

(B) PUMPS: Safety Injection Pumps (2A, 2B)

SAFETY CLASS: 2

FUNCTION: To provide emergency core cooling in the event of a break in either the reactor coolant or steam system piping.

TEST REQUIREMENT: IWP-3100 requires the resistance of the system to be varied until either the measured differential pressure or the measured flow rate equals the corresponding reference value.

BASIS FOR RELIEF: When testing these pumps on line, the only flow path available is thru the miniflow to the FWST. Flow is limited by an orifice in the miniflow line, which yields a test point back on the head curve. As stated in Generic Letter 89-04, minimum flow lines are not designed for pump testing purposes. The test point for monitoring pump performance for degradation should be in a more stable region on the pump performance curve. Also, the amount of time the pump is run at miniflow should be minimized.

ALTERNATE TESTING: The Safety Injection Pumps will be tested according to the following program, which is consistent with Generic Letter 89-04.

Quarterly  
The Safety Injection Pumps will be tested quarterly to verify Technical Specification limits on pump operability are met. Velocity vibration measurements will also be taken. The main thrust of this test will be to verify pump operability.

Refueling Outage  
During each refueling outage, a code pump test, including velocity vibration measurements, will be performed at a test point in the stable region of the performance curve.

Implementation  
The new testing program (quarterly and refueling) will be in place by the 1990 Unit 2 refueling outage and the 1991 Unit 1 refueling outage.

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Rev. 10

(C) PUMPS:	Residual Heat Removal Pumps (2A, 2B)
SAFETY CLASS:	2
FUNCTION:	To remove heat energy from the core and Reactor Coolant System during cooldown and refueling operations. Also, utilized as part of Safety Injection System and Containment Spray System during an accident condition.
BASIS FOR RELIEF:	When testing these pumps on line, the only flow path available is thru the miniflow line. Flow is limited by the miniflow control valve in the line, which yields a test point back on the head curve. As stated in Generic Letter 89-04, minimum flow lines are not designed for pump testing purposes. The test point for monitoring pump performance for degradation should be in a more stable region on the pump performance curve. Also, the amount of time the pump is run at miniflow should be minimized.
ALTERNATE TESTING:	<p>The Residual Heat Removal Pumps will be tested according to the following program, which is consistent with Generic Letter 89-04.</p> <p><u>Quarterly</u>  The Residual Heat Removal Pumps will be tested quarterly to verify Technical Specification limits on pump operability are met. Velocity vibration measurements will also be taken. The main thrust of this test will be to verify pump operability.</p> <p><u>Refueling Outage</u>  During each refueling outage, a code pump test, including velocity vibration measurements, will be performed at a test point in the stable region of the performance curve.</p> <p><u>Implementation</u>  The new testing program (quarterly and refueling) will be in place by the 1990 Unit 2 refueling outage and the 1991 Unit 1 refueling outage.</p>

(D) PUMPS: Centrifugal Charging Pump (2A, 2B)

SAFETY CLASS: 2

FUNCTION: To supply reactor coolant inventory in the Volume Control Tank or Refueling Water Storage Tank to the reactor coolant system.

TEST REQUIREMENT: Table IW-3100-1 requires measuring differential pressure (DP) and flow rate (Q).

BASIS FOR RELIEF: When testing these pumps on line, the only flow path available is thru a combination of the normal charging and the miniflow to the VCT. The miniflow is not instrumented for flow. Flow through the line is assumed to be at the flow rate corresponding to the orifice design conditions. Also, the combination flow paths yield a test point back on the head curve. The best test point back for monitoring pump performance for degradation should be in a more stable region on the pump performance curve.

ALTERNATE TESTING: The Centrifugal Charging Pumps will be tested according to the following program, which is consistent with Generic Letter 89-04.

Quarterly  
The Centrifugal Charging Pumps will be tested quarterly to verify Technical Specification limits on pump operability are met. Velocity vibration measurements will also be taken. The main thrust of this test will be to verify pump operability.

Refueling Outage  
During each refueling outage, a code pump test, including velocity vibration measurements, will be performed at a test point in the stable region of the performance curve.

Implementation  
The new testing program (quarterly and refueling) will be in place by the 1990 Unit 2 refueling outage and the 1991 Unit 1 refueling outage.

(E) PUMPS: D/G Room Sump Pumps (2A2, 2A3, 2B2, 2B3)  
SAFETY CLASS: 3  
FUNCTION: Water removal from Diesel Generator Rooms  
TEST REQUIREMENT: Test pumps in accordance with Subsection IWP.  
BASIS FOR RELIEF: The D/G Room Sump Pumps are vertical pumps tested by filling the D/G Room Sump and pumping the sump down. No stable system conditions can be obtained due to the continuous decrease in sump level. No suction pressure, flow, bearing temperature, or lubricant level instrumentation is available.

ALTERNATE TESTING: The D/G Room Sump Pumps will be tested for greater than or equal to emergency design flow by:

- (1) Filling the sump and recording level.
- (2) Pumping down the sump and recording both level and pump down time.

An average flow rate will be determined from the time it takes to pump a known volume from the sump. Pumping down the sump takes approximately 60 seconds. An average discharge pressure will be determined and recorded. The flow rate will be compared with acceptance criteria established per Table IWP-3100-2.

The above testing procedure is an interim method until modifications are made to the system which will permit full flow testing using a recirculation loop back to the sump. Included in the test loop modification will be direct flow indication and throttling capability to set either  $\Delta P$  or Q. The modifications will be installed by the 1992 refueling outage.

No lubrication level verification is required for this pump. Lubrication is maintained under our routine preventative maintenance program.

No suction pressure instrumentation is required since this pressure can be calculated from sump level measurements.

The mechanical condition of the subject pumps will be determined from vibration data to be gathered quarterly. No bearing temperature instrumentation is installed. ANSI/ASME OM-6 will not require bearing temperature measurements.

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PUMP AND VALVE INSERVICE  
TESTING PROGRAM

VALVE	CL	FLOW DIAGRAM	FLOW COOR	CAT	TEST REQ1	TEST REQ2	RR	STROKE TIME (SEC)	TEST ALTERNATIVES/ REMARKS	R E V
** AUXILIARY FEEDWATER										
2CA-0007AC	C	2592-1.1	B-10	B	ST-Q	-	-	10	-	-
2CA-0008	C	2592-1.1	B-11	C	MTC-Q	-	CA2	-	RF#	10
2CA-0009B	C	2592-1.1	C-05	B	ST-Q	-	-	10	-	-
2CA-0010	C	2592-1.1	C-05	C	MTC-Q	-	CA2	-	RF#	10
2CA-0011A	C	2592-1.1	B-04	B	ST-Q	-	-	10	-	-
2CA-0012	C	2592-1.1	B-03	C	MTC-Q	-	CA2	-	RF#	10
2CA-0015A	C	2592-1.1	D-03	B	ST-Q	-	-	10	-	-
2CA-0018B	C	2592-1.1	D-03	B	ST-Q	-	-	10	-	-
2CA-0020AB	C	2592-1.1	I-10	B	ST-Q	-	-	60	-	-
2CA-0022	C	2592-1.1	I-10	C	MTO-Q	-	-	-	-	-
2CA-0026	C	2592-1.1	I-04	C	MTO-Q	-	-	-	-	-
2CA-0027A	C	2592-1.1	J-05	B	ST-Q	-	-	60	-	-
2CA-0031	C	2592-1.1	I-07	C	MTO-Q	-	-	-	-	-
2CA-0032B	C	2592-1.1	I-08	B	ST-Q	-	-	60	-	-
2CA-0036AB	C	2592-1.0	L-10	B	ST-Q	-	-	60	-	-
2CA-0037	B	2592-1.0	K-14	C	MTO, C-Q	-	-	-	CS-CA1	-
2CA-0038B	B	2592-1.0	J-14	B	ST-Q	-	-	12	-	-
2CA-0040B	C	2592-1.0	G-14	B	ST-Q	-	-	60	-	-
2CA-0041	B	2592-1.0	H-14	C	MTO, C-Q	-	-	-	CS-CA1	-
2CA-0042B	B	2592-1.0	I-14	B	ST-Q	-	-	10	-	-
2CA-0044B	C	2592-1.0	C-11	B	ST-Q	-	-	60	-	-
2CA-0045	B	2592-1.0	C-09	C	MTO, C-Q	-	-	-	CS-CA1	-
2CA-0046B	B	2592-1.0	D-08	B	ST-Q	-	-	10	-	-
2CA-0048AB	C	2592-1.0	K-08	B	ST-Q	-	-	60	-	-
2CA-0049	B	2592-1.0	H-08	C	MTO, C-Q	-	-	-	CS-CA1	-
2CA-0050B	B	2592-1.0	G-08	B	ST-Q	-	-	12	-	-
2CA-0052AB	C	2592-1.0	K-07	B	ST-Q	-	-	60	-	-
2CA-0053	B	2592-1.0	H-07	C	MTO, C-Q	-	-	-	CS-CA1	-
2CA-0054AC	B	2592-1.0	G-07	B	ST-Q	-	-	12	-	-
2CA-0056A	C	2592-1.0	C-04	B	ST-Q	-	-	60	-	-
2CA-0057	B	2592-1.0	C-06	C	MTO, C-Q	-	-	-	CS-CA1	-
2CA-0058A	B	2592-1.0	D-07	B	ST-Q	-	-	10	-	-
2CA-0060A	C	2592-1.0	G-01	B	ST-Q	-	-	60	-	-
2CA-0061	B	2592-1.0	H-01	C	MTO, C-Q	-	-	-	CS-CA1	-
2CA-0062A	B	2592-1.0	I-01	B	ST-Q	-	-	10	-	-
2CA-0064AB	C	2592-1.0	L-04	B	ST-Q	-	-	60	-	-
2CA-0065	B	2592-1.0	K-01	C	MTO, C-Q	-	-	-	CS-CA1	-
2CA-0066AC	B	2592-1.0	J-01	B	ST-Q	-	-	12	-	-
2CA-0086A	C	2592-1.1	C-14	B	ST-Q	-	-	10	-	-
2CA-0116B	C	2592-1.1	G-14	B	ST-Q	-	-	10	-	-
2CA-0161C	C	2592-1.1	B-12	B	ST-Q	-	-	10	-	-
2CA-0162C	C	2592-1.1	B-12	B	ST-Q	-	-	10	-	-
2CA-0165	C	2592-1.1	C-14	C	MTO-Q	-	CA1	-	RF#	-
2CA-0166	C	2592-1.1	G-14	C	MTO-Q	-	CA1	-	RF#	-

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PUMP AND VALVE INSERVICE  
TESTING PROGRAM

VALVE	CL	FLOW DIAGRAM	FLOW COORD	CAT	TEST REQ1	TEST REQ2	RR	STROKE TIME (SEC)	TEST ALTERNATIVES/ REMARKS	R E V
** REFUELING WATER										
2FW-0001A	B	2571-1.0	E-11	B	ST-Q	-	-	10	-	-
2FW-0004	B	2571-1.0	D-08	A	LT-RF	-	-	-	PASSIVE	-
2FW-0005	B	2571-1.0	C-07	AC	LT-RF	-	-	-	PASSIVE	-
2FW-0011	B	2571-1.0	C-02	A	LT-RF	-	-	-	PASSIVE	-
2FW-0013	B	2571-1.0	D-02	A	LT-RF	-	-	-	PASSIVE	-
2FW-0027A	B	2571-1.0	C-12	B	ST-Q	-	-	30	CS-FW1	-
2FW-0028	B	2571-1.0	B-11	C	MTQ, C-Q	-	-	-	CS-FW2	10
2FW-0032B	B	2571-1.0	E-11	B	ST-Q	-	-	10	-	-
2FW-0033A	B	2571-1.0	F-11	B	ST-Q	-	-	10	-	-
2FW-0049B	B	2571-1.0	F-10	B	ST-Q	-	-	10	-	-
2FW-0052	E	2571-1.0	I-05	C	MTQ-Q	-	-	-	-	-
2FW-0063	B	2571-1.0	C-03	AC	LT-RF	-	-	-	PASSIVE	-

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PUMP AND VALVE INSERVICE  
TESTING PROGRAM

VALVE	CL	FLOW DIAGRAM	FLOW COOR	CAT	TEST REQ1	TEST REQ2	RR	STROKE TIME (SEC)	TEST ALTERNATIVES/ REMARKS	R E V
** RESIDUAL HEAT REMOVAL										
2ND-0001B	A	2561-1.0	I-13	A	ST-Q	LT-TS	-	60	CS-ND1 PIV	-
2ND-0002AC	A	2561-1.0	H-13	A	ST-Q	LT-TS	-	60	CS-ND1 PIV	-
2ND-0004B	B	2561-1.0	E-12	B	ST-Q	-	-	60	-	-
2ND-0008	B	2561-1.0	D-08	C	MT0,C-Q	-	-	-	CS-ND6	10
2ND-0014	B	2561-1.0	D-03	B	ST-Q	-	-	60	-	-
2ND-0015B	B	2561-1.0	E-03	B	ST-Q	-	-	10	CS-ND3	-
2ND-0019A	B	2561-1.0	H-12	B	ST-Q	-	-	60	-	-
2ND-0023	B	2561-1.0	J-08	C	MT0,C-Q	-	-	-	CS-ND6	10
2ND-0029A	B	2561-1.0	J-03	B	ST-Q	-	-	60	-	-
2ND-0030A	B	2561-1.0	I-03	B	ST-Q	-	-	10	CS-ND3	-
2ND-0058A	B	2561-1.0	K-03	B	ST-Q	-	-	10	CS-ND2	-
2ND-0067B	B	2561-1.0	B-09	B	ST-Q	-	-	10	-	-
2ND-0068A	B	2561-1.0	L-09	B	ST-Q	-	-	10	-	-
2ND-0070	B	2561-1.0	K-03	C	MT0,C-Q	-	-	-	CS-ND4	10
2ND-0071	B	2561-1.0	C-04	C	MT0,C-Q	-	-	-	CS-ND5	10

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PUMP AND VALVE INSERVICE  
TESTING PROGRAM

VALVE	CL	FLOW DIAGRAM	FLOW COOR	CAT	TEST REQ1	TEST REQ2	RR	STROKE TIME (SEC)	TEST ALTERNATIVES/ REMARKS	R E V
** SAFETY INJECTION										
2NI-0009A	B	2562-1.0	H-12	B	ST-Q	-	-	11	CS-NI1	-
2NI-0010B	B	2562-1.0	G-10	B	ST-Q	-	-	11	CS-NI1	-
2NI-0012	B	2562-1.0	G-09	C	MTO-Q	-	-	-	CS-NI14	10
2NI-0015	A	2562-1.0	K-07	C	MTO-Q	-	-	-	CS-NI13	10
2NI-0017	A	2562-1.0	I-04	C	MTO-Q	-	-	-	CS-NI13	10
2NI-0019	A	2562-1.0	F-04	C	MTO-Q	-	-	-	CS-NI13	10
2NI-0021	A	2562-1.0	C-07	C	MTO-Q	-	-	-	CS-NI13	10
2NI-0047A	B	2562-2.0	K-05	A	ST-Q	LT-RF	-	15	-	-
2NI-0048	B	2562-2.0	K-03	AC	MTC-Q	LT-RF	NI3	-	MT-RF*	-
2NI-0054A									DELETED	9
2NI-0059	A	2562-2.0	D-13	AC	MTO,C-Q	LT-TS	NI4	-	PIV RF#	-
2NI-0060	A	2562-2.0	D-14	AC	MTO,C-Q	LT-TS	NI6	-	PIV RF#	-
2NI-0065B									DELETED	9
2NI-0070	A	2562-2.0	H-13	AC	MTO,C-Q	LT-TS	NI4	-	PIV RF#	-
2NI-0071	A	2562-2.0	H-14	AC	MTO,C-Q	LT-TS	NI6	-	PIV RF#	-
2NI-0076A									DELETED	9
2NI-0081	A	2562-2.1	C-03	AC	MTO,C-Q	LT-TS	NI4	-	PIV RF#	-
2NI-0082	A	2562-2.1	C-03	AC	MTO,C-Q	LT-TS	NI6	-	PIV RF#	-
2NI-0088B									DELETED	9
2NI-0093	A	2562-2.1	C-08	AC	MTO,C-Q	LT-TS	NI4	-	PIV RF#	-
2NI-0094	A	2562-2.1	C-08	AC	MTO,C-Q	LT-TS	NI6	-	PIV RF#	-
2NI-0095A	B	2562-2.1	F-11	A	ST-Q	LT-RF	-	10	-	-
2NI-0096B	B	2562-2.1	E-13	A	ST-Q	LT-RF	-	10	-	-
2NI-0100B	B	2562-3.0	F-13	B	ST-Q	-	-	10	CS-NI3	-
2NI-0101	B	2562-3.0	F-13	C	MTO,C-Q	-	-	-	CS-NI15	10
2NI-0103A	B	2562-3.0	I-14	B	ST-Q	-	-	10	-	-
2NI-0114	B	2562-3.0	I-09	C	MTO-Q	-	-	-	-	-
2NI-0115B	B	2562-3.0	H-09	B	ST-Q	-	-	10	-	-
2NI-0116	B	2562-3.0	J-09	C	MTO,C	-	-	-	CS-NI16	10
2NI-0118A	B	2562-3.0	H-07	B	ST-Q	-	-	10	-	-
2NI-0120B	B	2562-3.0	J-07	A	ST-Q	LT-RF	-	10	-	-
2NI-0121A	B	2562-3.0	J-06	B	ST-Q	-	-	10	CS-NI5	-
2NI-0124	A	2562-3.0	J-03	AC	MTO,C-Q	LT-TS	-	-	PIV CS-NI17	10
2NI-0125	A	2562-3.0	I-03	AC	MTO,C-Q	LT-TS	-	-	PIV CS-NI20	10
2NI-0126	A	2562-3.0	J-02	AC	MTO,C-Q	LT-TS	-	-	PIV CS-NI20	10
2NI-0128	A	2562-3.0	I-04	AC	MTO,C-Q	LT-TS	-	-	PIV CS-NI17	10
2NI-0129	A	2562-3.0	I-03	AC	MTO,C-Q	LT-TS	-	-	PIV CS-NI20	10
2NI-0134	A	2562-3.0	H-04	AC	MTO,C-Q	LT-TS	-	-	PIV CS-NI20	10
2NI-0135B	B	2562-3.0	E-14	B	ST-Q	-	-	10	-	-
2NI-0136B	B	2562-3.0	C-14	B	ST-Q	-	-	10	-	-
2NI-0143	B	2562-3.0	F-09	C	MTO,C-Q	-	-	-	-	-
2NI-0144B	B	2562-3.0	G-09	B	ST-Q	-	-	10	-	-
2NI-0147A	B	2562-3.0	G-11	B	ST-Q	-	-	10	CS-NI4	-
2NI-0148	B	2562-3.0	D-09	C	MTO,C	-	-	-	CS-NI16	10
2NI-0150B	B	2562-3.0	E-07	B	ST-Q	-	-	10	-	-

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PUMP AND VALVE INSERVICE  
TESTING PROGRAM

VALVE	CL	FLOW DIAGRAM	FLOW COOR	CAT	TEST REQ1	TEST REQ2	RR	STROKE TIME (SEC)	TEST ALTERNATIVES/ REMARKS	R E V
2NI-0152B	B	2562-3.0	D-06	B	ST-Q	-	-	20	CS-NI6	-
2NI-0156	A	2562-3.0	D-03	AC	MTO, C-Q	LT-TS	-	-	PIV CS-NI17	10
2NI-0157	A	2562-3.0	D-02	AC	MTO, C-Q	LT-TS	-	-	PIV CS-NI17	10
2NI-0159	A	2562-3.0	B-04	AC	MTO, C-Q	LT-TS	-	-	PIV CS-NI17	10
2NI-0160	A	2562-3.0	B-03	AC	MTO, C-Q	LT-TS	-	-	PIV CS-NI17	10
2NI-0162A	B	2562-3.1	K-11	B	ST-Q	-	-	10	CS-NI7	-
2NI-0165	A	2562-3.1	J-03	AC	MTO, C-Q	LT-TS	-	-	PIV CS-NI18	10
2NI-0167	A	2562-3.1	J-05	AC	MTO, C-Q	LT-TS	-	-	PIV CS-NI18	10
2NI-0169	A	2562-3.1	J-06	AC	MTO, C-Q	LT-TS	-	-	PIV CS-NI18	10
2NI-0171	A	2562-3.1	J-07	AC	MTO, C-Q	LT-TS	-	-	PIV CS-NI18	10
2NI-0173A	B	2562-3.1	I-12	B	ST-Q	-	-	10	CS-NI8	-
2NI-0175	A	2562-3.1	I-03	AC	MTO, C-Q	LT-TS	-	-	PIV CS-NI19	10
2NI-0176	A	2562-3.1	H-08	AC	MTO, C-Q	LT-TS	-	-	PIV CS-NI19	10
2NI-0178B	B	2562-3.1	F-12	B	ST-Q	-	-	10	CS-NI9	-
2NI-0180	A	2562-3.1	F-07	AC	MTO, C-Q	LT-TS	-	-	PIV CS-NI19	10
2NI-0181	A	2562-3.1	D-08	AC	MTO, C-Q	LT-TS	-	-	PIV CS-NI19	10
2NI-0183B	B	2562-3.0	G-03	B	ST-Q	-	-	20	CS-NI10	-
2NI-0184B	B	2562-3.1	D-12	B	ST-Q	-	-	60	CS-NI11	-
2NI-0185A	B	2562-3.1	B-12	B	ST-Q	-	-	60	CS-NI11	-
2NI-0332A	B	2562-3.0	L-14	B	ST-Q	-	-	10	-	-
2NI-0333B	B	2562-3.0	L-12	B	ST-Q	-	-	10	-	-
2NI-0334B	B	2562-3.0	L-11	B	ST-Q	-	-	10	-	-
2NI-0347	A	2562-1.0	I-04	C	MTO-Q	-	-	-	CS-NI13	10
2NI-0348	A	2562-1.0	F-05	C	MTO-Q	-	-	-	CS-NI13	10
2NI-0349	A	2562-1.0	C-07	C	MTO-Q	-	-	-	CS-NI13	10
2NI-0354	A	2562-1.0	K-07	C	MTO-Q	-	-	-	CS-NI13	10
2NI-0430A	B	2562-2.0	F-04	B	ST-Q	-	-	60	CS-NI2	-
2NI-0431B	B	2562-2.0	J-04	B	ST-Q	-	-	60	CS-NI2	-
2NI-0436	B	2562-2.1	G-11	AC	LT-RF	MTC-Q	NI5	-	MT-RF*	-

Duke Power Company  
McGuire Nuclear Station  
PUMP AND VALVE INSERVICE  
TESTING PROGRAM

VALVE	CL	FLOW DIAGRAM	FLOW COORD	CAT	TEST REQ1	TEST REQ2	RR	STROKE TIME (SEC)	TEST ALTERNATIVES/ REMARKS	R E V
** CHEMICAL AND VOLUME CONTROL										
2NV-0001A	A	2554-1.2	C-05	B	ST-Q	-	-	15	CS-NV3	-
2NV-0002A	A	2554-1.2	D-05	B	ST-Q	-	-	15	CS-NV3	-
2NV-0007B	B	2554-1.2	J-11	B	ST-Q	-	-	10	CS-NV2	-
2NV-0021A	A	2554-1.2	E-03	B	ST-Q	-	-	2	CS-NV4	-
2NV-0022	A	2554-1.2	C-03	C	MT0-Q	-	-	-	CS-NV5	-
2NV-0024B	A	2554-1.2	D-06	B	ST-Q	-	-	2	-	-
2NV-0025B	A	2554-1.2	D-07	B	ST-Q	-	-	2	-	-
2NV-0094AC	B	2554-1.1	J-13	B	ST-Q	-	-	10	CS-NV1	-
2NV-0095B	B	2554-1.1	H-13	B	ST-Q	-	-	10	CS-NV1	-
2NV-0141A	B	2554-2.0	B-08	B	ST-Q	-	-	10	CS-NV7	-
2NV-0142B	B	2554-2.0	B-07	B	ST-Q	-	-	10	CS-NV7	-
2NV-0150B	B	2554-2.0	F-02	B	ST-Q	-	-	10	CS-NV12	8
2NV-0151A	B	2554-2.0	G-02	B	ST-Q	-	-	10	CS-NV12	8
2NV-0221A	B	2554-3.1	H-01	B	ST-Q	-	-	10	CS-NV9	-
2NV-0222B	B	2554-3.1	I-01	B	ST-Q	-	-	10	CS-NV9	-
2NV-0223	B	2554-3.1	I-02	C	MT0, C-Q	-	-	-	CS-NV15	10
2NV-0225	B	2554-3.1	F-05	C	MT0, C-Q	-	-	-	CS-NV14	10
2NV-0227	B	2554-3.1	E-06	C	MT0, C-Q	-	-	-	-	-
2NV-0231	B	2554-3.1	F-10	C	MT0, C-Q	-	-	-	CS-NV14	10
2NV-0233	B	2554-3.1	E-10	C	MT0, C-Q	-	-	-	-	-
2NV-0244A	B	2554-3.0	K-08	B	ST-Q	-	-	10	CS-NV3	-
2NV-0245B	B	2554-3.0	K-09	B	ST-Q	-	-	10	CS-NV8	-
2NV-0264	B	2554-3.1	J-10	C	MT0-Q	-	-	-	CS-NV11	-
2NV-0265B	B	2554-3.1	J-09	B	ST-Q	-	-	10	CS-NV13	8
2NV-0457A	B	2554-1.2	I-07	B	ST-Q	-	-	15	-	-
2NV-0458A	B	2554-1.2	J-07	B	ST-Q	-	-	15	-	-
2NV-0459A	B	2554-1.2	K-07	B	ST-Q	-	-	15	CS-NV10	-
2NV-0842AC	B	2554-1.3	F-01	B	ST-Q	-	-	15	-	-
2NV-0844	E	2554-1.3	F-04	C	MT0-Q	-	-	-	-	-
2NV-0849AC	B	2554-1.3	F-08	A	ST-Q	LT-RF	-	15	-	-
2NV-1002	B	2554-1.3	F-10	A, C	MT0, C-Q	LT-RF	NV1	-	MT-RF	-
2NV-1007	B	2554-1.3	F-13	C	MT0, C-Q	-	-	-	CS-NV6	-
2NV-1008	B	2554-1.3	F-13	C	MT0, C-Q	-	-	-	CS-NV6	-
2NV-1009	B	2554-1.3	F-14	C	MT0, C-Q	-	-	-	CS-NV6	-
2NV-1010	B	2554-1.3	F-14	C	MT0, C-Q	-	-	-	CS-NV6	-
2NV-1012C	E	2554-1.3	F-12	B	ST-Q	-	-	30	-	-
2NV-1013C	E	2554-1.3	F-12	B	ST-Q	-	-	30	-	-

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Duke Power Company  
McGuire Nuclear Station  
PUMP AND VALVE INSERVICE  
TESTING PROGRAM

VALVE	CL	FLOW DIAGRAM	FLOW COOR	CAT	TEST REQ1	TEST REQ2	RR	STROKE TIME (SEC)	TEST ALTERNATIVES/ REMARKS	R E V
** MAIN STEAM TO AUX. EQUIPMENT										
2SA-0005	B	2593-1.2	F-04	C	MT0,C-Q	-	-	-	-	10
2SA-0006	B	2593-1.2	F-03	C	MT0,C-Q	-	-	-	-	10
2SA-0048ABC	B	2593-1.2	E-04	B	ST-Q	-	-	50	-	-
2SA-0049AB	B	2593-1.2	F-02	B	ST-Q	-	-	50	-	-

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Duke Power Company  
McGuire Nuclear Station  
PUMP AND VALVE INSERVICE  
TESTING PROGRAM

VALVE	CL	FLOW DIAGRAM	FLOW COOR	CAT	TEST REQ1	TEST REQ2	RR	STROKE TIME (SEC)	TEST ALTERNATIVES/ REMARKS	R E V
** DIESEL GENERATOR STARTING AIR										
2VG-0061	C	2609-4.0	K-02	B	ST-Q	-	-	-	-	10
2VG-0062	C	2609-4.0	K-02	B	ST-Q	-	-	-	-	10
2VG-0063	C	2609-4.0	I-02	B	ST-Q	-	-	-	-	10
2VG-0064	C	2609-4.0	H-02	B	ST-Q	-	-	-	-	10
2VG-0065	C	2609-4.0	F-02	B	ST-Q	-	-	-	-	10
2VG-0066	C	2609-4.0	E-02	B	ST-Q	-	-	-	-	10
2VG-0067	C	2609-4.0	C-02	B	ST-Q	-	-	-	-	10
2VG-0068	C	2609-4.0	C-02	B	ST-Q	-	-	-	-	10
2VG-0115	C	2609-4.0	K-09	C	MTO-Q	-	-	-	-	-
2VG-0116	C	2609-4.0	H-09	C	MTO-Q	-	-	-	-	-
2VG-0117	C	2609-4.0	F-09	C	MTO-Q	-	-	-	-	-
2VG-0118	C	2609-4.0	C-09	C	MTO-Q	-	-	-	-	-

Duke Power Company  
McGuire Nuclear Station  
PUMP AND VALVE INSERVICE  
TESTING PROGRAM

VALVE	CL	FLOW DIAGRAM	FLOW COOR	CAT	TEST REQ1	TEST REQ2	RR	STROKE TIME (SEC)	TEST ALTERNATIVES/ REMARKS	R E V
** CONTAINMENT PURGE VENTILATION										
2VP-0001B	B	2576-1	I-06	A	LT-TS	-	-	-	-	10
2VP-0002A	B	2576-1	I-07	A	LT-TS	-	-	-	-	10
2VP-0003B	B	2576-1	K-06	A	LT-TS	-	-	-	-	10
2VP-0004A	B	2576-1	K-07	A	LT-TS	-	-	-	-	10
2VP-0006B	B	2576-1	E-06	A	LT-TS	-	-	-	-	10
2VP-0007A	B	2576-1	E-07	A	LT-TS	-	-	-	-	10
2VP-0008B	B	2576-1	D-06	A	LT-TS	-	-	-	-	10
2VP-0009A	B	2576-1	D-07	A	LT-TS	-	-	-	-	10
2VP-0010A	B	2576-1	J-08	A	LT-TS	-	-	-	-	10
2VP-0011B	B	2576-1	J-09	A	LT-TS	-	-	-	-	10
2VP-0012A	B	2576-1	I-08	A	LT-TS	-	-	-	-	10
2VP-0013B	B	2576-1	I-09	A	LT-TS	-	-	-	-	10
2VP-0015A	B	2576-1	F-08	A	LT-TS	-	-	-	-	10
2VP-0016B	B	2576-1	F-09	A	LT-TS	-	-	-	-	10
2VP-0017A	B	2576-1	B-07	A	LT-TS	-	-	-	-	10
2VP-0018B	B	2576-1	B-06	A	LT-TS	-	-	-	-	10
2VP-0019A	B	2576-1	B-08	A	LT-TS	-	-	-	-	10
2VP-0020B	B	2576-1	B-09	A	LT-TS	-	-	-	-	10

RELIEF/JUSTIFICATION: RR-CA2

VALVE: 2CA-8, 2CA-10, 2CA-12

FLOW DIAGRAM: MC-2592-1.1

CATEGORY: C

CLASS: C

FUNCTION: Auxiliary Feedwater Pump Suction check valves to prevent diversion of assured auxiliary feedwater source.

TEST REQUIREMENT: Full stroke exercise quarterly

BASIS: These valves cannot be tested to close without contaminating the Auxiliary Feedwater System with raw service water. These valves will not be tested during cold shutdown because disassembly is required.

ALTERNATE TESTING: Valves will be sample disassembled each refueling outage to verify valve closure capability.

McGUIRE - UNIT 2

RELIEF/JUSTIFICATION: RR-FW1 (Deleted per Rev. 10, see CS-FW2)

VALVE: 2FW-28

Revision 10

RELIEF/JUSTIFICATION: RR-ND1 (Deleted per Rev. 10; see CS-ND4)

VALVE: 2ND-70

RELIEF/JUSTIFICATION: RR-ND2 (Deleted per Rev. 10; see CS-ND5)

VALVE: 2ND-71

RELIEF/JUSTIFICATION: RR-ND3 (Deleted per Rev. 10; see CS-ND6)

VALVE: 2ND-8, 2ND-23

RELIEF/JUSTIFICATION: RR-NI1 (Deleted per Rev. 10; see CS-NI13)

VALVE: 2NI-15, 2NI-354, 2NI-17, 2NI-347, 2NI-19, 2NI-348,  
2NI-21, 2NI-349

RELIEF/JUSTIFICATION: RR-NI2 (Deleted per Rev. 10; see CS-NI14)

VALVE: 2NI-12

RELIEF/JUSTIFICATION:	RR-NI4	
VALVE:	2NI-81, 2NI-70, 2NI-59, 2NI-93	
FLOW DIAGRAM:	MC-2562-2.0, MC-2562-2.1	
CATEGORY:	A,C	
CLASS:	A	
FUNCTION:	Opens on flow from the NI cold leg accumulator to the Reactor Coolant System. Reactor Coolant Boundary valve.	10
TEST REQUIREMENT:	Full stroke exercise quarterly and leak test per Technical Specifications.	10
BASIS:	Valves cannot be full or partial stroked during power operation since the accumulator pressure is ~600 psig and cannot overcome RCS pressure. There is insufficient instrumentation to test valves individually. Valves will not be tested during cold shutdown since disassembly is required.	10
	Disassembly would render one train of RHR inoperable for an extended time period.	10
ALTERNATE TESTING:	Valves will be partial stroked during cold shutdown, but not more often than once per nine months. Valves will be full stroked at refueling by sample disassembly. Valves will be leak tested in accordance with Technical Specification 4.4.6.2.2.	10

RELIEF/JUSTIFICATION:	RR-NI6	
VALVE:	2NI-82, 2NI-71, 2NI-60, 2NI-94	
FLOW DIAGRAM:	MC-2562-2.0, MC-2562-2.1	
CATEGORY:	A, C	
CLASS:	A	
FUNCTION:	Open on flow from the cold leg accumulator or the ND system to the Reactor Coolant system. Reactor Coolant Boundary valve.	10
TEST REQUIREMENT:	Full stroke exercise quarterly and leak test per Technical Specifications.	10
BASIS:	Valves cannot be full or partial stroked during power operation since a driving head to force the valves open does not exist. Instrumentation is not present to measure the flow through individual valves. Valves will not be tested during cold shutdown since disassembly is required.	10
	Disassembly would render one train of RHR inoperable for an extended time period.	10
ALTERNATE TESTING:	Valves will be partial stroked during cold shutdowns on a 9-month frequency and leak tested per Tech Spec 4.4.6.2.2. The valves will be full stroke exercised at refueling by sample disassembly.	10

RELIEF/JUSTIFICATION: RR-NI7 (Deleted per Rev. 10; see CS-NI15)

VALVE: 2NI-101

RELIEF/JUSTIFICATION: RR-NI8 (Deleted per Rev. 10; see CS-NI16)

VALVE: 2NI-116, 2NI-148

RELIEF/JUSTIFICATION: RR-NI9 (Deleted per Rev. 10; see CS-NI17)

VALVE: 2NI-128, 2NI-159, 2NI-160, 2NI-156, 2NI-124, 2NI-157

RELIEF/JUSTIFICATION: RR-NI10 (Deleted per Rev. 10; see CS-NI18)

VALVE: 2NI-165, 2NI-167, 2NI-169, 2NI-171

RELIEF/JUSTIFICATION: RR-NI11 (Deleted per Rev. 10; see CS-NI19)

VALVE: 2NI-180, 2NI-181, 2NI-175, 2NI-176

RELIEF/JUSTIFICATION: RR-NI12 (Deleted per Rev. 10; see CS-NI20)

VALVE: 2NI-129, 2NI-125, 2NI-134, 2NI-126

RELIEF/JUSTIFICATION:	RR-NS1	
VALVE:	2NS-30, 2NS-33, 2NS-16, 2NS-13, 2NS-46, 2NS-41	
FLOW DIAGRAM:	MC-2563-1.0	
CATEGORY:	C	
CLASS:	B	
FUNCTION:	Open on flow from the Containment Spray Pumps	
TEST REQUIREMENT:	Verify proper valve movement once per three months, IWV-3522.	
BASIS:	Full stroke exercising of these check valves is not practical since there is no external indication of disk movement. Full stroke exercising would require for the pumps and spray nozzles to be activated which would require a large scale clean up effort. Valves will not be tested during cold shutdown since disassembly is required.	10
ALTERNATE TESTING:	These valves will be verified to fully cycle each refueling by sample disassembly. All valves will be partial stroked during cold shutdown, but not more often than once per nine months, and following disassembly.	10

RELIEF/JUSTIFICATION: RR-NV2 (Deleted per Rev. 10; see CS-NV14)

VALVE: 2NV-225, 2NV-231

McGUIRE - UNIT 2

RELIEF/JUSTIFICATION: RR-NV3 (Deleted per Rev. 10; see CS-NV15)

VALVE: 2NV-223

Revision 10

RELIEF/JUSTIFICATION: RR-SA1 (Deleted per Rev. 10)

VALVE: 2SA-5, 2SA-6

RELIEF/JUSTIFICATION: RR-VB1

VALVE: 2VB-50

FLOW DIAGRAM: MC-2605-3.1

CATEGORY: A,C

CLASS: B

FUNCTION: Provide containment isolation

TEST REQUIREMENT: Verify proper valve movement once per three months.

BASIS: 2VB-50 is inside containment. Closure can only be verified by a local leak rate test. To perform a leak test every three months would result in unnecessary radiation exposure.

ALTERNATE TESTING: Valve will be verified to close by leak test performed in accordance with Appendix J.

RELIEF/JUSTIFICATION: RR-VG1 (Deleted per Rev. 10)

VALVE: 2VG-61, 2VG-62, 2VG-63, 2VG-64, 2VG-65, 2VG-66,  
2VG-67, 2VG-69

RELIEF/JUSTIFICATION: RR-VP1 (Deleted per Rev. 10)

VALVE: 2VP-1B, 2VP-2A, 2VP-3B, 2VP-4A, 2VP-6B, 2VP-7A,  
2VP-8B, 2VP-9A, 2VP-10A, 2VP-11B, 2VP-12A, 2VP-13B,  
2VP-15A, 2VP-16B, 2VP-17A, 2VP-18B, 2VP-19A, 2VP-20B

RELIEF/JUSTIFICATION:	CS-FW2
VALVE:	2FW-28
FLOW DIAGRAM:	MC-2571-1.0
CATEGORY:	C
CLASS:	B
FUNCTION:	Prevents reverse flow to the FWST and prevents pressurizing the FWST.
TEST REQUIREMENT:	Full stroke exercise quarterly.
BASIS:	2FW-28 cannot be full stroked during power operation since the only full flow path is into the RCS by the Residual Heat Removal Pumps (ND). The ND Pumps cannot overcome RCS pressure.
ALTERNATE TESTING:	Valve will be full stroke exercised at cold shutdown, but not more often than once per nine months, and partial stroked quarterly.

RELIEF/JUSTIFICATION: CS-ND4

VALVE: 2ND-70

FLOW DIAGRAM: MC-2561-1.0

CATEGORY: C

CLASS: B

FUNCTION: RHR to SI Suction Check

TEST REQUIREMENT: Full stroke exercise quarterly.

BASIS: 2ND-70 cannot be full stroked during power operation since the only full flow path is into the RCS and this can only be performed during cold shutdown. The miniflow for ND Pump 2A does not pass through 2ND-70 so it cannot be partial stroked during power operation.

2ND-70 cannot be seat leak tested during power operation since the required valve lineup cannot be made without putting 2000 ppm boron water from the RWST into the Chemical and Volume Control Pump Suction. Additionally, with the RCS at normal operating pressure, the seat leakage cannot be identified.

ALTERNATE TESTING: 2ND-70 will be full stroke exercised and seat leak tested at cold shutdown, but not more often than once per nine months.

RELIEF/JUSTIFICATION: CS-ND5

VALVE: 2ND-71

FLOW DIAGRAM: MC-2561-1.0

CATEGORY: C

CLASS: B

FUNCTION: RHR to SI Suction Check

TEST REQUIREMENT: Full stroke exercise quarterly.

BASIS: Valve cannot be full stroked at power since the only full flow path is into the RCS and this can only be done at refueling. 2ND-71 cannot be partial stroked during power since the required valve lineup would render both trains of safety injection inoperable.

2ND-71 cannot be leak tested with the RCS at normal operating pressure because the seat leakage cannot be identified.

ALTERNATE TESTING: Valve will be full stroked at cold shutdown, but not more often than once per nine months.

RELIEF/JUSTIFICATION: CS-ND6

VALVE: 2ND-8, 2ND-23

FLOW DIAGRAM: MC-2561-1.0

CATEGORY: C

CLASS: B

FUNCTION: Prevents reverse flow through the ND Pumps

TEST REQUIREMENT: Full stroke exercise quarterly.

BASIS: 2ND-8 and 2ND-23 cannot be fully stroked during power operation since the only full flow path is into the RCS and the ND Pumps cannot overcome RCS pressure. The ND Pump recirc line is not large enough to accommodate full design flow.

ALTERNATE TESTING: Valves will be full stroke exercised at cold shutdown, but not more often than once per nine month. Valves will be partial stroked quarterly.

The opposite train check valves will be tested closed during quarterly pump testing except when the opposite train of ND is in service.

RELIEF/JUSTIFICATION: CS-NI13

VALVE: 2NI-15, 2NI-354, 2NI-17, 2NI-347, 2NI-19, 2NI-348,  
2NI-21, 2NI-349

FLOW DIAGRAM: MC-2562-1.0

CATEGORY: C

CLASS: A

FUNCTION: Provides safety injection flow path.

TEST REQUIREMENT: Full stroke exercise quarterly.

BASIS: Full or partial stroke during power operation would  
result in thermal shock to injection nozzles.

ALTERNATE TESTING: Valve will be full stroked at cold shutdown, but not  
more often than once per nine months.

RELIEF/JUSTIFICATION: CS-NI14

VALVE: 2NI-12

FLOW DIAGRAM: MC-2562-1.0

CATEGORY: C

CLASS: B

FUNCTION: Provides safety injection flow path

TEST REQUIREMENT: Full stroke exercise quarterly.

BASIS: Full or partial stroke during power operation would result in thermal shock to injection nozzles.

ALTERNATE TESTING: Valve will be full stroked at cold shutdown, but not more often than once per nine months.

RELIEF/JUSTIFICATION:	CS-NI15
VALVE:	2NI-101
FLOW DIAGRAM:	MC-2562-3.0
CATEGORY:	C
CLASS:	B
FUNCTION:	Opens on flow from FWST to SI. Checks flow if RHR is supplying SI suction pressure.
TEST REQUIREMENT:	Full stroke exercise quarterly.
BASIS:	Valve cannot be full stroked during power operation since the SI pumps cannot overcome RCS pressure.
ALTERNATE TESTING:	Valve will be partial stroked quarterly and full stroked and leak tested at cold shutdown, but not more often than once per nine months.

RELIEF/JUSTIFICATION: CS-NI16

VALVE: 2NI-116, 2NI-148

FLOW DIAGRAM: MC-2562-3.0

CATEGORY: C

CLASS: B

FUNCTION: Opens to flow from the NI Pump(s). Check flow from opposite train.

TEST REQUIREMENT: Verify proper valve movement once per three months.

BASIS: Valves cannot be full or partial stroked during power operation since the safety injection pumps cannot overcome RCS pressure.

ALTERNATE TESTING: Valves will be cycled full open during cold shutdown, but not more often than once per nine months. Valves will be checked closed quarterly.

RELIEF/JUSTIFICATION: CS-NI17

VALVE: 2NI-128, 2NI-159, 2NI-160, 2NI-156, 2NI-124, 2NI-157

FLOW DIAGRAM: MC-2562-3.0

CATEGORY: A,C

CLASS: B

FUNCTION: Open on flow from the SI pumps to the RCS hot legs.  
Reactor Coolant Boundary valve.

TEST REQUIREMENT: Verify proper valve movement once per three months and  
leak test per Technical Specifications.

BASIS: Valves cannot be full or partial stroked during power  
operation since the safety injection pumps cannot  
discharge into the RCS at operating pressure.

ALTERNATE TESTING: Valves will be verified to fully cycle during cold  
shutdown by acoustic emission monitoring, but not more  
often than once per nine months. Valves will be leak  
tested in accordance with Tech Spec 4.4.6.2.2.

RELIEF/JUSTIFICATION: CS-NI18

VALVE: 2NI-165, 2NI-167, 2NI-169, 2NI-171

FLOW DIAGRAM: MC-2562-3.1

CATEGORY: A,C

CLASS: A

FUNCTION: SI discharge check valves to RCS cold legs. Reactor Coolant Boundary valves.

TEST REQUIREMENT: Full stroke exercise quarterly and leak test per Technical Specifications.

BASIS: Valves cannot be cycled during power operation since the SI pumps cannot overcome RCS pressure to permit flow through the valves.

ALTERNATE TESTING: Valves will be fully cycled during cold shutdown, but not more often than once per nine months. Valves will be leak tested in accordance with Tech Spec 4.4.6.2.2.

RELIEF/JUSTIFICATION: CS-WI19

VALVE: 2NI-180, 2NI-181, 2NI-175, 2NI-176

FLOW DIAGRAM: MC-2562-3.1

CATEGORY: A,C

CLASS: A

FUNCTION: Opens on flow from the ND to the RCS. Reactor Coolant Boundary valve.

TEST REQUIREMENT: Verify proper valve movement once per three months and leak test per Technical Specifications.

BASIS: The discharge pressure of the ND Pumps is not sufficient for opening the valve to the Reactor Coolant System during power operation.

ALTERNATE TESTING: Valve will be verified to fully cycle during cold shutdown by acoustic emission monitoring, but not more often than once per nine months. Valves will be leak tested in accordance with Technical Specifications.

RELIEF/JUSTIFICATION: CS-NI20

VALVE: 2NI-129, 2NI-125, 2NI-134, 2NI-126

FLOW DIAGRAM: MC-2562-3.0

CATEGORY: A,C

CLASS: A

FUNCTION: Opens on flow from the ND system to the NC Hot Legs.  
Reactor Coolant Boundary valve.

TEST REQUIREMENT: Verify proper valve movement once per three months and  
leak test per Technical Specifications.

BASIS: ND pumps do not develop enough discharge pressure to  
overcome RCS pressure at power operation.

ALTERNATE TESTING: Valve will be verified to fully cycle during cold  
shutdown by acoustic emission monitoring, but not more  
often than once per nine months. Valves will be leak  
tested in accordance with Technical Specifications.

RELIEF/JUSTIFICATION:	CS-NV14
VALVE:	2NV-225, 2NV-231
FLOW DIAGRAM:	MC-2554-3.1
CATEGORY:	C
CLASS:	B
FUNCTION:	Opens on flow from the Centrifugal Charging Pump(s).
TEST REQUIREMENT:	Verify proper valve movement every three months.
BASIS:	Valve cannot be full stroke exercised during power operation because this would result in an increase in the RCS boron inventory and could result in a plant shutdown. To fully stroke 2NV-225 and 2NV-231 the full centrifugal charging pump flow would have to go through the valves. The reactor coolant system letdown capacity would not be enough to maintain volume control tank level. The additional flow would have to come from the refueling water storage tank which has a boron concentration of 2000 ppm.
ALTERNATE TESTING:	Valve will be full stroked during cold shutdown, but not more often than once per nine months, and partial stroked with normal use.

RELIEF/JUSTIFICATION: CS-NV15

VALVE: 2NV-223

FLOW DIAGRAM: MC-2554-3.1

CATEGORY: C

CLASS: B

FUNCTION: Opens on flow alignment from FWST. Closes to ensure sufficient centrifugal charging pump suction pressure when RHR is used as a suction source.

TEST REQUIREMENT: Verify proper valve movement every three months.

BASIS: Testing of these valve requires opening 2NV-221A or 2NV-222B. Failure of one of these valves in the open position aligns the FWST to the suction of the charging pumps with no means of isolating the flow path. This would result in an increase in boron inventory in the RCS and could result in a plant shutdown.

ALTERNATE TESTING: Valve will be full stroked and leak tested during cold shutdown, but not more often than one per nine months.