QUALITY ASSURANCE MANUAL GINNA STATION ROCHESTER GAS & ELECTRIC CORPORATION	---	REV. 4	PAGE 1 OF 39
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Appendix C - Ginna Station Inservice Pump and Valve Testing Program for the January 1, 1981 through December 31, 1990 Period	PREPARED BY:	C R Anderson	11/29/83
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Program Table of Contents

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Introduction

This appendix to the Quality Assurance Manual defines the Inservice Pump and Valve Testing Program for the ten year period starting January 1, 1981 through December 31, 1990. Included in this program are the Quality Groups A, B and C Pumps which are provided with an emergency power source and those Quality Groups A, B and C Valves which are required to shut down the reactor or to mitigate the consequences of an accident and maintain the reactor in a safe shutdown condition.

This program has been developed as required by Section 50.55a(g) of 10CFR50 following the guidance of the ASME Boiler and Pressure Vessel Code Section XI - "Rules for Inservice Inspection of Nuclear Power Plant Components," (hereafter referred to as the "Code") excluding the controls of the Authorized Inspector, Enforcement Authority, Reporting Systems and N-Stamp Symbol. The inservice testing program shall be controlled by the Ginna Station Quality Assurance Program for Station Operation. Quality Groups A, B and C components correspond to those defined in NRC Regulatory Guide 1.26.

Further addenda and editions of Section XI of the Code shall be used for clarification of test requirements and performance.

The Inservice Pump and Valve Testing Program substantially augments but does not affect the pump and valve surveillance program required by Technical Specifications. Technical Specification requirements associated with pump and valve surveillance, shall continue to be implemented as specified.

Definitions

AFP	-	Auxiliary Feedwater Pump
AOV	-	Air Operated Valve
APV	-	Air Operated Piston Valve
BA	-	Boric Acid
Code	-	American Society of Mechanical Engineers Boiler and Pressure Vessel Code
CC	-	Component Cooling
CS	-	Containment Spray
CSP	-	Containment Spray Pump
CV	-	Check Valve
C/R	-	Cold Shutdown and Refueling
ECCS	-	Emergency Core Cooling System
FCV	-	Flow Control Valve
GA	-	Gas Analyzer
GDT	-	Gas Decay Tank
HCV	-	Hand Control Valve
HX	-	Heat Exchanger
LCV	-	Level Control Valve
M	-	Monthly
MAFP	-	Motor Driven Auxiliary Feedwater Pump
MOV	-	Motor Operated Valve
MV	-	Manual Valve
PCV	-	Pressure Control Valve
PORV	-	Power Operated Relief Valve
PRT	-	Pressurizer Relief Tank
PRV	-	Pressure Relief Valve
PVT	-	Pump and Valve Testing
Q	-	Quarterly
R	-	Refueling Outage
RCDT	-	Reactor Coolant Drain Tank
RCP	-	Reactor Coolant Pump
RCV	-	Radiation Control Valve
RHR	-	Residual Heat Removal
RMW	-	Reactor Makeup Water
RV	-	Relief Valve
RWST	-	Refueling Water Storage Tank
RX	-	Reactor Vessel
S/G	-	Steam Generator
SAFWP	-	Standby Auxiliary Feedwater Pump
SI	-	Safety Injection
SOV	-	Solenoid Operated Valve
SW	-	Service Water

Definitions

TAFP	-	Turbine Driven Auxiliary Feedwater Pump
VC	-	Volume Control
VCT	-	Volume Control Tank
VH	-	Vent Header

CAT A VALVE - Valves for which seat leakage is limited to a specific maximum amount in the closed position of fullfillment of their function.

CAT B VALVE - Valves for which seat leakage in the closed position is inconsequential for fullfillment of their function.

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

Pump and Valve Testing Program

PVT 1.0 Scope and Responsibility

1.1 The inservice testing program defines the testing program for Quality Groups A, B and C Pumps and Valves in accordance with the requirements of Articles IWP and IWV of Section XI of the Code. The results of these tests are to assure the operational readiness of pumps and valves.

1.2 It is the responsibility of the Ginna Station Test and Results Supervisor to implement this test program and develop inservice test procedures which will outline the specific test for each pump and valve included in the program.

1.3 When a valve, pump or its control system has been replaced or repaired or has undergone maintenance that could affect its performance, and prior to the time it is returned to service, it shall be tested as necessary to demonstrate that the performance parameters which could have been affected by the replacement, repair, or maintenance are within acceptable limits.

PVT 2.0 Code Edition and Testing Interval

2.1 The Inservice Pump and Valve Testing Program for the ten (10) year period starting January 1, 1981 through December 31, 1990 was developed utilizing the 1977 Edition of Section XI of the Code through the Summer 1978 Addenda.

PVT 3.0 Inservice Pump Testing Program

3.1 The Inservice Pump Testing Program was developed in accordance with the requirements of Article IWP of Section XI of the Code. This program includes all Quality Group A, B and C pumps which are provided with an emergency power source and are required to perform a specific function in shutting down a reactor or in mitigating the consequences of an accident and maintain the reactor in a safe shutdown condition.

3.2 The following pumps shall be tested in accordance with Article IWP of Section XI:

(a) 1A Component Cooling
(b) 1B Component Cooling
(c) 1A Safety Injection
(d) 1B Safety Injection
(e) 1C Safety Injection
(f) 1A Residual Heat Removal
(g) 1B Residual Heat Removal
(h) 1A Containment Spray
(i) 1B Containment Spray
(j) 1A Motor Driven Auxiliary Feedwater
(k) 1B Motor Driven Auxiliary Feedwater
(l) Turbine Driven Auxiliary Feedwater
(m) 1A Service Water
(n) 1B Service Water
(o) 1C Service Water
(p) 1D Service Water
(q) 1C Standby Auxiliary Feedwater
(r) 1D Standby Auxiliary Feedwater

3.3 With one exception, test parameters that shall be measured or observed during inservice testing of each pump are those listed in Table IWP-3100-1 of Section XI and include inlet pressure, differential pressure, flow rate, vibration amplitude, and proper lubricant level or pressure. The exception is for the measurement of pump bearing temperatures and there are several reasons why this measurement is either undesirable or inconclusive. Specifically, for the service water pumps, the bearings are submersed in up to forty feet of water making bearing temperatures closely approximate the surrounding water temperature and measurement of temperatures almost impossible. For the auxiliary and standby auxiliary feedwater pumps the test conditions require the discharge of ambient temperature water into the 400 degree F feedwater lines. Since it can typically take in excess of an hour to stabilize bearing temperatures this causes an unnecessary extended temperature transient in the feedwater line. For the residual heat removal and safety injection pumps the system configurations do not allow testing the pumps at actual pump service conditions during plant operation. Instead, the tests must be

performed at an off-design flow condition which results in higher bearing temperatures than normal. This is to be expected since higher than normal thrust loads are placed on the pump bearings during this reduced flow test condition. The extended time required for bearing temperatures to stabilize subjects the pump to lengthy periods of unnecessarily high loads. The pump vendors do not consider the measurement of bearing temperature in this type of off-design condition to be a good indication of bearing conditions. The vendors recommended bearing temperature limits are based on normal operating conditions and do not apply to this type of testing. In general, vibration is considered to be a better indication of bearing condition since a significant increase in bearing temperature will normally only occur if bearing failure is imminent. Finally, test conditions cannot be easily controlled to produce temperature repeatability since readings are subject to a large number of variables such as ambient air temperature, cooling water temperature (where applicable), location of temperature probe attachment, temperature of the fluid pumped and quantity of the fluid pumped. One or both residual heat removal pumps may be required to be operable, by the plant Technical Specifications, when the average reactor coolant temperature is between 350 degrees F. and 200 degrees F. or the plant is at cold or refueling shutdown. Typically, in this case, at least one residual heat removal pump will be in operation. Testing will be performed in accordance with IWP-3400, which, includes operating the pump at reference conditions, if practicable, and providing a log which shows that the parameters monitored during normal plant operation were measured, recorded and analyzed. The practicability of duplicating cold shutdown reference conditions may be impacted by refueling water level during refueling and inservice reactor inspections as well as decay heat removal rate.

3.4 The test frequency for the pumps shall be as follows:

a. Component cooling water pumps shall be tested monthly.

b. Safety injection pumps shall be tested monthly except during cold or refueling shutdowns. The pumps shall be tested prior to startup if the time since the last test exceeds one month.

c. Residual heat removal pumps shall be tested monthly except during cold or refueling shutdown. The pumps shall be tested prior to startup if the time since the last test exceeds one month. When the reactor coolant system temperature is between 350°F and 200°F or the plant is at cold or refueling shutdown the plant Technical Specifications may require one or both residual heat removal pumps to be operable. If this is the case, then the required pumps shall be tested monthly.

d. Containment spray pumps shall be tested monthly except during cold or refueling shutdown. The pumps shall be tested prior to startup if the time since the last test exceeds one month.

e. Motor driven auxiliary feedwater pumps, turbine driven auxiliary feedwater pump, and the standby auxiliary feedwater pumps shall be tested monthly except during cold or refueling shutdowns.

   The pumps shall be tested prior to exceeding 5% power if the time since the last test exceeds one month.

f. Service water pumps shall be tested monthly.

Testing of a pump need not be performed if that pump is declared inoperable without the testing. Consistent with plant Technical Specifications, specified intervals may be extended by 25% to accommodate normal test schedules.

PVT 4.0 Inservice Valve Testing Program

4.1 The Inservice Valve Testing Program was developed in accordance with the requirements of Article IWV of Section XI of the Code. All those valves that are required to perform a specific function either to shut down the reactor to the cold shutdown condition or in mitigating the consequences of an accident and maintain the reactor in a safe shutdown condition are included in the program.

4.2 The Inservice Valve Testing Program Requirements for Category A and B Valves are in Tables PVT 4.7 and 4.8, respectively. Category C Valves are broken down into two categories, Check Valves and Relief Valves, which are in Tables PVT 4.9 and 4.10, respectively. Category D Valves are not included in this testing program because there are none included in Ginna Station design.

4.3 Some exceptions and exemptions to the testing requirements of Article IWV have been taken based on operational interference, placing the plant in an unsafe condition and Technical Specification requirements. All exceptions and exemptions are listed on the valve tables and explained in the referenced notes, PVT 4.12.

4.4 The exercising program for Category A and B Valves, with the exception of check valves, shall require a complete stroking of each valve per the valve testing tables. Except where operational constraints prevail and exceptions have been authorized all check valves, including Category C Valves, shall be exercised to the position required to fulfill their function. These functional tests shall be verified by the operation of the required system. Valves which malfunction during stroking will not be considered inoperable as defined by Technical Specifications, when the malfunction does not prevent the valves from performing its safety function.

4.5 Category A and B valves operation shall be timed each time they are stroked utilizing switch initiation and the position indicators, which are accessible during plant operation. During each

refueling outage a visual verification shall be made to confirm direct correspondence between valve operators and the position indicators.

4.6 For a valve in a system declared inoperable or not required to be operable the exercising test schedule need not be followed. Within 30 days prior to return of the system to operable status, the valves shall be exercised and the schedule resumed.

4.7 The testing of valves required at cold shutdown and refueling outages will normally take four (4) days to complete. When cold shutdowns are of a shorter duration (2-3 days), test personnel shall attempt to test as many valves as possible without holding up the startup of the unit with testing beginning no later than 48 hours after the plant reaches cold shutdown (as defined in Technical Specification 1.2). For very short cold shutdowns (less than 48 hours), it would be impossible to mobilize test personnel to implement the testing program under the required procedural controls, therefore no valves would be tested. It is possible that, during a four (4) day cold shutdown, the work load on test personnel may preclude their completion of all the required valve tests prior to startup. Any testing not completed at one cold shutdown due to outage duration shall be performed during any subsequent cold shutdowns that may occur before the next refueling outage to meet the specified testing frequency. Valve testing during cold shutdowns need not be more frequent than one test per quarter for each valve in the test program.

4.8 Category A Valves

Valve #	Type	Description	Note	Test	Freq
204A	MV	Letdown to NRHX	3	Stroke Leak	C/R R
304A	CV	1-A RCP Seal Injection	1	Stroke Leak	C/R R
304B	CV	1-B RCP Seal Injection	1	Stroke Leak	C/R R

Valve #	Type	Description	Note	Test	Freq
313	MOV	Seal Water Return Isolation	1	Stroke Leak	C/R R
370B	CV	Charging Line Isolation	2	Stroke Leak	C/R R
371	AOV	Letdown Isolation	3	Stroke Leak	C/R R
383B	CV	Alternate Charging Line	4	Stroke Leak	C/R R
508	AOV	RMW to Containment Vessel Stop	-	Stroke Leak	Q R
528	CV	N_2 Supply to PRT	-	Stroke Leak	Q R
529	CV	RMW to PRT	-	Stroke Leak	Q R
539	AOV	PRT Stop Valve to Gas Analyzer	-	Stroke Leak	Q R
546	MV	PRT to Gas Analyzer	-	Stroke Leak	Q R
547	MV	Nitrogen to PRT	-	Stroke Leak	Q R
743	CV	CC From Excess Letdown HX.	-	Stroke Leak	Q R
745	AOV	Return From Excess Letdown HX.	-	Stroke Leak	Q R
749A	MOV	CCW to A RCP	5	Stroke Leak	C/R R
749B	MOV	CCW to B RCP	5	Stroke Leak	C/R R
750A	CV	CC to A RCP	5	Stroke Leak	C/R R

Valve #	Type	Description	Note	Test	Freq
750B	CV	CC to B RCP	5	Stroke	C/R
				Leak	R
759A	MOV	Containment Stop CC From Loop A RCP	5	Stroke	C/R
				Leak	R
759B	MOV	Containment Stop CC From Loop B RCP	5	Stroke	C/R
				Leak	R
813	MOV	CC Supply to RX Support Coolers	6	Stroke	C/R
				Leak	R
814	MOV	CC Return to RX Support Coolers	6	Stroke	C/R
				Leak	R
820	MV	Letdown to NRHX	11	Stroke	-
				Leak	R
842A	CV	Loop A Accumulator Dump Line Check Valve	28	Stroke	C/R
				Leak	C/R
842B	CV	Loop B Accumulator Dump Line Check Valve	28	Stroke	C/R
				Leak	C/R
846	AOV	N_2 Supply to Accumulators	-	Stroke	Q
				Leak	R
853A	CV	Core Deluge Check	10	Stroke	C/R
			10	Leak	C/R
853B	CV	Core Deluge Check	10	Stroke	C/R
			10	Leak	C/R
862A	CV	1-A CSP Disch	-	Stroke	Q
				Leak	R
862B	CV	1-B CSP Disch	-	Stroke	Q
				Leak	R
867A	CV	Accumulator Dump and SI to Cold Leg Loop B	13	Stroke	R
			13	Leak	C/R
867B	CV	Accumulator Dump and SI to Cold Leg Loop A	13	Stroke	R
			13	Leak	C/R

Valve #	Type	Description	Note	Test	Freq
870A	CV	1-A to 1-C SI Pump Disch	-	Stroke	Q
				Leak	R
870B	CV	1-B to 1-C SI Pump Disch	-	Stroke	Q
				Leak	R
877A	CV	High Safety Injection	11	Stroke	-
		Loop B Hot Leg	29	Leak	40 Mo.
877B	CV	High Safety Injection	11	Stroke	-
		Loop A Hot Leg	29	Leak	40 Mo.
878F	CV	High Safety Injection	11	Stroke	-
		Loop B Hot Leg	29	Leak	40 Mo.
878G	CV	1-A SI Pump to Cold Leg	13	Stroke	R
		Loop B	13	Leak	C/R
878H	CV	High Safety Injection	11	Stroke	-
		Loop A Hot Leg	29	Leak	40 Mo.
878J	CV	1-B SI Pump to Cold Leg	13	Stroke	R
		Loop A	13	Leak	C/R
879	MV	SI Test Line Isolation	7	Stroke	-
				Leak	R
889A	CV	1-A SI Pump Disch	-	Stroke	Q
				Leak	R
889B	CV	1-B SI Pump Disch	-	Stroke	Q
				Leak	R
921	SOV	Loop A Hydrogen Monitor Inlet	-	Stroke	Q
				Leak	R
922	SOV	Loop A Hydrogen Monitor Outlet	-	Stroke	Q
				Leak	R
923	SOV	Loop B Hydrogen Monitor Inlet	-	Stroke	Q
				Leak	R
924	SOV	Loop B Hydrogen Monitor Outlet	-	Stroke	Q
				Leak	R

Valve #	Type	Description	Note	Test	Freq
956D	MV	Hot Leg Loop Sample Containment Isolation	-	Stroke Leak	Q R
956E	MV	PRZR Liquid Space Sample Containment Isolation	-	Stroke Leak	Q R
956F	MV	PRZR Steam Space Sample Containment Isolation	-	Stroke Leak	Q R
966A	AOV	Pressurizer Steam Space Containment Isolation	-	Stroke Leak	Q R
966B	AOV	Pressurizer Liquid Space Containment Isolation	-	Stroke Leak	Q R
966C	AOV	Loop A and B Hot Leg Containment Isolation	-	Stroke Leak	Q R
1003A	LCV	1-A RCDT Pump Suction	-	Stroke Leak	Q R
1003B	LCV	1-B RCDT Pump Suction	-	Stroke Leak	Q R
1076A	MV	Hydrogen to "A" Recombiner Pilot Containment Isolation	11	Stroke Leak	- R
IV-3A	SOV	Hydrogen to "A" Recombiner Pilot Containment Isolation	11	Stroke Leak	- R
1076B	MV	Hydrogen to "B" Recombiner Pilot Containment Isolation	11	Stroke Leak	- R
IV-3B	SOV	Hydrogen to "B" Recombiner Pilot Containment Isolation	11	Stroke Leak	- R
1080A	MV	Oxygen Make Up to Containment Isolation	11	Stroke Leak	- R
IV-2A		Oxygen Make Up to Containment Isolation (A Recombiner)	11	Stroke Leak	- R
IV-2B		Oxygen Make Up to Containment Isolation (B Recombiner)	11	Stroke Leak	- R

Valve #	Type	Description	Note	Test	Freq
1084A	MV	Hydrogen to "A" Recombiner Main Burner Containment Isolation	11	Stroke Leak	- R
IV-5A	SOV	Hydrogen to "A" Recombiner Main Burner Containment Isolation	11	Stroke Leak	- R
1084B	MV	Hydrogen to "B" Recombiner Main Burner Containment Isolation	11	Stroke Leak	- R
IV-5B	SOV	Hydrogen to "B" Recombiner Main Burner Containment Isolation	11	Stroke Leak	- R
1554	MV	D Recirc. Fan Air Sample Isolation	11	Stroke Leak	- R
1556	MV	D Recirc. Fan Air Sample Isolation	11	Stroke Leak	- R
1557	MV	A Recirc. Fan Air Sample Isolation	11	Stroke Leak	- R
1559	MV	A Recirc. Fan Air Sample Isolation	11	Stroke Leak	- R
1560	MV	A & D Return Line Isolation	11	Stroke Leak	- R
1562	MV	A & D Return Line Isolation	11	Stroke Leak	- R
1563	MV	B Recirc. Fan Air Sample Isolation	11	Stroke Leak	- R
1565	MV	B Recirc. Fan Air Sample Isolation	11	Stroke Leak	- R
1566	MV	B Recirc. Fan Air Sample Return Line Isolation	11	Stroke Leak	- R
1568	MV	B Recirc. Fan Air Sample Return Line Isolation	11	Stroke Leak	- R

Valve #	Type	Description	Note	Test	Freq
1569	MV	C Recirc. Fan Air Sample Isolation	11	Stroke Leak	- R
1571	MV	C Recirc. Fan Air Sample Isolation	11	Stroke Leak	- R
1572	MV	C Recirc. Fan Air Sample Return Line Isolation	11	Stroke Leak	- R
1574	MV	C Recirc. Fan Air Sample Return Line Isolation	11	Stroke Leak	- R
1596	MV	Radiation Monitor Supply	-	Stroke Leak	Q R
1597	AOV	Radiation Monitor Supply	-	Stroke Leak	Q R
1598	AOV	Radiation Monitor Exhaust	-	Stroke Leak	Q R
1599	AOV	Radiation Monitor Exhaust	-	Stroke Leak	Q R
1655	MV	RCDT to Gas Analyzer	-	Stroke Leak	Q R
1713	CV	N_2 to RCDT	-	Stroke Leak	Q R
1721	AOV	Suction line to RCDT	-	Stroke Leak	Q R
1723	AOV	A Containment Sump Disch to Waste Holdup Tank	-	Stroke Leak	Q R
1728	AOV	A Containment Sump Disch to Waste Holdup Tank	-	Stroke Leak	Q R
1786	AOV	RCDT to VH Isolation	-	Stroke Leak	Q R
1787	AOV	RCDT to VH Isolation	-	Stroke Leak	Q R

Valve #	Type	Description	Note	Test	Freq
1789	AOV	RCDT to GA Containment Isolation	-	Stroke Leak	Q R
1819A	MV	Containment Pressure Transmitter 945 Isolation	21	Stroke Leak	C/R R
1819B	MV	Containment Pressure Transmitter 946 Isolation	21	Stroke Leak	C/R R
1819C	MV	Containment Pressure Transmitter 947 Isolation	21	Stroke Leak	C/R R
1819D	MV	Containment Pressure Transmitter 948 Isolation	21	Stroke Leak	C/R R
1819E	MV	Containment Pressure Transmitter 949 Isolation	21	Stroke Leak	C/R R
1819F	MV	Containment Pressure Transmitter 950 Isolation	21	Stroke Leak	C/R R
1819G	MV	Containment Pressure Transmitter 944 Isolation	21	Stroke Leak	C/R R
4601	CV	1A Service Water Pump Discharge	31 31	Stroke Leak	Q R
4602	CV	1B Service Water Pump Discharge	31 31	Stroke Leak	Q R
4603	CV	1C Service Water Pump Discharge	31 31	Stroke Leak	Q R
4604	CV	1D Service Water Pump Discharge	31 31	Stroke Leak	Q R
5129	MV	Construction Fire Service Water Containment Isolation	11	Stroke Leak	- R
5392	AOV	Instrument Air to Containment Isolation	19	Stroke Leak	R R
5393	CV	Instrument Air to Containment Isolation	19	Stroke Leak	R R

Valve #	Type	Description	Note	Test	Freq
5701	MV	A-S/G Blowdown Isolation	-	Stroke Leak	Q R
5702	MV	B-S/G Blowdown Isolation	-	Stroke Leak	Q R
5733	MV	A-S/G Sample Isolation	-	Stroke Leak	Q R
5734	MV	B-S/G Sample Isolation	-	Stroke Leak	Q R
5735	AOV	"A" S/G Blowdown Sample Isolation	-	Stroke Leak	Q R
5736	AOV	"B" S/G Blowdown Sample Isolation	-	Stroke Leak	Q R
5737	AOV	"B" S/G Blowdown Isolation	-	Stroke Leak	Q R
5738	AOV	"A" S/G Blowdown Isolation	-	Stroke Leak	Q R
5869	APV	Containment Purge Supply Isolation	22	Stroke Leak	C *
5870	APV	Containment Purge Supply Isolation	22	Stroke Leak	C *
5878	APV	Containment Purge Exhaust Isolation	22	Stroke Leak	C *
5879	APV	Containment Purge Exhaust Isolation	22	Stroke Leak	C *
6151	MV	Auxiliary Steam Supply to Containment	11	Stroke Leak	- R
6152	MV	Condensate Return from Containment	11	Stroke Leak	- R

* - See Note 22

Valve #	Type	Description	Note	Test	Freq
6165	MV	Aux. Steam Supply to Containment	11	Stroke Leak	- R
6175	MV	Condensate Return from Containment	11	Stroke Leak	- R
7141	MV	Service Air Isolation Outside Containment	11	Stroke Leak	- R
7226	CV	Service Air Isolation Inside Containment	11	Stroke Leak	- R
7443	MOV	Containment Air Test Supply	11	Stroke Leak	- R
7444	MOV	Containment Air Test Vent	11	Stroke Leak	- R
7445	MOV	Containment Air Test Vent	11	Stroke Leak	- R
7448	MV	Isolation Valve from Containment to Local Pressure Indicator for Containment Air Test	11	Stroke Leak	- R
7452	MV	Isolation Valve from Containment to Local Pressure Indicator for Containment Air Test	11	Stroke Leak	- R
7456	MV	Isolation Valve from Containment to Local Pressure Indicator for Containment Air Test	11	Stroke Leak	- R
7970	AOV	Containment Depressurization Valve	-	Stroke Leak	Q R
7971	AOV	Containment Depressurization Valve	-	Stroke Leak	Q R
8418	AOV	Demin. Water to Containment Isolation	11	Stroke Leak	- R

Valve #	Type	Description	Note	Test	Freq
8419	CV	Demin. Water to Containment Isolation	11	Stroke Leak	- R
8623	CV	Nitrogen to Accumulators Isolation	11	Stroke Leak	- R
9227	AOV	Fire Service Water Containment Isolation	11	Stroke Leak	- R
9229	CV	Fire Service Water Containment Isolation	11	Stroke Leak	- R

4.9 Category B Valves

Valve #	Type	Description	Note	Test	Freq
014	RCV	Aux Building GDT Release	-	Stroke	Q
017	RCV	Component Cooling Surge Tank Vent	-	Stroke	Q
081	APV	Control Room Ventilation Damper	-	Stroke	Q
082	APV	Control Room Ventilation Damper	-	Stroke	Q
083	APV	Control Room Ventilation Damper	-	Stroke	Q
084	APV	Control Room Ventilation Damper	-	Stroke	Q
085	APV	Control Room Ventilation Damper	-	Stroke	Q
086	APV	Control Room Ventilation Damper	-	Stroke	Q
112B	LCV	Emergency Makeup RWST to Charging Pump	-	Stroke	Q
112C	LCV	VCT Outlet	-	Stroke	Q

Valve #	Type	Description	Note	Test	Freq
427	AOV	Letdown From Loop B	3	Stroke	C/R
430	PORV	Pressurizer Power Operated Relief	16	Stroke	C/R
431C	PORV	Pressurizer Power Operated Relief	16	Stroke	C/R
515	MOV	Pressurizer PORV Block Valve	23	Stroke	Q
516	MOV	Pressurizer PORV Block Valve	23	Stroke	Q
624	HCV	1-B RHR HX Outlet	26	Stroke	C/R
625	HCV	1-A RHR HX Outlet	26	Stroke	C/R
626	FCV	RHR Loop Return Recirc.	-	Stroke	Q
700	MOV	RHR Inlet Isolation From Loop A	8	Stroke	C/R
701	MOV	RHR Inlet Isolation From Loop A	8	Stroke	C/R
704A	MOV	Suction 1-A RHR Pump	24	Stroke	Q
704B	MOV	Suction 1-B RHR Pump	24	Stroke	Q
720	MOV	RHR Return Isolation to Loop B	8	Stroke	C/R
721	MOV	RHR Return Isolation to Loop B	8	Stroke	C/R
738A	MOV	CC to 1-A RHR HX	-	Stroke	Q
738B	MOV	CC to 1-B RHR HX	-	Stroke	Q
825A	MOV	SI Pump Suction From RWST	9	Stroke	C/R
825B	MOV	SI Pump Suction From RWST	9	Stroke	C/R

Valve #	Type	Description	Note	Test	Freq
826A	MOV	SI Pump Suction From BA Tank	25	Stroke	Q
826B	MOV	SI Pump Suction From BA Tank	25	Stroke	Q
826C	MOV	SI Pump Suction From BA Tank	25	Stroke	Q
826D	MOV	SI Pump Suction From BA Tank	25	Stroke	Q
836A	HCV	Spray Additive Tank Discharge	17/24	Stroke	Q
836B	HCV	Spray Additive Tank Discharge	17/24	Stroke	Q
850A	MOV	Sump B to RHR Pumps	24	Stroke	Q
850B	MOV	Sump B to RHR Pumps	24	Stroke	Q
851A	MOV	Sump B to RHR Isolation	30	Stroke	-
851B	MOV	Sump B to RHR Isolation	30	Stroke	-
852A	MOV	RHR Pumps to Reactor Vessel	18	Stroke	C/R
852B	MOV	RHR Pumps to Reactor Vessel	18	Stroke	C/R
856	MOV	RWST to RHR Pumps	9	Stroke	C/R
857A	MOV	1B RHR HX to CS and SI Pump Isolation	27	Stroke	C/R
857B	MOV	1A RHR HX to CS and SI Pump Isolation	27	Stroke	C/R
857C	MOV	1A RHR HX to CS and SI Pump Isolation	27	Stroke	C/R
860A	MOV	1-A CSP Discharge	24	Stroke	Q

Valve #	Type	Description	Note	Test	Freq
860B	MOV	1-A CSP Discharge	24	Stroke	Q
860C	MOV	1-B CSP Discharge	24	Stroke	Q
860D	MOV	1-B CSP Discharge	24	Stroke	Q
871A	MOV	1-A to 1-C SI Pump Discharge	24	Stroke	Q
871B	MOV	1-B to 1-C SI Pump Discharge	24	Stroke	Q
875A	MOV	CS Pump Discharge to 1A Charcoal Filter Deluge	-	Stroke	Q
875B	MOV	CS Pump Discharge to 1A Charcoal Filter Deluge	-	Stroke	Q
876A	MOV	CS Pump Discharge to 1B Charcoal Filter Deluge	-	Stroke	Q
876B	MOV	CS Pump Discharge to 1B Charcoal Filter Deluge	-	Stroke	Q
896A	MOV	RWST to CS and SI Pumps	9	Stroke	C/R
896B	MOV	RWST to CS and SI Pumps	9	Stroke	C/R
897	AOV	SI Pump Recirc. to RWST	27	Stroke	C/R
898	AOV	SI Pump Recirc. to RWST	27	Stroke	C/R
951	AOV	Pressurizer Steam Space Sample	-	Stroke	Q
953	AOV	Pressurizer Liquid Space Sample	-	Stroke	Q
955	AOV	"B" Loop Hot Leg Sample	-	Stroke	Q
959	AOV	RHR Loop Sample	20	Stroke	C/R

Valve #	Type	Description	Note	Test	Freq
1811A	MV	Reactor Coolant Drain Tank Isolation to RHR System	11		
1811B	MV	Reactor Coolant Drain Tank Isolation to RHR System	11		
1815A	MOV	C-SI Pump Suction From RWST	24	Stroke	Q
1815B	MOV	C-SI Pump Suction From RWST	24	Stroke	Q
3504	MOV	Main Steam to TAFP From 1-B S/G	-	Stroke	Q
3505	MOV	Main Steam to TAFP From 1-A S/G	-	Stroke	Q
3652	MV	Main Steam Throttle Valve to TAFP	-	Stroke	Q
3996	MOV	TAFP Discharge	-	Stroke	M
4000A	MOV	Cross Over Valve For MAFP	-	Stroke	M
4000B	MOV	Cross Over Valve For MAFP	-	Stroke	M
4007	MOV	1-A MAFP Discharge	-	Stroke	M
4008	MOV	1-B MAFP Discharge	-	Stroke	M
4013	MOV	TAFP Service Water Supply Isolation	-	Stroke	M
4027	MOV	1-A MAFP Service Water Isolation	-	Stroke	M
4028	MOV	1-B MAFP Service Water Isolation	-	Stroke	M
4291	AOV	TAFP Recir. Line	-	Stroke	M
4297	AOV	TAFP Discharge to 1-A S/G	-	Stroke	M
4298	AOV	TAFP Discharge to 1-B S/G	-	Stroke	M

Valve #	Type	Description	Note	Test	Freq
4304	AOV	1-A MAFP Recirculation Control	-	Stroke	M
4310	AOV	1-B MAFP Recirculation Control	-	Stroke	M
4561	AOV	Containment Vent Recirc. Fans Discharge Flow Control	-	Stroke	Q
4562	AOV	Containment Vent Recirc. Fans Discharge Flow Control Bypass	-	Stroke	Q
4609	MOV	1A1 Screen House SW Isolation	-	Stroke	Q
4613	MOV	1B2 Turbine Building SW Isolation	-	Stroke	Q
4614	MOV	1A1 Turbine Building SW Isolation	-	Stroke	Q
4615	MOV	1B1 Aux. Building SW Isolation	-	Stroke	Q
4616	MOV	1A1 Aux. Building SW Isolation	-	Stroke	Q
4627	MV	Service Water to A Fan Cooler Isolation	-	Stroke	Q
4628	MV	Service Water to B Fan Cooler Isolation	-	Stroke	Q
4629	MV	Service Water from A Fan Cooler Isolation	-	Stroke	Q
4630	MV	Service Water from B Fan Cooler Isolation	-	Stroke	Q
4635	MV	Reactor Compartment Cooling Unit A Inlet Isolation	-	Stroke	Q

Valve #	Type	Description	Note	Test	Freq
4636	MV	Reactor Compartment Cooling Unit A Outlet Isolation	-	Stroke	Q
4641	MV	Service Water to C Fan Cooler Isolation	-	Stroke	Q
4642	MV	Service Water to D Fan Cooler Isolation	-	Stroke	Q
4643	MV	Service Water from C Fan Cooler Isolation	-	Stroke	Q
4644	MV	Service Water from D Fan Cooler Isolation	-	Stroke	Q
4663	MOV	1A1 Air Cond. Chillers SW Isolation	-	Stroke	Q
4664	MOV	1A2 Turbine Building SW Isolation	-	Stroke	Q
4670	MOV	1B1 Turbine Building SW Isolation	-	Stroke	Q
4733	MOV	1A2 Air Cond. Chillers SW Isolation	-	Stroke	Q
4734	MOV	1B2 Aux. Build. SW Isolation	-	Stroke	Q
4735	MOV	1A2 Aux. Build. SW Isolation	-	Stroke	Q
4757	MV	Reactor Compartment Cooling Unit B Inlet Isolation	-	Stroke	Q
4758	MV	Reactor Compartment Cooling Unit B Outlet Isolation	-	Stroke	Q
4780	MOV	1A2 Screen House SW Isolation	-	Stroke	Q
5171	MOV	Turbine Build. Fire Water Loop Supply Isolation	-	Stroke	Q

Valve #	Type	Description	Note	Test	Freq
5871	APV	Containment Post Accident Filter Damper	-	Stroke	Q
5872	APV	Containment Post Accident Filter Damper	-	Stroke	Q
5873	APV	Containment Post Accident Filter Damper	-	Stroke	Q
5874	APV	Containment Post Accident Filter Damper	-	Stroke	Q
5875	APV	Containment Post Accident Filter Damper	-	Stroke	Q
5876	APV	Containment Post Accident Filter Damper	-	Stroke	Q
9629A	MOV	1C SAFP Service Water Isolation	-	Stroke	Q
9629B	MOV	1D SAFP Service Water Isolation	-	Stroke	Q
9701A	MOV	1C SAFP Discharge	-	Stroke	Q
9701B	MOV	1D SAFP Discharge	-	Stroke	Q
9703A	MOV	SAFP Cross Over	-	Stroke	Q
9703B	MOV	SAFP Cross Over	-	Stroke	Q
9704A	MOV	1C SAFP Containment Isolation	-	Stroke	Q
9704B	MOV	1D SAFP Containment Isolation	-	Stroke	Q
9710A	AOV	1C SAFP Recirc. Control	-	Stroke	Q
9710B	AOV	1D SAFP Recirc. Control	-	Stroke	Q

4.10 Category C Check Valves

Valve #	Type	Description	Note	Test	Freq
710A	CV	1-A RHR Pump Discharge	-	Stroke	Q
710B	CV	1-B RHR Pump Discharge	-	Stroke	Q
723A	CV	1-A CC Pump Discharge	-	Stroke	Q
723B	CV	1-B CC Pump Discharge	-	Stroke	Q
847A	CV	A-CSP From Spray Additive Tank to Eductor	-	Stroke	Q
847B	CV	B-CSP From Spray Additive Tank to Eductor	-	Stroke	Q
854	CV	RWST to RHR Pump Check	-	Stroke	Q
866A	CV	CS Pump 1-A to Charcoal Filter Deluge	12	Stroke	C/R
866B	CV	CS Pump 1-B to Charcoal Filter Deluge	-	Stroke	Q
3516	CV	1B Main Steam Isolation	14	Stroke	R
3517	CV	1A Main Steam Isolation	14	Stroke	R
3998	CV	TAFP Discharge Check	-	Stroke	M
4000C	CV	1A MAFP Discharge Check	-	Stroke	M
4000D	CV	1B MAFP Discharge Check	-	Stroke	M
4003	CV	TAFP to S/G 1A	-	Stroke	M
4004	CV	TAFP to S/G 1B	-	Stroke	M
4009	CV	1A MAFP to S/G 1A	-	Stroke	M
4010	CV	1B MAFP to S/G 1B	-	Stroke	M
4014	CV	TAFP Suction	-	Stroke	M

Valve #	Type	Description	Note	Test	Freq
4016	CV	1B MAFP Suction	-	Stroke	M
4017	CV	1A MAFP Suction	-	Stroke	M
4023	CV	TAFP Recirculation	-	Stroke	M
5133	CV	Diesel Fire Pump Disch.	-	Stroke	Q
5136	CV	Motor Fire Pump Discharge	-	Stroke	Q
9627A	CV	1C SAFP SW Suction	-	Stroke	Q
9627B	CV	1D SAFP SW Suction	-	Stroke	Q
9700A	CV	1C SAFP Discharge	-	Stroke	Q
9700B	CV	1D SAFP Discharge	-	Stroke	Q
9705A	CV	1C SAFP to S/G 1A	-	Stroke	Q
9705B	CV	1D SAFP to S/G 1B	-	Stroke	Q

4.11 Category C Relief Valve

Valve #	Type	Description	Note	Test	Freq
203	RV	Letdown High Pressure Safety Relief	15	-	-
209	RV	Letdown Low Pressure Safety Relief	15	-	-
434	RV	Pressurizer Safety Relief	15	-	-
435	RV	Pressurizer Safety Relief	15	-	-
732	RV	CC Surge Tank Relief	15	-	-
744	RV	CC From Excess Letdown Heat Exchanger	15	-	-
755A	RV	CC From A RCP Thermal Barrier	15	-	-

Valve #	Type	Description	Note	Test	Freq
755B	RV	CC From B RCP Thermal Barrier	15	-	-
758A	RV	CC From A-RCP Oil Coolers	15	-	-
758B	RV	CC From B-RCP Oil Coolers	15	-	-
818	RV	CC From Reactor Support Coolers	15	-	-
861	RV	1-B CS Pump Suction Relief	15	-	-
887	RV	SI Test Line Relief Valve Inside Containment	15	-	-
1817	RV	Alternate Suction From RHR Pump to C SI Pump	15	-	-
3508	RV	1-B S/G PRV	15	-	-
3509	RV	1-A S/G PRV	15	-	-
3510	RV	1-B S/G PRV	15	-	-
3511	RV	1-A S/G PRV	15	-	-
3512	RV	1-A S/G PRV	15	-	-
3513	RV	1-A S/G PRV	15	-	-
3514	RV	1-B S/G PRV	15	-	-
3515	RV	1-A S/G PRV	15	-	-
4653	RV	Service Water Relief	15	-	-
4654	RV	Service Water Relief	15	-	-
4657	RV	Service Water Relief	15	-	-
5134	RV	Diesel Fire Pump Disch Relief	15	-	-
5135	RV	Motor Fire Pump Disch Relief	15	-	-

4.12 Inservice Valve Testing Notes

Note 1 - Valves 304A, 304B and 313 cannot be stroked during normal plant operation on a quarterly basis because they would interrupt coolant flow to the reactor coolant pump seals. These valves will be stroked at cold shutdowns and refueling outages.

Note 2 - Valve 370B cannot be stroked during normal plant operation on a quarterly basis because this test would interrupt charging pump flow. This valve will be stroked at cold shutdowns and refueling outages.

Note 3 - Valves 204A, 371 and 427 cannot be stroked during normal plant operation on a quarterly basis because this test would interrupt the letdown (CVCS) system. These valves will be stroked at cold shutdowns and refueling outages.

Note 4 - Valve 383B cannot be stroked during normal plant operation on a quarterly basis because this test would result in substantial radiation exposure to test personnel. Surveys in the area of the test connection during plant operation indicate neutron fields of approximately 500 mr/hr and a gamma fields of 250 mr/hr. Total whole body dosage to test personnel is estimated to be 375 mrem. This valve will be stroked at cold shutdowns and refueling outages.

Note 5 - Valves 749A, 749B, 750A, 750B, 759A and 759B cannot be stroked during normal plant operation on a quarterly basis because this test would require the reactor coolant pumps to be shut down to eliminate the flow through these

checks and MOVs. These valves will be stroked at cold shutdowns and refueling outages.

Note 6 - Valves 813 and 814 cannot be stroked during normal plant operation on a quarterly basis because this test would remove the coolant to the reactor vessel supports and cavity wall. These valves will be stroked at cold shutdowns and refueling outages.

Note 7 - Valve 879 is a manual valve in the safety injection test line and is kept locked shut. This valve is not required to change position to perform a safety function. The only requirement is that leakage through valve 879 be acceptably low. Therefore, the quarterly stroke test has been deleted. This passive valve will be only leak tested at refueling outages consistent with IWV-3700-1.

Note 8 - Valves 700 and 721 cannot be stroked during normal plant operation on a quarterly basis because there is an interlock system which prevents these valves from opening when the primary system is at operating pressure. Valves 700, 701, 720 and 721 separate a high pressure system from a low pressure system. These valves will be stroked at cold shutdowns and refueling outages.

Note 9 - Valves 825A, 825B, 856, 896A, and 896B should not be stroked during normal operation on a quarterly basis because this would cause a temporary loss of system function of the ECCS. These valves provide the suction from the refueling water storage tank to the safety injection and residual heat removal pumps. These valves will be stroked at cold shutdowns and refueling outages.

Note 10- Valves 853A and 853B cannot be stroked during normal plant operation on a quarterly basis because this test requires pressurizing the RHR system to the primary system operation pressure. These valves will be stroked at refueling outages.

Leakage testing of check valves 853A and 853B shall be accomplished prior to criticality following (1) refueling, (2) cold shutdown, and (3) maintenance, repair or replacement work on the valves. Leakage may be measured indirectly from the performance of pressure indicators, system volume measuurements or by direct measurement. Minimum test differential shall be greater than 150 psid. Technical Specification 4.3.3.4 defines the allowable leakage rates.

Note 11- Valves 820, 877A, 877B, 878F, 878H, 1076A, 1076B, 1080A, 1084A, 1084B, IV-3A, IV-3B, IV-5A, IV-5B, IV-2A, IV-2B, 1554, 1556, 1557, 1579, 1560, 1562, 1563, 1565, 1566, 1568, 1569, 1571, 1572, 1574, 1811A, 1811B, 5129, 6151, 6152, 6155, 6175, 7141, 7226, 7443, 7444, 7445, 7448, 7452, 7456, 8418, 8419, 8623, 9227 and 9229 are considered passive valves which are not required to change position to acccomplish their specific function. Stroking these valves would serve no useful function and will therefore not be done as per IWV-3700-1.

Note 12- Valve 866A cannot be stroke tested during normal plant operation on a quarterly basis because this test would result in a substantial radiation exposure to test personnel. Stroke testing at this location resulted in approximately 400 mrem whole body exposure to the test personnel. This valve will be stroked at cold shutdowns and refueling outages.

Note 13- Valves 867A, 867B, 878G, and 878J cannot be stroked during normal operation on a quarterly basis or at cold shutdown condition when the primary system is full. This test may only be done when the plant is in a refueling shutdown condition with a partially full primary system in order to prevent an over-pressurization. Leakage testing of check valves 867A, 867B, 878G and 878J shall be accomplished prior to criticality following (1) refueling, (2) cold shutdown, and (3) maintenance, repair or replacement work on the valves. Leakage may be measured indirectly from the performance of pressure indicators, system volume measurements or by direct measurement. Check valves 878G and 878J shall also be tested for leakage following each safety injection flow test. Minimum test differential shall be greater than 150 psid. Technical Specification 4.3.3.4 defines the allowable leakage rates.

Note 14- Valves 3516 and 3517 cannot be stroked during normal plant operation on a quarterly basis because they are the main steam isolation valves. These valves are stroked during each plant refueling.

Note 15- Category C Relief Valves shall be tested in accordance with the extent and frequency requirements of Paragraph IWV-3510 of Article IWV of Section XI of the Code.

Note 16- Valves 430 and 431C are the power operated relief valves associated with the overpressurization system. These valves shall not be stroked quarterly as an unplanned pressure transient could result from a leaky block valve. Operability of these valves shall be verified as follows:

(1) Full stroke exercising during cool down prior to achieving water solid condition in the pressurizer and during cold shutdown prior to heat up.

(2) Stroke timing to be performed as a minimum once each refueling cycle as a part of the channel calibration specified by Technical Specifications 4.16.1b.

(3) Fail safe actuation testing is permitted by the code to be performed at each cold shutdown if valve cannot be tested during power operation.

(4) Technical specification 4.16.1a and 4.16.1c delineate additional requirements for operability verification of the PORV actuation channel and valve position.

Note 17- Additional stroking will be consistent with Technical Specifications.

Note 18- Valves 852A and 852B cannot be stroked during normal plant operation as these valves, when cycled, could subject the Residual Heat Removal System to a pressure in excess of its design pressure. These valves will be stroked at cold shutdowns and refueling outages.

Note 19- Stroking Valves 5392 and 5393 during operation and cold shutdown would interrupt instrument air to containment and be disruptive to air operated valves inside. These valves will be stroked at refueling outages.

Note 20- Valve 959 is normally closed and in the containment isolating position during normal operation. These valves will be stroked at cold shutdown and refueling outages.

Note 21- Valves 1819A, B, C, D, E, F and G cannot be stroked during normal plant operation as this test would interrupt containment pressure monitoring transmitters from performing their intended function. These valves will be stroked at cold and refueling outages.

Note 22- Category A valves 5869, 5870, 5878 and 5879 are normally closed and in the containment isolating position during normal operation. Leak tightness of these valves is reverified following reclosure after each use in accordance with Section 4.4.2.4 of Technical Specifications. The valves shall be stroked at least each cold shutdown. In addition, if the valves are opened for purging, they shall be stroked at least once each quarter during which they have been opened.

Note 23- Valves 515 and 516 stroked quarterly except if already closed or during cold and refueling shutdowns.

Note 24- Not to be done during time that redundant valve is inoperable per Technical Specification.

Note 25- As per Technical Specifications 3.3.1.2.f, no cycling shall be done if normally open valve in other flow path is inoperable in the open position.

Note 26- As per Technical Specifications 3.3.1.2.e, failure of valves 624 and 625 during quarterly stroking in the closed position can degrade LPSI system function. However, these valves shall be stroked at cold shutdown and refueling outages.

Note 27- As per Technical Specifications 3.3.1.2.e, failure of valves 857A, 857B, 857C, 897 and 898 during quarterly stroking can

degrade the injection phase of the SI pumps. However, these valves shall be stroked at cold shutdown and refueling outages.

Note 28- Check valves 842A and 842B (accumulator check valves) cannot and should not be exercised during plant operation. Exercising of these valves requires the reactor coolant system pressure to be reduced to below accumulator pressure. Therefore testing of these valves will be performed after refueling and cold shutdowns, and after maintenance, repair or replacement. Full stroke testing, which involves discharge of the accumulator through the valve to a partially-filled reactor coolant system will not be utilized since this test mode is considered impractical and unsafe. Valve operability from the normal closed position will be verified by partial stroking prior to leak testing with flow through the safety injection test line.

Leak testing will be performed to assure primary system integrity following each cold and refueling shutdown after achieving normal reactor coolant system pressure and prior to reactor criticality. Testing will be performed by either (1) closing each accumulator motor operated discharge valve, pressuring the line downstream of the check valves and measuring the upstream leakage, or (2) by measuring accumulator in-leakage by pressurizing the line downstream of the 842 valves. These valves are not event V-check valves. Therefore, the test acceptance criterion shall be that of Technical Specification 3.1.5.