdown or manual reactor trip.

PREPARED BY: Larry B. Collier RWK

APPROVED BY: Gary Moffatt DATE 8-3-89

COLD SHUTDOWN ISI VALVE TESTING

CS-AC-2

Valves:	XVC-7541, XVC-7544
Category:	C
Class:	2
Function:	Thermal Relief CIV check valves between XVG-7501 and XVC-7502; XVG-7503 and XVG-7504, respectively.
Test Requirement:	Exercise valves for operability every three (3) months.
Basis for CS Test:	Open testing these check valves would require closing the CRDM CIV(s). Closing the CRDM CIV(s) results in tripping the CRDM pumps on high discharge pressure. This allows containment penetration to heat up which actuates a temperature switch preventing the valves from re-opening. This could result in overheating the CRDMs, loss of rod position indication, requiring an immediate plant shutdown or manual reactor trip.

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