

Commonwealth Edison 1400 Opus Place Downers Grove, Illinois 60515

February 14, 1992

Dr. Thomas E. Murley, Director Office of Nuclear Reactor Regulation U.S. Nuclear Regulatory Commission Washington, D.C. 20555

Attn: Document Control Desk

Subject: Byron Station Units 1 and 2 Braidwood Station Units 1 and 2 Regulatory Guide 1.97 Compliance TAC Nos. M57198, M63250, M64029 and M64056 NRC Docket Nos. 50-454/455 and 456/457

References:

(a) February 27, 1987 K.A. Ainger letter to H.R. Denton

- (b) September 1, 1987 S.C. Hunsader letter to T.E. Murley
- (c) July 26, 1990, teleconference between CECo and C. Patel
- (d) Letter from R.A. Chrzanowski to T.E. Murley (NRC) regarding Zion Station Units 1 and 2 Regulatory Guide 1.97, dated July 30, 1990
- (e) Letter from S.F. Stimac to T.E. Murley (NRC) regarding Regulatory Guide 1.97 Containment Isolation Valve Position Indication Supplemental Response, dated January 31, 1991

## Dear Dr. Murley:

Reference (a) provided Commonwealth Edison's (Edison) preliminary evaluation of the Byron and Braidwood instrumentation for compliance with Regulatory Guide 1.97, Revision 3. Reference (b) provided the results of Edison's final evaluation which was included as Attachments to that letter. Attachment A to Reference (b) provided an update of Table 5-1. Attachment B to Reference (b) provided the revised Human Factors Engineering Review. These attachments supplemented the information provided in Reference (a) and, together, constituted Edison's "Final Report" concerning Regulatory Guide 1.97 compliance for the Byron and Braidwood Stations.

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The teleconference of Reference (c) between Commonwealth Edison and Mr. C. Patel, which was subsequently documented in the letter of Reference (d), regarded the categorization of containment isolation valve position indication. The teleconference concluded with a common understanding that containment isolation valve position indication is a Type B, Category 1 variables for the purpose of monitoring the accomplishment of plant safety functions. Furthermore, the redundancy requirements and the single failure criteria for Regulatory Guide 1.97 Category 1 parameters are on a per penetration basis, and position indication redundancy is not applicable to penetrations utilizing a check valve or a closed system as an isolation boundary. Later, Edison documented in the letter of Reference (e) the conclusion that position indication for closed, manual containment isolation valves was not required.

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The purpose of this letter is to provide a supplemental response to clarify the description of Byron/Braidwood compliance with Regulatory Guide 1.97. Our original submittal to the NRC (Reference (a)) implies that all the Byron/Braidwood Containment Isolation valves fully meet the Type B, Category 1, Regulatory Guide 1.97 requirements by having two containment isolation valves with remote indication for each penetration. In actuality, though Byron/Braidwood Containment isolation valves meet the requirements of Regulatory Guide 1.97, many of the containment penetrations are excluded from Regulatory Guide 1.97 requirements for isolation valve position indication redundancy.

The attachments to this letter summarize the different combinations of containment isolation provisions for each containment penetration configuration. Penetrations where redundant position indication is neither provided nor necessary because of the penetration design, are indicated as such.

Please direct any questions you may have concerning this matter to this office.

Respectfully,

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Terence K. Schuster Nuclear Licensing Administrator

### Attachments

- cc: W. Kropp Resident Inspector, Byron
  - S. Dupont Resident Inspector, Braidwood
  - A. Hsia Project Manager (Byron), NRR
  - R. Pulsifer Project Manager (Braidwood), NRR
  - B. Clayton Branch Chief, Region III

# Attachment A

Containment isolation valve position indication is a Type B. Category 1 variable for the purpose of monitoring the accomplishment of plant safety functions. The redundancy requirements and the single failure criteria for the Regulatory Guide 1.97 Category 1 parameters are on a per penetration basis. and redundancy is not applicable to penetrations utilizing a check valve or a closed system as an isolation boundary. In addition, some containment penetrations utilize a normally closed manual isolation valve without position indication as one or both containment isolation boundaries. Regulatory Guide 1.97 redundancy requirements are not applicable to closed manual containment isolation valves. Regulatory Guide 1.97 generally invokes the criteria and requirements of ANSI/ANS 4.5-1980, "Criteria for Accident Monitoring Functions in Light Water - Cooled Reactors". Section 6.2.5 of ANS 4.5 entitled "Variables for Primary Reactor Containment Integrity" states "the measured variables shall indicate the accomplishing and maintaining of primary reactor containment integrity". Closed manual containment isolation valves are passive components and perform the safety function of maintaining containment integrity with no change of position. Therefore, current position status information for manual isolation valves is not required to be available. This is consistent with Zion's Regulatory Guide 1.97 Containment Isolation Valve Position Indication Supplemental Response, (Reference e).

Two Byron/Braidwood UFSAR Tables have been provided for ease of reference. UFSAR Figure 6.2-29 provides a schematic of the isolation valve configurations. UFSAR Table 6.2-58 provides a summary of containment isolation provisions including identification of isolation valve configuration in the last column of the table. "Information only" copies of UFSAR Figure 6.2-29 and Table 6.2-58 have been included as Attachments B and C. Compliance with Regulatory Guide 1.97 requirements for redundancy by configuration type is as follows:

### Configurations 1, 2, 3, 8 and 9

Each containment penetration has two active isolation valves. Redundancy is provided by independent position indication on each of the two valves in series.

# **Configuration 4**

Each containment penetration has two manual isolation valves without position indication. Manual valves without position indication are not applicable for Regulatory Guide 1.97 requirements.

# Configurations 5 and 6

Each containment penetration has one active isolation valve and one check valve. Redundant position indication requirements are not applicable to penetrations which utilize a check valve as an isolation boundary.

# Configuration 7

Each containment penetration has one manual isolation valve and one check valve. Redundant position indication requirements are not applicable to penetrations which utilize either a closed manual valve or a check valve as an isolation boundary.

# Configuration 10, 11, 12

Each containment penetration has one active isolation valve and a closed system isolation boundary. Redundant position indication requirements are not applicable to penetrations which utilize a closed system as an isolation boundary.

# Configuration 13

Each containment penetration has one relief valve and a closed system isolation boundary. Redundant position indication requirements are not applicable.

### Configuration 14

Each containment penetration has one manual isolation valve and a closed system isolation boundary. Redundant position requirements are not applicable.

# Non-standard Configurations

Penetration number I5 (valve RY075). This is an instrumentation line penetration with a locked closed manual isolation valve outside of containment. The lines inside and outside the containment are considered closed systems. Redundant position indication requirements are not applicable to penetrations which utilize a closed system as an isolation boundary.

Penetration number AL (Air Lock), valves PR033A, B, C and D. These are manual isolation valves associated with the equipment hatch and emergency hatch air lock containment air particulate and iodine sampler. Redundant position indication requirements are not applicable to manual valves without position indication.

Penetration numbers 12, 31, 36 and 45, valves PS228A&B, PS229A&B, PS230A&B and PS231A&B. The valves are containment isolation for the hydrogen analyzer system which was installed in response to NUREG 0737. Redundant position indication is provided on the hydrogen analyzer suction line by independent position indication on the two solenoid valves in series. The return line consists of a solenoid valve outside containment and a check valve inside containment. Redundant position indication requirements are not applicable to penetrations which utilize a check valve as an isolation boundary.

Penetrations 92 and 93 (valves SI8811A&B). Valves SI8811A and B are considered isolation valves inside containment. The RHR system outside containment is considered a closed system. Redundant position indication requirements are not applicable to penetrations which utilize a closed system as an isolation boundary.

Penetrations 50, 51, 59, 73, 60, 66 and 26 (valves SI8890A&B, SI8881, SI8824, SI8823, SI8825 and SI8843). The penetrations have one or two motor operated valves outside containment, multiple paths inside containment with check valves and air operated isolation valves. Redundant position indication requirements are not applicable to penetrations which utilize a check valve as an isolation boundary.



1.4.

NOTE M-MANUAL MO-MOTOR OPERATED AO-SEAR OPERATED WITH SOLENOD

UPDATED FINAL SAFETY ANALYSIS REPORT

ISOLATION VALVE SCHEMES

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FIGURE 6.2-29

ATTACHMENT B

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ATTACHMENT C

### B/B-UFSAR

### TABLE 6.2-58

# CONTAINMENT ISOLATION PROVISIONS

ISOLATION VALVE NUMBEP	GDC REQUIRE- MENT MET	PENETRA- TION NUMBER	FLUID	LINE SIZF (in.)	ESSEN- TIAL*	REFERENCE	VALVE LOCA- TION (INSIDE OR OUTSIDE CONTAINMENT)	LEAN TEST (TES QR_NO)	DISTANCE TO OUTERMOST ISOLATION VALVE (Et)	VALVE TYPE_
ouce					-	* 64.2	Outside	YES	2.6	Globe
CVCS	55	28	RC	Z	YES	M-64-2	Incide	YES	K/A	Globe
1CA8100	55	28	RC	2	YES	M-99-2	Outeide	190	4.0	Globe
1CVB112	55	53	RC	2		M-54-2	Incide	NO	R/A	Check
1CV8355C	55	53	RC	2		M-64-2	Cutrido	NO	4.0	Globe
1CV8368C		23	RC	2		M-54-Z	OULSIDE .	100	N/A	Check
1CV8355D		33	RC	2		M-64-2	Inside	800	4.0	Globe
1CV8368D	33	23	RC	2		M-64-1	Outside	200	32./B	Check
1CV8355A	22	22	PC .	2		<b>第</b> -64-1	Inside	2817	4.0	Clabs.
1CV8368A	55	33	pC	2		M-64-1	Outside	280		Cherck
1CV8355B	55	2.5	200	2		M-64-1	Inside	80	A/A	Cate
10983688	55	53	EL.	2	VES	M-64-3	Outside	NO	2.9	Gate
1078105	57	- 71	RC		VES	M-64-3	Outside	NO	4.75	Date
1098106	57	71	RC							
Trepres			1. Sec. 1. Sec. 1.	1 A A		M-64-3	Outside	80	3.2	Globe
1000346	55	37	RC	<i>2</i>		W 64-3	Inside	80	N/A	Check
1049340	55	37	RC	2		m-94-9				
TCA9349							Outside	VES	2.9	Globe
	55	41	RC	3	YES	M-64-2	Teride	VES	N/A	Globe
1CV8152	55	41	RC	3	YES	M-54-5	Inside	VES	N/A	Check
1CV8160	22	28	RC	3/4		M-64-2	inside	LOO		
1CV8113	23									
									2.0	Gate
Chilled Water	1.	e .	Water	10	YES	M-118-5	Outside	3.6.5	2.0	Cate
1W0020A	56		Mator	10	YES	M-118-5	Outside	8.5.5	2.9	Cate
1W0006A	56	0	Water	10	YES	M-118-5	Outside	YES	3.3	Cate
1W0020B	56	8	Walas	10	YES	M-118-5	Outside	YES	3.3	Charle
1000068	56	10	water	10	VES	M-118-5	Inside	YES	B/A	Check
1000078	56	6	water	2.0	VES	M-118-5	Inside	YES	N/A	CINECK
180007B	56	10	Water	10	100	M-118-5	Inside	YES	N/A	Gate
1000558	56	5	Water	1.0	11.0	M. 110.5	Inside	YES	N/A	Gate
THOUSER	56	8	Water	10	155	-110-J				

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# TABLE 6.2-58 (Cont d)

ISOLATION VALVE NUMBER (Cont'd)_	GDC REQUIRE- MENT MET	VALVE OPER- ATOR_	NORMAL POSITION	SHUTDOWN	POSI- ACCIDENT POSITION	POWER FAILURE POSITION	CLOSURE TIME** (sec)	SOLA- TION SIGNALS	PRIMARY MODE OF ACTUA- 	ARY MODE OF ACTUA- TION	POWER SOURCE	ISOLATION VALVE CONFIGU- RATION
eves					closed	As Is	10	τ	A	RM	16	1.5
1CVB100	55	MO	Open	Open	Closed	he Is	10	T	A	RM	31	1
1048112	55	MO	Open	Open	Closed	Ac Is	N/*	N/A	RM	M	1E	5
10983550	55	MO	Open	Open	open	N/A	N/A	N/A	N/A	M/A	我/A	5
10783680	55	N/A	N/A	N/A	N/A	Ac Is	N/*	N/A	RM	M	100	5
10983550	55	MO	Open	Open	open	N/A	N/A	N/A	N/A	N/A	N/A	5
10483680	55	N/A	N/A	N/A	N/A	Ar Is	N/*	N/A	RM	м	15	
1CV8355A	55	MO	Open	Open	Open	N/A	N/A	N/A	N/A	N/A	N/A	5
1CV8368A	55	N/A	N/A	N/A	N/A	Ac Ic	N/#	N/A	RM	M	16	5
1CV8355R	55	MO	Open	Open	open	N/A	N/A	N/A	N/A	N/A	税/系	5
1CVR36RR	55	N/A	N/A	N/A	N/A	Ac Ic	10	S	A	RM	15	8
1048105	57	MO	Open	Open	Closed	AS IS	10	S	A	RM	1E	8
1040105	57	MO	Open	Open	Closed	AS IS	TO					
1040100				Section 2.		11.12	12/2	N/A	M	м	N/A	7
1010246	55	M	Closed	Closed	Closed	IN/A	N/A	N/A	N/A	N/A	N/A	7
1000340	55	N/A	N/A	N/P	N/A	BZA	11/ 1					
1046240							10	т	A	RM	15	2
1040153	55	AO/S	Open	Open	Open	Closed	10	Ŧ	A	RM	1E	2
10/0152	55	AO/S	Open	Open	Open	Closed	10	N/A	N/A	N/A	N/A	5
1008160	55	N/A	N/A	N/A	N/A	N/A	N/B	BV B				
1000113												
of 111-d Mahor								-	4	RM	1E	1
Chilled water	56	MO	Upen	Open	Closed	As is	50	A		RM	1E	5
IWOUZUA	56	MO	open	Open	Closed	As is	20	-		RM	18	2.1
INCOUGA	56	MO	the en	Open	Closed	As Is	50	-	6	RM	15	-5
1000208	56	MO	Open	Open	Closed	As Is	50	11/2	N/A	N/A	N/A	5
1000058	56	N/A	N/A	N/A	N/A	N/A	N/A	N/A	12/6	N/A	N/A	5
1W0007A	56	NZA	N/A	N/A	N/A	N/A	N/A	R/A	8	DM	1E	1
1W00078	56	MO	Open	Open	Closed	As Is	50	1		DM.	15	1
1W0056A	50	MO	Open	Open	Closed	AS IS	50	1	A	201		
1000568	20	PRO .	200									

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### TABLE 6.2-58 (Cont'd)

ISOLATION VALVE NUMBER	GDC REQUIRE- MENT MET	PENETRA- TION NUMBER	FLUID	LINE SIZE (in.)	ESSEN- TIAL*	REFERENCE	VALVE LOCA- TION (INSIDE OR OUTSIDE CONTAINMENT)	TYPE C LEAK TEST (YES QR NO)	ISTANCE TO OUTERMOST ISOLATION VALVE (ft)	VALVE TYPE
Component Cooling					VEC	M-66-1	Outside	YES		Gate
1CC9414	56	21	CCW	0	VEC	M-66-1	Inside	YES	54	Gate
1009416	56	21	CCW	0	100	M 66-1	inside	YES		Check
1009534	56	21	CCW	3/4	1000	M 65-1	Outside	NO		Globe
10094378	57	22	CCW	3	IED	M-00-1	Outside	YES	1.1.1	Gate
100685	56	24	CCW	4	YES	M-00-1	Incide	YES	N/A	Gate
1004438	56	2.4	CCW	4	YES	M-00-1	Incide	VES	N/A	Check
1009518	56	24	CCW	3/4	YES	M-00-1	Incide	VES	N/A	Check
1009310	56	25	CCW	6		M-00-1	Outeide	YES	4.9	Gate
10004138	56	25	CCW	6	YES	M-00-1	Outeide	NO	6.8	Gate
10094138	56	25	CCW	6	YES	M-00-1	Outeide	NO	6.8	Globe
1CC9437A	57	48	CCW	3	YES	M-66-1	Outside			
Containment Purge			1.1		VEC	M-105-1	Inside	YES	N/A	But. Fly
1V0005A	56	94	Alt	0	ILD	M-105-1	Outside	YES	6.0	But, Fly
1000058	56	94	Alt	0	ILO	M-105-1	Outside	YES	9.0	Bot. Fly
100003	56	94	Air	8	IES	M-105-1	Incide	YES	N/A	But. Fly
1000028	56	95	Air	48	YES	M-105-1	Outrido	YES	2.9	But. Fly
1000028	56	95	Air	48	YES	M-105-1	Incide	VES	N/A	But. Fly
1000048	56	96	Air	8	YES	M-105-1	Outside	VES	2.0	But, Fly
1000048	56	96	Air	8	YES	M-103-1	Incida	VES	N/A	But. Fly
1000018	56	97	Air	48	YES	M-105-1	Outeide	VES	2.9	But. Fly
1900018	56	97	Air	48	YES	M-105-1	Outside	VES	3.5	But. Fly
1VQ005C	56	94	Air	8	YES	M-105-1	OUCSIDE	200		
Containment Spray				10	VPC	M-46-1	Outside	YES	3.3	Gate
1CS007A	56	1	NOCH+EW	10	ILO	M_46-1	Inside	YES	N/A	Check
ICS008A	56	1	NSOH+BM	10	WEG	M 46-1	Outside	YES	3.8	Gate
1050078	56	16	NaOH+BW	10	ILD	M 46-1	Inside	YES	N/A	Check
1CS008B	56	16	NaOH+BW	10		M-40-1				

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# TABLE 6.2-58 (Cont'd)

ISOLATION VALVE NUMBER (Cont'd)	GDC REQUIRE- MENT MET	VALVE OPER- ATOR	NORMAL POSITION	SHUTDOWN POSITION	POST- ACCIDENT POSITION	POWER FAILURE POSITION	CLOSURE TIME** (sec)	ISOLA- TION SIGNALS	PRIMARY MODE OF ACTUA- TION	ARY MODE OF ACTUA- TION	POWER SOURCE	ISOLATION VALVE CONFIGU- RATION
Commonent Cooling							10	P	٨	RM	18	1,5
1009414	56	MO	Open	Open	Closed	AS IS	10	P	A	RM	1E	1
1009416	56	MO	Open	Open	Closed	AS 1S	10	N/A	N/A	N/A	N/A	5
1009534	56	N/A	N/A	N/A	N/A	N/A	10	T	A	RM	1E	11
10094378	57	AO/S	Open	Closed	Closed	Closed	10	p	A	RM	18	1,5
100685	56	MO	Open	Open	Closed	AS 15	10	P	A	RM	18	1
1009438	56	MO	Open	Open	Closed	AS 1S	8/8	N/3	R/A	N/A	N/A	5
1009518	56	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	5
1009486	56	N/A	N/A	N/A	N/A	N/A	10	P	A	RM	1E	5
10094138	56	MO	Open	Open	Closed	AS 15	10	p	A	RM	1E	5
10094138	56	MO	Open	Open	Closed	AS 15	10	Ŧ	A	RM	1E	11
1CC9437A	57	AO/S	Closed	Closed	Closed	Closed	10					
Containment Purge				The states	Closed	Closed	5	T2	A	RM	18	2
1V0005A	56	AO/S	Closed	Closec	Closed	Closed	5	T2	A	RM	12	2
1200058	56	40/S	Closed	Closed	Closed	Closed	5	T2	A	RM	1E	2
120003	56	AO/S	Closed	Closed	Closed	Closed	5	T2	A	RM	1E	1
1V0002A	56	HO	Closed	Open	Closed	Closed	ŝ	T2	A	RM	12	1
1000028	56	HO	Closed	Open	Closed	Closed	5	72	A	RM	18	2
100004A	56	AC/S	Closed	Closed	Closed	Closed	5	T2	A	RM	18	2
1100048	56	AO/S	Closed	Closed	Closed	Closed	5	T2	A	RM	1E	1
1000018	56	HO	Closed	Open	Closed	Closed	5	T2	A	RM	1E	1
1000018	56	HO	Closed	Open	Closed	Closed	e e	72	A	RM	12	2
1VQ005C	56	AO/S	Open	Open	Open	Closed		**				
Containment Spray					(Thomas)	As Is	30	T1	A	RM	15	5
1C5007A	56	MO	Closed	Closed	Closed	MO 15	N/A	N/A	N/A	N/A	R/A	5
ICSOORA	56	N/A	R/A	N/A	N/A	Br. Tr	30	TI	A	RM	18	5
1050078	56	MO	Closed	Closed	Closed	AS 15	N/A	N/A	N/A	N/A	N/A	5
1CS008B	56	N/A	N/A	N/A.	N/A	R/A	arn					

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# TABLE 6.2-58 (Cont'd)

ISOLATION VALVE NUMBER	GDC REQUIRE- MENT MET	PENETRA- TION N'MBER	L S FLUID	INE IZE in.)	ESSEN- TIAL*	REFERENCE DRAWING C	ALVE LOCA- TON (INSIDE OR OUTSIDE CONTAINMENT)	LEAK TEST (YES OR NO)	DISTANCE TO OUTERMOST ISOLATION VALVE (ft)	VALVE TYPE
Essential Service Water 1SX016B 1SX027B 1SX027A 1SX026A	57 57 57 57 57	7 9 14 15	Water Water Water Water	16 16 16 16	YES YES YES YES	M-42-5 M-42-5 M-42-5 M-42-5	Outside Outside Outside Outside	40 NO NO	3.2 3.2 2.8 2.8	But. Fly But. Fly But. Fly But. Fly
Fire Protection 1FP010 1FP345	56 56	34 34	Water Water	4 4	YES YES	M-52-1 M-52-1	Outside Inside	NO NO	3.3 N/A	Globe Check
Instrument Air 11A065 11A066 11A091	56 56 56	39 39 39	Air Air Air	3 3 3/4	YES YES YES	M-55-2 M-55-2 M-55-2	Outside Inside Inside	YES YES YES	3.3 N/A N/A	Globe Globe Check
Instrument Penetration 1VQ016 1VQ017 1VQ018 1VQ019	56 56 56 56	13 13 13 13 11 12 13 14 15	Air Air Air Silicone Oil S.licone Oil Silicone Oil Silicone Oil Water	1/2 1/2 1/2 1/2		M-105-3 M-105-3 M-105-3 M-105-3 M-2046-2,4 M-2046-2,4 M-2046-2,4 M-2046-2,4 M-2060-6 M-2060-6	Inside Inside Outside Outside	YES YES YES YES	N/A N/A MIN. MIN.	Globe Globe Globe Globe



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# TABLE 6.2-58 (Cont'd)

ISOLATION VALVE NUMBER	GDC REQUIRE- MENT MET	PENETRA- TION NUMBER	FLUID	LINE SIZE (in.)	ESSEN- TIAL*	REFERENCE _DRAWING	VALVE LOCA- TION (INSIDE OF OUTSIDE CONTAINMENT)	TYPE C LEAK TEST (YES OR_NO)	DISTANCE TO OUTERMOST ISOLATION VALVE (ft)	VALVE TYPE
Make-up Demineralizer 1WM190 1WM191	55 55	30 30	Water Water	2 2		M-49-1 M-49-1	Outside Inside	YES YES	1.6 8/A	Globe Check
Main Steam 1MS001D 1MS101D 1MS021D 1MS018D	57 57 57 57 57 57	77 77 77 77 77 77	Steam Steam Steam Steam Steam	30.25 4 3 6 5	YES YES YES	M-35-1 M-35-1 M-35-1 M-35-1 M-35-1 M-35-1	Outside Outside Outside Outside Outside	NO NG NO NO	14.8 20.0 15.4 32.1 39.1	Gate Gate Globe Relief Relief

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# TABLE 6.2-58 (Cont'd)

ISOLATION VALVE NUMBER (Cont'd)	GDC REQUIRE- MENT MET	VALVE OPER- ATOR_	NORMAL POSITION	SHUTDOWN POSITION	POST- ACCIDENT POSITION	POWER FAILURE FOSITION	CLOSURE TIME** (sec)	ISOLA- TION SIGNALS	PRIMARY MODE OF ACTUA- TION	SECOND- ARY MODE OF ACTUA- TION	POWER	ISOLATION VALVE CONFIGU- RATION
Essential Service Water ISX016B ISX027B ISX027A ISX016A	57 57 57 57 57	MO MO MO MO	Open Open Open Open	Open Open Open Open	Open Open Open Open	As Is As Is As Is As Is As Is	N/*S N/*S N/*S N/*S	(Open) (Open) (Open) (Open)	A A A A	RM RM RM RM	1E 1E 1E 1E	10 10 10 10
Fire Protection 1FP010 1FP345	56 56	AO/S N/A	Open N/A	Closed N/A	Closed N/A	Closed N/A	12 N/A	T N/A	A N/A	RM N/A	1E N/A	6 6
Instrument Air 11A065 11A066 11A091	56 56 56	AO/S AO/S N/A	Open Open N/A	Open Open N/A	Closed Closed N/A	Closed Closed N/A	15 15 N/A	T T R/A	A A N/A	RM RM N/A	1E 1E N/A	2,6 2 6
Instrument Penetration IVQ016 IVQ017 IVQ018 IVQ019	56 56 56 56	M M M M	Closed Closed Closed Closed	Closed Closed Closed Closed	Closeć Closed Closed Closed	N/A N/A N/A N/A	N/A N/A N/A N/A	N/A N/A N/A N/A	M M M M	M M M N	N/A N/A N/A N/A	4 4 4
18¥075	57	м	Closed	Closed	Closed	N/A	N/A	N/A	м	м	N/A	

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# TABLE 6.2-58 (Cont'd)

ISOLATION VALVE NUMBER (Cont'd)	GDC REQUIRE- MENT MET	VALVE OPER- ATOR	NORMAL POSITION	SHUTDOWN POSITION	POST- ACCIDENT POSITION	POWER FAILURE POSITION	CLOSURE TIME** _(sec)_	ISOLA- TION SIGNALS	PRIMARY MODE OF ACTUA- TION	SECOND- ARY MODE OF ACTUA- TION	POWER SOURCE	ISOLATION VALVE CONFIGU- RATION
Make-up Deminerslizer 1WM190 1WM191	55 55	M N/A	Closed N/A	Open N/A	Closed N/A	n/A n/A	N/A N/A	N/A N/A	M N/A	M N/A	N/A N/A	7 7
Main Ste 7 1MS001D 1MS101D 1MS021D 1MS018D 1MS013D	57 57 57 57 57 57	HO AO/S M HO N/A	Open Closed Closed Closed Closed	Closed Closed Closed Closed Closed	Closed Closed Closed Closed Closed	As Is Closed N/A Closed N/A	5.0 6.0 N/A N/A	MS MS N/A N/A N/A	A A M A N/A	RM RM RM R/A	le le N/A le N/A	10 11 14 13 13

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ISOLATION VALVE NUMBER	GDC REQUIRE- MENT MET	VENETRA- TION NUMBER	FLUID	LINE SIZE (in.)	ESSEN- TIAL*	REFERENCE DRAWING	VALVE LOCA- TION (INSIDE OR OUTSIDE CONTAINMENT)	TEST (YES QR_NO)	OUTERMOST ISOLATION VALVE (ft)	VALVE TYPE
Main Choom						N. 25-1	Outside	NO	36.6	Relief
Main Steam	57	77	Steam	6		M-35-1	Outside	NO	34.1	Relief
1050140	57	77	Steam	6		M-25-1	Outside	NO	31.6	Reliet
IMSUISD	57	77	Steam	6		M 25-1	Outside	NO	29.1	Relief
1050160	57	77	Steam	6		M-35-1	Outside	NO	10.0	Gate
1MS017D	57	85	Steam	32.75	YES	M-35-1	Outside	NO	17.7	Gate
IMSOUIB	57	63	Steam	4	YES	M-35-1	Outside	NO	11.0	Globe
IMSIUIB	57	85	Steam	3		M-30-1	outside	NO	16.5	Relief
1MS0218	57	85	Steam	6	YES	M-30-1	Outside	NO	38.8	Relief
1MS018B	57	85	Steam	5		M-30-1	Outside	NO	36.3	Relief
1MS013B	57	85	Steam	6		M-33-1	Outeide	NO	33.8	Relief
1MS014B	57	85	Steam	6		M-35-1	Outside	NO	31.3	Relief
1MS015B	67	85	Steam	6		M-35-1	Outside	NO	28 9	Relief
1MS0168	57	85	Steam	6		M-35-1	Outside	NO	14.8	Gate
1MS017B	57	78	Steam	30.25	YES	M-35-2	Outside	100	20.0	Gate
1MS001A	57	78	Steam	4	YES	M-35-2	Outside	NO	15.4	Globe
1MS101A	57	78	Steam	3		M-35-2	Outside	NO	37 1	Relief
1MS021A	57	70	Steam	6	YES	M-35-2	Outside	NO	20 1	Relief
1MS018A	57	70	Steam	6		M-35-2	Outside	NO	26 6	Relief
IMS013A	57	70	Ctoam	6		M-35-2	Outside	80	34 1	Relief
1MS014A	57	78	Ctoam	6		M-35-2	Outside	De0	21.6	Relief
1MS015A	57	76	Steam	6		M-35-2	Outside	NO	20 1	Polief
1MS016A	57	78	Steam	6		M-35-2	Outside	NO	29.1	Care
1MS017A	57	18	Steam	32 74	YES	M-35-2	Outside	NO	10.0	Cato
1MS001C	57	86	Steam	4	YES	M-35-2	Outside	NO	17.7	Cloba
1MS101C	57	86	Steam	-		M-35-2	Outside	NO	11.0	Grobe
1MS021C	57	86	Steam	6	VES	M-35-2	Outside	NO	16.5	Rellet
INSOIRC	57	86	Steam	6	1.2.0	M-35-2	Outside	NO	38.8	Reliet
INSOLUC	57	86	Steam	0		M-35-2	Outside	NO	36.3	Relief
INCOLAC	57	86	Steam	0		M-35-2	Outside	NO	33.8	Reflet
INCOISC	57	86	Steam	6		M-35-2	Outside	NO	31.3	Reflet
INCOLC	57	86	Steam	6		M-35-7	Outside	NO	28.8	Relief
IM6017C	57	86	Steam	0						

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TABLE 6.2-58 (Cont'd)

# TABLE 6.2-58 (Cont'd)

ISOLATION VALVE NUMBER (Cont'd)	GDC REQUIRE- MENT_MET	VALVE OPER- ATOR	NORMAL POSITION	SHUTDOWN POSITION	POST- ACCIDENT FOSITION	POWER FAILURE POSITION	CLOSURE TIME** (sec)	ISOLA- TION SIGNALS	PRIMARY MODE OF ACTUA- TION	ARY MODE OF ACTUA- TION	POWER SOURCE	ISOLATION VALVE CONFIGU- RATION
Main Steam					allowed	11/8	N/A	N/A	N/A	N/A	N/A	13
1MS0140	57	N/A	Closed	Closed	Closed	11/ /S	N/A	N/A	3/A	N/A	N/A	13
1MS015D	57	N/A	Closed	Closed	Closed	25/25	N/A	N/A	N/A	N/A	N/A	13
1MS016D	57	N/A	Closed	Closed	Closed	N/A	N/A	N/A	N/A	N/A	N/A	13
1MS017D	57	N/A	Closed	Closed	Closed	Ac Is	5.0	MS	A	RM	1E	10
1MS0018	57	HO	Open	Closed	Closed	Closed	6.0	MS	A	RM	1E	11
1MS1018	57	AO/S	Closed	Closed	Closed	N/A	N/A	N/A	M	M	N/A	14
1MS021B	57	M	Closed	Closed	Closed	Closed	N/A	N/A	A	RM	1E	13
1MS018B	57	HO	Closed	Closed	Closed	M/A	N/A	N/A	N/A	N/A	N/A	13
1MS013B	57	N/A	Closed	Closed	Closed	12/A	N/A	N/A	N/A	N/A	N/A	13
1MS0148	57	N/A	Closed	Closed	Closed	11/16	N/A	N/A	N/A	N/A	N/A	13
1MS015B	57	N/A	Closed	Closed	Closed	N/A	N/h	N/A	N/A	N/A	预/系	13
1MS016B	57	N/A	Closed	Closed	Closed	N/A	N/A	N/A	N/A	N/A	N/A	13
1MS017B	57	N/A	Closed	Closed	Closed	N/M	5.0	MS	A	RM	12	10
1MS001A	57	HO	Open	Closed	Closed	AS 15	6.0	MS	A	RM	18	11
1MS101A	57	AO/S	Closed	Closed	Closed	Crosed B/A	81/5	N/A	M	M	N/A	14
1MS021A	57	м	Closed	Closed	Closed	B/B Cloned	NI/B	N/A	A	RM	1E	13
IMS018A	57	HO	Closed	Closed	Closed	Closed	NE / A	N/A	N/A	N/A	预/A	13
1MS013A	57	N/A	Closed	Closed	Closed	B/A	N/A	N/A	N/A	N/A	B/A	13
IMS014A	57	N/A	Closed	Closed	Closed	N/R	N/A	N/A	N/A	N/A	N/A	13
IMS015A	57	N/A	Closed	Closed	Closed	N/A	8/8	N/A	N/A	N/A	N/A	13
IMS016A	57	N/A	Closed	Closed	Closed	N/A	81/8	NA	N/A	N/A	B/A	13
1MS017A	57	N/A	Closed	Closed	Closed	N/A	5 0	MS	A	RM	1E	10
1MS001C	57	HO	Open	Closed	Closed	AS 15	6.0	MS	A	RM	1E	11
1MS101C	57	AO/S	Closed	Closed	Closed	Ciosea	0.0	81/8	M	м	N/A	14
1MS021C	57	м	Closed	Closed	Closed	N/A	11/2	N/B	A	RM	1E	13
IMSOLAC	57	HO	Closed	Closed	Closed	Closed	87/6	N/A	R/A	N/A	N/7.	13
1MS013C	57	N/A	Closed	Closed	rlosed	N/A	87.78	N/A	N/A	N/A	N/A	13
INSOIAC	57	N/A	Closed	Closed	C. sed	N/A	10/15	N/B	N/A	N/A	N/A	13
1MS015C	57	N/A	Closed	Closed	Closed	N/A	11/2	N/A	N/A	N/A	N/A	13
1MS0160	57	N/A	Closed	Closed	Closed	N/A	N/A	N/A	S/A	N/A	N/A	13
1MS017C	57	N/A	Closed	Closed	Closed	37A	av.a					

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# TABLE 6.2-58 (Cont'd)

ISOLATION VALVE NUMBER	GDC REQUIRE- MENT MET	PENETRA- TION NUMBER	FLUID	LINE SIZE (in.)	ESSEN- TIAL*	REFERENCE 	VALVE LOCA- TION (INSIDE OR OUTSIDE CONTAINMENT)	LEAK TEST (YES OR NO)	DISTANCE TO OUTERMOST ISOLATION VALVE (ft)	VALVE TYPE_
Off-Gas			No. 7 11	2	YES	M-47-2	Inside	YES	N/A	But. Fly
106079	56	13	All & n2	2	YES	M-47-2	Inside	YES	N/A	But. Fiy
100080	56	13	Alf & H2	3	YES	M-47-2	Inside	YES	N/A	But. Fly
100081	56	23	All & H2		VES	M-47-2	Inside	YES	N/A	But. Fly
10C057A	56	69	AIT & H2	2	VES	M-47-2	Outside	YES	MIN.	But. Fly
10G082	56	13	All & H2	2	AEC	M-47-2	Outside	YES	MIN.	But. Fly
100083	56	69	Air & H2	3	100	M-47-2	Outside	YES	MIN.	But. Fly
100084	56	13	Air & H <sub>2</sub>	3	VPC	M-47-2	Outside	YES	MIN.	But. Fly
10G095	56	23	Air & H <sub>2</sub>	4	100	B-47-2				
Process Radiation						M-78-10	Outside	YES	1.4	Globe
1PRC01A	56	52	Alt			M-78-10	Outside	YES	3.5	Globe
1PR001B	56	52	AIT			M-78-10	Outside	YES	2.3	Globe
1PR066	56	52	Alr			M. 78-10	Inside	YES	N/A	Check
126032	56	52	Air			M. 78-6	Outside	YES	MIN.	Globe
1000338	56	AL	Air	2		M 70 C	Outside	YES	MIN.	Globe
1000338	56	AL	Air	2		M-70-6	Cuteide	YES	MIN.	Globe
1000030	56	AL	Air	2		M-70-0	Inside	YES	N/A	Check
1000020	56	AL	Air	2		M-78-0	Outoide	YES	MIN.	Globe
100020	56	AL	Air	2		M-70-0	Outside	YES	MIN.	Globe
100330	56	AL	Air	2		M-70-0	Contaide	YES	MIN.	Globe
11 RUJJU	55	AL	Air	2		M-78-0	Ingida	YES	N/A	Check
1PR002H	56	AL	Air	2		M- 19-0	100 100			
Hydrogen Monitor						M. CO. 7	Outside	YES	MIN.	Globet
1002288	56	45	$H_2 + Air$	1/2		M-00-7	Outeide	YES	MIN.	Globet
1002208	56	45	H <sub>2</sub> + Air	1/2		M CO 7	Outgide	YES	MIN.	Globet
1092304	56 12	(BY) 45(BW)	H <sub>2</sub> + Air	1/2		M-60-7	Inside	YES	N/A1	Check
1P\$231A	56 12	(BY) 45(BW)	H <sub>2</sub> + Air	3/4		M. 68.7	Outside	YES	MIN.	Globet !
1D9228B	56	36	H <sub>2</sub> + Air	1/2		M. CR. 7	Outside	YES	MIN.	Globet
1093298	56	36	H <sub>2</sub> + Air	1/2		N CD 7	Outside	YES	MIN.	Globet
1002308	56 31	(BY) 36(BW)	$H_2 + Air$	1/2		M 60 7	Ingide	YES	N/A	Check
1PS231B	56 31	(BY) 36(BW)	H <sub>2</sub> + Air	3/4		21-00-1	200400			



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# TABLE 6.2-58 (Cont'd)

ISOLATION VALVE NUMBER (Cont'd)	GDC REQUIRE- MENT MET	VALVE OPER- ATOR	NORMAL POSITION	SHUTDOWN POSITION	POST- ACCIDENT POSITION	POWER FAILURE POSITION	CLOSURE TIME** (sec)	ISOLA- TION SIGNALS	PRIMARY MODE OF ACTUA- TION	ARY MODE OF ACTUA- TION	POWER SOURCE	ISOLATION VALVE CONFIGU- RATION
OFF-Gas						Ac 10	60	т	A	RM	18	1
106079	56	MO	Closed	Closed	Closed	AS IS	60	T	A	RM	1E	1
100073	56	MO	Closed	Closed	Closed	AS IS	60	Ť	A	RM	1E	1
100080	56	MO	Closed	Closed	Closed	AS IS	60	Ť	A	RM	1E	1
100081	56	MO	Closed	Closed	Closed	AS 1S	60	T	A	RM	16	1
1060578	56	MO	Closed	Closed	( iosed	AS 1S	60	Ť	A	RM	1E	1
106082	56	MO	Closed	Closed	Closed	As 15	60	Ŧ	A	RM	16	1
LOG083	56	MO	Closed	Closed	Closed	As Is	60	-		DM	1E	1
10G084 10G085	56	MO	Closed	Closed	Closed	As Is	60	1	^			
Process Radiation					Clored	Closed	4.5	τ	A	RM	18	8
1PR001A	56	AO/S	Open	Closed	Closed	Closed	4.5	T	Α	RM	1E	8
100001B	56	AO/S	Open	Closed	Closed	Closed	5.0	т	A	RM	1E	6
100066	56	AO/S	Open	Closed	Closed	CIUSED W/A	N/A	N/A	N/A	N/A	N/A	6
100022	56	N/A	N/A	N/A	N/A	11/2	10/2	N/A	N/A	N/A	附/A	
1000326	56	M	Closed	Closed	Closed	N/A	N/A	N/A	N/A	N/A	N/A	
1780338	56	M	Closed	Closed	Closed	N/A	11/2	NI/A	N/A	N/A	N/A	7
IPR033B	56	M	Closed	Closed	Closed	N/A	N/PA	N/D	N/A	N/A	N/A	7
1PROD2E	56	N/A	N/A	N/A	N/A	N/A	M/ PL	NI/A	N/A	N/A	N/A	
1PR002G	56	м	Closed	Closed	Closed	N/A	R/A	12/2	N/A	N/A	S/A	
IPR033C	56	M	Closed	Closed	Closed	N/A	N/A	19/15	N/A	N/A	N/A	7
1PR033D	56	M	Closed	Closed	Closed	N/A	N/A	B/A	N/A	N/A	N/A	7
1PR002F 1PR002H	56	N/A	N/A	N/A	N/A	N/A	N/A	8/6				
Hydrogen Monitor				Clored	Closed	As Is	15	т	A	RM	1E	
1PS228A	56	S	Open	Closed	Closed	As Is	15	T	A	RM	1E	
1PS229A	56	S	Open	Closed	Closed	Closed	15	T	A	RM	18	
1PS230A	56	S	Closed	Closed	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
1P5231A	56	N/A	N/A	N/A	Clored	As Is	15	T	A	RM	18	
1952288	56	S	Open	Closed	Closed	Ac Is	15	T	A	RM	1E	
1052298	56	S	Open	Closed	Closed	Closed	15	T	A	RM	16	
1PS230B	56 56	S N/A	Closed N/A	Closed N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	



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# TABLE 6.2-58 (Cont'd)

ISOLATION VALVE NUMBER	GDC REQUIRE MENT_MET	PENETRA- TION NUMBER	FLUID	LINE SIZE (in.)	ESSEN- *	REFERENCE DRAWING	VALVE LOCA- TION (INSIDE OR OUTSIDE CONTAINMENT)	TYPE C LEAK TEST (YES OR NO)	DISIANCE TO OUTERMOST ISOLATION VALVE (ft)	VALVE TYPE_
Process Sampling			80	3/8	YES	M-68-1	Inside	YES	N/A	Globe
1PS9354A	55	70	RC	3/8	YES	M-68-1	Outside	YES	MIN.	Globe
1PS9354B	55	70	NC	3/8	VES	M-68-1	Inside	YES	N/A	Globe
1PS9355A	55	70	RC	3/8	VES	M-68-1	Outs de	YES	MIN.	Globe
1PS9355B	55	70	RC	3/8	VES	M-68-1	Inside	YES	N/A	Globe
1PS9356A	55	70	RC	3/8	VES	M-68-1	Outside	YES	MIN.	Globe
1PS9356B	55	70	RC	3/8	VES	M-68-1	Inside	YES	N/A	Globe
1PS9357A	55	70	RC	2/8	YES	M-68-1	Outside	YES	MIN.	Globe
1PS9357B	55	70	RC	3/0	100					
Reactor and Contain- ment Drains to									2	
Radwaste			0	1	VES	M-70-1	Outside	YES	2.5	DIAPH
1RE9157	55	65	Gas	210	VES	M-70-1	Inside	YES	N/A	DIAPH
1RE9159A	55	65	Gas	214	VES	M-70-1	Outside	YES	1.0	DIAPH
18E9159B	55	65	Gas	3/4	VES	M-70-1	Inside	YES	N/A	DIAPH
IRF916CA	55	65	Gas		VES	M-70-1	Outside	YES	1.5	DIAPH
12F9160B	55	65	Gas	2	VES	M-70-1	Inside	YES	N/A	DIAPH
18F1003	55	11	Water	3	VEC	M-70-1	Outside	YES	1.0	DIAPH
1RE9170	55	11	Water	3	160					
Reactor Coolant										
Pressurizer				2/8	YES	M-60-6	Outside	YES	1.3	Globe
1RY8025	56	27	Nitrogen	3/8	VES	M-60-6	Inside	YES	N/A	Globe
1RY8026	56	27	Nitrogen	3/4	YES	M-50-6	Outside	YES	1.3	DIAPH
1RY8033	56	27	Nitrogen	3/4		M-60-6	Inside	YES	N/A	CHECK
1848047	56	27	Nitrogen	3/4	VES	M-60-6	Outside	YES	1.0	DIAPH
1RY8028	56	44	Water		2.445	M-60-6	Inside	YES	N/A	CHECK
1RY8046	56	44	water							



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# TABLE 6.2-58 (Cont'd)

ISOLATION VALVE NUMBER	GDC REQUIRE- MENT MET	PENETRA- TION NUMBER	FLUID	LINE SIZE (in.)	ESSEN- *	REFERENCE DRAWING	VALVE LOCA- TION (INSIDE OF OUTSIDE CONTAINMENT)	TYPE C LEAK TEST (YES OR NO)	DISTANCE TO OUTERMOST ISOLATION VALVE (ft)	VALVE TYPE
Residual Heat Removal 1RH8701A 1RH8701B 1RH8702A 1RH8702B	55 55 55 55	68 68 75 75	RC RC RC RC	12 12 12 12 12	YES YES YES YES	M-62 M-62 M-62 M-62	Inside Inside Inside Inside	NO NO NO	N/A N/A N/A N/A	Gate Gate Gate Gate

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### TABLE 6,2-58 (Cont'd)

ISOLATION VALVE NUMBER (Cont'd)	GDC REQUIRE- MENT MET	VALVE OPER- ATOR	NORMAL POSITION	SHUTDOWN POSITION	POST- ACCIDENT POSITION	POWER FAILURE POSITION	CLOSURE TIME** (sec)	ISOLA- TION SIGNALS	PRIMARY MODE OF ACTUA- TION	ARY MODE OF ACTUA- TION	POWER SOURCE	ISOLATION VALVE CONFIGU- RATION
Process Samplin	a											
1PS9354A	55	AO/S	Closed	Closed	Closed	Closed	10	Т	Α	RM	18	2
1PS93548	55	AO/S	Closed	Closed	Closed	Closed	10	Т	A	RM	16	2
10593556	55	AO/S	Closed	Closed	Closed	Closed	10	Т	A	RM	1E	2
10593558	55	AO/S	Closed	Closed	Closed	Closed	10	T	A	RM	IE	2
1PS9356A	55	A0/S	Closed	Closed	Closed	Closed	10	T	A	RM	16	2
10593568	55	A0/S	Closed	Closed	Closed	Closed	10	T	A	RM	1E	2
10593574	55	A0/S	Closed	Closed	Closed	Closed	10	Т	A	RM	1E	Z
1PS9357B	5*	AO/S	Closed	Closed	Closed	Closed	10	Т	A	RM	1E	2
Reactor and Con	itain-											
ment Drains to												
Radwaste												
1RE9157	55	AO/S	Open	Open	Closed	Closed	10	T	A	RM	15	2
1RE9159A	55	AO/S	Open	Open	Closed	Closed	10	T	A	RM	31	4
1RE91598	55	A0/S	Closed	Closed	Closed	Closed	10	T	A	RM	15	4
1RE9160A	55	AO/S	Open	Open	Closed	Closed	10	T	Α	RM	1E	2
1RE9160B	55	AO/S	Open	Open	Closed	Closed	10	T	A	RM	18	4
1RE1003	55	AO/S	Closed	Closed	Closed	Closed	10	Т	A	RM	16	4
1RE9170	55	AO/S	Open	Open	Closed	Closed	10	T		RM	1E	2
Reactor Coolant												
Pressurizer								1.00				
1RY8025	56	AO/S	Closed	Closed	Closed	Closed	10	T	A	RM	15	2
1RY8026	56	A0/S	Open	Open	Closed	Closed	10	T	A	RPI	12	
18¥8033	56	AO/S	Open	Open	Closed	Closed	10	T	A	KP1	12.	0
1RY8047	56	N/A	N/A	N/A	N/A	N/A	N/A	N/A	NA	N/A	NZA	2
1RY8028	56	AC/S	Open	Open	Closed	Closed	10	T	A	RM	16	0
1RY8046	56	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	B/A	NYA	0



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### TABLE 6.2-58 (Cont'd)

ISOLATION VALVE NUMBER (Cont'd)	GDC REQUIRE- MENT MET	VALVE OPER- ATOR	NORMAL POSITION	SHUTDOWN POSITION	POST- ACCIDENT POSITION	POWER FAILURE POSITION	CLOSURE TIME** _(sec)_	ISOLA- TION SIGNALS	PRIMARY MODE OF ACTUA- TION	SECOND- ARY MODE OF ACTUA- TION	POWER SOURCE	ISOLATION VALVE CONFIGU- RATION
Residual Heat Removal 1RH8701A 1RH8701B 1RN8702A 1RH8702B	55 55 55 55	MO MO MO MO	Closed Closed Closed Closed	Closed Closed Closed Closed	Closed Closed Closed Closed	As Is As Is As Is As Is As Is	N/A N/A N/A N/A	N/A N/A N/A N/A	RM RM RM RM	M M M M	1E 1E 1E 1E	9 9 9 9

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# TABLE 6.2-58 (Cont'd)

ISOLATION VALVE NUMBER	GDC REQUIRE- MENT MET	PENETRA- TION NUMBER	FLUID	LINE SIZE (in.)	ESSEN- TIAL*	REFERENCE	VALVE LOCA- TION (INSIDE OR OUTSIDE CONTAINMENT)	TYPE C LEAK TEST (YES QR_NQ)	DISTANCE TO OUTERMOST ISOLATION VALVE (ft)	VALVE TYPE
a data triaction					VEC	M-61-2	Outside	NO	4.8	Gate
Safety Injection	55	26	BW	4	1LO VEC	M-61-2	Outside	NO	8.9	Gate
1518801A	55	26	BW	4	100	M 61-7	Inside	NO	N/A	Check
1SI8801B	55	26	BW	3		M-01-2	Ontside	YES	15.5	Globe
IS18815	55	55	Nitrogen	1		M-01-0	Inside	YES	N/A	Check
1SI8880	55	55	Nitrogen	1		M-01-0	Outside	YES	17.8	Globe
1SI8968	55	55	BW	3/4	YES	M-01-0	Inside	YES	N/A	Globe
1SI8964	55	55	BW	3/4	YES	M-01-0	Outside	NO	3.7	Gate
1518871	55	59	Water	4	YES	M-01-3	Inside	NO	N/A	Check
1SI8802A	55	59	Water	2		M-51-3	Incide	NO	N/A	Check
1SI8905A	33	59	Water	2		M-61-3	Outeide	NO	2.7	Gate
1SI8905D	33	73	Water	4	YES	M-61-3	Incide	NO	N/A	Check
1SI8802B	22	73	Water	2		所-61-3	Incide	NO	N/A	Check
1518905C	22	73	Water	2		M-61-3	Outride	NO	3.3	Gate
1S18905B	33	60	Water	4	YES	7-51-3	Jacido	NO	N/A	Check
1SI8835	22	60	Water	2		M-61-3	inside	NO	N/A	Check
1S18819A	55	60	Water	2		<b>州</b> -61-3	inside	NO	N/A	Check
1S18819B	55	60	Water	2		M-61-3	nstole	NO	N/A	Check
1S18819C	55	60	Water	2		M-61-3	Insloe	NO	3.7	Gate
1S18819D	55	50	Water	8	YES	M-61-4	Outside	NO	N/A	Check
1S18809A	55	50	Water	6		M-61-4	Inside	No	N/A	Check
1518818A	55	50	Water	6		M-61-4	Inside	100	3.3	Gate
1SI8818D	55	50	Water	8		M-61-4	Outside	MO MO	N/A	Check
1ST8809B	55	51	Wator	6		M-61-4	Inside	NO	N/A	Check
ISTAB18B	55	51	Water	6		M-61-4	Inside	NO	1.9	Cate
ISTRA18C	55	51	Mater AM	24	YES	M-61-4	Inside	NO	1.0	Cate
ISTRALIA	56	92	NaOH+DW	24	YES	M-61-4	Inside	NO	1.0	Clobe
19199118	56	93	NaUN+DH	3/4		M-61-4	Inside	NO	N/A	Globe
1. 188908	55	50	water	3/4		M-61-4	Inside	NO	N/A	Clobe
10100000	55	51	water	2/4	VES	M-61-3	Outside	YES	14.7	Globe
10100700	55	55	Water	3/4	1.00	M-61-3	Inside	NO	N/A	DIGINE
1518881	55	59	Water	3/4						

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# TABLE 6.2-58 (Cont\*d)

ISOLATION VALVE NUMBER (Cont'd)	GDC REQUIRE- MENT_MET	VALVE OPER- ATOR	NORMAL POSITION	SHUTDOWN POSITION	POST- ACCIDENT POSITION	POJER FAILURE POSITION	CLOSURE TIME** (sec)	ISOLA- TION SIGNALS	PRIMARY MODE OF ACTUA- TION	ARY MODE OF ACTUA- TION	POWER SOURCE	ISOLATION VALVE CONFIGU- RATION
Safety Injection						No. To	8/*	S(Open)		RM	18	5
1CTRROIA	55	MO	Closed	Closed	open	AS IS	81/*	S(Open)	A	RM	1E	5
15188018	55	MO	Closed	Closed	Open	A5 15	NI/D	N/A	N/A	N/A	N/A	5
10108015	55	N/A	N/A	N/A	N/A	Closed	10	T	A	RM	18	6
1518880	55	AO/S	Closed	Closed	Closed	N/A	N/A	N/A	S/A	N/A	N/A	6
1518968	55	N/A	N/A	N/A	N/A Glanod	Clozed	10	Т	A	RM	12	2
1518964	55	AO/S	Closed	Closed	Closed	Closed	10	T	A	RM	16	2
1518871	55	AO/S	Closed	Closed	Crosed	Ae Te	N/*	N/A	RM	M	18	5
15188028	55	MO	Closed	Closed	Open.	N/h	N/A	N/A	N/A	N/A	N/A	5
1518905A	55	N/A	N/A	B/A	N/A	10/5	N/A	N/A	R/A	N/A	N/A	5
1S18905D	55	N/A	N/A	R/A	R/A	Be Is	N/*	N/A	RM	M	12	5
1S16802B	55	MO	Closed	Closed	w/h	N/A	N/A	N/A	N/A	N/A	發/為	5
1SI8905C	55	N/A	R/A	N/25	87.8	N/A	N/A	N/A	N/A	N/A	N/A	5
1S18905B	55	N/A	N/A	N/A	Closed	As Is	N/*	N/A	RM	M	1E	5
1518835	55	MO	Open	open	10300	N/A	N/A	N/A	N/A	N/A	N/A	5
1SI8819A	55	N/A	N/A	B/A	87.78	N/A	H/A	N/A	N/A	N/A	N/A	5
1S18819B	55	N/A	N/A	N/A	11/2	N/A	N/A	N/A	N/A	N/A	N/A	5
1518819C	55	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	R/A	5
1S18819D	55	N/A	N/A	B/A	Closed	As Is	8/*	N/A	RM	м	1E	5
1S18809A	55	MO	Open	opes	K/A	N/A	N/A	N/A	N/A	N/A	N/A	5
1S18818A	55	N/A	N/A	R/A	N/A	N/A	N/A	N/A	N/A	N/A	R/A	5
1SI8818D	55	N/A	N/A	N/A	Closed	As Is	11/*	N/A	RM	M	15	5
1S18809B	55	MO	Open	open	K/A	N/A	N/A	N/A	N/A	N/A	₩/A	5
1SI8818B	55	N/A	N/A	N/A	8/8	N/A	N/A	N/A	N/A	N/A	N/A	5
1S18818C	55	N/A	N/A	N/A Cloned	Onen	As Is	N/*	S(Open)	A	RM	IE	
1S18811A	56	MO	Closed	Closed	Open	As Is	N/*	S(Open)	A	RM	1E	
1SI8811B	56	MO	Closed	Closed	Clozed	Closed	N/*	N/A	RM	M	Non 1	E
1518890A	55	AO/S	Closed	Closed	Closed	Closed	8/*	R/A	RM	м	Non 1	8
1SI8890B	55	AO/S	Closed	Closed	Closed	Closed	10	Т	A	RM	16	Z
1518888	55	AO/S	Closed	Closed	Closed	Closed	N/*	N/A	RM	M	Non 1	E
1S18681	55	AO/S	Closed	Crosed	010000							



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TABLE 6.2-58 (Cont'd)

ISOLATION VALVE NUMBER	GDC REQUIRE- MENT_MET	PENETRA- TION NUMBER	FLUID	LINE SIZE (in.)	ESSEN- TIAL*	REFERENCE 	VALVE LOCA- TION (INSIDE OR OUTSIDE CONTAINMENT)	TYPE C LEAK TEST (YES OR NO)	DISTANCE TO OUTERMOST ISOLATION VALVE (ft)	VALVE TYPE
Safety Injection										
1SI8840	55	66	Water	12	YES	M-61-3	Outside	NO	3.8	Gate
1S18824	55	73	Water	3/4		M-61-3	Outside	NO	N/A	Globe
1518823	55	60	Water	3/4		M-61-3	Inside	NO	N/A	Globe
1SI8841A	55	66	Water	8		M-61-3	Inside	NO	N/A	Check
1SI8841B	55	66	Water	8		M-61-3	Inside	NO	N/A	Check
1SI8825	55	66	Water	3/4		M-61-3	Inside	NO	N/A	Giobe
1518843	55	26	BW	3/4		M-61-2	Inside	NO	N/A	Globe
Service Air										
1SA032	56	56	Air	1.50	YES	M-54-2	Outside	YES	4.4	Gate
1SA033	56	56	Air	1.50	YES	M 54-2	Inside	YES	N/A	Gate
Spent Fuel Pool										
Cleaning										-
1FC009	56	57	Water	4		M-63	Inside	YES	N/A	Plug
1FC010	56	57	Water	Ŕ.		M-63	Outside	YES	3.3	Flug
1FC011	56	32	Water	3		M-63	Outside	YES	2.0	Plug
1FC012	56	32	Water	3		M-63	Inside	YES	N/A	Plug
Steam Generator										
Blowdown					1.		and the second second			
1SD002C	57	50	Steam	2	YES	M-48-5	Outside	NO	53.95	Globe
1SD005B	57	60	Steam	3/8	YES	M-48-5	Outside	NO	61.50	Globe
1SD002D	57	81	Steam	2	YES	M-48-5	Outside	NO	58.39	Globe
1SD002A	57	82	Steam	2	YES	M-48-5	Outside	NO	12.86	Globe
1SD005A	57	82	Steam	3/8	YES	M-48-5	Outside	NO	20.50	Globe
1SD002B	57	83	Steam	2	YES	M-48-5	Outside	NO	11.25	Globe
1SD002E	57	88	Steam	2	YES	M-48-5	Outside	NO	62.32	Globe
1SD005C	57	88	Steam	3/8	YES	M-48-5	Outside	NO	67.29	Globe
1SD002F	57	89	Steam	2	YES	M-48-5	Outside	NO	46.18	Globe
1SD002G	57	90	Steam	2	YES	M-48-5	Outside	NO	6.0	Globe
1SD005D	57	90	Steam	3/8	VES	M-48-5	Outside	30	12.0	Globe
1SD002H	57	91	Steam	2	1'ES	M-48-5	Outside	-0	18.69	Globe

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# TABLE 6.2-58 (Cont'd'

ISOLATION VALVE NUMBER (Cont'd)	GDC REQUIRE- MENT MET	VALVE OPER- ATOR	NORMAL POSITION	SHUTDOWN POSITION	POST- ACCIDENT POSITION	POWER FAILURE POSITION	CLOSURE TIME** (sec)	ISOLA- TION SIGNALS	PRIMARY MODE OF ACTUA- TION	ARY MODE OF ACTUA- TION	POWER SOURCE	ISOLATION VALVE CONFIGU- RATION
Cotate Ininction									DM		15	5
safety injection	55	MO	Closed	Closed	Open	As Is	N/A	N7 P5	DM	M	Non 1E	
1516890	55	AO/S	Closed	Closed	Closed	Closed	N/*	N/A	DM	M	Non IE	
1510029	55	AO/S	Closed	Closed	Closed	Closed	N/*	N/A	RICE.	NI/A	N/A	5
1518823	55	N/A	N/A	N/A	N/A	N/A	N/A	N/A	187.75	N / B	12/8	5
1518641A	55	N/A	N/A	N/A	N/A	N/A	N/A	N/A	247.25	AN AN	Non 1E	
15188418	33	10/5	Closed	Closed	Closed	Closed	N/*	N/A	RM		Non 1E	
1518525	22	NO/S	Closed	Closed	Closed	Closed	N/*	N/A	KM	n .	NON YE	
1S18843	.53	807.5	CACH-									
Corvice Air						Closed	4.5	T	A	RM	15	2
156032	56	AO/S	Open	Open	Closed	Closed	4.5	Ť	A	RM	1E	2
156032	56	AO/S	Open	Open	Closed	Closed	4.3	- <b>1</b>				
LUNUSS										1.1		
Spent Fuel Pool											and the second sec	1
Cleaning			Claned.	0000	Closed	N/A	N/A	N/A	M	M	N/A	4
1FC009	56	M	Closed	Open	Closed	N/A	N/A	N/A	M	м	N/A	4
1FC010	56	M	Closed	Open	Closed	N/A	R/A	N/A	M	M	<b>预/A</b>	4
1FC011	56	M	Closed	open	Closed	82/3	N/A	N/A	M	M	N/A	4
1FC012	56	м	Closed	Open	Closed	BY A						
Steam Generator												
Bloudown				The second s		A	7.5	TSC	Δ.	RM	1E	11
1000020	57	AO/S	Open	Closed	Closed	Closed	1.3	T,00		RM	1E	11
1000058	57	AO/S	Closed	Closed	Closed	Closed	3.0	T 60		DM	1E	11
1500030	57	AO/S	Open	Closed	Closed	Closed	7.5	1,00		DM	15	11
1500020	57	AO/S	Open	Closed	Closed	Closed	7.5	1,50		EM	15	11
ISDOUZA	57	AO/S	Closed	Closed	Closed	Closed	3.0	T	2	D.M	15	11
ISDOUSA	4.7	AO/S	Open	Closed	Closed	Closed	7.5	T, 56	A	1042	15	11
1500028	57	AO/S	Open	Closed	Closed	Closed	7.5	T,SG	A	20M	15	11
1SD002E	57	10/5	Closed	Closed	Closed	Closed	3.0	T	A	RM DM	15	11
1SD005C	57	NO/S	Open	Closed	Closed	Closed	7.5	T,SG	A	50M	10	3.1
1SD0C2F	57	80/5	Open	Closed	Closed	Closed	7.5	T,SG	A	RM	16	11
1SD002G	57	AO/S	Closed	Closed	Closed	Closed	3.0	T	A	RM	15	11
1SD005D	57	AU/S	Open	Closed	Closed	Closed	7.5	T,SG	A	RM	18	8.5
1SD002H	37	A075	open	220000							A States	and a second

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TABLE 6.2-58 (Cont'd)

ISOLATION VALVE	GDC REQUIRE-	PENETRA- TION		LINE SIZE	ESSEN-	REFERENCE	VALVE LOCA- TION (INSIDE OR OUTSIDE CONTAINMENT)	TYPE C LEAK TEST (YES OR NO)	DISTANCE TO OUTERMOST ISOLATION VALVE (ft)	VALVE TYPE
NUMBER	MENT MET	NUMBER	FLUID	110.1	1470					
Steam Generator										
Feedwater						N 26 1	Outcide	80	13.75	Gate
1FW009A	57	79	Water	16	YES	M-30-1	Outside	NO	66.75	Globe
IAF013A	57	100	Water	4	YES	M-37	Outside	NO	62.5	Globe
1650135	57	100	Water	4	YES	M-37	Outside	80	46 75	Globe
1FW015A	57	100	Water	3/4		M-36-1	Outside	NO	12.75	Cate
1 FW009B	57	84	Water	16	YES	M-36-1	Outside	100	57 66	Clobe
1650124	57	101	Water	4	YES	M-37	Outside	NO	57.00	Cloba
1450125	57	101	Water	4	YES	M-37	Outside	NO	23.0	Clobe
160152	57	101	Water	3/4		M-36-1	Outside	NO	90.73	Cate
1EM0030	57	87	Water	16	YES	M-36-1	Outside	NO	13.73	Cloba
IFM003C	57	102	Water	4	YES	M-37	Outside	NO	33.73	Globe
IAFUI3C	57	102	Water	4	YES	M-37	Outside	NO	52.25	Globe
IAF013G	57	102	Water	3/4		M-36-1	Outside	NO	46.75	Globe
IFW015C	57	76	Water	16	YES	M-36-1	Outside	NO	13.75	Gate
1FW009D	57	00	Water	4	YES	M-37	Outside	NO	57.75	Globe
1AF013D	57	00	Water	4	YES	M-37	Outside	NO	54.25	Globe
1AF013H	27	0.0	Water	3/4		M-36-1	Outside	NO	46.75	Globe
1FW015D	57	200	Water	3	VES	M-36-1	Outside	NO	29.0	Globe
1FW035A	57	100	Wator	3	VES	M-36-1	Outside	NO	29.0	Globe
1FW035B	57	101	Water		VES	M-36-1	Outside	NO	32.5	Globe
1FW035C	-57	102	water		VEC	M-36-1	Outside	NO	32.5	Globe
1FW035D	57	99	water	2	VEC	M-76-1	Outside	NO	14.5	Gate
1FW039A	57	100	water	0	150	N 26 1	Outside	NO	14.5	Cate
1FW039B	57	101	Water		ILD	M 26 1	Outside	NO	14.5	Gate
1FW039C	57	102	Water	6	ILD	29-30-1 M 26 1	Outeide	NO	14.5	Gate
1FW039D	57	99	Water	6	YES	M-30-1	Outcide	NO	27.25	Globe
1FW043A	57	79	Water	3	YES	M-30-1	Outside	NO	27.25	Globe
1FW0433	57	84	Water	3	YES	M-30-1	Outside	RIC)	27 25	Clobe
1590430	57	87	Water	3	YES	M-36-1	Outside	100	27 25	Globe
1FW043D	57	76	Water	3	YES	M-36-1	Outside	RO	A	
Waeto Disnosal								ver	5.0	Plug
100026	56	47	Water	2	YES	M-48-6	Inside	TES	3.0	Dian
1RF027	56	47	Water	2	YES	M-48-6	Outside	YES	4.5	Filly .

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# TABLE 6.2-58 (Cont\*d)

ISOLATION VALVE NUMBER (Cont'd)	GDC REQUIRE- MENT MET	VALVE OPER- ATOR	NORMAL POSITION	SHUTDOWN POSITION	POST- ACCIDENT POSITION	POWER FAILURE POSITION	CLOSURE TIME** (sec)	ISOLA- TION SIGNALS	PRIMARY MODE OF ACTUA- TION	ARY MODE OF ACTUA- TION	POWER SOURCE	ISOLATION VALVE CONFIGU- RATION
Steam Generator								-		DM	15	10
Feedwater		110	Onen	Closed	Closed	Closed	5.0	EM.	DM .	M	15	10
1FW009A	57	HO	Open	Closed	Open	As Is	N/*	N/A	DM	M	IE	10
1AF013A	57	MO	Open	Closed	Open	As Is	N/*	N/A			N/A	14
1AF013E	57	MO	Closed	Closed	Closed	N/A	N/A	N/A		DM	15	10
1FW015A	57	M	Cioseu	Closed	Closed	Closed	5.0	EM	A	203	18	10
1FW009B	57	HO	Open	Closed	Open	As Is	报/#	N/A	KPS		15	10
IAF013B	57	MO	Open	Closed	Open	As Is	N/*	N/A	RM		N/A	14
1AF013F	57	MO	Open	Closed	Closed	N/A	N/A	N/A	M		18	10
1FW015B	57	M	Closed	Closed	Closed	Closed	5.0	FW	A	KM .	15	10
1FW009C	57	HO	open	Closed	Open	As Is	N/*	N/A	RM	m	15	10
1AF013C	57	MO	Upen	Closed	Open	As 13	N/*	N/A	RM	M	15	14
1AF013G	57	MO	Open	Closed	Closed	N/A	H/A	N/A	м	M	N/A	10
1FW015C	57	M	Closed	Closed	Closed	Closed	5.0	FH	A	RM	15	10
1 FW009D	57	HO	Open	Closed	Onon	As Is	N/*	N/A	RM	M	18	10
IAF013D	57	MO	Open	Closed	Open	As Is	N/*	N/A	RM	M	1E	1.4
1AF013H	57	MO	Open	Closed	Closed	N/A	H/A	N/A	M	M	N/A	1.4
1 FMOISD	57	M	Closed	Closed	Closed	Closed	6.0	FW	A	RM	18	11
1640358	57	AO/S	Open	Closed	Closed	Closed	6.0	FW	A	RM	16	11
1540358	57	AO/S	Open	Closed	Closed	Closed	6.0	FW	A	RM	16	11
100350	57	AC/S	Open	Closed	Closed	Closed	6.0	FW	A	RM	1E	11
100350	57	AO/S	Open	Closed	Closed	Closed	6.0	FW	A	RM	1E	11
1140330	57	AO/S	Open	Closed	Closed	Closed	6.0	FW	A	RM	16	11
1110394	57	AO/S	Open	Closed	Closed	Closed	6.0	FW	A	RM	1E	11
1FW039B	57	A0/5	Open	Closed	Closed	Closed	5.0	FW	A	RM	15	11
1FW039C	57	AO/S	Open	Closed	Closed	Closed	6.0	FM	A	RM	1E	11
1FW039D	57	AO/S	Closed	Closed	Closed	Closed	5.0	FW	A	RM	18	11
1FW043A	57	80/S	Closed	Closed	Closed	Closed	0.0	FW	A	MR	18	11
1FW043B	57	10/S	Closed	Closed	Closed	Closed	0.0	EW	A	RM	18	11
1FW043C	57	A0/5	Closed	Closed	Closed	Closed	6.0	2.14				
1FW043D	21	nore										
Martin Disposal						Closed	15	т	. A	RM	18	2
waste Disposal	56	AO/S	Open	Open	Closed	Closed	15	Т	A	RM	15	Z
147026	56	AO/S	Open	Open	closed	Croseu		나는 것이 가 있는 것				
198027	10 M									ALCONG 1 11 1 11 18	T DECE	ATTEND 1 1 19 19 19

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### TABLE 6.2-58 (Cont'd)

- NOTE: Although the data listed is only given for Unit 1, the data applies to Unit 2 valves as well.
  - \* Essential systems are those systems which may be used following a containment isolation signal. Essential systems may be isolated on containment isolation signals as noted in Column Isolation Signals, but their isolation valves are supplied with 1E power to permit remote manual reopening if required.
  - \*\* The valve closure times listed in column Closure Time are estimated maximum closure times. Actual measured times may vary from those listed. N/\* indicates that the valve does not receive an automatic isolation signal to close, however, the valve closure time is consistent with isolation valve requirements.
  - \*\*\* See Figure 6.2-29.

Braidwood has gate valves.

KEY:

AL		Air Lock
RC	-	Reactor Coolant
BW	-	Borated Water
CCW		Component Cooling Water
M	-	Manual
S		Solenoid
MO	20	Motor Operated
HO		Hydraulic Operated
AO		Air Operated
AO/S		Air Operated with Solenoid Accessory
"As Is"		is the Safe Position
S		Actuates on Safety Injection
Т		Actuates on Phase A Containment Isolation
P		Actuates on Phase B Containment Isolation
MS	-	Actuates on Main Steam Isolation
FW		Actuates on Main Feedwater Isolation
T1		Actuates on Containment Spray Actuation
T2	88	Actuates on Containment Vent Isolation
A	-	Automatic (Air, Hydraulic, or Electrical) Operation
M	10	Manual Operation
RM	-	Remote Manual Operation
AI	an i	Instrument Air
MIN.	20	Valves will be placed as close to the containment as practical.
SG	5.5	Actuates on Low-Low Steam Generator Level for Byron Unit 2 and Braidwood Units 1 and 2 only

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