INSERVICE INSPECTION PROGRAM FOR VALVES AT TMI #1

I. Scope and Objectives

This attachment describes the inservice inspection program for Class 1, 2, and 3 valves in TMI-1. The objective of this program is to provide assurance of the operational readiness of the valves during their service life.

II. Identification of Class Boundaries

The Class 1, 2, and 3 boundaries are established in accordance with the NRC Standard Review Plan Section 3.2.2 (November 24, 1975), ANSI N 18.2A (1975) and Regulating Guide 1.26, Revision 3. The system boundaries are shown on ISI drawings C-300-001-GN1 through C-300-005-GN1 and C-300-008-GN1 through C-300-023-GN1.

III. Applicable Code Editions and Addenda

In accordance with 10 CFR 50, paragraph 50.55a(f), the applicable Code Section and Addenda are the 1974 Edition with Addenda through Summer 1975.

IV. Period of Applicability

In accordance with 10 CFR 50, paragraph 50.55a(g)(4)(iii), this program is applicable from January 2, 1978 to September 1, 1979.

V. Inspection Program

The inservice inspection program which is detailed in the attached Table E-1 will be carried out in accordance with ASME Section XI, 1974 Edition, with Addenda through Summer 1975. Specific exceptions to the ASME Code Section XI requirements for selected components are identified in Table E - 2 along with the basis for each exception requested. The valves have been categorized as defined in ASME Code Section XI, paragraph IWV-2110.

TABLE E-1

TMI UNIT #1

VALVES REQUIRING PERIODIC

IN-SERVICE INSPECTION

NOTES TO TABLE E-1

NOTES APPEAR IN PARENTHESIS IN TYPE OF TEST AND TEST FREQUENCY COLUMNS OF TABLE E-1.

(1) See Request for Relief, Paragraph A.

(2) These valves are tested for operational readiness only during cold shutdowns as their failure could result in loss of containment integrity. See NRC letter to Met-Ed dated November 17, 1976, Enclosure 2, paragraph 2.

(3) These valves are containment isolation valves and will be seat leak tested. However, these valves do not function during an accident, and thus do not require functional testing or exercising.

(4) See Request for Relief, Paragraph E.

(5) See Request for Relief, Paragraph F.

(6) See Request for Relief, Paragraph D.

SYMBOLS:

SYMBOLS APPEAR IN THE FOLLOWING COLUMNS OF TABLE E-1:

CLASS - The ISI system classification of the portion of the system in which the valve is located.

CATEGORY - As defined in ASME Code, Section XI, Paragraph IWV-2110.

TYPE OF TEST

T - Full stroke valve exercise and time measurement for power operated valves.

F - Functional check of valve operation.

P - Partial valve stroke exercise.

L - Valve seat leak test.

N - None, see Note in parenthesis.

SP - Set point test.

TEST FREQUENCY

Q - Quarterly test frequency

C - Cold shutdown test frequency (when shutdown exceeds 48 hours and more than 92 days have elapsed since previous test).

R - Refueling outage test frequency.

F - Tests of valves are distributed over a 5 year period per ASME Section XI, Paragraph IWV-3510(a).

TMI A.P. 1

VALVES REQUIRING PERIODIC IN-SERVICE INSPECTION

SYSTEM	VALVE NO.	TYPE	SIZE	OPERATOR	CLASS	CATE-GORY	TYPE OF TEST	TEST FREQUENCY
REACTOR BUILDING SPRAY SYSTEM C-300-012-GN1	BS-V1A/B	"Y"GLOBE	8"	MOTOR	2	B	T	Q
	BS-V2A/B	GATE	4"	MOTOR	2	B	T	Q
	BS-V3A/B	GATE	10"	MOTOR	2	B	T	Q
	BS-V4A/B	GATE	4"	MOTOR	2	B	T	Q
	BS-V21A/B	CHECK	4"	----	2	C	N(1)	-
	BS-V23	CHECK	10"	----	2	C	F	Q
	BS-V30A/B	CHECK	8"	----	2	C	N(1)	-
	BS-V52A/B	CHECK	4"	----	2	C	N(1)	-

TMI NO. 1

VALVES REQUIRING PERIODIC IN-SERVICE INSPECTION

SYSTEM	VALVE NO.	TYPE	SIZE	OPERATOR	CLASS	CATE-GORY	TYPE OF TEST	TEST FREQUENCY
DECAY HEAT REMOVAL SYSTEM C-300-005-GN1	DH-V1	GATE	12"	MOTOR	1	B	T	C
	DH-V2	GATE	12"	MOTOR	1	B	T	C
	DH-V3	GATE	12"	MOTOR	2	B	T	Q
	DH-V4A/B	GATE	10"	MOTOR	2	B	T	Q
	DH-V5A/B	GATE	14"	MOTOR	2	B	T	Q
	DH-V6A/B	GATE	14"	MOTOR	2	B	T	R
	DH-V7A/B	GATE	4"	MOTOR	2	B	T	Q
	DH-V14A/B	CHECK	14"	----	2	C	F	Q
	DH-V16A/B	CHECK	10"	----	2	C	F	Q
	DH-V22A/B	CHECK	10"	----	1	C	F	C

TMI NO. 1

VALVES REQUIRING PERIODIC IN-SERVICE INSPECTION

SYSTEM	VALVE NO.	TYPE	SIZE	OPERATOR	CLASS	CATE-GORY	TYPE OF TEST	TEST FREQUENCY
DECAY HEAT RIVER WATER SYSTEM C-300-002-GN1	DR-V1A/B	B'FLY	20"	MOTOR	3	B	T	Q
	DR-V21A/B	CHECK	1"	----	3	C	F	Q
	DR-V22A/B	CHECK	1"	----	3	C	F	Q

TMI NO. 1

VALVES REQUIRING PERIODIC IN-SERVICE INSPECTION

SYSTEM	VALVE NO.	TYPE	SIZE	OPERATOR	CLASS	CATE-GORY	TYPE OF TEST	TEST FREQUENCY
CORE FLOODING SYSTEM	CF-V2A/B	GLOBE	1"	MOTOR	2	A	L/T	R/Q
	CF-V4A/B	CHECK	14"	----	1	C	F	C
C-300-004-GN1	CF-V5A/B	CHECK	14"	----	1	C	F	C
	CF-V12A/B	CHECK	1"	----	2	AC	L/F	R/Q
	CF-V19A/B	GATE	1"	DIAPHRAGM	2	A	L/F(6)	R/Q
	CF-V20A/B	GATE	1"	DIAPHRAGM	2	A	L/F(6)	R/Q

TMI NO. 1

VALVES REQUIRING PERIODIC IN-SERVICE INSPECTION

SYSTEM	VALVE NO.	TYPE	SIZE	OPERATOR	CLASS	CATE-GORY	TYPE OF TEST	TEST FREQUENCY
REACTOR BUILDING EMERGENCY COOLING SYSTEM C-300-002-GN1 C-300-010-GN1	RR-V1A/B	B'FLY	16"	MOTOR	3	B	T	Q
	RR-V3A/B/C	GATE	12"	MOTOR	2	B	T	Q
	RR-V4A-D	GATE	12"	MOTOR	2	B	T	Q
	RR-V7A/B	CHECK	16"	----	3	C	F	Q
	RR-V8A/B	CHECK	20"	----	3	C	F	Q
	RR-V10A/B	CONTROL	2"	DIAPARAGM	3	B	F(4)	Q
	RR-V20A/B	CHECK	1"	----	3	C	F	Q
	RR-V21A/B	CHECK	1"	----	3	C	F	Q

TMI NO. 1

VALVES REQUIRING PERIODIC IN-SERVICE INSPECTION

SYSTEM	VALVE NO.	TYPE	SIZE	OPERATOR	CLASS	CATE-GORY	TYPE OF TEST	TEST FREQUENCY
NUCLEAR SERVICE RIVER WATER SYSTEM C-300-007-GH1	NR-V1A-C	B'FLY	16"	MOTOR	3	B	T	Q
	NR-V4A/B	B'FLY	30"	MOTOR	3	B	T	Q
	NR-V20A-C	CHECK	16"	----	3	C	F	Q
	NR-V44A-C	CHECK	2"	----	3	C	F	Q
	NR-V48A-C	CHECK	1"	----	3	C	F	Q

TMI NO. 1

VALVES REQUIRING PERIODIC IN-SERVICE INSPECTION

SYSTEM	VALVE NO.	TYPE	SIZE	OPERATOR	CLASS	CATE-GORY	TYPE OF TEST	TEST FREQUENCY
SCREEN WASH AND SLUICE SYSTEM C-300-014-GN1	SW-V3A/B	CHECK	10"	----	3	C	F	Q
	SW-V11A/B	BALL	2"	PNEU.	3	B	F(6)	Q
	SW-V14A/B	CHECK	1"	----	3	C	F	Q
	SW-V13A/B	CHECK	1"	----	3	C	F	Q
	SW-V20A/B	CHECK	1"	----	3	C	F	Q
	SW-V19A/B	CHECK	1"	----	3	C	F	Q

TMI NO. 1

VALVES REQUIRING PERIODIC IN-SERVICE INSPECTION

SYSTEM	VALVE NO.	TYPE	SIZE	OPERATOR	CLASS	CATE-GORY	TYPE OF TEST	TEST FREQUENCY
ENT FUEL COOLING SYSTEM C-300-018-GN1	SF-V23	GATE	8"	MANUAL	2	A	L(3)	R

TMI NO. 1

VALVES REQUIRING PERIODIC IN-SERVICE INSPECTION

SYSTEM	VALVE NO.	TYPE	SIZE	OPERATOR	CLASS	CATE-GORY	TYPE OF TEST	TEST FREQUENCY
MAKE-UP SYSTEM C-300-016-GN1	MU-V2A/B	GLOBE	2½"	MOTOR	1	A	L/T	R/Q
	MU-V3	GATE	2½"	PNEU.	2	A	L/T	R/C
	MU-V12	GATE	4"	MOTOR	2	B	T	C
	MU-V16A-D	GLOBE	2½"	MOTOR	1	B	T	R/Q
C-300-017-GN1	MU-V18	GATE	2½"	PNEU.	1	A	L/T	R/C
	MU-V20	GATE	4"	PNEU.	1	A	L/T	R/C
	MU-V25	GLOBE	4"	MOTOR	1	A	L/T	R/C
	MU-V26	GATE	4"	PNEU.	2	A	L/T	R/C
	MU-V36	GATE	2"	MOTOR	3	B	T	C
	MU-V37	GATE	1"	MOTOR	3	B	T	C
	MU-V51	DIAPH.	1"	PNEU.	3	B	F(6)	Q
	MU-V73A-C	CHECK	3"	----	2	C	F	Q
	MU-V86A/B	CHECK	2½"	----	1	C	F	C
	MU-V94	CHECK	2½"	----	1	C	F	C
	MU-V95	CHECK	2½"	----	1	C	F	C
	MU107A-D	CHECK	2½"	----	1	C	F	C
	MU-V116	CHECK	4"	----	1	AC	L/F	R/C

TMI NO. 1

VALVES REQUIRING PERIODIC IN-SERVICE INSPECTION

SYSTEM	VALVE NO.	TYPE	SIZE	OPERATOR	CLASS	CATE-GORY	TYPE OF TEST	TEST FREQUENCY
INTER-MEDIATE COOLING SYSTEM C-300-022-GN1	IC-V2	GATE	6"	MOTOR	3	A	L/T	R/C
	IC-V3	GATE	6"	PNEU.	2	A	L/T	R/C
	IC-V4	GATE	6"	PNEU.	2	A	L/T	R/C
	IC-V6	GATE	3"	PNEU.	2	A	L/T	R/C

TMI NO. 1

VALVES REQUIRING PERIODIC IN-SERVICE INSPECTION

SYSTEM	VALVE NO.	TYPE	SIZE	OPERATOR	CLASS	CATE-GORY	TYPE OF TEST	TEST FREQUENCY
.UID BLOCK	FB-V13	CHECK	1/2"	----	2	C	F	C(2)
	FB-V16	CHECK	3/4"	----	2	C	F	C(2)
	FB-V17	CHECK	3/4"	----	2	C	F	C(2)
	FB-V21	CHECK	3/4"	----	2	C	F	C(2)
	FB-V22	CHECK	3/4"	----	2	C	F	C(2)
	FB-V23	CHECK	3/4"	----	2	C	F	C(2)
	FB-V25	CHECK	1/2"	----	2	C	F	C(2)
	FB-V26	CHECK	3/4"	----	2	C	F	C(2)
	FB-V27	CHECK	1/2"	----	2	C	F	C(2)
	FB-V28	CHECK	1/2"	----	1	C	F	C(2)
	FB-V31	CHECK	3/4"	----	2	C	F	C(2)
	FB-V3-	CHECK	1/2"	----	2	C	F	C(2)
	FB-V4-	CHECK	1/2"	----	2	C	F	C(2)
	FB-V4-	CHECK	1/2"	----	1	C	F	C(2)
	FB-V42	CHECK	1/2"	----	2	C	F	C(2)

TMI NO. 1

VALVES REQUIRING PERIODIC IN-SERVICE INSPECTION

SYSTEM	VALVE NO.	TYPE	SIZE	OPERATOR	CLASS	CATE-GORY	TYPE OF TEST	TEST FREQUENCY
REACTOR COOLANT SYSTEM C-300-019-GN1	RC-V1	GLOBE	2½"	MOTOR	1	B	T	C
	RC-V4	"Y"GLOBE	2½"	MOTOR	1	B	T	C
	RC-V23	CHECK	2½"	----	1	C	F	C
	RC-RV1A/B	RELIEF	2½"	----	1	C	SP	F

TMI NO. 1

VALVES REQUIRING PERIODIC IN-SERVICE INSPECTION

SYSTEM	VALVE NO.	TYPE	SIZE	OPERATOR	CLASS	CATE-GORY	TYPE OF TEST	TEST FREQUENCY
CHEMICAL SAMPLING SYSTEM C-300-005-GN1 C-300-020-GN1	CA-V1	"Y"GLOBE	1"	MOTOR	1	A	L/T	R/Q
	CA-V2	"Y"GLOBE	1"	PNEU.	1	A	L/F(6)	R/Q
	CA-V3	"Y"GLOBE	1"	MOTOR	1	A	L/T	R/Q
	CA-V4A/B	"Y"GLOBE	1"	MOTOR	2	A	L/T	R/Q
	CA-V5A/B	"Y"GLOBE	1"	PNEU.	2	A	L/F(6)	R/Q
	CA-V13	GLOBE	1/2"	MOTOR	1	A	L/T	R/Q
	CA-V177	CHECK	1"	----	3	C	F	C
	CA-V189	S.W.GATE	2"	PNEU.	2	A	L/F(6)	R/Q

TMI NO. 1

VALVES REQUIRING PERIODIC IN-SERVICE INSPECTION

SYSTEM	VALVE NO.	TYPE	SIZE	OPERATOR	CLASS	CATE-GORY	TYPE OF TEST	TEST FREQUENCY
MAIN STEAM SYSTEM C-300-001-GN1	MS-V1A-D	STOP CHECK	24"	MOTOR	2	BC	P	Q
	MS-V4A/B	CONTROL	6"	PNEU.	3	B	F(4)	Q
	MS-V6	CONTROL	4"	DIAPHRAGM	3	B	F(4)	Q
	MS-V9A/B	CHECK	6"	----	3	C	F	Q
	MS-V10A/B	GATE	6"	MOTOR	3	B	T	Q
	MS-V13A/B	STOP CHECK	2"	DIAPHRAGM	3	B	F(6)	Q
	MS-V17A-D	RELIEF	6"x10"	----	2	C	SP	F
	MS-V18A-D	RELIEF	6"x10"	----	2	C	SP	F
	MS-V19A-D	RELIEF	6"x10"	----	2	C	SP	F
	MS-V20A-D	RELIEF	6"x10"	----	2	C	SP	F
	MS-V21A/B	RELIEF	3"x6"	----	2	C	SP	F

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TMI NO. 1

VALVES REQUIRING PERIODIC IN-SERVICE INSPECTION

SYSTEM	VALVE NO.	TYPE	SIZE	OPERATOR	CLASS	CATE-GORY	TYPE OF TEST	TEST FREQUENCY
CONDEN-SATE SYSTEM C-300 - 009- GN1	CO-V16A/B	CHECK	10"	----	3	C	F	Q

TMI NO. 1

VALVES REQUIRING PERIODIC IN-SERVICE INSPECTION

SYSTEM	VALVE NO.	TYPE	SIZE	OPERATOR	CLASS	CATE-GORY	TYPE OF TEST	TEST FREQUENCY
EMERG. FEED WATER SYSTEM C-300-009- GN1	EF-V3	CHECK	6"	----	3	C	N(1)	----
	EF-V4	GATE	6"	MOTOR	3	B	T	Q
	EF-V5	GATE	6"	MOTOR	3	B	T	Q
	EF-V11A/B	CHECK	4"	----	3	C	P	Q
C-300-010- GN1	EF-V12A/B	CHECK	6"	----	2	C	F	C
	EF-V13	CHECK	6"	----	3	C	P	Q
	EF-V30A/B	CONTROL	3"	PNEU.	3	B	F(4)	Q

1408 192

TMI NO. 1

VALVES REQUIRING PERIODIC IN-SERVICE INSPECTION

SYSTEM	VALVE NO.	TYPE	SIZE	OPERATOR	CLASS	CATE-GORY	TYPE OF TEST	TEST FREQUENCY
AED WATER SYSTEM C-300-009-GN1	FW-V12A/B	CHECK	20"	----	2	C	N(1)	----

TMI NO. 1

VALVES REQUIRING PERIODIC IN-SERVICE INSPECTION

SYSTEM	VALVE NO.	TYPE	SIZE	OPERATOR	CLASS	CATE-GORY	TYPE OF TEST	TEST FREQUENCY
NUCLEAR SERVICES CLOSED COOLING	NS-V4	GATE	8"	MOTOR	2	A	L/T	R/C
	NS-V10A-C	CHECK	12"	----	3	C	F	Q
	NS-V15	GATE	8"	MOTOR	2	A	L/T	R/C
C-300-010-GW1	NS-V35	GATE	8"	MOTOR	3	A	L/T	R/C

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TMI NO. 1

VALVES REQUIRING PERIODIC IN-SERVICE INSPECTION

SYSTEM	VALVE NO.	TYPE	SIZE	OPERATOR	CLASS	CATE-GORY	TYPE OF TEST	TEST FREQUENCY
ILL WATER SYSTEM C-300-011-GN1	CH-V22A-B	CHECK	4"	----	3	C	F	Q

TMI NO. 1

VALVES REQUIRING PERIODIC IN-SERVICE INSPECTION

SYSTEM	VALVE NO.	TYPE	SIZE	OPERATOR	CLASS	CATE-GORY	TYPE OF TEST	TEST FREQUENCY
AIR HANDLING SYSTEM C-300-011-GN1 C-300-023-GN1	AH-V1A&D	B'FLY	48"	PNEU.	2	A	L/T	R/Q
	AH-V11A/B	3WAY	5"	DIAPHRAGM	3	B	F(4)	Q

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TMI NO. 1

VALVES REQUIRING PERIODIC IN-SERVICE INSPECTION

SYSTEM	VALVE NO.	TYPE	SIZE	OPERATOR	CLASS	CATE-GORY	TYPE OF TEST	TEST FREQUENCY
PENETRATION PRESSURI-ZATION SYSTEM C-300-015-GN1	PP-V101	CHECK	1"	----	2	C	F	Q
	PP-V102	CHECK	1"	----	2	C	F	Q
	PP-V133	CHECK	2"	----	2	C	F	Q
	PP-V134	CHECK	2"	----	2	C	F	Q

TMI NO. 1

VALVES REQUIRING PERIODIC IN-SERVICE INSPECTION

SYSTEM	VALVE NO.	TYPE	SIZE	OPERATOR	CLASS	CATE-GORY	TYPE OF TEST	TEST FREQUENCY
WASTE DISPOSAL LIQUID SYSTEM C-300-021-GN1	WDL-V49	DIAPH.	1½"	DIAPH.	3	B	F(6)	Q
	WDL-V50	DIAPH.	1½"	DIAPH.	3	B	F(6)	Q
	WDL-V89	DIAPH.	2"	DIAPH.	3	B	F(6)	Q
	WDL-V90	DIAPH.	3"	DIAPH.	3	B	F(6)	Q
	WDL-V91	DIAPH.	2"	DIAPH.	3	B	F(6)	Q
	WDL-V92	DIAPH.	2"	DIAPH.	3	B	F(6)	Q
	WDL-V304	GATE	3"	PNEU.	2	A	L/F	R/Q
	WDL-V353	CHECK	1½"	----	3	C	F	Q
	WDL-V354	CHECK	1½"	----	3	C	F	Q
	WDL-V361	CHECK	1"	----	3	C	F	C
	WDL-V362	CHECK	2½"	----	3	C	N(5)	----
	WDL-V535	GATE	6"	PNEU.	2	A	T	Q

1408 198

TMI NO. 1

VALVES REQUIRING PERIODIC IN-SERVICE INSPECTION

SYSTEM	VALVE NO.	TYPE	SIZE	OPERATOR	CLASS	CATE-GORY	TYPE OF TEST	TEST FREQUENCY
NTAIN-MENT MONITORING C-300-023-GN1	CM-V1	BALL	1"	PNEU.	2	A	L/F(6)	R/Q
	CM-V4	BALL	1"	PNEU.	2	A	L/F(6)	R/Q

1408 199

TMI NO. 1

VALVES REQUIRING PERIODIC IN-SERVICE INSPECTION

SYSTEM	VALVE NO.	TYPE	SIZE	OPERATOR	CLASS	CATE-GORY	TYPE OF TEST	TEST FREQUENCY
ASTE DISPOSAL GAS C-300-023-GN1	WDG-V4	GATE	2"	DIAPH.	2	A	L/T	R/Q

TMI NO. 1

VALVES REQUIRING PERIODIC IN-SERVICE INSPECTION

SYSTEM	VALVE NO.	TYPE	SIZE	OPERATOR	CLASS	CATE-CORY	TYPE OF TEST	TEST FREQUENCY
REACTOR BUILDING NORMAL COOLING SYSTEM	RB-V2	CHECK	8"	----	2	AC	L/F	R/Q
	RB-V7	GATE	8"	PNEU.	2	A	L/T	R/R

TABLE E-2

TMI UNIT 1

EXCEPTIONS TO VALVE
INSERVICE INSPECTION PROGRAM

REQUESTS FOR RELIEF FROM ASME CODE SECTION XI (VALVES)
REQUIREMENTS DETERMINED TO BE IMPRACTICAL

A. Valves Which Will Not Be Tested

1. Valve Identification

Valve Name and Function	Valve Number	Class	Category
Feed Water to O.T.S.G. Check Valve	FW-V12 A/B	2	C
Sodium Thiosulfate Tank Suction Check Valve	BS-V21 A/B	2	C
Sodium Hydroxide Tank Suction Check Valve	BS-V52 A/B	2	C
Spray Header Isolation Check Valve	BS-V30 A/B	2	C
Emergency River Water to Emergency Feed Pump Check Valve	EF-V3	3	C

2. ASME Code Section XI Requirement From Which Relief is Requested

Relief is requested from paragraph IWV-3520(b) which states that check valves that cannot be operated during normal plant operation shall be part-stroked during plant operations and shall be full-stroke exercised during each cold shutdown.

3. Basis for Requesting Relief

a. Check Valves FW-V12 A and B are normally open during plant operations to provide feedwater flow to the steam generators. However, there is no practical way to test the valves closed when feedwater flow stops or the plant is in cold shutdown.

b. There is no practical way to test normally closed check valves BS-V21 A/B, BS-V30 A/B, BS-V52 A/B and EF-V3 during reactor operation or shutdown.

4. Alternative to ASME Code Section XI Requirements

As discussed above, there are no safe, practical ways to test the installed check valves closed and no alternate plans to test the valves are considered feasible.

B. Corrective Action for Inoperative Valves

1. Valve Identification

All the Class 1, 2, and 3 valves identified in Table E-1, TMI No. 1 Valves Requiring Periodic Inservice Inspection

2. ASME Code Section XI Requirement From Which Relief is Requested

Corrective action for inoperable valves require condition be corrected before unit startup from a cold shutdown condition in accordance with paragraphs IWV-3410(g) and IWV-3520(c).

3. Basis for Requesting Relief

Constraints and limits on plant startup with an inoperable valve depend on many specific plant design features and conditions. The limiting conditions for startup and operation have been analyzed and are described in the TMI No. 1 Technical Specifications.

4. Alternative to ASME Code Section XI Requirements

Inoperable valves will be evaluated considering the TMI No. 1 Technical Specifications to determine when an inoperable valve will limit plant startup from a cold shutdown condition.

C. Valves Which Will Not Be Part-Stroked

1. Valve Identification

Valve Name and Function	Valve Number	Class	Category
Decay Heat Suction From Loop "B"	DH-V1	1	B
Decay Heat Suction From Loop "B"	DH-V2	1	B
Reactor Building Sump Suction Valve	DH-V6 A/B	2	B
Decay Heat Discharge into Core Flooding Lines	DH-V22 A/B	1	C
Core Flooding Tanks Check Valves - Discharge	CF-V4 A/B	1	C
Core Flooding Tanks Check Valves - Discharge	CF-V5 A/B	1	C
Let Down Isolation Valve at Containment Vessel	MU-V3	2	A
Make Up Tank Suction Isolation Valve	MU-V12	2	B

Valve Name and Function	Valve Number	Class	Category
Charging Isolation Valve at Containment Vessel	MU-V18	1	A
Reactor Coolant Pump Seal Water Isolation Valve at Containment Vessel	MU-V20	1	A
Reactor Coolant Pump Seal Let Down Isolation Valve	MU-V25	1	A
Reactor Coolant Pump Seal Let Down Isolation Valve at Containment Vessel	MU-V26	2	A
Make Up Pump Recirc. Isolation Valve	MU-V36	3	B
Make Up Pump Recirc. Isolation	MU-V37	3	B
High Pressure Injection Check Valves at Loop	MU-V86 A/B	1	C
High Pressure Injection Isolation at Loop "A"	MU-V94	1	C
High Pressure Injection Isolation at Loop "A"	MU-V95	1	C
High Pressure Injection Containment Isolation Check Valves	MU-V107 A/B/C/D	1	C
Isolation Valve to R.C.P. Seals	MU-V116	1	AC
Intermediate Cooling Return Inside Containment Penetration Isolation	IC-V2	3	A
Intermediate Cooling Return Outside Containment Penetration Isolation	IC-V3	2	A
Intermediate Cooling Supply Outside Containment Penetration Isolation	IC-V4	2	A
CRD Cooling Penetration Isolation	IC-V6	2	A
Pressurizer Spray Line Isolation Valve	RC-V1	1	B
Decay Heat Injection Line Isolation Valve	RC-V4	1	B

Valve Name and Function	Valve Number	Class	Category
Decay Heat Injection Line Non Return Valve	RC-V23	1	C
Boric Acid to Make Up Pump Filters and R. C. Bleed Tanks	CA-V177	3	C
Emergency F. W. Pump Discharge at Steam Generator	EF-V12 A/B	2	C
R. C. P. Coolers Discharge Valve	NS-V4	2	A
R. C. P. Coolers Inlet	NS-V15	2	A
R. C. P. Coolers Discharge	NS-V35	3	A
Feed Injection Check, Boric Acid Mix Tank to Make Up & Purif. System	WDL-V361	3	C
Reactor Building Air Cooling Coils Return Penetration Isolation	RB-V7	2	A

2. ASME Code Section XI Requirement From Which Relief is Requested

Relief is requested from paragraph IWV-3410(b)(1) which states that if only limited operation is practical during plant operation the valve shall be part-stroke exercised during plant operation and full-stroked during each cold shutdown.

3. Basis for Requesting Relief

All of the above listed make-up,intermediate cooling and nuclear service closed cooling water valves are in constant operation providing makeup and letdown to the reactor primary system, seal water and cooling water to the reactor coolant pumps, etc. The valves are not designed with a part-stroke capability and any error in the frequent part-stroke testing of the valve could jeopardize the continued safe operation of the reactor coolant system.

DH-V1 and DH-V2 are in the decay heat outlet line and part-stroking them could overpressurize downstream piping.

The Reactor Building Sump contains water that does not meet the cleanliness requirements of the Decay Heat System and exercising DH-V6 will allow the entry of that water, thereby contaminating the Decay Heat System suction line.

It is not possible to exercise low pressure injection line check valves DH-V22 A/B, cope flooding check valves CF-V4 A/B and CF-V5 A/B, pressurizer spray line isolation valve RC-V1, and Decay Heat injection line isolation and check valves RC-V4 and RC-V23 while the reactor is in normal operation.

It is impractical to exercise CA-V177 and WDL-V361 while the reactor is in normal operation as a change in the R.C. System boron concentration is the only means of determining satisfactory valve operation. Such a concentration change would adversely affect plant operation.

Due to the design restrictions on the number of thermal cycles the emergency feedwater nozzles can undergo it is in the best interest of the plant not to exercise EF-V12 A/B by charging through the emergency feed header while in normal operation.

In order to exercise RB-V7 reactor building normal cooling must be shut down. Since the system is necessary during reactor operation, it is not feasible to exercise RB-V7.

4. Alternative to ASME Code Section XI Requirements

With the exception of DH-V6 and RB-V7 each of the valves will be full stroke tested during plant cold shutdowns exceeding 48 hours in duration and more than 92 days have elapsed since the previous valve tests.

DH-V6 and RB-V7 will be full stroke tested during plant refueling outages when such testing would not interfere with safe plant operations.

D. Small Bore Air Operated Valve Stroke Times

1. Valve Identification

All Class 1, 2, and 3 air operated valves 2" and less are identified in Table E-1, TMI No. 1 Valves Requiring Periodic Inservice Inspection.

2. ASME Code Section XI Requirement From Which Relief is Requested

Paragraph IWV-3410(c)(2) which states that the stroke time for all power-operated valves shall be measured to the nearest second or 10% of the maximum allowable stroke time, whichever is less whenever such a valve is full-stroke tested.

3. Basis for Requesting Relief

Air operated valves 2" and less have full-stroke times usually less than one second. Thus, the valve stroke time cannot effectively be measured using normal test equipment such as a stopwatch.

4. Alternative to ASME Code Section XI Requirements

Air operated valves 2" and less will be tested to ensure their operational readiness as required by Section XI; however, the valve full-stroke time will not be recorded for these valves.

E. Full-Stroke Exercising of Control Valves

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1. Valve Identification

Valve Name and Function	Valve Number	Class	Category
Reactor Building Emergency Cooling Pump Minimum Flow Bypass	RR-V10 A/B	3	B

Valve Name and Function	Valve Number	Class	Category
Atmospheric Relief Valves	MS-V4 A/B	3	B
EFPT Steam Pressure Regulators	MS-V6	3	B
Emergency Feed Control Valves	EF-V30 A/B	3	B
Control Bldg. Vent. Unit Cooling Coil Discharge	AH-V11 A/B	3	B

2. ASME Code Section XI Requirement From Which Relief is Requested

Relief is requested from paragraph IWV-3410(c)(2) which states that the stroke time for all power-operated valves shall be measured to the nearest second or 10% of the maximum allowable stroke time, whichever is less, whenever such a valve is full-stroke tested.

3. Basis for Requesting Relief

These valves are temperature and pressure contolled valves whose operators depend on changes in temperature or flow/pressure to initiate valve operation or change in position. There is no practical way to determine exactly when a normally open control valve starts to close and during normal operation the valve may be only partially open which would not be a full-stroke test. Thus, the time test results for these valves will not be repeatable even though the valve operates as required.

4. Alternative to ASME Code Section XI Requirements

Each of the control valves will be functionally tested on a quarterly basis to ensure they operate as required; however, the valve full-stroke time will not be recorded.

SUBJECT _____ DATE _____ SHEET _____

LOCATION _____

ENGINEER _____

VALVE TYPE	Number Tested	SYSTEM	TAG #	SIZE	MFGR Valve	FIG #	MFGR Operator	OPERATOR TYPE	
GATE (continued)	1	MU	20	4"	POWELL	11303WE	PATHON	PO	
	1	MU	26	4"	Aloyco	N6226 ACC-SP	FLICK-REEDY	PO	
	1	RB	2A	8"	VELAN	B15-054	Limitorque	MO	
	1	RB	7	8"	WALWORTH	5202WE	LYNAIR	PO	
	1	SF	23	8"	ALOYCO	N216	NA	HW	
	1	WDG	4	2"	HANCOCK	990W		DO	
	1	WDL	303	3"	ALOYCO	N216	Limitorque	MO	
	1	WDL	304	3"	ALOYCO	N216		PO	
	2	WDL	534, 535	6"	ALOYCO	N216		PO	
12 GLOBE	4	CA	13, 4A, 4B	1"	ROCKWELL	3624 F316	Limitorque	MO	
	2	CF	2A, 2B	1"	ROCKWELL	3624 F316	Limitorque	MO	
	1	DH	64	2"	HANCOCK	7250 B	NA	HW	
	2	MU	2A/2B	2½"	ROCKWELL	3628 F316	Limitorque	MO	
	1	MU	25	4"	ROCKWELL	K 3628 F316	Limitorque	MO	
	1	WDG	3	2"	HANCOCK	5500W	Limitorque	MO	
	1	CA	13	1/2"	HANCOCK	7150B	Limitorque	MO	

FORM 00 47 ME

SUBJECT _____ DATE _____ SHEET ____

LOCATION _____

ENGINEER _____

PENETRATION TYPE	Number Tested	SYSTEM	TAG #	SIZE	MFGR				
5 BLIND FLANGES (Gasketed)	3 -	OTSG DRAINS	Penet. 104, 210, 211	2"	CBEI				
	1	CC	Penet 105	8"	CBEI				
	1	CC	Penet 106	4"	CBEI				
2 BLIND FLANGES (with concentric flexitalics)	2	FH	Penet 212, 332	30"	Stearns Rogers				
				KEY	HW	Handwheel			
					MO	Motor Operator			
					PO	Piston Operator			
					DO	Diaphragm Operator			

APPENDIX III

DATA 1976 REFUELING

REACTOR BUILDING LEAK RATE TESTING

APPENDIX III - DATA 1976 REFUELING - RB. LOCAL LEAK RATE

Nitrogen/Air Leakage SP1303-11.18

VALVE/ PENETRATION	SCHEDULED DATE	1976 "AS FOUND" LEAKAGE (SCCM)	DATE LAST TEST	TARGET CRITERIA (SCCM)	1976 "AS LEFT" LEAKAGE (SCCM)
AH-V1A/1B	18 MARCH	>31000	4/22/76	1400	2925
AH-V1C/D	18 MARCH	>12000	4/21/76	1400	483
CA-V1	REFUELING	22	2/26/76	87	22 **
CA-V2	REFUELING	*	4/23/76	87	2250
CA-V3	REFUELING	22	2/26/76	87	22 **
CA-V4A	REFUELING	22	2/26/76	87	22 **
CA-V4B	REFUELING	22	2/26/76	87	22 **
CA-V5A	REFUELING	NA	4/30/76	87	1700
CA-V5B	REFUELING	NA	4/29/76	87	220
CA-V13	REFUELING	22	2/26/76	87	22 **
CA-V189	REFUELING	NA	4/11/76	174	1565
CF-V2A	REFUELING	22 **	2/25/76	87	22 **
CF-V2B	REFUELING	22 **	2/25/76	87	22
CF-V12A	REFUELING	>5000	3/01/76	87	51 **
CF-V12B	REFUELING	22	2/25/76	87	22
CF-V19A	REFUELING	875	2/24/76	87	875
CF-V19B	REFUELING	22 **	2/24/76	87	22 **
CF-V20A	REFUELING	600	2/25/76	87	600
CF-V20B	REFUELING	22 **	2/25/76	87	22. **
CM-V1	REFUELING	>12000	4/01/76	87	80 **
CM-V2	REFUELING	3000 **	2/22/76	87	3000
CM-V3	REFUELING	80 **	2/22/76	87	80 **
CM-V4	REFUELING	80	2/22/76	87	80
DH-V63		80 **	3/10/76	174	80 **
DH-V64	REFUELING	80 **	3/10/76	174	80 **
DH-V69	REFUELING	80	4/28/76	174	80
HP-V1	REFUELING	80	2/21/76	521	80
HP-V6	REFUELING	80 **	2/21/76	521	80 **

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F.T.T. EAST	REFUELING	NA			NA
F.T.T. WEST	REFUELING	NA		2630	
IC-V2	REFUELING	>7600	4/04/76	521	1550
IC-V3	REFUELING	*	5/01/76	521	1625
IC-V4	REFUELING	*	4/16/76	521	625
IC-V6	REFUELING	*	4/09/76	260	22
MU-2A	REFUELING	22	2/28/76	217	22 **
MU-2B	REFUELING	22	2/28/76	217	22 **
MU-V3	REFUELING	*	4/10/76	217	80
MU-V18	REFUELING	13500	2/20/76	217	13500
MU-V20	REFUELING	22 **	2/23/76	347	22 **
MU-V25	REFUELING	440	2/23/76	347	440
MU-V26	REFUELING	*	4/11/76	347	375 **
MU-V116	REFUELING	54000	5/07/76	347	9170
NS-V4	REFUELING	*	4/18/76	695	3075
NS-V15	REFUELING	*	4/14/76	695	7740
NS-V35	REFUELING	1000	3/01/76	695	1000 **
RB-V2A	REFUELING	1700	3/03/76	695	1200
RB-V7	REFUELING	59500	5/08/76	695	825
SE-V23	REFUELING	22	5/02/76	695	22
WDG-V3/4	REFUELING	80	4/10/76	347	80
WDL-V303	REFUELING	80	2/27/76	260	80 **
WDL-V304	REFUELING	*	4/16/76	260	2750
WDL-V534	REFUELING	80	3/07/76	521	80
WDL-V535	REFUELING	*	4/04/76	521	80 **
PERS ACCESS	MAY 17/NOV 17	1174	7/01/76	1400	1174
EMER ACCESS	MAY 13/NOV 13	1311	6/29/76	1400	1311
PENETR 104	REFUELING	0	5/10/76	347	0
PENETR 105	REFUELING	0	4/13/76	1390	0
PENETR 106	REFUELING	0	4/22/76	692	0
PENETR 210	REFUELING	0	5/10/76		0
PENETR 211	REFUELING	0	5/10/76		0
TOTAL LEAKAGE		>205908	NA	2411 SCCM 6/3 99	
LEAKAGE/PENETRATION TOTAL		>202473	NA	NA 59171	
ACCEPTANCE CRITERIA NITROGEN/AIR				1408 213	

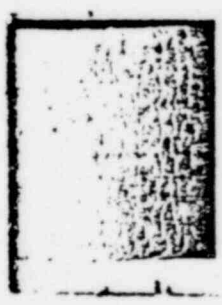
NOTES: THESE LEAK RATES NOT CORRECTED FOR INSI. ERROR.

* ~~REPAIR PERFORMED~~ AS-FOUND LEAKAGE BY FLUID BLOCK

** THIS LEAKAGE NOT INCLUDED IN LEAKAGE/PENETRATION TOTAL

FLUID BLOCK LEAKAGE - SP1303-11.23 - FREQUENCY REFUELING OPTIONAL

TANK A VALVES	LAST TEST DATE	1976 AS-LEFT LEAKAGE (CC/M)	1976 "AS FOUND" LEAKAGE (CC/MIN)
CA-V2	04/29/76	01.07/0.2	NOT PZBLE
IC-V4	04/15/76	NOT PZBLE /1.13	NOT PZBLE
IC-V6	04/11/76	00.00/0.56	017.5
NS-V4		02.06/1.50	002.05
NS-V15	03/02/76	10.00/1.50	010.1
MU-V26	02/24/76	01.66/0.75	001.66
*DG-~~8~~V4	02/29/76	00.90/0.4	000.9
*DL-V304	02/27/76	01.40/0.56	001.4
TANK A TOTAL/ADMIN LIMIT		>>17.80	>>033.62
TECH. SPEC. LIMIT		13.398 CC/MIN	
TANK B VALVES			
CA-V5A	05/03/76	00.53/0.25	NOT PZBL
CA-V5B	12/11/75	00.33/0.25	NOT PZBL
CA-V189	02/26/76	03.40/0.51	003.40
IC-V3	05/02/76	133.00/1.52	NOT PZBL
MU-V3	02/28/76	00.93/0.63	000.93
SF-V23	02/21/76	00.27/2.02	000.27
*DL-V535	03/01/76	04.86/1.52	004.85
TANK B TOTAL		143.32/6.70	>>009.59
TECH. SPEC. LIMIT		13.133 CC/MIN	



APPENDIX IV

STANDARDIZATION PROCEDURE FOR SMALL GAS FLOW ROTAMETERS USED IN RB LOCAL LEAK RATE TESTING

FEBRUARY 1976

Revised 3/10/76

Modification of Data Sheet to Remove Temperature Data
and
Part of the Calib. Meter Description

STANDARDIZATION PROCEDURE FOR SMALL
GAS FLOW ROTAMETERS

(With Ranges from 80 to 61000 sccm @ 0 psig
& from 130 to 150000 sccm @ 55 psig)

NOTES:

1. This procedure is primarily designed to satisfy calibration and requirements for meters used in Reactor Building Local Leak Rate Testing (SP1303-11.18). i.e. to demonstrate that meters used in that testing are capable of ± 5% full scale accuracy when graphs in the Surveillance Procedure are used for comparison.

2. The test equipment should probably be assembled and set up in the hot instrument shop as many of the meters to be calibrated will probably be contaminated.

3. The calibration rotameters must be sent to the manufacturer (Brooks Inst. Co.) yearly for certification of their calibration to ± 1% full scale accuracy at the following gas conditions.

   a) 70° F, Nitrogen, 0 psig
   b) 70° F, Nitrogen, 55 psig

4. Sccm Vs Scale Reading Graphs are attached to the Reactor Building Leak Rate Testing Surveillance Procedure SP1303-11.18 for each of the meter float/tube/pressure combinations.

Tube #	R-2-15-AA	R-2-15-C	R-6-15-B
Float Mat'l	Tentalum	Synt. Saphire	Carboloy
Pressure psig	0/55	0/55	0/55
Temp. °F	70	70	70

LIMITS AND PRECAUTIONS:

1. METER FLOATS ARE EASILY DAMAGED BY RAPID PEGGING

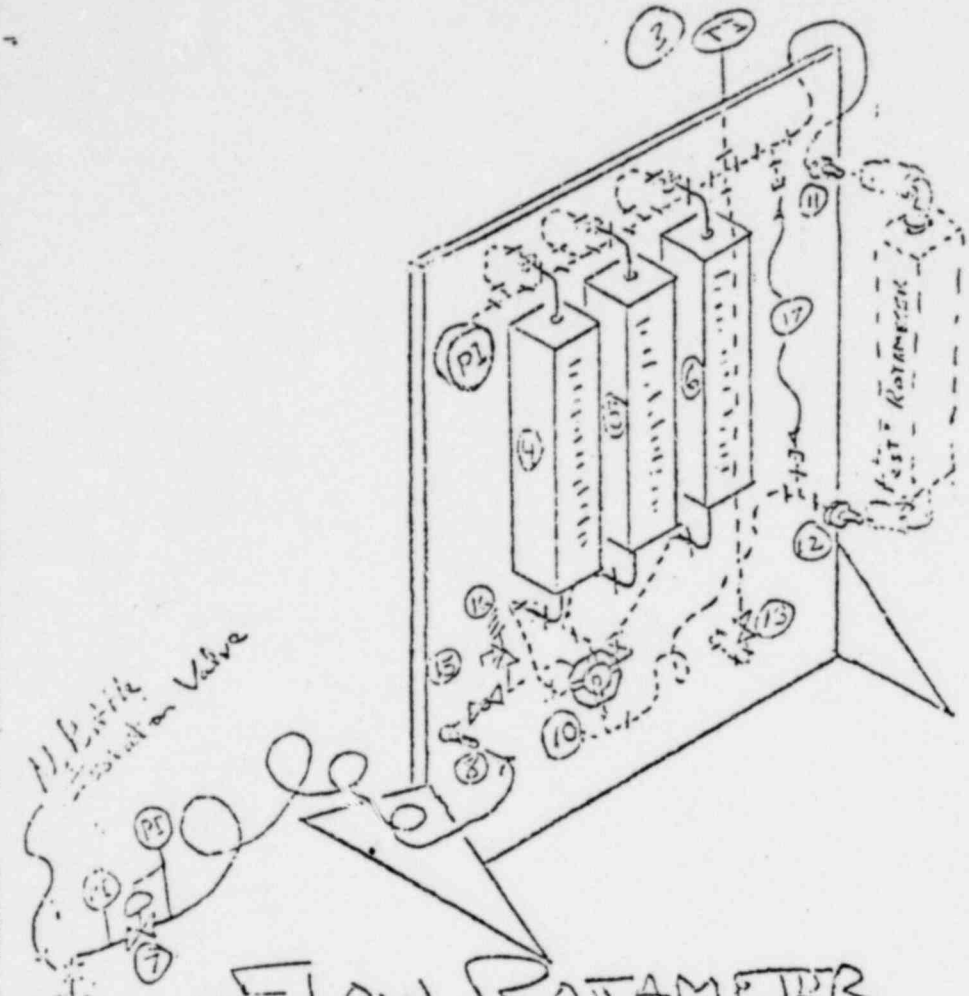
   Switch flow SLOWLY and avoid switching through a lower range meter position when switching between the "Test" and the "Calibration" meters.

2. ASSURE TEST RIG REMAINS LEAK TIGHT

   Leakage can cause inaccuracies in the standardizations.

3. USE THE APPROPRIATE GAS FOR STANDARDIZATION

   a. Nitrogen is used for most of the RB Local Leak Rate Test rotameters.
   b. Air is used for the RB Integrated Leak Rate Test rotameters.
   c. Air is used for the Penetration Pressurization Main Subsystem rotameters.
   d. Nitrogen is used for the Penet. Pressurization Elect. Penet. rotameters.



NOTES:

A. Quick connect bulk-head couplings are provided for Test Rotameters.

B. Parallel piping runs are made as similar in length and in number and type of bends as possible.

FLOW ROTAMETER STANDARDIZATION RIG

1) Pressure Gage 0-100 psig ± 1psi
2) Deleted
3) Temperature Indicator 32- 125 °F

Calibration Rotameters

Meter outlet Pressure

4)	R-2-15-AA Tantalum	10-430 sccm	@ 0 psig	70 °F	140-1720 sccm	@ 5 psig	70 °F
5)	R-2-15-C Sapphire	100-5300 sccm		N_2	200-12,200 sccm		N_2
6)	R-6-15-D Carboloy	1000-61,000 sccm		↓	2000-142,000 sccm		↓

7) Pressure Regulator- Bleed type
8) Gas Inlet Connection
9) Deleted
10) 5- Way Switching Ball Valve
11) Test Rotameter Outlet Male Quick-Connect
12) " " Inlet " " "
13) Back-pressure Regulating Needle Valve
14) Deleted
15) Flow-rate Regulating Needle Valve- High Pressure- Greater than 2500 psi
16) Relief Valve- Set at 125 psi
17) Capped D/P Test Connections

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3/3/16

PROCEDURE - CALIBRATION OF ROTAMETERS

1. Calculate values for "Calibration Meter Scale" data points and write these in the appropriate data sheet column. The data points do not need to be the exact % of meter scale which is suggested but three (3) nearly equal spaced test points are required and they should be easily readible values on the meter scale. (not between graduations)

2. Set up the test rig as shown on the attached sketch.

3. Assure up-to-date calibration done on the following:

   a. "Calibration" Meters - Yearly
   b. Temperature Indicator- Yearly
   c. Pressure Gage - Yearly

4. Obtain conversion charts for the meter to be tested. The charts/graphs must be identical to what will be used in the field for the "Test" meter. These should be found on the latest approved copy of SP 1303-11.18 (RB Local Leak Rate Testing) for the meters used in that program.

5. Perform Test Rig Leakage Test

   a. Connect regulated pressure gas supply to the calibration rig Gas Inlet (8)
   b. Close Back-pressure Valve (13) and plug port #12. (A Brooks "Test" Rotameter plugged in will accomplish this)
   c. Regulate gas pressure to 55 psig with the pressure regulator (7)
   d. Open Flow-rate Reg Valve (15)
   e. Direct gas flow to the lowest range "calibration" Rotameter (4)

      If there is any flow indication which remains on that meter it indicates excessive leakage which must be located with "Snoop"solution and eliminated.

6. Perform Calibration

   a. Connect the "Test Rotameter inlet and outlet to the quick connect male couplings (#11 and 12)
   b. Assure gas bottle isolation valve CLOSED and gas pressure regulator (7) backed off all the way.
   c. OPEN valve #13 and turn 5-way valve (10) to direct flow to the proper range "Calibration" meter.
   d. CLOSE valve #15.

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e. Slowly open the gas bottle isolation valve and adjust the pressure regulator (7) to obtain approx. 100 psig downstream pressure.

f. Adjust high pressure needle valve #15 to obtain desired flow reading on the "Calibration"rotameter. (See list of data points on the data sheet)

g. If Back-pressure is Required
Slowly throttle with valve #13 to obtain desired back-pressure (+ 1 psi) while at the same time maintaining the desired flow with valve #15. Assure that the gas pressure regulator outlet pressure remains at approx. 100 psig.

h. After desired pressure and flow indications have steadied out slowly switch gas flow to the "Test" rotameter.

i. Record "Test Meter Scale" reading on the data sheet.

j. Slowly switch gas flow back to the appropriate range "Calibration" rotameter.

k. Repeat steps f-j for each of the required data points.

7. Evaluate Results

a. Convert the "Calibration" meter scale readings to sccm units using the latest manufacturers calibration data.

b. Convert the "Test" meter scale readings to sccm units. If correlation graphs will be used in field use of the meters use the same graphs here.

c. Perform the following math operation on each set of corrected meter data:

$$\frac{\text{Calibration Meter - Test Meter}}{\text{Full Scale Test Meter}} = \%\ \text{observed deviation}$$

Record this deviation (±) on data sheet for each data point.

d. Select the largest deviation (%) and use it or the meter Industrial accuracy (whichever is largest) in the following:

$$\%\ \text{accuracy} = \sqrt{(\text{calib. meter accuracy})^2 + (\text{largest deviation})^2}$$

or

$$(\text{Indust. Accuracy})^2$$

8. Complete the documentation at the top and bottom of the data sheet.

9. Secure the test rig:

   a. Back off on pressure regulator (7)

   b. Close flow reg. valve (15) and open back-pressure valve (13)

   c. Close gas bottle isolation valve.

   d. Disconnect "Test" meter.

ROTAMETER STANDARDIZATION DATA SHEET

CALIBRATION METER DESCRIPTION
Calib. Date_____
Accuracy ± 1 % FSA

TEST METER DESCRIPTION
Tube #_____
Float Mat'l_____
Mfgr. _____
Serial # _____
Tag # _____

TEST CONDITIONS
Gas_____
Metering pressure_____psig (@ meter outlet)

UNCORRECTED		DECRIBE CALIBRATION METER USED (FLOAT MAT'L)	CORRECTED (to common units)		DEVIATION (%)		
Calib. Meter Scale (mm)	Test Meter Scale		Calib. Meter Flow	Test Meter Flow	+%	-%	
Full Scale ____	_____	_____	_____	_____	____	____	
60% ____	_____	_____	_____	_____	____	____	
20% ____	_____	_____	_____	_____	____	____	

COMMENTS:
Reason for calibration
1) Due time-wise ☐
2) Replacement of parts ☐
3) Other_____

Test Meter Accuracy = ± _____

= ± √(calib. meter accuracy)² + (largest deviation)²
or
(indust. accuracy)² *

* whichever is larger

CERTIFIED BY _____
JOB TITLE _____

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*Industrial Accuracies
Brooks ± 2% ; Fisher & Porter ± 5%

POOR ORIGINAL

3/1/72