



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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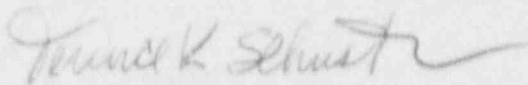
The teleconference of Reference (c) between Commonwealth Edison and Mr. C. Patel, which was subsequently documented in the letter of Reference (d), regarded the categorization of containment isolation valve position indication. The teleconference concluded with a common understanding that containment 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.

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,



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.

## Attachment (continued)

### 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.

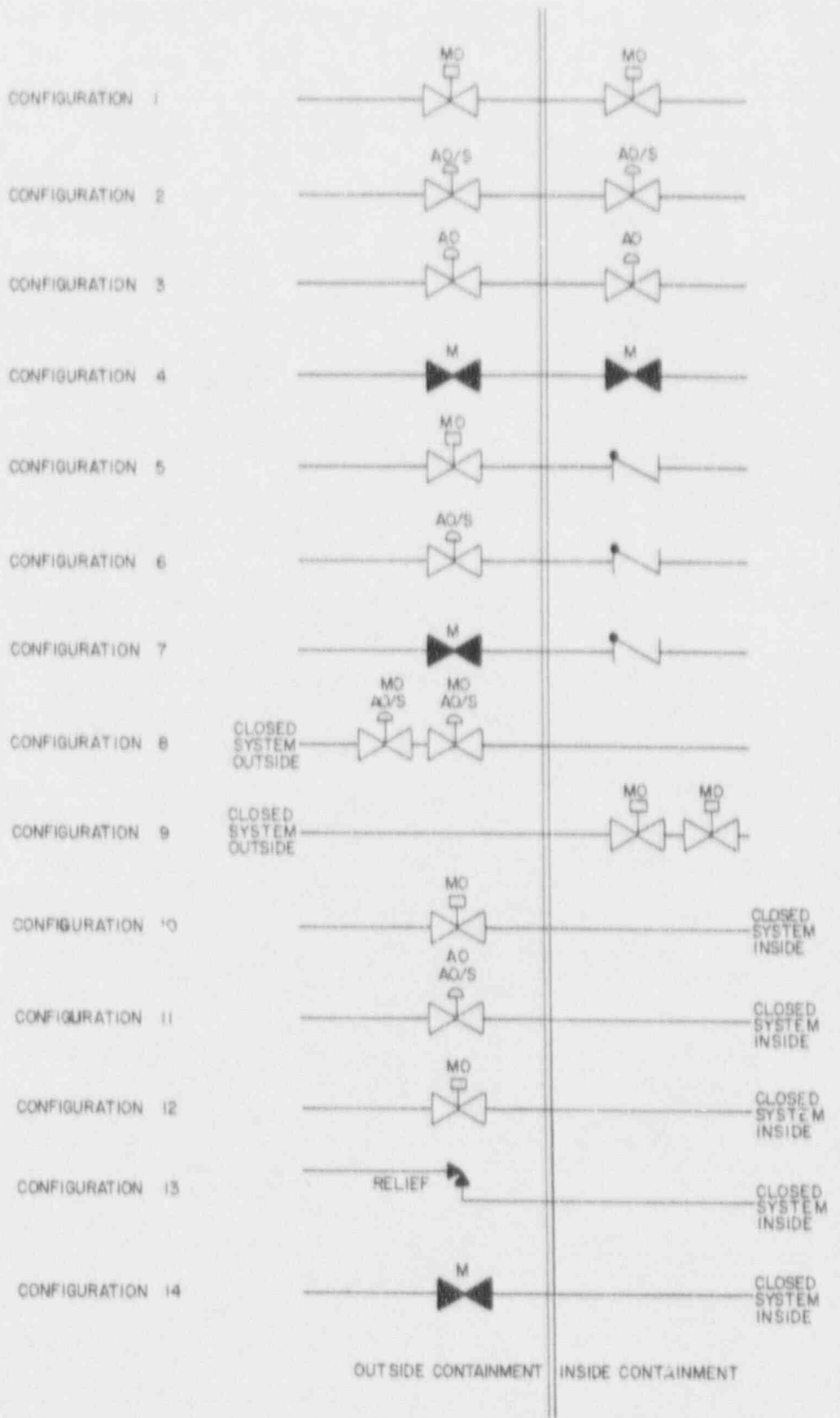
Penetration numbers 12, 31, 36 and 45, valves PS228A&B, PS229A&B, PS230A&B and PS231A&B. The valves are containment isolation for the hydrogen analyzer system which was installed in response to NUREG 0737. Redundant position indication is provided on the hydrogen analyzer suction line by independent 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.

ATTACHMENT B

NOTE: M - MANUAL  
 MO - MOTOR OPERATED  
 AO - AIR OPERATED  
 AO/S - AIR OPERATED WITH SOLENOID



BYRON BRADWOOD STATIONS  
 UPDATED FINAL SAFETY ANALYSIS REPORT  
 FIGURE 6.2-29  
 ISOLATION VALVE SCHEMES

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## ATTACHMENT C

B/B-UFSAR

TABLE 6.2-58

## CONTAINMENT ISOLATION PROVISIONS

ISOLATION VALVE NUMBER	GDC REQUIREMENT MET	PENETRATION NUMBER	FLUID	LINE SIZE (in.)	ESSENTIAL*	REFERENCE DRAWING	VALVE LOCATION (INSIDE OR OUTSIDE CONTAINMENT)	TYPE C LEAK TEST (YES OR NO)	DISTANCE TO OUTERMOST ISOLATION VALVE (ft)	VALVE TYPE
CVCS										
1CV8100	55	28	RC	2	YES	M-64-2	Outside	YES	2.6	Globe
1CV8112	55	28	RC	2	YES	M-64-2	Inside	YES	N/A	Globe
1CV8355C	55	53	RC	2		M-64-2	Outside	NO	4.0	Globe
1CV8368C	55	53	RC	2		M-64-2	Inside	NO	N/A	Check
1CV8355D	55	33	RC	2		M-64-2	Outside	NO	4.0	Globe
1CV8368D	55	33	RC	2		M-64-2	Inside	NO	N/A	Check
1CV8368D	55	33	RC	2		M-64-1	Outside	NO	4.0	Globe
1CV8355A	55	33	RC	2		M-64-1	Inside	NO	N/A	Check
1CV8368A	55	33	RC	2		M-64-1	Outside	NO	4.0	Globe
1CV8355B	55	53	RC	2		M-64-1	Inside	NO	N/A	Check
1CV8368B	55	53	RC	2		M-64-1	Outside	NO	2.9	Gate
1CV8105	57	71	RC	3	YES	M-64-3	Outside	NO	4.75	Gate
1CV8106	57	71	RC	3	YES	M-64-3	Outside	NO	4.75	Gate
1CV8346	55	37	RC	2		M-64-3	Outside	NO	3.2	Globe
1CV8348	55	37	RC	2		M-64-3	Inside	NO	N/A	Check
1CV8152	55	41	RC	3	YES	M-64-5	Outside	YES	2.9	Globe
1CV8160	55	41	RC	3	YES	M-64-5	Inside	YES	N/A	Globe
1CV8113	55	28	RC	3/4		M-64-2	Inside	YES	N/A	Check
Chilled Water										
1W0020A	56	5	Water	10	YES	M-118-5	Outside	YES	3.0	Gate
1W0006A	56	6	Water	10	YES	M-118-5	Outside	YES	3.0	Gate
1W0020B	56	8	Water	10	YES	M-118-5	Outside	YES	3.3	Gate
1W0006B	56	10	Water	10	YES	M-118-5	Outside	YES	3.3	Gate
1W0007A	56	6	Water	10	YES	M-118-5	Inside	YES	N/A	Check
1W0007B	56	10	Water	10	YES	M-118-5	Inside	YES	N/A	Check
1W0056A	56	5	Water	10	YES	M-118-5	Inside	YES	N/A	Gate
1W0056B	56	8	Water	10	YES	M-118-5	Inside	YES	N/A	Gate

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TABLE 6.2-58 (Cont'd)

ISOLATION VALVE NUMBER (Cont'd)	GDC REQUIREMENT MET	VALVE OPERATOR	NORMAL POSITION	SHUTDOWN POSITION	POST-ACCIDENT POSITION	POWER FAILURE POSITION	CLOSURE TIME** (sec)	ISOLATION SIGNALS	PRIMARY MODE OF ACTION	SECONDARY MODE OF ACTION	POWER SOURCE	ISOLATION VALVE CONFIGURATION
CVCS												1, 5
1CV8100	55	MO	Open	Open	Closed	As Is	10	T	A	RM	1E	1
1CV8112	55	MO	Open	Open	Closed	As Is	10	T	A	RM	1E	5
1CV8355C	55	MO	Open	Open	Open	As Is	N/**	N/A	RM	M	1E	5
1CV8368C	55	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	5
1CV8355D	55	MO	Open	Open	Open	As Is	N/**	N/A	RM	M	1E	5
1CV8368D	55	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	5
1CV8355A	55	MO	Open	Open	Open	As Is	N/**	N/A	RM	M	1E	5
1CV8368A	55	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	5
1CV8355B	55	MO	Open	Open	Open	As Is	N/**	N/A	RM	M	1E	5
1CV8368B	55	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	5
1CV8105	57	MO	Open	Open	Closed	As Is	10	S	A	RM	1E	8
1CV8106	57	MO	Open	Open	Closed	As Is	10	S	A	RM	1E	8
1CV8346	55	M	Closed	Closed	Closed	N/A	N/A	N/A	M	M	N/A	7
1CV8348	55	N/A	N/A	N/P	N/A	N/A	N/A	N/A	N/A	N/A	N/A	7
1CV8152	55	AO/S	Open	Open	Open	Closed	10	T	A	RM	1E	2
1CV8160	55	AO/S	Open	Open	Open	Closed	10	T	A	RM	1E	2
1CV8113	55	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	5
Chilled Water												
1W0020A	56	MO	Open	Open	Closed	As Is	50	T	A	RM	1E	1
1W0006A	56	MO	Open	Open	Closed	As Is	50	T	A	RM	1E	5
1W0020B	56	MO	Open	Open	Closed	As Is	50	T	A	RM	1E	5
1W0006B	56	MO	Open	Open	Closed	As Is	50	T	A	RM	1E	5
1W0007A	56	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	5
1W0007B	56	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	5
1W0056A	56	MO	Open	Open	Closed	As Is	50	T	A	RM	1E	1
1W0056B	56	MO	Open	Open	Closed	As Is	50	T	A	RM	1E	1

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TABLE 6.2-58 (Cont'd)

ISOLATION VALVE NUMBER	GDC REQUIREMENT MET	PENETRATION NUMBER	FLUID	LINE SIZE (in.)	ESSENTIAL*	REFERENCE DRAWING	VALVE LOCATION (INSIDE OR OUTSIDE CONTAINMENT)	TYPE C LEAK TEST (YES OR NO)	DISTANCE TO OUTERMOST ISOLATION VALVE (ft.)	VALVE TYPE
Component Cooling										
1CC9414	56	21	CCW	6	YES	M-66-1	Outside	YES		Gate
1CC9416	56	21	CCW	6	YES	M-66-1	Inside	YES	8.7	Gate
1CC9534	56	21	CCW	3/4		M-66-1	inside	YES	4.7	Check
1CC9437B	57	22	CCW	3	YES	M-66-1	Outside	NO	6.1	Globe
1CC685	56	24	CCW	4	YES	M-66-1	Outside	YES	2.1	Gate
1CC9438	56	24	CCW	4	YES	M-66-1	Inside	YES	N/A	Gate
1CC9518	56	24	CCW	3/4	YES	M-66-1	Inside	YES	N/A	Check
1CC9486	56	25	CCW	6		M-66-1	Inside	YES	N/A	Check
1CC9413A	56	25	CCW	6	YES	M-66-1	Outside	YES	4.9	Gate
1CC9413B	56	25	CCW	6	YES	M-66-1	Outside	NO	6.8	Gate
1CC9437A	57	48	CCW	3	YES	M-66-1	Outside	NO	6.8	Globe
Containment Purge										
1VQ005A	56	94	Air	8	YES	M-105-1	Inside	YES	N/A	But. Fly
1VQ005B	56	94	Air	8	YES	M-105-1	Outside	YES	6.0	But. Fly
1VQ003	56	94	Air	8	YES	M-105-1	Outside	YES	9.0	But. Fly
1VQ002A	56	95	Air	48	YES	M-105-1	Inside	YES	N/A	But. Fly
1VQ002B	56	95	Air	48	YES	M-105-1	Outside	YES	2.9	But. Fly
1VQ004A	56	96	Air	8	YES	M-105-1	Inside	YES	N/A	But. Fly
1VQ004B	56	96	Air	8	YES	M-105-1	Outside	YES	2.0	But. Fly
1VQ001A	56	97	Air	48	YES	M-105-1	Inside	YES	N/A	But. Fly
1VQ001B	56	97	Air	48	YES	M-105-1	Outside	YES	2.9	But. Fly
1VQ005C	56	94	Air	8	YES	M-105-1	Outside	YES	3.5	But. Fly
Containment Spray										
1CS007A	56	1	NaOH+BW	10	YES	M-46-1	Outside	YES	3.3	Gate
1CS008A	56	1	NaOH+BW	10		M-46-1	Inside	YES	N/A	Check
1CS007B	56	16	NaOH+BW	10	YES	M-46-1	Outside	YES	3.8	Gate
1CS008B	56	16	NaOH+BW	10		M-46-1	Inside	YES	N/A	Check

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## B/B-UFSAR

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
Component Cooling												
1CC9414	56	MO	Open	Open	Closed	As Is	10	P	A	RM	1E	1,5
1CC9416	56	MO	Open	Open	Closed	As Is	10	P	A	RM	1E	1
1CC9534	56	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	5
1CC9437B	57	AO/S	Open	Closed	Closed	Closed	10	T	A	RM	1E	11
1CC685	56	MO	Open	Open	Closed	As Is	10	P	A	RM	1E	1,5
1CC9438	56	MO	Open	Open	Closed	As Is	10	P	A	RM	1E	1
1CC9518	56	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	5
1CC9486	56	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	5
1CC9413A	56	MO	Open	Open	Closed	As Is	10	P	A	RM	1E	5
1CC9413B	56	MO	Open	Open	Closed	As Is	10	P	A	RM	1E	5
1CC9437A	57	AO/S	Closed	Closed	Closed	Closed	10	T	A	RM	1E	11
Containment Purge												
1VQ005A	56	AO/S	Closed	Closed	Closed	Closed	5	T2	A	RM	1E	2
1VQ005B	56	AO/S	Closed	Closed	Closed	Closed	5	T2	A	RM	1E	2
1VQ003	56	AO/S	Closed	Closed	Closed	Closed	5	T2	A	RM	1E	2
1VQ002A	56	HO	Closed	Open	Closed	Closed	5	T2	A	RM	1E	1
1VQ002B	56	HO	Closed	Open	Closed	Closed	5	T2	A	RM	1E	1
1VQ004A	56	AO/S	Closed	Closed	Closed	Closed	5	T2	A	RM	1E	2
1VQ004B	56	AO/S	Closed	Closed	Closed	Closed	5	T2	A	RM	1E	2
1VQ001A	56	HO	Closed	Open	Closed	Closed	5	T2	A	RM	1E	1
1VQ001B	56	HO	Closed	Open	Closed	Closed	5	T2	A	RM	1E	1
1VQ005C	56	AO/S	Open	Open	Open	Closed	5	T2	A	RM	1E	2
Containment Spray												
1CS007A	56	MO	Closed	Closed	Closed	As Is	30	T1	A	RM	1E	5
1CS008A	56	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	5
1CS007B	56	MO	Closed	Closed	Closed	As Is	30	T1	A	RM	1E	5
1CS008B	56	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	5

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TABLE 6.2-58 (Cont'd)

ISOLATION VALVE NUMBER	GDC REQUIREMENT MET	PENETRATION NUMBER	FLUID	LINE SIZE (in.)	ESSENTIAL*	REFERENCE DRAWING	VALVE LOCATION (INSIDE OR OUTSIDE CONTAINMENT)	TYPE C LEAK TEST (YES OR NO)	DISTANCE TO OUTERMOST ISOLATION VALVE (ft.)	VALVE TYPE
Essential Service										
Water										
1SX016B	57	7	Water	16	YES	M-42-5	Outside		3.2	But. Fly
1SX027B	57	9	Water	16	YES	M-42-5	Outside	NO	3.2	But. Fly
1SX027A	57	14	Water	16	YES	M-42-5	Outside	NO	2.8	But. Fly
1SX016A	57	15	Water	16	YES	M-42-5	Outside	NO	2.8	But. Fly
Fire Protection										
1FP010	56	34	Water	4	YES	M-52-1	Outside	NO	3.3	Globe
1FP345	56	34	Water	4	YES	M-52-1	Inside	NO	N/A	Check
Instrument										
Air										
1IA065	56	39	Air	3	YES	M-55-2	Outside	YES	3.3	Globe
1IA066	56	39	Air	3	YES	M-55-2	Inside	YES	N/A	Globe
1IA091	56	39	Air	3/4	YES	M-55-2	Inside	YES	N/A	Check
Instrument Penetration										
1VQ016	56	I3	Air	1/2		M-105-3	Inside	YES	N/A	Globe
1VQ017	56	I3	Air	1/2		M-105-3	Inside	YES	N/A	Globe
1VQ018	56	I3	Air	1/2		M-105-3	Outside	YES	MIN.	Globe
1VQ019	56	I3	Air	1/2		M-105-3	Outside	YES	MIN.	Globe
		I1	Silicone Oil			M-2046-2,4				
		I2	Silicone Oil			M-2046-2,4				
		I3	Silicone Oil			M-2046-2,4				
		I4	Silicone Oil			M-2046-2,4				
1RY075	57	I5	Water	1/2		M-2060-6	Outside	YES	1.0	Globe
		I9	Water			M-2060-17,18				

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TABLE 6.2-58 (Cont'd)

ISOLATION VALVE NUMBER	GDC REQUIREMENT MET	PENETRATION NUMBER	FLUID	LINE SIZE (in.)	ESSENTIAL*	REFERENCE DRAWING	VALVE LOCATION (INSIDE OR OUTSIDE CONTAINMENT)	TYPE C LEAK TEST (YES OR NO)	DISTANCE TO OUTERMOST ISOLATION VALVE (ft)	VALVE TYPE
Make-up										
Demineralizer										
1WM190	55	30	Water	2		M-49-1	Outside	YES	1.6	Globe
1WM191	55	30	Water	2		M-49-1	Inside	YES	N/A	Check
Main Steam										
IMS001D	57	77	Steam	30.25	YES	M-35-1	Outside	NO	14.6	Gate
IMS101D	57	77	Steam	4	YES	M-35-1	Outside	NO	20.0	Gate
IMS021D	57	77	Steam	3		M-35-1	Outside	NO	15.4	Globe
IMS018D	57	77	Steam	6	YES	M-35-1	Outside	NO	32.1	Relief
IMS013D	57	77	Steam	6		M-35-1	Outside	NO	39.1	Relief

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## B/B-UFSAR

TABLE 6.2-58 (Cont'd)

ISOLATION VALVE NUMBER (Cont'd)	GDC REQUIREMENT MET	VALVE OPERATOR	NORMAL POSITION	SHUTDOWN POSITION	POST-ACCIDENT POSITION	POWER FAILURE POSITION	CLOSURE TIME** (sec)	ISOLATION SIGNALS	PRIMARY MODE OF ACTUATION	SECONDARY MODE OF ACTUATION	POWER SOURCE	ISOLATION VALVE CONFIGURATION
Essential Service												
Water												
1SX016B	57	MO	Open	Open	Open	As Is	N/*S	(Open)	A	RM	1E	10
1SX027B	57	MO	Open	Open	Open	As Is	N/*S	(Open)	A	RM	1E	10
1SX027A	57	MO	Open	Open	Open	As Is	N/*S	(Open)	A	RM	1E	10
1SX016A	57	MO	Open	Open	Open	As Is	N/*S	(Open)	A	RM	1E	10
Fire Protection												
1FP010	56	AO/S	Open	Closed	Closed	Closed	12	T	A	RM	1E	6
1FP345	56	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	6
Instrument Air												
1IA065	56	AO/S	Open	Open	Closed	Closed	15	T	A	RM	1E	2,6
1IA066	56	AO/S	Open	Open	Closed	Closed	15	T	A	RM	1E	2
1IA091	56	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	6
Instrument Penetration												
1VQ016	56	M	Closed	Closed	Closed	N/A	N/A	N/A	M	M	N/A	4
1VQ017	56	M	Closed	Closed	Closed	N/A	N/A	N/A	M	M	N/A	4
1VQ018	56	M	Closed	Closed	Closed	N/A	N/A	N/A	M	M	N/A	4
1VQ019	56	M	Closed	Closed	Closed	N/A	N/A	N/A	M	M	N/A	4
1RY075	57	M	Closed	Closed	Closed	N/A	N/A	N/A	M	M	N/A	

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TABLE 6.2-58 (Cont'd)

ISOLATION VALVE NUMBER (Cont'd)	GDC REQUIREMENT MET	VALVE OPERATOR	NORMAL POSITION	SHUTDOWN POSITION	POST-ACCIDENT POSITION	POWER FAILURE POSITION	CLOSURE TIME** (sec)	ISOLATION SIGNALS	PRIMARY MODE OF ACTUATION	SECONDARY MODE OF ACTUATION	POWER SOURCE	ISOLATION VALVE CONFIGURATION
Make-up												
Demineralizer												
1WM190	55	M	Closed	Open	Closed	N/A	N/A	N/A	M	M	N/A	7
1WM191	55	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	7
Main Steam												
IMS001D	57	HO	Open	Closed	Closed	As Is	5.0	MS	A	RM	1E	10
IMS101D	57	AO/S	Closed	Closed	Closed	Closed	6.0	MS	A	RM	1E	11
IMS021D	57	M	Closed	Closed	Closed	N/A	N/A	N/A	M	M	N/A	14
IMS018D	57	HO	Closed	Closed	Closed	Closed	N/A	N/A	A	RM	1E	13
IMS013D	57	N/A	Closed	Closed	Closed	N/A	N/A	N/A	N/A	N/A	N/A	13

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TABLE 6.2-58 (Cont'd)

ISOLATION VALVE NUMBER	GDC REQUIREMENT MET	PENETRATION NUMBER	FLUID	LINE SIZE (in.)	ESSENTIAL*	REFERENCE DRAWING	VALVE LOCATION (INSIDE OR OUTSIDE CONTAINMENT)	TYPE C LEAK TEST (YES OR NO)	DISTANCE TO OUTERMOST ISOLATION VALVE (ft)	VALVE TYPE
Main Steam			Steam	6		M-35-1	Outside	NO	36.6	Relief
1MS014D	57	77	Steam	6		M-35-1	Outside	NO	34.1	Relief
1MS015D	57	77	Steam	6		M-35-1	Outside	NO	31.6	Relief
1MS016D	57	77	Steam	6		M-35-1	Outside	NO	29.1	Relief
1MS017D	57	77	Steam	6		M-35-1	Outside	NO	10.0	Gate
1MS001B	57	85	Steam	32.75	YES	M-35-1	Outside	NO	17.7	Gate
1MS101B	57	85	Steam	4	YES	M-35-1	Outside	NO	11.0	Globe
1MS021B	57	85	Steam	3		M-35-1	Outside	NO	16.5	Relief
1MS018B	57	85	Steam	6	YES	M-35-1	Outside	NO	38.8	Relief
1MS013B	57	85	Steam	6		M-35-1	Outside	NO	36.3	Relief
1MS014B	57	85	Steam	6		M-35-1	Outside	NO	33.8	Relief
1MS015B	57	85	Steam	6		M-35-1	Outside	NO	31.3	Relief
1MS016B	57	85	Steam	6		M-35-1	Outside	NO	28.8	Relief
1MS017B	57	85	Steam	6		M-35-1	Outside	NO	14.8	Gate
1MS001A	57	78	Steam	30.25	YES	M-35-2	Outside	NO	20.0	Gate
1MS101A	57	78	Steam	4	YES	M-35-2	Outside	NO	15.4	Globe
1MS021A	57	78	Steam	3		M-35-2	Outside	NO	32.1	Relief
1MS018A	57	78	Steam	6	YES	M-35-2	Outside	NO	39.1	Relief
1MS013A	57	78	Steam	6		M-35-2	Outside	NO	36.6	Relief
1MS014A	57	78	Steam	6		M-35-2	Outside	NO	34.1	Relief
1MS015A	57	78	Steam	6		M-35-2	Outside	NO	31.6	Relief
1MS016A	57	78	Steam	6		M-35-2	Outside	NO	29.1	Relief
1MS017A	57	78	Steam	6		M-35-2	Outside	NO	10.0	Gate
1MS001C	57	86	Steam	32.75	YES	M-35-2	Outside	NO	17.7	Gate
1MS101C	57	86	Steam	4	YES	M-35-2	Outside	NO	11.0	Globe
1MS021C	57	86	Steam	3		M-35-2	Outside	NO	16.5	Relief
1MS018C	57	86	Steam	6	YES	M-35-2	Outside	NO	38.8	Relief
1MS013C	57	86	Steam	6		M-35-2	Outside	NO	36.3	Relief
1MS014C	57	86	Steam	6		M-35-2	Outside	NO	33.8	Relief
1MS015C	57	86	Steam	6		M-35-2	Outside	NO	31.3	Relief
1MS016C	57	86	Steam	6		M-35-2	Outside	NO	28.8	Relief
1MS017C	57	86	Steam	6		M-35-2	Outside	NO		

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TABLE 6.2-58 (Cont'd)

ISOLATION VALVE NUMBER (Cont'd)	GDC REQUIREMENT MET	VALVE OPERATOR	NORMAL POSITION	SHUTDOWN POSITION	POST-ACCIDENT POSITION	POWER FAILURE POSITION	CLOSURE TIME** (sec)	ISOLATION SIGNALS	PRIMARY MODE OF ACTUATION	SECONDARY MODE OF ACTUATION	POWER SOURCE	ISOLATION VALVE CONFIGURATION
Main Steam												13
IMS014D	57	N/A	Closed	Closed	Closed	N/A	N/A	N/A	N/A	N/A	N/A	13
IMS015D	57	N/A	Closed	Closed	Closed	N/A	N/A	N/A	N/A	N/A	N/A	13
IMS016D	57	N/A	Closed	Closed	Closed	N/A	N/A	N/A	N/A	N/A	N/A	13
IMS017D	57	N/A	Closed	Closed	Closed	N/A	N/A	N/A	N/A	N/A	N/A	13
IMS001B	57	HO	Open	Closed	Closed	As Is	5.0	MS	A	RM	1E	10
IMS101B	57	AO/S	Closed	Closed	Closed	Closed	6.0	MS	A	RM	1E	11
IMS021B	57	M	Closed	Closed	Closed	N/A	N/A	N/A	M	M	N/A	14
IMS018B	57	HO	Closed	Closed	Closed	N/A	N/A	N/A	A	RM	1E	13
IMS013B	57	N/A	Closed	Closed	Closed	N/A	N/A	N/A	N/A	N/A	N/A	13
IMS014B	57	N/A	Closed	Closed	Closed	N/A	N/A	N/A	N/A	N/A	N/A	13
IMS015B	57	N/A	Closed	Closed	Closed	N/A	N/A	N/A	N/A	N/A	N/A	13
IMS016B	57	N/A	Closed	Closed	Closed	N/A	N/A	N/A	N/A	N/A	N/A	13
IMS017B	57	N/A	Closed	Closed	Closed	N/A	N/A	N/A	N/A	N/A	N/A	13
IMS001A	57	HO	Open	Closed	Closed	As Is	5.0	MS	A	RM	1E	10
IMS101A	57	AO/S	Closed	Closed	Closed	Closed	6.0	MS	A	RM	1E	11
IMS021A	57	M	Closed	Closed	Closed	N/A	N/A	N/A	M	M	N/A	14
IMS018A	57	HO	Closed	Closed	Closed	N/A	N/A	N/A	A	RM	1E	13
IMS013A	57	N/A	Closed	Closed	Closed	N/A	N/A	N/A	N/A	N/A	N/A	13
IMS014A	57	N/A	Closed	Closed	Closed	N/A	N/A	N/A	N/A	N/A	N/A	13
IMS015A	57	N/A	Closed	Closed	Closed	N/A	N/A	N/A	N/A	N/A	N/A	13
IMS016A	57	N/A	Closed	Closed	Closed	N/A	N/A	N/A	N/A	N/A	N/A	13
IMS017A	57	N/A	Closed	Closed	Closed	N/A	N/A	N/A	N/A	N/A	N/A	13
IMS001C	57	HO	Open	Closed	Closed	As Is	5.0	MS	A	RM	1E	10
IMS101C	57	AO/S	Closed	Closed	Closed	Closed	6.0	MS	A	RM	1E	11
IMS021C	57	M	Closed	Closed	Closed	N/A	N/A	N/A	M	M	N/A	14
IMS018C	57	HO	Closed	Closed	Closed	Closed	N/A	N/A	A	RM	1E	13
IMS013C	57	N/A	Closed	Closed	Closed	N/A	N/A	N/A	N/A	N/A	N/A	13
IMS014C	57	N/A	Closed	Closed	Closed	N/A	N/A	N/A	N/A	N/A	N/A	13
IMS015C	57	N/A	Closed	Closed	Closed	N/A	N/A	N/A	N/A	N/A	N/A	13
IMS016C	57	N/A	Closed	Closed	Closed	N/A	N/A	N/A	N/A	N/A	N/A	13
IMS017C	57	N/A	Closed	Closed	Closed	N/A	N/A	N/A	N/A	N/A	N/A	13

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TABLE 6.2-58 (Cont'd)

ISOLATION VALVE NUMBER	GDC REQUIREMENT MET	PENETRATION NUMBER	FLUID	LINE SIZE (in.)	ESSENTIAL*	REFERENCE DRAWING	VALVE LOCATION (INSIDE OR OUTSIDE CONTAINMENT)	TYPE C LEAK TEST (YES OR NO)	DISTANCE TO OUTERMOST ISOLATION VALVE (ft.)	VALVE TYPE
Off-Gas										
1OG079	56	13	Air & H <sub>2</sub>	3	YES	M-47-2	Inside	YES	N/A	But. Fly
1OG080	56	13	Air & H <sub>2</sub>	3	YES	M-47-2	Inside	YES	N/A	But. Fly
1OG081	56	23	Air & H <sub>2</sub>	3	YES	M-47-2	Inside	YES	N/A	But. Fly
1OG057A	56	69	Air & H <sub>2</sub>	3	YES	M-47-2	Outside	YES	MIN.	But. Fly
1OG082	56	13	Air & H <sub>2</sub>	3	YES	M-47-2	Outside	YES	MIN.	But. Fly
1OG083	56	69	Air & H <sub>2</sub>	3	YES	M-47-2	Outside	YES	MIN.	But. Fly
1OG084	56	13	Air & H <sub>2</sub>	3	YES	M-47-2	Outside	YES	MIN.	But. Fly
1OG095	56	23	Air & H <sub>2</sub>	3	YES	M-47-2	Outside	YES	MIN.	But. Fly
Process Radiation										
1PR001A	56	52	Air	1		M-78-10	Outside	YES	1.4	Globe
1PR001B	56	52	Air	1		M-78-10	Outside	YES	3.5	Globe
1PR066	56	52	Air	1		M-78-10	Outside	YES	2.3	Globe
1Pk032	56	52	Air	1		M-78-10	Inside	YES	N/A	Check
1PR033A	56	AL	Air	2		M-78-6	Outside	YES	MIN.	Globe
1PR033B	56	AL	Air	2		M-78-6	Outside	YES	MIN.	Globe
1PR002E	56	AL	Air	2		M-78-6	Inside	YES	N/A	Check
1PR002G	56	AL	Air	2		M-78-6	Outside	YES	MIN.	Globe
1PR033C	56	AL	Air	2		M-78-6	Outside	YES	MIN.	Globe
1PR033D	56	AL	Air	2		M-78-6	Outside	YES	MIN.	Globe
1PR002F	56	AL	Air	2		M-78-6	Inside	YES	N/A	Check
1PR002H	56	AL	Air	2		M-78-6	Inside	YES	N/A	Check
Hydrogen Monitor										
1PS228A	56	45	H <sub>2</sub> + Air	1/2		M-68-7	Outside	YES	MIN.	Globe†
1PS229A	56	45	H <sub>2</sub> + Air	1/2		M-68-7	Outside	YES	MIN.	Globe†
1PS230A	56	12 (BY) 45 (BW)	H <sub>2</sub> + Air	1/2		M-68-7	Outside	YES	MIN.	Globe†
1PS231A	56	12 (BY) 45 (BW)	H <sub>2</sub> + Air	3/4		M-68-7	Inside	YES	N/A	Check
1PS228B	56	36	H <sub>2</sub> + Air	1/2		M-68-7	Outside	YES	MIN.	Globe†
1PS229B	56	36	H <sub>2</sub> + Air	1/2		M-68-7	Outside	YES	MIN.	Globe†
1PS230B	56	31 (BY) 36 (BW)	H <sub>2</sub> + Air	1/2		M-68-7	Outside	YES	MIN.	Globe†
1PS231B	56	31 (BY) 36 (BW)	H <sub>2</sub> + Air	3/4		M-68-7	Inside	YES	N/A	Check

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TABLE 6.2-58 (Cont'd)

ISOLATION VALVE NUMBER (Cont'd)	GDC REQUIREMENT MET	VALVE OPERATOR	NORMAL POSITION	SHUTDOWN POSITION	POST-ACCIDENT POSITION	POWER FAILURE POSITION	CLOSURE TIME** (sec)	ISOLATION SIGNALS	PRIMARY MODE OF ACTION	SECONDARY MODE OF ACTION	POWER SOURCE	ISOLATION VALVE CONFIGURATION
Off-Gas												
IOG079	56	MO	Closed	Closed	Closed	As Is	60	T	A	RM	1E	1
IOG080	56	MO	Closed	Closed	Closed	As Is	60	T	A	RM	1E	1
IOG081	56	MO	Closed	Closed	Closed	As Is	60	T	A	RM	1E	1
IOG057A	56	MO	Closed	Closed	Closed	As Is	60	T	A	RM	1E	1
IOG082	56	MO	Closed	Closed	Closed	As Is	60	T	A	RM	1E	1
IOG083	56	MO	Closed	Closed	Closed	As Is	60	T	A	RM	1E	1
IOG084	56	MO	Closed	Closed	Closed	As Is	60	T	A	RM	1E	1
IOG085	56	MO	Closed	Closed	Closed	As Is	60	T	A	RM	1E	1
Process Radiation												
1PR001A	56	AO/S	Open	Closed	Closed	Closed	4.5	T	A	RM	1E	8
1PR001B	56	AO/S	Open	Closed	Closed	Closed	4.5	T	A	RM	1E	8
1PR066	56	AO/S	Open	Closed	Closed	Closed	5.0	T	A	RM	1E	6
1PR032	56	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	6
1PR033A	56	M	Closed	Closed	Closed	N/A	N/A	N/A	N/A	N/A	N/A	
1PR033B	56	M	Closed	Closed	Closed	N/A	N/A	N/A	N/A	N/A	N/A	7
1PR002E	56	M	Closed	Closed	Closed	N/A	N/A	N/A	N/A	N/A	N/A	7
1PR002G	56	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
1PR033C	56	M	Closed	Closed	Closed	N/A	N/A	N/A	N/A	N/A	N/A	
1PR033D	56	M	Closed	Closed	Closed	N/A	N/A	N/A	N/A	N/A	N/A	7
1PR002F	56	M	Closed	Closed	Closed	N/A	N/A	N/A	N/A	N/A	N/A	7
1PR002H	56	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
Hydrogen Monitor												
1PS228A	56	S	Open	Closed	Closed	As Is	15	T	A	RM	1E	
1PS229A	56	S	Open	Closed	Closed	As Is	15	T	A	RM	1E	
1PS230A	56	S	Closed	Closed	Closed	As Is	15	T	A	RM	1E	
1PS231A	56	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
1PS228B	56	S	Open	Closed	Closed	As Is	15	T	A	RM	1E	
1PS229B	56	S	Open	Closed	Closed	As Is	15	T	A	RM	1E	
1PS230B	56	S	Closed	Closed	Closed	Closed	15	T	A	RM	1E	
1PS231B	56	N/A	N/A	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 REQUIREMENT MET	PENETRATION NUMBER	FLUID	LINE SIZE (in.)	ESSENTIAL*	REFERENCE DRAWING	VALVE LOCATION (INSIDE OR OUTSIDE CONTAINMENT)	TYPE C LEAK TEST (YES OR NO)	DISTANCE TO OUTERMOST ISOLATION VALVE (ft)	VALVE TYPE
Process Sampling										
IPS9354A	55	70	RC	3/8	YES	M-68-1	Inside	YES	N/A	Globe
IPS9354B	55	70	RC	3/8	YES	M-68-1	Outside	YES	MIN.	Globe
IPS9355A	55	70	RC	3/8	YES	M-68-1	Outside	YES	N/A	Globe
IPS9355B	55	70	RC	3/8	YES	M-68-1	Outside	YES	MIN.	Globe
IPS9356A	55	70	RC	3/8	YES	M-68-1	Inside	YES	N/A	Globe
IPS9356B	55	70	RC	3/8	YES	M-68-1	Outside	YES	MIN.	Globe
IPS9357A	55	70	RC	3/8	YES	M-68-1	Inside	YES	N/A	Globe
IPS9357B	55	70	RC	3/8	YES	M-68-1	Outside	YES	MIN.	Globe
Reactor and Containment Drains to Radwaste										
IRE9157	55	65	Gas	1	YES	M-70-1	Outside	YES	2.5	DIAPH
IRE9159A	55	65	Gas	3/4	YES	M-70-1	Inside	YES	N/A	DIAPH
IRE9159B	55	65	Gas	3/4	YES	M-70-1	Outside	YES	1.0	DIAPH
IRE9159B	55	65	Gas	1	YES	M-70-1	Inside	YES	N/A	DIAPH
IRE9160A	55	65	Gas	1	YES	M-70-1	Outside	YES	1.5	DIAPH
IRE9160B	55	65	Gas	1	YES	M-70-1	Inside	YES	N/A	DIAPH
IRE1003	55	11	Water	3	YES	M-70-1	Inside	YES	N/A	DIAPH
IRE9170	55	11	Water	3	YES	M-70-1	Outside	YES	1.0	DIAPH
Reactor Coolant Pressurizer										
IRY8025	56	27	Nitrogen	3/8	YES	M-60-6	Outside	YES	1.3	Globe
IRY8026	56	27	Nitrogen	3/8	YES	M-60-6	Inside	YES	N/A	Globe
IRY8033	56	27	Nitrogen	3/4	YES	M-60-6	Outside	YES	1.3	DIAPH
IRY8047	56	27	Nitrogen	3/4	YES	M-60-6	Inside	YES	N/A	CHECK
IRY8028	56	44	Water	3	YES	M-60-6	Outside	YES	1.0	DIAPH
IRY8046	56	44	Water	3	YES	M-60-6	Inside	YES	N/A	CHECK

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TABLE 6.2-58 (Cont'd)

<u>ISOLATION VALVE NUMBER</u>	<u>GDC REQUIREMENT MET</u>	<u>PENETRATION NUMBER</u>	<u>FLUID</u>	<u>LINE SIZE (in.)</u>	<u>ESSENTIAL*</u>	<u>REFERENCE DRAWING</u>	<u>VALVE LOCATION (INSIDE OR OUTSIDE CONTAINMENT)</u>	<u>TYPE C LEAK TEST (YES OR NO)</u>	<u>DISTANCE TO OUTERMOST ISOLATION VALVE (ft.)</u>	<u>VALVE TYPE</u>
Residual Heat Removal										
1RH8701A	55	68	RC	12	YES	M-62	Inside	NO	N/A	Gate
1RH8701B	55	68	RC	12	YES	M-62	Inside	NO	N/A	Gate
1RH8702A	55	75	RC	12	YES	M-62	Inside	NO	N/A	Gate
1RH8702B	55	75	RC	12	YES	M-62	Inside	NO	N/A	Gate

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TABLE 6.2-5B (Cont'd)

ISOLATION VALVE NUMBER (Cont'd)	GDC REQUIREMENT MET	VALVE OPERATOR	NORMAL POSITION	SHUTDOWN POSITION	POST-ACCIDENT POSITION	POWER FAILURE POSITION	CLOSURE TIME** (sec)	ISOLATION SIGNALS	PRIMARY MODE OF ACTION	SECONDARY MODE OF ACTION	POWER SOURCE	ISOLATION VALVE CONFIGURATION
Process Sampling												
1PS9354A	55	AO/S	Closed	Closed	Closed	Closed	10	T	A	RM	1E	2
1PS9354B	55	AO/S	Closed	Closed	Closed	Closed	10	T	A	RM	1E	2
1PS9355A	55	AO/S	Closed	Closed	Closed	Closed	10	T	A	RM	1E	2
1PS9355B	55	AO/S	Closed	Closed	Closed	Closed	10	T	A	RM	1E	2
1PS9356A	55	AO/S	Closed	Closed	Closed	Closed	10	T	A	RM	1E	2
1PS9356B	55	AO/S	Closed	Closed	Closed	Closed	10	T	A	RM	1E	2
1PS9357A	55	AO/S	Closed	Closed	Closed	Closed	10	T	A	RM	1E	2
1PS9357B	5*	AO/S	Closed	Closed	Closed	Closed	10	T	A	RM	1E	2
Reactor and Containment Drains to Radwaste												
1RE9157	55	AO/S	Open	Open	Closed	Closed	10	T	A	RM	1E	2
1RE9159A	55	AO/S	Open	Open	Closed	Closed	10	T	A	RM	1E	2
1RE9159B	55	AO/S	Closed	Closed	Closed	Closed	10	T	A	RM	1E	2
1RE9160A	55	AO/S	Open	Open	Closed	Closed	10	T	A	RM	1E	2
1RE9160B	55	AO/S	Open	Open	Closed	Closed	10	T	A	RM	1E	2
1RE1003	55	AO/S	Closed	Closed	Closed	Closed	10	T	A	RM	1E	2
1RE9170	55	AO/S	Open	Open	Closed	Closed	10	T	A	RM	1E	2
Reactor Coolant Pressurizer												
1RY8025	56	AO/S	Closed	Closed	Closed	Closed	10	T	A	RM	1E	2
1RY8026	56	AO/S	Open	Open	Closed	Closed	10	T	A	RM	1E	2
1RY8033	56	AO/S	Open	Open	Closed	Closed	10	T	A	RM	1E	6
1RY8047	56	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	6
1RY8028	56	AO/S	Open	Open	Closed	Closed	10	T	A	RM	1E	6
1RY8046	56	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	6

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TABLE 6.2-58 (Cont'd)

ISOLATION VALVE NUMBER (Cont'd)	GDC REQUIREMENT MET	VALVE OPERATOR	NORMAL POSITION	SHUTDOWN POSITION	POST-ACCIDENT POSITION	POWER FAILURE POSITION	CLOSURE TIME** (sec)	ISOLATION SIGNALS	PRIMARY MODE OF ACTUATION	SECONDARY MODE OF ACTUATION	POWER SOURCE	ISOLATION VALVE CONFIGURATION
Residual Heat Removal												
1RH8701A	55	MO	Closed	Closed	Closed	As Is	N/A	N/A	RM	M	1E	9
1RH8701B	55	MO	Closed	Closed	Closed	As Is	N/A	N/A	RM	M	1E	9
1RH8702A	55	MO	Closed	Closed	Closed	As Is	N/A	N/A	RM	M	1E	9
1RH8702B	55	MO	Closed	Closed	Closed	As Is	N/A	N/A	RM	M	1E	9

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TABLE 6.2-58 (Cont'd)

ISOLATION VALVE NUMBER	GDC REQUIREMENT MET	PENETRATION NUMBER	FLUID	LINE SIZE (in.)	ESSENTIAL*	REFERENCE DRAWING	VALVE LOCATION (INSIDE OR OUTSIDE CONTAINMENT)	TYPE C LEAK TEST (YES OR NO)	DISTANCE TO OUTERMOST ISOLATION VALVE (ft)	VALVE TYPE
Safety Injection										
1SI8801A	55	26	BW	4	YES	M-61-2	Outside	NO	4.8	Gate
1SI8801B	55	26	BW	4	YES	M-61-2	Outside	NO	8.9	Gate
1SI8815	55	26	BW	3		M-61-2	Inside	NO	N/A	Check
1SI8880	55	55	Nitrogen	1		M-61-6	Outside	YES	15.5	Globe
1SI8968	55	55	Nitrogen	1		M-61-6	Inside	YES	N/A	Check
1SI8964	55	55	BW	3/4	YES	M-61-6	Outside	YES	17.8	Globe
1SI8871	55	55	BW	3/4	YES	M-61-6	Inside	YES	N/A	Globe
1SI8802A	55	59	Water	4	YES	M-61-3	Outside	NO	3.7	Gate
1SI8905A	55	59	Water	2		M-61-3	Inside	NO	N/A	Check
1SI8905D	55	59	Water	2		M-61-3	Inside	NO	N/A	Check
1SI8802B	55	73	Water	4	YES	M-61-3	Outside	NO	2.7	Gate
1SI8905C	55	73	Water	2		M-61-3	Inside	NO	N/A	Check
1SI8905B	55	73	Water	2		M-61-3	Inside	NO	N/A	Check
1SI8835	55	60	Water	4	YES	M-61-3	Outside	NO	3.3	Gate
1SI8819A	55	60	Water	2		M-61-3	Inside	NO	N/A	Check
1SI8819B	55	60	Water	2		M-61-3	Inside	NO	N/A	Check
1SI8819C	55	60	Water	2		M-61-3	Inside	NO	N/A	Check
1SI8819D	55	60	Water	2		M-61-3	Inside	NO	N/A	Check
1SI8809A	55	50	Water	8	YES	M-61-4	Outside	NO	3.7	Gate
1SI8818A	55	50	Water	6		M-61-4	Inside	NO	N/A	Check
1SI8818B	55	50	Water	6		M-61-4	Inside	NO	N/A	Check
1SI8818C	55	50	Water	6		M-61-4	Outside	NO	3.3	Gate
1SI8818D	55	51	Water	8		M-61-4	Inside	NO	N/A	Check
1SI8809B	55	51	Water	6		M-61-4	Inside	NO	N/A	Check
1SI8818E	55	51	Water	6		M-61-4	Inside	NO	N/A	Check
1SI8818C	55	51	Water	6		M-61-4	Inside	NO	1.8	Gate
1SI8811A	56	92	N <sub>2</sub> OH+BW	24	YES	M-61-4	Inside	NO	1.8	Gate
1SI8811A	56	93	N <sub>2</sub> OH+BW	24	YES	M-61-4	Inside	NO	N/A	Globe
1SI8811B	56	50	Water	3/4		M-61-4	Inside	NO	N/A	Globe
1SI8890A	55	51	Water	3/4		M-61-4	Inside	NO	N/A	Globe
1SI8890B	55	51	Water	3/4	YES	M-61-3	Outside	YES	14.7	Globe
1SI8888	55	55	Water	3/4	YES	M-61-3	Outside	YES	14.7	Globe
1SI8881	55	59	Water	3/4		M-61-3	Inside	NO	N/A	Globe

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TABLE 6.2-58 (Cont'd)

ISOLATION VALVE NUMBER (Cont'd)	GDC REQUIREMENT MET	VALVE OPERATOR	NORMAL POSITION	SHUTDOWN POSITION	POST-ACCIDENT POSITION	POWER FAILURE POSITION	CLOSURE TIME** (sec)	ISOLATION SIGNALS	PRIMARY MODE OF ACTION	SECONDARY MODE OF ACTION	POWER SOURCE	ISOLATION VALVE CONFIGURATION
Safety Injection												
1SI8801A	55	MO	Closed	Closed	Open	As Is	N/**	S(Open)	A	RM	1E	5
1SI8801B	55	MO	Closed	Closed	Open	As Is	N/**	S(Open)	A	RM	1E	5
1SI8815	55	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	5
1SI8880	55	AO/S	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	6
1SI8968	55	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	6
1SI8964	55	AO/S	Closed	Closed	Closed	Closed	10	T	A	RM	1E	2
1SI8871	55	AO/S	Closed	Closed	Closed	Closed	10	T	A	RM	1E	2
1SI8802A	55	MO	Closed	Closed	Open	As Is	N/**	N/A	RM	M	1E	5
1SI8905A	55	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	5
1SI8905D	55	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	5
1SI8802B	55	MO	Closed	Closed	Open	As Is	N/**	N/A	RM	M	1E	5
1SI8905C	55	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	5
1SI8905B	55	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	5
1SI8835	55	MO	Open	Open	Closed	As Is	N/**	N/A	RM	M	1E	5
1SI8819A	55	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	5
1SI8819B	55	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	5
1SI8819C	55	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	5
1SI8819D	55	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	5
1SI8809A	55	MO	Open	Open	Closed	As Is	N/**	N/A	RM	M	1E	5
1SI8818A	55	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	5
1SI8818D	55	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	5
1SI8809B	55	MO	Open	Open	Closed	As Is	N/**	N/A	RM	M	1E	5
1SI8818B	55	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	5
1SI8818C	55	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	5
1SI8811A	56	MO	Closed	Closed	Open	As Is	N/**	S(Open)	A	RM	1E	5
1SI8811B	56	MO	Closed	Closed	Open	As Is	N/**	S(Open)	A	RM	1E	5
1SI8890A	55	AO/S	Closed	Closed	Closed	Closed	N/**	N/A	RM	M	Non 1E	
1SI8890B	55	AO/S	Closed	Closed	Closed	Closed	N/**	N/A	RM	M	Non 1E	
1SI8888	55	AO/S	Closed	Closed	Closed	Closed	10	T	A	RM	1E	2
1SI8881	55	AO/S	Closed	Closed	Closed	Closed	N/**	N/A	RM	M	Non 1E	

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TABLE 6.2-58 (Cont'd)

ISOLATION VALVE NUMBER	GDC REQUIREMENT MET	PENETRATION NUMBER	FLUID	LINE SIZE (in.)	ESSENTIAL*	REFERENCE DRAWING	VALVE LOCATION (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
1SI8824	55	73	Water	3/4		M-61-3	Outside	NO	N/A	Globe
1SI8823	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	Globe
1SI8843	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	4		M-63	Outside	YES	3.3	Plug
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										
1SD002C	57	80	Steam	2	YES	M-48-5	Outside	NO	53.95	Globe
1SD005B	57	80	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	YES	M-48-5	Outside	NO	12.0	Globe
1SD002H	57	91	Steam	2	YES	M-48-5	Outside	NO	18.69	Globe

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TABLE 6.2-58 (Cont'd)

ISOLATION VALVE NUMBER (Cont'd)	GDC REQUIREMENT MET	VALVE OPERATOR	NORMAL POSITION	SHUTDOWN POSITION	POST-ACCIDENT POSITION	POWER FAILURE POSITION	CLOSURE TIME** (sec)	ISOLATION SIGNALS	PRIMARY MODE OF ACTUATION	SECONDARY MODE OF ACTUATION	POWER SOURCE	ISOLATION VALVE CONFIGURATION
Safety Injection												
1SI8840	55	MO	Closed	Closed	Open	As Is	N/A	N/A	RM	M	1E	5
1SI8824	55	AO/S	Closed	Closed	Closed	Closed	N/**	N/A	RM	M	Non 1E	
1SI8823	55	AO/S	Closed	Closed	Closed	Closed	N/**	N/A	RM	M	Non 1E	
1SI8841A	55	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	5
1SI8841B	55	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	5
1SI8825	55	AO/S	Closed	Closed	Closed	Closed	N/**	N/A	RM	M	Non 1E	
1SI8843	55	AO/S	Closed	Closed	Closed	Closed	N/**	N/A	RM	M	Non 1E	
Service Air												
1SA032	56	AO/S	Open	Open	Closed	Closed	4.5	T	A	RM	1E	2
1SA033	56	AO/S	Open	Open	Closed	Closed	4.5	T	A	RM	1E	2
Spent Fuel Pool Cleaning												
1FC009	56	M	Closed	Open	Closed	N/A	N/A	N/A	M	M	N/A	4
1FC010	56	M	Closed	Open	Closed	N/A	N/A	N/A	M	M	N/A	4
1FC011	56	M	Closed	Open	Closed	N/A	N/A	N/A	M	M	N/A	4
1FC012	56	M	Closed	Open	Closed	N/A	N/A	N/A	M	M	N/A	4
Steam Generator Blowdown												
1SD002C	57	AO/S	Open	Closed	Closed	Closed	7.5	T,SG	A	RM	1E	11
1SD005B	57	AO/S	Closed	Closed	Closed	Closed	3.0	T	A	RM	1E	11
1SD002D	57	AO/S	Open	Closed	Closed	Closed	7.5	T,SG	A	RM	1E	11
1SD002A	57	AO/S	Open	Closed	Closed	Closed	7.5	T,SG	A	RM	1E	11
1SD005A	57	AO/S	Closed	Closed	Closed	Closed	3.0	T	A	RM	1E	11
1SD005A	57	AO/S	Closed	Closed	Closed	Closed	7.5	T,SG	A	RM	1E	11
1SD002B	57	AO/S	Open	Closed	Closed	Closed	7.5	T,SG	A	RM	1E	11
1SD002E	57	AO/S	Open	Closed	Closed	Closed	7.5	T,SG	A	RM	1E	11
1SD005C	57	AO/S	Closed	Closed	Closed	Closed	3.0	T	A	RM	1E	11
1SD005C	57	AO/S	Closed	Closed	Closed	Closed	7.5	T,SG	A	RM	1E	11
1SD002F	57	AO/S	Open	Closed	Closed	Closed	7.5	T,SG	A	RM	1E	11
1SD002G	57	AO/S	Open	Closed	Closed	Closed	7.5	T,SG	A	RM	1E	11
1SD005D	57	AO/S	Closed	Closed	Closed	Closed	3.0	T	A	RM	1E	11
1SD005D	57	AO/S	Closed	Closed	Closed	Closed	7.5	T,SG	A	RM	1E	11
1SD002H	57	AO/S	Open	Closed	Closed	Closed	7.5	T,SG	A	RM	1E	11

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TABLE 6.2-58 (Cont'd)

ISOLATION VALVE NUMBER	GDC REQUIREMENT MET	PENETRATION NUMBER	FLUID	LINE SIZE (in.)	ESSENTIAL*	REFERENCE DRAWING	VALVE LOCATION (INSIDE OR OUTSIDE CONTAINMENT)	TYPE C LEAK TEST (YES OR NO)	DISTANCE TO OUTERMOST ISOLATION VALVE (ft)	VALVE TYPE
Steam Generator Feedwater										
1FW009A	57	79	Water	16	YES	M-36-1	Outside	NO	13.75	Gate
1AF013A	57	100	Water	4	YES	M-37	Outside	NO	66.75	Globe
1AF013E	57	100	Water	4	YES	M-37	Outside	NO	62.5	Globe
1FW015A	57	100	Water	3/4		M-36-1	Outside	NO	46.75	Globe
1FW009B	57	84	Water	16	YES	M-36-1	Outside	NO	13.75	Gate
1AF013B	57	101	Water	4	YES	M-37	Outside	NO	57.66	Globe
1AF013F	57	101	Water	4	YES	M-37	Outside	NO	53.0	Globe
1FW015B	57	101	Water	3/4		M-36-1	Outside	NO	46.75	Globe
1FW009C	57	87	Water	16	YES	M-36-1	Outside	NO	13.75	Gate
1AF013C	57	102	Water	4	YES	M-37	Outside	NO	55.75	Globe
1AF013G	57	102	Water	4	YES	M-37	Outside	NO	52.25	Globe
1FW015C	57	102	Water	3/4		M-36-1	Outside	NO	46.75	Globe
1FW009D	57	76	Water	16	YES	M-36-1	Outside	NO	13.75	Gate
1AF013D	57	99	Water	4	YES	M-37	Outside	NO	57.75	Globe
1AF013H	57	99	Water	4	YES	M-37	Outside	NO	54.25	Globe
1FW015D	57	99	Water	3/4		M-36-1	Outside	NO	46.75	Globe
1FW035A	57	100	Water	3	YES	M-36-1	Outside	NO	29.0	Globe
1FW035B	57	101	Water	3	YES	M-36-1	Outside	NO	29.0	Globe
1FW035C	57	102	Water	3	YES	M-36-1	Outside	NO	32.5	Globe
1FW035D	57	99	Water	3	YES	M-36-1	Outside	NO	32.5	Globe
1FW039A	57	100	Water	6	YES	M-36-1	Outside	NO	14.5	Gate
1FW039B	57	101	Water	6	YES	M-36-1	Outside	NO	14.5	Gate
1FW039C	57	102	Water	6	YES	M-36-1	Outside	NO	14.5	Gate
1FW039D	57	99	Water	6	YES	M-36-1	Outside	NO	14.5	Gate
1FW043A	57	79	Water	3	YES	M-36-1	Outside	NO	27.25	Globe
1FW043B	57	84	Water	3	YES	M-36-1	Outside	NO	27.25	Globe
1FW043C	57	87	Water	3	YES	M-36-1	Outside	NO	27.25	Globe
1FW043D	57	76	Water	3	YES	M-36-1	Outside	NO	27.25	Globe
Waste Disposal										
1RF026	56	47	Water	2	YES	M-48-6	Inside	YES	5.8	Plug
1RF027	56	47	Water	2	YES	M-48-6	Outside	YES	4.6	Plug

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TABLE 6.2-58 (Cont'd)

ISOLATION VALVE NUMBER (Cont'd)	GDC REQUIREMENT MET	VALVE OPERATOR	NORMAL POSITION	SHUTDOWN POSITION	POST-ACCIDENT POSITION	POWER FAILURE POSITION	CLOSURE TIME** (sec)	ISOLATION SIGNALS	PRIMARY MODE OF ACTUATION	SECONDARY MODE OF ACTUATION	POWER SOURCE	ISOLATION VALVE CONFIGURATION
Steam Generator Feedwater												
1FW009A	57	HO	Open	Closed	Closed	Closed	5.0	FW	A	RM	1E	10
1AF013A	57	MO	Open	Closed	Open	As Is	N/**	N/A	RM	M	1E	10
1AF013E	57	MO	Open	Closed	Open	As Is	N/**	N/A	RM	M	1E	10
1FW015A	57	M	Closed	Closed	Closed	N/A	N/A	N/A	M	M	N/A	14
1FW009B	57	HO	Open	Closed	Closed	Closed	5.0	FW	A	RM	1E	10
1AF013B	57	MO	Open	Closed	Open	As Is	N/**	N/A	RM	M	1E	10
1AF013F	57	MO	Open	Closed	Open	As Is	N/**	N/A	RM	M	1E	10
1FW015B	57	M	Closed	Closed	Closed	N/A	N/A	N/A	M	M	N/A	14
1FW009C	57	HO	Open	Closed	Closed	Closed	5.0	FW	A	RM	1E	10
1AF013C	57	MO	Open	Closed	Open	As Is	N/**	N/A	RM	M	1E	10
1AF013G	57	MO	Open	Closed	Open	As Is	N/**	N/A	RM	M	1E	10
1FW015C	57	M	Closed	Closed	Closed	N/A	N/A	N/A	M	M	N/A	14
1FW009D	57	HO	Open	Closed	Closed	Closed	5.0	FW	A	RM	1E	10
1AF013D	57	MO	Open	Closed	Open	As Is	N/**	N/A	RM	M	1E	10
1AF013H	57	MO	Open	Closed	Open	As Is	N/**	N/A	RM	M	1E	10
1FW015D	57	M	Closed	Closed	Closed	N/A	N/A	N/A	M	M	N/A	14
1FW035A	57	AO/S	Open	Closed	Closed	Closed	6.0	FW	A	RM	1E	11
1FW035B	57	AO/S	Open	Closed	Closed	Closed	6.0	FW	A	RM	1E	11
1FW035C	57	AO/S	Open	Closed	Closed	Closed	6.0	FW	A	RM	1E	11
1FW035D	57	AO/S	Open	Closed	Closed	Closed	6.0	FW	A	RM	1E	11
1FW039A	57	AO/S	Open	Closed	Closed	Closed	6.0	FW	A	RM	1E	11
1FW039B	57	AO/S	Open	Closed	Closed	Closed	6.0	FW	A	RM	1E	11
1FW039C	57	AO/S	Open	Closed	Closed	Closed	6.0	FW	A	RM	1E	11
1FW039D	57	AO/S	Open	Closed	Closed	Closed	6.0	FW	A	RM	1E	11
1FW043A	57	AO/S	Closed	Closed	Closed	Closed	6.0	FW	A	RM	1E	11
1FW043B	57	AO/S	Closed	Closed	Closed	Closed	6.0	FW	A	RM	1E	11
1FW043C	57	AO/S	Closed	Closed	Closed	Closed	6.0	FW	A	RM	1E	11
1FW043D	57	AO/S	Closed	Closed	Closed	Closed	6.0	FW	A	RM	1E	11
Waste Disposal												
1P026	56	AO/S	Open	Open	Closed	Closed	15	T	A	RM	1E	2
1P027	56	AO/S	Open	Open	Closed	Closed	15	T	A	RM	1E	2

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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	=	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
T	=	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	=	Actuates on Containment Vent Isolation
A	=	Automatic (Air, Hydraulic, or Electrical) Operation
M	=	Manual Operation
RM	=	Remote Manual Operation
IA	=	Instrument Air
MIN.	=	Valves will be placed as close to the containment as practical.
SG	=	Actuates on Low-Low Steam Generator Level for Byron Unit 2 and Braidwood Units 1 and 2 only

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