

WSES-FSAR-UNIT-3

TABLE 6.2-1 (Sheet 1 of 3) Revision 307 (07/13)

POSTULATED ACCIDENTS FOR CONTAINMENT DESIGN

Containment Design Parameter	Postulated Accidents	Mass and Energy Release Reference
<p>→(DRN 03-2060, R14)</p> <p>A. Containment Peak Pressure and Temperature</p> <p>←(DRN 03-2060, R14)</p>	Loss of coolant accidents (LOCA)	
<p>→(DRN 01-230, R12)</p>	Double-ended hot leg slot (DEHLS), 19.24 ft ² area Maximum Safety Injection	Table 6.2-12(A)
<p>→(DRN 03-2060, R14)</p> <p>←(DRN 03-2060, R14)</p>	Double-ended discharge leg slot (DEDLS), 9.82 ft ² area Minimum Safety Injection	Table 6.2-12(B)
<p>→(DRN 03-2060, R14)</p> <p>←(DRN 03-2060, R14)</p>		
<p>←(DRN 01-230, R12)</p>		
<p>→(DRN 01-230, R12)</p> <p>←(DRN 01-230, R12)</p>	Safety Injection Nitrogen Addition for DESLS assuming maximum Safety Injection	Table 6.2-12(C)
<p>→(DRN 01-230, R12)</p> <p>←(DRN 01-230, R12)</p>		
<p>→(DRN 01-230, R12; 03-2060, R14; EC-8458, R307)</p>	<u>Main steam line breaks (MSLB)</u>	
<p>←(DRN 01-230, R12; 03-2060, R14)</p>	3.9 ft ² MSLB HZP Conditions with a Failed Open MSIV Peak Containment Pressure Case	Table 6.2-12(D)
<p>→(DRN 05-1247, R14)</p>	7.88 ft ² MSLB, HFP Conditions with a Failed Open MSIV Peak Temperature Case	Table 6.2-12(E)
<p>←(DRN 05-1247, R14; EC-8458, R307)</p>		

POSTULATED ACCIDENTS FOR CONTAINMENT DESIGN

Containment Design Parameter	Postulated Accidents	Mass and Energy Release Reference
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→(DRN 01-230, R12)

A. Containment Peak
Pressure Temperature
(Cont'd)

→(DRN 05-1247, R14)

←(DRN 05-1247, R14)

←(DRN 01-230, R12)

→(DRN 01-230, R12)

←(DRN 01-230, R12)

B. Subcompartment
Peak Pressure

Reactor Cavity

→(EC-29816, R306)

100 in² hot leg guillotine
(HLG) (note 1)

Table 6.2-13(A,B)

350 in² discharge leg
guillotine (DLG) (note 1)

Table 6.2-13(C,D)

Notes: 1. Guillotine Breaks of the reactor coolant system main loop piping no longer need to be considered for subcompartment pressurization based on application of leak-before-break methodologies. See Section 6.2.1.2.

←(EC-29816, R306)

POSTULATED ACCIDENTS FOR CONTAINMENT DESIGN

Containment Design Parameter	Postulated Accidents	Mass and Energy Release Reference
	<u>Steam generator compartment</u>	
→(EC-29816, R306) B. Subcompartment Peak Pressure (Cont'd)	600 in ² hot leg guillotine (HLG) (note 1)	Table 6.2-13(E,F)
	430 in ² suction leg guillotine (SLG) (note 1)	Table 6.2-13(G,H)
	592 in ² suction leg guillotine (SLG) (note 1)	Table 6.2-13(I,J)
	532 in ² suction leg slot (SLS) (note 1)	Table 6.2-13(K)
	480 in ² discharge leg guillotine (DLG) (note 1)	Table 6.2-13(L,M)
←(EC-29816, R306)	2.88 ft ² feedwater line circumferential break	Table 6.2-13(S,T)
	<u>Pressurizer Subcompartment</u>	
→(EC-19087, R305)	161.05 in ² double ended pressurizer surge line guillotine break *	Table 6.2-13(P,Q)
←(EC-19087, R305)	20.64 in ² double ended pressurizer spray line guillotine break	Table 6.2-13(N,O)
	21.14 in ² single ended safety relief line guillotine break	Table 6.2-13(R)
→(EC-706, R304) C. External pressure	Inadvertent actuation of one Containment Spray Train	N/A
←(EC-706, R304)		
D. Containment ECCS Minimum pressure	<u>Refer to Subsection 6.2.1.5</u>	N/A

→(EC-19087, R305)

* The subcompartment pressurization analysis conservatively assumes the affects of a pressurizer surge line break even though eliminated under LBB (See section 3.6.3 and 6.2.1.2.3.c).

←(EC-19087, R305)

→(EC-29816, R306)

Notes: 1. Guillotine Breaks of the reactor coolant system main loop piping no longer need to be considered for subcompartment pressurization based on application of leak-before-break methodologies. See Section 6.2.1.2.

←(EC-29816, R306)

CALCULATED VALUES FOR CONTAINMENT PARAMETERS

Parameter	Design Basis Accident	Calculated Value
→(DRN 01-230, R12; 03-2060, R14; EC-8458, R307) Peak Containment Atmosphere Pressure (LOCA)	19.24 ft ² DEHLSB Hot Leg Break Blowdown Pressure	40.2 psig
Containment Pressure at 24 hours	9.82 ft ² Double-Ended Discharge Leg Slot Break DEDLSB Minimum SI Flow (peak pressure = 35.8 psig)	16 psig
←(DRN 01-230, R12)		
→(DRN 01-230, R12) ←(DRN 01-230, R12)		
Peak Pressure (MSLB)	MSLB – Hot Zero Power One MSIV Failure	41.6 psig
→(DRN 01-230, R12) ←(DRN 01-230, R12)		
Peak Containment Atmosphere Temperature (LOCA)	19.24 ft ² DEHLSB Hot Leg Break Blowdown Temperature	262.7°F
→(DRN 01-230, R12) ←(DRN 01-230, R12)		
Peak Temperature (MSLB) EQ Case	MSLB – Hot Full Power One MSIV Failure	382.4°F
←(EC-8458, R307)		
Peak Subcompartment Pressure Reactor Cavity	350 in ² DLG	138 psid
→(DRN 04-1422, R14) Steam Generator	592 in ² SLG	35.8 psid ⁽¹⁾
←(DRN 04-1422, R14)		
→(EC-19087, R305) Pressurizer	Double Ended Pressurizer Surge Line Guillotine **	6.4 psid
←(EC-19087, R305)		

* CHRS: Containment Heat Removal System (one train includes one containment spray train and one containment fan cooler train)

→(EC-19087, R305)

** The subcompartment pressurization analysis conservatively assumes the affects of a pressurizer surge line break even though eliminated under LBB (See section 3.6.3 and 6.2.1.2.3.c).

←(DRN 03-2060, R14; EC-19087, R305)

CALCULATED VALUES FOR CONTAINMENT PARAMETERS

<u>Parameter</u>	<u>Design Basis Accident</u>	<u>Calculated Value</u>
External Pressure		
→(EC-706, R304) Containment	Inadvertent operation of one train of Containment Spray System	0.53 psid
Shield Building	Inadvertent operation of one train of Containment Spray System	2.80 psid
←(EC-706, R304)		
Minimum Pressure	DEDLG	See Subsection 6.2.1.5

→(DRN 04-1422, R14)

Notes:

- 1) The calculated value of the maximum differential pressure for the steam generator subcompartment was originally calculated using RELAPS-3 Mod 68 computer code. The original calculated value was 21.9 psid. The input data that was used to calculate this differential pressure is contained in Table 6.2-15. Since the values in Table 6.2-15 have been calculated, maintenance platforms were added in the steam generator subcompartments which changed the flow areas at the junctions and the volumes in the control volumes. Consequently, this changed the calculated value for the steam generator subcompartment from 21.9 psid to 35.8 using conservative analysis.

←(DRN 04-1422, R14)

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TABLE 6.2-3

Revision 307 (07/13)

PRINCIPAL CONTAINMENT DESIGN PARAMETERS

Parameter	Design	Margin ⁽¹⁾
Containment		
→(DRN 01-230, R12; 03-2060, R14; EC-8458, R307) Internal pressure limit, psig (LOCA)	44.0	9.45%
Internal pressure limit, psig (MSLB) ←(DRN 01-230, R12; EC-8458, R307) →(EC-706, R304)	44.0	5.77%
External design pressure, psid ←(EC-706, R304) →(EC-8458, R307)	0.65	22.41%
Peak Temperature ⁽²⁾ , °F (LOCA)	269.3	2.51%
Peak Temperature ⁽²⁾ , °F (MSLB)	413.5	8.13%
Net free volume, 10 ⁶ ft ³ ←(EC-8458, R307)	2.672	Not applicable
Design leak rate, percent free volume Per day at 44.0 psig	0.5	Not applicable
Shield Building		
→(EC-706, R304) External design pressure, psig ←(EC-706, R304)	3.0	7.14%
Subcompartments		
Reactor cavity design wall loading, psid	240.0	74%
→(DRN 05-1550, R14) Steam generator compartment design wall loading, psid ←(DRN 05-1550, R14)	55.5	55% ⁽³⁾
Pressurizer compartment design wall loading, psid	10.0	56.25%

NOTES:

$$^{(1)} \text{Margin (\%)} = \frac{100 * (\text{design value} - \text{peak calculated value})}{\text{peak calculated value}}$$

←(DRN 03-2060, R14)

→(EC-8458, R307)

⁽¹⁾ Actual margin, i.e., the margin between design values and peak calculated values when using realistic or median parameter values would be much larger.

←(EC-8458, R307)

⁽²⁾ Peak temperature acceptance limits are based on EQ temperature profiles.

→(DRN 05-1550, R14)

⁽³⁾ The original margin was 153% based on the original calculated value of the maximum differential pressure of 21.9 psid. Refer to Note 1 on Table 6.2-2.

←(DRN 05-1550, R14)

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TABLE 6.2-4

Revision 307 (07/13)

SUMMARY OF CALCULATED CONTAINMENT PRESSURE AND TEMPERATURE

➔(DRN 01-230, R12)

⬅(DRN 01-230, R12)

➔(DRN 01-230, R12; 03-2060, R14; EC-8458, R307)

Peak Containment Pressure and Temperature Results for Replacement Steam Generators

	19.24 ft ² DEHLSB Peak Pressure & Peak Temperature	9.82 ft ² DEDLSB Min. SI Flow 24 Hour Pressure	MSLB HZP One MSIV Failure Peak Pressure	MSLB HFP One MSIV Failure Peak Temperature
Peak Pressure (psig)	40.2	37.1	41.6	---
P @ 24 Hour (psig)	---	16.0	---	---
Peak Temperature (°F)	262.7	257.3	361.9	382.4
Time of Peak Pressure (sec)	18.5	660.9	177.2	---
Time to End of Blowdown, sec	15.1	15.0	---	---
LOCA Energy Release to Containment at end of Blowdown BTU x 10 ⁶	328.04	315.91	---	---

⬅(DRN 03-2060, R14)

⬅(DRN 01-230, R12; EC-8458, R307)

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TABLE 6.2-5

Revision 307 (07/13)

INITIAL CONDITIONS FOR LOCA CONTAINMENT PEAK

PRESSURE-TEMPERATURE ANALYSIS

Parameter	Value
Reactor Coolant System	
→(DRN 01-230, R12) Reactor power level, MWt	3734.4
RCS Inlet Temperature (Maximum) °F	552
Pressurizer pressure (Maximum), psia	2310
Primary Coolant Flow (minimum), gpm	396,000
→(EC-8458, R307) Nominal Steam Generator Pressure, psia	917
←(EC-8458, R307)	
Containment	
→(DRN 03-2060, R14) Pressure, psia	15.7
Temperature, °F	120.0
Relative humidity, %	50
Component cooling water temperature, °F	115
Refueling water storage pool temperature, °F	100
→(EC-8458, R307) Net free volume (minimum), x 10 ⁶ ft ³	2.672
←(DRN 03-2060, R14; EC-8458, R307)	
Stored Water	
Usable refueling water storage pool (minimum), gal	383,000
Average Safety injection tanks liquid volume, ft ³ /tank	
→(EC-8458, R307) (A) Suction Leg Break	1367.0
(B) Discharge leg break	1367.0
←(DRN 01-230, R12; EC-8458, R307)	

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TABLE 6.2-6 (Sheet 1 of 2)

Revision 307 (07/13)

ENGINEERED SAFETY FEATURE SYSTEMS OPERATING ASSUMPTIONS FOR LOCA
CONTAINMENT PEAK PRESSURE ANALYSIS

→(DRN 01-230, R12)

System/Item	Value Used for LOCA Peak Pressure Analysis
<u>Passive Safety Injection System</u>	
Number of safety injection tanks	4
→(EC-8458, R307) Pressure, psia	685
Average liquid volume, ft ³ /tank	
DESLSB	1367.0
DEDLSB	1367.0
<u>Active Safety Injection Systems</u>	
High-pressure safety injection	
Flow rate, (minimum SI Flow Case) gpm	235.0
Flow rate, (maximum SI Flow Case) gpm	1750.0
Low-pressure safety injection	
Flow rate, (minimum SI Flow Case) gpm	2612.5
Flow rate, (maximum SI Flow Case) gpm	10450.0
←(EC-8458, R307)	
<u>Containment Spray System</u>	
Flow rate, gpm/pump	1750
←(DRN 01-230, R12)	

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TABLE 6.2-6 (Sheet 2 of 2)

Revision 14 (12/05)

ENGINEERED SAFETY FEATURE SYSTEMS OPERATING ASSUMPTIONS FOR LOCA
CONTAINMENT PEAK PRESSURE ANALYSIS

→(DRN M99001091; DRN 01-230, R12; 03-2060, R14)

System/Item	Value Used for LOCA Peak Pressure Analysis
<u>Containment Fan Coolers</u>	
Number of Units	1
Air side flowrate, acfm/unit	33,250
Heat Removal Rate	see Figure 6.2-12a
Fouling factor	5×10^{-4}
Cooling Water flowrates, gpm	1100
Source of Cooling Water	Component Cooling Water
Cooling Water Temperature, °F	115
<u>Heat Exchangers</u>	
Shutdown heat exchangers (shell and U-Tube)	
Number	1
Heat transfer area/unit, ft ² (Secondary heat transfer area with 5% plugged tubes)	6650
Overall heat transfer coefficient @ 200°F, Btu/hr-ft ² -°F	262.98*
Flowrates:	
Recirculation side, gpm	1750
Exterior side, gpm	2550
Temperature:	
Exterior side, °F	115
Source of cooling water	Component cooling water

“3716 MWt Containment P&T Response Analysis” modeled the shutdown heat exchanger in GOTHIC using primary and secondary heat transfer coefficients derived as a function of safety injection sump temperature for CCW temperatures of 115°F (base cases).

←(DRN M99001091; DRN 01-230, R12; 03-2060, R14)

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TABLE 6.2-7 (Sheet 1 of 5)

Revision 10 (10/99)

CONTAINMENT PASSIVE HEAT SINKS

COMPONENT	EXPOSED SURFACE AREAS(FT ²)	EFFECTIVE THICKNESS (1) (inches unless noted otherwise)	THERMAL CONDUCTIVITY (BTU/HR-FT.F)	VOLUMETRIC HEAT CAPACITY (BTU/FT ³ F)	UNCERTAINTIES USED IN MINIMUM CONTAINMENT PRESSURE ANALYSIS
→ A. <u>Steel</u>					
Primary Containment Cylinder	61,400	1.9	25.9	53.57	+1.0%
Primary Dome Containment	30,500	0.95	25.9	53.57	+1.0%
Exposed Steel in Refueling Pool	29	0.5	9.8	54.0	+1.0%
	89	1.5	9.8	54.0	+1.0%
	6,967	0.1875	9.8	54.0	+1.0%
	2,589	0.25	9.8	54.0	+1.0%
	30	0.75	25.9	53.57	+1.0%
Grating Incl. Tread	73,172	0.071	25.9	53.57	+5.0%
Handrails & Ladder	2,990	0.2	25.9	53.57	+5.0%
Plates Embed & Anchor Plate	6,262	1.0	25.9	53.57	+5.0%
S.G. Sliding Base Plate	140	3.0	25.9	53.57	+5.0%
Structural Framing Steel	116,870	0.459	25.9	53.57	+2.0%
Miscellaneous Steel	20,985	0.193	25.9	53.57	+1.0%
Metal Deck Exposed One Side	7,000	0.13	25.9	53.57	+1.0%
R.V. Grill Support Foundation	5,574	1.76	25.9	53.57	+1.0%
HVAC Seismic Support	16,123	0.15	25.9	53.57	+1.0%
Elect. Seismic Support	8,294	0.22	25.9	53.57	+1.0%
Jet Impingement Barrier Steel	1,343	0.11	25.9	53.57	+1.0%
5/16" Plate	281	0.155	25.9	53.57	+1.0%
1 Plate	103	0.5	25.9	53.57	+1.0%
RCP Support	10,229	1.526	25.9	53.57	+1.0%
Pressurizer Support	900	3.00	25.9	53.57	+3.0%
Scaffold & Storage Racks	8,882	0.09	25.9	53.57	+1.0%
Alternate Crane	2,086	0.234	25.9	53.57	+3.0%
Alternate Crane Seismic Support	123	0.15	25.9	53.57	+1.0%
	26,042	0.38	25.9	53.57	+1.0%
Polar Crane					
	5,409	0.12	25.9	53.57	+1.0%
Polar Crane Platform Steel					

←

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TABLE 6.2-7 (Sheet 2 of 5)

Revision 14 (12/05)

CONTAINMENT PASSIVE HEAT SINKS

COMPONENT	EXPOSED SURFACE AREAS(FT ²)	EFFECTIVE THICKNESS (1) (inches unless noted otherwise)	THERMAL CONDUCTIVITY (BTU/HR-FT.F)	VOLUMETRIC HEAT CAPACITY (BTU/FT ³ F)	UNCERTAINTIES USED IN MINIMUM CONTAINMENT PRESSURE ANALYSIS
A. (Cont'd)					
Polar Crane Runway Girder	21,690	0.67	25.9	53.57	+1.0%
S.I. Tank Support	1,379	0.5	25.9	53.57	+5.0%
S.I. Screen Support	3,294	0.27	9.8	54.0	+2.0%
S.I. Screens	2,131	0.02	9.8	54.0	+2.0%
Internals Lifting Rig	1,368	0.6875	25.9	53.57	+10.0%
Refueling Machine	403	1.6	25.9	53.57	+67.0%
Vessel Head Lifting Rig	1,817	0.5	25.9	53.57	+10.0%
→(DRN 03-2060, R14)	3,382	1.74	25.9	53.57	+11.0%
Safety Injection Tanks (shell) ⁽³⁾	3,382	0.125	9.8	54.	+11.0%
Safety Injection Tanks (head) ⁽³⁾	828	1.92	25.9	53.57	+11.0%
	828	0.125	9.8	54.	+11.0%
←(DRN 03-2060, R14)	22	0.5	25.9	53.57	+22.0%
Stud Storage Rack	180	0.375	9.8	54.	+11.0%
Quench Tank (shell)	66	0.625	9.8	54.	+11.0%
Quench Tank (head)	86	0.25	25.9	53.57	+22.0%
Quench Tank Supports	439	0.25	25.9	53.57	+0%
Nozzles	559	0.625	25.9	53.57	+0%
	1,199	1.125	25.9	53.57	+0%
Reactor Drain Tank	54	0.17	25.9	53.57	+0%
	158	0.31	25.9	53.57	+0%
	7	1.0	25.9	53.57	+0%
	18	0.5	25.9	53.57	+0%
Piping and Valves	9,800	0.3	9.8	54	+3.0%
	9,600	0.26	25.9	53.57	+3.0%
	600	0.5	61.0	48.06	+5.0%
Pipe Supports/Restraints	30,000	0.3	25.9	53.57	+5.0%

CONTAINMENT PASSIVE HEAT SINKS

COMPONENT	EXPOSED SURFACE AREAS(FT ²)	EFFECTIVE THICKNESS (1) (inches unless noted otherwise)	THERMAL CONDUCTIVITY (BTU/HR-FT.F)	VOLUMETRIC HEAT CAPACITY (BTU/FT ³ F)	UNCERTAINTIES USED IN MINIMUM CONTAINMENT PRESSURE ANALYSIS
Instrumentation & Control	10,769	0.106	25.9	53.57	+8.0%
Recombiner	800	0.75	25.9	53.57	+0%
HVAC (includes ducts & fan coolers)	70,000	0.056 in.	25.9	53.57	+5.0%
→(DRN 03-2060, R14)	3,400	0.125	9.8	54	+5.0%
Insulation (outer layer only)	24,000	24 (mil)	9.8	54	+5.0%
Cable Trays ⁽⁴⁾	21,835	4.0 (mils)	64.0	40.6	+0%
	21,835	0.0375	25.9	53.57	+0%
Boxes ⁽⁴⁾	9,407	2.0 (mils)	64.0	40.6	+5.0%
	1,434	0.067	25.9	53.57	+5.0%
	7,228	0.545	25.9	53.57	+5.0%
	743	0.0415	25.9	53.57	+5.0%
Panels ⁽⁴⁾	562	0.6 (mils)	64.0	40.6	+0%
	562	0.03	25.9	53.57	+0%
Conduit ⁽⁴⁾	84,900	0.8 (mils)	64.0	40.6	+5.0%
	84,900	0.0965	25.9	53.57	+5.0%
Supports for Conduits & Boxes	2,800	0.0545	25.9	53.57	+5.0%
	2,200	0.168	25.9	53.57	+5.0%
	500	0.156	25.9	53.57	+5.0%
	250	0.427	25.9	53.57	+0%
	40	0.089	25.9	53.57	+0%
	70	0.412	25.9	53.57	+0%
	80	0.122	25.9	53.57	+0%
Allowance for Future Additions	13,000	0.45	25.9	53.57	+5.0
Excess Steel for Additional Margin	12,000	0.5	25.9	53.57	+1.0
Excess Steel (#2)	26,000	0.175	25.9	53.57	+5.0
→(DRN 06-1061, R15)					
Allowance for Sump Plugging Modification	10,000	0.12	25.9	53.57	---
←(DRN 03-2060, R14; 06-1061, R15)					
→(EC-8458, R307))					
Allowance for Future Additions	5,000	0.5	25.9	53.57	+0%
←(EC-8458, R307))					

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TABLE 6.2-7 (Sheet 4 of 5)

Revision 307 (07/13)

CONTAINMENT PASSIVE HEAT SINKS

COMPONENT	EXPOSED SURFACE AREAS(FT ²)	EFFECTIVE THICKNESS (1) (inches unless noted otherwise)	THERMAL CONDUCTIVITY (BTU/HR-FT.F)	VOLUMETRIC HEAT CAPACITY (BTU/FT ³ F)	UNCERTAINTIES USED IN MINIMUM CONTAINMENT PRESSURE ANALYSIS
→(DRN 03-2060, R14)					
B. <u>Concrete In Air</u> ⁽⁵⁾		<u>TOTAL THICKNESS</u> ⁽⁴⁾			
Pool Wall Unlined		3'-0			
←(DRN 03-2060, R14)	2,609	5'-6			
	588	6'-0			
	5,880				
Primary Shield Wall		7'-6			
	2,507				
Secondary Shield Wall	23,032	4'-0	1.0	31.9	+1.0%
	3,696	4'-8	1.0	31.9	+1.0%
Pressurizer Room		2'-0	1.0	31.9	+1.0%
	825	5'-0	1.0	31.9	+1.0%
	744	2'-6	1.0	31.9	+1.0%
	7,305				
Regenerative Heat Exchanger Room		4'-0	1.0	31.9	+1.0%
	338	3'-0	1.0	31.9	+1.0%
	318	2'-0	1.0	31.9	+1.0%
	2,868				
Reactor Sump Wall		1'-0	1.0	31.9	+1.0%
Steam Generator Foundation		20'-0	1.0	31.9	+1.0%
	142	11'-0	1.0	31.9	+1.0%
	320	12'-0	1.0	31.9	+1.0%
	478	7'-2	1.0	31.9	+1.0%
	488				
Architectural Floor Slabs		0'-9	1.0	31.9	+1.0%
	1,700	0'-6	1.0	31.9	+1.0%
	1,700	0'-4	1.0	31.9	+1.0%
	816				
R.V. Head Laydown Area Sheilding		1'-0	1.0	31.9	+1.0%
	228				
→(EC-8458, R307)					
Allowance for Future Additions	3000	0'-6	1.0	31.9	+0%
←(EC-8458, R307)					
→(DRN 03-2060, R14)					
<u>Concrete Below Water</u> ⁽⁶⁾		<u>TOTAL THICKNESS</u> ⁽²⁾			
←(DRN 03-2060, R14)					
Pool Wall Unlined		6'-0	1.0	31.9	+1.0%
	765	6'-2	1.0	31.9	+1.0%
	592	16'-0	1.0	31.9	+1.0%
	518	3'-0	1.0	31.9	+1.0%
	499	37'-0	1.0	31.9	+1.0%
	200				
Primary Shield Wall		7'-6	1.0	31.9	+1.0%
	3,221				

CONTAINMENT PASSIVE HEAT SINKS

COMPONENT	EXPOSED SURFACE AREAS(FT ²)	EFFECTIVE THICKNESS (1) (inches unless noted otherwise)	THERMAL CONDUCTIVITY (BTU/HR-FT.F)	VOLUMETRIC HEAT CAPACITY (BTU/FT ³ F)	UNCERTAINTIES USED IN MINIMUM CONTAINMENT PRESSURE ANALYSIS
Secondary Shield Wall	1,260	4'-0	1.0	31.9	+1.0%
Pressurizer Room	620	2'-6	1.0	31.9	+1.0%
Regen. Heat Exchanger Room	294	2'-0	1.0	31.9	+1.0%
Reactor Sump Wall	500	1'-0	1.0	31.9	+1.0%
Steam Generator Foundation	156	7'-6	1.0	31.9	+1.0%
	810	12'-0	1.0	31.9	+1.0%
Base Concrete (FL. EL -11.0)	14,309	11'-6	1.0	31.9	+1.0%

NOTES: (1) For steel, effective thickness is the thickness value which will result in a volume of material that acts as a heat sink when multiplied by a corresponding surface area. Effective thicknesses are determined differently for different items, as follows:

A solid shape, such as a beam or instrument stand, is exposed to the air on its exterior (perimeter) surface area. The effective thickness, however, is only half of the actual thickness since there are two exposed surfaces for each thickness.

- For a hollow shape with exposure to air on the exterior surface only, such as a pipe, the effective thickness equals the actual thickness.
- For a hollow shape whose inner surface is also exposed to air, such as HVAC duct or cable trays, the effective thickness is again equal to half the actual thickness.
- For galvanized or other layered material, the effective thickness of each material layer is accounted for consistent with the above shape considerations.
- For certain complex shapes or items with multiple thickness, an average effective thickness was used.

(2) • For concrete, the total thickness is given for each item in the table.

→(DRN 03-2060, R14)

(3) The SIT shell and head heat sinks contain two layers, namely, an outer layer of carbon steel (exposed to the containment atmosphere) and an inner layer of stainless steel.

(4) The cable trays, boxes, panels, and conduit heat sinks contain two layers, namely, an outer layer of galvanized coating and an inner layer of carbon steel.

(5) The effective thicknesses of the concrete heat sinks are half of the total thicknesses listed in this table, except for the below-water portions of the steam generator foundation heat sinks and the base concrete heat sink (these correspond to heat sink no.3 in Table 6.2-8), for which the total thicknesses are the effective thicknesses.

←(DRN 03-2060, R14)

WSES-FSAR-UNIT-3

TABLE 6.2-8 (Sheet 1 of 2)

Revision 307 (07/13)

SUMMARY OF PASSIVE HEAT SINKS
USED IN THE CONTAINMENT ANALYSIS

A. Heat Sinks

→(EC-8458, R307)

Structure	Thickness ⁽¹⁾	Surface Area Exposed to Containment	Thermal Conductivity	Specific Heat Capacity
		Interior (ft ²)	(BTU/hr-ft-F)	(BTU/lbm-F)
1. Containment Primary Cylinder	Top coat - 7 mils	60786	0.083 to 0.286	0.286
	Bottom coat - 5 mils		1.5	0.192
	Steel Shell 1.9 in		25.9	0.10955
	Paint film - 6 mils		1.5	0.192
2. Containment Primary Dome	Top coat - 7 mils	30195	0.083	0.286
	Bottom coat - 5 mils		1.5	0.192
	Steel Shell - 0.95 in.		25.9	0.10955
	Paint film - 6 mils		1.5	0.192
3. Concrete Underwater (Basemat & S.G. Foundation)	Paint film - 16 mils	15122	0.156	0.4079
	Concrete 137.475 in		1.0	0.2774
4. Concrete exposed to Contain- ment Sump water for LOCA or Containment atmosphere for MSLB	Paint film - 16 mils	8384	0.156	0.4079
	Concrete – 24.6 in		1.0	0.2774
5. Concrete exposed to Contain- thick) Atmosphere (less than 6' thick)	Paint film - 16 mils	41646	0.156	0.4079
	Concrete – 17.19 in		1.0	31.9
	Concrete – 0.5 ft.			
6. Concrete Exposed to Contain- ment Atmosphere (more than 6 ft thick)	Paint film - 16 mils	9716	0.156	0.4079
	Concrete – 40.37 in		1.0	0.2774
7. Stainless Steel (Refueling pool and piping)	Stainless Steel 0.1256 in.	31595	9.8	0.11

←(EC-8458, R307)

WSES-FSAR-UNIT-3

TABLE 6.2-8 (Sheet 2 of 2)

Revision 307 (07/13)

SUMMARY OF PASSIVE HEAT SINKS
USED IN THE CONTAINMENT ANALYSIS

A. Heat Sinks
→(EC-8458, R307)

Structure	Thickness ⁽¹⁾	Surface Area Exposed to Containment	Thermal Conductivity	Specific Heat Capacity
		Interior (ft ²)	(BTU/hr-ft-F)	(BTU/lbm-F)
8. Galvanized Steel (conduits and cable trays)	Zinc - 1	111988	64.0	0.091
	Steel - 0.076328 in.		25.9	0.10955
9. Structural and Miscellaneous Exposed Steel less than 0.2 inch thick	Paint film 9 mils	210,864	0.235	0.558
	Steel 0.076674 in.		25.9	0.10955
10. Structural and Miscellaneous Exposed Steel greater than 0.2 inch And less than 0.5 inch thick	Paint film 9 mils	192,185	0.235	0.558
	Steel 0.375618 in.		25.9	0.10955
11. Structural and Miscellaneous Exposed Steel greater than 0.5 inch thick	Paint film 9 mils	55,431	0.235	0.558
	Steel 0.88731 in.		25.9	0.10955
Steel	0.5 in.	5000	25.9	53.57

←(EC-8458, R307)

(1) one side insulated

→(DRN 01-230)

TABLE 6.2-9 INTENTIONALLY DELETED.

←(DRN 01-230)

WSES-FSAR-UNIT-3

TABLE 6.2-10 (Sheet 1 of 2)

Revision 307 (07/13)

➔ (DRN 01-230, R12; 03-2060, R14)

ACCIDENT CHRONOLOGIES (Cases with no uncertainties)

A. Worst case LOCA Peak P&T (19.24 Ft² DEHLSB) Case

<u>Time (Seconds)</u>	<u>Event</u>
0.0	Break occurs
➔ (EC-8458, R307) 18.47	Peak containment pressure (blowdown)
15.1	End of blowdown
⬅ (EC-8458, R307) 32.0 after CIAS	Start of containment fan cooler
33.60 after CIAS	Start containment spray injection
41.25 after CIAS	Containment spray reaches full flow
1823.58	Start ECCS recirculation (Max. SI Flow)
3171.25	Start ECCS recirculation (Min. SI Flow)

B. Worst case LOCA 24-Hour Pressure Case (9.82 Ft² DEDLSB, Min. SI Flow)

<u>Time (Seconds)</u>	<u>Event</u>
0.0	Break occurs
➔ (EC-8458, R307) 13.7	Peak Containment pressure (blowdown)
15.00	End of blowdown
⬅ (EC-8458, R307) 32.0 after CIAS	Start of containment fan cooler
33.60 after CIAS	Start containment spray injection
41.25 after CIAS	Containment spray reaches full flow
3253.19	Start ECCS recirculation
⬅ (DRN 01-230, R12; 03-2060, R14)	

➔(DRN 01-230, R12; 03-2060, R14)

ACCIDENT CHRONOLOGIES (Cases with no uncertainties)

➔(EC-8458, R307)

D. Worst Case MSLB Peak Pressure (Hot Zero Power, One MSIV Failure)

⬅(EC-8458, R307)

Time
(Seconds)

Event

0.0

Break occurs

20.5 after CIAS

Start of containment fan cooler

➔(EC-8458, R307)

22.07 after CIAS

Start containment spray injection

31.94 after CIAS

Containment spray reaches full flow

177.2

Peak Pressure

E. Worst Case MSLB Peak Temperature (Hot Full Power, One MSIV Failure)

⬅(EC-8458, R307)

Time
(Seconds)

Event

0.0

Break occurs

20.5 after CIAS

Start of containment fan cooler

➔(EC-8458, R307)

22.07 after CIAS

Start containment spray injection

31.94 after CIAS

Containment spray reaches full flow

32.6

Peak Temperature

⬅(DRN 01-230, R12; 03-2060, R14; EC-8458, R307)

ASSUMPTIONS USED IN ANALYSIS OF INADVERTENT CONTAINMENT
SPRAY SYSTEM ACTUATION

Item	Assumed Value
<u>Containment</u>	
Initial temperature, °F →(EC-706, R304)	120
Initial pressure, psia	14.025
Relative humidity, %	
a) for containment vessel Δp	50
b) for shield wall Δp	100
Net free volume (minimum), ft. ³	2.677 x 10 ⁶
<u>Containment Spray System</u>	
Number of trains in operation	1
Flowrate per train, gpm (runout flow)	2500
Refueling water temperature, °F	50
<u>Containment Fan Coolers</u>	
Number of units in operation	3
Flowrate per unit through fan cooler, acfm	80000
Fan Cooler Heat Removal Rate	1306 BTU/sec
<u>Containment Vacuum Breakers</u>	
Number of Vacuum Breaker assumed For Containment Vessel Δp	1
Number assumed for Shield Building Δp ←(EC-706, R304)	2

ASSUMPTIONS USED IN ANALYSIS OF INADVERTENT CONTAINMENT
SPRAY SYSTEM ACTUATION

Item	Assumed Value
<u>Containment Vacuum Breakers (Cont'd)</u>	
→(EC-706, R304)	
Setpoint differential pressure to open Vacuum Breakers, psid	0.3613 ¹
Delay time to start opening Vacuum Breakers, seconds	
a) For Containment Vessel Δp	6
b) For Shield Wall Δp	0
 <u>Shield Building</u>	
Initial temperature, °F	120
Initial pressure, psia	14.339
Relative humidity, %	
a) For Containment Vessel Δp	50
b) For Shield Wall Δp	100
Net free volume (minimum), ft ³	560,000
 <u>Ambient Atmosphere</u>	
Assumed pressure, psia	14.7

⁽¹⁾ This valve represents 10 inch W.C.
←(EC-706, R304)

MASS AND ENERGY RELEASE DATA

→(DRN 01-230, R12; EC-8458, R307)

A. DOUBLE ENDED HOT LEG SLOT BREAK
(19.242 SQUARE FEET TOTAL AREA)
BLOWDOWN PHASE

TIME (SEC)	MASS RATE (LBM/SEC)	ENERGY RATE (BTU/SEC)	ENTHALPY (BTU/LBM)
0.00	0.0000E+00	0.0000E+00	628.16
0.05	1.3441E+05	8.4432E+07	628.16
0.10	1.4190E+05	8.9262E+07	629.05
0.20	1.3058E+05	8.2297E+07	630.23
0.30	1.1993E+05	7.5447E+07	629.09
0.40	1.1324E+05	7.1035E+07	627.28
0.50	1.0656E+05	6.6742E+07	626.35
0.60	1.0154E+05	6.3511E+07	625.45
0.70	9.6152E+04	6.0098E+07	625.03
0.80	9.0206E+04	5.6556E+07	626.97
0.90	8.5285E+04	5.3649E+07	629.06
1.00	8.1185E+04	5.1353E+07	632.54
2.00	7.1207E+04	4.3125E+07	605.63
3.00	6.3437E+04	3.8322E+07	604.10
4.00	5.1364E+04	3.2431E+07	631.39
5.00	4.6711E+04	2.9151E+07	624.07
6.00	4.0124E+04	2.5319E+07	631.02
7.00	2.3986E+04	1.8163E+07	757.22
8.00	1.6323E+04	1.4226E+07	871.53
9.00	1.1006E+04	1.0100E+07	917.69
10.00	9.1942E+03	8.2156E+06	893.57
11.00	5.6427E+03	5.7752E+06	1023.49
12.00	2.8273E+03	3.4212E+06	1210.09
12.50	3.2657E+03	3.4833E+06	1066.61
13.00	4.7167E+03	3.5545E+06	753.60
13.50	3.8227E+03	3.1156E+06	815.02
14.00	2.3662E+03	2.5481E+06	1076.86
14.10	2.1411E+03	2.4186E+06	1129.58
14.20	1.9286E+03	2.2780E+06	1181.16
14.30	1.6683E+03	2.0228E+06	1212.46
14.40	15070E+03	1.8359E+06	1218.20
14.50	1.3151E+03	1.6092E+06	1223.66
14.60	1.1371E+03	1.3961E+06	1227.78
14.70	9.9323E+02	1.2226E+06	1230.93
14.80	8.2958E+02	1.0228E+06	1232.91
14.90	6.5112E+02	8.0283E+05	1233.00
15.00	4.5022E+02	5.5420E+05	1230.95
15.10	3.5550E+02	4.1628E+05	1170.97
15.10	0.0000E+00	0.0000E+00	1170.97

INTEGRAL : 4.9666E+05 LBM

3.28040E+08 BTU

←(DRN 01-230, R12; EC-8458, R307)

MASS AND ENERGY RELEASE DATA

➔(DRN 01-230, R12)

A. DOUBLE ENDED HOT LEG SLOT BREAK
(19.242 SQUARE FEET TOTAL AREA)
LONG-TERM BOIL-OFF PHASE

TIME (SEC)	STEAM MASS RATE (LBM/SEC)	STEAM ENERGY RATE (BTU/SEC)	SPILL MASS RATE (LBM/SEC)	SPILL ENERGY RATE (BTU/SEC)
➔(EC-8458, R307)				
1.510000E+01	0.000000E+00	0.000000E+00	0.000000E+00	0.000000E+00
1.511000E+01	2.830102E+03	3.320627E+06	0.000000E+00	0.000000E+00
←(EC-8458, R307)				
1.850327E+01	2.376682E+03	2.777849E+06	0.000000E+00	0.000000E+00
1.855327E+01	7.869118E+02	9.235642E+05	7.336482E+02	4.986724E+04
1.860327E+01	8.560871E+02	1.004751E+06	6.644729E+02	4.516528E+04
1.865327E+01	8.528423E+02	1.000942E+06	6.677177E+02	4.538583E+04
1.870327E+01	8.528471E+02	1.000947E+06	6.677129E+02	4.538551E+04
1.875327E+01	8.527079E+02	1.000782E+06	6.678521E+02	4.539497E+04
1.880327E+01	8.087209E+02	9.491559E+05	7.118391E+02	4.838484E+04
1.885327E+01	8.105707E+02	9.513259E+05	7.099893E+02	4.825910E+04
1.890327E+01	8.103506E+02	9.510666E+05	7.102094E+02	4.827406E+04
1.895327E+01	8.102252E+02	9.509184E+05	7.103348E+02	4.828259E+04
1.900327E+01	8.100965E+02	9.507663E+05	7.104636E+02	4.829134E+04
1.905327E+01	8.099688E+02	9.506154E+05	7.105912E+02	4.830001E+04
1.910327E+01	8.098420E+02	9.504656E+05	7.107180E+02	4.830864E+04
1.915327E+01	8.097159E+02	9.503167E+05	7.108441E+02	4.831720E+04
1.920327E+01	8.095906E+02	9.501686E+05	7.109694E+02	4.832572E+04
1.925327E+01	8.094660E+02	9.500214E+05	7.110940E+02	4.833419E+04
1.930327E+01	8.093421E+02	9.498749E+05	7.112179E+02	4.834261E+04
1.935327E+01	8.092188E+02	9.497293E+05	7.113412E+02	4.835099E+04
1.940327E+01	8.090962E+02	9.495843E+05	7.114638E+02	4.835933E+04
1.945327E+01	8.089741E+02	9.494401E+05	7.115859E+02	4.836763E+04
1.950327E+01	8.088526E+02	9.492965E+05	7.117074E+02	4.837589E+04
1.955327E+01	8.087316E+02	9.491536E+05	7.118284E+02	4.838411E+04
1.960327E+01	8.086112E+02	9.490113E+05	7.119488E+02	4.839229E+04
1.965327E+01	8.084912E+02	9.488695E+05	7.120688E+02	4.840045E+04
1.970327E+01	8.083717E+02	9.487284E+05	7.121883E+02	4.840857E+04
1.975327E+01	8.082527E+02	9.485877E+05	7.123073E+02	4.841666E+04
1.980327E+01	8.081341E+02	9.484476E+05	7.124259E+02	4.842472E+04
1.985327E+01	8.080160E+02	9.483080E+05	7.125440E+02	4.843275E+04
1.990327E+01	8.078982E+02	9.481689E+05	7.126618E+02	4.844075E+04
1.995327E+01	8.077809E+02	9.480302E+05	7.127791E+02	4.844873E+04
2.000327E+01	8.077809E+02	9.480302E+05	7.127791E+02	4.844873E+04
2.005327E+01	8.076646E+02	9.478928E+05	7.128954E+02	4.845664E+04
2.010327E+01	8.075580E+02	9.477668E+05	7.130020E+02	4.846388E+04
2.015327E+01	8.074513E+02	9.476406E+05	7.131087E+02	4.847113E+04
2.020327E+01	8.073450E+02	9.475150E+05	7.132150E+02	4.847836E+04
2.025327E+01	8.072390E+02	9.473897E+05	7.133210E+02	4.848556E+04
2.030327E+01	8.071334E+02	9.472648E+05	7.134266E+02	4.849274E+04
2.035327E+01	8.070280E+02	9.471402E+05	7.135320E+02	4.849990E+04
2.040327E+01	8.069230E+02	9.470160E+05	7.136370E+02	4.850704E+04
2.045327E+01	8.068182E+02	9.468922E+05	7.137418E+02	4.851417E+04
2.050327E+01	8.067137E+02	9.467687E+05	7.138463E+02	4.852127E+04
2.055327E+01	8.066095E+02	9.466455E+05	7.139505E+02	4.852835E+04
2.060327E+01	8.065056E+02	9.465226E+05	7.140544E+02	4.853542E+04
2.065327E+01	8.064019E+02	9.464000E+05	7.141581E+02	4.854246E+04
2.070327E+01	8.062985E+02	9.462777E+05	7.142616E+02	4.854949E+04
2.075327E+01	8.061952E+02	9.461557E+05	7.143647E+02	4.855651E+04
2.080327E+01	8.060923E+02	9.460340E+05	7.144677E+02	4.856351E+04
←(DRN 01-230, R12)				

MASS AND ENERGY RELEASE DATA

→(DRN 01-230)

A. DOUBLE ENDED HOT LEG SLOT BREAK
(19.242 SQUARE FEET TOTAL AREA)
LONG-TERM BOIL-OFF PHASE (Cont'd)

TIME (SEC)	STEAM MASS RATE (LBM/SEC)	STEAM ENERGY RATE (BTU/SEC)	SPILL MASS RATE (LBM/SEC)	SPILL ENERGY RATE (BTU/SEC)
2.080327E+01	8.059896E+02	9.459126E+05	7.145704E+02	4.857049E+04
2.085327E+01	8.058871E+02	9.457914E+05	7.146729E+02	4.857746E+04
2.090327E+01	8.057848E+02	9.456705E+05	7.147752E+02	4.858441E+04
2.095327E+01	8.056827E+02	9.455499E+05	7.148773E+02	4.859135E+04
2.100327E+01	8.055808E+02	9.454294E+05	7.149792E+02	4.859827E+04
3.610327E+01	4.057674E+02	4.760934E+05	1.114793E+03	7.577423E+04
5.120327E+01	3.480797E+02	4.082155E+05	1.172480E+03	7.969535E+04
6.630327E+01	2.985802E+02	3.500135E+05	1.221980E+03	8.305991E+04
8.140327E+01	2.915270E+02	3.416182E+05	1.229033E+03	8.353933E+04
9.650327E+01	2.834494E+02	3.320542E+05	1.237111E+03	8.408837E+04
1.116033E+02	2.792298E+02	3.270243E+05	1.241330E+03	8.437519E+04
1.267033E+02	2.745993E+02	3.215287E+05	1.245961E+03	8.468993E+04
1.418033E+02	1.926130E+02	2.254766E+05	1.327947E+03	9.026267E+04
1.569533E+02	1.227729E+02	1.436814E+05	1.397787E+03	9.500981E+04
1.720533E+02	1.191942E+02	1.394523E+05	1.401366E+03	9.525306E+04
1.871533E+02	1.160255E+02	1.357082E+05	1.404534E+03	9.546845E+04
2.022533E+02	1.132577E+02	1.324376E+05	1.407302E+03	9.565657E+04
2.173533E+02	1.109857E+02	1.297503E+05	1.409574E+03	9.581101E+04
2.324533E+02	1.088268E+02	1.271981E+05	1.411733E+03	9.595775E+04
2.475533E+02	1.067691E+02	1.247670E+05	1.413791E+03	9.609762E+04
2.626533E+02	1.050033E+02	1.226793E+05	1.415557E+03	9.621764E+04
2.778033E+02	1.033565E+02	1.207325E+05	1.417203E+03	9.632957E+04
2.929033E+02	1.017827E+02	1.188728E+05	1.418777E+03	9.643655E+04
3.080033E+02	1.005122E+02	1.173689E+05	1.420048E+03	9.652290E+04
3.231033E+02	9.936308E+01	1.160077E+05	1.421197E+03	9.660101E+04
3.382033E+02	9.823085E+01	1.146674E+05	1.422329E+03	9.667797E+04
3.533033E+02	9.713700E+01	1.133727E+05	1.423423E+03	9.675232E+04
3.684033E+02	9.613751E+01	1.121891E+05	1.424422E+03	9.682026E+04
3.835033E+02	9.515326E+01	1.110242E+05	1.425407E+03	9.688716E+04
3.986033E+02	9.418361E+01	1.098771E+05	1.426376E+03	9.695307E+04
4.137533E+02	9.329000E+01	1.088194E+05	1.427270E+03	9.701381E+04
4.288533E+02	9.241944E+01	1.077893E+05	1.428141E+03	9.707299E+04
4.439533E+02	9.156178E+01	1.067750E+05	1.428998E+03	9.713128E+04
4.590533E+02	9.074947E+01	1.058143E+05	1.429811E+03	9.718649E+04
4.741533E+02	8.997107E+01	1.048936E+05	1.430589E+03	9.723940E+04
4.892533E+02	8.921878E+01	1.040040E+05	1.431341E+03	9.729054E+04
5.043533E+02	8.849505E+01	9.986772E+04	1.435601E+03	9.758008E+04
5.194533E+02	8.775572E+01	9.973725E+04	1.445204E+03	9.823283E+04
5.345533E+02	8.702209E+01	9.960649E+04	1.451438E+03	9.865654E+04
5.496533E+02	8.628404E+01	9.947577E+04	1.456076E+03	9.897180E+04
5.647533E+02	8.554664E+01	9.934499E+04	1.459983E+03	9.923739E+04
5.798533E+02	8.480949E+01	9.921429E+04	1.808455E+02	1.743965E+04
5.949533E+02	8.407239E+01	9.908362E+04	1.854276E+02	1.817905E+04
6.100533E+02	8.333512E+01	9.895290E+04	1.888849E+02	1.876575E+04
6.251533E+02	8.259785E+01	9.882217E+04	1.915545E+02	1.924155E+04
6.402533E+02	8.186068E+01	9.869144E+04	1.936623E+02	1.963551E+04
6.553533E+02	8.112351E+01	9.856071E+04	1.953741E+02	1.996920E+04
6.704533E+02	8.038634E+01	9.843000E+04	1.968327E+02	2.025941E+04
6.855533E+02	7.964917E+01	9.830000E+04	1.980555E+02	2.051078E+04
7.006533E+02	7.891200E+01	9.817000E+04	1.991541E+02	2.073672E+04
7.157533E+02	7.817483E+01	9.804000E+04	2.000560E+02	2.093114E+04

←(DRN 01-230)

MASS AND ENERGY RELEASE DATA

→(DRN 01-230)

A. DOUBLE ENDED HOT LEG SLOT BREAK
(19.242 SQUARE FEET TOTAL AREA)
LONG-TERM BOIL-OFF PHASE (Cont'd)

TIME (SEC)	STEAM MASS RATE (LBM/SEC)	STEAM ENERGY RATE (BTU/SEC)	SPILL MASS RATE (LBM/SEC)	SPILL ENERGY RATE (BTU/SEC)
8.236003E+03	3.774581E+01	4.364528E+04	2.008942E+02	2.110914E+04
8.840003E+03	3.699960E+01	4.277950E+04	2.016404E+02	2.126878E+04
9.444003E+03	3.633151E+01	4.200446E+04	2.023085E+02	2.141235E+04
1.000000E+04	3.574709E+01	4.132664E+04	2.028929E+02	2.153503E+04
1.051400E+04	3.567189E+01	4.123836E+04	2.029681E+02	2.159437E+04
1.102800E+04	3.562477E+01	4.118311E+04	2.030152E+02	2.164737E+04
1.154400E+04	3.558611E+01	4.113786E+04	2.030539E+02	2.169697E+04
1.205600E+04	3.552169E+01	4.106293E+04	2.031183E+02	2.174666E+04
1.257200E+04	3.520455E+01	4.069555E+04	2.034355E+02	2.182141E+04
1.308600E+04	3.487394E+01	4.031240E+04	2.037661E+02	2.189470E+04
1.360000E+04	3.453846E+01	3.992356E+04	2.041015E+02	2.196565E+04
1.411400E+04	3.421218E+01	3.954537E+04	2.044278E+02	2.203279E+04
1.462800E+04	3.392733E+01	3.921514E+04	2.047127E+02	2.209276E+04
1.514400E+04	3.364320E+01	3.888583E+04	2.049968E+02	2.215026E+04
1.565800E+04	3.336044E+01	3.855813E+04	2.052796E+02	2.220515E+04
1.617200E+04	3.308879E+01	3.824330E+04	2.055512E+02	2.225658E+04
1.668600E+04	3.284157E+01	3.795678E+04	2.057984E+02	2.230324E+04
1.720000E+04	3.259547E+01	3.767161E+04	2.060445E+02	2.234781E+04
1.771600E+04	3.234856E+01	3.738550E+04	2.062914E+02	2.239065E+04
1.822800E+04	3.211779E+01	3.711810E+04	2.065222E+02	2.242985E+04
1.874400E+04	3.190529E+01	3.687186E+04	2.067347E+02	2.246549E+04
1.925800E+04	3.169458E+01	3.662773E+04	2.069454E+02	2.249935E+04
1.977400E+04	3.148320E+01	3.638283E+04	2.071568E+02	2.253185E+04
2.286000E+04	3.041063E+01	3.514029E+04	2.082294E+02	2.267940E+04
2.800000E+04	2.887772E+01	3.336494E+04	2.097623E+02	2.282417E+04
3.316000E+04	2.765599E+01	3.195031E+04	2.109840E+02	2.288000E+04
3.830000E+04	2.664777E+01	3.078314E+04	2.119922E+02	2.288506E+04
4.344000E+04	2.577976E+01	2.977843E+04	2.128602E+02	2.286272E+04
4.858000E+04	2.502028E+01	2.889948E+04	2.136197E+02	2.282518E+04
5.374000E+04	2.437503E+01	2.815279E+04	2.142650E+02	2.277710E+04
5.888000E+04	2.376733E+01	2.744967E+04	2.148727E+02	2.273088E+04
6.400000E+04	2.323217E+01	2.683051E+04	2.154078E+02	2.268288E+04
6.916000E+04	2.271482E+01	2.623204E+04	2.159252E+02	2.263878E+04
7.430000E+04	2.226902E+01	2.571636E+04	2.163710E+02	2.259371E+04
7.946000E+04	2.183709E+01	2.521678E+04	2.168029E+02	2.255356E+04
8.458000E+04	2.145804E+01	2.477838E+04	2.171820E+02	2.251443E+04
8.974000E+04	2.108333E+01	2.434503E+04	2.175567E+02	2.247997E+04
9.488000E+04	2.180960E+01	2.518454E+04	2.168304E+02	2.235400E+04
1.000200E+05	2.260683E+01	2.610637E+04	2.160332E+02	2.226279E+04
1.320000E+05	2.101933E+01	2.427077E+04	2.176207E+02	2.232842E+04
1.640000E+05	1.985188E+01	2.292090E+04	2.187881E+02	2.226884E+04
1.960000E+05	1.896348E+01	2.189384E+04	2.196765E+02	2.220921E+04
2.280000E+05	1.828376E+01	2.110812E+04	2.203562E+02	2.216105E+04
2.600000E+05	1.766291E+01	2.039051E+04	2.209771E+02	2.212320E+04
2.920000E+05	1.712641E+01	1.977046E+04	2.215136E+02	2.209082E+04
3.600000E+05	1.623292E+01	1.873791E+04	2.224071E+02	2.203206E+04
4.400000E+05	1.502433E+01	1.734146E+04	2.236157E+02	2.198488E+04
5.200000E+05	1.375733E+01	1.587774E+04	2.248827E+02	2.190541E+04
6.000000E+05	1.274468E+01	1.470806E+04	2.258953E+02	2.184600E+04
6.800000E+05	1.187051E+01	1.369845E+04	2.267695E+02	2.179156E+04

←(DRN 01-230)

MASS AND ENERGY RELEASE DATA

→(DRN 01-230)

A. DOUBLE ENDED HOT LEG SLOT BREAK
 (19.242 SQUARE FEET TOTAL AREA)
 LONG-TERM BOIL-OFF PHASE (Cont'd)

TIME (SEC)	STEAM MASS RATE (LBM/SEC)	STEAM ENERGY RATE (BTU/SEC)	SPILL MASS RATE (LBM/SEC)	SPILL ENERGY RATE (BTU/SEC)
7.600000E+05	1.107611E+01	1.278107E+04	2.275639E+02	2.174196E+04
8.400000E+05	1.035177E+01	1.194470E+04	2.282882E+02	2.169634E+04
9.200000E+05	9.695284E+00	1.118673E+04	2.289447E+02	2.165446E+04
1.000000E+06	9.111968E+00	1.051329E+04	2.295280E+02	2.161783E+04

←(DRN 01-230)

MASS AND ENERGY RELEASE DATA

→(DRN 01-230, R12; EC-8458, R307)

B. DOUBLE ENDED DISCHARGE LEG SLOT BREAK
 MINIMUM SI FLOW (9.82 SQUARE FEET TOTAL AREA)
 MASS & ENERGY RELEASE DATA :
 BLOWDOWN PHASE

TIME (SEC)	MASS RATE (LBM/SEC)	ENERGY RATE (BTU/SEC)	ENTHALPY (BTU/LBM)
0.00	0.0000E+00	0.0000E+00	543.07
0.05	8.5208E+04	4.6274E+07	543.07
0.10	1.1726E+05	6.3756E+07	543.73
0.20	1.2051E+05	6.5829E+07	546.26
0.30	1.1920E+05	6.5180E+07	546.82
0.40	1.1736E+05	6.4156E+07	546.68
0.50	1.1629E+05	6.3558E+07	546.55
0.60	1.1425E+05	6.2578E+07	546.42
0.70	1.1391E+05	6.2259E+07	546.55
0.80	1.1034E+05	6.0323E+07	546.72
0.90	1.0906E+05	5.9668E+07	547.13
1.00	1.0770E+05	5.9021E+07	547.99
2.00	7.6822E+04	4.3487E+07	566.08
3.00	5.7467E+04	3.2493E+07	565.42
4.00	5.0960E+04	2.9604E+07	580.92
5.00	3.3726E+04	2.3192E+07	687.66
6.00	3.3004E+04	2.1819E+07	661.11
7.00	2.8240E+04	1.9072E+07	675.38
8.00	2.2271E+04	1.5988E+07	717.88
9.00	1.1252E+04	1.0375E+07	922.09
10.00	1.1708E+04	9.8313E+06	839.68
11.00	1.4141E+04	8.4508E+06	597.59
12.00	1.3916E+04	6.3916E+06	459.29
12.50	1.2406E+04	5.1419E+06	414.48
13.00	1.1143E+04	4.1945E+06	376.41
13.50	9.6104E+03	3.3029E+06	343.69
14.00	1.0445E+04	3.3778E+06	323.39
14.10	4.4181E+03	1.4136E+06	319.96
14.20	4.2993E+03	1.3702E+06	318.69
14.30	3.5824E+03	1.1542E+06	322.20
14.40	3.0529E+03	9.8932E+05	324.06
14.50	2.6350E+03	8.5534E+05	324.61
14.60	2.2077E+03	7.1909E+05	325.72
14.70	1.7272E+03	5.6777E+05	328.72
14.80	1.1935E+03	4.0135E+05	336.28
14.90	5.9897E+02	2.1489E+05	358.76
15.00	0.0000E+00	0.0000E+00	358.76

←(DRN 01-230, R12; EC-8458, R307)

MASS AND ENERGY RELEASE DATA

→(DRN 01-230, R12; EC-8458, R307)

B. DOUBLE ENDED DISCHARGE LEG SLOT BREAK
 MINIMUM SI FLOW (9.82 SQUARE FEET TOTAL AREA)
 MASS & ENERGY RELEASE DATA : REFLOOD & POST-REFLOOD PHASES

TIME (SEC)	MASS RATE (LBM/SEC)	ENERGY RATE (BTU/SEC)	ENTHALPY (BTU/LBM)
15.10	0.0000E+00	0.0000E+00	1300.99
15.20	1.1565E+02	1.5046E+05	1300.99
17.00	3.3624E+02	4.3569E+05	1295.77
18.60	5.6575E+02	7.2962E+05	1289.65
20.00	6.9083E+02	8.8735E+05	1284.47
20.01	3.4542E+02	4.4368E+05	1284.47
20.20	3.4556E+02	4.4369E+05	1283.97
21.80	3.4633E+02	4.4358E+05	1280.79
23.40	3.4646E+02	4.4301E+05	1278.69
25.00	3.4617E+02	4.4216E+05	1277.31
26.60	3.4562E+02	4.4113E+05	1276.35
28.20	3.4492E+02	4.3999E+05	1275.65
29.80	3.4416E+02	4.3881E+05	1275.04
31.40	3.4337E+02	4.3762E+05	1274.47
33.00	3.4257E+02	4.3641E+05	1273.91
34.60	3.4176E+02	4.3518E+05	1273.37
36.20	3.4093E+02	4.3395E+05	1272.84
37.80	3.4011E+02	4.3272E+05	1272.31
39.39	3.3928E+02	4.3148E+05	1271.76
39.40	6.7855E+02	8.6295E+05	1271.76
55.60	5.8722E+02	7.4564E+05	1269.78
71.70	5.1931E+02	6.5870E+05	1268.41
87.80	4.6995E+02	5.9540E+05	1266.94
104.00	4.3473E+02	5.5003E+05	1265.22
120.10	4.1055E+02	5.1863E+05	1263.26
136.20	3.9424E+02	4.9715E+05	1261.03
152.30	3.8349E+02	4.8266E+05	1258.60
168.50	3.7656E+02	4.7292E+05	1255.90
184.60	3.7220E+02	4.6639E+05	1253.06
200.70	3.6951E+02	4.6191E+05	1250.06
216.80	3.6786E+02	4.5871E+05	1246.97
233.00	3.6678E+02	4.5625E+05	1243.93
249.10	3.6631E+02	4.5443E+05	1240.56
265.20	3.6606E+02	4.5286E+05	1237.12
281.30	3.7862E+02	4.4601E+05	1178.00
281.40	3.7109E+02	4.3714E+05	1178.00
282.40	3.8151E+02	4.4942E+05	1178.00
284.50	3.6754E+02	4.3296E+05	1178.00
287.60	3.6926E+02	4.3499E+05	1178.00
291.80	3.5698E+02	4.2052E+05	1178.00
297.10	3.5166E+02	4.1426E+05	1178.00
303.30	3.3953E+02	3.9997E+05	1178.00

←(DRN 01-230, R12; EC-8458, R307)

MASS AND ENERGY RELEASE DATA

→(DRN 01-230, R12; EC-8458, R307)

B. DOUBLE ENDED DISCHARGE LEG SLOT BREAK
 MINIMUM SI FLOW (9.82 SQUARE FEET TOTAL AREA)
 MASS & ENERGY RELEASE DATA : REFLOOD & POST-REFLOOD PHASES

TIME (SEC)	MASS RATE (LBM/SEC)	ENERGY RATE (BTU/SEC)	ENTHALPY (BTU/LBM)
310.70	3.2982E+02	3.8853E+05	1178.00
319.10	3.1665E+02	3.7301E+05	1178.00
328.50	3.0489E+02	3.5916E+05	1178.00
339.00	2.9133E+02	3.4319E+05	1178.00
350.50	2.7903E+02	3.2870E+05	1178.00
363.00	2.3098E+02	2.7209E+05	1178.00
376.70	2.0491E+02	2.4138E+05	1178.00
391.30	1.7815E+02	2.0986E+05	1178.00
407.00	1.6089E+02	1.8953E+05	1178.00
407.10	0.0000E+00	0.0000E+05	1178.00

←(DRN 01-230, R12; EC-8458, R307)

MASS AND ENERGY RELEASE DATA

➔(DRN 01-230, R12; EC-8458, R307)

B. DOUBLE ENDED DISCHARGE LEG SLOT BREAK
 MINIMUM SI FLOW (9.82 SQUARE FEET TOTAL AREA)
 MASS & ENERGY RELEASE DATA : SPILLAGE

←(EC-8458, R307)

TIME (SEC)	MASS RATE (LBM/SEC)	ENERGY RATE (BTU/SEC)	ENTHALPY (BTU/LBM)
15.11	0.0000E+00	0.0000E+00	259.94
15.20	5.7825E+01	1.5031E+04	259.94
15.50	9.2200E+01	2.3966E+04	259.94
16.00	1.1609E+02	3.0176E+04	259.94
16.50	1.2725E+02	3.3077E+04	259.94
17.00	1.6812E+02	4.3701E+04	259.94
18.00	2.0896E+02	5.4317E+04	259.94
18.50	2.4449E+02	6.3553E+04	259.94
19.00	2.7672E+02	7.1931E+04	259.94
19.50	3.0669E+02	7.9720E+04	259.94
20.00	8.9930E+03	8.5077E+05	94.60
21.00	8.7679E+03	8.3108E+05	94.79
22.00	8.5406E+03	8.1113E+05	94.97
23.00	8.3293E+03	7.9255E+05	95.15
24.00	8.1321E+03	7.7518E+05	95.32
25.00	7.9474E+03	7.5889E+05	95.49
26.00	7.7739E+03	7.4356E+05	95.65
27.00	7.6104E+03	7.2911E+05	95.80
28.00	7.4558E+03	7.1543E+05	95.96
29.00	7.3094E+03	7.0247E+05	96.10
30.00	7.1704E+03	6.9015E+05	96.25
31.00	7.0381E+03	6.7843E+05	96.39
32.00	6.9120E+03	6.6725E+05	96.53
33.00	6.7916E+03	6.5656E+05	96.67
34.00	6.6764E+03	6.4634E+05	96.81
35.00	6.5661E+03	6.3654E+05	96.94
36.00	6.4603E+03	6.2714E+05	97.08
37.00	6.3586E+03	6.1811E+05	97.21
38.00	6.2609E+03	6.0942E+05	97.34
39.00	6.1668E+03	6.0105E+05	97.47
39.40	3.3928E+02	8.8191E+04	259.94
39.50	0.0000E+00	0.0000E+00	259.83
279.90	0.0000E+00	0.0000E+00	259.83
280.00	5.7350E+01	1.4901E+04	259.83
281.30	6.5010E+01	1.6890E+04	259.81
301.30	2.3032E+02	5.9839E+04	259.81
321.30	3.0627E+02	7.9571E+04	259.81
341.30	3.3798E+02	8.7810E+04	259.81
361.30	3.9930E+02	1.0374E+05	259.81
381.30	4.3773E+02	1.1373E+05	259.81
401.30	4.5441E+02	1.1806E+05	259.81
➔(EC-8458, R307)			
407.00	4.6144E+02	1.1989E+05	259.81
←(DRN 01-230, R12; EC-8458, R307)			

MASS AND ENERGY RELEASE DATA

➔(DRN 01-230, R12; EC-8458, R307)

B. DOUBLE ENDED DISCHARGE LEG SLOT BREAK
 MINIMUM SI FLOW (9.82 SQUARE FEET TOTAL AREA)
 MASS & ENERGY RELEASE DATA : LONG-TERM BOIL-OFF PHASE

◀(EC-8458, R307)

TIME (SEC)	STEAM MASS RATE (LBM/SEC)	STEAM ENERGY RATE (BTU/SEC)	SPILL MASS RATE (LBM/SEC)	SPILL ENERGY RATE (BTU/SEC)
4.070075E+02	1.660093E+02	1.966511E+05	5.701207E+02	3.875201E+04
4.070575E+02	1.675085E+02	1.984354E+05	5.686215E+02	3.865011E+04
4.071075E+02	1.701533E+02	2.015662E+05	5.659767E+02	3.847034E+04
4.071575E+02	1.698996E+02	2.012689E+05	5.662304E+02	3.848758E+04
4.072075E+02	1.699195E+02	2.012922E+05	5.662105E+02	3.848622E+04
4.072575E+02	1.699139E+02	2.012856E+05	5.662161E+02	3.848661E+04
4.073075E+02	1.699107E+02	2.012818E+05	5.662193E+02	3.848683E+04
4.073575E+02	1.699072E+02	2.012777E+05	5.662228E+02	3.848706E+04
4.074075E+02	1.699038E+02	2.012736E+05	5.662262E+02	3.848730E+04
4.074575E+02	1.699003E+02	2.012695E+05	5.662297E+02	3.848753E+04
4.075075E+02	1.698969E+02	2.012655E+05	5.662332E+02	3.848777E+04
4.075575E+02	1.698934E+02	2.012614E+05	5.662366E+02	3.848800E+04
4.076075E+02	1.698899E+02	2.012573E+05	5.662401E+02	3.848824E+04
4.076575E+02	1.698865E+02	2.012532E+05	5.662435E+02	3.848847E+04
4.077075E+02	1.698830E+02	2.012491E+05	5.662470E+02	3.848871E+04
4.077575E+02	1.698795E+02	2.012450E+05	5.662505E+02	3.848894E+04
4.078075E+02	1.698761E+02	2.012409E+05	5.662539E+02	3.848918E+04
4.078575E+02	1.698726E+02	2.012368E+05	5.662574E+02	3.848942E+04
4.079075E+02	1.698691E+02	2.012328E+05	5.662609E+02	3.848965E+04
4.079575E+02	1.698657E+02	2.012287E+05	5.662643E+02	3.848989E+04
4.080075E+02	1.698622E+02	2.012246E+05	5.662678E+02	3.849012E+04
4.080575E+02	1.698587E+02	2.012205E+05	5.662713E+02	3.849036E+04
4.081075E+02	1.698552E+02	2.012164E+05	5.662748E+02	3.849060E+04
4.081575E+02	1.698518E+02	2.012123E+05	5.662782E+02	3.849083E+04
4.082075E+02	1.698483E+02	2.012082E+05	5.662817E+02	3.849107E+04
4.082575E+02	1.698448E+02	2.012041E+05	5.662852E+02	3.849130E+04
4.083075E+02	1.698414E+02	2.012000E+05	5.662886E+02	3.849154E+04
4.083575E+02	1.698379E+02	2.011959E+05	5.662921E+02	3.849178E+04
4.084075E+02	1.698344E+02	2.011918E+05	5.662956E+02	3.849201E+04
4.084575E+02	1.698309E+02	2.011877E+05	5.662991E+02	3.849225E+04
4.085075E+02	1.698275E+02	2.011836E+05	5.663025E+02	3.849248E+04
4.085575E+02	1.698240E+02	2.011795E+05	5.663060E+02	3.849272E+04
4.086075E+02	1.698205E+02	2.011754E+05	5.663095E+02	3.849296E+04
4.086575E+02	1.698170E+02	2.011713E+05	5.663130E+02	3.849319E+04
4.087075E+02	1.698136E+02	2.011672E+05	5.663164E+02	3.849343E+04
4.087575E+02	1.698101E+02	2.011631E+05	5.663199E+02	3.849366E+04
4.088075E+02	1.698066E+02	2.011590E+05	5.663234E+02	3.849390E+04
4.088575E+02	1.698031E+02	2.011549E+05	5.663269E+02	3.849414E+04
4.089075E+02	1.697997E+02	2.011508E+05	5.663303E+02	3.849437E+04
4.089575E+02	1.697962E+02	2.011467E+05	5.663338E+02	3.849461E+04
4.090075E+02	1.697927E+02	2.011426E+05	5.663373E+02	3.849485E+04
4.090575E+02	1.697893E+02	2.011385E+05	5.663407E+02	3.849508E+04
4.091075E+02	1.697858E+02	2.011344E+05	5.663442E+02	3.849532E+04
4.091575E+02	1.697823E+02	2.011303E+05	5.663477E+02	3.849555E+04
4.092075E+02	1.697788E+02	2.011262E+05	5.663512E+02	3.849579E+04
4.092575E+02	1.697754E+02	2.011221E+05	5.663546E+02	3.849603E+04
4.093075E+02	1.697719E+02	2.011180E+05	5.663581E+02	3.849626E+04
4.093575E+02	1.697684E+02	2.011139E+05	5.663616E+02	3.849650E+04
4.094075E+02	1.697649E+02	2.011098E+05	5.663650E+02	3.849673E+04
4.094575E+02	1.697615E+02	2.011057E+05	5.663685E+02	3.849697E+04

◀(DRN 01-230, R12)

MASS AND ENERGY RELEASE DATA

➔(DRN 01-230, R12; EC-8458, R307)

B. DOUBLE ENDED DISCHARGE LEG SLOT BREAK
 MINIMUM SI FLOW (9.82 SQUARE FEET TOTAL AREA)
 MASS & ENERGY RELEASE DATA : LONG-TERM BOIL-OFF PHASE (Cont'd)

←(EC-8458, R307)

TIME (SEC)	STEAM MASS RATE (LBM/SEC)	STEAM ENERGY RATE (BTU/SEC)	SPILL MASS RATE (LBM/SEC)	SPILL ENERGY RATE (BTU/SEC)
4.095075E+02	1.697580E+02	2.011016E+05	5.663720E+02	3.849721E+04
4.168575E+02	1.692519E+02	2.005046E+05	5.668781E+02	3.853160E+04
4.241575E+02	1.695639E+02	2.008661E+05	5.665661E+02	3.851040E+04
4.315075E+02	1.690712E+02	2.002843E+05	5.670588E+02	3.854389E+04
4.388075E+02	1.685919E+02	1.997185E+05	5.675381E+02	3.857647E+04
4.461575E+02	1.681189E+02	1.991603E+05	5.680111E+02	3.860862E+04
4.534575E+02	1.676706E+02	1.986314E+05	5.684594E+02	3.863909E+04
4.608575E+02	1.672389E+02	1.981220E+05	5.688911E+02	3.866843E+04
4.681575E+02	1.668211E+02	1.976291E+05	5.693089E+02	3.869683E+04
4.755075E+02	1.664123E+02	1.971470E+05	5.697177E+02	3.872462E+04
4.828075E+02	1.660323E+02	1.966987E+05	5.700978E+02	3.875045E+04
4.901575E+02	1.656533E+02	1.962518E+05	5.704767E+02	3.877621E+04
4.974575E+02	1.652805E+02	1.958122E+05	5.708496E+02	3.880155E+04
5.047575E+02	1.649164E+02	1.953666E+05	5.712136E+02	3.882649E+04
5.120575E+02	8.136775E+01	9.640348E+04	6.547622E+02	4.450523E+04
5.193575E+02	7.644771E+01	9.058748E+04	6.596823E+02	4.483965E+04
5.266575E+02	7.270700E+01	8.616835E+04	6.634230E+02	4.509392E+04
5.339575E+02	6.968550E+01	8.260082E+04	6.664445E+02	4.529929E+04
5.412575E+02	6.723876E+01	7.969889E+04	6.688912E+02	4.546560E+04
5.485575E+02	6.528355E+01	7.738730E+04	6.708465E+02	4.559850E+04
5.558575E+02	6.350939E+01	7.528914E+04	6.726206E+02	4.571909E+04
5.631575E+02	6.190739E+01	7.339400E+04	6.742226E+02	4.582798E+04
5.704575E+02	6.042287E+01	7.163754E+04	6.757071E+02	4.592889E+04
5.777575E+02	5.855121E+01	6.942191E+04	6.775788E+02	4.605611E+04
5.850575E+02	5.611132E+01	6.653563E+04	6.800187E+02	4.622195E+04
5.923575E+02	5.402349E+01	6.405284E+04	6.821065E+02	4.636386E+04
5.996575E+02	5.205970E+01	6.173190E+04	6.840703E+02	4.649735E+04
6.069575E+02	5.175212E+01	6.135822E+04	4.457787E+01	5.186992E+03
6.142575E+02	5.036524E+01	5.971429E+04	4.596476E+01	5.390810E+03
6.215575E+02	4.913477E+01	5.824136E+04	4.719523E+01	5.575383E+03
6.288575E+02	4.799330E+01	5.688600E+04	4.833670E+01	5.748815E+03
6.361575E+02	4.692111E+01	5.561271E+04	4.940889E+01	5.912989E+03
6.434575E+02	4.597695E+01	5.448335E+04	5.035305E+01	6.060712E+03
6.507575E+02	4.508321E+01	5.342023E+04	5.124679E+01	6.201158E+03
6.580575E+02	4.432179E+01	5.250588E+04	5.200821E+01	6.324129E+03
6.653575E+02	4.356475E+01	5.160397E+04	5.276525E+01	6.445521E+03
6.726575E+02	4.282147E+01	5.071905E+04	5.350853E+01	6.563852E+03
6.799575E+02	4.219544E+01	4.997111E+04	5.413456E+01	6.666792E+03
6.872575E+02	4.160832E+01	4.926922E+04	5.472168E+01	6.763745E+03
6.945575E+02	4.102936E+01	4.857750E+04	5.530064E+01	6.858555E+03
7.018575E+02	4.049560E+01	4.793894E+04	5.583440E+01	6.946523E+03
7.091575E+02	4.002032E+01	4.736882E+04	5.630967E+01	7.026306E+03
7.164575E+02	3.955553E+01	4.681144E+04	5.677447E+01	7.103635E+03
7.237575E+02	3.909296E+01	4.625704E+04	5.723704E+01	7.179864E+03
7.310575E+02	3.869539E+01	4.578479E+04	5.763461E+01	7.247014E+03
7.383575E+02	3.830596E+01	4.531609E+04	5.802404E+01	7.312251E+03
7.456575E+02	3.792138E+01	4.485334E+04	5.840862E+01	7.376037E+03
7.529575E+02	3.756802E+01	4.443342E+04	5.876198E+01	7.434978E+03

←(DRN 01-230, R12)

MASS AND ENERGY RELEASE DATA

➔(DRN 01-230, R12; EC-8458, R307)

B. DOUBLE ENDED DISCHARGE LEG SLOT BREAK
 MINIMUM SI FLOW (9.82 SQUARE FEET TOTAL AREA)
 MASS & ENERGY RELEASE DATA : LONG-TERM BOIL-OFF PHASE (Cont'd)

←(EC-8458, R307)

TIME (SEC)	STEAM MASS RATE (LBM/SEC)	STEAM ENERGY RATE (BTU/SEC)	SPILL MASS RATE (LBM/SEC)	SPILL ENERGY RATE (BTU/SEC)
9.462007E+03	3.723705E+01	4.403342E+04	5.909295E+01	7.490413E+03
9.754007E+03	3.691197E+01	4.364055E+04	5.941803E+01	7.544278E+03
1.000001E+04	3.663964E+01	4.331582E+04	5.969306E+01	7.588925E+03
1.051201E+04	3.652005E+01	4.316624E+04	5.980995E+01	7.623412E+03
1.102801E+04	3.643009E+01	4.304582E+04	5.989991E+01	7.652400E+03
1.154201E+04	3.635766E+01	4.295277E+04	5.997234E+01	7.677560E+03
1.205601E+04	3.626974E+01	4.283598E+04	6.006026E+01	7.703443E+03
1.257001E+04	3.594842E+01	4.244860E+04	6.038158E+01	7.758188E+03
1.308401E+04	3.561751E+01	4.204999E+04	6.071249E+01	7.813106E+03
1.360001E+04	3.528090E+01	4.163842E+04	6.104910E+01	7.867715E+03
1.411201E+04	3.495300E+01	4.124326E+04	6.137700E+01	7.920029E+03
1.462801E+04	3.466081E+01	4.088958E+04	6.166919E+01	7.966737E+03
1.514201E+04	3.437080E+01	4.053856E+04	6.195920E+01	8.012096E+03
1.565601E+04	3.408125E+01	4.018818E+04	6.224875E+01	8.056411E+03
1.617001E+04	3.380266E+01	3.985058E+04	6.252734E+01	8.098363E+03
1.668401E+04	3.354649E+01	3.954536E+04	6.278351E+01	8.136506E+03
1.720001E+04	3.329190E+01	3.923581E+04	6.303810E+01	8.173607E+03
1.771201E+04	3.304011E+01	3.892961E+04	6.328989E+01	8.209504E+03
1.822801E+04	3.280068E+01	3.863779E+04	6.352932E+01	8.243047E+03
1.874201E+04	3.258038E+01	3.837453E+04	6.374962E+01	8.273363E+03
1.925601E+04	3.236273E+01	3.810816E+04	6.396727E+01	8.302650E+03
1.977001E+04	3.214487E+01	3.784788E+04	6.418513E+01	8.331315E+03
2.284001E+04	3.103951E+01	3.650280E+04	6.529049E+01	8.465559E+03
2.798001E+04	2.945020E+01	3.458120E+04	6.687980E+01	8.623565E+03
3.312001E+04	2.818608E+01	3.304941E+04	6.814392E+01	8.714653E+03
3.828001E+04	2.713328E+01	3.177432E+04	6.919672E+01	8.765928E+03
4.342001E+04	2.623057E+01	3.068441E+04	7.009943E+01	8.793531E+03
4.856001E+04	2.544153E+01	2.972711E+04	7.088847E+01	8.806163E+03
5.370001E+04	2.477124E+01	2.891805E+04	7.155876E+01	8.806146E+03
5.884001E+04	2.414121E+01	2.816114E+04	7.218879E+01	8.805056E+03
6.398001E+04	2.358171E+01	2.749127E+04	7.274829E+01	8.799260E+03
6.912001E+04	2.304882E+01	2.685255E+04	7.328118E+01	8.794656E+03
7.428001E+04	2.258386E+01	2.629279E+04	7.374614E+01	8.785756E+03
7.942001E+04	2.213943E+01	2.576201E+04	7.419057E+01	8.779031E+03
8.456001E+04	2.174513E+01	2.528946E+04	7.458487E+01	8.770313E+03
8.970001E+04	2.136021E+01	2.483289E+04	7.496979E+01	8.764328E+03
9.484001E+04	2.205155E+01	2.562347E+04	7.427845E+01	8.643683E+03
9.998001E+04	2.285527E+01	2.654517E+04	7.347473E+01	8.533835E+03
1.000000E+05	2.285839E+01	2.654879E+04	7.347161E+01	8.533449E+03
1.320000E+05	2.126527E+01	2.465218E+04	7.506473E+01	8.637576E+03
1.640000E+05	2.007183E+01	2.324357E+04	7.625817E+01	8.657614E+03
1.960000E+05	1.915427E+01	2.216758E+04	7.717573E+01	8.662022E+03
2.280000E+05	1.845998E+01	2.135555E+04	7.787002E+01	8.661812E+03
2.600000E+05	1.782717E+01	2.061740E+04	7.850283E+01	8.665459E+03
2.920000E+05	1.728106E+01	1.997983E+04	7.904894E+01	8.668225E+03
3.600000E+05	1.637145E+01	1.892238E+04	7.995855E+01	8.668998E+03
4.400000E+05	1.514683E+01	1.750263E+04	8.118317E+01	8.691909E+03
5.200000E+05	1.386099E+01	1.601445E+04	8.246901E+01	8.692867E+03
6.000000E+05	1.283518E+01	1.482761E+04	8.349482E+01	8.693631E+03
6.800000E+05	1.195021E+01	1.380398E+04	8.437979E+01	8.690798E+03

←(DRN 01-230, R12)

MASS AND ENERGY RELEASE DATA

➔(DRN 01-230, R12; EC-8458, R307)

B. DOUBLE ENDED DISCHARGE LEG SLOT BREAK
 MINIMUM SI FLOW (9.82 SQUARE FEET TOTAL AREA)
 MASS & ENERGY RELEASE DATA : LONG-TERM BOIL-OFF PHASE (Cont'd)

⬅(EC-8458, R307)

TIME (SEC)	STEAM MASS RATE (LBM/SEC)	STEAM ENERGY RATE (BTU/SEC)	SPILL MASS RATE (LBM/SEC)	SPILL ENERGY RATE (BTU/SEC)
7.600000E+05	1.113661E+01	1.286116E+04	8.519339E+01	8.686808E+03
8.400000E+05	1.040508E+01	1.201537E+04	8.592492E+01	8.682051E+03
9.200000E+05	9.741997E+00	1.124888E+04	8.658800E+01	8.676550E+03
1.000000E+06	9.153335E+00	1.056852E+04	8.717666E+01	8.671430E+03

⬅(DRN 01-230, R12)

MASS AND ENERGY RELEASE DATA

→(DRN 01-230)

C. SAFETY INJECTION NITROGEN ADDITION

<u>TIME (SEC)</u>	<u>MASS OUT** INTEGRAL (LBM)</u>	<u>MASS OUT** RATE (LBM/SEC)</u>	<u>TEMPERATURE OUT (DEGREE °F)</u>
91.750	0.	0.00	-158.
91.755	1.	253.96	-158.
92.250	120.	228.82	-160.
92.750	228.	204.66	-163.
93.250	325.	181.61	-166.
93.750	410.	159.50	-168.
94.250	485.	138.21	-170.
94.750	549.	117.62	-172.
95.250	603.	97.61	-173.
95.750	646.	78.01	-174.
96.250	681.	58.67	-175.
96.750	705.	39.39	-176.
97.250	720.	19.67	-176.
97.750	725.	0.00	-176.
98.250	725.	0.00	-176.
98.750	725.	0.00	-176.
99.250	725.	0.00	-176.
99.750	725.	0.00	-176.
200.005	725.	0.00	-176.
300.005	725.	0.00	-176.
400.005	725.	0.00	-176.
500.005	725.	0.00	-176.
600.005	725.	0.00	-176.
700.005	725.	0.00	-176.
800.005	725.	0.00	-176.
900.005	725.	0.00	-176.
1000.005	725.	0.00	-176.
2000.005	725.	0.00	-176.
3000.005	725.	0.00	-176.
4000.005	725.	0.00	-176.
4370.005	732.	0.04*	-177.
5220.005	775.	0.06*	-177.
6015.005	807.	0.02*	-179.
7210.005	843.	0.04*	-181.
8005.005	878.	0.05*	-182.
9025.005	924.	0.04*	-184.
10260.005	961.	0.02*	-186.
20000.005	1205.	0.03*	-189.
30200.005	1511.	0.03*	-203.
40625.005	1771.	0.02*	-208.
50550.005	1920.	0.01*	-212.
58605.005	2001.	0.01*	-215.

** Total release from four tanks.

* Mass out rate is oscillatory, average values are used in table.

←(DRN 01-230)

MASS AND ENERGY RELEASE DATA

→(DRN 01-230, R12; EC-8458, R307)

D. MAIN STEAM LINE BREAK
 (3.9 ft² BREAK AREA)
 MSIV FAILURE
 0 PERCENT POWER

←(DRN 01-230, R12)

TIME (SEC)	STEAM MASS RATE (LBM/SEC)	STEAM ENTHALPY (BTU/LBM)
0.00	7953.87	1193.26
0.49	7814.11	1194.10
0.99	7618.02	1194.81
1.49	7432.32	1195.42
1.99	7276.91	1195.97
2.49	7133.54	1196.47
2.99	7003.76	1196.92
3.49	6888.97	1197.34
3.99	6783.12	1197.71
4.49	6686.39	1198.05
4.99	6598.42	1198.36
5.49	6518.51	1198.64
5.99	6443.84	1198.89
6.49	6374.80	1199.14
6.99	6305.22	1199.37
7.49	6241.39	1199.59
7.99	6175.40	1199.80
8.49	6106.81	1200.07
8.99	6024.31	1200.49
9.49	5916.92	1200.95
9.99	5742.66	1201.39
10.49	5473.77	1201.83
10.99	5224.56	1202.20
11.49	5003.51	1202.50
11.99	4806.34	1202.76
12.49	4630.58	1202.98
12.99	4473.25	1203.16
13.49	4332.11	1203.33
13.99	4201.20	1203.47
14.49	4081.74	1203.60
14.99	3974.32	1203.72
15.49	3876.58	1203.82
15.99	3787.58	1203.92
16.49	3705.90	1204.01
16.99	3630.62	1204.08
17.49	3561.08	1204.15
17.99	3496.41	1204.22
18.49	3436.65	1204.27
18.99	3379.60	1204.32
19.49	3326.79	1204.37

→(DRN 05-1247, R14)

←(DRN 05-1247, R14; EC-8458, R307)

MASS AND ENERGY RELEASE DATA

→(DRN 01-230, R12; EC-8458, R307)

D. MAIN STEAM LINE BREAK
(3.9 ft² BREAK AREA)
MSIV FAILURE
0 PERCENT POWER

←(DRN 01-230, R12)

TIME (SEC)	STEAM MASS RATE (LBM/SEC)	STEAM ENTHALPY (BTU/LBM)
19.99	3276.53	1204.41
20.49	3228.85	1204.44
20.99	3182.97	1204.46
21.49	3139.82	1204.49
21.99	3098.14	1204.51
22.49	3057.77	1204.52
22.99	3019.08	1204.53
23.49	2982.58	1204.54
23.99	2947.48	1204.54
24.49	2914.01	1204.54
24.99	2881.45	1204.54
25.49	2849.37	1204.54
25.99	2819.99	1204.53
26.49	2790.50	1204.52
26.99	2762.38	1204.51
27.49	2735.20	1204.50
27.99	2709.26	1204.49
28.49	2684.60	1204.47
28.99	2659.70	1204.45
29.49	2636.27	1204.44
29.99	2612.62	1204.42
30.49	2590.77	1204.40
30.99	2569.03	1204.38
31.49	2548.47	1204.35
31.99	2527.30	1204.33
32.49	2507.63	1204.31
32.99	2488.76	1204.28
33.49	2469.77	1204.26
33.99	2451.71	1204.23
34.49	2432.94	1204.20
34.99	2415.67	1204.18
35.49	2399.24	1204.15
35.99	2381.20	1204.12
36.49	2366.45	1204.09
36.99	2349.28	1204.06
37.49	2335.24	1204.03
37.99	2318.38	1204.00
38.49	2303.65	1203.97
38.99	2289.09	1203.93
39.49	2274.81	1203.90

→(DRN 05-1247, R14)

←(DRN 05-1247, R14; EC-8458, R307)

MASS AND ENERGY RELEASE DATA

→(DRN 01-230, R12; EC-8458, R307)

D. MAIN STEAM LINE BREAK
(3.9 ft² BREAK AREA)
MSIV FAILURE
0 PERCENT POWER

TIME (SEC)	STEAM MASS RATE (LBM/SEC)	STEAM ENTHALPY (BTU/LBM)
39.99	2260.78	1203.87
44.99	2132.04	1203.51
49.99	2020.50	1203.21
54.99	1920.00	1202.68
59.99	1824.44	1202.19
64.99	1733.96	1201.67
69.99	1650.93	1201.12
74.99	1574.79	1200.53
79.99	1502.94	1199.95
84.99	1438.44	1199.36
89.99	1376.80	1198.74
94.99	1320.48	1198.10
99.99	1266.14	1197.46
104.99	1211.77	1196.86
109.99	1165.79	1196.28
114.99	1125.48	1195.65
119.99	1082.57	1195.01
124.99	1041.39	1194.36
129.99	1003.01	1193.71
134.99	962.44	1193.07
139.99	923.37	1192.40
144.99	882.59	1191.53
149.99	833.92	1190.65
154.99	794.42	1189.60
159.99	749.14	1188.43
164.99	699.30	1187.06
169.99	650.99	1185.32
174.99	595.28	1183.04
179.99	473.21	1180.45
184.99	321.81	1178.99
189.99	227.24	1178.18
194.99	166.83	1177.77
199.99	128.60	1177.47
204.99	54.34	1209.37
209.99	1.99	1212.58
214.99	1.87	1213.04
219.99	1.86	1213.20
224.99	1.96	1213.45
229.99	1.79	1213.54
234.99	1.75	1213.71

←(DRN 01-230, R12; EC-8458, R307)

MASS AND ENERGY RELEASE DATA

➔(DRN 01-230, R12; EC-8458, R307)

D. MAIN STEAM LINE BREAK
 (3.9 ft² BREAK AREA)
 MSIV FAILURE
 0 PERCENT POWER

TIME (SEC)	STEAM MASS RATE (LBM/SEC)	STEAM ENTHALPY (BTU/LBM)
239.99	1.69	1213.80
244.99	1.22	1213.94
249.99	1.60	1214.04
250.00	1.60	1214.04

←(DRN 01-230, R12; EC-8458, R307)

MASS AND ENERGY RELEASE DATA

→(DRN 03-2060, R14; EC-8458, R307)

E. MAIN STEAM LINE BREAK
 (7.88 ft² BREAK AREA)
 MSIV FAILURE
 100.5 PERCENT POWER

TIME (SEC)	STEAM MASS RATE (LBM/SEC)	STEAM Enthalpy (BTU/lbm)
0.00	10624.00	1.27E+07
0.49	9806.22	1.18E+07
0.99	9128.07	1.10E+07
1.49	8471.63	1.02E+07
1.99	7995.84	9.60E+06
2.49	7651.32	9.19E+06
2.99	7398.80	8.89E+06
3.49	7211.51	8.66E+06
3.99	7070.96	8.49E+06
4.49	6964.29	8.37E+06
4.99	6882.29	8.27E+06
5.49	7438.77	8.94E+06
5.99	7848.15	9.43E+06
6.49	8141.39	9.78E+06
6.99	8347.64	1.00E+07
7.49	8393.05	1.01E+07
7.99	8314.69	9.99E+06
8.49	8094.21	9.73E+06
8.99	7772.42	9.34E+06
9.49	7371.01	8.86E+06
9.99	6900.99	8.30E+06
10.49	6369.79	7.67E+06
10.99	5816.19	7.00E+06
11.49	5372.81	6.46E+06
11.99	5027.91	6.05E+06
12.49	4759.36	5.72E+06
12.99	4551.60	5.47E+06
13.49	4388.64	5.27E+06
13.99	4258.35	5.12E+06
14.49	4151.49	4.99E+06
14.99	4061.44	4.88E+06
15.49	3982.85	4.79E+06
15.99	3911.70	4.70E+06
16.49	3845.49	4.63E+06
16.99	3784.35	4.55E+06
17.49	3726.19	4.48E+06
17.99	3670.87	4.42E+06
18.49	3617.49	4.35E+06
18.99	3568.17	4.29E+06
19.49	3521.43	4.24E+06

←(DRN 03-2060, R14; EC-8458, R307)

MASS AND ENERGY RELEASE DATA

→(DRN 03-2060, R14; EC-8458, R307)

E. MAIN STEAM LINE BREAK
 (7.88 ft² BREAK AREA)
 MSIV FAILURE
 100.5 PERCENT POWER

TIME (SEC)	STEAM MASS RATE (LBM/SEC)	STEAM ENTHALPY (BTU/LBM)
19.99	3478.13	4.19E+06
20.49	3436.95	4.14E+06
20.99	3399.08	4.09E+06
21.49	3362.24	4.05E+06
21.99	3328.05	4.01E+06
22.49	3294.38	3.97E+06
22.99	3261.29	3.93E+06
23.49	3230.16	3.89E+06
23.99	3198.64	3.85E+06
24.49	3167.67	3.81E+06
24.99	3138.62	3.78E+06
25.49	3109.19	3.74E+06
25.99	3079.05	3.71E+06
26.49	3050.09	3.67E+06
26.99	3022.08	3.64E+06
27.49	2993.79	3.61E+06
27.99	2967.74	3.57E+06
28.49	2940.87	3.54E+06
28.99	2915.97	3.51E+06
29.49	2891.95	3.48E+06
29.99	2868.87	3.46E+06
30.49	2846.72	3.43E+06
30.99	2825.12	3.40E+06
31.49	2804.08	3.38E+06
31.99	2784.29	3.35E+06
32.49	2764.04	3.33E+06
32.99	2745.21	3.31E+06
33.49	2725.86	3.28E+06
33.99	2707.47	3.26E+06
34.49	2688.34	3.24E+06
34.99	2670.74	3.22E+06
35.49	2653.34	3.20E+06
35.99	2635.48	3.17E+06
36.49	2616.88	3.15E+06
36.99	2600.10	3.13E+06
37.49	2581.48	3.13E+06
37.99	2561.64	3.11E+06
38.49	2540.26	3.09E+06
38.99	2519.37	3.06E+06
39.49	2498.70	3.04E+06

←(DRN 03-2060, R14; EC-8458, R307)

MASS AND ENERGY RELEASE DATA

→(DRN 03-2060, R14; EC-8458, R307)

E. MAIN STEAM LINE BREAK
 (7.88 ft² BREAK AREA)
 MSIV FAILURE
 100.5 PERCENT POWER

TIME (SEC)	STEAM MASS RATE (LBM/SEC)	STEAM ENTHALPY (BTU/LBM)
39.99	2479.40	3.01E+06
44.99	2310.33	2.81E+06
49.99	2175.24	2.64E+06
54.99	2049.39	2.49E+06
59.99	1935.73	2.35E+06
64.99	1835.05	2.23E+06
69.99	1728.07	2.10E+06
74.99	1642.91	1.99E+06
79.99	1560.28	1.89E+06
84.99	1483.27	1.80E+06
89.99	1398.00	1.70E+06
94.99	1282.94	1.56E+06
99.99	1156.21	1.41E+06
104.99	1003.53	1.23E+06
109.99	823.88	1.01E+06
114.99	635.85	7.84E+05
119.99	385.64	4.75E+05
124.99	50.76	6.23E+04
129.99	3.71	4.60E+03
134.99	4.13	5.13E+03
139.99	3.28	4.09E+03
144.99	3.32	4.14E+03
149.99	3.02	3.77E+03
154.99	2.87	3.58E+03
159.99	2.75	3.43E+03
164.99	2.58	3.22E+03
169.99	2.51	3.13E+03
174.99	2.36	2.94E+03
179.98	1.81	2.26E+03
184.98	1.73	2.16E+03
189.98	1.69	2.11E+03
194.98	1.62	2.03E+03
199.98	1.58	1.97E+03
204.98	1.53	1.91E+03
209.98	1.48	1.86E+03
214.98	1.44	1.80E+03
219.98	1.40	1.76E+03
224.98	1.37	1.71E+03
229.98	1.33	1.67E+03
234.98	1.30	1.63E+03

←(DRN 03-2060, R14; EC-8458, R307)

MASS AND ENERGY RELEASE DATA

➔(DRN 05-1247, R14; EC-8458, R307)

E. MAIN STEAM LINE BREAK
 (7.88 ft² BREAK AREA)
 MSIV FAILURE
 100.5 PERCENT POWER

TIME (SEC)	STEAM MASS RATE (LBM/SEC)	STEAM ENTHALPY (BTU/LBM)
239.98	1.27	1.59E+03
244.98	1.24	1.56E+03
249.98	1.21	1.52E+03
250.00	1.21	1.52E+03

➔(DRN 05-1247, R14; EC-8458, R307)

MASS AND ENERGY RELEASE DATA

➔(DRN 05-1247, R14; EC-8458, R307)

F. MAIN STEAM LINE BREAK
(7.87 SQ. Fr. BREAK AREA)
COOLING TRAIN FAILURE
102 PERCENT POWER

Point	TIME (sec)	BREAK MASS FLOW RATE (lbm/sec)	BREAK ENERGY FLOW RATE (Million BTU/sec)
1	0.000	0.00	0.000000
2	0.020	15143.89	18.106775
3	0.100	14787.93	17.691435
4	0.200	14374.07	17.207556
5	0.300	13992.75	16.760798
6	0.400	13640.95	16.347846
7	0.620	12952.76	15.536841
8	0.820	12419.25	14.904862
9	1.020	11952.42	14.350577
10	1.270	11462.03	13.767365
11	1.520	11039.05	13.263489
12	2.020	10336.35	12.424785
13	3.020	9664.29	11.608095
14	4.020	9253.56	11.115238
15	5.020	8950.57	10.751527
16	6.020	7996.06	9.631305
17	7.020	7191.09	8.661218
18	8.020	6633.71	7.988180
19	9.020	6213.82	7.480525
20	10.020	5867.51	7.061458
21	12.020	5306.92	6.382466
22	14.020	4866.82	5.848981
23	16.020	4531.65	5.442492
24	18.020	4285.81	5.144244
25	20.020	4098.36	4.916816
26	25.020	3711.71	4.447667
27	30.020	3346.21	4.004476
28	35.020	3061.55	3.659424
29	40.020	2809.87	3.354479
30	45.020	2611.36	3.114077
31	50.020	455.83	0.544141
32	55.020	10.48	0.013244
33	60.020	13.79	0.017464
34	65.020	7.83	0.009960
35	70.020	8.41	0.010680
36	75.020	5.35	0.006816
37	80.020	3.53	0.004497
38	85.020	4.58	0.005832
39	90.020	3.45	0.004400
40	95.020	3.55	0.004540
41	100.020	3.40	0.004351
42	110.020	3.07	0.003921
43	120.020	2.68	0.003429
44	130.020	2.41	0.003077
45	140.020	2.21	0.002830
46	150.020	2.05	0.002618

←(DRN 05-1247, R14; EC-8458, R307)

MASS AND ENERGY RELEASE DATA

➔(DRN 05-1247, R14; EC-8458, R307)

F. MAIN STEAM LINE BREAK
 (7.87 SQ. Fr. BREAK AREA)
 COOLING TRAIN FAILURE
 102 PERCENT POWER (Cont'd)

Point	TIME (sec)	BREAK MASS FLOW RATE (lbm/sec)	BREAK ENERGY FLOW RATE (Million BTU/sec)
47	160.020	1.89	0.002419
48	180.020	1.64	0.002095
49	200.020	1.29	0.001660
INTEGRAL	227300.LBM BTU	272.685 MILLION	

←(DRN 05-1247, R14; EC-8458, R307)

WSES-FSAR-UNIT-3

TABLE 6.2-13 (Sheet 1 of 30) Revision 14 (12/05)

MASS ENERGY RELEASE DATA

A. 100 SQ. IN. HOT LEG CIRCUMFERENTIAL BREAK FOR
REACTOR CAVITY SUBCOMPARTMENT ANALYSIS
 (FROM R.V. SIDE)

TIME (sec)	FLOW RATE (lb/sec)	ENTHALPY (BTU/lb)	ENERGY RATE (BTU/sec)	B.N. PRESS (psia)
0.000	0.0	640.45	0.	2259.0
.001	1949.0	640.24	1247828.	2211.0
.002	3706.3	639.84	2371439.	2122.1
.003	5426.3	639.67	3471041.	2082.5
.004	5649.0	639.98	3615247.	2152.2
.005	6012.4	640.50	3850942.	2266.2
.006	6084.3	640.63	3897765.	2291.0
.007	5826.6	640.26	3731819.	2205.3
.008	5505.6	639.82	3522593.	2106.2
.009	5449.8	639.76	3486564.	2090.6
.010	5675.7	640.07	3632845.	2160.1
.012	5956.6	640.47	3815024.	2248.3
.014	5691.9	640.07	3643214.	2162.9
.016	5891.4	640.31	3772322.	2225.2
.018	5999.1	640.45	3842124.	2262.0
.020	5821.5	640.16	3726691.	2201.8
.022	5882.5	640.23	3766153.	2222.0
.024	5837.2	640.16	3736742.	2207.1
.026	5675.6	639.94	3632043.	2157.5
.028	5707.0	639.98	3652366.	2167.4
.030	5677.6	639.94	3633323.	2158.0
.034	5694.0	639.95	3643875.	2163.5
.038	5720.7	639.94	3660905.	2171.1
.042	5739.0	639.93	3672558.	2175.8
.046	5681.0	639.82	3634817.	2158.4
.050	5619.5	639.73	3594963.	2140.0
.055	5612.7	639.70	3590444.	2137.9
.060	5632.2	639.70	3602918.	2143.3
.070	5485.8	639.45	3507895.	2098.4
.080	5451.3	639.36	3485343.	2087.7
.090	5330.0	639.12	3406510.	2049.7
.100	5356.6	639.08	3423296.	2057.6
.120	5197.6	638.73	3319863.	2007.3
.140	5005.8	638.40	3195703.	1950.0
.160	4925.8	638.20	3143646.	1925.9
.180	4861.4	638.04	3101768.	1906.6
.200	4723.7	637.81	3012823.	1866.2
.220	4614.2	637.60	2942014.	1834.2
.260	4465.3	637.38	2846093.	1791.1
.300	4293.0	637.15	2735285.	1738.9
.340	4235.2	637.13	2698373.	1722.2
.380	4233.1	637.27	2697628.	1722.6
.420	4256.1	637.51	2713306.	1730.7

WSES-FSAR-UNIT-3

TABLE 6.2-13 (Sheet 2 of 30) Revision 14 (12/05)

<u>TIME</u> <u>(sec)</u>	<u>FLOW RATE</u> <u>(lb/sec)</u>	<u>ENTHALPY</u> <u>(BTU/lb)</u>	<u>ENERGY RATE</u> <u>(BTU/sec)</u>	<u>B.N. PRESS</u> <u>(psia)</u>
.460	4254.6	637.73	2713286.	1731.7
.500	4229.3	637.87	2697744.	1725.3
.600	4221.4	638.20	2694097.	1725.3
.700	4217.0	638.49	2692912.	1725.9
.900	4206.0	638.69	2686330.	1724.0
.900	4207.8	638.88	2688279.	1725.7
1.000	4201.6	639.03	2684948.	1725.0
1.200	4190.5	639.32	2679070.	1723.7
1.400	4177.1	639.67	2671966.	1723.5
1.600	4156.9	640.10	2660832.	1722.6
1.800	4131.4	640.67	2646864.	1721.9
2.000	4099.6	641.39	2629442.	1720.3
2.500	4008.9	643.89	2581935.	1720.3
3.000	3903.8	647.26	2526774.	1723.0
3.500	3781.5	651.24	2462664.	1726.8
4.000	3649.9	655.61	2392911.	1731.4

B. 100 SQ. IN. HOT LEG CIRCUMFERENTIAL BREAK FOR
REACTOR CAVITY SUBCOMPARTMENT ANALYSIS
(FROM S.G. SIDE)

<u>TIME</u> <u>(sec)</u>	<u>FLOW RATE</u> <u>(lb/sec)</u>	<u>ENTHALPY</u> <u>(BTU/lb)</u>	<u>ENERGY RATE</u> <u>(BTU/sec)</u>	<u>B.N. PRESS</u> <u>(psis)</u>
0.000	0.0	640.45	0.	2258.3
.001	1986.4	640.41	1272110.	2248.6
.002	3914.1	640.27	2506081.	2219.0
.003	5715.6	640.05	3658270.	2169.2
.004	5527.6	639.80	3536558.	2112.7
.005	5374.1	639.59	3437221.	2065.9
.006	5278.4	639.45	3375273.	2036.6
.007	5246.9	639.41	3354920.	2027.0
.008	5266.5	639.44	3367611.	2033.3
.009	5320.1	639.51	3402257.	2050.0
.010	5396.5	639.62	3452989.	2074.3
.012	5628.0	639.94	3601582.	2145.2
.014	5897.8	640.31	3776420.	2227.4
.016	6058.1	640.56	3880577.	2281.7
.018	6107.9	640.64	3912965.	2298.7
.020	6053.9	640.57	3877947.	2280.6
.022	5907.0	640.35	3782547.	2231.3
.024	5728.1	640.09	3666500.	2173.2
.026	5569.0	639.68	3563492.	2125.6
.028	5476.3	639.75	3503483.	2097.8
.030	5473.9	639.75	3501928.	2097.4
.034	5661.3	640.00	3623232.	2154.7
.036	5851.6	640.27	3746604.	2212.3
.042	5834.1	640.24	3735224.	2206.5
.046	5669.3	640.02	3628465.	2156.1

WSES-FSAR-UNIT-3

TABLE 6.2-13 (Sheet 3 of 30) Revision 14 (12/05)

<u>TIME</u> <u>(sec)</u>	<u>FLOW RATE</u> <u>(lb/sec)</u>	<u>ENTHALPY</u> <u>(BTU/lb)</u>	<u>ENERGY RATE</u> <u>(BTU/sec)</u>	<u>B.N. PRESS</u> <u>(psia)</u>
.050	5549.9	639.86	3551159.	2120.3
.055	5598.8	639.92	3582784.	2135.8
.060	5682.3	640.04	3636899.	2160.4
.070	5385.2	639.63	3444535.	2069.5
.080	5457.3	639.73	3491199.	2092.5
.090	5230.0	639.42	3344167.	2021.6
.100	5491.3	639.78	3513224.	2103.3
.120	5253.5	639.42	3359193.	2029.6
.140	4896.0	638.93	3128201.	1922.3
.160	4792.2	638.78	3061162.	1892.0
.180	4815.4	638.79	3076029.	1898.6
.200	4693.7	638.60	2997397.	1862.9
.220	4618.7	638.47	2948901.	1841.0
.260	4433.9	638.15	2829493.	1786.6
.300	4279.5	637.88	2729807.	1739.9
.340	4215.6	637.73	2688415.	1720.6
.380	4224.7	637.68	2694007.	1722.8
.420	4239.0	637.66	2703001.	1726.8
.460	4240.5	637.65	2703955.	1727.2
.500	4231.4	637.66	2698195.	1724.5
.600	4228.1	637.76	2696513.	1724.3
.700	4222.6	637.95	2693808.	1724.0
.800	4215.7	638.17	2690333.	1723.4
.900	4224.8	638.40	2697112.	1727.5
1.000	4208.4	638.58	2687400.	1724.0
1.200	4197.5	638.93	2681909.	1723.1
1.400	4189.0	639.25	2677818.	1722.9
1.600	4173.3	639.60	2669243.	1722.2
1.800	4152.0	640.02	2657363.	1721.0
2.000	4126.7	640.56	2643399.	1719.8
2.500	4055.0	642.55	2605540.	1719.7
3.000	3966.1	645.45	2559919.	1722.5
3.500	3856.7	649.09	2503345.	1728.7
4.000	3732.6	653.24	2438284.	1733.4

WSES-FSAR-UNIT-3

TABLE 6.2-13 (Sheet 4 of 30) Revision 14 (12/05)

→(DRN 03-2060, R14)

C. 350 SQ. IN. DISCHARGE LEG CIRCUMFERENTIAL BREAK
FOR REACTOR CAVITY SUBCOMPARTMENT ANALYSIS

<u>TIME (sec)</u>	<u>MASS RATE (lbm/sec)</u>	<u>ENERGY RATE (Btu/sec)</u>
0.000	0.0	0.0
0.001	49158.6	26993617.0
0.002	36899.0	20176325.0
0.003	22868.9	12472719.0
0.005	18860.2	10280063.0
0.005	18857.7	10278680.0
0.006	18856.5	10277918.0
0.007	19301.6	10521310.0
0.008	20144.1	10981217.0
0.009	20961.2	11428557.0
0.010	23064.2	12576793.0
0.012	28270.7	15430766.0
0.014	32258.2	17618492.0
0.016	35025.0	19137784.0
0.018	36870.8	20153851.0
0.020	38494.7	21048473.0
0.022	40013.6	21885001.0
0.024	41451.4	22677062.0
0.026	42664.2	23347057.0
0.028	43897.3	24028737.0
0.030	45109.9	24699473.0
0.032	46230.7	25319694.0
0.034	47200.4	25857051.0
0.036	48063.3	26335070.0
0.038	48787.2	26735823.0
0.040	49353.5	27048784.0
0.042	49751.9	27268160.0
0.044	49980.4	27392809.0
0.046	50046.0	27426563.0
0.048	49965.0	27378613.0
0.050	49765.9	27264811.0
0.056	48862.4	26753636.0
0.060	48235.8	26399538.0
0.065	47684.3	26086430.0
0.071	47171.6	25794185.0
0.075	46827.1	25598883.0
0.083	45707.2	24969157.0
0.087	44922.1	24530323.0
0.091	44075.8	24057715.0
0.094	43617.8	23802292.0
0.101	42537.7	23199502.0
0.112	41834.7	22802930.0
0.123	42238.2	23018720.0
0.132	42806.5	23327501.0

←(DRN 03-2060, R14)

WSES-FSAR-UNIT-3

TABLE 6.2-13 (Sheet 5 of 30) Revision 14 (12/05)

→(DRN 03-2060, R14)

C. 350 SQ. IN. DISCHARGE LEG CIRCUMFERENTIAL BREAK
FOR REACTOR CAVITY SUBCOMPARTMENT ANALYSIS (Cont'd)

<u>TIME (sec)</u>	<u>MASS RATE (lbm/sec)</u>	<u>ENERGY RATE (Btu/sec)</u>
0.141	43371.6	23634548.0
0.151	43778.5	23854428.0
0.161	43972.6	23957245.0
0.171	43967.5	23950464.0
0.181	43803.4	23856316.0
0.191	43559.1	23718241.0
0.201	43338.0	23593373.0
0.221	43239.9	23534530.0
0.241	43484.1	23665681.0
0.261	43671.9	23766698.0
0.281	43700.2	23780633.0
0.301	43597.9	23723104.0
0.321	43559.4	23701407.0
0.341	43574.6	23709790.0
0.361	43586.2	23716689.0
0.381	43571.6	23709438.0
0.401	43544.6	23695626.0
0.421	43528.9	23688353.0
0.441	43530.1	23690551.0
0.461	43537.8	23696491.0
0.481	43544.6	23702099.0
0.501	43549.2	23706629.0
0.551	43543.5	23708369.0
0.601	43518.7	23700177.0
0.651	43611.7	23756736.0
0.701	43681.3	23800167.0
0.751	43724.8	23828836.0
0.801	43744.3	23843782.0
0.851	43732.3	23840871.0
0.901	43737.9	23847275.0
0.951	43757.5	23861087.0
1.000	43747.7	23858219.0
1.104	43737.4	23856912.0
1.205	43721.7	23851622.0
1.304	43692.0	23837948.0
1.404	43598.3	23788649.0
1.504	43533.9	23755590.0
1.604	43481.3	23729342.0
1.704	43360.2	23665704.0
1.804	43212.1	23587936.0
1.904	43062.8	23510262.0
2.004	42879.7	23414267.0
2.504	41563.5	22719161.0
3.004	39377.3	21555212.0
3.504	37168.2	20382171.0
3.999	35025.0	19248544.0

←(DRN 03-2060, R14)

WSES-FSAR-UNIT-3

TABLE 6.2-13 (Sheet 6 of 30) Revision 14 (12/05)

→(DRN 03-2060, R14)

D. NOT USED

←(DRN 03-2060, R14)

E. 600 SQ. IN. HOT LEG CIRCUMFERENTIAL BREAK FOR
STEAM GENERATOR SUBCOMPARTMENT ANALYSIS
(FROM R.V. SIDE)

TIME (sec)	FLOW RATE (lb/sec)	ENTHALPY (BTU/lb)	ENERGY RATE (BTU/sec)	B.N. PRESS (psia)
0.000	0.0	640.45	0.	2259.0
.001	5558.9	639.84	3556807.	2119.5
.002	9585.5	638.82	6123409.	1892.6
.003	13703.0	638.53	8749777.	2007.2
.004	19201.0	638.85	12266559.	1842.6
.005	24604.0	639.03	15722694.	1714.1
.006	28629.0	638.85	18289637.	1712.5
.007	29081.0	638.95	18581305.	1710.9
.008	30558.0	639.27	19534813.	1709.7
.009	31173.0	639.41	19932328.	2011.5
.010	30930.0	639.34	19774786.	1998.8
.012	30067.0	639-11	19216120.	1956.3
.014	30008.0	639.05	19176612.	1953.1
.016	30065.0	639.01	19211836.	1955.6
.018	29974.0	638.93	19151288.	1950.7
.020	29756.0	638.82	19008728.	1939.6
.022	29320.0	638.65	18725218.	1917.9
.024	29000.0	638.46	18515340.	1901.4
.026	29302.0	638.36	18705225.	1915.0
.028	29337.0	638.20	18722873.	1915.7
.030	29159.0	638.04	18604608.	2027.1
.032	28923.0	637.92	18450560.	1894.2
.034	28544.0	637.80	18205363.	1875.6
.036	27993.0	637.66	17850016.	1849.0
.038	27373.0	637.52	17450835.	1819.3
.040	26817.0	637.37	17092351.	1792.2
.042	26368.0	637.21	16801953.	1768.8
.044	26035.0	637.07	16586117.	1751.6
.046	25818.0	636.94	16444517.	1740.4
.048	25777.0	636.85	16416082.	1737.9
.050	25922.0	636.83	16507907.	1744.8
.055	26205.0	636.82	16687868.	1758.3
.060	25344.0	636.57	16133230.	1715.0
.070	25011.0	636.42	15917501.	1712.7
.080	24881.0	636.40	15834268.	1694.7
.090	24811.0	636.43	15790465.	1692.6
.100	24782.0	636.51	15773991.	1692.2
.120	24577.0	636.66	15647193.	1686.6
.140	24233.0	636.79	15431332.	1676.3
.160	24186.0	636.99	15406240.	1676.1
.180	24217.0	637.21	15431315.	1678.7
.200	23996.0	637.36	15294091.	1672.7
.220	23726.0	637.48	15124850.	1664.8

WSES-FSAR-UNIT-3

TABLE 6.2-13 (Sheet 7 of 30) Revision 14 (12/05)

TIME (sec)	FLOW RATE (lb/sec)	ENTHALPY (BTU/lb)	ENERGY RATE (BTU/sec)	B.N. PRESS (psia)
.260	23416.0	637.72	14932852.	1656.3
.300	23143.0	637.97	14764540.	1649.3
.340	22621.0	638.10	14434460.	1633.4
.380	22335.0	638.26	14255537.	1625.3
.420	21990.0	638.37	14037756.	1614.9
.460	21807.0	638.48	13923333.	1609.8
.500	21585.0	638.56	13783318.	1603.0
.600	21177.0	638.72	13526173.	1592.0
.700	20774.0	638.81	13270639.	1580.6
.700	20774.0	638.81	13270639.	1580.6
.800	20332.0	638.92	12990521.	1568.0
.900	19885.0	639.09	12708305.	1559.9
1.000	19414.0	639.34	12412147.	1543.5
1.200	18438.0	640.14	11802901.	1519.7
1.400	17798.0	641.37	11415103.	1496.6
1.600	17457.0	642.81	11221534.	1473.0
2.000	16745.0	645.72	10812581.	1420.8
2.500	15908.0	650.08	10341473.	1356.5
3.000	14986.0	657.87	9858840.	1292.7
3.500	14127.0	658.87	9307856.	1230.6
4.000	13250.0	663.10	8786075.	1160.0

F. 600 SQ. IN. HOT LEG CIRCUMFERENTIAL BREAK FOR STEAM GENERATOR SUBCOMPARTMENT ANALYSIS
(FROM S.G. SIDE)

TIME (sec)	FLOW RATE (lb/sec)	ENTHALPY (BTU/lb)	ENERGY RATE (BTU/sec)	B.N. PRESS (psia)
0.000	0.0	640.45	0.	2258.3
.001	5902.0	640.32	3779169.	2229.5
.002	11264.0	639.94	7208284.	2143.3
.003	15568.0	639.32	9952934.	2007.2
.004	18482.0	638.58	11802236.	1842.6
.005	20933.0	637.99	13355045.	1714.1
.006	25087.0	637.98	16005004.	1712.5
.007	25042.0	637.97	15976045.	1710.9
.008	25005.0	637.97	15952440.	1709.7
.009	24978.0	637.96	15933689.	1708.7
.010	24955.0	637.96	15920292.	1708.0
.012	24936.0	637.96	15908171.	1707.4
.014	24941.0	637.97	15911610.	1707.6
.016	24968.0	637.98	15929085.	1708.5
.018	25013.0	637.99	15958044.	1710.1
.020	25072.0	638.01	15996167.	1712.0
.022	25127.0	638.02	16031529.	1714.5
.024	29411.0	638.96	18792453.	1924.1
.026	32054.0	639.57	20500777.	2057.9
.028	32586.0	639.69	20844938.	2083.8

WSES-FSAR-UNIT-3

TABLE 6.2-13 (Sheet 8 of 30) Revision 14 (12/05)

<u>TIME</u> <u>(sec)</u>	<u>FLOW RATE</u> <u>(lb/sec)</u>	<u>ENTHALPY</u> <u>(BTU/lb)</u>	<u>ENERGY RATE</u> <u>(BTU/sec)</u>	<u>B.N. PRESS</u> <u>(psia)</u>
.030	31499.0	639.44	20141721.	2027.1
.032	29504.0	639.00	18853056.	1929.0
.034	27450.0	638.55	17528198.	1829.5
.036	25973.0	638.21	16576228.	1755.7
.038	25266.0	638.05	16120971.	1721.2
.040	25311.0	638.05	16149684.	1723.6
.042	25816.0	638.16	16474739.	1748.6
.044	26411.0	638.28	16857613.	1778.5
.046	26832.0	638.37	17128744.	1799.8
.048	26970.0	638.39	17217378.	1806.2
.050	26839.0	638.36	17132944.	1800.1
.055	26268.0	638.20	16764238.	1770.4
.060	25714.0	638.04	16406561.	1742.3
.070	25110.0	637.85	16016414.	1712.7
.080	25076.0	637.79	15993222.	1710.8
.090	25004.0	637.73	15945801.	1708.0
.100	24902.0	637.66	15879009.	1704.2
.120	24625.0	637.54	15699423.	1694.4
.140	24296.0	637.46	15487728.	1682.9
.160	23971.0	637.33	15277437.	1671.6
.180	23720.0	637.27	15116044.	1663.1
.200	23577.0	637.25	15024443.	1658.3
.220	23510.0	637.26	14981983.	1656.2
.260	23381.0	637.31	14900945.	1652.3
.300	23031.0	637.37	14679268.	1641.5
.340	22538.0	637.45	14366848.	1626.2
.380	22115.0	637.56	14099639.	1613.3
.420	21952.0	637.72	13999229.	1609.2
.460	21867.0	637.89	13948741.	1607.7
.500	21696.0	638.03	13842699.	1603.2
.600	21180.0	638.30	13519194.	1589.4
.700	20844.0	638.52	13309311.	1580.6
.800	20382.0	638.64	13016760.	1567.8
.900	19916.0	638.76	12721544.	1554.7
1.000	19410.0	638.92	12401437.	1540.7
1.200	18439.0	639.48	11791372.	1515.4
1.400	17810.0	640.46	11406593.	1494.8
1.600	17474.0	641.72	11213415.	1471.1
1.800	17096.0	643.11	10994609.	1443.5
2.000	16743.0	644.59	10792370.	1417.2
2.500	15941.0	648.78	10342202.	1354.7
3.000	15004.0	653.50	9805114.	1289.7
3.500	14144.0	657.89	9305196.	1228.7
4.000	13310.0	662.20	8813882.	1170.0

WSES-FSAR-UNIT-3

TABLE 6.2-13 (Sheet 9 of 30) Revision 14 (12/05)

G. 430 SQ. IN. SUCTION LEG CIRCUMFERENTIAL BREAK FOR
STEAM GENERATOR SUBCOMPARTMENT ANALYSIS
 (FROM S.G. SIDE)

<u>TIME</u> <u>(sec)</u>	<u>FLOW RATE</u> <u>(lb/sec)</u>	<u>ENTHALPY</u> <u>(BTU/lb)</u>	<u>ENERGY RATE</u> <u>(BTU/sec)</u>	<u>B.N. PRESS</u> <u>(psia)</u>
0.000	0.0	556.40	0.	2214.8
.001	6328.3	555.75	3516953.	2051.4
.002	12739.0	555.82	7080591.	2069.2
.003	17878.0	555.31	9927832.	1938.8
.004	21864.0	554.71	12128179.	1789.9
.005	25531.0	554.16	14148259.	1653.9
.006	24237.0	553.79	13422208.	1568.9
.007	21903.0	553.20	12116740.	1428.1
.008	20140.0	552.74	11132184.	1328.7
.009	19243.0	552.47	10631180.	1279.0
.010	18668.0	552.26	10309590.	1246.9
.012	18998.0	552.16	10489936.	1264.6
.014	20033.0	552.22	11062623.	1321.0
.016	20837.0	552.26	11507442.	1364.2
.018	21060.0	552.18	11628911.	1375.6
.020	20928.0	552.03	11552884.	1367.6
.022	20793.0	551.87	11475033.	1359.5
.024	20781.0	551.76	11466125.	1356.3
.026	20798.0	551.66	11473425.	1358.7
.028	20751.0	551.56	11445422.	1355.6
.030	20697.0	551.47	11413775.	1352.2
.032	20771.0	551.41	11453337.	1356.0
.034	21059.0	551.41	11612143.	1371.5
.036	21524.0	551.46	11869625.	1396.8
.038	22098.0	551.55	12166090.	1428.9
.040	22676.0	551.68	12509896.	1466.2
.042	23393.0	551.84	12909193.	1509.4
.044	24196.0	552.04	13357160.	1557.3
.046	25000.0	552.25	13806250.	1605.2
.048	25587.0	552.45	14139538.	1647.4
.050	26017.0	552.62	14377515.	1679.3
.055	26562.0	552.92	14686661.	1721.2
.060	27179.0	553.28	15037597.	1769.2
.065	27896.0	553.69	15445736.	1821.1
.070	27069.0	553.62	14985940.	1762.8
.075	26775.0	553.65	14823979.	1742.1
.080	26743.0	553.77	14809471.	1739.8
.085	24544.0	553.18	13577250.	1582.2
.090	23584.0	552.96	13041009.	1527.1
.095	23771.0	553.01	13145601.	1538.2
.100	23950.0	553.04	13245308.	1549.1
.120	25166.0	553.46	13929481.	1624.7
.140	24659.0	553.50	13648757.	1591.4
.160	25349.0	553.87	14040051.	1641.0
.180	24182.0	553.80	13391992.	1566.7
.200	23973.0	553.96	13280083.	1555.1

WSES-FSAR-UNIT-3

TABLE 6.2-13 (Sheet 10 of 30) Revision 14 (12/05)

TIME (sec)	FLOW RATE (lb/sec)	ENTHALPY (BTU/lb)	ENERGY RATE (BTU/sec)	B.N. PRESS (psia)
. 220	24679.0	554.24	13678089.	1597.6
. 260	24045.0	554.50	13332953.	1562.8
. 300	23596.0	554.78	13090589.	1538.7
. 340	24341.0	555.37	13518261.	1584.6
. 380	23783.0	555.61	13214073.	1554.4
. 420	23933.0	556.01	13306987.	1565.4
. 460	23513.0	556.30	13080282.	1542.4
. 500	23484.0	556.64	13072134.	1543.0
. 600	23165.0	557.44	12913098.	1528.7
. 700	22888.0	558.23	12776768.	1517.2
. 800	22654.0	558.99	12663359.	1507.8
. 900	22472.0	559.73	12578253.	1501.5
1.000	22270.0	560.44	12480999.	1493.9
1.200	21862.0	561.82	12282509.	1477.9
1.400	21498.0	563.09	12105309.	1464.0
1.600	21178.0	564.19	11948416.	1451.6
1.800	20818.0	565.07	11763627.	1435.5
2.000	20457.0	565.71	11572729.	1417.9
2.500	19760.0	566.37	11191471.	1382.1
3.000	19240.0	566.44	10898306.	1354.4
3.500	18990.0	566.79	10763342.	1342.8
4.000	18251.0	568.57	10376971.	1312.4

H. 430 SQ. IN. SUCTION LEG CIRCUMFERENTIAL BREAK
FOR STEAM GENERATOR SUBCOMPARTMENT ANALYSIS (FROM PUMP SIDE)

TIME (sec)	FLOW RATE (lb/sec)	ENTHALPY (BTU/lb)	ENERGY RATE (BTU/sec)	B.N. PRESS (psia)
0.000	0.0	556.40	0.	2211.7
.001	6601.6	556.17	3671612.	2153.3
.002	12196.0	555.49	6774756.	1981.4
.003	16104.0	554.57	8930795.	1751.9
.004	18633.0	553.60	10315229.	1511.7
.005	19710.0	552.76	10894900.	1304.8
.006	17501.0	552.27	9665277.	1184.4
.007	16995.0	552.16	9383959.	1159.8
.008	17556.0	552.26	9695477.	1188.0
.009	18410.0	552.44	10170420.	1234.3
.010	19205.0	552.61	10612875.	1278.2
.012	19991.0	552.77	11050425.	1321.3
.014	19954.0	552.76	11029773.	1319.1
.016	19915.0	552.75	11008016.	1317.1
.018	20207.0	552.81	11170632.	1333.2
.020	20573.0	552.88	11374400.	1353.3
.022	20698.0	552.91	11444131.	1360.0
.024	20576.0	552.88	11376059.	1353.2
.026	20422.0	552.84	11290098.	1344.8
.028	20401.0	552.83	11278285.	1343.7
.030	20510.0	552.84	11338748.	1349.6
.032	20708.0	552.88	11449039.	1360.5

WSES-FSAR-UNIT-3

TABLE 6.2-13 (Sheet 11 of 30) Revision 14 (12/05)

<u>TIME</u> <u>(sec)</u>	<u>FLOW RATE</u> <u>(lb/sec)</u>	<u>ENTHALPY</u> <u>(BTU/lb)</u>	<u>ENERGY RATE</u> <u>(BTU/sec)</u>	<u>B.N. PRESS</u> <u>(psia)</u>
.034	21036.0	552.95	11631856.	1378.6
.036	21452.0	553.03	11863600.	1401.8
.038	21914.0	553.14	12121510.	1429.8
.040	22431.0	553.26	12410175.	1461.0
.042	22973.0	553.38	12712799.	1493.7
.044	23542.0	553.52	13030968.	1528.1
.046	24158.0	553.65	13375077.	1564.6
.048	24794.0	553.80	13730917.	1602.1
.050	25310.0	553.94	14020221.	1638.6
.055	26057.0	554.14	14439226.	1693.3
.060	26390.0	554.22	14625866.	1718.2
.065	27449.0	554.52	15221019.	1798.3
.070	27557.0	554.55	15281734.	1806.8
.075	26155.0	554.10	14492486.	1699.5
.080	26411.0	554.16	14635920.	1719.3
.085	25255.0	553.79	13985966.	1631.0
.090	22340.0	553.05	12355137.	1453.7
.095	23215.0	553.24	12843467.	1507.6
.100	23883.0	553.39	13216613.	1546.9
.120	24742.0	553.55	13695934.	1596.9
.140	24815.0	553.54	13736095.	1601.1
.160	24936.0	553.55	13803323.	1610.3
.180	23741.0	553.26	13134946.	1537.9
.200	24090.0	553.34	13329961.	1558.2
.220	24361.0	553.41	13481621.	1575.1
.260	23875.0	553.35	13211231.	1546.0
.300	23343.0	553.30	12915682.	1515.0
.340	24416.0	553.66	13518163.	1579.0
.380	23846.0	553.66	13202576.	1546.3
.420	23915.0	553.82	13244605.	1551.4
.460	23580.0	553.90	13060962.	1532.2
.500	23479.0	554.05	13008940.	1527.3
.600	23253.0	554.45	12892626.	1516.2
.700	23017.0	554.85	12770982.	1504.7
.800	22820.0	555.27	12671281.	1495.6
.900	22672.0	555.69	12598604.	1489.4
1,000	22502.0	556.11	12513587.	1481.5
1,200	22161.0	556.90	12341461.	1466.4
1,400	21853.0	557.65	12186325.	1452.6
1,600	21571.0	558.37	12044599.	1440.3
1,800	21239.0	559.02	11873026.	1424.4
2,000	20896.0	559.55	11692357.	1407.3
2,500	20180.0	560.33	11307459.	1372.1
3,000	19640.0	560.68	11011755.	1344.9
3,500	19403.0	560.83	10881784.	1332.9
4,000	18782.0	561.55	10547032.	1303.2

WSES-FSAR-UNIT-3

TABLE 6.2-13 (Sheet 12 of 30) Revision 14 (12/05)

I. 592 SQ. IN. SUCTION LEG CIRCUMFERENTIAL BREAK
FOR STEAM GENERATOR SUBCOMPARTMENT ANALYSIS (FROM S.G. SIDE)

<u>TIME</u> <u>(sec)</u>	<u>FLOW RATE</u> <u>(lb/sec)</u>	<u>ENTHALPY</u> <u>(BTU/lb)</u>	<u>ENERGY RATE</u> <u>(BTU/sec)</u>	<u>B.N. PRESS</u> <u>(psia)</u>
0.000	0.0	556.40	0.	2214.8
.001	7184.3	555.66	3992028.	2028.9
.002	14479.0	555.74	8046559.	2049.4
.003	20097.0	555.17	11157251.	1905.3
.004	24448.0	554.50	13556416.	1737.7
.005	28256.0	553.90	15656537.	1591.7
.006	29988.0	553.19	16589062.	1421.0
.007	28135.0	552.82	15553591.	1345.1
.008	25124.0	552.26	13874980.	1223.6
.009	22967.0	551.84	12674109.	1142.6
.010	22080.0	551.61	12179549.	1110.1
.012	22324.0	551.44	12310347.	1118.5
.014	23821.0	551.45	13136090.	1172.0
.016	24794.0	551.41	13671660.	1207.0
.018	25010.0	551.27	13787263.	1214.6
.020	24941.0	551.10	13744985.	1210.9
.022	24999.0	550.96	13773449.	1212.6
.024	25226.0	550.86	13895994.	1221.0
.026	25377.0	550.77	13976890.	1226.4
.028	25352.0	550.67	13960586.	1224.8
.030	25342.0	550.57	13952545.	1224.0
.032	25581.0	550.53	14083108.	1233.3
.034	26033.0	550.54	14332208.	1251.2
.036	26418.0	550.56	14544694.	1266.3
.038	26595.0	550.55	14641877.	1273.2
.040	26826.0	550.56	14769323.	1282.4
.042	27515.0	550.66	15151410.	1310.1
.044	28778.0	550.87	15852937.	1360.8
.046	30240.0	551.15	16666776.	1421.5
.048	31377.0	551.40	17301278.	1471.6
.050	32166.0	551.61	17743037.	1506.5
.055	34283.0	552.19	18930730.	1599.4
.060	35229.0	552.67	19470011.	1648.9
.070	37262.0	553.66	20630479.	1764.0
.080	33194.0	553.13	18360597.	1559.2
.090	31528.0	552.99	17434669.	1486.7
.100	31615.0	553.06	17484992.	1491.1
.120	32482.0	553.40	17975539.	1530.3
.140	32501.0	553.63	17993529.	1532.7
.160	32370.0	553.88	17929096.	1528.6
.180	32684.0	554.23	18114453.	1543.9
.200	31675.0	554.26	17556186.	1501.0
.220	31492.0	554.42	17459795.	1494.2
.240	32122.0	554.80	17821286.	1523.4
.300	30928.0	555.38	17176793.	1475.4
.340	31394.0	556.00	17455064.	1499.1
.380	30976.0	556.44	17236285.	1484.0

WSES-FSAR-UNIT-3

TABLE 6.2-13 (Sheet 13 of 30) Revision 14 (12/05)

TIME (sec)	FLOW RATE (lb/sec)	ENTHALPY (BTU/lb)	ENERGY RATE (BTU/sec)	B.N. PRESS (psia)
.420	30771.0	556.96	17138216.	1478.3
.460	30207.0	557.44	16838590.	1456.9
.500	29932.0	557.95	16700559.	1448.2
.550	29746.0	558.68	16618495.	1444.2
.600	29481.0	559.40	16491671.	1437.1
.700	28778.0	569.80	16138702.	1415.4
.800	28318.0	562.27	15922362.	1404.3
.900	27838.0	563.73	15693116.	1392.8
1.000	27331.0	565.14	15445841.	1380.6
1.200	26525.0	567.80	15060895.	1363.4
1.400	25617.0	569.97	14600921.	1339.5
1.600	24891.0	571.52	14225704.	1319.4
1.800	24375.0	572.50	13954688.	1304.2
2.000	23877.0	573.00	13681521.	1287.3
2.500	22714.0	573.26	13021028.	1242.7
3.000	22274.0	573.28	12769239.	1225.3
3.500	21645.0	575.74	12461892.	1218.9
4.000	19223.0	581.97	11187209.	1200.3

J. 592 SQ. IN. SUCTION LEG CIRCUMFERENTIAL BREAK
FOR STEAM GENERATOR SUBCOMPARTMENT ANALYSIS (FROM PUMP SIDE)

TIME (sec)	FLOW RATE (lb/sec)	ENTHALPY (BTU/lb)	ENERGY DATE (BTU/sec)	B.N. PRESS (psia)
0.000	0.0	556.40	0.	2211.7
.001	7550.8	556.14	4199302.	2144.8
.002	13751.0	555.36	7636755.	1949.9
.003	17943.0	554.33	9946343.	1693.7
.004	20869.0	553.28	11159104.	1432.4
.005	20790.0	552.41	11484604.	1217.0
.006	21032.0	551.82	11605878.	1072.9
.007	20761.0	551.77	11455297.	1063.8
.008	20760.0	551.76	11454538.	1063.7
.009	20760.0	551.75	11454330.	1063.7
.010	20762.0	551.74	11455226.	1063.7
.012	21661.0	551.86	11953839.	1096.9
.014	22858.0	552.03	12618302.	1140.3
.016	23500.0	552.11	12974585.	1163.5
.018	23902.0	552.17	13197967.	1178.0
.020	24842.0	552.18	13275512.	1082.9
.022	23963.0	552.16	13231410.	1180.0
.024	23892.0	552.15	13191968.	1177.4
.026	24020.0	552.16	13262883.	1182.1
.028	24414.0	552.21	13481655.	1198.4
.030	24833.0	552.27	13714521.	1213.1
.032	25197.0	552.31	13916555.	1227.7
.034	25574.0	552.37	14126310.	1242.9
.036	26038.0	552.43	14384172.	1261.5
.038	26504.0	552.50	14643460.	1280.2

WSES-FSAR-UNIT-3

TABLE 6.2-13 (Sheet 14 of 30) Revision 14 (12/05)

TIME (sec)	FLOW RATE (lb/sec)	ENTHALPY (BTU/lb)	ENERGY RATE (BTU/sec)	B.N. PRESS (psia)
.040	26824.0	552.54	14821333.	1292.9
.042	27023.0	552.56	14931829.	1300.8
.044	27355.0	552.60	15116373.	1314.2
.046	28078.0	552.71	15518991.	1343.1
.048	29182.0	552.87	16133852.	1471.3
.050	30287.0	553.05	16750225.	1434.7
.055	32109.0	553.34	17767194.	1514.6
.060	33883.0	553.62	18758306.	1590.5
.070	35226.0	553.86	19510272.	1659.0
.080	32120.0	553.25	17770390.	1513.0
.090	31688.0	553.13	17527583.	1494.1
.100	30832.0	552.95	17048554.	1457.4
.120	31795.0	553.11	17586132.	1499.2
.140	31516.0	553.05	17429924.	1487.2
.160	31887.0	553.14	17637975.	1503.3
.180	31805.0	553.16	17593294.	1500.1
.200	31032.0	553.07	17162868.	1466.4
.220	30835.0	553.09	17054530.	1494.2
.240	31519.0	553.28	17438832.	1488.7
.300	30519.0	553.37	16888299.	1445.9
.340	30954.0	553.66	17137992.	1466.4
.380	30587.0	553.82	16939692.	1451.8
.420	30430.0	554.05	16859742.	1446.4
.460	29921.0	554.22	16582817.	1425.5
.500	29704.0	554.46	16469680.	1417.7
.550	29572.0	554.79	16406250.	1413.8
.600	29416.0	555.14	16329998.	1409.1
.700	28788.0	555.83	16001234.	1387.3
.800	28414.0	556.59	15814948.	1376.8
.900	28043.0	557.37	15630327.	1366.5
1.000	27639.0	558.14	15426431.	1354.9
1.200	26992.0	559.76	15109042.	1338.3
1.400	26226.0	561.22	14718556.	1316.1
1.600	25574.0	562.42	14383329.	1297.0
1.800	25075.0	563.39	14127004.	1282.6
2.000	24565.0	564.08	13856625.	1266.2
2.500	23392.0	564.87	13213439.	1224.1
3.000	22954.0	564.90	12966715.	1206.9
3.500	22560.0	565.94	12767606.	1187.0
4.000	21652.0	569.01	12320205.	1179.8

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TABLE 6.2-13 (Sheet 15 of 30) Revision 14 (12/05)

K. 532 SQ. IN. SUCTION LEG SLOT BREAK
FOR STEAM GENERATOR SUBCOMPARTMENT ANALYSIS

<u>TIME</u> <u>(sec)</u>	<u>FLOW RATE</u> <u>(lb/sec)</u>	<u>ENTHALPY</u> <u>(BTU/lb)</u>	<u>ENERGY RATE</u> <u>(BTU/sec)</u>	<u>B.N. PRESS</u> <u>(psia)</u>
0.000	0.0	556.40	0.	2214.6
.001	16044.0	555.96	8919822.	2101.6
.002	27301.0	554.82	15147141.	1815.7
.003	33553.0	553.42	18568901.	1469.2
.004	34502.0	552.25	19053730.	1179.5
.005	37323.0	551.77	20593712.	1063.8
.006	37313.0	551.77	20588194.	1063.6
.007	37314.0	551.76	20588373.	1063.5
.008	37323.0	551.74	20592592.	1063.6
.009	40020.0	551.94	22088639.	1119.1
.010	43975.0	552.24	24288754.	1198.6
.012	45846.0	552.36	25323497.	1239.8
.014	44293.0	552.17	24497266.	1204.5
.016	43072.0	552.03	23777036.	1179.2
.018	43853.0	552.06	24209487.	1195.1
.020	45598.0	552.19	25178760.	1233.8
.022	46919.0	552.28	25912425.	1263.1
.024	47098.0	552.26	26010341.	1266.7
.026	46606.0	552.19	25735367.	1255.5
.028	46301.0	552.13	25564171.	1248.6
.030	46535.0	552.13	25693370.	1253.8
.032	47027.0	552.15	25965958.	1264.7
.034	47466.0	552.16	26208827.	1274.3
.036	47806.0	552.17	26397039.	1281.8
.038	48196.0	552.18	26612867.	1290.4
.040	48760.0	552.22	26926247.	1302.9
.042	49424.0	552.26	27294898.	1317.6
.046	51120.0	552.38	28237666.	1355.3
.048	52726.0	552.52	29132170.	1391.0
.050	54896.0	552.72	30342117.	1443.5
.055	60303.0	553.24	33362032.	1574.6
.060	62852.0	553.52	34789839.	1642.3
.065	64181.0	553.70	35537020.	1681.3
.070	64872.0	553.80	35926114.	1702.9
.075	67519.0	554.16	37416329.	1783.1
.080	62042.0	553.50	34340247.	1616.1
.090	60656.0	553.36	33564604.	1581.9
.100	56634.0	552.95	31315770.	1486.3
.120	58818.0	553.19	32537929.	1539.1
.140	58381.0	553.19	32295785.	1528.9
.160	59447.0	553.39	32897375.	1555.0
.180	59708.0	553.51	33048975.	1562.0
.200	57944.0	553.45	32069107.	1519.9
.220	57832.0	553.52	31906000.	1513.3
.260	57787.0	553.81	32003018.	1518.2
.300	57445.0	554.07	31828551.	1511.5
.340	57809.0	554.42	32050466.	1522.4

WSES-FSAR-UNIT-3

TABLE 6.2-13 (Sheet 16 of 30) Revision 14 (12/05)

TIME (sec)	FLOW RATE (lb/sec)	ENTHALPY (BTU/lb)	ENERGY RATE (BTU/sec)	B.N. PRESS (psia)
.380	56655.0	554.63	31422563.	1496.4
.420	56372.0	554.96	31284205.	1491.6
.460	55783.0	555.27	30974626.	1479.3
.500	55348.0	555.60	30751349.	1471.0
.550	53788.0	556.02	30463224.	1460.0
.600	54471.0	556.47	30311477.	1455.2
.700	53590.0	557.38	29869994.	1439.4
.800	52986.0	558.34	29584203.	1430.7
.900	52379.0	559.30	29295575.	1421.9
1.000	51801.0	560.26	29022028.	1413.8
1.200	50430.0	562.11	28347207.	1392.4
1.400	49183.0	563.76	27727408.	1743.0
1.600	48082.0	565.18	27174985.	1357.9
1.800	46973.0	566.24	26597992.	1339.4
2.000	46028.0	566.95	26095575.	1322.6
2.500	44005.0	567.70	24981639.	1282.3
3.000	43096.0	567.70	24466599.	1262.3
3.500	42467.0	568.60	24146736.	1253.4
4.000	40409.0	572.10	23117989.	1227.0

L. 480 SQ. IN. DISCHARGE LEG CIRCUMFERENTIAL BREAK
FOR STEAM GENERATOR SUBCOMPARTMENT ANALYSIS (FROM PUMP SIDE)

TIME (sec)	FLOW RATE (lb/sec)	ENTHALPY (BTU/lb)	ENERGY RATE (BTU/sec)	B.N. PRESS (psia)
0.000	0.0	556.40	0.	2302.3
.001	6332.9	556.14	3521979.	2234.7
.002	11763.0	555.39	6533053.	2045.9
.003	15102.0	554.28	8370737.	1766.8
.004	16387.0	552.95	9061192.	1433.5
.005	14880.0	551.65	8268592.	1107.4
.006	16778.0	551.46	9251293.	1061.2
.007	16760.0	551.47	9242637.	1060.6
.008	16741.0	551.48	9232327.	1059.9
.009	16717.0	551.48	9219091.	1059.3
.010	16695.0	551.48	9206959.	1058.7
.012	16657.0	551.48	9186002.	1057.8
.014	16631.0	551.48	9171664.	1057.0
.016	16616.0	551.47	9163226.	1056.6
.018	16610.0	551.45	0159584.	1056.3
.020	16614.0	551.44	9161624.	1056.3
.022	16627.0	551.42	9168460.	1056.5
.024	16647.0	551.40	9179156.	1056.9
.026	16677.0	551.38	9195364.	1057.6
.028	16715.0	551.37	9216150.	1058.5
.030	16757.0	551.36	9239140.	1059.7
.032	16790.0	551.35	9257166.	1066.7
.034	26778.0	553.32	14816803.	1556.7
.036	30760.0	554.30	17050268.	1801.2

WSES-FSAR-UNIT-3

TABLE 6.2-13 (Sheet 17 of 30) Revision 14 (12/05)

<u>TIME</u> <u>(sec)</u>	<u>FLOW RATE</u> <u>(lb/sec)</u>	<u>ENTHALPY</u> <u>(BTU/lb)</u>	<u>ENERGY RATE</u> <u>(BTU/sec)</u>	<u>B.N. PRESS</u> <u>(psia)</u>
.038	32519.0	554.68	18037639.	1895.0
.040	32740.0	554.72	18161533.	1906.2
.042	32361.0	554.66	17949352.	1889.7
.044	31938.0	554.58	17712176.	1869.6
.046	31594.0	554.51	17519189.	1852.1
.048	31329.0	554.46	17368460.	1837.6
.050	31098.0	554.41	17241042.	1824.9
.055	30550.0	554.27	16932949.	1791.0
.060	29803.0	554.05	16512352.	1740.2
.070	28227.0	553.59	15626185.	1635.1
.080	27649.0	553.41	15301233.	1598.7
.090	27716.0	553.40	15338034.	1602.6
.100	27144.0	553.26	15017689.	1572.2
.120	27059.0	553.17	14968227.	1567.8
.140	27417.0	553.22	15167633.	1585.8
.160	27986.0	553.33	15485493.	1618.8
.180	27510.0	553.20	15218532.	1590.4
.200	26910.0	553.04	14882306.	1559.2
.220	27101.0	553.05	14988208.	1569.1
.260	27265.0	553.07	15079454.	1577.5
.300	26663.0	552.92	14742506.	1545.8
.340	27044.0	593.00	14955332.	1565.7
.380	26509.0	552.89	14656561.	1537.5
.420	26667.0	552.93	14744984.	1546.1
.460	26188.0	552.86	14478298.	1520.5
.500	26294.0	552.91	14538216.	1526.4
.550	25921.0	552.87	14330943.	1506.4
.600	26043.0	552.95	14400477.	1513.4
.700	25674.0	552.99	14197465.	1494.0
.800	25328.0	553.04	14006291.	1476.0
.900	25069.0	553.14	13866667.	1463.1
1.000	24773.0	553.24	13705415.	1448.0
1.200	24113.0	553.47	13345822.	1414.4
1.400	23482.0	553.75	13003158.	1384.1
1.600	22943.0	554.07	12712028.	1359.9
1.800	22422.0	554.39	12430533.	1336.6
2.000	21876.0	554.71	12134836.	1311.9
2.500	20714.0	555.51	11506834.	1259.9
3.000	19595.0	556.08	10896388.	1208.5
3.500	18587.0	556.44	10342550.	1165.1
4.000	17688.0	556.50	9843372.	1125.9

WSES-FSAR-UNIT-3

TABLE 6.2-13 (Sheet 18 of 30) Revision 14 (12/05)

M. 480 SQ. IN. DISCHARGE LEG CIRCUMFERENTIAL BREAK
FOR STEAM GENERATOR SUBCOMPARTMENT ANALYSIS (FROM R.V. SIDE)

<u>TIME</u> <u>(sec)</u>	<u>FLOW RATE</u> <u>(lb/sec)</u>	<u>ENTHALPY</u> <u>(BTU/lb)</u>	<u>ENERGY RATE</u> <u>(BTU/sec)</u>	<u>B.N. PRESS</u> <u>(psia)</u>
0.000	0.0	556.40	0.	2300.5
.001	6086.3	555.68	3382035.	2118.2
.002	9803.7	554.06	5431838.	1711.9
.003	11019.0	552.41	6087006.	1305.1
.004	11362.0	551.45	6265575.	1071.9
.005	13985.0	551.37	7710909.	1061.0
.006	16777.0	551.34	9249831.	1060.6
.007	16778.0	551.30	9249711.	1060.5
.008	17830.0	551.46	9832532.	1109.3
.009	21384.0	552.10	11806106.	1275.0
.010	23615.0	552.51	13047524.	1384.5
.012	25834.0	552.93	14284394.	1502.8
.014	26540.0	553.03	14677416.	1540.1
.016	26543.0	552.98	14677748.	1539.8
.018	26343.0	552.90	14565045.	1528.8
.020	26162.0	552.82	14462877.	1518.9
.022	26064.0	552.78	14407658.	1513.5
.024	26035.0	552.76	14391107.	1511.8
.026	26031.0	552.75	14388635.	1511.6
.028	26004.0	552.74	14373451.	1510.1
.030	25924.0	552.72	14328713.	1505.7
.032	25780.0	552.70	14248606.	1497.9
.034	26137.0	552.76	14447488.	1517.7
.036	27737.0	553.07	15340503.	1602.8
.038	29376.0	553.46	16258441.	1709.0
.040	30591.0	553.74	16939480.	1790.4
.042	31188.0	553.84	17273162.	1825.8
.044	31312.0	553.84	17341838.	1832.9
.046	31268.0	553.79	17315906.	1830.4
.048	31183.0	553.74	17267274.	1825.4
.050	31083.0	553.69	17210346.	1819.5
.055	30684.0	553.51	16983901.	1794.4
.060	29989.0	553.24	16591114.	1746.5
.070	28524.0	552.66	15764074.	1647.1
.080	27850.0	552.31	15381834.	1602.8
.090	27350.0	552.03	15098021.	1575.4
.100	27080.0	551.80	14942744.	1560.6
.120	27939.0	551.91	15419813.	1605.4
.140	27720.0	551.73	15293956.	1592.5
.160	28361.0	551.93	15653287.	1631.9
.180	27490.0	551.70	15166233.	1580.6
.200	27367.0	551.66	15097279.	1574.4
.220	27619.0	551.79	15239388.	1587.8
.260	27650.0	551.93	15260865.	1590.3
.300	27112.0	551.92	14963655.	1563.0
.340	27010.0	552.05	14910871.	1558.4
.380	26782.0	552.10	14786342.	1547.0

WSES-FSAR-UNIT-3

TABLE 6.2-13 (Sheet 19 of 30) Revision 14 (12/05)

<u>TIME</u> <u>(sec)</u>	<u>FLOW RATE</u> <u>(lb/sec)</u>	<u>ENTHALPY</u> <u>(BTU/lb)</u>	<u>ENERGY RATE</u> <u>(BTU/sec)</u>	<u>B.N. PRESS</u> <u>(psia)</u>
.420	26886.0	552.25	14847794.	1553.2
.460	26457.0	552.25	14610878.	1531.0
.500	26455.0	552.36	14612684.	1531.6
.550	26033.0	552.37	14379848.	1509.4
.600	26134.0	552.51	14439296.	1515.6
.700	25753.0	552.63	14231880.	1496.1
.800	25426.0	552.72	14053459.	1479.4
.900	25171.0	552.82	13915032.	1466.6
1.000	24870.0	552.88	13750126.	1451.0
1.200	24223.0	552.93	13393623.	1417.0
1.400	23624.0	552.93	13062418.	1386.0
1.600	23133.0	552.95	12791392.	1363.1
1.800	22627.0	552.94	12511373.	1338.6
2.000	22122.0	552.90	12231254.	1314.1
2.500	21052.0	552.66	11638809.	1262.0
3.000	19984.0	552.84	11047955.	1210.0
3.500	19003.0	552.93	10507329.	1166.4
4.000	18101.0	553.11	10011844.	1127.6

WSES-FSAR-UNIT-3

TABLE 6.2-13 (Sheet 20 of 30) Revision 14 (12/05)

N. MASS/ENERGY RELEASE DATA FOR 20.64 SQ. IN.
PRESSURIZER SPRAY LINE DOUBLE ENDED
GUILLOTINE BREAK (FROM PRESSURIZER SIDE)

<u>TIME</u> <u>(sec)</u>	<u>FLOW RATE</u> <u>(lb/sec)</u>	<u>ENTHALPY</u> <u>(BTU/lb)</u>
0.000	0.0	747.34
.001	757.3	747.34
.002	757.3	747.34
.003	757.3	747.34
.004	757.2	747.34
.005	757.2	747.34
.006	757.2	747.34
.007	757.2	747.34
.008	757.2	747.34
.009	757.2	747.34
.010	757.2	747.34
.012	757.1	747.34
.014	757.1	747.34
.016	757.1	747.34
.018	757.1	747.34
.020	757.1	747.34
.022	757.0	747.34
.024	757.0	747.34
.026	757.0	747.34
.028	757.0	747.34
.030	756.9	747.34
.032	756.9	747.34
.034	756.9	747.34
.038	756.8	747.34
.042	756.8	747.34
.046	756.8	747.34
.050	756.7	747.33
.055	756.6	747.33
.060	756.6	747.33
.070	756.5	747.33
.080	756.3	747.33
.090	756.2	747.33
.100	756.1	747.33
.120	755.9	747.32
.140	755.6	747.32
.160	755.3	747.31
.180	755.1	747.31
.200	754.8	747.30
.220	754.5	747.30
.260	753.9	747.29
.300	753.3	747.28
.340	752.6	747.27
.380	751.8	747.26
.420	751.0	747.24
.460	750.2	747.23

WSES-FSAR-UNIT-3

TABLE 6.2-13 (Sheet 21 of 30) Revision 14 (12/05)

<u>TIME</u> <u>(sec)</u>	<u>FLOW RATE</u> <u>(lb/sec)</u>	<u>ENTHALPY</u> <u>(BTU/lb)</u>
.500	749.3	747.21
.550	748.0	747.19
.600	746.7	747.17
.700	744.0	747.13
.800	741.1	747.08
.900	738.0	747.03
1.000	735.0	746.98
1.200	728.6	746.87
1.400	722.8	746.76
1.600	717.1	746.65
1.800	711.5	746.55
2.000	706.0	746.45
2.500	692.5	746.20
3.000	679.8	745.96
3.500	667.9	745.73
4.000	657.0	745.52
4.500	647.2	745.33
5.000	638.9	745.15

0. MASS/ENERGY RELEASE DATA FOR 20.64 SQ. IN.
PRESSURIZER SPRAY LINE DOUBLE ENDED
GUILLOTINE BREAK (FROM COLD LEG SIDE)

<u>TIME</u> <u>(sec)</u>	<u>FLOW RATE</u> <u>(lb/sec)</u>	<u>ENTHALPY</u> <u>(BTU/lb)</u>
0.000	0.0	556.40
.001	1672.1	556.35
.002	1653.8	556.25
.003	1637.9	556.16
.004	1624.9	556.08
.005	1614.9	556.02
.006	1608.4	555.98
.007	1604.9	555.96
.008	1604.7	555.96
.009	1607.8	555.98
.010	1614.0	556.01
.012	1633.4	556.13
.014	1658.9	556.27
.016	1685.2	556.41
.018	1702.9	556.52
.020	1710.7	556.57
.022	1709.8	556.56
.024	1701.6	556.51
.026	1688.1	556.43
.028	1671.1	556.34
.030	1658.0	556.27
.032	1651.0	556.23
.034	1650.6	556.23

WSES-FSAR-UNIT-3

TABLE 6.2-13 (Sheet 22 of 30) Revision 14 (12/05)

<u>TIME</u> <u>(sec)</u>	<u>FLOW RATE</u> <u>(lb/sec)</u>	<u>ENTHALPY</u> <u>(BTU/lb)</u>
.038	1665.4	556.31
.042	1684.4	556.41
.046	1688.6	556.43
.050	1675.5	556.37
.055	1655.8	556.26
.060	1652.6	556.24
.070	1673.3	556.35
.080	1661.0	556.29
.090	1643.7	556.19
.100	1661.5	556.29
.120	1638.8	556.17
.140	1649.2	556.22
.160	1652.5	556.24
.180	1638.3	556.16
.200	1629.9	556.11
.220	1631.6	556.13
.260	1623.3	556.08
.300	1619.1	556.05
.340	1606.5	555.97
.380	1605.6	555.97
.420	1601.9	555.95
.460	1595.6	555.91
.500	1594.6	555.90
.550	1593.4	555.89
.600	1590.8	555.87
.700	1587.2	555.85
.800	1584.6	555.83
.900	1583.6	555.81
1.000	1583.2	555.80
1.200	1582.7	555.77
1.400	1581.3	555.71
1.600	1578.7	555.62
1.800	1575.0	555.49
2.000	1570.9	555.34
2.500	1558.0	554.84
3.000	1545.6	554.22
3.500	1536.4	553.50
4.000	1528.5	552.67
4.500	1520.7	551.76
5.000	1535.3	550.91

WSES-FSAR-UNIT-3

TABLE 6.2-13 (Sheet 23 of 30) Revision 14 (12/05)

P. MASS/ENERGY RELEASE DATA FOR 161 SQ. IN.
PRESSURIZER SURGE LINE DOUBLE ENDED
GUILLOTINE BREAK (FROM PRESSURIZER SIDE)

<u>TIME</u> <u>(sec)</u>	<u>FLOW RATE</u> <u>(lb/sec)</u>	<u>ENTHALPY</u> <u>(BTU/lb)</u>
0.000	0.0	700.73
.001	7248.3	700.73
.002	7247.7	700.73
.003	7247.0	700.72
.004	7246.4	700.72
.005	7245.8	700.72
.006	7245.1	700.71
.007	7244.5	700.71
.008	7243.8	700.71
.009	7243.2	700.70
.010	7242.5	700.70
.012	7241.2	700.70
.014	7239.5	700.69
.016	7238.7	700.68
.018	7237.1	700.68
.020	7236.1	700.67
.022	7234.8	700.66
.024	7233.5	700.66
.026	7232.3	700.65
.028	7231.0	700.65
.030	7229.7	700.64
.032	7228.4	700.63
.034	7227.1	700.63
.038	7224.6	700.61
.042	7222.0	700.60
.046	7219.5	700.57
.050	7216.9	700.57
.055	7213.7	700.56
.060	7210.5	700.54
.070	7204.2	700.51
.080	7197.6	700.47
.090	7188.2	700.44
.100	7178.8	700.41
.120	7160.2	700.33
.140	7141.6	700.26
.160	7123.2	700.19
.180	7104.8	700.11
.200	7086.8	700.03
.220	7068.8	699.95
.260	7032.7	694.79
.300	6997.4	699.61
.340	6962.1	699.43
.380	6924.9	699.24
.420	6889.0	699.95
.460	6854.0	698.84

WSES-FSAR-UNIT-3

TABLE 6.2-13 (Sheet 24 of 30) Revision 14 (12/05)

<u>TIME</u> <u>(sec)</u>	<u>FLOW RATE</u> <u>(lb/sec)</u>	<u>ENTHALPY</u> <u>(BTU/lb)</u>
.500	6819.7	698.63
.550	6774.4	698.36
.600	6733.6	698.07
.700	6655.1	697.45
.800	6580.5	696.78
.900	6509.8	696.05
1.000	6442.0	696.27
1.200	6320.3	393.53
1.400	6212.6	691.56
1.600	6119.8	689.36
1.800	6017.2	686.92
2.000	5923.4	684.20
2.500	5765.4	676.22
3.000	5713.1	666.50
3.500	5739.8	654.86
4.000	5910.9	641.13
4.500	6200.9	625.20
5.000	6424.3	610.34

Q. MASS/ENERGY RELEASE DATA FOR 161 SQ. IN.
PRESSURIZER SURGE LINE DOUBLE ENDED
GUILLOTINE BREAK (FROM HOT LEG SIDE)

<u>TIME</u> <u>(sec)</u>	<u>FLOW RATE</u> <u>(lb/sec)</u>	<u>ENTHALPY</u> <u>(BTU/lb)</u>
0.000	0.0	640.45
.001	9452.6	640.28
.002	9088.9	639.96
.003	8765.5	639.69
.004	8516.7	639.48
.005	8349.3	639.33
.006	8262.7	639.26
.007	8261.4	639.26
.008	8335.7	639.32
.009	8471.6	639.44
.010	8657.2	639.60
.012	9108.0	639.99
.014	9538.4	640.36
.016	9806.0	640.61
.018	9890.7	640.69
.020	9794.4	640.61
.022	9571.4	640.40
.024	9303.0	640.15
.026	9041.7	639.94
.028	8889.2	639.81
.030	8866.0	639.79
.032	8957.0	639.87

WSES-FSAR-UNIT-3

TABLE 6.2-13 (Sheet 25 of 30) Revision 14 (12/05)

<u>TIME</u> <u>(sec)</u>	<u>FLOW RATE</u> <u>(lb/sec)</u>	<u>ENTHALPY</u> <u>(BTU/lb)</u>
.034	9120.7	640.00
.038	9439.7	640.27
.042	9500.3	640.33
.046	9343.9	640.18
.050	9145.6	640.02
.055	9104.5	639.98
.060	9183.1	640.04
.070	8907.3	639.81
.080	8867.2	639.76
.090	8667.0	639.59
.100	8987.3	639.84
.120	8558.8	639.45
.140	8035.8	639.00
.160	8021.0	638.97
.180	8203.2	638.09
.200	7955.7	638.86
.220	7749.8	638.66
.260	7411.4	638.33
.300	7142.9	638.07
.340	6881.8	637.80
.380	6779.0	637.89
.420	6761.6	637.66
.460	6751.8	637.65
.500	6739.1	637.67
.550	6730.8	637.71
.600	6705.2	637.77
.700	6663.8	637.94
.800	6645.0	638.16
.900	6622.4	638.38
1.000	6600.9	638.58
1.200	6545.2	638.99
1.400	6497.6	639.39
1.600	6456.7	639.85
1.800	6410.8	640.41
2.000	6361.6	641.09
2.500	6222.6	643.40
3.000	6057.6	646.52
3.500	5870.8	650.29
4.000	5666.7	654.51
4.500	5453.5	658.98
5.000	5254.0	663.57

WSES-FSAR-UNIT-3

TABLE 6.2-13 (Sheet 26 of 30) Revision 14 (12/05)

R. MASS/ENERGY RELEASE DATA FOR 21.14 SQ. IN.
PRESSURIZER SAFETY VALVE NOZZLE SINGLE
AREA GUILLOTINE BREAK

<u>TIME</u> <u>(sec)</u>	<u>FLOW RATE</u> <u>(lb/sec)</u>	<u>ENTHALPY</u> <u>(BTU/lb)</u>
0.000	0.0	747.34
.001	1584.9	747.34
.004	1584.7	747.34
.008	1584.5	747.34
.012	1584.3	747.34
.018	1584.0	747.34
.026	1583.6	747.33
.034	1583.2	747.33
.042	1582.8	747.33
.050	1582.4	747.32
.060	1581.9	747.32
.070	1581.4	747.32
.080	1580.9	747.31
.090	1580.4	747.31
.100	1579.9	747.31
.120	1578.9	747.30
.140	1577.8	747.29
.160	1576.8	747.28
.180	1575.8	747.27
.200	1574.8	747.26
.220	1573.8	747.25
.260	1571.8	747.24
.300	1569.9	747.21
.340	1567.9	747.19
.380	1566.0	747.17
.420	1564.0	747.14
.460	1562.1	747.11
.500	1560.2	747.08
.550	1557.7	747.04
.600	1555.4	747.00
.700	1550.8	746.90
.800	1546.3	746.78
.900	1541.9	746.66
1.000	1537.5	746.52
1.200	1528.5	746.24
1.400	1520.2	745.97
1.600	1511.8	745.70
1.800	1502.8	745.46
2.000	1493.8	745.24
2.500	1470.9	744.63
3.000	1449.8	743.78
3.500	1431.2	742.63
4.000	1414.4	741.34
4.500	1399.0	739.99

WSES-FSAR-UNIT-3

TABLE 6.2-13 (Sheet 27 of 30) Revision 14 (12/05)

S. MASS/ENERGY RELEASE DATA FOR 2.88 SQ. FT.
FEEDWATER LINE CIRCUMFERENTIAL BREAK
FOR CONTAINMENT SUBCOMPARTMENT ANALYSIS
(FLOW FROM FW LINE SIDE)

<u>TIME</u> <u>(SECONDS)</u>	<u>FLOW RATE</u> <u>(LB/SEC)</u>	<u>ENTHALPY</u> <u>(BTU/LB)</u>	<u>ENERGY RATE</u> <u>(BTU/SEC)</u>
0.00000	0.0	428.30	0.
.00100	9291.0	426.30	3960753.
.00200	9283.0	426.30	3957343.
.00300	9265.0	426.30	3949670.
.00400	9232.0	426-30	3935602.
.00500	9198.0	426.30	3921107.
.00600	9165.0	426.30	3907040.
.00700	9133.0	426.30	3893398.
.00800	9101.0	426.30	3879756.
.00900	9068.0	426.30	3865688.
.01000	9036.0	426.30	3852047.
.01200	8951.0	426.30	3815811.
.01400	8888.0	426.30	3788954.
.01600	8825.0	426.20	3761215.
.01800	8761.0	426.20	3733938.
.02000	8696.0	426.20	3706235.
.02200	8631.0	426.20	3678532.
.02400	8557.0	426.20	3646993.
.02600	8489.0	426.10	3588188.
.03000	8352.0	426.10	3558787.
.03200	8282.0	426.10	3528960.
.03400	8211.0	426.10	3498707.
.03600	8141.0	426.00	3468066.
.03800	8009.0	426.00	3437394.
.04000	7997.0	426.00	3406722.
.04200	7925.0	426.00	3376050.
.04400	7852.0	426.00	3344952.
.04600	7778.0	426.00	3313428.
.04800	7705.0	425.90	3281560.
.05000	7631.0	425-90	3250043.
.05200	7556.0	425.90	3218100.
.05600	7407.0	425.90	3154641.
.06000	7257.0	425.80	3090031.
.06600	7082.0	425.80	3015516.
.07000	6970.0	425.70	2967129.
.07600	6824.0	425.70	2904977.
.08000	6782.0	425.60	2890675.
.08600	6741.0	425.60	2868970.
.09000	6707.0	425.60	2854499.
.09600	6654.0	425.50	2831277.
.10000	6617.0	425.50	2815534.

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TABLE 6.2-13 (Sheet 28 of 30) Revision 14 (12/05)

<u>TIME</u> <u>(SECONDS)</u>	<u>FLOW RATE</u> <u>(LB/SEC)</u>	<u>ENTHALPY</u> <u>(BTU/LB)</u>	<u>ENERGY RATE</u> <u>(BTU/SEC)</u>
.12000	6375.0	425.30	2711288.
.14000	6175.0	425.20	2625610.
.16000	5966.0	425.00	2535550.
.18000	5755.0	424.90	2445300.
.20000	5552.0	424.90	2359045.
.22000	5367.0	424.90	2280438.
.24000	5209.0	424.90	2213304.
.26000	5081.0	424.90	2158917.
.28000	4985.0	425.00	2118625.
.30000	4918.0	425.10	2090642.
.32000	4873.0	425.20	2072000.
.34000	4843.0	425.30	2060579.
.36000	4829.0	425.40	2054257.
.38000	4819.0	425.50	2050485.
.40000	4813.0	425.60	2048413.
.42500	4827.0	425.70	2046340.
.45000	4802.0	425.80	2044692.
.47500	4790.0	425.80	2042137.
.50000	4789.0	425.90	2039635.
.52500	4782.0	425.90	2036654.
.55000	4774.0	426.00	2033724.
.57500	4765.0	426.00	2029890.
.60000	4756.0	426.00	2026056.
.62500	4746.0	426.10	2022271.
.65000	4737.0	426.10	2018436.
.67500	4727.0	426.10	2014175.
.70000	4718.0	426.10	2010340.
.72500	4709.0	426.10	2006505.
.75000	4701.0	426.10	2003096.
.77500	4695.0	426.20	2001009.
.80000	4691.0	426.20	1999304.
.85000	4981.0	426.20	1995042.
.90000	4672.0	426.20	1991206.
.95000	4663.0	426.20	1987371.
1.00000	4655.0	426.20	1983961.
1.10000	4643.0	426.20	1978847.
1.20000	4633.0	426.30	1975048.
1.30000	4626.0	426.30	1972064.
1.40000	4622.0	426.30	1970359.
1.50000	4618.0	426.40	1969115.
1.60000	4615.0	426.40	1967836.
1.70000	4613.0	426.40	1966983.
1.80000	4612.0	426.50	1967018.
2.00000	4610.0	426.60	1966626.
2.50000	4610.0	426.80	1967548.
3.00000	4612.0	427.00	1969324.
3.50000	4610.0	427.20	1971955.
4.00000	4624.0	427.30	1975835.

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TABLE 6.2-13 (Sheet 29 of 30) Revision 14 (12/05)

T. MASS/ENERGY RELEASE DATA FOR 2.88 SQ FT.
FEEDWATER LINE CIRCUMFERENTIAL BREAK
FOR CONTAINMENT SUBCOMPARTMENT ANALYSIS
(FLOW FROM SG SIDE)

<u>TIME</u> <u>(SECONDS)</u>	<u>FLOW RATE</u> <u>(LB/SEC)</u>	<u>ENTHALPY</u> <u>(BTU/LB)</u>	<u>ENERGY RATE</u> <u>(BTU/SEC)</u>
0.00000	0.0	428.30	0.
.00100	8833.0	426.30	3765508.
.00200	8618.0	426.30	3673853.
.00300	8416.0	426.30	3587741.
.00400	8209.0	426.30	3499497.
.00500	7951.0	426.30	3389511.
.00600	7733.0	426.30	3296578.
.00700	7518.0	426.20	3204172.
.00800	7310.0	426.20	3115522.
.00900	7116.0	426.20	3032839.
.01000	6952.0	426.20	2962942.
.12000	6705.0	426.10	2857001.
.01400	6598.0	426.10	2811408.
.01600	6581.0	426.00	2803506.
.01800	6562.0	426.90	2794756.
.02000	6552.0	425.80	2789842.
.02200	6551.0	425.70	2788761.
.02400	6554.0	425.70	2790038.
.02600	6554.0	425.60	2789382.
.02800	6553.0	425.60	2788957.
.03000	6555.0	425.50	2789153.
.03200	6561.0	425.50	2791706.
.03400	6571.0	425.50	2795961.
.03600	6585.0	425.50	2801918.
.03800	6600.0	425.50	2808300.
.04000	6618.0	425.50	2815959.
.04200	6638.0	425.50	2824469.
.04400	6659.0	425.60	2834070.
.04600	6682.0	425.80	2843859.
.04800	6705.0	425.60	2853648.
.05000	6729.0	425.70	2864535.
.05200	6798.0	425.70	2893909.
.05600	6918.0	425.70	2944993.
.06000	7010.0	425.80	2984858.
.06600	7102.0	425.80	3024032.
.07000	7132.0	425.90	3037519.
.07600	7129.0	425.90	3036241.
.08000	7115.0	425.90	3030279.
.08600	7111.0	426.00	3029286.
.09000	7128.0	426.10	3037241.
.09000	7188.0	426.20	3063526.
.10000	7241.0	426.20	3086114.
.12000	7338.0	426.50	3129657.
.14000	7252.0	426.60	3093703.
.16000	7348.0	426.90	3136861.

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TABLE 6.2-13 (Sheet 30 of 30) Revision 14 (12/05)

<u>TIME</u> <u>(SECONDS)</u>	<u>FLOW RATE</u> <u>(LB/SEC)</u>	<u>ENTHALPY</u> <u>(BTU/LB)</u>	<u>ENERGY RATE</u> <u>(BTU/SEC)</u>
.18000	7299.0	427.00	3116673.
.20000	7299.0	427.20	3118133.
.22000	7324.0	427.30	3129545.
.24000	7286.0	427.40	3114036.
.26000	7313.0	427.60	3127039.
.28000	7297.0	427.70	3120927.
.30000	7293.0	427.80	3119943.
.32000	7303.0	427.90	3124954.
.34000	7289.0	420.10	3120421.
.36000	7297.0	428.20	3124575.
.38000	7291.0	428.30	3122735.
.40000	7288.0	428.50	3122908.
.42500	7289.0	428.70	3124794.
.45000	7284.0	428.90	3124108.
.47500	7283.0	429.10	3125135.
.50000	7279.0	429.30	3124875.
.52500	7277.0	429.60	3126199.
.55000	7272.0	429.80	3125506.
.57500	7268.0	430.10	3125967.
.60000	7261.0	430.40	3125134.
.62500	7257.0	430.70	3125590.
.65000	7251.0	431.00	3125181.
.67500	7244.0	431.30	3124337.
.70000	7237.0	431.70	3124213.
.72500	7235.0	432.00	3125520.
.75000	7235.0	432.40	3128414.
.77500	7234.0	432.70	3130132.
.80000	7231.0	433.10	3131746.
.85000	7224.0	433.80	3133771.
.90000	7216.0	434.60	3136074.
.95000	7207.0	435.50	3138649.
1.00000	7197.0	436.30	3140051.
1.10000	7179.0	438.00	3144402.
1.20000	7157.0	439.80	3147649.
1.30000	7136.0	441.50	3150544.
1.40000	7114.0	443.30	3153636.
1.50000	7094.0	445.10	3157539.
1.60000	7074.0	446.90	3161371.
1.70000	7054.0	448.70	3165130.
1.80000	7036.0	450.50	3169718.
2.00000	7001.0	454.10	3179154.
2.50000	6921.0	462.70	3202347.
3.00000	6703.0	471.00	3157113.
3.50000	6517.0	478.10	3115778.
4.00000	6427.0	483.00	3108097.

WSES-FSAR-UNIT-3

TABLE 6.2-14 (Sheet 1 of 2)

REACTOR CAVITY RELAP INPUT DATA

A. VOLUMES

Volume Number	Volume (ft) ³	Height (ft)	Elevation (ft. MSL)
1	266.4	10.261	9.615
2	268.6	10.261	9.615
3	268.6	10.261	9.615
4	266.4	10.261	9.615
5	268.6	10.261	9.615
6	268.6	10.261	9.615
7	256.1	8.0	9.615
8	558.5	8.0	9.615
9	522.8	8.0	9.615
10	256.1	8.0	9.615
11	572.3	8.0	9.615
12	537.0	8.0	9.615
13	2.39 x 10 ⁴	32.001	19.875
14	3.61 x 10 ⁴	53.001	-11.
15	3.61 x 10 ⁴	53.001	-11.
16	1.61 x 10 ⁴	20.251	42
17	1.61 x 10 ⁴	20.251	42
18	4.42 x 10 ⁴	43.501	2.5
19	1.92 x 10 ⁶	162	42

B. JUNCTIONS

Junction Number	Connecting Volumes	Min. Flow Area (ft ²)	Elevation (ft)	L/A (ft ⁻¹)	Forward and Reverse Friction Coefficient K _{RELAP}
1	1-7	38.612	9.615	0.1106	0.397
2	2-8	40.27	9.615	0.2	0.5724
3	3-9	40.27	9.615	0.191	1.331
4	4-10	38.612	9.615	0.1106	0.397
5	5-11	40.27	9.615	0.206	0.5735
6	6-12	40.27	9.615	0.191	1.331
7	7-15	38.612	9.615	0.0974	0.9784
8	8-15	40.27	9.615	0.187	1.192
9	9-14	40.27	9.615	0.178	0.99
10	10-14	38.612	9.615	0.0974	0.9784
11	11-14	40.27	9.615	0.193	1.193
12	12-15	40.27	9.615	0.178	0.99
13	1-2	16.277	9.615	0.4259	0.7058
14	2-3	16.277	9.615	0.4259	0.7058
15	3-4	15.911	9.615	0.43	0.7211
16	5-4	15.911	9.615	0.43	0.7211

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TABLE 6.2-14 (Sheet 2 of 2)

REACTOR CAVITY RELAP INPUT DATA

B. JUNCTIONS (Cont'd)

Junction Number	Connecting Volumes	Min. Flow Area 2 (ft)	Elevation (ft)	L/A (ft ⁻¹)	Forward and Reverse Friction Coefficient K _{RELAP}
17	6-5	16.277	9.615	0.4259	0.7058
18	1-6	16.277	9.615	0.4259	0.7058
19	1-13	17.482	19.875	0.2484	1.32
20	2-13	17.482	19.875	0.2484	1.32
21	3-13	17.482	19.875	0.2484	1.32
22	4-13	17.482	19.875	0.2484	1.32
23	5-13	17.482	19.875	0.2484	1.32
24	6-13	17.482	19.875	0.2484	1.32
25	15-17	894.27	42.	0.041	1.53
26	14-16	894.27	42.	0.041	1.53
27	17-19	1245.0	62.25	0.02	1.55
28	16-19	1245.0	62.25	0.02	1.55
29	13-18	760.0	20.0	0.0448	1.23
30	18-19	922.9	46.0	0.1113	1.08

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TABLE 6.2-15 (Sheet 1 of 2) Revision 14 (12/05)

STEAM GENERATOR SUBCOMPARTMENT RELAP INPUT DATA

A. VOLUMES

→(DRN 04-1422, R14)

Volume Number	Volume ⁽¹⁾ (ft ³)	Volume Height (ft)	Volume Elevation (ft)
1	5964.00	7.0	-11.0
2	4909.75	7.0	-11.0
3	10500.00	7.0	-11.0
4	2677.50	7.0	-11.0
5	6909.00	7.0	-11.0
6	75315.00	25.0	-4.0
7	37578.42	25.0	-4.0
8	73085.50	25.0	-4.0
9	69116.70	25.0	21.0
10	37529.50	25.0	21.0
11	67036.00	25.0	21.0
12	1991094.41	162.0	46.0
13	2671.20	14.0	-11.0
14	2671.20	14.0	-11.0
15	6796.24	20.0	3.0
16	10803.00	20.0	3.0
17	5122.62	19.0	23.0
18	8068.80	19.0	23.0
19	2433.50	9.0	42.0
20	4918.50	9.0	42.0
21	2894.72	11.25	51.0
22	5834.25	11.25	51.0
23	18005.00	30.0	62.25

←(DRN 04-1422, R14)

B. JUNCTIONS

→(DRN 04-1422, R14)

Junction Number	Connecting Volume	Flow Area ⁽¹⁾ (ft ²)	Elevation (ft)	Inertia Coefficient L/A (ft ⁻¹)	Forward and Reverse Friction Coefficient K _{RELAP}
1	1-2	54.0	-11.0	1.0714	.16
2	2-3	120.37	-11.0	.72264	1.5
3	3-4	14.0	-11.0	.6869	1.5
4	4-5	56.0	-11.0	.8929	.16
5	6-7	318.0	-4.0	.2594	.093
6	7-8	384.0	-4.0	.2270	.084
7	9-10	278.88	21.0	.3048	.102

←(DRN 04-1422, R14)

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TABLE 6.2-15 (Sheet 2 of 2) Revision 14 (12/05)

STEAM GENERATOR SUBCOMPARTMENT RELAP INPUT DATA

B. JUNCTIONS (Cont'd)

→(DRN 04-1422, R14)

Junction Number	Connecting Volume	Flow Area ⁽¹⁾ (ft ²)	Elevation (ft)	Inertia Coefficient L/A (ft ⁻¹)	Forward and Reverse Friction Coefficient K _{RELAP}
8	10-11	282.3	21.0	.34065	.101
9	1-6	414.15	-4.0	.01338	1.5
10	2-6	387.15	-4.0	.01374	1.5
11	3-7	459.35	4.0	.03484	1.5
12	4-8	411.75	-4.0	.01400	1.5
13	5-8	493.85	-4.0	.01312	1.5
14	6-9	1864.50	21.0	.00812	1.5
15	7-10	912.80	21.0	.0436	1.5
16	8-11	1839.45	21.0	.00847	1.5
17	9-12	1236.69	46.0	.01848	1.5
18	10-12	884.8	46.0	.01643	1.5
19	11-12	1542.162	46.0	.01852	1.5
23	16-14	183.93	3.0	.1088	.0324
24	16-18	279.96	23.0	.04179	1.422
20	13-1	238.0	-11.0	.06303	1.5
21	14-2	238.0	-11.0	.04202	1.5
22	16-13	183.93	3.0	.10875	.0324
25	15-17	159.678	23.0	.07327	1.44
26	18-20	562.5	42.0	.02547	.0129
27	17-19	331.77	42.0	.04434	.0216
28	20-22	486.57	51.0	.02014	.08
29	19-21	241.23	51.0	.03902	.151
30	22-23	172.5	62.25	.01156	1.019
31	21-23	133.23	62.25	.02332	1.015
32	15-16	923.69	3.0	.01489	.2883
33	17-18	849.85	23.0	.01618	.3306
34	19-20	421.52	42.0	.03084	.006
35	21-22	552.0	51.0	.02355	.0053
36	23-12	542.0	62.25	.02952	1.193

←(DRN 04-1422, R14)

→(DRN 04-1422, R14)

Notes:

- (1) The volume and flow area listed in this table is the RELAP-3 Mod 68 input data used to compute the original peak calculated value of the differential pressure in the steam generator subcompartment, 21.9 psid. Refer to Note 1 on Table 6.2-2.

The graphs shown on Figures 6.2-23 thru 6.2-27m correspond to the analysis performed using RELAP-3 Mode 68 Computer Code.

←(DRN 04-1422, R14)

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TABLE 6.2-16

PRESSURIZER SUBCOMPARTMENT REPLAP INPUT DATA

A. VOLUMES

Volume Number	Volume (ft ³)	Elevation (ft)	Height (ft)
1	624.33	17	14.5
2	6356.1	17	29.
3	6440.17	46	24.
4	75315.0	-4	25.
5	69116.7	21	25.
6	1991094.41	46	162.
7	37578.42	-4	25.
8	37529.5	21	25.
9	73085.5	-4	25.
10	67036.	21	25.

B. JUNCTIONS

Junction Number	Connecting Volumes	Minimum Flow Area (ft ²)	Floor Elevation (ft)	Inertia Coefficient L/A (ft ⁻¹)	Forward and Reverse Friction Coefficient K _{RELAP}
1	1-2	30.0	17.54	0.13245	0.90607
2	1-4	33.18	17.1	0.3014	1.2166
3	2-3	114.0	46	0.12457	0.53589
4	2-5	26.29	21	0.1275	1.3933
5	3-6	168.0	64	.05410	0.98558
6	3-6	21	46	0.1583	1.4170
7	4-5	1864.5	21	0.008119	1.5
8	4-7	318.	-4	0.25943	0.093
9	5-6	1236.69	46	0.018478	0.3813
10	5-8	278.88	21	0.30479	0.102
11	6-8	884.8	46	0.016433	1.5
12	6-10	1542.162	46	0.01852	1.5
13	7-8	912.804	21	0.043654	1.5
14	7-9	384.0	-4	0.22700	0.084
15	8-10	282.3	21	0.34079	0.101
16	9-10	1839.45	21	0.00847	1.5

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TABLE 6.2-17

SUMMARY OF REACTOR COOLANT SYSTEM POSTULATED PIPE RUPTURES

<u>Pipe</u>	<u>ID (in.)</u>	<u>Location</u>	<u>Type-Description</u>	<u>Break Area (sq. in.)</u>
Hot Leg	42	R.V. terminal end	circumferential break	100.
Hot Leg	42	S.G. terminal end	circumferential break	600.
Discharge Leg	30	R.V. terminal end	circumferential break	350.
Discharge Leg	30	Pump terminal end	circumferential break	480.
Suction Leg	30	Pump terminal end	circumferential break	430.
Suction Leg	30	Pump elbow (1)	slot within + 90° from elbow crotch	532.
Suction Leg	30	S. G. elbow (1)	slot within + 90° from elbow crotch	532.
Suction Leg	30	S.G. terminal end	circumferential break	592.
Surge Line	12 Sch 160	Pressurizer terminal end	double ended guillotine	161.05
Safety Relief Line	6 Sch 160	Pressurizer terminal end	single area guillotine	21.14
Spray Line	4 Sch 120	Pressurizer terminal end	double ended guillotine	20.64

Note (1): Where an elbow is adjacent to a terminal end, the slot break in the elbow extends up to the terminal end.

→(DRN 01-230)

TABLE 6.2-18 INTENTIONALLY DELETED.

←(DRN 01-230)

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TABLE 6.2-19 (Sheet 1 of 3) Revision 307 (07/13)

→(DRN 06-1061, R15; EC-9533, R302)

BLOWDOWN AND REFLOOD MASS AND ENERGY RELEASE DATA

1.0 DEG/PD

→(DRN 03-2060, R14; 05-545, R14; EC-8458, R307)

TIME (sec)	MASS FLOW (lbm/sec)	ENERGY RELEASE (Btu/sec)	INTEGRAL OF MASS FLOW (lbm)	INTEGRAL OF ENERGY RELEASE (Btu)
BLOWDOWN PERIOD				
0.00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
0.13	9.4956E+04	4.9233E+07	1.1279E+04	5.7954E+06
0.26	9.0397E+04	4.7110E+07	2.3143E+04	1.1967E+07
0.51	8.7316E+04	4.5595E+07	4.5209E+04	2.3482E+07
1.01	8.4720E+04	4.4312E+07	8.8851E+04	4.6288E+07
2.01	6.1841E+04	3.2537E+07	1.6166E+05	8.4464E+07
3.01	5.0225E+04	2.6640E+07	2.1681E+05	1.1360E+08
4.01	4.7020E+04	2.5159E+07	26536E+05	1.3945E+08
6.51	3.5102E+04	1.9841E+07	3.6870E+05	1.9595E+08
9.00	1.6043E+04	1.1874E+07	4.3214E+05	2.3559E+08
11.52	9.0255E+03	7.8130E+06	4.6067E+05	2.5875E+08
14.02	7.9195E+03	5.6267E+06	4.8263E+05	2.7626E+08
16.50	6.6842E+03	3.3833E+06	5.0108E+05	2.8734E+08
19.00	5.2978E+03	1.9927E+06	5.1531E+05	2.9366E+08
21.50	7.6665E+01	7.3530E+04	5.2058E+05	2.9570E+08
24.00	4.1794E+01	2.8008E+04	5.2076E+05	2.9582E+08
24.29	3.5692E+01	2.3901E+04	5.2077E+05	2.9583E+08
End of Blowdown Period				
REFLOOD PERIOD (Release data are for steam only)				
24.29	0.0000E+00	0.0000E+00	5.2077E+05	2.9583E+08
29.29	0.0000E+00	0.0000E+00	5.2077E+05	2.9583E+08
34.29	0.0000E+00	0.0000E+00	5.2077E+05	2.9583E+08
39.29	0.0000E+00	0.0000E+00	5.2077E+05	2.9583E+08
44.29	0.0000E+00	0.0000E+00	5.2077E+05	2.9583E+08
49.29	0.0000E+00	0.0000E+00	5.2077E+05	2.9583E+08
54.29	0.0000E+00	0.0000E+00	5.2077E+05	2.9583E+08
59.29	0.0000E+00	0.0000E+00	5.2077E+05	2.9583E+08
64.29	0.0000E+00	0.0000E+00	5.2077E+05	2.9583E+08
69.29	0.0000E+00	0.0000E+00	5.2077E+05	2.9583E+08
74.29	0.0000E+00	0.0000E+00	5.2077E+05	2.9583E+08
79.29	1.9080E+02	2.4686E+05	5.2154E+05	2.9683E+08
84.29	1.8988E+02	2.4560E+05	5.2250E+05	2.9806E+08
89.29	1.9010E+02	2.4581E+05	5.2345E+05	2.9929E+08
94.29	1.8918E+02	2.4455E+05	5.2440E+05	3.0052E+08
99.29	1.8896E+02	2.4421E+05	5.2534E+05	3.0174E+08
104.29	1.8879E+02	2.4392E+05	5.2629E+05	3.0296E+08
109.29	1.8870E+02	2.4375E+05	5.2723E+05	3.0418E+08

←(DRN 03-2060, R14; 05-545, R14; 06-1061, R15; EC-9533, R302; EC-8458, R307)

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TABLE 6.2-19 (Sheet 2 of 3) Revision 307 (07/13)

→ (DRN 03-2060, R14; 05-545, R14; 06-1061, R15; EC-9533, R302; EC-8458, R307)

TIME (sec)	MASS FLOW (lbm/sec)	ENERGY RELEASE (Btu/sec)	INTEGRAL OF MASS FLOW (lbm)	INTEGRAL OF ENERGY RELEASE (Btu)
114.29	1.8890E+02	2.4395E+05	5.2817E+05	3.0540E+08
119.29	1.9010E+02	2.4543E+05	5.2912E+05	3.0662E+08
124.29	1.8967E+02	2.4482E+05	5.3007E+05	3.0785E+08
129.29	1.8991E+02	2.4505E+05	5.3102E+05	3.0907E+08
134.29	1.8963E+02	2.4463E+05	5.3197E+05	3.1030E+08
139.29	1.8939E+02	2.4426E+05	5.3292E+05	3.1152E+08
144.29	1.8917E+02	2.4392E+05	5.3386E+05	3.1274E+08
149.29	1.8895E+02	2.4357E+05	5.3481E+05	3.1396E+08
154.29	1.8887E+02	2.4340E+05	5.3575E+05	3.1518E+08
159.29	1.8878E+02	2.4322E+05	5.3670E+05	3.1639E+08
164.29	1.8919E+02	2.4368E+05	5.3764E+05	3.1761E+08
169.29	1.8866E+02	2.4294E+05	5.3859E+05	3.1883E+08
174.29	1.8849E+02	2.4266E+05	5.3953E+05	3.2004E+08
179.29	1.8836E+02	2.4243E+05	5.4047E+05	3.2126E+08
184.29	1.8826E+02	2.4225E+05	5.4142E+05	3.2247E+08
189.29	1.8817E+02	2.4208E+05	5.4236E+05	3.2368E+08
194.29	1.8810E+02	2.4192E+05	5.4330E+05	3.2489E+08
199.29	1.8802E+02	2.4176E+05	5.4424E+05	3.2610E+08
204.29	1.8795E+02	2.4160E+05	5.4518E+05	3.2731E+08
209.29	1.8786E+02	2.4143E+05	5.4612E+05	3.2852E+08
214.29	1.8784E+02	2.4135E+05	5.4706E+05	3.2972E+08
219.29	1.8897E+02	2.4274E+05	5.4800E+05	3.3093E+08
224.29	1.8838E+02	2.4193E+05	5.4894E+05	3.3214E+08
229.29	1.8806E+02	2.4146E+05	5.4988E+05	3.3335E+08
234.29	1.8780E+02	2.4107E+05	5.5082E+05	3.3456E+08
239.29	1.8779E+02	2.4099E+05	5.5176E+05	3.3576E+08
244.29	1.8778E+02	2.4093E+05	5.5270E+05	3.3697E+08
249.29	1.8777E+02	2.4086E+05	5.5364E+05	3.3817E+08
254.29	1.8776E+02	2.4078E+05	5.5458E+05	3.3937E+08
259.29	1.8774E+02	2.4071E+05	5.5551E+05	3.4058E+08
264.29	1.8772E+02	2.4062E+05	5.5645E+05	3.4178E+08
269.29	1.8770E+02	2.4053E+05	5.5739E+05	3.4298E+08
274.29	1.8766E+02	2.4043E+05	5.5833E+05	3.4419E+08
279.29	1.8762E+02	2.4032E+05	5.5927E+05	3.4539E+08
284.29	1.8757E+02	2.4020E+05	5.6021E+05	3.4659E+08
289.29	1.8751E+02	2.4007E+05	5.6114E+05	3.4779E+08
294.29	1.8744E+02	2.3994E+05	5.6208E+05	3.4899E+08
299.29	1.8737E+02	2.3979E+05	5.6302E+05	3.5019E+08
304.29	1.8729E+02	2.3963E+05	5.6396E+05	3.5139E+08
309.29	1.8808E+02	2.4059E+05	5.6489E+05	3.5259E+08
314.29	1.8775E+02	2.4011E+05	5.6583E+05	3.5379E+08
319.29	1.8755E+02	2.3981E+05	5.6677E+05	3.5499E+08

← (DRN 03-2060, R14; 05-545, R14; 06-1061, R15; EC-9533, R302; EC-8458, R307)

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TABLE 6.2-19 (Sheet 3 of 3) Revision 307 (07/13)

→ (DRN 03-2060, R14; 05-545, R14; 06-1061, R15; EC-9533, R302; EC-8458, R307)

TIME (sec)	MASS FLOW (lbm/sec)	ENERGY RELEASE (Btu/sec)	INTEGRAL OF MASS FLOW (lbm)	INTEGRAL OF ENERGY RELEASE (Btu)
324.29	1.8738E+02	2.3954E+05	5.6771E+05	3.5619E+08
329.29	1.8717E+02	2.3922E+05	5.6865E+05	3.5739E+08
334.29	1.8704E+02	2.3899E+05	5.6958E+05	3.5858E+08
339.29	1.8705E+02	2.3895E+05	5.7052E+05	3.5978E+08
344.29	1.8704E+02	2.3888E+05	5.7145E+05	3.6097E+08
349.29	1.8702E+02	2.3881E+05	5.7239E+05	3.6217E+08
354.29	1.8700E+02	2.3874E+05	5.7332E+05	3.6336E+08
359.29	1.8698E+02	2.3865E+05	5.7426E+05	3.6455E+08
364.29	1.8695E+02	2.3857E+05	5.7519E+05	3.6575E+08
369.29	1.8692E+02	2.3848E+05	5.7613E+05	3.6694E+08
374.29	1.8689E+02	2.3839E+05	5.7706E+05	3.6813E+08
379.29	1.8686E+02	2.3830E+05	5.7800E+05	3.6932E+08
384.29	1.8682E+02	2.3820E+05	5.7893E+05	3.7051E+08
389.29	1.8678E+02	2.3810E+05	5.7986E+05	3.7171E+08
394.29	1.8674E+02	2.3800E+05	5.8080E+05	3.7290E+08
399.29	1.8669E+02	2.3789E+05	5.8173E+05	3.7409E+08
404.29	1.8664E+02	2.3778E+05	5.8266E+05	3.7527E+08
409.29	1.8659E+02	2.3766E+05	5.8360E+05	3.7646E+08
414.29	1.8654E+02	2.3754E+05	5.8453E+05	3.7765E+08
419.29	1.8648E+02	2.3742E+05	5.8546E+05	3.7884E+08
424.29	1.8642E+02	2.3730E+05	5.8640E+05	3.8003E+08
429.29	1.8635E+02	2.3717E+05	5.8733E+05	3.8121E+08
434.29	1.8628E+02	2.3703E+05	5.8826E+05	3.8240E+08
439.29	1.8621E+02	2.3689E+05	5.8919E+05	3.8358E+08
444.29	1.8613E+02	2.3674E+05	5.9012E+05	3.8477E+08
449.29	1.8667E+02	2.3738E+05	5.9105E+05	3.8595E+08
454.29	1.8642E+02	2.3701E+05	5.9199E+05	3.8714E+08
459.29	1.8627E+02	2.3678E+05	5.9292E+05	3.8832E+08
464.29	1.8616E+02	2.3659E+05	5.9385E+05	3.8951E+08
469.29	1.8604E+02	2.3640E+05	5.9478E+05	3.9069E+08
474.29	1.8591E+02	2.3619E+05	5.9571E+05	3.9187E+08
479.29	1.8575E+02	2.3594E+05	5.9664E+05	3.9305E+08
484.29	1.8555E+02	2.3563E+05	5.9757E+05	3.9423E+08
489.29	1.8541E+02	2.3542E+05	5.9849E+05	3.9541E+08
494.29	1.8540E+02	2.3535E+05	5.9942E+05	3.9658E+08
499.29	1.8536E+02	2.3526E+05	6.0035E+05	3.9776E+08
504.29	1.8532E+02	2.3516E+05	6.0127E+05	3.9894E+08
509.29	1.8528E+02	2.3507E+05	6.0220E+05	4.0011E+08
514.29	1.8523E+02	2.3497E+05	6.0313E+05	4.0129E+08
519.29	1.8519E+02	2.3487E+05	6.0405E+05	4.0246E+08
524.29	1.8514E+02	2.3477E+05	6.0498E+05	4.0364E+08

← (DRN 03-2060, R14; 05-545, R14; 06-1061, R15; EC-9533, R302; EC-8458, R307)

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TABLE 6.2-20 HAS BEEN DELETED

TABLE 6.2-21 (Sheet 1 of 2) Revision 307 (07/13)

DESIGN DATA FOR CONTAINMENT FAN COOLERS

➔(EC-40195, R307)

1 - Fans

Quantity

One per fan cooler

Type

Vane axial type, direct-driven

←(EC-40195, R307)

	<u>Normal Conditions</u>	<u>Accident</u>
Leaving Air flow each, acfm	75,000	37,800
Actual air mixture density, lb/ft ³	0.069	0.173
Fan total pressure, in. wg (actual cfm std density)	6.6	1.4
Fan total pressure, in. wg (actual cfm, actual density)	6.072	3.23
Fan Speed, rpm	1770	870
Applicable standards	AMCA	
Manufacturer	Joy Manufacturing Company	

2 - Motor

Quantity

One per fan

Type

125 HP, 460 V, 60 Hz, 3-phase,
Induction Type

Insulation

Class RN

Enclosure and Ventilation

Totally enclosed, air over

➔(EC-40281, R307)

Applicable Standards

IEEE-323 (1974), 334 (1974),
344 (1975), 334 (1994)

←(EC-40281, R307)

Manufacturer

Reliance Electric Company

3 - Cooling Coils

Tube Material

Copper, ASME SB-75 Alloy 122

Number of coil banks per
fan cooler

Two banks of 4 coils each

Tube OD, in.

5/8

Minimum wall thickness, in.

0.049

Heat removal capacity each, Btu/hr

1.73 x 10⁶

63.5 x 10⁶

Air temperature, F inlet

120

261

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TABLE 6.2-21 (Sheet 2 of 2)

DESIGN DATA FOR CONTAINMENT FAN COOLERS

3 - Cooling Coils (Cont'd)

Cooling water temperature, F inlet	95	115
Cooling water flow each, gpm	670	1350
Coil Frame	ASTM - A526	
Coil Type	Horizontal tube, Vertical plate fin	
Applicable Standard	ASME, Section III, Class 2, 1974 Edition, addenda up to and including Winter 1975	

4 - Other

Housing	Constructed of Carbon Steel with Structural Reinforcing	
Filters	To be utilized during construction only and removed before startup.	
Painting	Steel surfaces are painted with one Primer Coat of Amercoat 71 at DFT 2 - 4 mils and one Top coat of Amercoat 90 at DFT 5 - 7 mils as manufactured by Ameron Corporation.	

5 - Other Codes and Standards

- ASME Section II, 1974 Edition addenda up to and including Winter 1975.
- ASME Section IX, 1974 Edition, addenda up to and including Winter 1975
- ASTM-DIO56, Sponge and Cellular Rubber Products (1973) ASTM-A570, Hot Rolled Carbon Steel Sheets Commercial Quality (1972)
- ASTM-36, Structural Steel Specification (1970)
- AWS-D1.1, American Welding Society Structural Welding Code (Rev 2, 1975)

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TABLE 6.2-22 (Sheet 1 of 3) Revision 307 (07/13)

DESIGN DATA FOR CONTAINMENT SPRAY SYSTEM COMPONENTS

Containment Spray Pumps

Quantity	2
Type	Horizontal centrifugal with mechanical seals backed up by secondary seals to collect leakage past the primary seals
No. of Stages	1
Rotational Speed, rpm	3560
Material	
Casing	ASME SA-351 Gr CF8
Impeller	ASTM A-743 Gr CA6NM
	Stainless steel used for pressure parts in contact with borated water
Codes	ASME Code Sec III, Class 2, 1971 Edition, up to and including winter 1972 addenda
Liquid pumped	Borated water (2050 - 2900 ppm)
Temperature (max/min), °F	240/50
Pressure, psia	14.7
Design Capacity each, gpm	1810 (includes 60 gpm recirc. flow)
Design Total dynamic head, ft.	485
➔(DRN 00-314, R11; 01-3706, R11-B; 05-1332, R15; 06-1026, R15; EC-1002, R302; EC-25199, R307)	
Minimum NPSH avail calculated, ft.	23.02 (At Runout Flow)
←(DRN 00-314, R11; 01-3706, R11-B; 05-1332, R15; EC-25199, R307)	
Minimum NPSH required, ft.	18.63 (At Runout Flow)
←(DRN 06-1026, R15; EC-1002, R302)	
Temperature Transient	50°F to 240°F in 10 seconds
Connections	
Discharge, in.	6
Suction, in.	8

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TABLE 6.2-22 (Sheet 2 of 3) Revision 10 (10/99)

DESIGN DATA FOR CONTAINMENT SPRAY SYSTEM COMPONENTS

2)	Motor	
	Quantity	One per pump
→	Type	282 hp, 4160 V, 60 Hz, 3 phase induction
←	Insulation	Class B
	Enclosure and Ventilation	Drip-proof
	Shaft	Solid
3)	Piping, Fittings and Valves	
	a) Suction Side	
	Material	Type 304 or 316 stainless steel
	Pressure, psig	160
	Temperature, °F	250
	Pipe Sizes	
	14 in. through 24 in. valves	0.375 in nominal wall thickness
	2-1/2 in. and larger	Stainless steel, butt weld, wafer and/or flanged 150 lb design
	Code	ASME Code Section III Class 2, 1971 Edition addendum up to and including Winter 1972, or later
	Testing	As required by ASME Section III
	b) Discharge Side	
	Material	Type 304 or 316 stainless steel
	Pressure, psig	650
	Temperature, °F	350
	Pipe Sizes	
	2-1/2 in. to 12 in.	Sch 40

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TABLE 6.2-22 (Sheet 3 of 3)

b)	Discharge Side (Cont'd)	
	Connections	
	2 in. and smaller	Socket weld
	2-1/2 in. and larger	Butt weld or flanged
	Valves	
	2 in. and smaller	Stainless steel, socket weld 600 lb design
	2-1/2 in. and larger	Stainless steel, butt weld, wafer and/or flanged 300 lb design
	Code	ASME B & PV Code Section III Class 2
	Testing	As required by ASME Section III
4)	Spray Nozzles	
	Quantity	116 per set of headers
	Type	Nonclogging, open throat
	Material	SS 304
	Flow per nozzle, gpm	15.2
	Pressure drop, psi	40 when passing 15.2 gpm
	Spray droplet size, microns	700

CONTAINMENT HEAT REMOVAL SYSTEM DELAY TIMES
(OFFSITE POWER AVAILABLE)

<u>System</u>	<u>Time (Seconds)</u>	<u>Events</u>
Containment Spray System	0.0	Containment pressure reaches 5 psig (assumed). Containment spray actuation signal (CSAS) begins to actuate.
	0.4	CSAS present, spray isolation valves begin to open
	2.8	Time delay contacts close
	2.9	Spray pump breakers close
	4.6	Spray pumps up to speed
	10.4	Spray isolation valve fully open, full flow established.
	→(DRN 03-2060, R14)	
	30.65	Spray header filled, full spray flow established from nozzles.
Containment Cooling System	0.0	Containment pressure reaches 5 psig. CSAS begins to actuate.
	2.0	Component cooling water isolation valves begin to position.
	11.0	Containment fan cooler breaker closes.
	19.5	Containment cooling fans at design speed. Containment fan cooler system in full operation.
	←(DRN 03-2060, R14)	

CONTAINMENT HEAT REMOVAL SYSTEM DELAY TIMES
(LOSS OF OFFSITE POWER)

<u>System</u>	<u>Time (Seconds)</u>	<u>Event</u>
Containment Spray System	0.0	Containment pressure reaches 5 psig. Containment spray actuation signal (CSAS) begins to actuate.
	2.0	Diesel generator(s) starts.
	12.0	Diesel generator output breaker closes.
	15.2	Spray pumps up to speed. Partial flow established.
	23.5	Spray isolation valves full open.
	→(DRN 03-2060, R14) 41.25	Spray headers filled, full spray flow established from nozzles.
Containment Cooling System	←(DRN 03-2060, R14) 0.0	Containment pressure reaches 5 psig. SIAS begins to actuate.
	2.0	Diesel generator starts.
	12.0	Diesel generator output breaker closes. Component cooling water isolation valves begin to position.
	19.0	Containment fan cooler breakers close.
	32.0	Containment cooling fan at design speed, and Containment Cooling System in full operation.

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TABLE 6.2-25 (Sheet 1 of 3) Revision 307 (07/13)

LOCATION AND QUANTITY OF MAJOR THERMAL INSULATION MATERIALS INSIDE CONTAINMENT

→(DRN 99-2239, R11)	<u>Location</u>	<u>Insulation(a)</u>	<u>Estimated Quantity</u>
←(DRN 99-2239, R11)	Primary System Equipment		
	Reactor vessel head and flanges	* / R	410 ft ²
	Reactor vessel including insulation support	*	1900 ft ²
	R/C pumps	R	680 ft ²
→(EC-8437, R307)	Steam Generators	** /R	7993 ft ²
←(EC-8437, R307)	Pressurizer	R	1025 ft ²
→(DRN 03-1838, R13)			
←(DRN 03-1838, R13)	Regenerative heat exchanger	R	65 ft ²
	Primary System Piping		
	42 in. pipe	R	30 ft
→(DRN 03-1838, R13)	30 in. pipe	R	175 ft
←(DRN 03-1838, R13)	14 in. pipe	R	200 ft
	12 in. pipe	R	385 ft
	8 in. pipe	R	310 ft
	4 in. pipe	R	30 ft
	3 in. pipe	R	435 ft
	2 in. pipe	R	530 ft

→(DRN 99-2239, R11)

General Note - All Quantities are Preliminary

This table specifies estimated quantities of major insulation inside containment, which is removable to accommodate ISI. Types of insulation installed and amounts are included in Table 6.2-26. Any Quantity changes will be incorporated in Table 6.2-26.

←(DRN 99-2239, R11)

- a. R = Removable insulation to accommodate ISI
 * = Reflective insulation supplied by NSSS Supplier

→(EC-8437, R307)

** = Reflective insulation installed as part of steam generator replacement.

←(EC-8437, R307)

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TABLE 6.2-25 (Sheet 2 of 3) Revision 13 (04/04)

LOCATION AND QUANTITY OF MAJOR THERMAL INSULATION
MATERIALS INSIDE CONTAINMENT

<u>Location</u>	<u>Insulation Type (a)</u>	<u>Estimated Quantity</u>
Primary System Piping (Cont'd)		
3/4 in. pipe	R	40 ft
Primary System Valves		
14 in. valves →(DRN 03-1838, R13)	R	4
12 in. valves	R	12
←(DRN 03-1838, R13) 8 in. valves	R	4
4 in. valves	R	1
3 in. valves	R	12
2 in. valves	R	22
1 in. valves	R	41
3/4 in. valves	R	8
Secondary System Piping		
40 in. pipe	R	36 ft
34 in. pipe	R	50 ft
20 in. pipe	R	130 ft
18 in. pipe	R	20 ft
14 in. pipe	R	55 ft
12 in. pipe	R	150 ft
10 in. pipe	R	25 ft
8 in. pipe	R	330 ft
6 in. pipe	R	920 ft

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TABLE 6.2-25 (Sheet 3 of 3) Revision 13 (04/04)

LOCATION AND QUANTITY OF MAJOR THERMAL INSULATION
MATERIALS INSIDE CONTAINMENT

<u>Location</u>	<u>Insulation Type (a)</u>	<u>Estimated Quantity</u>
Secondary System Piping (cont'd)		
→(DRN 03-1838, R13) 4 in pipe	R	1200 ft
←(DRN 03-1838, R13) 3 in. pipe	R	370 ft
2 in. pipe	R	540 ft
1 in. pipe	R	350 ft
3/4 in. pipe	R	320 ft
1/2 in. pipe	R	628 ft
Secondary System Valves		
14 in. valves	R	4
12 in. valves	R	11
8 in. valves	R	2
4 in. valves	R	1
3 in. valves	R	8
2 in. valves	R	29
1 in. valves	R	55

MATERIALS OF CONSTRUCTION FOR INSULATION USED INSIDE CONTAINMENT

→(DRN 01-1124, R12; 03-1838, R13)

There are four types of insulation used inside the RCB. They are:

←(DRN 03-1838, R13)

1. Metal Reflective,
2. Metal Encapsulated,
3. Nuclear Blanket Type Thermal Insulation.

→(DRN 03-1838, R13)

4. Fiberglass Insulation Encapsulated with Glass Cloth

→(DRN 99-2239, R11; EC-1020, R307; EC-8437, R307)

The metal reflective insulation is built of stainless steel panels. The panels consist of interior and exterior sheets. The exterior sheets are either 22 or 24 gage austenitic steel, 304. Radiation shielded insulation uses 16 gage steel sheets. The interior material is three layers per inch of 0.002 inch thick waffled, type 304, stainless steel sheets. This insulation is manufactured by Transco. This insulation is attached, using either of two methods. One method is buckle fasteners (positive lock-quick release buckle fasteners). The other method is by using stainless steel, #14, self-tapping screws or rivets. This insulation is used on the Reactor Vessel, flanges, reactor head, steam generators and RCS piping locations.

←(DRN 01-1124, R12; EC-1020, R307)

The second type of insulation is metal encapsulated. This insulation consists of Owens-Corning inner material and Transco's encapsulating material. Owens-Corning identifies this insulation as TIW Type II, FG (fiberglass) encapsulated. This material conforms to the property requirements of government specifications: HH-1-558B (Amendment 3), Form B-Blanket and Felt, Flexible, Type I Blankets, Flexible, Class 7 and 8; MIL-1-24244 Chemical Requirements and USCG 164.009/135/2. Transco provides the encapsulation material for the fiberglass insulation. The fiberglass is totally encapsulated. This method of attachment is buckle fasteners (positive lock-quick release buckle fasteners). The construction of the totally encapsulated modules is exactly the same as for the reflective-type, except that non-reflective insulation (fiberglass) is used inside. It is estimated that 6980 linear feet of insulation is supplied for piping while another 6595 square feet of insulation is supplied for equipment. This insulation is applied to the Pressurizer and skirt, and Regenerative Heat Exchanger in addition to various piping systems.

←(DRN 99-2239, R11; 03-1838, R13; EC-8437, R307)

→(DRN 99-2239, R11; DRN 01-1124, R12; 03-1838, R13; EC-1020, R307)

The third type of insulation is a nuclear blanket type thermal insulation. The insulation blankets are manufactured of light density, semi-rigid, fibrous glass insulation and covered in a woven fiberglass cloth forming a composite blanket. The woven fiberglass fabric is woven from E-Type glass fibers. This woven fabric meets all requirements of USNRC RG 1.36. In addition, the fabric has a finish applied to give uniform strength. Seams are all sewn with an uncoated E-Type fiberglass thread. Depending on the need for abuse protection, this type insulation may be jacketed with 22 gauge type 304 stainless steel, or individual blankets may be covered with thin stainless steel wire mesh sewn into the blanket and covering the outer surface, or it may be unjacketed. This type insulation is qualified for use inside containment per Topical Report OCF-1, Nuclear Containment Insulation System, on file with U.S. Nuclear Regulatory Commission. As evaluated per application, it may be used as a replacement for the other three types of insulation. It is estimated that 680 square feet has been used on the RCPs, 423 linear feet on piping and 8055 square feet on equipment.

←(DRN 99-2239, R11; 01-1124, R12; 03-1838, R13)

→(DRN 03-1838, R13)

The fourth type of insulation is a fiberglass glass cloth. The fiberglass cloth material is used as a "flexible collar" insulation riveted to the reactor head dome insulation to seal around the CEDM nozzles. It is estimated that approximately 0.7 cubic feet of this type of insulation is used around the CEDM nozzles.

←(DRN 03-1838, R13; EC-1020, R307)

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TABLE 6.2-27 (Sheet 1 of 2)

FAILURE MODE AND EFFECTS ANALYSES
CONTAINMENT HEAT REMOVAL SYSTEMS

Component Identification	Failure Mode	Effect on System	Method of Detection	Monitor	Remarks
Containment Spray Pump A or B	Fails to start	Loss of one redundant spray train	Pump start failure /motor overload alarm and trip	CRI	One spray train remains operable supplemented by Containment Cooling System.
			Low flow indication from FE-CS-7122 AS or FE-CS-7122 BS	CRI	
Shutdown Heat Exchanger A or B	Loss of shell side cooling water	Loss of one spray train during recirculation mode	Spray water high temperature indication from TE 303X or TE 303Y	CRI	One spray train remains operable for recirculation mode supplemented by Containment Cooling System.
			Cooling water low flow indication from FE-CC 5520 AS or FE-CC 5520 BS	CRI	
Spray line flow Control Valve 2CS-F305A or 2CS-F306B	Loss of air supply	Valves fail open - No effect on system	Valve position indicating lights Full flow indication from FE-CS-7122AS or FE-CS-7122BS	CRI	
	Fails to open	Loss of one redundant spray train	No flow indication from FE-CS-7122AS or FE-CS-7122BS	CRI	One spray train remains operable supplemented by Containment Cooling System.
Spray header check valve 2CS-VI03A or 2CS-VI04B	Fails to open	Loss of one redundant spray train	No flow indication from FE-CS-7122AS or FE-CS-7122BS	CRI	One spray train remains operable supplemented by Containment Cooling system.

CRI - Control room indication
HX - Heat exchanger
CCW - Component cooling water
RAS - Recirculation actuation signal

WSES-FSAR-UNIT-3

TABLE 6.2-27 (Sheet 2 of 2)

FAILURE MODE AND EFFECTS ANALYSES
CONTAINMENT HEAT REMOVAL SYSTEMS

Component Identification	Failure Mode	Effect on System	Method of Detection	Monitor	Remarks
Spray nozzles (116 per train)	Clogged	Clogging of up to 10 percent of nozzles can be tolerated before the spray flow will decrease significantly.	Low flow indication from FE-CS 7122AS or FE-CS 7122BS	CRI	Spray nozzles are of open throat design and clogging of significant number is improbable. One redundant spray train remains operable supplemented by Containment Cooling System.
Sump recirculation valve supply	Loss of air No effect on system	Valve fails as is indicating lights	Valve position	CRI	-
2SI-LI01A or 2SI-LI02B on RAS	Fails to open train during recirculation mode	Loss of one spray	Valve position indicating lights	CRI	One spray train remains operable during recirculation mode supplemented by Containment Cooling System
Refueling water storage pool suction line valve	Loss of air supply	Valve fails as is No effect on system	Valve position indicating lights	CRI	-
2SI-LI03A or 2SI-LI04B	Fails to close after RAS	No effect on system, recirculation mode will be operating	Valve position indicating lights	CRI	Check valve 2SI-VI07A or 2SI-VI07B will prevent water flowing from SIS s-P to RWSP.
Containment fan cooler	Loss of cooling water	Loss of two fan coolers	Containment air flow high temperature alarm and CCW low flow alarm.	CRI	Two containment fan coolers remain operable supplemented by the Containment Spray System.
Containment Cooling Fan	Fails to start	Loss of one containment Fan Cooler	Containment fan Cooler Low Fan differential pressure alarm.	CRI	Three remaining fan coolers operable supplemented by Containment Spray System.
Diesel generator Set	Fails to start	Loss of one redundant train of the Containment Heat Removal System.	Diesel generator malfunction alarm	CRI	One diesel generator set remains operable supplying power to two containment fan coolers and one spray pump.
Containment Cooling System A or B Distribution Duct	Duct is collapsed and flow is blocked or damper on emerg. duct fails to open	Temporary Loss of containment cooling by System A or B	Containment fan cooler low fan differential pressure alarm	CRI	Other Containment Cooling System and Containment Spray System are available to provide the required cooling.

DESIGN DATA FOR SHIELD BUILDING VENTILATION SYSTEM COMPONENTS

→(DRN-99-2461)

1. Fans

Quantity	2, (1 per filter train)
Type	Radial blade centrifugal, direct drive
Casing material:	ASTM - A-36, carbon steel
Design air flow at design density per fan, acfm	11,020 (includes 1020 acfm through inoperative train for decay heat removal)
Design air density, lb/ft ³	0,065
Fan static pressure, in. wg at standard density	27.6 at 11,020 acfm
Codes	Air Moving and Conditioning Association (AMCA), Anti-Friction Bearing Manufacturer's Association (AFBMA)

2. Motors

Quantity	2, (1 per fan)
Type	100 hp, horizontal induction
Insulation	Type H
Electrical characteristic	460 volt, 3 Phase, 60 Hz
Enclosure & ventilation	TEFC
Codes	NEMA Design B IEEE 323-1974 IEEE 344-1975

3. Demister Cells

Quantity	2 banks, (1 per filter train)
Air flow per bank, cfm	10,000
Face velocity, fpm	278
Cell arrangement	3 high x 3 wide
Cell size (nominal)	24 in. high, 24 in. wide, 6 in. deep

4. Medium Efficiency Prefilters

Quantity	2 banks, (1 per filter train)
Air flow per bank, cfm	10,000
Face velocity, fpm	208
Cell size	24 in. high, 24 in. wide, 12 in. deep
Cell arrangement	4 wide x 3 high
Max. resistance clean, in. wg	0.5
Max. resistance loaded, in. wg	1.0
Ent. dry bulb/rel. humidity, F/percent	120/70
Efficiency	85-90% per ASHRAE Standard 52-68
Materials:	
Frame	Galvanized steel
Media	Glass

5. HEPA Media Prefilters

Quantity	2 banks, (1 per filter train)
Air flow per bank, cfm	10,000
Face velocity, fpm	208
Cell size	24 in. high, 24 in. wide, 12 in. deep
Cell arrangement	4 wide x 3 high
Max. resistance clean, in. wg	1.0
Max. resistance loaded, in. wg	4.0
Efficiency	99.97% when tested with 0.3 Micron DOP
Material	Glass sheet, separatorless type, supported on stainless steel ASTM A240 frame
Construction standard	MIL-F-51079 A, MIL-F-51068 D

← (DRN-99-2461)

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TABLE 6.2-28 (Sheet 3 of 4) Revision 301 (09/07)

6. Charcoal Adsorbers

Make and type	VI Company, HECA
Cell construction	ANSI N509-1976
Material	Adsorber, activated coconut shell charcoal; Enclosure, stainless steel type 304L ASTM; Gaskets, Neoprene ASTM D1056, Grade SCE-43; Frame, steel ASTM-A36
Bulk density (dry), lb/ft ³	28 to 30
→(EC-5000081471, R301) Design loading	654 gms iodine
←(EC-5000081471, R301) Minimum Charcoal Charge, lb	2500
Particle size distribution	No. 8 thru No. 16 ASTM sieves
Number of charcoal beds	10, (5 per filter train)
Capacity per bed, cfm	2,000
Bed thickness, in. nominal	4
Air flow per adsorber, cfm	10,000
→(DRN 01-571, R11-A) Efficiency	Methyl iodide penetration of less than 0.5% when tests are performed in accordance with ASTM D3803-1989 at 30°C and relative humidity of 70%
←(DRN 01-571, R11-A) Max. air resistance, in. wg	1.8
Nondestructive test	USAEC Report DP-1082 ANSI N510-1980
→(DRN-99-2461, R11)	
←(DRN-99-2461, R11)	

→(DRN-99-2461)

7. HEPA Media Afterfilters

Quantity	2 banks, (1 per filter train)
Airflow per bank, cfm	10,000
Face velocity, fpm	208
Cell size	24 in. high, 24 in. wide, 12 in. deep
Cell arrangement	4 wide x 3 high
Max. resistance clean, in. wg	1.0
Max. resistance loaded, in. wg	4.0
Efficiency	99.97% when tested with 0.3 micron DOP
Material	Glass sheet, separatorless type, supported on a stainless steel ASTM A240 frame
Construction standard	MIL-F-51079A, MIL-F-51068D

8. Heating Coils

Identification	EHC-51(3A-SA), EHC-51(3B-SB)
Quantity	2 (1 per filter train)
Type	Electric
Capacity	60 kw
Electrical characteristics	480V, 60 Hz, 3 phase
Code	UL Standard 1096-1973 IEEE 323-1971 IEEE 344-1975

9. Ducts

Material	Galvanized sheet metal, ASTM Specification A-526
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←(DRN-99-2461)

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TABLE 6.2-29 (Sheet 1 of 3)

ADDITIONAL INFORMATION TO BE PERFORMED FOR
DUAL-CONTAINMENT PLANTS

I. Secondary Containment Design

For each volume comprising the secondary containment, the following information applies:

- A. Free Volume, ft³ 550,000
- B. Pressure, in. of water, gauge

- 1. Normal Operation 5 in. w.g. (negative)
- 2. Post accident 1 to 8 in. w.g. (negative)

- C. Leak Rate at Post accident Pressure (%/day)*

Into shield building from containment vessel 0.5% of containment volume per day @ 44 psig

Into shield building from outside environment 0.5% of annulus volume per day @ 0.25 in H₂O gage

*varies linearly with pressure differentials

- D. Exhaust Fans

- 1. Number Two (one per train)
- 2. Type Centrifugal

- E. Filters (Quantity per train)

1. Number	One Medium Efficiency Prefilter	One HEPA Prefilter	One Charcoal Adsorber	One HEPA Afterfilter
2. Type	High Efficiency Dry Re- placeable	Glass Sheet 99.97% Efficiency	High Efficiency Gasketless	Glass Sheet 99.97% Efficiency

II. Transient Analysis

A. Initial Conditions	<u>Primary</u>	<u>Secondary</u>
1. Pressure, psia	14.7	14.52
2. Temperature, F	120	120
3. Humidity (percent)	50%	100%
4. Constant outside air pressure		14.7
5. Constant outside air temperature, F		95

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TABLE 6.2-29 (Sheet 2 of 3)

		<u>Secondary</u>
6.	Constant outside humidity	100%
7.	Steel cylinder and dome internal radii, ft	70
8.	Steel building and concrete shield building	
	Cylinder heights:	
	From annulus floor to midpoint effective height of secondary shield wall, ft:	62
	from midpoint effective height secondary shield wall to springline, ft;	77
9.	Thickness of steel cylinder, in.	1.90
10.	Thickness of steel dome, in.	0.95
11.	Thickness of concrete shield building cylinder ft	3.0
	Thickness of concrete shield building top (for heat transfer calculation by 50% of a sphere with a 74 ft radius) (ft)	2.5

B. Thermal Characteristics

1.	Primary Containment Wall	
	a. Coefficient of temperature Linear Expansion in/in-F	0.65×10^{-5}
	b. Modulus of Elasticity, psi	30×10^6
	c. Poissons ratio	0.3
	d. Thermal Conductivity, BTU/hr-ft-F	25.9
	e. Thermal Capacitance, BTU/ft ³ -F	53.57
2.	Secondary Containment Wall	
	a. Thermal Conductivity, BTU/hr-ft-F	1.0
	b. Thermal Capacitance, BTU/ft ³ -F	31.9
3.	Heat Transfer Coefficients	
	a. Containment vapor to steel vessel (BTU/hr-ft ² -F)	4 x Tagami heat transfer coefficient*

* See Appendix 6.2A

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TABLE 6.2-29 (Sheet 3 of 3)

3.	Heat Transfer Coefficients (Cont'd)	
	b. Steel Cylinder to annulus air (BTU/hr-ft ² -F)	0.19 (ΔT) ^{1/3}
	c. Steel dome to annulus air (BTU/hr-ft ² -F)	0.22 (ΔT) ^{1/3}
	d. Annulus air to concrete cylinder (BTU/hr-ft ² -F)	0.25 (ΔT) ^{1/3}
	e. Annulus air to concrete dome (BTU/hr-ft ² -F)	0.27 (ΔT) ^{1/3}
	f. Primary Containment Emissivity	0.9
	g. Secondary Containment Emissivity	0.9
	h. Concrete cylinder to outside air (BTU/hr-ft ² -F)	1.0
	i. Concrete dome to outside air (BTU/hr-ft ² -F)	0.2

C. Additional Heat Sources in Shield Building
Annulus

1.	SBVS heating coil and motor	135 kW
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TABLE 6.2-30

SHIELD BUILDING VENTILATION SYSTEM VALVE POSITIONS

VALVE FUNCTION	VALVE NUMBER		VALVE POSITION	
			Phase 1	Phase 2
	"A" Train	"B" Train		
Train Inlet	2HV-B160A	2HV-B161B	0	0
Train Outlet	2HV-B158A	2HV-B159B	0	0
Main Exhaust to Stack	2HV-B162A	2HV-B163B	0	C
Recir. Valve to Annulus	2HV-BI64A	2HV-BI65B	C	0
Cross-Tie Valve	2HV-B166		See Par. a) below	

0 = Full Open
C = Full Closed

- a) The cross-tie valve 2HV-B166 remains open at all times. This valve will be closed only during filter testing and maintenance. With this valve open, charcoal filter decay heat cooling is effected by passing a constant fraction of air through the inactive filter train.

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TABLE 6.2-31 (Sheet 1 of 2)

FAILURE MODES & EFFECTIVE ANALYSIS - SHIELD BUILDING VENTILATION SYSTEM

<u>Component Identification and Quantity</u>	<u>Failure Mode</u>	<u>Effect on System</u>	<u>Method of Detection</u>	<u>Monitor</u>	<u>Remarks</u>
Filter train inlet valves 2HV-B160A, 2HV-B161B 2HV-B158A, 2HV-B159B	Fails to open	Fan will not start	Class IE valve position indicating lights. Fan status indication in main control room.	CRI	100 percent capacity redundant filtration unit will start automatically.
Main discharge valves 2HV-162A, 2HV-B163B	Fails to open during full exhaust phase	Loss of suction in associated filter train.	Class IE differential pressure alarm across filter train.	CRI	100 percent capacity filtration unit remains operable
	Fails to close during recirculation phase	Inability to recirculate Shield Building atmosphere through associated filter train.	Low differential pressure alarm across filter train. Class IE valve position indicating lights.	CRI	100 percent capacity redundant filtration unit will automatically start in same phase.
Recirculation Valves 2HV-B164A, 2HV-B165B	Fails to open during recirculation phase	Inability to recirculate Shield Building atmosphere through associated filter train.	Low differential pressure alarm across filter train. Class IE valve position indicating lights.	CRI	100 percent capacity redundant filtration unit will automatically start in same phase.
	Fails to close upon reverting to full exhaust phase	Annulus pressure and temperature increase slowly indicating lights.	High annulus pressure alarm. Class IE valve position	CRI	100 percent capacity redundant filtration unit will operate in full exhaust phase.
Filtration Unit fan (2) E-17 (3A-SA) E-17 (3B-SB)	Fan fails to start	No air flow through filter train	Class IE differential pressure alarm across filter train.	CRI	100 percent capacity redundant filter train will automatically start.
Filter train demisters (2)	Clogs	Reduced air flow through filter train	Class IE differential pressure alarm across filter train.	CRI	100 percent redundant filter train remains operable.
Filtration Unit filters (8), Medium Efficiency filters, HEPA Prefilters, Charcoal Adsorbers, HEPA Afterfilters	Filter clogs	Reduced air flow through filter train	Class IE differential pressure alarm across filter train.	CRI	100 percent capacity redundant filtration unit remains operable.
Diesel Generator (2)	Loss of emergency power by diesel failure	Fan will not start	Class IE differential pressure alarm across filter train. Diesel generator malfunction alarm.	CRI	100 percent capacity redundant diesel generator and filtration unit automatically start.

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TABLE 6.2-31 (Sheet 2 of 2)

FAILURE MODES & EFFECTIVE ANALYSIS - SHIELD BUILDING VENTILATION SYSTEM

<u>Component Identification and Quantity</u>	<u>Failure Mode</u>	<u>Effect on System</u>	<u>Method of Detection</u>	<u>Monitor</u>	<u>Remarks</u>
Filter train heating coils (2) EHC-51 (3A-SA) EHC-51 (3B-SB)	Does not go on	Filter train fan will stop	Class IE temperature sensors	CRI	100 percent capacity redundant system automatically starts.
	Class IE primary over-temperature protection thermal cutouts fail to de-energize coil.	Increased air temperature	Class IE temperature sensors	CRI	Class IE secondary over-temperature protection thermal cutouts are provided to de-energize coil and coil in redundant system remains operational.
	Class IE primary over-temperature protection thermal cutouts remain in open position or coil fails to operate for other reasons.	Decrease in supply air temperature	Class IE temperature sensors	CRI	Coil in redundant system remains operational.

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TABLE 6.2-32 (SHEET 1 OF 85)

Revision 14 (12/05)

CONTAINMENT PENETRATIONS AND ISOLATION VALVES

→ (DRN-99-2371, R11)

PENETRATION NO.: 1 TYPE^(j): I CLASS: C VENTED/DRAINED FOR TYPE "A" TEST^(k): NO⁽ⁿ⁾ TYPE FLUID^(a): SECONDARY COOLANT
 General Design Criteria: 54, 57

VALVE TAG NO.: UNID	MS MVAAA124 A	MS MVAAA401 A	MS MVAAA116 A	SSLMVAAA301 A
VALVE TYPE	GATE	GATE	ANGLE	GLOBE
VALVE OPERATOR ^(g)	HYDRAULIC	ELECTRIC	PNEUMATIC	PNEUMATIC
ACTUATION MODE ^(z) : PRIMARY	AUTOMATIC*	REMOTE MANUAL	REMOTE MANUAL	AUTOMATIC*
SECONDARY	REMOTE MANUAL	MANUAL	MANUAL	REMOTE MANUAL
VALVE POSITION ^(f) :				
NORMAL	OPEN	CLOSED	CLOSED	OPEN
SHUTDOWN	OPEN	CLOSED	CLOSED	OPEN
POST-ACCIDENT	CLOSED/OPEN ^(w)	CLOSED/OPEN	CLOSED/OPEN	CLOSED/OPEN ^(w)
LOSS OF POWER TO ACTUATOR	AS IS	AS IS	CLOSED	CLOSED
ACTUATION SIGNAL ^(e) :	MSIS	EFAS (OPEN)	NOT APPLICABLE	MSIS
→ (DRN 00-1734; 03-2060, R14)				
MAXIMUM CLOSURE TIME (SEC.)	8**	NOT APPLICABLE	NOT APPLICABLE	NOT APPLICABLE
← (DRN 00-1734; 03-2060, R14)				
LINE SIZE (INCH)	40	6	8	1
ESSENTIAL ^(d) :	NO	YES	YES	NO
FLOW DIRECTION ^(b) :	EFFLUENT FROM CONTAINMENT	EFFLUENT FROM CONTAINMENT	EFFLUENT FROM CONTAINMENT	EFFLUENT FROM CONTAINMENT
LOCATION REFERENCE TO CONTAINMENT ^(c) :	OUTSIDE	OUTSIDE	OUTSIDE	OUTSIDE
POWER SOURCE (AC/DC)	DC-SA AND SB	DC-SAB	E/P (SA)	AC-SA
APPROXIMATE LENGTH OF PIPE (FT.-IN.) ^(h) :	74-0	54-9	57-3	45-0
TYPE "C" TESTS ⁽ⁱ⁾ :	NO	NO	NO	NO
TEST ARRANGEMENT ^(o) :	NOT APPLICABLE	NOT APPLICABLE	NOT APPLICABLE	NOT APPLICABLE
SYSTEM	MAIN STEAM	EMERGENCY SG FEED PUMP TURBINES	ATMOSPHERIC STEAM DUMP	MAIN STEAM SAMPLE
REMARKS	HYDRAULIC MODULE		EQUIPPED WITH ACCUMULATOR	

* VALVE DOES NOT RECEIVE A CIAS. HOWEVER, A MSIS IS CONSIDERED A CONTAINMENT ISOLATION SIGNAL FOR THE PURPOSE OF ACTUATION MODE.

← (DRN 99-2371, R11)

→ (DRN 03-2060, R14)

** THE MAXIMUM CLOSURE TIME ALLOWED BY TECHNICAL SPECIFICATIONS IS 8 SECONDS, WHICH INCLUDES A 1.0 SECOND INSTRUMENT RESPONSE TIME.

← (DRN 03-2060, R14)

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TABLE 6.2-32 (SHEET 2 OF 85)

Revision 14 (12/05)

CONTAINMENT PENETRATIONS AND ISOLATION VALVES

→ (DRN 99-2371, R11)

PENETRATION NO.: 1 (CONTINUED) TYPE^(j): I CLASS: C VENTED/DRAINED FOR TYPE "A" TEST^(k): NO⁽ⁿ⁾ TYPE FLUID^(a): SECONDARY COOLANT

General Design Criteria: 54, 57

→ (DRN 01-991, R11-B; 05-41, R14)

VALVE TAG NO.: UNID	MS MVA000120 A	MS MVA000119 A	NG MVA000412 A
← (DRN 01-991, R11-B)			
VALVE TYPE	GLOBE	GLOBE	GLOBE
VALVE OPERATOR ^(g)	ELECTRIC	ELECTRIC	ELECTRIC
ACTUATION MODE ^(z) : PRIMARY	AUTOMATIC	AUTOMATIC	REMOTE MANUAL
SECONDARY	REMOTE MANUAL	REMOTE MANUAL	MANUAL
VALVE POSITION ^(f) :			
NORMAL	OPEN	CLOSED	LOCKED CLOSED*
SHUTDOWN	OPEN	CLOSED	CLOSED/OPEN
POST-ACCIDENT	CLOSED	CLOSED	CLOSED
LOSS OF POWER TO ACTUATOR	AS IS	AS IS	AS IS
ACTUATION SIGNAL ^(e) :	CIAS	CIAS	NOT APPLICABLE
MAXIMUM CLOSURE TIME (SEC.)	10	10	NOT APPLICABLE
LINE SIZE (INCH)	2	2	1
ESSENTIAL ^(d) :	NO	NO	NO
FLOW DIRECTION ^(b) :	EFFLUENT FROM CONTAINMENT	EFFLUENT FROM CONTAINMENT	INFLUENT TO CONTAINMENT
LOCATION REFERENCE TO CONTAINMENT ^(c) :	OUTSIDE	OUTSIDE	OUTSIDE
POWER SOURCE (AC/DC)	AC-SA	AC-SA	AC
APPROXIMATE LENGTH OF PIPE (FT.-IN.) ^(h) :	57-0	57-0	37-6
TYPE "C" TESTS ⁽ⁱ⁾ :	NO	NO	NO
TEST ARRANGEMENT ^(o) :	NOT APPLICABLE	NOT APPLICABLE	NOT APPLICABLE
SYSTEM	MAIN STEAM DRAIN	MAIN STEAM DRAIN	MAIN STEAM NITROGEN BLANKET
REMARKS	TRAP DOWNSTREAM OF THE VALVE PREVENTS STEAM ESCAPE		LOCKED CLOSED

* VALVE HAS A LOCKED OPEN BREAKER AND A LOCKED HANDWHEEL.

← (DRN 99-2371, R11; 05-41, R14)

TABLE 6.2-32 (SHEET 3 OF 85)

Revision 11 (05/01)

CONTAINMENT PENETRATIONS AND ISOLATION VALVES

→ (DRN 99-2371)

PENETRATION NO.: 1 (CONTINUED) TYPE^(j): I CLASS: C VENTED/DRAINED FOR TYPE "A" TEST^(k): NO⁽ⁿ⁾ TYPE FLUID^(a): SECONDARY COOLANT
 General Design Criteria: 54, 57

VALVE TAG NO.:	UNID	MS MVA001244 A
VALVE TYPE		GLOBE
VALVE OPERATOR ^(g)		MANUAL
ACTUATION MODE ^(z) :	PRIMARY	MANUAL
	SECONDARY	NONE
VALVE POSITION ^(f) :		
NORMAL		LOCKED CLOSED
SHUTDOWN		CLOSED
POST-ACCIDENT		CLOSED
LOSS OF POWER TO ACTUATOR		NOT APPLICABLE
ACTUATION SIGNAL ^(e) :		NONE
MAXIMUM CLOSURE TIME (SEC.)		NOT APPLICABLE
LINE SIZE (INCH)		2
ESSENTIAL ^(d) :		NO
FLOW DIRECTION ^(b) :		EFFLUENT FROM CONTAINMENT
LOCATION REFERENCE TO CONTAINMENT ^(c) :		OUTSIDE
POWER SOURCE (AC/DC)		NOT APPLICABLE
APPROXIMATE LENGTH OF PIPE (FT.-IN.) ^(h) :		71-3
TYPE "C" TESTS ⁽ⁱ⁾ :		NO
TEST ARRANGEMENT ^(o) :		NOT APPLICABLE
SYSTEM		MSIV BYPASS

REMARKS
 ← (DRN 99-2371)

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TABLE 6.2-32 (SHEET 4 OF 85)

Revision 14 (12/05)

CONTAINMENT PENETRATIONS AND ISOLATION VALVES

→ (DRN 99-2371, R11)

PENETRATION NO.: 2 TYPE^(j): I CLASS: C VENTED/DRAINED FOR TYPE "A" TEST^(k): NO⁽ⁿ⁾ TYPE FLUID^(a): SECONDARY COOLANT
 General Design Criteria: 54, 57

VALVE TAG NO.: UNID	MS MVA00124 B	MS MVA00401 B	MS MVA00116 B	SSLMVA00301 B
VALVE TYPE	GATE	GATE	ANGLE	GLOBE
VALVE OPERATOR ^(g)	HYDRAULIC	ELECTRIC	PNEUMATIC	PNEUMATIC
ACTUATION MODE ^(z) : PRIMARY	AUTOMATIC*	REMOTE MANUAL	REMOTE MANUAL	AUTOMATIC*
SECONDARY	REMOTE MANUAL	MANUAL	MANUAL	REMOTE MANUAL
VALVE POSITION ^(f) :				
NORMAL	OPEN	CLOSED	CLOSED	OPEN
SHUTDOWN	OPEN	CLOSED	CLOSED	OPEN
POST-ACCIDENT	CLOSED/OPEN ^(w)	CLOSED/OPEN	CLOSED/OPEN	CLOSED/OPEN ^(w)
LOSS OF POWER TO ACTUATOR	AS IS	AS IS	CLOSED	CLOSED
ACTUATION SIGNAL ^(e) :	MSIS	EFAS (OPEN)	NOT APPLICABLE	MSIS
→ (DRN 00-1734; 03-2060, R14)				
MAXIMUM CLOSURE TIME (SEC.)	8**	NOT APPLICABLE	NOT APPLICABLE	NOT APPLICABLE
← (DRN 00-1734; 03-2060, R14)				
LINE SIZE (INCH)	40	6	8	1
ESSENTIAL ^(d) :	NO	YES	YES	NO
FLOW DIRECTION ^(b) :	EFFLUENT FROM CONTAINMENT	EFFLUENT FROM CONTAINMENT	EFFLUENT FROM CONTAINMENT	EFFLUENT FROM CONTAINMENT
LOCATION REFERENCE TO CONTAINMENT ^(c) :	OUTSIDE	OUTSIDE	OUTSIDE	OUTSIDE
POWER SOURCE (AC/DC)	DC-SA AND SB	DC-SAB	E/P (SB)	AC-SB
APPROXIMATE LENGTH OF PIPE (FT.-IN.) ^(h) :	74 - 0	54 - 9	57 - 3	45 - 0
TYPE "C" TESTS ^(l) :	NO	NO	NO	NO
TEST ARRANGEMENT ^(o) :	NOT APPLICABLE	NOT APPLICABLE	NOT APPLICABLE	NOT APPLICABLE
SYSTEM	MAIN STEAM	EMERGENCY STEAM GEN FEED PUMP TURBINES	ATMOSPHERIC STEAM DUMP	MAIN STEAM SAMPLE
REMARKS	HYDRAULIC MODULE		EQUIPPED WITH ACCUMULATOR	

* VALVE DOES NOT RECEIVE A CIAS. HOWEVER, A MSIS IS CONSIDERED A CONTAINMENT ISOLATION SIGNAL FOR THE PURPOSES OF ACTUATION MODE.

← (DRN 99-2371, R11)

→ (DRN 03-2060, R14)

** THE MAXIMUM CLOSURE TIME ALLOWED BY TECHNICAL SPECIFICATIONS IS 8 SECONDS, WHICH INCLUDES A 1.0 SECOND INSTRUMENT RESPONSE TIME.

← (DRN 03-2060, R14)

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TABLE 6.2-32 (SHEET 5 OF 85)

Revision 14 (12/05)

CONTAINMENT PENETRATIONS AND ISOLATION VALVES

→ (DRN 99-2371, R11)

PENETRATION NO.: 2 (CONTINUED) TYPE^(j): I CLASS: C VENTED/DRAINED FOR TYPE "A" TEST^(k): NO⁽ⁿ⁾ TYPE FLUID^(a): SECONDARY COOLANT
 General Design Criteria: 54, 57

→ (DRN 01-991, R11-B; 05-41, R14)

VALVE TAG NO.: UNID	MS MVA000120 B	MS MVA000119 B	NG MVA000412 B
← (DRN 01-991, R11-B)			
VALVE TYPE	GLOBE	GLOBE	GLOBE
VALVE OPERATOR ^(g)	ELECTRIC	ELECTRIC	ELECTRIC
ACTUATION MODE ^(z) : PRIMARY	AUTOMATIC	AUTOMATIC	REMOTE MANUAL
SECONDARY	REMOTE MANUAL	REMOTE MANUAL	MANUAL
VALVE POSITION ^(f) :			
NORMAL	OPEN	CLOSED	LOCKED CLOSED*
SHUTDOWN	OPEN	CLOSED	CLOSED/OPEN
POST-ACCIDENT	CLOSED	CLOSED	CLOSED
LOSS OF POWER TO ACTUATOR	AS IS	AS IS	AS IS
ACTUATION SIGNAL ^(e) :	CIAS	CIAS	NONE
MAXIMUM CLOSURE TIME (SEC.)	10	10	NOT APPLICABLE
LINE SIZE (INCH)	2	2	1
ESSENTIAL ^(d) :	NO	NO	NO
FLOW DIRECTION ^(b) :	EFFLUENT FROM CONTAINMENT	EFFLUENT FROM CONTAINMENT	INFLUENT TO CONTAINMENT
LOCATION REFERENCE TO CONTAINMENT ^(c) :	OUTSIDE	OUTSIDE	OUTSIDE
POWER SOURCE (AC/DC)	AC-SB	AC-SB	AC
APPROXIMATE LENGTH OF PIPE (FT.-IN.) ^(h) :	57 - 0	57 - 0	37 - 6
TYPE "C" TESTS ⁽ⁱ⁾ :	NO	NO	NO
TEST ARRANGEMENT ^(o) :	NOT APPLICABLE	NOT APPLICABLE	NOT APPLICABLE
SYSTEM	MAIN STEAM DRAIN	MAIN STEAM DRAIN	MAIN STEAM NITROGEN BLANKET
REMARKS	TRAP DOWNSTREAM OF THE VALVE PREVENTS STEAM ESCAPE		LOCKED CLOSED

* VALVE HAS A LOCKED OPEN BREAKER AND A LOCKED HANDWHEEL.

← (DRN 99-2371, R11; 05-41, R14)

CONTAINMENT PENETRATIONS AND ISOLATION VALVES

→ (DRN 99-2371)

PENETRATION NO.: 2 (CONTINUED) TYPE^(j): I CLASS: C VENTED/DRAINED FOR TYPE "A" TEST^(k): NO⁽ⁿ⁾ TYPE FLUID^(a): SECONDARY COOLANT
 General Design Criteria: 54, 56

VALVE TAG NO.:	UNID	MS MVA001244 B
VALVE TYPE		GATE
VALVE OPERATOR ^(g)		MANUAL
ACTUATION MODE ^(z) :	PRIMARY	MANUAL
	SECONDARY	NONE
VALVE POSITION ^(f) :		
NORMAL		LOCKED CLOSED
SHUTDOWN		CLOSED
POST-ACCIDENT		CLOSED
LOSS OF POWER TO ACTUATOR		NOT APPLICABLE
ACTUATION SIGNAL ^(e) :		NONE
MAXIMUM CLOSURE TIME (SEC.)		NOT APPLICABLE
LINE SIZE (INCH)		4
ESSENTIAL ^(d) :		NO
FLOW DIRECTION ^(b) :		EFFLUENT FROM CONTAINMENT
LOCATION REFERENCE TO CONTAINMENT ^(c) :		OUTSIDE
POWER SOURCE (AC/DC)		NOT APPLICABLE
APPROXIMATE LENGTH OF PIPE (FT.-IN.) ^(h) :		51 - 0
TYPE "C" TESTS ⁽ⁱ⁾ :		NO
TEST ARRANGEMENT ^(o) :		NOT APPLICABLE
SYSTEM		MSIV BYPASS

REMARKS
 ← (DRN 99-2371)

WSES-FSAR-UNIT-3

TABLE 6.2-32 (SHEET 7 OF 85)

Revision 14 (12/05)

CONTAINMENT PENETRATIONS AND ISOLATION VALVES

→ (DRN 99-2371, R11)
 PENETRATION NO.: 3 TYPE^(j): I CLASS: C VENTED/DRAINED FOR TYPE "A" TEST^(k): NO⁽ⁿ⁾ TYPE FLUID^(a): SECONDARY COOLANT
 General Design Criteria: 54, 57

→ (DRN 01-991, R11-B) VALVE TAG NO.: UNID	FW MVA00184 A	EFWMV00229 A	EFWMV00228 A	EFWMV00224 A ^(u)
← (DRN 01-991, R11-B) → (DRN 05-41, R14) VALVE TYPE	GATE	GLOBE	GLOBE	GLOBE
VALVE OPERATOR ^(g)	HYDRAULIC	PNEUMATIC	PNEUMATIC	PNEUMATIC
ACTUATION MODE ^(z) : PRIMARY	AUTOMATIC*	AUTOMATIC*	AUTOMATIC***	AUTOMATIC***
SECONDARY	REMOTE MANUAL	REMOTE MANUAL	REMOTE MANUAL	REMOTE MANUAL
← (DRN 05-41, R14) VALVE POSITION ^(f) :				
NORMAL	OPEN	CLOSED	CLOSED	CLOSED
SHUTDOWN	OPEN	CLOSED	CLOSED	CLOSED
POST-ACCIDENT	CLOSED/OPEN ^(w)	OPEN	OPEN	OPEN
LOSS OF POWER TO ACTUATOR	AS IS	OPEN	OPEN	OPEN
ACTUATION SIGNAL ^(e) :	MSIS	EFAS (OPEN)/MSIS (CLOSE)	EFAS (OPEN)/MSIS (CLOSE)	ESFAS (OPEN)/MSIS (CLOSE)
→ (DRN 00-1182; 03-2060, R14) MAXIMUM CLOSURE TIME (SEC.)	6**	24	24	24
← (DRN 03-2060, R14)				
LINE SIZE (INCH)	20	4	4	4
ESSENTIAL ^(d) :	NO	YES	YES	YES
FLOW DIRECTION ^(b) :	INFLUENT TO CONTAINMENT	INFLUENT TO CONTAINMENT	INFLUENT TO CONTAINMENT	INFLUENT TO CONTAINMENT
LOCATION REFERENCE TO CONTAINMENT ^(c) :	OUTSIDE	OUTSIDE	OUTSIDE	OUTSIDE
POWER SOURCE (AC/DC)	DC-SA/SB; AC-SA	DC-SB	DC-SA	E/P (SB)
APPROXIMATE LENGTH OF PIPE (FT.-IN.) ^(h) :	36-0	43-2	43-2	45-9
TYPE "C" TESTS ⁽ⁱ⁾ :	NO	NO	NO	NO
TEST ARRANGEMENT ^(o) :	NOT APPLICABLE	NOT APPLICABLE	NOT APPLICABLE	NOT APPLICABLE
SYSTEM	FEEDWATER	EMERGENCY FEEDWATER	EMERGENCY FEEDWATER	EMERGENCY FEEDWATER

REMARKS

→ (DRN 03-2060, R14; 05-41, R14)

* VALVE DOES NOT RECEIVE A CIAS. HOWEVER, A MSIS IS CONSIDERED A CONTAINMENT ISOLATION SIGNAL FOR THE PURPOSES OF ACTUATION MODE.

** THE MAXIMUM CLOSURE TIME ALLOWED BY TECHNICAL SPECIFICATIONS IS 6 SECONDS, WHICH INCLUDES A 1.0 SECOND INSTRUMENT RESPONSE TIME.

MAXIMUM ALLOWED CLOSURE TIME DURING AUXILIARY FEEDWATER PUMP OPERATIONS IS 30 SECONDS FOR A FEEDWATER LINE BREAK EVENT. (SEE SECTION 10.4.7.2)

*** VALVE NOT CREDITED AS A CONTAINMENT ISOLATION VALVE.

← (DRN 00-1182; 99-2371, R11; 03-2060, R14; 05-41, R14)

CONTAINMENT PENETRATIONS AND ISOLATION VALVES

→ (DRN 99-2371, R11)

PENETRATION NO.: 3 (CONTINUED) TYPE^(j): I CLASS: C VENTED/DRAINED FOR TYPE "A" TEST^(k): NO⁽ⁿ⁾ TYPE FLUID^(a): SECONDARY COOLANT
 General Design Criteria: 54, 57

→ (DRN 01-991, R11-B)

VALVE TAG NO.: UNID EFWMVAAA223 A^(u)

← (DRN 01-991, R11-B)

VALVE TYPE	GLOBE
VALVE OPERATOR ^(g)	PNEUMATIC
ACTUATION MODE ^(z) : PRIMARY	AUTOMATIC*
SECONDARY	REMOTE MANUAL

VALVE POSITION^(f):

NORMAL CLOSED

SHUTDOWN CLOSED

POST-ACCIDENT OPEN

LOSS OF POWER TO ACTUATOR OPEN

ACTUATION SIGNAL^(e): EFAS (OPEN)/MSIS (CLOSE)

MAXIMUM CLOSURE TIME (SEC.) 24

LINE SIZE (INCH) 4

ESSENTIAL^(d): YES

FLOW DIRECTION^(b): INFLUENT TO CONTAINMENT

LOCATION REFERENCE TO CONTAINMENT^(c): OUTSIDE

POWER SOURCE (AC/DC) E/P (SA)

APPROXIMATE LENGTH OF PIPE (FT.-IN.)^(h): 45-9

TYPE "C" TESTS⁽ⁱ⁾: NO

TEST ARRANGEMENT^(o): NOT APPLICABLE

SYSTEM EMERGENCY FEEDWATER

REMARKS

* VALVE DOES NOT RECEIVE A CIAS. HOWEVER, A MSIS IS CONSIDERED A CONTAINMENT ISOLATION SIGNAL FOR THE PURPOSES OF ACTUATION MODE.

← (DRN 99-2371, R11)

→ (DRN 05-41, R14)

* VALVE NOT CREDITED AS A CONTAINMENT ISOLATION VALVE.

← (DRN 05-41, R14)

CONTAINMENT PENETRATIONS AND ISOLATION VALVES

→ (DRN 99-2371, R11)
 PENETRATION NO.: 4 TYPE^(j): I CLASS: C VENTED/DRAINED FOR TYPE "A" TEST^(k): NO⁽ⁿ⁾ TYPE FLUID^(a): SECONDARY COOLANT
 General Design Criteria: 54, 57

→ (DRN 01-991, R11-B)	VALVE TAG NO.: UNID	FW MVA00184 B	EFWMVAAA229 B	EFWMVAAA228 B	EFWMVAAA224 B ^(u)
← (DRN 01-991, R11-B)	VALVE TYPE	GATE	GLOBE	GLOBE	GLOBE
→ (DRN 05-41, R14)	VALVE OPERATOR ^(g)	HYDRAULIC	PNEUMATIC	PNEUMATIC	PNEUMATIC
	ACTUATION MODE ^(z) : PRIMARY	AUTOMATIC*	AUTOMATIC*	AUTOMATIC***	AUTOMATIC***
	SECONDARY	REMOTE MANUAL	REMOTE MANUAL	REMOTE MANUAL	REMOTE MANUAL
← (DRN 05-41, R14)	VALVE POSITION ^(f) :				
	NORMAL	OPEN	CLOSED	CLOSED	CLOSED
	SHUTDOWN	OPEN	CLOSED	CLOSED	CLOSED
	POST-ACCIDENT	CLOSED/OPEN ^(w)	OPEN	OPEN	OPEN
	LOSS OF POWER TO ACTUATOR	AS IS	OPEN	OPEN	OPEN
	ACTUATION SIGNAL ^(e) :	MSIS	EFAS(OPEN)/MSIS(CLOSE)	EFAS(OPEN)/MSIS(CLOSE)	EFAS(OPEN)/MSIS(CLOSE)
→ (DRN 00-1182; 03-2060, R14)	MAXIMUM CLOSURE TIME (SEC.)	6**	24	24	24
← (DRN 03-2060, R14)	LINE SIZE (INCH)	20	4	4	4
	ESSENTIAL ^(d) :	NO	YES	YES	YES
	FLOW DIRECTION ^(b) :	INFLUENT TO CONTAINMENT	INFLUENT TO CONTAINMENT	INFLUENT TO CONTAINMENT	INFLUENT TO CONTAINMENT
	LOCATION REFERENCE TO CONTAINMENT ^(c) :	OUTSIDE	OUTSIDE	OUTSIDE	OUTSIDE
	POWER SOURCE (AC/DC)	DC-SA/SB; AC-SB	DC-SA	DC-SB	E/P (SA)
	APPROXIMATE LENGTH OF PIPE (FT.-IN.) ^(h) :	36 - 0	43 - 2	43 - 2	45-9
	TYPE "C" TESTS ⁽ⁱ⁾ :	NO	NO	NO	NO
	TEST ARRANGEMENT ^(o) :	NOT APPLICABLE	NOT APPLICABLE	NOT APPLICABLE	NOT APPLICABLE
	SYSTEM	FEEDWATER	EMERGENCY FEEDWATER	EMERGENCY FEEDWATER	EMERGENCY FEEDWATER

REMARKS

→ (DRN 03-2060, R14; 05-41, R14)

* VALVE DOES NOT RECEIVE A CIAS. HOWEVER, A MSIS IS CONSIDERED A CONTAINMENT ISOLATION SIGNAL FOR THE PURPOSES OF ACTUATION MODE.

** THE MAXIMUM CLOSURE TIME ALLOWED BY TECHNICAL SPECIFICATION IS 6 SECONDS, WHICH INCLUDES A 1.0 SECOND INSTRUMENT RESPONSE TIME.

MAXIMUM ALLOWED CLOSURE TIME DURING AUXILIARY FEEDWATER PUMP OPERATIONS IS 30 SECONDS FOR A FEEDWATER LINE BREAK EVENT. (SEE SECTION 10.4.7.2)

*** VALVE NOT CREDITED AS A CONTAINMENT ISOLATION VALVE.

← (DRN 99-2371, R11; 00-1182; 03-2060, R14; 05-41, R14)

CONTAINMENT PENETRATIONS AND ISOLATION VALVES

→ (DRN 99-2371, R11)

PENETRATION NO.: 4 (CONTINUED) TYPE^(j): I CLASS: C VENTED/DRAINED FOR TYPE "A" TEST^(k): NO⁽ⁿ⁾ TYPE FLUID^(a): SECONDARY COOLANT
 General Design Criteria: 54, 57

→ (DRN 01-991, R11-B)

VALVE TAG NO.: UNID EFWMVAAA223 B^(u)

← (DRN 01-991, R11-B)

VALVE TYPE	GLOBE
VALVE OPERATOR ^(g)	PNEUMATIC
ACTUATION MODE ^(z) : PRIMARY	AUTOMATIC*
SECONDARY	REMOTE MANUAL

VALVE POSITION^(f):

NORMAL CLOSED

SHUTDOWN CLOSED

POST-ACCIDENT OPEN

LOSS OF POWER TO ACTUATOR OPEN

ACTUATION SIGNAL^(e): EFAS(OPEN)/MSIS(CLOSE)

MAXIMUM CLOSURE TIME (SEC.) 24

LINE SIZE (INCH) 4

ESSENTIAL^(d): YES

FLOW DIRECTION^(b): INFLUENT TO CONTAINMENT

LOCATION REFERENCE TO CONTAINMENT^(c): OUTSIDE

POWER SOURCE (AC/DC) E/P (SB)

APPROXIMATE LENGTH OF PIPE (FT.-IN.)^(h): 45 - 9

TYPE "C" TESTS⁽ⁱ⁾: NO

TEST ARRANGEMENT^(o): NOT APPLICABLE

SYSTEM EMERGENCY FEEDWATER

REMARKS

* VALVE DOES NOT RECEIVE A CIAS. HOWEVER, A MSIS IS CONSIDERED A CONTAINMENT ISOLATION SIGNAL FOR THE PURPOSES OF ACTUATION MODE.

← (DRN 99-2371, R11)

→ (DRN 05-41, R14)

* VALVE NOT CREDITED AS A CONTAINMENT ISOLATION VALVE.

←(DRN 05-41, R14)

CONTAINMENT PENETRATIONS AND ISOLATION VALVES

→ (DRN 2371)
 PENETRATION NO.: 5 TYPE^(j): III CLASS: C VENTED/DRAINED FOR TYPE "A" TEST^(k): NO⁽ⁿ⁾ TYPE FLUID^(a): SECONDARY COOLANT
 General Design Criteria: 54, 57

→ (DRN 01-991, R11-B; 05-41, R14)	VALVE TAG NO.: UNID	BD MVA000103 A	BD MVA000102 A ^{(u)*}
← (DRN 01-991, R11-B)			
VALVE TYPE	GLOBE	GATE	
VALVE OPERATOR ^(g)	PNEUMATIC	PNEUMATIC	
ACTUATION MODE ^(z) : PRIMARY	AUTOMATIC	AUTOMATIC	
SECONDARY	REMOTE MANUAL	REMOTE MANUAL	
← (DRN 05-41, R14)			
VALVE POSITION ^(f) :			
NORMAL	OPEN	OPEN	
SHUTDOWN	OPEN	OPEN	
POST-ACCIDENT	CLOSED	CLOSED	
LOSS OF POWER TO ACTUATOR	CLOSED	CLOSED	
ACTUATION SIGNAL ^(e) :	CIAS/EFAS	CIAS/EFAS	
MAXIMUM CLOSURE TIME (SEC.)	10	10	
LINE SIZE (INCH)	4	4	
ESSENTIAL ^(d) :	NO	NO	
FLOW DIRECTION ^(b) :	EFFLUENT FROM CONTAINMENT	EFFLUENT FROM CONTAINMENT	
LOCATION REFERENCE TO CONTAINMENT ^(c) :	OUTSIDE	INSIDE	
POWER SOURCE (AC/DC)	AC-SA	AC-SB	
APPROXIMATE LENGTH OF PIPE (FT.-IN.) ^(h) :	13 – 3	NOT APPLICABLE	
TYPE "C" TESTS ⁽ⁱ⁾ :	NO	NO	
TEST ARRANGEMENT ^(o) :	NOT APPLICABLE	NOT APPLICABLE	
SYSTEM	STEAM GENERATOR BLOWDOWN	STEAM GENERATOR BLOWDOWN	

REMARKS
 ← (DRN 99-2371, R11)
 → (DRN 05-41, R14)
 * VALVE NOT CREDITED AS A CONTAINMENT ISOLATION VALVE. VALVE HAS POSITION INDICATION IN CONTROL ROOM. VALVE ISOLATION SAFETY FUNCTION IS PROVIDED BY CIAS/EFAS TO ISOLATE STEAM GENERATOR.
 ← (DRN 05-41, R14)

CONTAINMENT PENETRATIONS AND ISOLATION VALVES

→ (DRN 99-2371, R11)
 PENETRATION NO.: 6 TYPE^(j): III CLASS: C VENTED/DRAINED FOR TYPE "A" TEST^(k): NO⁽ⁿ⁾ TYPE FLUID^(a): SECONDARY COOLANT
 General Design Criteria: 54, 57

→ (DRN 01-991, R11-B; 05-41, R14)

VALVE TAG NO.: UNID BD MVA000103 B BD MVA000102 B^{(u)*}

←(DRN 05-41, R14)

VALVE TYPE	GLOBE	GATE
VALVE OPERATOR ^(g)	PNEUMATIC	PNEUMATIC
ACTUATION MODE ^(z) : PRIMARY	AUTOMATIC	AUTOMATIC
SECONDARY	REMOTE MANUAL	REMOTE MANUAL

← (DRN 01-991, R11-B)

VALVE POSITION ^(f) : NORMAL	OPEN	OPEN
SHUTDOWN	OPEN	OPEN
POST-ACCIDENT	CLOSED	CLOSED
LOSS OF POWER TO ACTUATOR	CLOSED	CLOSED
ACTUATION SIGNAL ^(e) :	CIAS/EFAS	CIAS/EFAS
MAXIMUM CLOSURE TIME (SEC.)	10	10
LINE SIZE (INCH)	4	4
ESSENTIAL ^(d) :	NO	NO
FLOW DIRECTION ^(b) :	EFFLUENT FROM CONTAINMENT	EFFLUENT FROM CONTAINMENT
LOCATION REFERENCE TO CONTAINMENT ^(c) :	OUTSIDE	INSIDE
POWER SOURCE (AC/DC)	AC-SA	AC-SB
APPROXIMATE LENGTH OF PIPE (FT.-IN.) ^(h) :	15 - 3	NOT APPLICABLE
TYPE "C" TESTS ⁽ⁱ⁾ :	NO	NO
TEST ARRANGEMENT ^(o) :	NOT APPLICABLE	NOT APPLICABLE
SYSTEM	STEAM GENERATOR BLOWDOWN	STEAM GENERATOR BLOWDOWN

REMARKS

← (DRN 99-2371, R11)

→ (DRN 05-41, R14)

*VALVE NOT CREDITED AS A CONTAINMENT ISOLATION VALVE. VALVE HAS POSITION INDICATION IN CONTROL ROOM. VALVE ISOLATION SAFETY FUNCTION IS PROVIDED BY CIAS/EFAS TO ISOLATE STEAM GENERATOR.

← (DRN 05-41, R14)

CONTAINMENT PENETRATIONS AND ISOLATION VALVES

→ (DRN 99-2371)

PENETRATION NO.: 7 TYPE^(j): III CLASS: A2 VENTED/DRAINED FOR TYPE "A" TEST^(k): YES TYPE FLUID^(a): DEMINERALIZED WATER
 General Design Criteria: 54, 56

VALVE TAG NO.: UNID	PMUMVAAA151	PMUMVAAA152
VALVE TYPE	GLOBE	CHECK
VALVE OPERATOR ^(g)	MANUAL	SELF
ACTUATION MODE ^(z) : PRIMARY	MANUAL	NOT APPLICABLE
SECONDARY	NONE	NONE
VALVE POSITION ^(f) :		
NORMAL	LOCKED CLOSED	NOT APPLICABLE
SHUTDOWN	CLOSED/OPEN	NOT APPLICABLE
POST-ACCIDENT	CLOSED	NOT APPLICABLE
LOSS OF POWER TO ACTUATOR	NOT APPLICABLE	NOT APPLICABLE
ACTUATION SIGNAL ^(e) :	NONE	NONE
MAXIMUM CLOSURE TIME (SEC.)	NOT APPLICABLE	NOT APPLICABLE
LINE SIZE (INCH)	2	2
ESSENTIAL ^(d) :	NO	NOT APPLICABLE
FLOW DIRECTION ^(b) :	INFLUENT TO CONTAINMENT	INFLUENT TO CONTAINMENT
LOCATION REFERENCE TO CONTAINMENT ^(c) :	OUTSIDE	INSIDE
POWER SOURCE (AC/DC)	NONE	NONE
APPROXIMATE LENGTH OF PIPE (FT.-IN.) ^(h) :	13 - 0	NOT APPLICABLE
TYPE "C" TESTS ⁽ⁱ⁾ :	YES	YES
TEST ARRANGEMENT ^(o) :	1	1
SYSTEM	DEMINERALIZED WATER	DEMINERALIZED WATER
REMARKS	HAND OPERATED	

← (DRN 99-2371)

CONTAINMENT PENETRATIONS AND ISOLATION VALVES

→ (DRN 99-2371)

PENETRATION NO.: 8 TYPE^(j): III CLASS: A2 VENTED/DRAINED FOR TYPE "A" TEST^(k): YES TYPE FLUID^(a): COMPRESSED AIR
 General Design Criteria: 54, 56

VALVE TAG NO.: UNID	SA MVA908	SAISV9082	SA MVA9085	SA MVA909
VALVE TYPE	GATE	GATE	CHECK	GATE
VALVE OPERATOR ^(g)	MANUAL	SOLENOID	SELF	MANUAL
ACTUATION MODE ^(z) : PRIMARY	MANUAL	REMOTE MANUAL	NOT APPLICABLE	MANUAL
SECONDARY	NONE	NONE	NOT APPLICABLE	NONE
VALVE POSITION ^(f) :				
NORMAL	LOCKED CLOSED	LOCKED CLOSED	NOT APPLICABLE	LOCKED CLOSED
SHUTDOWN	CLOSED	CLOSED	NOT APPLICABLE	OPEN
POST-ACCIDENT	CLOSED	OPEN OR CLOSED	NOT APPLICABLE	LOCKED CLOSED
LOSS OF POWER TO ACTUATOR	NOT APPLICABLE	CLOSED	NOT APPLICABLE	NOT APPLICABLE
ACTUATION SIGNAL ^(e) :	NONE	OPEN	NOT APPLICABLE	NOT APPLICABLE
MAXIMUM CLOSURE TIME (SEC.)	NOT APPLICABLE	NOT APPLICABLE	NOT APPLICABLE	NOT APPLICABLE
LINE SIZE (INCH)	2	3/8	1/2	2
ESSENTIAL ^(d) :	NO	NO	NOT APPLICABLE	NO
FLOW DIRECTION ^(b) :	INFLUENT TO CONTAINMENT	INFLUENT TO CONTAINMENT	INFLUENT TO CONTAINMENT	INFLUENT TO CONTAINMENT
LOCATION REFERENCE TO CONTAINMENT ^(c) :	OUTSIDE	OUTSIDE	INSIDE	INSIDE
POWER SOURCE (AC/DC)	NONE	AC, SA	NONE	NONE
APPROXIMATE LENGTH OF PIPE (FT.-IN.) ^(h) :	21 - 6	18 - 0	2 - 0	2 - 6
TYPE "C" TESTS ⁽ⁱ⁾ :	YES	YES	YES	YES
TEST ARRANGEMENT ^(o) :	8	8	8	8
SYSTEM	STATION AIR	STATION AIR	STATION AIR	STATION AIR
REMARKS	HAND OPERATED		HAND OPERATED	HAND OPERATED

← (DRN 99-2371)

CONTAINMENT PENETRATIONS AND ISOLATION VALVES

→ (DRN 99-2371)

PENETRATION NO.: 9 TYPE^(j): III CLASS: A1 VENTED/DRAINED FOR TYPE "A" TEST^(k): YES TYPE FLUID^(a): COMPRESSED AIR
 General Design Criteria: 54, 56

VALVE TAG NO.:	UNID	IA MVA909	IA MVA910
VALVE TYPE		GLOBE	CHECK
VALVE OPERATOR ^(g)		PNEUMATIC	SELF
ACTUATION MODE ^(z) :	PRIMARY	AUTOMATIC	NOT APPLICABLE
	SECONDARY	REMOTE MANUAL	NONE
VALVE POSITION ^(f) :			
NORMAL		OPEN	NOT APPLICABLE
SHUTDOWN		OPEN	NOT APPLICABLE
POST-ACCIDENT		CLOSED	NOT APPLICABLE
LOSS OF POWER TO ACTUATOR		CLOSED	NOT APPLICABLE
ACTUATION SIGNAL ^(e) :		CIAS ^(q)	NONE
MAXIMUM CLOSURE TIME (SEC.)		10	NOT APPLICABLE
LINE SIZE (INCH)		2	2
ESSENTIAL ^(d) :		NO	NOT APPLICABLE
FLOW DIRECTION ^(b) :		INFLUENT TO CONTAINMENT	INFLUENT TO CONTAINMENT
LOCATION REFERENCE TO CONTAINMENT ^(c) :		OUTSIDE	INSIDE
POWER SOURCE (AC/DC)		AC-SA	NONE
APPROXIMATE LENGTH OF PIPE (FT.-IN.) ^(h) :		20 - 0	NOT APPLICABLE
TYPE "C" TESTS ⁽ⁱ⁾ :		YES	YES
TEST ARRANGEMENT ^(o) :		7	7
SYSTEM		INSTRUMENT AIR	INSTRUMENT AIR

REMARKS
 ← (DRN 99-2371)

CONTAINMENT PENETRATIONS AND ISOLATION VALVES

→ (DRN 99-2371)

PENETRATION NO.: 10 TYPE^(j): II CLASS: A1 VENTED/DRAINED FOR TYPE "A" TEST^(k): NO TYPE FLUID^(a): MAKE-UP AIR
(MODIFIED)

General Design Criteria: 54, 56

VALVE TAG NO.: UNID	CAPMVAAA103*	CAPMVAAA104	CAPMVAAA1032
VALVE TYPE	BUTTERFLY	BUTTERFLY	GLOBE
VALVE OPERATOR ^(g)	PNEUMATIC	PNEUMATIC	MANUAL
ACTUATION MODE ^(z) : PRIMARY	AUTOMATIC	AUTOMATIC	MANUAL
SECONDARY	REMOTE MANUAL	REMOTE MANUAL	NONE
VALVE POSITION ^(f) :			
NORMAL	CLOSED	CLOSED	LOCKED CLOSED
SHUTDOWN	OPEN	OPEN	LOCKED CLOSED
POST-ACCIDENT	CLOSED	CLOSED	LOCKED CLOSED
LOSS OF POWER TO ACTUATOR	CLOSED	CLOSED	NOT APPLICABLE
ACTUATION SIGNAL ^(e, x) :	CIAS/CPIS/CADP ^(x)	CIAS/CPIS/CADP ^(x)	NONE
MAXIMUM CLOSURE TIME (SEC.)	5	5	NOT APPLICABLE
LINE SIZE (INCH)	48	48	1
ESSENTIAL ^(d) :	NO	NO	NO
FLOW DIRECTION ^(b) :	INFLUENT TO CONTAINMENT	INFLUENT TO CONTAINMENT	INFLUENT TO CONTAINMENT
LOCATION REFERENCE TO CONTAINMENT ^(c) :	OUTSIDE	INSIDE	OUTSIDE
POWER SOURCE (AC/DC)	AC-SA	AC-SA	NONE
APPROXIMATE LENGTH OF PIPE (FT.-IN.) ^(h) :	1 - 5	NOT APPLICABLE	80 - 0
TYPE "C" TESTS ⁽ⁱ⁾ :	YES	YES	NO
TEST ARRANGEMENT ^(o) :	2 ^(v)	2	NOT APPLICABLE
SYSTEM	HEATING & VENTILATING PURGE INLET	HEATING & VENTILATING PURGE INLET	HEATING & VENTILATING PURGE INLET
REMARKS	LOCATED INSIDE THE ANNULUS		IN RAB - LOCKED CLOSED

* VALVE IS LOCATED BETWEEN STEEL CONTAINMENT AND SHIELD BUILDING.

← (DRN 99-2371)

CONTAINMENT PENETRATIONS AND ISOLATION VALVES

→ (DRN 99-2371)

PENETRATION NO.: 11 TYPE^(j): II CLASS: A1 VENTED/DRAINED FOR TYPE "A" TEST^(k): NO TYPE FLUID^(a): CONTAINMENT ATMOSPHERE
(MODIFIED)

General Design Criteria: 54, 56

VALVE TAG NO.: UNID	CAPMVAAA204	CAPMVAAA203	CAPMVAAA2032
VALVE TYPE	BUTTERFLY	BUTTERFLY	GLOBE
VALVE OPERATOR ^(g)	PNEUMATIC	PNEUMATIC	MANUAL
ACTUATION MODE ^(z) : PRIMARY	AUTOMATIC	AUTOMATIC	MANUAL
SECONDARY	REMOTE MANUAL	REMOTE MANUAL	NONE
VALVE POSITION ^(f) :			
NORMAL	CLOSED	CLOSED	LOCKED CLOSED
SHUTDOWN	OPEN	OPEN	LOCKED CLOSED
POST-ACCIDENT	CLOSED	CLOSED	LOCKED CLOSED
LOSS OF POWER TO ACTUATOR	CLOSED	CLOSED	NOT APPLICABLE
ACTUATION SIGNAL ^(e, x) :	CIAS/CPIS/CADP ^(x)	CIAS/CPIS/CADP ^(x)	NONE
MAXIMUM CLOSURE TIME (SEC.)	5	5	NOT APPLICABLE
LINE SIZE (INCH)	48	48	1
ESSENTIAL ^(d) :	NO	NO	NO
FLOW DIRECTION ^(b) :	EFFLUENT FROM CONTAINMENT	EFFLUENT FROM CONTAINMENT	EFFLUENT FROM CONTAINMENT
LOCATION REFERENCE TO CONTAINMENT ^(c) :	OUTSIDE	INSIDE	OUTSIDE
POWER SOURCE (AC/DC)	AC-SB	AC-SB	NOT APPLICABLE
APPROXIMATE LENGTH OF PIPE (FT.-IN.) ^(h) :	1 - 0	NOT APPLICABLE	50 - 0
TYPE "C" TESTS ⁽ⁱ⁾ :	YES	YES	NO
TEST ARRANGEMENT ^(o) :	2 ^(v)	2	NOT APPLICABLE
SYSTEM	HEATING & VENTILATING PURGE OUTLET	HEATING & VENTILATING PURGE OUTLET	HEATING & VENTILATING PURGE OUTLET
REMARKS	LOCATED INSIDE THE ANNULUS		IN RAB - LOCKED CLOSED

← (DRN 99-2371)

TABLE 6.2-32 (SHEET 18 OF 85)

Revision 11 (05/01)

CONTAINMENT PENETRATIONS AND ISOLATION VALVES

→ (DRN 99-2371)
 PENETRATION NO.: 12 TYPE^(j): STEEL CLASS: A2 VENTED/DRAINED FOR TYPE "A" TEST^(k): YES TYPE FLUID^(a): CONTAINMENT ATMOSPHERE
 CONTAINMENT

General Design Criteria: 54, 56

VALVE TAG NO.: UNID	CVRMVAAA101	CVRMVAAA102
VALVE TYPE	BUTTERFLY	CHECK
VALVE OPERATOR ^(g)	PNEUMATIC	SELF
ACTUATION MODE ^(z) : PRIMARY	REMOTE MANUAL	NOT APPLICABLE
SECONDARY	MANUAL	NONE
VALVE POSITION ^(f) :		
NORMAL	CLOSED	NOT APPLICABLE
SHUTDOWN	CLOSED	NOT APPLICABLE
POST-ACCIDENT	CLOSED	NOT APPLICABLE
LOSS OF POWER TO ACTUATOR	CLOSED	NOT APPLICABLE
ACTUATION SIGNAL ^(e) :	HDP (OPENS)	NONE
MAXIMUM CLOSURE TIME (SEC.)	5	NOT APPLICABLE
LINE SIZE (INCH)	24	24
ESSENTIAL ^(d) :	YES	NOT APPLICABLE
FLOW DIRECTION ^(b) :	INFLUENT TO CONTAINMENT	INFLUENT TO CONTAINMENT
LOCATION REFERENCE TO CONTAINMENT ^(c) :	OUTSIDE	INSIDE
POWER SOURCE (AC/DC)	AC-SB	NONE
APPROXIMATE LENGTH OF PIPE (FT.-IN.) ^(h) :	0 – 6	NOT APPLICABLE
TYPE "C" TESTS ⁽ⁱ⁾ :	YES	YES
TEST ARRANGEMENT ^(o) :	4	4
SYSTEM	HEATING & VENTILATION VACUUM RELIEF	HEATING & VENTILATION VACUUM RELIEF
REMARKS	EQUIPPED WITH ACCUMULATOR	

← (DRN 99-2371)

TABLE 6.2-32 (SHEET 19 OF 85)

Revision 11 (05/01)

CONTAINMENT PENETRATIONS AND ISOLATION VALVES

→ (DRN 99-2371)

PENETRATION NO.: 13 TYPE^(j): STEEL CLASS: A2 VENTED/DRAINED FOR TYPE "A" TEST^(k): YES TYPE FLUID^(a): CONTAINMENT ATMOSPHERE
CONTAINMENT

General Design Criteria: 54, 56

VALVE TAG NO.: UNID	CVRMVAAA201	CVRMVAAA202
VALVE TYPE	BUTTERFLY	CHECK
VALVE OPERATOR ^(g)	PNEUMATIC	SELF
ACTUATION MODE ^(z) : PRIMARY	REMOTE MANUAL	NOT APPLICABLE
SECONDARY	MANUAL	NONE
VALVE POSITION ^(f) :		
NORMAL	CLOSED	NOT APPLICABLE
SHUTDOWN	CLOSED	NOT APPLICABLE
POST-ACCIDENT	CLOSED	NOT APPLICABLE
LOSS OF POWER TO ACTUATOR	CLOSED	NOT APPLICABLE
ACTUATION SIGNAL ^(e) :	HDP (OPENS)	NONE
MAXIMUM CLOSURE TIME (SEC.)	5	NOT APPLICABLE
LINE SIZE (INCH)	24	24
ESSENTIAL ^(d) :	YES	NOT APPLICABLE
FLOW DIRECTION ^(b) :	INFLUENT TO CONTAINMENT	INFLUENT TO CONTAINMENT
LOCATION REFERENCE TO CONTAINMENT ^(c) :	OUTSIDE	INSIDE
POWER SOURCE (AC/DC)	AC-SA	NONE
APPROXIMATE LENGTH OF PIPE (FT.-IN.) ^(h) :	0 – 6	NOT APPLICABLE
TYPE "C" TESTS ⁽ⁱ⁾ :	YES	YES
TEST ARRANGEMENT ^(o) :	4	4
SYSTEM	HEATING & VENTILATING VACUUM RELIEF	HEATING & VENTILATING VACUUM RELIEF
REMARKS	EQUIPPED WITH ACCUMULATOR	

← (DRN 99-2371)

CONTAINMENT PENETRATIONS AND ISOLATION VALVES

→ (DRN 99-2371)

PENETRATION NO.: 14 TYPE^(j): III CLASS: A1 VENTED/DRAINED FOR TYPE "A" TEST^(k): YES TYPE FLUID^(a): NITROGEN
 General Design Criteria: 54, 56

VALVE TAG NO.: UNID	NG MVAA157	NG MVAA158
VALVE TYPE	GLOBE	CHECK
VALVE OPERATOR ^(g)	PNEUMATIC	SELF
ACTUATION MODE ^(z) : PRIMARY	AUTOMATIC	NOT APPLICABLE
SECONDARY	REMOTE MANUAL	NONE
VALVE POSITION ^(f) :		
NORMAL	OPEN	NOT APPLICABLE
SHUTDOWN	OPEN	NOT APPLICABLE
POST-ACCIDENT	CLOSED	NOT APPLICABLE
LOSS OF POWER TO ACTUATOR	CLOSED	NOT APPLICABLE
ACTUATION SIGNAL ^(e) :	CIAS	NONE
MAXIMUM CLOSURE TIME (SEC.)	5	NOT APPLICABLE
LINE SIZE (INCH)	1	1
ESSENTIAL ^(d) :	NO	NOT APPLICABLE
FLOW DIRECTION ^(b) :	INFLUENT TO CONTAINMENT	INFLUENT TO CONTAINMENT
LOCATION REFERENCE TO CONTAINMENT ^(c) :	OUTSIDE	INSIDE
POWER SOURCE (AC/DC)	AC-SB	NONE
APPROXIMATE LENGTH OF PIPE (FT.-IN.) ^(h) :	24 – 10	NOT APPLICABLE
TYPE "C" TESTS ⁽ⁱ⁾ :	YES	YES
TEST ARRANGEMENT ^(o) :	7	7
SYSTEM	NITROGEN SYSTEM SUPPLY TO REACTOR BUILDING	NITROGEN SYSTEM SUPPLY TO REACTOR BUILDING

REMARKS

← (DRN 99-2371)

CONTAINMENT PENETRATIONS AND ISOLATION VALVES

→ (DRN 99-2371)

PENETRATION NO.: 15 TYPE^(j): III CLASS: C VENTED/DRAINED FOR TYPE "A" TEST^(k): NO⁽ⁿ⁾ TYPE FLUID^(a): DEMINERALIZED WATER
 General Design Criteria: 54, 57

VALVE TAG NO.:	UNID	CC MVA00807 B
VALVE TYPE		BUTTERFLY
VALVE OPERATOR ^(g)		PNEUMATIC
ACTUATION MODE ^(z) :	PRIMARY	MANUAL
	SECONDARY	NONE
VALVE POSITION ^(f) :		
NORMAL		OPEN
SHUTDOWN		OPEN
POST-ACCIDENT		OPEN
LOSS OF POWER TO ACTUATOR		OPEN
ACTUATION SIGNAL ^(e) :		SIAS (OPEN)
MAXIMUM CLOSURE TIME (SEC.)		NOT APPLICABLE
LINE SIZE (INCH)		8
ESSENTIAL ^(d) :		YES
FLOW DIRECTION ^(b) :		INFLUENT TO CONTAINMENT
LOCATION REFERENCE TO CONTAINMENT ^(c) :		OUTSIDE
POWER SOURCE (AC/DC)		AC-SB
APPROXIMATE LENGTH OF PIPE (FT.-IN.) ^(h) :		25 - 9
TYPE "C" TESTS ⁽ⁱ⁾ :		NO
TEST ARRANGEMENT ^(o) :		NOT APPLICABLE
SYSTEM		COMPONENT COOLING WATER INLET TO CONTAINMENT FAN COOLER UNITS

REMARKS
 ← (DRN 99-2371)

CONTAINMENT PENETRATIONS AND ISOLATION VALVES

→ (DRN 99-2371)

PENETRATION NO.: 16 TYPE^(j): III CLASS: C VENTED/DRAINED FOR TYPE "A" TEST^(k): NO⁽ⁿ⁾ TYPE FLUID^(a): DEMINERALIZED WATER
 General Design Criteria: 54, 57

VALVE TAG NO.: UNID	CC MVA00823 B
VALVE TYPE	BUTTERFLY
VALVE OPERATOR ^(g)	PNEUMATIC
ACTUATION MODE ^(z) : PRIMARY	MANUAL
SECONDARY	NONE
VALVE POSITION ^(f) :	
NORMAL	OPEN
SHUTDOWN	OPEN
POST-ACCIDENT	OPEN
LOSS OF POWER TO ACTUATOR	OPEN
ACTUATION SIGNAL ^(e) :	SIAS (OPEN)
MAXIMUM CLOSURE TIME (SEC.)	NOT APPLICABLE
LINE SIZE (INCH)	8
ESSENTIAL ^(d) :	YES
FLOW DIRECTION ^(b) :	EFFLUENT FROM CONTAINMENT
LOCATION REFERENCE TO CONTAINMENT ^(c) :	OUTSIDE
POWER SOURCE (AC/DC)	AC-SB
APPROXIMATE LENGTH OF PIPE (FT.-IN.) ^(h) :	29 - 9
TYPE "C" TESTS ⁽ⁱ⁾ :	NO
TEST ARRANGEMENT ^(o) :	NOT APPLICABLE
SYSTEM	COMPONENT COOLING WATER OUTLET FROM CONTAINMENT FAN COOLER UNITS

REMARKS
 ← (DRN 99-2371)

CONTAINMENT PENETRATIONS AND ISOLATION VALVES

→ (DRN 99-2371)

PENETRATION NO.: 17 TYPE^(j): III CLASS: C VENTED/DRAINED FOR TYPE "A" TEST^(k): NO⁽ⁿ⁾ TYPE FLUID^(a): DEMINERALIZED WATER
 General Design Criteria: 54, 57

VALVE TAG NO.:	UNID	CC MVA00823A
VALVE TYPE		BUTTERFLY
VALVE OPERATOR ^(g)		PNEUMATIC
ACTUATION MODE ^(z) :	PRIMARY	MANUAL
	SECONDARY	NONE
VALVE POSITION ^(f) :		
NORMAL		OPEN
SHUTDOWN		OPEN
POST-ACCIDENT		OPEN
LOSS OF POWER TO ACTUATOR		OPEN
ACTUATION SIGNAL ^(e) :		SIAS (OPEN)
MAXIMUM CLOSURE TIME (SEC.)		NOT APPLICABLE
LINE SIZE (INCH)		8
ESSENTIAL ^(d) :		YES
FLOW DIRECTION ^(b) :		EFFLUENT FROM CONTAINMENT
LOCATION REFERENCE TO CONTAINMENT ^(c) :		OUTSIDE
POWER SOURCE (AC/DC)		AC-SA
APPROXIMATE LENGTH OF PIPE (FT.-IN.) ^(h) :		19 - 6
TYPE "C" TESTS ⁽ⁱ⁾ :		NO
TEST ARRANGEMENT ^(o) :		NOT APPLICABLE
SYSTEM		COMPONENT COOLING WATER OUTLET FROM CONTAINMENT FAN COOLER UNITS

REMARKS
 ← (DRN 99-2371)

CONTAINMENT PENETRATIONS AND ISOLATION VALVES

→ (DRN 99-2371)

PENETRATION NO.: 18 TYPE^(j): III CLASS: C VENTED/DRAINED FOR TYPE "A" TEST^(k): NO⁽ⁿ⁾ TYPE FLUID^(a): DEMINERALIZED WATER
 General Design Criteria: 54, 57

VALVE TAG NO.:	UNID	CC MVA00807A
VALVE TYPE		BUTTERFLY
VALVE OPERATOR ^(g)		PNEUMATIC
ACTUATION MODE ^(z) :	PRIMARY	MANUAL
	SECONDARY	NONE
VALVE POSITION ^(f) :		
NORMAL		OPEN
SHUTDOWN		OPEN
POST-ACCIDENT		OPEN
LOSS OF POWER TO ACTUATOR		OPEN
ACTUATION SIGNAL ^(e) :		SIAS (OPEN)
MAXIMUM CLOSURE TIME (SEC.)		NOT APPLICABLE
LINE SIZE (INCH)		8
ESSENTIAL ^(d) :		YES
FLOW DIRECTION ^(b) :		INFLUENT TO CONTAINMENT
LOCATION REFERENCE TO CONTAINMENT ^(c) :		OUTSIDE
POWER SOURCE (AC/DC)		AC-SA
APPROXIMATE LENGTH OF PIPE (FT.-IN.) ^(h) :		19 - 6
TYPE "C" TESTS ⁽ⁱ⁾ :		NO
TEST ARRANGEMENT ^(o) :		NOT APPLICABLE
SYSTEM		COMPONENT COOLING WATER INLET TO CONTAINMENT FAN COOLER UNITS

REMARKS
 ← (DRN 99-2371)

CONTAINMENT PENETRATIONS AND ISOLATION VALVES

→ (DRN 99-2371)

PENETRATION NO.: 19 TYPE^(j): III CLASS: C VENTED/DRAINED FOR TYPE "A" TEST^(k): NO⁽ⁿ⁾ TYPE FLUID^(a): DEMINERALIZED WATER
 General Design Criteria: 54, 57

VALVE TAG NO.: UNID	CC MVA00822A
VALVE TYPE	BUTTERFLY
VALVE OPERATOR ^(g)	PNEUMATIC
ACTUATION MODE ^(z) : PRIMARY	MANUAL
SECONDARY	NONE
VALVE POSITION ^(f) :	
NORMAL	OPEN
SHUTDOWN	OPEN
POST-ACCIDENT	OPEN
LOSS OF POWER TO ACTUATOR	OPEN
ACTUATION SIGNAL ^(e) :	SIAS (OPENS)
MAXIMUM CLOSURE TIME (SEC.)	NOT APPLICABLE
LINE SIZE (INCH)	8
ESSENTIAL ^(d) :	YES
FLOW DIRECTION ^(b) :	EFFLUENT FROM CONTAINMENT
LOCATION REFERENCE TO CONTAINMENT ^(c) :	OUTSIDE
POWER SOURCE (AC/DC)	AC-SA
APPROXIMATE LENGTH OF PIPE (FT.-IN.) ^(h) :	19 - 8
TYPE "C" TESTS ⁽ⁱ⁾ :	NO
TEST ARRANGEMENT ^(o) :	NOT APPLICABLE
SYSTEM	COMPONENT COOLING WATER OUTLET FROM CONTAINMENT FAN COOLER UNITS

REMARKS
 ← (DRN 99-2371)

CONTAINMENT PENETRATIONS AND ISOLATION VALVES

→ (DRN 99-2371)

PENETRATION NO.: 20 TYPE^(j): III CLASS: C VENTED/DRAINED FOR TYPE "A" TEST^(k): NO⁽ⁿ⁾ TYPE FLUID^(a): DEMINERALIZED WATER
 General Design Criteria: 54, 57

VALVE TAG NO.:	UNID	CC MVA808A
VALVE TYPE		BUTTERFLY
VALVE OPERATOR ^(z)		PNEUMATIC
ACTUATION MODE ^(g) :	PRIMARY	MANUAL
	SECONDARY	NONE
VALVE POSITION ^(f) :		
NORMAL		OPEN
SHUTDOWN		OPEN
POST-ACCIDENT		OPEN
LOSS OF POWER TO ACTUATOR		OPEN
ACTUATION SIGNAL ^(e) :		SIAS (OPENS)
MAXIMUM CLOSURE TIME (SEC.)		NOT APPLICABLE
LINE SIZE (INCH)		8
ESSENTIAL ^(d) :		YES
FLOW DIRECTION ^(b) :		INFLUENT TO CONTAINMENT
LOCATION REFERENCE TO CONTAINMENT ^(c) :		OUTSIDE
POWER SOURCE (AC/DC)		AC-SA
APPROXIMATE LENGTH OF PIPE (FT.-IN.) ^(h) :		19 - 9
TYPE "C" TESTS ⁽ⁱ⁾ :		NO
TEST ARRANGEMENT ^(o) :		NOT APPLICABLE
SYSTEM		COMPONENT COOLING WATER INLET TO CONTAINMENT FAN COOLER UNITS

REMARKS
 ← (DRN 99-2371)

CONTAINMENT PENETRATIONS AND ISOLATION VALVES

→ (DRN 99-2371)

PENETRATION NO.: 21 TYPE^(j): III CLASS: C VENTED/DRAINED FOR TYPE "A" TEST^(k): NO⁽ⁿ⁾ TYPE FLUID^(a): DEMINERALIZED WATER
 General Design Criteria: 54, 57

VALVE TAG NO.:	UNID	CC MVA808B
VALVE TYPE		BUTTERFLY
VALVE OPERATOR ^(g)		PNEUMATIC
ACTUATION MODE ^(z) :	PRIMARY	MANUAL
	SECONDARY	NONE
VALVE POSITION ^(f) :		
NORMAL		OPEN
SHUTDOWN		OPEN
POST-ACCIDENT		OPEN
LOSS OF POWER TO ACTUATOR		OPEN
ACTUATION SIGNAL ^(e) :		SIAS (OPENS)
MAXIMUM CLOSURE TIME (SEC.)		NOT APPLICABLE
LINE SIZE (INCH)		8
ESSENTIAL ^(d) :		YES
FLOW DIRECTION ^(b) :		INFLUENT TO CONTAINMENT
LOCATION REFERENCE TO CONTAINMENT ^(c) :		OUTSIDE
POWER SOURCE (AC/DC)		AC-SB
APPROXIMATE LENGTH OF PIPE (FT.-IN.) ^(h) :		19 - 6
TYPE "C" TESTS ⁽ⁱ⁾ :		NO
TEST ARRANGEMENT ^(o) :		NOT APPLICABLE
SYSTEM		COMPONENT COOLING WATER INLET TO CONTAINMENT FAN COOLER UNITS

REMARKS
 ← (DRN 99-2371)

CONTAINMENT PENETRATIONS AND ISOLATION VALVES

→ (DRN 99-2371)

PENETRATION NO.: 22 TYPE^(j): III CLASS: C VENTED/DRAINED FOR TYPE "A" TEST^(k): NO⁽ⁿ⁾ TYPE FLUID^(a): DEMINERALIZED WATER
 General Design Criteria: 54, 57

VALVE TAG NO.: UNID	CC MVA00822B
VALVE TYPE	BUTTERFLY
VALVE OPERATOR ^(g)	PNEUMATIC
ACTUATION MODE ^(z) : PRIMARY	MANUAL
SECONDARY	NONE
VALVE POSITION ^(f) :	
NORMAL	OPEN
SHUTDOWN	OPEN
POST-ACCIDENT	OPEN
LOSS OF POWER TO ACTUATOR	OPEN
ACTUATION SIGNAL ^(e) :	SIAS (OPENS)
MAXIMUM CLOSURE TIME (SEC.)	NOT APPLICABLE
LINE SIZE (INCH)	8
ESSENTIAL ^(d) :	YES
FLOW DIRECTION ^(b) :	EFFLUENT FROM CONTAINMENT
LOCATION REFERENCE TO CONTAINMENT ^(c) :	OUTSIDE
POWER SOURCE (AC/DC)	AC-SB
APPROXIMATE LENGTH OF PIPE (FT.-IN.) ^(h) :	19 - 6
TYPE "C" TESTS ⁽ⁱ⁾ :	NO
TEST ARRANGEMENT ^(o) :	NOT APPLICABLE
SYSTEM	COMPONENT COOLING WATER OUTLET FROM CONTAINMENT FAN COOLER UNITS

REMARKS
 ← (DRN 99-2371)

CONTAINMENT PENETRATIONS AND ISOLATION VALVES

→ (DRN 99-2371, R11)

PENETRATION NO.: 23 TYPE^(j): III CLASS: C VENTED/DRAINED FOR TYPE "A" TEST^(k): NO⁽ⁿ⁾ TYPE FLUID^(a): DEMINERALIZED WATER

General Design Criteria: 54, 56

VALVE TAG NO.: UNID	CC MVA00641	CC MVA00644
VALVE TYPE	BUTTERFLY	CHECK
VALVE OPERATOR ^(g)	PNEUMATIC	SELF
ACTUATION MODE ^(z) : PRIMARY	AUTOMATIC*	NOT APPLICABLE
SECONDARY	REMOTE MANUAL	NOT APPLICABLE
VALVE POSITION ^(f) :		
NORMAL	OPEN	NOT APPLICABLE
SHUTDOWN	OPEN	NOT APPLICABLE
POST-ACCIDENT	CLOSED/OPEN	NOT APPLICABLE
LOSS OF POWER TO ACTUATOR	OPEN ^(s)	NOT APPLICABLE
ACTUATION SIGNAL ^(e) :	CSAS ^(q)	NONE
→(DRN 03-169, R13) MAXIMUM / MINIMUM CLOSURE TIME (SEC) ←(DRN 03-169, R13)	≤ 50.0 / ≥ 5.0	NOT APPLICABLE
LINE SIZE (INCH)	10	10
ESSENTIAL ^(d) :	NO	NOT APPLICABLE
FLOW DIRECTION ^(b) :	INFLUENT TO CONTAINMENT	INFLUENT TO CONTAINMENT
LOCATION REFERENCE TO CONTAINMENT ^(c) :	OUTSIDE	INSIDE
POWER SOURCE (AC/DC)	DC-SB	NONE
APPROXIMATE LENGTH OF PIPE (FT.-IN.) ^(h) :	25 – 0	NOT APPLICABLE
TYPE "C" TESTS ⁽ⁱ⁾ :	YES	YES
TEST ARRANGEMENT ^(o) :	1	1
SYSTEM	COMPONENT COOLING WATER INLET TO REACTOR COOLANT PUMPS AND CEDM COOLER	COMPONENT COOLING WATER INLET TO REACTOR COOLANT PUMPS AND CEDM COOLER

REMARKS

* A CSAS IS CONSIDERED A CONTAINMENT ISOLATION SIGNAL FOR THE PURPOSES OF ACTUATION MODE.

← (DRN 99-2371, R11)

CONTAINMENT PENETRATIONS AND ISOLATION VALVES

→ (DRN 99-2371, R11)

PENETRATION NO.: 24 TYPE^(j): III CLASS: C VENTED/DRAINED FOR TYPE "A" TEST^(k): NO⁽ⁿ⁾ TYPE FLUID^(a): DEMINERALIZED WATER

General Design Criteria: 54, 56

→ (DRN 00-1162, R10)

VALVE TAG NO.:	UNID	CC MVA713	CC MVA710	CCMVA7102
VALVE TYPE	BUTTERFLY	BUTTERFLY	BUTTERFLY	RELIEF
VALVE OPERATOR ^(g)	PNEUMATIC	PNEUMATIC	PNEUMATIC	SELF
ACTUATION MODE ^(z) :	PRIMARY	AUTOMATIC*	AUTOMATIC*	N/A
	SECONDARY	REMOTE MANUAL	REMOTE MANUAL	
VALVE POSITION ^(f) :				
NORMAL	OPEN	OPEN	OPEN	CLOSED
SHUTDOWN	OPEN	OPEN	OPEN	CLOSED
POST-ACCIDENT	CLOSED/OPEN	CLOSED/OPEN	CLOSED/OPEN	OPEN/CLOSED
LOSS OF POWER TO ACTUATOR	OPEN ^(s)	OPEN ^(s)	OPEN ^(s)	N/A
ACTUATION SIGNAL ^(e) :	CSAS ^(q)	CSAS ^(q)	CSAS ^(q)	N/A
→ (DRN 03-169, R13)				
MAXIMUM / MINIMUM CLOSURE TIME (SEC)	≤ 50.0 / ≥ 5.0	≤ 50.0 / ≥ 5.0	≤ 50.0 / ≥ 5.0	N/A
← (DRN 03-169, R13)				
LINE SIZE (INCH)	10	10	10	½"
ESSENTIAL ^(d) :	NO	NO	NO	YES
FLOW DIRECTION ^(b) :	EFFLUENT FROM CONTAINMENT	EFFLUENT FROM CONTAINMENT	EFFLUENT FROM CONTAINMENT	EFFLUENT FROM CONTAINMENT
LOCATION REFERENCE TO CONTAINMENT ^(c) :	OUTSIDE	INSIDE	INSIDE	INSIDE
POWER SOURCE (AC/DC)	DC-SB	DC-SA	DC-SA	N/A
APPROXIMATE LENGTH OF PIPE (FT.-IN.) ^(h) :	28 – 3	NOT APPLICABLE	NOT APPLICABLE	4"
TYPE "C" TESTS ⁽ⁱ⁾ :	YES	YES	YES	YES
TEST ARRANGEMENT ^(o) :	3	3	3	3
SYSTEM	COMPONENT COOLING WATER OUTLET FROM REACTOR COOLANT PUMPS AND CEDM COOLER	COMPONENT COOLING WATER OUTLET FROM REACTOR COOLANT PUMPS AND CEDM COOLER	COMPONENT COOLING WATER OUTLET FROM REACTOR COOLANT PUMPS AND CEDM COOLER	COMPONENT COOLING WATER OUTLET FROM REACTOR COOLANT PUMPS AND CEDM COOLER

← (DRN 00-1162, R10)

REMARKS

* A CSAS IS CONSIDERED A CONTAINMENT ISOLATION SIGNAL FOR THE PURPOSES OF ACTUATION MODE.

← (DRN 99-2371, R11)

CONTAINMENT PENETRATIONS AND ISOLATION VALVES

→ (DRN 99-2371)

PENETRATION NO.: 25 TYPE^(j): VI CLASS: ** VENTED/DRAINED FOR TYPE "A" TEST^(k): _____ TYPE FLUID^(a): FUEL TRANSFER TUBE
 General Design Criteria: Not Applicable

VALVE TAG NO.: UNID	BLIND FLANGE
VALVE TYPE	DOUBLE SEALED FLANGE
VALVE OPERATOR ^(g)	NOT APPLICABLE
ACTUATION MODE ^(z) : PRIMARY	NOT APPLICABLE
SECONDARY	NOT APPLICABLE
VALVE POSITION ^(f) :	
NORMAL	NOT APPLICABLE
SHUTDOWN	NOT APPLICABLE
POST-ACCIDENT	NOT APPLICABLE
LOSS OF POWER TO ACTUATOR	NOT APPLICABLE
ACTUATION SIGNAL ^(e) :	NONE
MAXIMUM CLOSURE TIME (SEC.)	NOT APPLICABLE
LINE SIZE (INCH)	36
ESSENTIAL ^(d) :	NO
FLOW DIRECTION ^(b) :	NOT APPLICABLE
LOCATION REFERENCE TO CONTAINMENT ^(c) :	INSIDE
POWER SOURCE (AC/DC)	NONE
APPROXIMATE LENGTH OF PIPE (FT.-IN.) ^(h) :	NOT APPLICABLE
TYPE "C" TESTS ⁽ⁱ⁾ :	NO
TEST ARRANGEMENT ^(o) :	NOT APPLICABLE
SYSTEM	FUEL TRANSFER CONTAINMENT AND FUEL HANDLING BUILDING
REMARKS	

** THE DOUBLE SEALED BLIND FLANGE WHEN INSTALLED IS CONSIDERED PART OF THE CONTAINMENT PRESSURE BOUNDARY.

← (DRN 99-2371)

TABLE 6.2-32 (SHEET 32 OF 85)

Revision 11 (05/01)

CONTAINMENT PENETRATIONS AND ISOLATION VALVES

→ (DRN 99-2371)
 PENETRATION NO.: 26 TYPE^(j): III CLASS: B1 VENTED/DRAINED FOR TYPE "A" TEST^(k): YES TYPE FLUID^(a): BORATED WATER
 General Design Criteria: 54, 55

→ (DRN 00-1162)				
VALVE TAG NO.:	UNID	CVCMVAAA109	CVCMVAAA103	CVCMVAAA1081
VALVE TYPE		GLOBE	GLOBE	RELIEF
VALVE OPERATOR ^(g)		PNEUMATIC	PNEUMATIC	SELF
ACTUATION MODE ^(z) :	PRIMARY	AUTOMATIC	AUTOMATIC	N/A
	SECONDARY	REMOTE MANUAL	REMOTE MANUAL	
VALVE POSITION ^(f) :				
NORMAL		OPEN	OPEN	CLOSED
SHUTDOWN		OPEN	OPEN	CLOSED
POST-ACCIDENT		CLOSED/OPEN	CLOSED/OPEN	OPEN/CLOSED
LOSS OF POWER TO ACTUATOR		CLOSED	CLOSED	N/A
ACTUATION SIGNAL ^(e) :		CIAS ^(q)	CIAS ^(q) /SIAS ^(q)	N/A
MAXIMUM CLOSURE TIME (SEC.)		10	10	N/A
LINE SIZE (INCH)		2	2	1"
ESSENTIAL ^(d) :		NO	NO	YES
FLOW DIRECTION ^(b) :		EFFLUENT FROM CONTAINMENT	EFFLUENT FROM CONTAINMENT	EFFLUENT FROM CONTAINMENT
LOCATION REFERENCE TO CONTAINMENT ^(c) :		OUTSIDE	INSIDE	INSIDE
POWER SOURCE (AC/DC)		AC-SA	AC-SB	N/A
APPROXIMATE LENGTH OF PIPE (FT.-IN.) ^(h) :		17 – 9	NOT APPLICABLE	4"
TYPE "C" TESTS ⁽ⁱ⁾ :		YES	YES	YES
TEST ARRANGEMENT ^(o) :		3	3	3
SYSTEM		CHEMICAL & VOLUME CONTROL LETDOWN LINE	CHEMICAL & VOLUME CONTROL LETDOWN LINE	CHEMICAL & VOLUME CONTROL LETDOWN LINE

← (DRN 00-1162)

REMARKS

← (DRN 99-2371)

TABLE 6.2-32 (SHEET 33 OF 85)

Revision 11 (05/01)

CONTAINMENT PENETRATIONS AND ISOLATION VALVES

→ (DRN 99-2371)

PENETRATION NO.: 27 TYPE^(j): III CLASS: D VENTED/DRAINED FOR TYPE "A" TEST^(k): NO^(l) TYPE FLUID^(a): BORATED WATER
 General Design Criteria: 54, 55

VALVE TAG NO.: UNID	CVCMVAAA209	CVCISV0216 A	CVCISV0216 B	CVCISV0218 B
VALVE TYPE	GATE	GLOBE	GLOBE	GLOBE
VALVE OPERATOR ^(g)	PNEUMATIC	SOLENOID	SOLENOID	SOLENOID
ACTUATION MODE ^(z) : PRIMARY	REMOTE MANUAL	REMOTE MANUAL	REMOTE MANUAL	REMOTE MANUAL
SECONDARY	MANUAL	NONE	NONE	NONE
VALVE POSITION ^(f) :				
NORMAL	LOCKED OPEN	LOCKED CLOSED	LOCKED CLOSED	OPEN
SHUTDOWN	OPEN	CLOSED	CLOSED	OPEN
POST-ACCIDENT	OPEN	CLOSED/OPEN	CLOSED/OPEN	OPEN
LOSS OF POWER TO ACTUATOR	OPEN	CLOSED	CLOSED	CLOSED
ACTUATION SIGNAL ^(e) :	NONE	NONE	NONE	NONE
→(DRN-99-2461)				
MAXIMUM CLOSURE TIME (SEC.)	<10	<5	<5	<5
LINE SIZE (INCH)	2	2	2	2
ESSENTIAL ^(d) :	YES ^(t)	YES	YES	YES
FLOW DIRECTION ^(b) :	INFLUENT TO CONTAINMENT	INFLUENT TO CONTAINMENT	INFLUENT TO CONTAINMENT	INFLUENT TO CONTAINMENT
LOCATION REFERENCE TO CONTAINMENT ^(c) :	OUTSIDE	INSIDE	INSIDE	INSIDE
POWER SOURCE (AC/DC)	DC – SAB	AC-SA	AC-SB	AC-SB
APPROXIMATE LENGTH OF PIPE (FT.-IN.) ^(h) :	13 – 0	NOT APPLICABLE	NOT APPLICABLE	NOT APPLICABLE
TYPE "C" TESTS ⁽ⁱ⁾ :	NO	NO	NO	NO
TEST ARRANGEMENT ^(o) :	NOT APPLICABLE	NOT APPLICABLE	NOT APPLICABLE	NOT APPLICABLE
SYSTEM CONTROL	CHEMICAL & VOLUME CONTROL CHARGING LINE	CHEMICAL & VOLUME CONTROL CHARGING LINE	CHEMICAL & VOLUME CONTROL CHARGING LINE	CHEMICAL & VOLUME CONTROL CHARGING LINE
REMARKS				

* REMOTE MANUAL CAPACITY EXISTS TO CLOSE THE VALVE BUT NOT TO OPEN IT.

← (DRN 99-2461; 99-2371)

CONTAINMENT PENETRATIONS AND ISOLATION VALVES

→ (DRN 99-2371)

PENETRATION NO.: 27 (CONTINUED) TYPE^(j): III CLASS: D VENTED/DRAINED FOR TYPE "A" TEST^(k): NO^(l) TYPE FLUID^(a): BORATED WATER
 General Design Criteria: 54, 55

VALVE TAG NO.:	UNID	CVC ISV0218A	CVC MVA00219
VALVE TYPE		GLOBE	CHECK
VALVE OPERATOR ^(g)		SOLENOID	SELF
ACTUATION MODE ^(z) :	PRIMARY	REMOTE MANUAL	NOT APPLICABLE
	SECONDARY	NONE	NONE
VALVE POSITION ^(f) :			
NORMAL		OPEN	NOT APPLICABLE
SHUTDOWN		OPEN	NOT APPLICABLE
POST-ACCIDENT		OPEN	NOT APPLICABLE
LOSS OF POWER TO ACTUATOR		CLOSED	NOT APPLICABLE
ACTUATION SIGNAL ^(e) :		NONE	NONE
→ (DRN99-2461)			
MAXIMUM CLOSURE TIME (SEC.)		<5	NOT APPLICABLE
LINE SIZE (INCH)		2	2
ESSENTIAL ^(d) :		YES	NOT APPLICABLE
FLOW DIRECTION ^(b) :		INFLUENT TO CONTAINMENT	INFLUENT TO CONTAINMENT
LOCATION REFERENCE TO CONTAINMENT ^(c) :		INSIDE	INSIDE
POWER SOURCE (AC/DC)		AC-SA	NONE
APPROXIMATE LENGTH OF PIPE (FT.-IN.) ^(h) :		NOT APPLICABLE	NOT APPLICABLE
TYPE "C" TESTS ⁽ⁱ⁾ :		NO	NO
TEST ARRANGEMENT ^(o) :		NOT APPLICABLE	NOT APPLICABLE
SYSTEM		CHEMICAL & VOLUME CONTROL CHARGING LINE	CHEMICAL & VOLUME CONTROL CHARGING LINE

REMARKS

← (DRN 99-2461; 99-2371)

TABLE 6.2-32 (SHEET 35 OF 85)

Revision 11 (05/01)

CONTAINMENT PENETRATIONS AND ISOLATION VALVES

→ (DRN 99-2371)

PENETRATION NO.: 28 TYPE^(j): III CLASS: B1 VENTED/DRAINED FOR TYPE "A" TEST^(k): YES TYPE FLUID^(a): PRIMARY COOLANT
 General Design Criteria: 54, 55

VALVE TAG NO.: UNID	PSLMVAAA107	PSLMVAAA105
VALVE TYPE	GLOBE	GLOBE
VALVE OPERATOR ^(g)	PNEUMATIC	PNEUMATIC
ACTUATION MODE ^(z) : PRIMARY	AUTOMATIC	AUTOMATIC
SECONDARY	REMOTE MANUAL	REMOTE MANUAL
VALVE POSITION ^(f) :		
NORMAL	OPEN	OPEN
SHUTDOWN	OPEN	OPEN
POST-ACCIDENT	CLOSED/OPEN	CLOSED/OPEN
LOSS OF POWER TO ACTUATOR	CLOSED	CLOSED
ACTUATION SIGNAL ^(e) :	CIAS ^(q)	CIAS ^(q)
MAXIMUM CLOSURE TIME (SEC.)	10	10
LINE SIZE (INCH)	½	½
ESSENTIAL ^(d) :	NO	NO
FLOW DIRECTION ^(b) :	EFFLUENT FROM CONTAINMENT	EFFLUENT FROM CONTAINMENT
LOCATION REFERENCE TO CONTAINMENT ^(c) :	OUTSIDE	INSIDE
POWER SOURCE (AC/DC)	AC-SA	AC-SB
APPROXIMATE LENGTH OF PIPE (FT.-IN.) ^(h) :	26 – 6	NOT APPLICABLE
TYPE "C" TESTS ⁽ⁱ⁾ :	YES	YES
TEST ARRANGEMENT ^(o) :	3	3
SYSTEM	SAMPLING LINE FROM REACTOR COOLANT LINE	SAMPLING LINE FROM REACTOR COOLANT LINE

REMARKS
 ← (DRN 99-2371)

TABLE 6.2-32 (SHEET 36 OF 85)

Revision 11 (05/01)

CONTAINMENT PENETRATIONS AND ISOLATION VALVES

→ (DRN 99-2371)

PENETRATION NO.: 29 TYPE^(j): III CLASS: B1 VENTED/DRAINED FOR TYPE "A" TEST^(k): YES TYPE FLUID^(a): PRIMARY COOLANT
 General Design Criteria: 54, 55

VALVE TAG NO.: UNID	PSLMVAAA204	PSLMVAAA203
VALVE TYPE	GLOBE	GLOBE
VALVE OPERATOR ^(g)	PNEUMATIC	PNEUMATIC
ACTUATION MODE ^(z) : PRIMARY	AUTOMATIC	AUTOMATIC
SECONDARY	REMOTE MANUAL	REMOTE MANUAL
VALVE POSITION ^(f) :		
NORMAL	OPEN	OPEN
SHUTDOWN	OPEN	OPEN
POST-ACCIDENT	CLOSED/OPEN	CLOSED/OPEN
LOSS OF POWER TO ACTUATOR	CLOSED	CLOSED
ACTUATION SIGNAL ^(e) :	CIAS ^(q)	CIAS ^(q)
MAXIMUM CLOSURE TIME (SEC.)	10	10
LINE SIZE (INCH)	½	½
ESSENTIAL ^(d) :	NO	NO
FLOW DIRECTION ^(b) :	EFFLUENT FROM CONTAINMENT	EFFLUENT FROM CONTAINMENT
LOCATION REFERENCE TO CONTAINMENT ^(c) :	OUTSIDE	INSIDE
POWER SOURCE (AC/DC)	AC-SA	AC-SB
APPROXIMATE LENGTH OF PIPE (FT.-IN.) ^(h) :	26 – 6	NOT APPLICABLE
TYPE "C" TESTS ⁽ⁱ⁾ :	YES	YES
TEST ARRANGEMENT ^(o) :	3	3
SYSTEM	SAMPLING LINE FROM PRESSURIZER SURGE LINE	SAMPLING LINE FROM PRESSURIZER SURGE LINE

REMARKS

← (DRN 99-2371)

TABLE 6.2-32 (SHEET 37 OF 85)

Revision 11 (05/01)

CONTAINMENT PENETRATIONS AND ISOLATION VALVES

→ (DRN 99-2371)

PENETRATION NO.: 30 TYPE^(j): III CLASS: B1 VENTED/DRAINED FOR TYPE "A" TEST^(k): YES TYPE FLUID^(a): PRIMARY COOLANT
 General Design Criteria: 54, 55

VALVE TAG NO.: UNID	PSLMVAAA304	PSLMVAAA303
VALVE TYPE	GLOBE	GLOBE
VALVE OPERATOR ^(g)	PNEUMATIC	PNEUMATIC
ACTUATION MODE ^(z) : PRIMARY	AUTOMATIC	AUTOMATIC
SECONDARY	REMOTE MANUAL	REMOTE MANUAL
VALVE POSITION ^(f) :		
NORMAL	OPEN	OPEN
SHUTDOWN	OPEN	OPEN
POST-ACCIDENT	CLOSED/OPEN	CLOSED/OPEN
LOSS OF POWER TO ACTUATOR	CLOSED	CLOSED
ACTUATION SIGNAL ^(e) :	CIAS ^(q)	CIAS ^(q)
MAXIMUM CLOSURE TIME (SEC.)	10	10
LINE SIZE (INCH)	½	½
ESSENTIAL ^(d) :	NO	NO
FLOW DIRECTION ^(b) :	EFFLUENT FROM CONTAINMENT	EFFLUENT FROM CONTAINMENT
LOCATION REFERENCE TO CONTAINMENT ^(c) :	OUTSIDE	INSIDE
POWER SOURCE (AC/DC)	AC-SA	AC-SB
APPROXIMATE LENGTH OF PIPE (FT.-IN.) ^(h) :	24 - 9	NOT APPLICABLE
TYPE "C" TESTS ⁽ⁱ⁾ :	YES	YES
TEST ARRANGEMENT ^(o) :	3	3
SYSTEM	SAMPLING LINE FROM PRESSURIZER STEAM SPACE	SAMPLING LINE FROM PRESSURIZER STEAM SPACE

REMARKS

← (DRN 99-2371)

CONTAINMENT PENETRATIONS AND ISOLATION VALVES

→ (DRN 99-2371)

PENETRATION NO.: 31 TYPE^(j): III CLASS: A1 VENTED/DRAINED FOR TYPE "A" TEST^(k): YES TYPE FLUID^(a): WASTE GAS
 General Design Criteria: 54, 56

VALVE TAG NO.: UNID	GWMMVAAA105	GWMMVAAA104
VALVE TYPE	DIAPHRAGM	DIAPHRAGM
VALVE OPERATOR ^(g)	PNEUMATIC	PNEUMATIC
ACTUATION MODE ^(z) : PRIMARY	AUTOMATIC	AUTOMATIC
SECONDARY	REMOTE MANUAL	REMOTE MANUAL
VALVE POSITION ^(f) :		
NORMAL	OPEN	OPEN
SHUTDOWN	OPEN	OPEN
POST-ACCIDENT	CLOSED	CLOSED
LOSS OF POWER TO ACTUATOR	CLOSED	CLOSED
ACTUATION SIGNAL ^(e) :	CIAS	CIAS
MAXIMUM CLOSURE TIME (SEC.)	7	7
LINE SIZE (INCH)	1	1
ESSENTIAL ^(d) :	NO	NO
FLOW DIRECTION ^(b) :	EFFLUENT FROM CONTAINMENT	EFFLUENT FROM CONTAINMENT
LOCATION REFERENCE TO CONTAINMENT ^(c) :	OUTSIDE	INSIDE
POWER SOURCE (AC/DC)	AC-SA	AC-SB
APPROXIMATE LENGTH OF PIPE (FT.-IN.) ^(h) :	24 - 9	NOT APPLICABLE
TYPE "C" TESTS ⁽ⁱ⁾ :	YES	YES
TEST ARRANGEMENT ^(o) :	3	3
SYSTEM	WASTE MANAGEMENT FROM CONTAINMENT VENT HEADER	WASTE MANAGEMENT FROM CONTAINMENT VENT HEADER

REMARKS

← (DRN 99-2371)

CONTAINMENT PENETRATIONS AND ISOLATION VALVES

→ (DRN 99-2371)

PENETRATION NO.: 32 TYPE^(j): IV CLASS: D VENTED/DRAINED FOR TYPE "A" TEST^(k): NO^(m) TYPE FLUID^(a): BORATED WATER
 General Design Criteria: 54, 56

VALVE TAG NO.:	UNID	SI MVA00602 A
VALVE TYPE		BUTTERFLY
VALVE OPERATOR ^(g)		ELECTRIC
ACTUATION MODE ^(z) :	PRIMARY	REMOTE MANUAL
	SECONDARY	MANUAL
VALVE POSITION ^(f) :		
NORMAL		CLOSED
SHUTDOWN		CLOSED
POST-ACCIDENT		OPEN
LOSS OF POWER TO ACTUATOR		AS IS
ACTUATION SIGNAL ^(e) :		SIAS(CLOSE)/RAS(OPEN)
MAXIMUM CLOSURE TIME (SEC.)		35*
LINE SIZE (INCH)		24
ESSENTIAL ^(d) :		YES
FLOW DIRECTION ^(b) :		EFFLUENT FROM CONTAINMENT
LOCATION REFERENCE TO CONTAINMENT ^(c) :		OUTSIDE
POWER SOURCE (AC/DC)		AC-SA
APPROXIMATE LENGTH OF PIPE (FT.-IN.) ^(h) :		6 - 0
TYPE "C" TESTS ⁽ⁱ⁾ :		NO
TEST ARRANGEMENT ^(o) :		NOT APPLICABLE
SYSTEM		SAFETY INJECTION FROM SIS SUMP
REMARKS		

* NOMINAL STROKE TIME IS 25 SECONDS, MAXIMUM IS 35 SECONDS.

← (DRN 99-2371)

CONTAINMENT PENETRATIONS AND ISOLATION VALVES

→ (DRN 99-2371)

PENETRATION NO.: 33 TYPE^(j): IV CLASS: D VENTED/DRAINED FOR TYPE "A" TEST^(k): NO^(m) TYPE FLUID^(a): BORATED WATER
 General Design Criteria: 54, 56

VALVE TAG NO.:	UNID	SI MVA00602 B
VALVE TYPE		BUTTERFLY
VALVE OPERATOR ^(g)		ELECTRIC
ACTUATION MODE ^(z) :	PRIMARY	REMOTE MANUAL
	SECONDARY	MANUAL
VALVE POSITION ^(f) :		
NORMAL		CLOSED
SHUTDOWN		CLOSED
POST-ACCIDENT		OPEN
LOSS OF POWER TO ACTUATOR		AS IS
ACTUATION SIGNAL ^(e) :		SIAS(CLOSE)/RAS(OPEN)
MAXIMUM CLOSURE TIME (SEC.)		35*
LINE SIZE (INCH)		24
ESSENTIAL ^(d) :		YES
FLOW DIRECTION ^(b) :		EFFLUENT FROM CONTAINMENT
LOCATION REFERENCE TO CONTAINMENT ^(c) :		OUTSIDE
POWER SOURCE (AC/DC)		AC-SB
APPROXIMATE LENGTH OF PIPE (FT.-IN.) ^(h) :		6 - 0
TYPE "C" TESTS ⁽ⁱ⁾ :		NO
TEST ARRANGEMENT ^(o) :		NOT APPLICABLE
SYSTEM		SAFETY INJECTION FROM SIS SUMP

REMARKS

* NOMINAL STROKE TIME IS 25 SECONDS, MAXIMUM IS 35 SECONDS.

← (DRN 99-2371)

CONTAINMENT PENETRATIONS AND ISOLATION VALVES

→ (DRN 99-2371)

PENETRATION NO.: 34 A & B TYPE^(j): II CLASS: D VENTED/DRAINED FOR TYPE "A" TEST^(k): NO^(m) TYPE FLUID^(a): BORATED WATER
(MODIFIED)

General Design Criteria: 54, 56

VALVE TAG NO.: UNID	CS MVA00125 A	CS ISV0129 A	CS MVA00128 A
VALVE TYPE	GATE	GLOBE	CHECK
VALVE OPERATOR ^(g)	PNEUMATIC	SOLENOID	SELF
ACTUATION MODE ^(z) : PRIMARY	REMOTE MANUAL	REMOTE MANUAL**	NOT APPLICABLE
SECONDARY	MANUAL	NONE	NONE
VALVE POSITION ^(f) :			
NORMAL	CLOSED	CLOSED/OPEN	NOT APPLICABLE
SHUTDOWN	CLOSED	CLOSED/OPEN	NOT APPLICABLE
POST-ACCIDENT	OPEN	CLOSED	NOT APPLICABLE
LOSS OF POWER TO ACTUATOR	OPEN	CLOSED	NOT APPLICABLE
ACTUATION SIGNAL ^(e) :	CSAS(OPEN)	NONE	NONE
MAXIMUM CLOSURE TIME (SEC.)	NOT APPLICABLE	NOT APPLICABLE	NOT APPLICABLE
LINE SIZE (INCH)	10	½	10
ESSENTIAL ^(d) :	YES	NO	NOT APPLICABLE
FLOW DIRECTION ^(b) :	INFLUENT TO CONTAINMENT	INFLUENT TO CONTAINMENT	INFLUENT TO CONTAINMENT
LOCATION REFERENCE TO CONTAINMENT ^(c) :	OUTSIDE	INSIDE	INSIDE
POWER SOURCE (AC/DC)	DC-SA	AC-SA	NONE
APPROXIMATE LENGTH OF PIPE (FT.-IN.) ^(h) :	214 – 11	NOT APPLICABLE	NOT APPLICABLE
TYPE "C" TESTS ⁽ⁱ⁾ :	NO	NO	NO
TEST ARRANGEMENT ^(o) :	NOT APPLICABLE	NOT APPLICABLE	NOT APPLICABLE
SYSTEM	CONTAINMENT SPRAY	CONTAINMENT SPRAY	CONTAINMENT SPRAY
REMARKS		*	

* DURING RECIRCULATION MODE, CONTAINMENT WATER LEVEL IS ABOVE ELEVATION OF VALVES 2CS-F305A AND 2CS-F306B, THEREFORE, IF THESE VALVES ARE CLOSED POST-LOCA, A WATER SEAL WILL BE PROVIDED UP VALVES F305A AND F306B. SEE ALSO NOTE ^(m).

**CONTROL SWITCH AT LOCAL STATION.

← (DRN 99-2371)

CONTAINMENT PENETRATIONS AND ISOLATION VALVES

→ (DRN 99-2371)

PENETRATION NO.: 35 A & B TYPE^(j): II CLASS: D VENTED/DRAINED FOR TYPE "A" TEST^(k): NO^(m) TYPE FLUID^(a): BORATED WATER
(MODIFIED)

General Design Criteria: 54, 56

VALVE TAG NO.: UNID	CS MVA00125B	CS ISV0129 B	CS MVA00128 B
VALVE TYPE	GATE	GLOBE	CHECK
VALVE OPERATOR ^(g)	PNEUMATIC	SOLENOID	SELF
ACTUATION MODE ^(z) : PRIMARY	REMOTE MANUAL	REMOTE MANUAL **	NOT APPLICABLE
SECONDARY	MANUAL	NONE	NONE
VALVE POSITION ^(f) :			
NORMAL	CLOSED	CLOSED/OPEN	NOT APPLICABLE
SHUTDOWN	CLOSED	CLOSED/OPEN	NOT APPLICABLE
POST-ACCIDENT	OPEN	CLOSED	NOT APPLICABLE
LOSS OF POWER TO ACTUATOR	OPEN	CLOSED	NOT APPLICABLE
ACTUATION SIGNAL ^(e) :	CSAS(OPEN)	NONE	NONE
MAXIMUM CLOSURE TIME (SEC.)	NOT APPLICABLE	NOT APPLICABLE	NOT APPLICABLE
LINE SIZE (INCH)	10	½	10
ESSENTIAL ^(d) :	YES	NO	NOT APPLICABLE
FLOW DIRECTION ^(b) :	INFLUENT TO CONTAINMENT	INFLUENT TO CONTAINMENT	INFLUENT TO CONTAINMENT
LOCATION REFERENCE TO CONTAINMENT ^(c) :	OUTSIDE	INSIDE	INSIDE
POWER SOURCE (AC/DC)	DC-SB	AC-SB	NONE
APPROXIMATE LENGTH OF PIPE (FT.-IN.) ^(h) :	193 – 9	NOT APPLICABLE	NOT APPLICABLE
TYPE "C" TESTS ⁽ⁱ⁾ :	NO	NO	NO
TEST ARRANGEMENT ^(o) :	NOT APPLICABLE	NOT APPLICABLE	NOT APPLICABLE
SYSTEM	CONTAINMENT SPRAY	CONTAINMENT SPRAY	CONTAINMENT SPRAY
REMARKS			

** CONTROL SWITCH AT LOCAL STATION.

← (DRN 99-2371)

CONTAINMENT PENETRATIONS AND ISOLATION VALVES

→ (DRN 99-2371)

PENETRATION NO.: 36 TYPE^(j): III CLASS: D VENTED/DRAINED FOR TYPE "A" TEST^(k): NO^(m) TYPE FLUID^(a): BORATED WATER
 General Design Criteria: 54, 55

VALVE TAG NO.: UNID	SI MVA000139 B	SI MVA000143 B
VALVE TYPE	GLOBE	CHECK
VALVE OPERATOR ^(g)	ELECTRIC	SELF
ACTUATION MODE ^(z) : PRIMARY	REMOTE MANUAL	NOT APPLICABLE
SECONDARY	MANUAL	NONE
VALVE POSITION ^(f) :		
NORMAL	CLOSED	NOT APPLICABLE
SHUTDOWN	OPEN	NOT APPLICABLE
POST-ACCIDENT	OPEN	NOT APPLICABLE
LOSS OF POWER TO ACTUATOR	AS IS	NOT APPLICABLE
ACTUATION SIGNAL ^(e) :	SIAS(OPEN)	NONE
MAXIMUM CLOSURE TIME (SEC.)	15	NOT APPLICABLE
LINE SIZE (INCH)	8	8
ESSENTIAL ^(d) :	YES	NOT APPLICABLE
FLOW DIRECTION ^(b) :	INFLUENT TO CONTAINMENT	INFLUENT TO CONTAINMENT
LOCATION REFERENCE TO CONTAINMENT ^(c) :	OUTSIDE	INSIDE
POWER SOURCE (AC/DC)	AC-SB	NONE
APPROXIMATE LENGTH OF PIPE (FT.-IN.) ^(h) :	53 – 0	NOT APPLICABLE
TYPE "C" TESTS ⁽ⁱ⁾ :	NO	NO ^(r)
TEST ARRANGEMENT ^(o) :	NOT APPLICABLE	NOT APPLICABLE
SYSTEM	SAFETY INJECTION FROM LPSI PUMPS	SAFETY INJECTION FROM LPSI PUMPS

REMARKS

← (DRN 99-2371)

CONTAINMENT PENETRATIONS AND ISOLATION VALVES

→ (DRN 99-2371)

PENETRATION NO.: 37 TYPE^(j): III CLASS: D VENTED/DRAINED FOR TYPE "A" TEST^(k): NO^(m) TYPE FLUID^(a): BORATED WATER
 General Design Criteria: 54, 55

VALVE TAG NO.: UNID	SI MVA000138 B	SI MVA000142 B
VALVE TYPE	GLOBE	CHECK
VALVE OPERATOR ^(g)	ELECTRIC	SELF
ACTUATION MODE ^(z) : PRIMARY	REMOTE MANUAL	NOT APPLICABLE
SECONDARY	MANUAL	NONE
VALVE POSITION ^(f) :		
NORMAL	CLOSED	NOT APPLICABLE
SHUTDOWN	OPEN	NOT APPLICABLE
POST-ACCIDENT	OPEN	NOT APPLICABLE
LOSS OF POWER TO ACTUATOR	AS IS	NOT APPLICABLE
ACTUATION SIGNAL ^(e) :	SIAS(OPEN)	NONE
MAXIMUM CLOSURE TIME (SEC.)	15	NOT APPLICABLE
LINE SIZE (INCH)	8	8
ESSENTIAL ^(d) :	YES	NOT APPLICABLE
FLOW DIRECTION ^(b) :	INFLUENT TO CONTAINMENT	INFLUENT TO CONTAINMENT
LOCATION REFERENCE TO CONTAINMENT ^(c) :	OUTSIDE	INSIDE
POWER SOURCE (AC/DC)	AC-SB	NONE
APPROXIMATE LENGTH OF PIPE (FT.-IN.) ^(h) :	59 – 3	NOT APPLICABLE
TYPE "C" TESTS ⁽ⁱ⁾ :	NO	NO ^(r)
TEST ARRANGEMENT ^(o) :	NOT APPLICABLE	NOT APPLICABLE
SYSTEM	SAFETY INJECTION FROM LPSI PUMPS	SAFETY INJECTION FROM LPSI PUMPS

REMARKS

← (DRN 99-2371)

WSES-FSAR-UNIT-3

TABLE 6.2-32 (SHEET 45 OF 85)

Revision 303 (06/09)

CONTAINMENT PENETRATIONS AND ISOLATION VALVES

→(DRN 99-2371, R11; EC-14945, R303)

PENETRATION NO.: 38 TYPE^(j): III CLASS: D VENTED/DRAINED FOR TYPE "A" TEST^(k): NO^(m) TYPE FLUID^(a): BORATED WATER

General Design Criteria: 54, 55

←(EC-14945, R303)

VALVE TAG NO.: UNID	SI MVA000139 A	SI MVA000143 A
VALVE TYPE	GLOBE	CHECK
VALVE OPERATOR ^(g)	ELECTRIC	SELF
ACTUATION MODE ^(z) : PRIMARY	REMOTE MANUAL	NOT APPLICABLE
SECONDARY	MANUAL	NONE
VALVE POSITION ^(f) :		
NORMAL	CLOSED	NOT APPLICABLE
SHUTDOWN	OPEN	NOT APPLICABLE
POST-ACCIDENT	OPEN	NOT APPLICABLE
LOSS OF POWER TO ACTUATOR	AS IS	NOT APPLICABLE
ACTUATION SIGNAL ^(e) :	SIAS(OPEN)	NONE
MAXIMUM CLOSURE TIME (SEC.)	15	NOT APPLICABLE
LINE SIZE (INCH)	8	8
ESSENTIAL ^(d) :	YES	NOT APPLICABLE
FLOW DIRECTION ^(b) :	INFLUENT TO CONTAINMENT	INFLUENT TO CONTAINMENT
LOCATION REFERENCE TO CONTAINMENT ^(c) :	OUTSIDE	INSIDE
POWER SOURCE (AC/DC)	AC-SA	NONE
APPROXIMATE LENGTH OF PIPE (FT.-IN.) ^(h) :	64 – 0	NOT APPLICABLE
TYPE "C" TESTS ⁽ⁱ⁾ :	NO	NO ^(r)
TEST ARRANGEMENT ^(o) :	NOT APPLICABLE	NOT APPLICABLE
SYSTEM	SAFETY INJECTION FROM LPSI PUMPS	SAFETY INJECTION FROM LPSI PUMPS

REMARKS

← (DRN 99-2371, R11)

WSES-FSAR-UNIT-3

TABLE 6.2-32 (SHEET 46 OF 85)

Revision 309 (06/16)

CONTAINMENT PENETRATIONS AND ISOLATION VALVES

→ (DRN 99-2371, R11)
 PENETRATION NO.: 39 TYPE^(j): III CLASS: D VENTED/DRAINED FOR TYPE "A" TEST^(k): NO^(m) TYPE FLUID^(a): BORATED WATER
 General Design Criteria: 54, 55

→(DRN 02-1399, R12-A, LBDCR 14-030, R309)

VALVE TAG NO.: UNID	SI MVA000138 A	SI MVA000142 A	SI ISV14023 A
←(LBDCR 14-030, R309)			
VALVE TYPE	GLOBE	CHECK	GLOBE
VALVE OPERATOR ^(g)	ELECTRIC	SELF	SOLENOID
ACTUATION MODE ^(z) : PRIMARY	REMOTE MANUAL	NOT APPLICABLE	CIAS / SIAS
SECONDARY	MANUAL	NONE	REMOTE MANUAL
VALVE POSITION ^(f) :			
NORMAL	CLOSED	NOT APPLICABLE	OPEN
SHUTDOWN	OPEN	NOT APPLICABLE	CLOSED
POST-ACCIDENT	OPEN	NOT APPLICABLE	CLOSED
LOSS OF POWER TO ACTUATOR	AS IS	NOT APPLICABLE	CLOSED
ACTUATION SIGNAL ^(e) :	SIAS(OPEN)	NONE	CIAS (CLOSED), SIAS (CLOSED)
MAXIMUM CLOSURE TIME (SEC.)	15	NOT APPLICABLE	10
LINE SIZE (INCH)	8	8	3/4
ESSENTIAL ^(d) :	YES	NOT APPLICABLE	NO
FLOW DIRECTION ^(b) :	INFLUENT TO CONTAINMENT	INFLUENT TO CONTAINMENT	N/A
LOCATION REFERENCE TO CONTAINMENT ^(c) :	OUTSIDE	INSIDE	OUTSIDE
POWER SOURCE (AC/DC)	AC-SA	NONE	AC-SA
APPROXIMATE LENGTH OF PIPE (FT.-IN.) ^(h) :	53 – 6	NOT APPLICABLE	NOT APPLICABLE
TYPE "C" TESTS ⁽ⁱ⁾ :	NO	NO ^(r)	NO
TEST ARRANGEMENT ^(o) :	NOT APPLICABLE	NOT APPLICABLE	NOT APPLICABLE
SYSTEM	SAFETY INJECTION FROM LPSI PUMPS	SAFETY INJECTION FROM LPSI PUMPS	SAFETY INJECTION FROM LPSI PUMPS AUTO-VENT ISOLATION

←(DRN 02-1399, R12-A)

REMARKS

←(DRN 99-2371, R11)

WSES-FSAR-UNIT-3

TABLE 6.2-32 (SHEET 47 OF 85)

Revision 309 (06/16)

CONTAINMENT PENETRATIONS AND ISOLATION VALVES

→(DRN 99-2371, R11)
 PENETRATION NO.: 40 TYPE^(j): III CLASS: D VENTED/DRAINED FOR TYPE "A" TEST^(k): NO^(l) TYPE FLUID^(a): BORATED WATER
 General Design Criteria: 54, 55

→(DRN 03-1543, R13-A; EC-14765, R305, LBDCR 14-030, R309) VALVE TAG NO.: UNID	SI MVA407 B	SI MVA405 B	SI MVA406 B	SI ISV 4052 B
←(LBDCR 14-030, R309) →(EC-935, R302) VALVE TYPE VALVE OPERATOR ^(g) ACTUATION MODE ^(z) : PRIMARY SECONDARY	GATE ELECTRIC REMOTE MANUAL MANUAL	GATE PNEUMATIC REMOTE MANUAL NONE	RELIEF SELF NOT APPLICABLE	GLOBE SOLENOID REMOTE MANUAL NONE
←(EC-935, R302) VALVE POSITION ^(f) : NORMAL	LOCKED CLOSED	LOCKED CLOSED	CLOSED	LOCKED CLOSED
SHUTDOWN	OPEN	OPEN	CLOSED	OPEN/CLOSED
POST-ACCIDENT	LOCKED CLOSED/OPEN	LOCKED CLOSED/OPEN	CLOSED	LOCKED CLOSED/OPEN
LOSS OF POWER TO ACTUATOR	AS IS	CLOSED	NOT APPLICABLE	CLOSED
ACTUATION SIGNAL ^(e) :	NONE	NONE	NOT APPLICABLE	NONE
MAXIMUM CLOSURE TIME (SEC.)	NOT APPLICABLE	NOT APPLICABLE	NOT APPLICABLE	NOT APPLICABLE
LINE SIZE (INCH)	14	14	6 X 8	3/4
ESSENTIAL ^(d) :	YES	YES	YES	YES
FLOW DIRECTION ^(b) :	EFFLUENT FROM CONTAINMENT	EFFLUENT FROM CONTAINMENT	EFFLUENT FROM CONTAINMENT	EFFLUENT FROM CONTAINMENT
LOCATION REFERENCE TO CONTAINMENT ^(c) :	OUTSIDE	INSIDE	INSIDE	INSIDE
POWER SOURCE (AC/DC)	AC-SB	DC-SB	NOT APPLICABLE	DC-SB
APPROXIMATE LENGTH OF PIPE (FT.-IN.) ^(h) :	15 – 0	NOT APPLICABLE	NOT APPLICABLE	NOT APPLICABLE
→(DRN 03-1014, R13) TYPE "C" TESTS ⁽ⁱ⁾ :	YES	YES ^(r)	YES	YES ^(r)
TEST ARRANGEMENT ^(o) : ←(DRN 03-1014, R13) SYSTEM	3 SAFETY INJECTION SHUTDOWN COOLING	3 SAFETY INJECTION SHUTDOWN COOLING	3 SAFETY INJECTION SHUTDOWN COOLING	3 SAFETY INJECTION SHUTDOWN COOLING

REMARKS

←(DRN 99-2371, R11; 03-1543, R13-A; EC-14765, R305)

WSES-FSAR-UNIT-3

TABLE 6.2-32 (SHEET 48 OF 85)

Revision 309 (06/16)

CONTAINMENT PENETRATIONS AND ISOLATION VALVES

→(DRN 99-2371, R11);
 PENETRATION NO.: 41 TYPE^(j): III CLASS: D VENTED/DRAINED FOR TYPE "A" TEST^(k): NO^(l) TYPE FLUID^(a): BORATED WATER
 General Design Criteria: 54, 55

→(DRN 03-1543, R13-A; EC-14765, R305, LBDCR 14-030,R309)		SI MVA4407 A	SI MVA4405 A	SI MVA4406 A	SI ISV 4052 A
←(LBDCR 14-030, R309)					
→(EC-935, R302)					
VALVE TAG NO.: UNID					
VALVE TYPE	GATE	GATE	RELIEF	GLOBE	
VALVE OPERATOR ^(g)	ELECTRIC	PNEUMATIC	SELF	SOLENOID	
ACTUATION MODE ^(z) : PRIMARY	REMOTE MANUAL	REMOTE MANUAL	NOT APPLICABLE	REMOTE MANUAL	
SECONDARY	MANUAL	NONE		NONE	
←(EC-935, R302)					
VALVE POSITION ^(f) :					
NORMAL	LOCKED CLOSED	LOCKED CLOSED	CLOSED	LOCKED CLOSED	
SHUTDOWN	OPEN	OPEN	CLOSED	OPEN/CLOSED	
POST-ACCIDENT	LOCKED CLOSED/OPEN	LOCKED CLOSED/OPEN	CLOSED	LOCKED CLOSED/OPEN	
LOSS OF POWER TO ACTUATOR	AS IS	CLOSED	NOT APPLICABLE	CLOSED	
ACTUATION SIGNAL ^(e) :	NONE	NONE	NOT APPLICABLE	NONE	
MAXIMUM CLOSURE TIME (SEC.)	NOT APPLICABLE	NOT APPLICABLE	NOT APPLICABLE	NOT APPLICABLE	
LINE SIZE (INCH)	14	14	6 X 8	3/4	
ESSENTIAL ^(d) :	YES	YES	YES	YES	
FLOW DIRECTION ^(b) :	EFFLUENT FROM CONTAINMENT	EFFLUENT FROM CONTAINMENT	EFFLUENT FROM CONTAINMENT	EFFLUENT FROM CONTAINMENT	
				CONTAINMENT	
LOCATION REFERENCE TO CONTAINMENT ^(c) :	OUTSIDE	INSIDE	INSIDE	INSIDE	
POWER SOURCE (AC/DC)	AC-SA	DC-SA	NOT APPLICABLE	DC-SA	
APPROXIMATE LENGTH OF PIPE (FT.-IN.) ^(h) :	22 – 9	NOT APPLICABLE	NOT APPLICABLE	NOT APPLICABLE	
→(DRN 03-1014, R13)					
TYPE "C" TESTS ⁽ⁱ⁾ :	YES	YES ^(r)	YES	YES ^(r)	
TEST ARRANGEMENT ^(o) :	3	3	3	3	
←(DRN 03-1014, R13)					
SYSTEM	SAFETY INJECTION SHUTDOWN COOLING	SAFETY INJECTION SHUTDOWN COOLING	SAFETY INJECTION SHUTDOWN COOLING	SAFETY INJECTION SHUTDOWN COOLING	

REMARKS

←(DRN 99-2371, R11; 03-1543, R13-A; EC-14765, R305)

WSES-FSAR-UNIT-3

TABLE 6.2-32 (SHEET 49 OF 85)

Revision 13-A (09/04)

CONTAINMENT PENETRATIONS AND ISOLATION VALVES

→ (DRN 99-2371, R11)
 PENETRATION NO.: 42 TYPE^(j): III CLASS: A1 VENTED/DRAINED FOR TYPE "A" TEST^(k): YES TYPE FLUID^(a): BORATED WATER
 General Design Criteria: 54, 56

→(DRN 01-478, R12)

VALVE TAG NO.: UNID	SP MVAAA106	SP MVAAA105	SP MVAAA1051
VALVE TYPE	DIAPHRAGM	DIAPHRAGM	RELIEF
VALVE OPERATOR ^(g)	PNEUMATIC	PNEUMATIC	SELF
ACTUATION MODE ^(z) : PRIMARY	AUTOMATIC	AUTOMATIC	N/A
SECONDARY	REMOTE MANUAL	REMOTE MANUAL	
VALVE POSITION ^(f) :			
→(DRN 04-1220, R13-A) NORMAL	NORMALLY OPEN	NORMALLY OPEN	CLOSED
←(DRN 04-1220, R13-A)			
SHUTDOWN	OPEN	OPEN	CLOSED
POST-ACCIDENT	CLOSED/OPEN	CLOSED/OPEN	OPEN / CLOSED
LOSS OF POWER TO ACTUATOR	CLOSED	CLOSED	N/A
ACTUATION SIGNAL ^(e) :	CIAS ^(q)	CIAS ^(q)	N/A
MAXIMUM CLOSURE TIME (SEC.)	7	7	N/A
LINE SIZE (INCH)	1 - ½	1 - ½	1/2"
ESSENTIAL ^(d) :	NO	NO	YES
FLOW DIRECTION ^(b) :	EFFLUENT FROM CONTAINMENT/ INFLUENT TO CONTAINMENT	EFFLUENT FROM CONTAINMENT/ INFLUENT TO CONTAINMENT	EFFLUENT FROM CONTAINMENT
LOCATION REFERENCE TO CONTAINMENT ^(c) :	OUTSIDE	INSIDE	INSIDE
POWER SOURCE (AC/DC)	AC-SA	AC-SB	N/A
APPROXIMATE LENGTH OF PIPE (FT.-IN.) ^(h) :	13 - 1	NOT APPLICABLE	6"
TYPE "C" TESTS ⁽ⁱ⁾ :	YES	YES	YES
TEST ARRANGEMENT ^(o) :	3	3	3
SYSTEM	CONTAINMENT SUMP PUMP DISCHARGE/POST ACCIDENT SAMPLE RETURN	CONTAINMENT SUMP PUMP DISCHARGE/POST ACCIDENT SAMPLE RETURN	CONTAINMENT SUMP PUMP DISCHARGE / POST ACCIDENT SAMPLE RETURN

←(DRN 01-478, R12)

REMARKS

← (DRN 99-2371, R11)

TABLE 6.2-32 (SHEET 50 OF 85)

Revision 12 (10/02)

CONTAINMENT PENETRATIONS AND ISOLATION VALVES

→ (DRN 99-2371)
 PENETRATION NO.: 43 TYPE^(j): V CLASS: A1 VENTED/DRAINED FOR TYPE "A" TEST^(k): YES TYPE FLUID^(a): BORATED WATER
 General Design Criteria: 54, 56

→(DRN 01-478)				
VALVE TAG NO.:	UNID	BM MVA000110	BM MVA000109	BM MVA0001091
VALVE TYPE		DIAPHRAGM	DIAPHRAGM	RELIEF
VALVE OPERATOR ^(g)		PNEUMATIC	PNEUMATIC	SELF
ACTUATION MODE ^(z) :	PRIMARY	AUTOMATIC	AUTOMATIC	N/A
	SECONDARY	REMOTE MANUAL	REMOTE MANUAL	
VALVE POSITION ^(f) :				
NORMAL		OPEN	OPEN	CLOSED
SHUTDOWN		OPEN	OPEN	CLOSED
POST-ACCIDENT		CLOSED	CLOSED	OPEN / CLOSED
LOSS OF POWER TO ACTUATOR		CLOSED	CLOSED	N/A
ACTUATION SIGNAL ^(e) :		CIAS	CIAS	N/A
MAXIMUM CLOSURE TIME (SEC.)		7	7	N/A
LINE SIZE (INCH)		3	3	1/2"
ESSENTIAL ^(d) :		NO	NO	YES
FLOW DIRECTION ^(b) :		EFFLUENT FROM CONTAINMENT	EFFLUENT FROM CONTAINMENT	EFFLUENT FROM CONTAINMENT
LOCATION REFERENCE TO CONTAINMENT ^(c) :		OUTSIDE	INSIDE	INSIDE
POWER SOURCE (AC/DC)		AC-SA	AC-SB	N/A
APPROXIMATE LENGTH OF PIPE (FT.-IN.) ^(h) :		9 – 6	NOT APPLICABLE	6"
TYPE "C" TESTS ⁽ⁱ⁾ :		YES	YES	YES
TEST ARRANGEMENT ^(o) :		3	3	3
SYSTEM		BORON MANAGEMENT REACTOR DRAIN TANK OUTLET	BORON MANAGEMENT REACTOR DRAIN TANK OUTLET	BORON MANAGEMENT REACTOR DRAIN TANK OUTLET

←(DRN 01-478)
 REMARKS
 ← (DRN 99-2371)

TABLE 6.2-32 (SHEET 51 OF 85)

Revision 11 (05/01)

CONTAINMENT PENETRATIONS AND ISOLATION VALVES

→ (DRN 99-2371)
 PENETRATION NO.: 44 TYPE^(j): III CLASS: B1 VENTED/DRAINED FOR TYPE "A" TEST^(k): YES TYPE FLUID^(a): PRIMARY COOLANT
 General Design Criteria: 54, 55

→ (DRN 00-1162)			
VALVE TAG NO.:	UNID	CVCMVAAA401	RC MVAAA606
VALVE TYPE	GLOBE	GLOBE	RELIEF
VALVE OPERATOR ^(g)	PNEUMATIC	PNEUMATIC	SELF
ACTUATION MODE ^(z) : PRIMARY	AUTOMATIC	AUTOMATIC	N/A
SECONDARY	REMOTE MANUAL	REMOTE MANUAL	
VALVE POSITION ^(f) :			
NORMAL	OPEN	OPEN	CLOSED
SHUTDOWN	OPEN	OPEN	CLOSED
POST-ACCIDENT	CLOSED	CLOSED	OPEN/CLOSED
LOSS OF POWER TO ACTUATOR	CLOSED	CLOSED	N/A
ACTUATION SIGNAL ^(e) :	CIAS ^(q)	CIAS ^(q)	N/A
MAXIMUM CLOSURE TIME (SEC.)	10	10	N/A
LINE SIZE (INCH)	3/4	3/4	3/4"
ESSENTIAL ^(d) :	NO	NO	YES
FLOW DIRECTION ^(b) :	EFFLUENT FROM CONTAINMENT	EFFLUENT FROM CONTAINMENT	EFFLUENT FROM CONTAINMENT
LOCATION REFERENCE TO CONTAINMENT ^(c) :	OUTSIDE	INSIDE	INSIDE
POWER SOURCE (AC/DC)	AC-SA	AC-SB	N/A
APPROXIMATE LENGTH OF PIPE (FT.-IN.) ^(h) :	24 – 11	NOT APPLICABLE	4"
TYPE "C" TESTS ⁽ⁱ⁾ :	YES	YES	YES
TEST ARRANGEMENT ^(o) :	3	3	3
SYSTEM	CHEMICAL & VOLUME CONTROL FROM RCP CONTROL BLEEDOFF	CHEMICAL & VOLUME CONTROL FROM RCP CONTROLLED BLEEDOFF	CHEMICAL & VOLUME CONTROL FROM RCP CONTROLLED BLEEDOFF

← (DRN 00-1162)

REMARKS

← (DRN 99-2371)

TABLE 6.2-32 (SHEET 52 OF 85)

Revision 11-B (06/02)

CONTAINMENT PENETRATIONS AND ISOLATION VALVES

→ (DRN 99-2371)

PENETRATION NO.: 45 TYPE ^(j): III CLASS: A2 VENTED/DRAINED FOR TYPE "A" TEST ^(k): YES TYPE FLUID ^(a): AIR

General Design Criteria: 54, 56

VALVE TAG NO.: UNID	CARMVAAA101 B	CARMVAAA102 B
VALVE TYPE	BUTTERFLY	CHECK
VALVE OPERATOR ^(g)	MANUAL	SELF
ACTUATION MODE ^(z) : PRIMARY	MANUAL	NOT APPLICABLE
SECONDARY	NONE	NONE
VALVE POSITION ^(f) :		
NORMAL	LOCKED CLOSED	NOT APPLICABLE
SHUTDOWN	CLOSED	NOT APPLICABLE
POST-ACCIDENT	CLOSED/OPEN	NOT APPLICABLE
LOSS OF POWER TO ACTUATOR	NOT APPLICABLE	NOT APPLICABLE
ACTUATION SIGNAL ^(e) :	NONE	NONE
MAXIMUM CLOSURE TIME (SEC.)	NOT APPLICABLE	NOT APPLICABLE
LINE SIZE (INCH)	4	4
→ (DRN 01-991)		
ESSENTIAL ^(d) :	NO	NOT APPLICABLE
← (DRN 01-991)		
FLOW DIRECTION ^(b) :	INFLUENT TO CONTAINMENT	INFLUENT TO CONTAINMENT
LOCATION REFERENCE TO CONTAINMENT ^(c) :	OUTSIDE	INSIDE
POWER SOURCE (AC/DC)	NONE	NONE
APPROXIMATE LENGTH OF PIPE (FT.-IN.) ^(h) :	11 – 3	NOT APPLICABLE
TYPE "C" TESTS ⁽ⁱ⁾ :	YES	YES
TEST ARRANGEMENT ^(o) :	5	5
SYSTEM	CARS MAKEUP TO CONTAINMENT	CARS MAKEUP TO CONTAINMENT

REMARKS

← (DRN 99-2371)

TABLE 6.2-32 (SHEET 53 OF 85)

Revision 11-B (06/02)

CONTAINMENT PENETRATIONS AND ISOLATION VALVES

→ (DRN 99-2371)

PENETRATION NO.: 46 TYPE ^(j): III CLASS: A2 VENTED/DRAINED FOR TYPE "A" TEST ^(k): YES TYPE FLUID ^(a): AIR

General Design Criteria: 54, 56

VALVE TAG NO.: UNID	CARMVAAA101 A	CARMVAAA102 A
VALVE TYPE	BUTTERFLY	CHECK
VALVE OPERATOR ^(g)	MANUAL	SELF
ACTUATION MODE ^(z) : PRIMARY	MANUAL	NOT APPLICABLE
SECONDARY	NONE	NONE
VALVE POSITION ^(f) :		
NORMAL	LOCKED CLOSED	NOT APPLICABLE
SHUTDOWN	CLOSED	NOT APPLICABLE
POST-ACCIDENT	CLOSED/OPEN	NOT APPLICABLE
LOSS OF POWER TO ACTUATOR	NOT APPLICABLE	NOT APPLICABLE
ACTUATION SIGNAL ^(e) :	NONE	NONE
MAXIMUM CLOSURE TIME (SEC.)	NOT APPLICABLE	NOT APPLICABLE
LINE SIZE (INCH)	4	4
→ (DRN 01-991)		
ESSENTIAL ^(d) :	NO	NOT APPLICABLE
← (DRN 01-991)		
FLOW DIRECTION ^(b) :	INFLUENT TO CONTAINMENT	INFLUENT TO CONTAINMENT
LOCATION REFERENCE TO CONTAINMENT ^(c) :	OUTSIDE	INSIDE
POWER SOURCE (AC/DC)	NONE	NONE
APPROXIMATE LENGTH OF PIPE (FT.-IN.) ^(h) :	11 – 3	NOT APPLICABLE
TYPE "C" TESTS ⁽ⁱ⁾ :	YES	YES
TEST ARRANGEMENT ^(o) :	5	5
SYSTEM	CARS MAKEUP TO CONTAINMENT	CARS MAKEUP TO CONTAINMENT

REMARKS

← (DRN 99-2371)

TABLE 6.2-32 (SHEET 54 OF 85)

Revision 11-B (06/02)

CONTAINMENT PENETRATIONS AND ISOLATION VALVES

→ (DRN 99-2371)
 PENETRATION NO.: 47 TYPE^(j): III CLASS: A1 VENTED/DRAINED FOR TYPE "A" TEST^(k): YES TYPE FLUID^(a): CONTAINMENT ATMOSPHERE
 General Design Criteria: 54, 56

VALVE TAG NO.: UNID	CARMVAAA201 B	CARMVAAA200 B	CARMVAAA202 B
VALVE TYPE	BUTTERFLY	BALL	BALL
VALVE OPERATOR ^(g)	ELECTRIC	PNEUMATIC	PNEUMATIC
ACTUATION MODE ^(z) : PRIMARY	AUTOMATIC	AUTOMATIC	AUTOMATIC
SECONDARY	REMOTE MANUAL	REMOTE MANUAL	REMOTE MANUAL
VALVE POSITION ^(f) :			
NORMAL	CLOSED	CLOSED	CLOSED
SHUTDOWN	CLOSED	CLOSED	CLOSED
POST-ACCIDENT	CLOSED/OPEN	CLOSED/OPEN	CLOSED/OPEN
LOSS OF POWER TO ACTUATOR	AS IS	CLOSED	CLOSED
ACTUATION SIGNAL ^(e) :	CIAS	CIAS/CPIS	CIAS/CPIS
MAXIMUM CLOSURE TIME (SEC.)	10	5	5
LINE SIZE (INCH)	4	4	4
ESSENTIAL ^(d) :	NO	NO	NO
FLOW DIRECTION ^(b) :	EFFLUENT FROM CONTAINMENT	EFFLUENT FROM CONTAINMENT	EFFLUENT FROM CONTAINMENT
LOCATION REFERENCE TO CONTAINMENT ^(c) :	INSIDE	INSIDE	OUTSIDE
POWER SOURCE (AC/DC)	AC-SB	AC-SA	AC-SB
APPROXIMATE LENGTH OF PIPE (FT.-IN.) ^(h) :	NOT APPLICABLE	NOT APPLICABLE	13 - 9
TYPE "C" TESTS ⁽ⁱ⁾ :	YES	YES	YES
TEST ARRANGEMENT ^(o) :	6	6	6
SYSTEM	CARS EXHAUST FROM CONTAINMENT	CARS EXHAUST FROM CONTAINMENT	CARS EXHAUST FROM CONTAINMENT

REMARKS
 ← (DRN 99-2371)

CONTAINMENT PENETRATIONS AND ISOLATION VALVES

→ (DRN 99-2371)

PENETRATION NO.: 48 TYPE^(j): III CLASS: A2 VENTED/DRAINED FOR TYPE "A" TEST^(k): YES TYPE FLUID^(a): CONTAINMENT ATMOSPHERE
 General Design Criteria: 54, 56

VALVE TAG NO.:	UNID	CARMVAAA202 A	CARMVAAA201 A
VALVE TYPE		BUTTERFLY	BUTTERFLY
VALVE OPERATOR ^(g)		MANUAL	ELECTRIC
ACTUATION MODE ^(z) :	PRIMARY	MANUAL	AUTOMATIC
	SECONDARY	NONE	REMOTE MANUAL
VALVE POSITION ^(f) :			
NORMAL		LOCKED CLOSED	CLOSED
SHUTDOWN		CLOSED	CLOSED
POST-ACCIDENT		CLOSED/OPEN	CLOSED/OPEN
LOSS OF POWER TO ACTUATOR		NOT APPLICABLE	AS IS
ACTUATION SIGNAL ^(e) :		NONE	CIAS
MAXIMUM CLOSURE TIME (SEC.)		NOT APPLICABLE	10
LINE SIZE (INCH)		4	4
→ (DRN 01-991)			
ESSENTIAL ^(d) :		NO	NO
← (DRN 01-991)			
FLOW DIRECTION ^(b) :		EFFLUENT FROM CONTAINMENT	EFFLUENT FROM CONTAINMENT
LOCATION REFERENCE TO CONTAINMENT ^(c) :		OUTSIDE	INSIDE
POWER SOURCE (AC/DC)		NONE	AC-SA
APPROXIMATE LENGTH OF PIPE (FT.-IN.) ^(h) :		11 – 3	NOT APPLICABLE
TYPE "C" TESTS ⁽ⁱ⁾ :		YES	YES
TEST ARRANGEMENT ^(o) :		6	6
SYSTEM		CARS EXHAUST FROM CONTAINMENT	CARS EXHAUST FROM CONTAINMENT
REMARKS			
← (DRN 99-2371)			

TABLE 6.2-32 (SHEET 56 OF 85)

Revision 11 (05/01)

CONTAINMENT PENETRATIONS AND ISOLATION VALVES

→ (DRN 99-2371)

PENETRATION NO.: 49 TYPE^(j): II CLASS: A1 VENTED/DRAINED FOR TYPE "A" TEST^(k): YES TYPE FLUID^(a): CONTAINMENT ATMOSPHERE
(MODIFIED)

General Design Criteria: 54, 56

VALVE TAG NO.:	UNID	ARMISV0110	ARMISV0109	ARMMVAAA104	ARMISV0103
VALVE TYPE		GLOBE	GLOBE	CHECK	GLOBE
VALVE OPERATOR ^(g)		SOLENOID	SOLENOID	SELF	SOLENOID
ACTUATION MODE ^(z) :	PRIMARY	AUTOMATIC	AUTOMATIC	NOT APPLICABLE	AUTOMATIC
	SECONDARY	REMOTE MANUAL	REMOTE MANUAL	NONE	REMOTE MANUAL
VALVE POSITION ^(f) :					
NORMAL		OPEN	OPEN	NOT APPLICABLE	OPEN
SHUTDOWN		OPEN	OPEN	NOT APPLICABLE	OPEN
POST-ACCIDENT		CLOSED	CLOSED	NOT APPLICABLE	CLOSED
LOSS OF POWER TO ACTUATOR		CLOSED	CLOSED	NOT APPLICABLE	CLOSED
ACTUATION SIGNAL ^(e) :		CIAS	CIAS	NONE	CIAS
MAXIMUM CLOSURE TIME (SEC.)		5	5	NOT APPLICABLE	5
LINE SIZE (INCH)		1	3/4	1	1
ESSENTIAL ^(d) :		NO	NO	NOT APPLICABLE	NO
FLOW DIRECTION ^(b) :					
		INFLUENT TO CONTAINMENT EFFLUENT FROM CONTAINMENT	INFLUENT TO CONTAINMENT EFFLUENT FROM CONTAINMENT	INFLUENT TO CONTAINMENT EFFLUENT FROM CONTAINMENT	INFLUENT TO CONTAINMENT EFFLUENT FROM CONTAINMENT
LOCATION REFERENCE TO CONTAINMENT ^(c) :		OUTSIDE	INSIDE	INSIDE	OUTSIDE
POWER SOURCE (AC/DC)		AC-SA	AC-SB	NONE	AC-SA
APPROXIMATE LENGTH OF PIPE (FT.-IN.) ^(h) :		5	NOT APPLICABLE	NOT APPLICABLE	5
TYPE "C" TESTS ⁽ⁱ⁾ :		YES	YES	YES	YES
TEST ARRANGEMENT ^(o) :		3	3	7	7
SYSTEM		CONTAINMENT ATMOSPHERE	CONTAINMENT ATMOSPHERE	CONTAINMENT ATMOSPHERE	CONTAINMENT ATMOSPHERE
		MONITORING INLET AND OUTLET	MONITORING INLET AND OUTLET	MONITORING INLET AND OUTLET	MONITORING INLET AND OUTLET

REMARKS

← (DRN 99-2371)

CONTAINMENT PENETRATIONS AND ISOLATION VALVES

→ (DRN 99-2371)

PENETRATION NO.: 50 TYPE^(j): SPARE CLASS: _____ VENTED/DRAINED FOR TYPE "A" TEST^(k): _____ TYPE FLUID^(a): _____

General Design Criteria:

VALVE TAG NO.: UNID

VALVE TYPE

VALVE OPERATOR^(g)

ACTUATION MODE^(z): PRIMARY
SECONDARY

VALVE POSITION^(f):

NORMAL

SHUTDOWN

POST-ACCIDENT

LOSS OF POWER TO ACTUATOR

ACTUATION SIGNAL^(e):

MAXIMUM CLOSURE TIME (SEC.)

LINE SIZE (INCH)

ESSENTIAL^(d):

FLOW DIRECTION^(b):

LOCATION REFERENCE TO CONTAINMENT^(c):

POWER SOURCE (AC/DC)

APPROXIMATE LENGTH OF PIPE (FT.-IN.)^(h):

TYPE "C" TESTS⁽ⁱ⁾:

TEST ARRANGEMENT^(o):

SYSTEM

REMARKS

← (DRN 99-2371)

TYPE A TEST ONLY

TABLE 6.2-32 (SHEET 58 OF 85)

Revision 11 (05/01)

CONTAINMENT PENETRATIONS AND ISOLATION VALVES

→ (DRN 99-2371)

PENETRATION NO.: 51 TYPE^(j): III CLASS: A2 VENTED/DRAINED FOR TYPE "A" TEST^(k): YES TYPE FLUID^(a): REFUELING WATER
 General Design Criteria: 54, 56

VALVE TAG NO.: UNID	FS MVA4405	FS MVA4406
VALVE TYPE	GATE	GATE
VALVE OPERATOR ^(g)	MANUAL	MANUAL
ACTUATION MODE ^(z) : PRIMARY	MANUAL	MANUAL
SECONDARY	NONE	NONE
VALVE POSITION ^(f) :		
NORMAL	LOCKED CLOSED	LOCKED CLOSED
SHUTDOWN	CLOSED/OPEN	CLOSED/OPEN
POST-ACCIDENT	CLOSED	CLOSED
LOSS OF POWER TO ACTUATOR	NOT APPLICABLE	NOT APPLICABLE
ACTUATION SIGNAL ^(e) :	NONE	NONE
MAXIMUM CLOSURE TIME (SEC.)	NOT APPLICABLE	NOT APPLICABLE
LINE SIZE (INCH)	3	3
ESSENTIAL ^(d) :	NO	NO
FLOW DIRECTION ^(b) :	INFLUENT TO CONTAINMENT	INFLUENT TO CONTAINMENT
LOCATION REFERENCE TO CONTAINMENT ^(c) :	OUTSIDE	INSIDE
POWER SOURCE (AC/DC)	NONE	NONE
APPROXIMATE LENGTH OF PIPE (FT.-IN.) ^(h) :	30 – 3	NOT APPLICABLE
TYPE "C" TESTS ⁽ⁱ⁾ :	YES	YES
TEST ARRANGEMENT ^(o) :	3	3
SYSTEM	REFUELING CAVITY PURIFICATION INLET	REFUELING CAVITY PURIFICATION INLET

REMARKS

← (DRN 99-2371)

CONTAINMENT PENETRATIONS AND ISOLATION VALVES

→ (DRN 99-2371, R11)
 PENETRATION NO.: 52 TYPE^(j): III CLASS: C VENTED/DRAINED FOR TYPE "A" TEST^(k): NO⁽ⁿ⁾ TYPE FLUID^(a): SECONDARY COOLANT
 General Design Criteria: 54, 57

→ (DRN 01-1383, R11-B; 05-41, R14) VALVE TAG NO.: UNID	SSLMVAAA8006 A	SSLMVAAA8004 A ^{(u)*}
← (DRN 01-1383, R11-B; 05-41, R14) VALVE TYPE	GLOBE	GLOBE
VALVE OPERATOR ^(g)	PNEUMATIC	PNEUMATIC
ACTUATION MODE ^(z) : PRIMARY	AUTOMATIC	AUTOMATIC
SECONDARY	REMOTE MANUAL	REMOTE MANUAL
VALVE POSITION ^(f) : NORMAL	OPEN	OPEN
SHUTDOWN	OPEN	OPEN
POST-ACCIDENT	CLOSED/OPEN	CLOSED/OPEN
LOSS OF POWER TO ACTUATOR	CLOSED	CLOSED
ACTUATION SIGNAL ^(e) :	CIAS ^(q)	CIAS ^(q)
MAXIMUM CLOSURE TIME (SEC.)	10	10
LINE SIZE (INCH)	½	½
ESSENTIAL ^(d) :	NO	NO
FLOW DIRECTION ^(b) :	EFFLUENT FROM CONTAINMENT	EFFLUENT FROM CONTAINMENT
LOCATION REFERENCE TO CONTAINMENT ^(c) :	OUTSIDE	INSIDE
POWER SOURCE (AC/DC)	AC-SA	AC-SB
APPROXIMATE LENGTH OF PIPE (FT.-IN.) ^(h) :	30 – 0	NOT APPLICABLE
TYPE "C" TESTS ⁽ⁱ⁾ :	NO	NO
TEST ARRANGEMENT ^(o) :	NOT APPLICABLE	NOT APPLICABLE
SYSTEM	SAMPLING FROM STEAM GENERATOR 1 BLOWDOWN	SAMPLING FROM STEAM GENERATOR 1 BLOWDOWN

REMARKS

← (DRN 99-2371, R11)

→ (DRN 05-41, R14)

*VALVE NOT CREDITED AS A CONTAINMENT ISOLATION VALVE. VALVE HAS POSITION INDICATION IN CONTROL ROOM. VALVE ISOLATION SAFETY FUNCTION IS PROVIDED BY CIAS/EFAS TO ISOLATE STEAM GENERATOR.

← (DRN 05-41, R14)

CONTAINMENT PENETRATIONS AND ISOLATION VALVES

→ (DRN 99-2371)

(MODIFIED)

PENETRATION NO.: 53 TYPE (j): II CLASS: INST VENTED/DRAINED FOR TYPE "A" TEST (k): NO TYPE FLUID (a): CONTAINMENT ATMOSPHERE

General Design Criteria: 54, 56

VALVE TAG NO.: UNID	LRTMVA400	CVRMVA301 A	CVRMVA302A	CVRISV0401	CVRISV0400
→ (DRN 01-991)					
VALVE TYPE	GLOBE	GLOBE	EXCESS FLOW CHECK	GLOBE	GLOBE
VALVE OPERATOR (g)	MANUAL	MANUAL	SELF	SOLENOID	SOLENOID
ACTUATION MODE (Z): PRIMARY	MANUAL	MANUAL	NOT APPLICABLE	AUTOMATIC	AUTOMATIC
SECONDARY	NONE	NONE	NONE	REMOTE MANUAL*	NOT APPLICABLE
← (DRN 01-991)					
VALVE POSITION (f):					
NORMAL	CLOSED	OPEN	OPEN	OPEN	OPEN
SHUTDOWN	CLOSED	OPEN	OPEN	OPEN	OPEN
POST-ACCIDENT	CLOSED	OPEN	OPEN	CLOSED	CLOSED
LOSS OF POWER TO ACTUATOR	NOT APPLICABLE	NOT APPLICABLE	NOT APPLICABLE	CLOSED	CLOSED
ACTUATION SIGNAL (e):	NONE	NONE	NONE	CIAS	CIAS
MAXIMUM CLOSURE TIME (SEC.)	NOT APPLICABLE	NOT APPLICABLE	NOT APPLICABLE	5	5
LINE SIZE (INCH)	½	½	½	3/8	3/8
ESSENTIAL (d):	NO	YES	NOT APPLICABLE	NO	NO
FLOW DIRECTION (b):	EFFLUENT FROM CONTAINMENT	EFFLUENT FROM CONTAINMENT	EFFLUENT FROM CONTAINMENT	EFFLUENT FROM CONTAINMENT	EFFLUENT FROM CONTAINMENT
LOCATION REFERENCE TO CONTAINMENT (c):	OUTSIDE	OUTSIDE	OUTSIDE	OUTSIDE	OUTSIDE
POWER SOURCE (AC/DC)	NONE	NONE	NONE	AC-SA	AC-SB
APPROXIMATE LENGTH OF PIPE (FT.-IN.) (h):	5	5	5	5	5
TYPE "C" TESTS (i):	YES	NO	NO	YES	YES
TEST ARRANGEMENT (o):	B430 SHEET DP-31	NOT APPLICABLE	NOT APPLICABLE	B430 SHEET DP-31	B430 SHEET DP-31
SYSTEM	CONTAINMENT LEAKAGE RATE TEST CONNECTION AND INSTRUMENT H&V	CONTAINMENT LEAKAGE RATE TEST CONNECTION AND INSTRUMENT H&V	CONTAINMENT LEAKAGE RATE TEST CONNECTION AND INSTRUMENT H&V	CONTAINMENT LEAKAGE RATE TEST CONNECTION AND INSTRUMENT H&V	CONTAINMENT LEAKAGE RATE TEST CONNECTION AND INSTRUMENT H&V

REMARKS*

CONTROL SWITCH AT LOCAL STATION

← (DRN 99-2371)

CONTAINMENT PENETRATIONS AND ISOLATION VALVES

→ (DRN 99-2371)

(MODIFIED)

PENETRATION NO.: 54 TYPE^(j): II CLASS: INST VENTED/DRAINED FOR TYPE "A" TEST^(k): _____ TYPE FLUID^(a): SEALED FLUID SYSTEM

General Design Criteria: 54, 56

VALVE TAG NO.: UNID	THE INSTRUMENT LINES ARE CLOSED SYSTEMS BOTH INSIDE AND OUTSIDE CONTAINMENT. THEREFORE, THE DESIGN IS ACCEPTABLE WITHOUT CONTAINMENT ISOLATION VALVES. (ANSI N271-1976, PARA. 3.6.2 AND SRP 6.2.4.II.a)	
VALVE TYPE	NOT APPLICABLE	NOT APPLICABLE
VALVE OPERATOR ^(g)		
ACTUATION MODE ^(z) : PRIMARY		
SECONDARY		
VALVE POSITION ^(f) : NORMAL	NOT APPLICABLE	NOT APPLICABLE
SHUTDOWN	NOT APPLICABLE	NOT APPLICABLE
POST-ACCIDENT	NOT APPLICABLE	NOT APPLICABLE
LOSS OF POWER TO ACTUATOR	NOT APPLICABLE	NOT APPLICABLE
ACTUATION SIGNAL ^(e) :	NOT APPLICABLE	NOT APPLICABLE
MAXIMUM CLOSURE TIME (SEC.)	NOT APPLICABLE	NOT APPLICABLE
LINE SIZE (INCH)	1/2	1/2
ESSENTIAL ^(d) :	NO	NO
FLOW DIRECTION ^(b) :	NOT APPLICABLE	NOT APPLICABLE
LOCATION REFERENCE TO CONTAINMENT ^(c) :	NOT APPLICABLE	NOT APPLICABLE
POWER SOURCE (AC/DC)	NONE	NONE
APPROXIMATE LENGTH OF PIPE (FT.-IN.) ^(h) :	7	7
TYPE "C" TESTS ⁽ⁱ⁾ :	NO	NO
TEST ARRANGEMENT ^(o) :	NOT APPLICABLE	NOT APPLICABLE
SYSTEM	WIDE RANGE CONTAINMENT PRESSURE INSTRUMENTATION	WIDE RANGE CONTAINMENT PRESSURE INSTRUMENTATION

REMARKS

← (DRN 99-2371)

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TABLE 6.2-32 (SHEET 62 OF 85)

Revision 13-A (09/04)

CONTAINMENT PENETRATIONS AND ISOLATION VALVES

→ (DRN 99-2371, R11)

PENETRATION NO.: 55 TYPE^(j): III CLASS: D VENTED/DRAINED FOR TYPE "A" TEST^(k): NO^(m) TYPE FLUID^(a): BORATED WATER
 General Design Criteria: 54, 55

→ (DRN 04-1139, R13-A)

VALVE TAG NO.: UNID	SI MVAAA225 A	SI MVAAA225 B	SI MVAAA241	SI MVAAA2411
VALVE TYPE	GLOBE	GLOBE	CHECK	GLOBE
VALVE OPERATOR ^(g)	ELECTRIC	ELECTRIC	SELF	MANUAL
ACTUATION MODE ^(z) : PRIMARY	REMOTE MANUAL	REMOTE MANUAL	NOT APPLICABLE	MANUAL
SECONDARY	MANUAL	MANUAL	NONE	NONE
VALVE POSITION ^(f) :				
NORMAL	CLOSED	CLOSED	NOT APPLICABLE	LOCKED CLOSE
SHUTDOWN	CLOSED	CLOSED	NOT APPLICABLE	LOCKED CLOSE/OPEN
POST-ACCIDENT	OPEN	OPEN	NOT APPLICABLE	LOCKED CLOSE
LOSS OF POWER TO ACTUATOR	AS IS	AS IS	NOT APPLICABLE	NOT APPLICABLE
ACTUATION SIGNAL ^(e) :	SIAS(OPEN)	SIAS(OPEN)	NONE	NONE
MAXIMUM CLOSURE TIME (SEC.)	12	12	NOT APPLICABLE	NOT APPLICABLE
LINE SIZE (INCH)	3	3	3	1
ESSENTIAL ^(d) :	YES	YES	NOT APPLICABLE	NO
FLOW DIRECTION ^(b) :	INFLUENT TO CONTAINMENT	INFLUENT TO CONTAINMENT	INFLUENT TO CONTAINMENT	INFLUENT TO CONTAINMENT
LOCATION REFERENCE TO CONTAINMENT ^(c) :	OUTSIDE	OUTSIDE	INSIDE	INSIDE
POWER SOURCE (AC/DC)	AC-SA	AC-SB	NONE	NONE
APPROXIMATE LENGTH OF PIPE (FT.-IN.) ^(h) :	215'-8"	156 – 8	NOT APPLICABLE	NOT APPLICABLE
TYPE "C" TESTS ⁽ⁱ⁾ :	NO	NO	NO ^(r)	NO
TEST ARRANGEMENT ^(o) :	NOT APPLICABLE	NOT APPLICABLE	NOT APPLICABLE	NOT APPLICABLE
SYSTEM	SAFETY INJECTION SYSTEM FROM HPSI LOOP 1A	SAFETY INJECTION SYSTEM FROM HPSI LOOP 1A	SAFETY INJECTION SYSTEM FROM HPSI LOOP 1A	SAFETY INJECTION SYSTEM FROM HPSI LOOP 1A

REMARKS

← (DRN 99-2371, R11; 04-1139, R13-A)

WSES-FSAR-UNIT-3

TABLE 6.2-32 (SHEET 63 OF 85)

Revision 13-A (09/04)

CONTAINMENT PENETRATIONS AND ISOLATION VALVES

→ (DRN 99-2371, R11)

PENETRATION NO.: 56 TYPE^(j): III CLASS: D VENTED/DRAINED FOR TYPE "A" TEST^(k): NO^(m) TYPE FLUID^(a): BORATED WATER
 General Design Criteria: 54, 55

→(DRN 04-1139, R13-A)

VALVE TAG NO.:	SI MVA00226 A	SI MVA00226 B	SI MVA00242	SI MVA002421
VALVE TYPE	GLOBE	GLOBE	CHECK	GLOBE
VALVE OPERATOR ^(g)	ELECTRIC	ELECTRIC	SELF	MANUAL
ACTUATION MODE ^(z) : PRIMARY	REMOTE MANUAL	REMOTE MANUAL	NOT APPLICABLE	MANUAL
SECONDARY	MANUAL	MANUAL	NONE	NONE
VALVE POSITION ^(f) :				
NORMAL	CLOSED	CLOSED	NOT APPLICABLE	LOCKED CLOSE
SHUTDOWN	CLOSED	CLOSED	NOT APPLICABLE	LOCKED CLOSE/OPEN
POST-ACCIDENT	OPEN	OPEN	NOT APPLICABLE	LOCKED CLOSE
LOSS OF POWER TO ACTUATOR	AS IS	AS IS	NOT APPLICABLE	NOT APPLICABLE
ACTUATION SIGNAL ^(e) :	SIAS(OPEN)	SIAS(OPEN)	NONE	NONE
MAXIMUM CLOSURE TIME (SEC.)	12	12	NOT APPLICABLE	NOT APPLICABLE
LINE SIZE (INCH)	3	3	3	1
ESSENTIAL ^(d) :	YES	YES	NOT APPLICABLE	NO
FLOW DIRECTION ^(b) :	INFLUENT TO CONTAINMENT	INFLUENT TO CONTAINMENT	INFLUENT TO CONTAINMENT	INFLUENT TO CONTAINMENT
LOCATION REFERENCE TO CONTAINMENT ^(c) :	OUTSIDE	OUTSIDE	INSIDE	INSIDE
POWER SOURCE (AC/DC)	AC-SA	AC-SB	NONE	NONE
APPROXIMATE LENGTH OF PIPE (FT.-IN.) ^(h) :	166'-11"	225 - 9	NOT APPLICABLE	NOT APPLICABLE
TYPE "C" TESTS ⁽ⁱ⁾ :	NO	NO	NO ^(r)	NO
TEST ARRANGEMENT ^(o) :	NOT APPLICABLE	NOT APPLICABLE	NOT APPLICABLE	NOT APPLICABLE
SYSTEM	SAFETY INJECTION SYSTEM FROM HPSI LOOP 1B	SAFETY INJECTION SYSTEM FROM HPSI LOOP 1B	SAFETY INJECTION SYSTEM FROM HPSI LOOP 1B	SAFETY INJECTION SYSTEM FROM HPSI LOOP 1B

REMARKS

← (DRN 99-2371, R11; 04-1139, R13-A)

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TABLE 6.2-32 (SHEET 64 OF 85)

Revision 13-A (09/04)

CONTAINMENT PENETRATIONS AND ISOLATION VALVES

→ (DRN 99-2371, R11)
 PENETRATION NO.: 57 TYPE^(j): III CLASS: D VENTED/DRAINED FOR TYPE "A" TEST^(k): NO^(m) TYPE FLUID^(a): BORATED WATER
 General Design Criteria: 54, 55

→ (DRN 04-1139, R13-A) VALVE TAG NO.: UNID	SI MVA00227 A	SI MVA00227 B	SI MVA00243	SI MVA002431
VALVE TYPE	GLOBE	GLOBE	CHECK	GLOBE
VALVE OPERATOR ^(g)	ELECTRIC	ELECTRIC	SELF	MANUAL
ACTUATION MODE ^(z) : PRIMARY	REMOTE MANUAL	REMOTE MANUAL	NOT APPLICABLE	MANUAL
SECONDARY	MANUAL	MANUAL	NONE	NONE
VALVE POSITION ^(f) :				
NORMAL	CLOSED	CLOSED	NOT APPLICABLE	LOCKED CLOSE
SHUTDOWN	CLOSED	CLOSED	NOT APPLICABLE	LOCKED CLOSE/OPEN
POST-ACCIDENT	OPEN	OPEN	NOT APPLICABLE	LOCKED CLOSE
LOSS OF POWER TO ACTUATOR	AS IS	AS IS	NOT APPLICABLE	NOT APPLICABLE
ACTUATION SIGNAL ^(e) :	SIAS(OPEN)	SIAS(OPEN)	NONE	NONE
MAXIMUM CLOSURE TIME (SEC.)	12	12	NOT APPLICABLE	NOT APPLICABLE
LINE SIZE (INCH)	3	3	3	1
ESSENTIAL ^(d) :	YES	YES	NOT APPLICABLE	NO
FLOW DIRECTION ^(b) :	INFLUENT TO CONTAINMENT	INFLUENT TO CONTAINMENT	INFLUENT TO CONTAINMENT	INFLUENT TO CONTAINMENT
LOCATION REFERENCE TO CONTAINMENT ^(c) :	OUTSIDE	OUTSIDE	INSIDE	INSIDE
POWER SOURCE (AC/DC)	AC-SA	AC-SB	NONE	NONE
APPROXIMATE LENGTH OF PIPE (FT.-IN.) ^(h) :	192 – 9	121'-9"	NOT APPLICABLE	NOT APPLICABLE
TYPE "C" TESTS ⁽ⁱ⁾ :	NO	NO	NO ^(r)	NO
TEST ARRANGEMENT ^(o) :	NOT APPLICABLE	NOT APPLICABLE	NOT APPLICABLE	NOT APPLICABLE
SYSTEM	SAFETY INJECTION SYSTEM FROM HPSI LOOP 2A	SAFETY INJECTION SYSTEM FROM HPSI LOOP 2A	SAFETY INJECTION SYSTEM FROM HPSI LOOP 2A	SAFETY INJECTION SYSTEM FROM HPSI LOOP 2A

REMARKS
 ← (DRN 99-2371, R11; 04-1139, R13-A)

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TABLE 6.2-32 (SHEET 65 OF 85)

Revision 13-A (09/04)

CONTAINMENT PENETRATIONS AND ISOLATION VALVES

→ (DRN 99-2371, R11)
 PENETRATION NO.: 58 TYPE^(j): III CLASS: D VENTED/DRAINED FOR TYPE "A" TEST^(k): NO^(m) TYPE FLUID^(a): BORATED WATER
 General Design Criteria: 54, 55

→(DRN 04-1139, R13-A) VALVE TAG NO.: UNID	SI MVA00228 A	SI MVA00228 B	SI MVA00244	SI MVA002441
VALVE TYPE	GLOBE	GLOBE	CHECK	GLOBE
VALVE OPERATOR ^(g)	ELECTRIC	ELECTRIC	SELF	MANUAL
ACTUATION MODE ^(z) : PRIMARY	REMOTE MANUAL	REMOTE MANUAL	NOT APPLICABLE	MANUAL
SECONDARY	MANUAL	MANUAL	NONE	NONE
VALVE POSITION ^(f) : NORMAL	CLOSED	CLOSED	NOT APPLICABLE	LOCKED CLOSE
SHUTDOWN	CLOSED	CLOSED	NOT APPLICABLE	LOCKED CLOSE/OPEN
POST-ACCIDENT	OPEN	OPEN	NOT APPLICABLE	LOCKED CLOSE
LOSS OF POWER TO ACTUATOR	AS IS	AS IS	NOT APPLICABLE	NOT APPLICABLE
ACTUATION SIGNAL ^(e) :	SIAS(OPEN)	SIAS(OPEN)	NONE	NONE
MAXIMUM CLOSURE TIME (SEC.)	12	12	NOT APPLICABLE	NOT APPLICABLE
LINE SIZE (INCH)	3	3	3	1
ESSENTIAL ^(d) :	YES	YES	NOT APPLICABLE	NO
FLOW DIRECTION ^(b) :	INFLUENT TO CONTAINMENT	INFLUENT TO CONTAINMENT	INFLUENT TO CONTAINMENT	INFLUENT TO CONTAINMENT
LOCATION REFERENCE TO CONTAINMENT ^(c) :	OUTSIDE	OUTSIDE	INSIDE	INSIDE
POWER SOURCE (AC/DC)	AC-SA	AC-SB	NONE	NONE
APPROXIMATE LENGTH OF PIPE (FT.-IN.) ^(h) :	138 – 6	85'-2"	NOT APPLICABLE	NOT APPLICABLE
TYPE "C" TESTS ⁽ⁱ⁾ :	NO	NO	NO ^(r)	NO
TEST ARRANGEMENT ^(o) :	NOT APPLICABLE	NOT APPLICABLE	NOT APPLICABLE	NOT APPLICABLE
SYSTEM	SAFETY INJECTION SYSTEM FROM HPSI LOOP 2B	SAFETY INJECTION SYSTEM FROM HPSI LOOP 2B	SAFETY INJECTION SYSTEM FROM HPSI LOOP 2B	SAFETY INJECTION SYSTEM FROM HPSI LOOP 2B

REMARKS
 ← (DRN 99-2371, R11; 04-11139, R13-A)

TABLE 6.2-32 (SHEET 66 OF 85)

Revision 12 (10/02)

CONTAINMENT PENETRATIONS AND ISOLATION VALVES

→ (DRN 99-2371)
 PENETRATION NO.: 59 TYPE^(j): III CLASS: B2 VENTED/DRAINED FOR TYPE "A" TEST^(k): YES TYPE FLUID^(a): BORATED WATER
 General Design Criteria: 54, 55

→ (DRN 01-478)			
VALVE TAG NO.:	UNID	SI MVA344	SI MVA343
VALVE TYPE		GLOBE	GATE
VALVE OPERATOR ^(g)		MANUAL	PNEUMATIC
ACTUATION MODE ^(z) : PRIMARY		MANUAL	AUTOMATIC
SECONDARY		NONE	REMOTE MANUAL
VALVE POSITION ^(f) :			
NORMAL		LOCKED CLOSED	CLOSED
SHUTDOWN		CLOSED	CLOSED
POST-ACCIDENT		CLOSED	CLOSED
LOSS OF POWER TO ACTUATOR		NOT APPLICABLE	CLOSED
ACTUATION SIGNAL ^(e) :		NONE	CIAS
MAXIMUM CLOSURE TIME (SEC.)		NONE	10
LINE SIZE (INCH)		2	2
ESSENTIAL ^(d) :		NO	NO
FLOW DIRECTION ^(b) :		EFFLUENT FROM CONTAINMENT	EFFLUENT FROM CONTAINMENT
LOCATION REFERENCE TO CONTAINMENT ^(c) :		OUTSIDE	INSIDE
POWER SOURCE (AC/DC)		NONE	AC-SA
APPROXIMATE LENGTH OF PIPE (FT.-IN.) ^(h) :		142 – 0	NOT APPLICABLE
TYPE "C" TESTS ⁽ⁱ⁾ :		YES	YES
TEST ARRANGEMENT ^(o) :		3	3
SYSTEM		SIS FROM SI TANKS TO RWSP	SIS FROM SI TANKS TO RWSP

← (DRN 01-478)
 REMARKS
 ← (DRN 99-2371)

CONTAINMENT PENETRATIONS AND ISOLATION VALVES

→ (DRN 99-2371)

PENETRATION NO.: 60 TYPE^(j): III CLASS: A1 VENTED/DRAINED FOR TYPE "A" TEST^(k): YES TYPE FLUID^(a): PRIMARY WATER
 General Design Criteria: 54, 56

VALVE TAG NO.:	UNID	FP MVAAA601 A	FP MVAAA602 A
VALVE TYPE		GLOBE	CHECK
VALVE OPERATOR ^(g)		PNEUMATIC	SELF
ACTUATION MODE ^(z) :	PRIMARY	AUTOMATIC	NOT APPLICABLE
	SECONDARY	REMOTE MANUAL	NONE
VALVE POSITION ^(f) :			
NORMAL		OPEN	NOT APPLICABLE
SHUTDOWN		OPEN	NOT APPLICABLE
POST-ACCIDENT		CLOSED	NOT APPLICABLE
LOSS OF POWER TO ACTUATOR		CLOSED	NOT APPLICABLE
ACTUATION SIGNAL ^(e) :		CIAS	NONE
MAXIMUM CLOSURE TIME (SEC.)		10	NOT APPLICABLE
LINE SIZE (INCH)		3	3
ESSENTIAL ^(d) :		NO	NOT APPLICABLE
FLOW DIRECTION ^(b) :		INFLUENT TO CONTAINMENT	INFLUENT TO CONTAINMENT
LOCATION REFERENCE TO CONTAINMENT ^(c) :		OUTSIDE	INSIDE
POWER SOURCE (AC/DC)		AC-SA	NONE
APPROXIMATE LENGTH OF PIPE (FT.-IN.) ^(h) :		29 – 10	NOT APPLICABLE
TYPE "C" TESTS ⁽ⁱ⁾ :		YES	YES
TEST ARRANGEMENT ^(o) :		1	1
SYSTEM		FIRE PROTECTION SYSTEM TO REACTOR BUILDING	FIRE PROTECTION SYSTEM TO REACTOR BUILDING

REMARKS

← (DRN 99-2371)

TABLE 6.2-32 (SHEET 68 OF 85)

Revision 11 (05/01)

CONTAINMENT PENETRATIONS AND ISOLATION VALVES

→ (DRN 99-2371)

PENETRATION NO.: 61 TYPE^(j): III CLASS: A1 VENTED/DRAINED FOR TYPE "A" TEST^(k): YES TYPE FLUID^(a): PRIMARY WATER
 General Design Criteria: 54, 56

VALVE TAG NO.:	UNID	FP MVA00601 B	FP MVA00602 B
VALVE TYPE		GLOBE	CHECK
VALVE OPERATOR ^(g)		PNEUMATIC	SELF
ACTUATION MODE ^(z) :	PRIMARY	AUTOMATIC	NOT APPLICABLE
	SECONDARY	REMOTE MANUAL	NONE
VALVE POSITION ^(f) :			
NORMAL		OPEN	NOT APPLICABLE
SHUTDOWN		OPEN	NOT APPLICABLE
POST-ACCIDENT		CLOSED	NOT APPLICABLE
LOSS OF POWER TO ACTUATOR		CLOSED	NOT APPLICABLE
ACTUATION SIGNAL ^(e) :		CIAS	NONE
MAXIMUM CLOSURE TIME (SEC.)		10	NOT APPLICABLE
LINE SIZE (INCH)		3	3
ESSENTIAL ^(d) :		NO	NOT APPLICABLE
FLOW DIRECTION ^(b) :		INFLUENT TO CONTAINMENT	INFLUENT TO CONTAINMENT
LOCATION REFERENCE TO CONTAINMENT ^(c) :		OUTSIDE	INSIDE
POWER SOURCE (AC/DC)		AC-SB	NONE
APPROXIMATE LENGTH OF PIPE (FT.-IN.) ^(h) :		31 – 10	NOT APPLICABLE
TYPE "C" TESTS ⁽ⁱ⁾ :		YES	YES
TEST ARRANGEMENT ^(o) :		1	1
SYSTEM		FIRE PROTECTION SYSTEM TO REACTOR BUILDING	FIRE PROTECTION SYSTEM TO REACTOR BUILDING

REMARKS

← (DRN 99-2371)

CONTAINMENT PENETRATIONS AND ISOLATION VALVES

→ (DRN 99-2371)

PENETRATION NO.: 62 TYPE^(j): III CLASS: A2 VENTED/DRAINED FOR TYPE "A" TEST^(k): YES TYPE FLUID^(a): BORATED WATER
 General Design Criteria: 54, 56

VALVE TAG NO.: UNID	FS MVA4416	FS MVA4415
VALVE TYPE	DIAPHRAGM	DIAPHRAGM
VALVE OPERATOR ^(g)	MANUAL	MANUAL
ACTUATION MODE ^(z) : PRIMARY	MANUAL	MANUAL
SECONDARY	NONE	NONE
VALVE POSITION ^(f) :		
NORMAL	LOCKED CLOSED	LOCKED CLOSED
SHUTDOWN	LOCKED CLOSED	LOCKED CLOSED
POST-ACCIDENT	CLOSED	CLOSED
LOSS OF POWER TO ACTUATOR	NOT APPLICABLE	NOT APPLICABLE
ACTUATION SIGNAL ^(e) :	NONE	NONE
MAXIMUM CLOSURE TIME (SEC.)	NOT APPLICABLE	NOT APPLICABLE
LINE SIZE (INCH)	6	6
ESSENTIAL ^(d) :	NO	NO
FLOW DIRECTION ^(b) :	EFFLUENT FROM CONTAINMENT	EFFLUENT FROM CONTAINMENT
LOCATION REFERENCE TO CONTAINMENT ^(c) :	OUTSIDE	INSIDE
POWER SOURCE (AC/DC)	NONE	NONE
APPROXIMATE LENGTH OF PIPE (FT.-IN.) ^(h) :	14 - 0	3 - 10
TYPE "C" TESTS ⁽ⁱ⁾ :	YES	YES
TEST ARRANGEMENT ^(o) :	3	3
SYSTEM	REFUELING WATER FROM REFUELING CAVITY TO RWSP	REFUELING WATER FROM REFUELING CAVITY TO RWSP

REMARKS

← (DRN 99-2371)

CONTAINMENT PENETRATIONS AND ISOLATION VALVES

→ (DRN 99-2371)

PENETRATION NO.: 63 TYPE^(j): II CLASS: A2 VENTED/DRAINED FOR TYPE "A" TEST^(k): YES/NO* TYPE FLUID^(a): CONTAINMENT ATMOSPHERE
 General Design Criteria: 54, 56

VALVE TAG NO.: UNID	LRTMVAAA109	BLIND FLANGE	LRTMVAAA110
VALVE TYPE	GATE	NOT APPLICABLE	GLOBE
VALVE OPERATOR ^(g)	MANUAL	NOT APPLICABLE	MANUAL
ACTUATION MODE ^(z) : PRIMARY	MANUAL	NOT APPLICABLE	MANUAL
SECONDARY	NONE	NOT APPLICABLE	NONE
VALVE POSITION ^(f) :			
NORMAL	LOCKED CLOSED	NOT APPLICABLE	LOCKED CLOSED
SHUTDOWN	CLOSED	NOT APPLICABLE	LOCKED CLOSED
POST-ACCIDENT	CLOSED	NOT APPLICABLE	LOCKED CLOSED
LOSS OF POWER TO ACTUATOR	NOT APPLICABLE	NOT APPLICABLE	NOT APPLICABLE
ACTUATION SIGNAL ^(e) :	NOT APPLICABLE	NOT APPLICABLE	NOT APPLICABLE
MAXIMUM CLOSURE TIME (SEC.)	NOT APPLICABLE	NOT APPLICABLE	NOT APPLICABLE
LINE SIZE (INCH)	10	10	1
ESSENTIAL ^(d) :	NO	NOT APPLICABLE	NO
FLOW DIRECTION ^(b) :	INFLUENT TO CONTAINMENT/ EFFLUENT FROM CONTAINMENT		EFFLUENT FROM CONTAINMENT
LOCATION REFERENCE TO CONTAINMENT ^(c) :	OUTSIDE	INSIDE	OUTSIDE
POWER SOURCE (AC/DC)	NONE	NONE	NONE
APPROXIMATE LENGTH OF PIPE (FT.-IN.) ^(h) :	14 – 0	NOT APPLICABLE	6-0
TYPE "C" TESTS ⁽ⁱ⁾ :	YES	YES	NO
TEST ARRANGEMENT ^(o) :	G-164 SH1(N-12)	G-164SH1(L-10)	NOT APPLICABLE NOT APPLICABLE
SYSTEM	MISC REACTOR AUXILIARY, CONTAINMENT LEAKAGE RATE TEST	MISC REACTOR AUXILIARY, CONTAINMENT LEAKAGE RATE TEST	MISC REACTOR AUXILIARY, CONTAINMENT LEAKAGE RATE TEST

REMARKS * "YES" FOR 2SA – V114, "NO" FOR 2SA – V604

← (DRN 99-2371)

CONTAINMENT PENETRATIONS AND ISOLATION VALVES

→ (DRN 99-2371)

PENETRATION NO.: 64 TYPE^(j): SPARE CLASS: _____ VENTED/DRAINED FOR TYPE "A" TEST^(k): _____ TYPE FLUID^(a): _____
General Design Criteria: Not Applicable

VALVE TAG NO.: UNID

VALVE TYPE

VALVE OPERATOR^(g)

ACTUATION MODE^(z): PRIMARY
SECONDARY

VALVE POSITION^(f):

NORMAL

SHUTDOWN

POST-ACCIDENT

LOSS OF POWER TO ACTUATOR

ACTUATION SIGNAL^(e):

MAXIMUM CLOSURE TIME (SEC.)

LINE SIZE (INCH)

ESSENTIAL^(d):

FLOW DIRECTION^(b):

LOCATION REFERENCE TO CONTAINMENT^(c):

POWER SOURCE (AC/DC)

APPROXIMATE LENGTH OF PIPE (FT.-IN.)^(h):

TYPE "C" TESTS⁽ⁱ⁾:

TEST ARRANGEMENT^(o):

SYSTEM

REMARKS

← (DRN 99-2371)

CONTAINMENT PENETRATIONS AND ISOLATION VALVES

→ (DRN 99-2371)

PENETRATION NO.: 65 TYPE^(j): II ^(MODIFIED) CLASS: INST VENTED/DRAINED FOR TYPE "A" TEST^(k): YES* TYPE FLUID^(a): CONTAINMENT ATMOSPHERE
 General Design Criteria: 54, 56

VALVE TAG NO.: UNID	LRTMVA00202	LRTMVA00204	CVRMVA00301B	CVRMVA00302B
VALVE TYPE	GLOBE	GLOBE	GLOBE	EXCESS FLOW CHECK
VALVE OPERATOR ^(g)	MANUAL	MANUAL	MANUAL	SELF
ACTUATION MODE ^(z) : PRIMARY	MANUAL	MANUAL	MANUAL	NOT APPLICABLE
SECONDARY	NONE	NONE	NONE	NONE
VALVE POSITION ^(f) :				
NORMAL	LOCKED CLOSED	LOCKED CLOSED	OPEN	OPEN
SHUTDOWN	LOCKED CLOSED	LOCKED CLOSED	OPEN	OPEN
POST-ACCIDENT	LOCKED CLOSED	LOCKED CLOSED	OPEN	OPEN
LOSS OF POWER TO ACTUATOR	NOT APPLICABLE	NOT APPLICABLE	NOT APPLICABLE	NOT APPLICABLE
ACTUATION SIGNAL ^(e) :	NONE	NONE	NONE	NONE
MAXIMUM CLOSURE TIME (SEC.)	NOT APPLICABLE	NOT APPLICABLE	NOT APPLICABLE	NOT APPLICABLE
LINE SIZE (INCH)	1	1	1/2	1/2
ESSENTIAL ^(d) :	NO	NO	YES	NOT APPLICABLE
FLOW DIRECTION ^(b) :				
CONTAINMENT	INFLUENT TO CONTAINMENT/ EFFLUENT FROM CONTAINMENT	INFLUENT TO CONTAINMENT/ EFFLUENT FROM CONTAINMENT	INFLUENT TO CONTAINMENT/ EFFLUENT FROM CONTAINMENT	INFLUENT TO CONTAINMENT/ EFFLUENT FROM
LOCATION REFERENCE TO CONTAINMENT ^(c) :	OUTSIDE	OUTSIDE	OUTSIDE	OUTSIDE
POWER SOURCE (AC/DC)	NONE	NONE	NONE	NONE
APPROXIMATE LENGTH OF PIPE (FT.-IN.) ^(h) :	5	5	5	5
TYPE "C" TESTS ⁽ⁱ⁾ :	YES	YES	NO	NO
TEST ARRANGEMENT ^(o) :	**	**	NOT APPLICABLE	NOT APPLICABLE
SYSTEM	CONTAINMENT LEAKAGE RATE TEST CONNECTION AND INSTRUMENT H&V	CONTAINMENT LEAKAGE RATE TEST CONNECTION AND INSTRUMENT H&V	CONTAINMENT LEAKAGE RATE TEST CONNECTION AND INSTRUMENT H&V	CONTAINMENT LEAKAGE RATE TEST CONNECTION AND INSTRUMENT H&V

REMARKS

** REFER TO LOU 1564-G-164 SH1 (ZONE N-14)

← (DRN 99-2371)

CONTAINMENT PENETRATIONS AND ISOLATION VALVES

→ (DRN 99-2371)

PENETRATION NO.: 65 (CONTINUED) TYPE^(j): II CLASS: D VENTED/DRAINED FOR TYPE "A" TEST^(k): YES* TYPE FLUID^(a): CONTAINMENT ATMOSPHERE
 General Design Criteria: 54, 56

VALVE TAG NO.: UNID	LRTMVAAA201	LRTMVAAA203
VALVE TYPE	GLOBE	GLOBE
VALVE OPERATOR ^(g)	MANUAL	MANUAL
ACTUATION MODE ^(z) : PRIMARY	MANUAL	MANUAL
SECONDARY	NONE	NONE
VALVE POSITION ^(f) :		
NORMAL	LOCKED CLOSED	LOCKED CLOSED
SHUTDOWN	LOCKED CLOSED	LOCKED CLOSED
POST-ACCIDENT	LOCKED CLOSED	LOCKED CLOSED
LOSS OF POWER TO ACTUATOR	NOT APPLICABLE	NOT APPLICABLE
ACTUATION SIGNAL ^(e) :	NONE	NONE
MAXIMUM CLOSURE TIME (SEC.)	NOT APPLICABLE	NOT APPLICABLE
LINE SIZE (INCH)	1	1
ESSENTIAL ^(d) :	NO	NO
FLOW DIRECTION ^(b) :	EFFLUENT FROM CONTAINMENT	EFFLUENT FROM CONTAINMENT
LOCATION REFERENCE TO CONTAINMENT ^(c) :	OUTSIDE	OUTSIDE
POWER SOURCE (AC/DC)	NONE	NONE
APPROXIMATE LENGTH OF PIPE (FT.-IN.) ^(h) :	6-0	6-0
TYPE "C" TESTS ⁽ⁱ⁾ :	YES	YES
TEST ARRANGEMENT ^(o) :	G-164 SH1 (L-12)	G-164 SH1 (M-14)
SYSTEM	CONTAINMENT LEAKAGE RATE TEST CONNECTION AND INSTRUMENT H&V	CONTAINMENT LEAKAGE RATE TEST CONNECTION AND INSTRUMENT H&V

REMARKS

* CONTROL SWITCH AT LOCAL STATION.

← (DRN 99-2371)

CONTAINMENT PENETRATIONS AND ISOLATION VALVES

→ (DRN 99-2371)

PENETRATION NO.: 65 (CONTINUED) TYPE^(j): II CLASS: D VENTED/DRAINED FOR TYPE "A" TEST^(k): YES/NO* TYPE FLUID^(a): CONTAINMENT ATMOSPHERE
 General Design Criteria: 54, 56

VALVE TAG NO.: UNID	LRTMVAAA2011	LRTMVAAA2031
VALVE TYPE	GLOBE	GLOBE
VALVE OPERATOR ^(g)	MANUAL	MANUAL
ACTUATION MODE ^(z) : PRIMARY	MANUAL	MANUAL
SECONDARY	NONE	NONE
VALVE POSITION ^(f) :		
NORMAL	LOCKED CLOSED	LOCKED CLOSED
SHUTDOWN	CLOSED	CLOSED
POST-ACCIDENT	CLOSED	CLOSED
LOSS OF POWER TO ACTUATOR	NOT APPLICABLE	NOT APPLICABLE
ACTUATION SIGNAL ^(e) :	NONE	NONE
MAXIMUM CLOSURE TIME (SEC.)	NOT APPLICABLE	NOT APPLICABLE
LINE SIZE (INCH)	3/4	3/4
ESSENTIAL ^(d) :	NO	NO
FLOW DIRECTION ^(b) :	EFFLUENT FROM CONTAINMENT	EFFLUENT FROM CONTAINMENT
LOCATION REFERENCE TO CONTAINMENT ^(c) :	OUTSIDE	OUTSIDE
POWER SOURCE (AC/DC)	NONE	NONE
APPROXIMATE LENGTH OF PIPE (FT.-IN.) ^(h) :	6-0	6-0
TYPE "C" TESTS ⁽ⁱ⁾ :	NO	NO
TEST ARRANGEMENT ^(o) :	NOT APPLICABLE	NOT APPLICABLE
SYSTEM	CONTAINMENT LEAKAGE RATE TEST CONNECTION AND INSTRUMENT H&V	CONTAINMENT LEAKAGE RATE TEST CONNECTION AND INSTRUMENT H&V

REMARKS

← (DRN 99-2371)

CONTAINMENT PENETRATIONS AND ISOLATION VALVES

→ (DRN 99-2371)

PENETRATION NO.: 66 TYPE^(j): II (MODIFIED) CLASS: A2 VENTED/DRAINED FOR TYPE "A" TEST^(k): YES TYPE FLUID^(a): CONTAINMENT ATMOSPHERE
 General Design Criteria: 54, 56

VALVE TAG NO.: UNID	HRAISV0110A	HRAISV0109A	HRAISV0126A	HRAISV0126A	HRAISV0126A
VALVE TYPE	GLOBE	GLOBE	GLOBE	GLOBE	CHECK
VALVE OPERATOR ^(g)	SOLENOID	SOLENOID	SOLENOID	SOLENOID	SELF
ACTUATION MODE ^(z) : PRIMARY	AUTOMATIC	AUTOMATIC	AUTOMATIC	AUTOMATIC	NOT APPLICABLE
SECONDARY	REMOTE MANUAL	REMOTE MANUAL	REMOTE MANUAL	REMOTE MANUAL	NONE
VALVE POSITION ^(f) :					
NORMAL	LOCKED CLOSED	LOCKED CLOSED	LOCKED CLOSED	LOCKED CLOSED	NOT APPLICABLE
SHUTDOWN	LOCKED CLOSED	LOCKED CLOSED	LOCKED CLOSED	LOCKED CLOSED	NOT APPLICABLE
POST-ACCIDENT	CLOSED/OPEN	CLOSED/OPEN	CLOSED/OPEN	CLOSED/OPEN	NOT APPLICABLE
LOSS OF POWER TO ACTUATOR	CLOSED	CLOSED	CLOSED	CLOSED	NOT APPLICABLE
ACTUATION SIGNAL ^(e) :	CIAS ^(q)	CIAS ^(q)	CIAS ^(q)	CIAS ^(q)	NONE
MAXIMUM CLOSURE TIME (SEC.)	NOT APPLICABLE	NOT APPLICABLE	NOT APPLICABLE	NOT APPLICABLE	NOT APPLICABLE
LINE SIZE (INCH)	3/8	3/8	3/8	3/8	3/8
ESSENTIAL ^(d) :	YES	YES	YES	YES	NOT APPLICABLE
FLOW DIRECTION ^(b) :	EFFLUENT FROM CONTAINMENT	EFFLUENT FROM CONTAINMENT	INFLUENT TO CONTAINMENT	INFLUENT TO CONTAINMENT	INFLUENT TO CONTAINMENT
LOCATION REFERENCE TO CONTAINMENT ^(c) :	OUTSIDE	INSIDE	OUTSIDE	OUTSIDE	INSIDE
POWER SOURCE (AC/DC)	AC-SA	AC-SA	AC-SA	AC-SA	NONE
APPROXIMATE LENGTH OF PIPE (FT.-IN.) ^(h) :	5	NOT APPLICABLE	5	5	NOT APPLICABLE
TYPE "C" TESTS ⁽ⁱ⁾ :	YES	YES	YES	YES	YES
TEST ARRANGEMENT ^(o) :	3	3	7	7	7
SYSTEM	HYDROGEN ANALYZER SUPPLY & RETURN	HYDROGEN ANALYZER SUPPLY & RETURN	HYDROGEN ANALYZER SUPPLY & RETURN	HYDROGEN ANALYZER SUPPLY & RETURN	HYDROGEN ANALYZER SUPPLY & RETURN

REMARKS
 ← (DRN 99-2371)

TABLE 6.2-32 (SHEET 76 OF 85)

Revision 11 (05/01)

CONTAINMENT PENETRATIONS AND ISOLATION VALVES

→ (DRN 99-2371)

PENETRATION NO.: 67 TYPE^(j): II (MODIFIED) CLASS: A2 VENTED/DRAINED FOR TYPE "A" TEST^(k): YES TYPE FLUID^(a): CONTAINMENT ATMOSPHERE
 General Design Criteria: 54, 56

VALVE TAG NO.:	UNID	HRAISV0110 B	HRAISV0109 B	HRAISV0126 B	HRAISV0128 B
VALVE TYPE		GLOBE	GLOBE	GLOBE	CHECK
VALVE OPERATOR ^(g)		SOLENOID	SOLENOID	SOLENOID	SELF
ACTUATION MODE ^(z) : PRIMARY		AUTOMATIC	AUTOMATIC	AUTOMATIC	NOT APPLICABLE
SECONDARY		REMOTE MANUAL	REMOTE MANUAL	REMOTE MANUAL	NONE
VALVE POSITION ^(f) :					
NORMAL		LOCKED CLOSED	LOCKED CLOSED	LOCKED CLOSED	NOT APPLICABLE
SHUTDOWN		LOCKED CLOSED	LOCKED CLOSED	LOCKED CLOSED	NOT APPLICABLE
POST-ACCIDENT		CLOSED/OPEN	CLOSED/OPEN	CLOSED/OPEN	NOT APPLICABLE
LOSS OF POWER TO ACTUATOR		CLOSED	CLOSED	CLOSED	NOT APPLICABLE
ACTUATION SIGNAL ^(e) :		CIAS ^(q)	CIAS ^(q)	CIAS ^(q)	NONE
MAXIMUM CLOSURE TIME (SEC.)		NOT APPLICABLE	NOT APPLICABLE	NOT APPLICABLE	NOT APPLICABLE
LINE SIZE (INCH)		3/8	3/8	3/8	3/8
ESSENTIAL ^(d) :		YES	YES	YES	NOT APPLICABLE
FLOW DIRECTION ^(b) :					
		EFFLUENT FROM CONTAINMENT	EFFLUENT FROM CONTAINMENT	INFLUENT TO CONTAINMENT	INFLUENT TO CONTAINMENT
LOCATION REFERENCE TO CONTAINMENT ^(c) :		OUTSIDE	INSIDE	OUTSIDE	INSIDE
POWER SOURCE (AC/DC)		AC-SB	AC-SB	AC-SB	NONE
APPROXIMATE LENGTH OF PIPE (FT.-IN.) ^(h) :		5	5	5	NOT APPLICABLE
TYPE "C" TESTS ⁽ⁱ⁾ :		YES	YES	YES	YES
TEST ARRANGEMENT ^(o) :		3	3	7	7
SYSTEM		HYDROGEN ANALYZER SUPPLY & RETURN LINE	HYDROGEN ANALYZER SUPPLY & RETURN LINE	HYDROGEN ANALYZER SUPPLY & RETURN LINE	HYDROGEN ANALYZER SUPPLY & RETURN LINE

REMARKS
 ← (DRN 99-2371)

CONTAINMENT PENETRATIONS AND ISOLATION VALVES

→ (DRN 99-2371, R11)
 PENETRATION NO.: 68 TYPE^(j): III CLASS: C VENTED/DRAINED FOR TYPE "A" TEST^(k): NO⁽ⁿ⁾ TYPE FLUID^(a): SECONDARY COOLANT
 General Design Criteria: 54, 57

→ (DRN 01-1383, R11-B; 05-41, R14)		
VALVE TAG NO.: UNID	SSLMVAAA8006 B	SSLMVAAA8004 B ^{(u)*}
← (DRN 01-1383, R11-B; 05-41, R14)		
VALVE TYPE	GLOBE	GLOBE
VALVE OPERATOR ^(g) :	PNEUMATIC	PNEUMATIC
ACTUATION MODE ^(z) : PRIMARY	AUTOMATIC	AUTOMATIC
SECONDARY	REMOTE MANUAL	REMOTE MANUAL
VALVE POSITION ^(f) :		
NORMAL	OPEN	OPEN
SHUTDOWN	OPEN	OPEN
POST-ACCIDENT	CLOSED/OPEN	CLOSED/OPEN
LOSS OF POWER TO ACTUATOR	CLOSED	CLOSED
ACTUATION SIGNAL ^(e) :		
	CIAS ^(q)	CIAS ^(q)
MAXIMUM CLOSURE TIME (SEC.)		
	10	10
LINE SIZE (INCH)		
	½	½
ESSENTIAL ^(d) :		
	NO	NO
FLOW DIRECTION ^(b) :		
LOCATION REFERENCE TO CONTAINMENT ^(c) :	EFFLUENT FROM CONTAINMENT OUTSIDE	EFFLUENT FROM CONTAINMENT INSIDE
POWER SOURCE (AC/DC)		
	AC-SA	AC-SB
APPROXIMATE LENGTH OF PIPE (FT.-IN.) ^(h) :		
	24 – 4	NOT APPLICABLE
TYPE "C" TESTS ⁽ⁱ⁾ :		
	NO	NO
TEST ARRANGEMENT ^(o) :		
	NOT APPLICABLE	NOT APPLICABLE
SYSTEM		
	SAMPLING FROM STEAM GENERATOR 2 BLOWDOWN	SAMPLING FROM STEAM GENERATOR 2 BLOWDOWN

REMARKS

← (DRN 99-2371, R11)
 → (DRN 05-41, R14)

*VALVE NOT CREDITED AS A CONTAINMENT ISOLATION VALVE. VALVE HAS POSITION INDICATION IN CONTROL ROOM. VALVE ISOLATION SAFETY FUNCTION IS PROVIDED BY CIAS/EFAS TO ISOLATE STEAM GENERATOR.

← (DRN 05-41, R14)

WSES-FSAR-UNIT-3

TABLE 6.2-32 (SHEET 78 OF 85)

Revision 13-A (09/04)

CONTAINMENT PENETRATIONS AND ISOLATION VALVES

→ (DRN 99-2371, R11)

PENETRATION NO.: 69 (MODIFIED) TYPE^(j): III CLASS: D VENTED/DRAINED FOR TYPE "A" TEST^(k): NO^(m) TYPE FLUID^(a): BORATED WATER
 General Design Criteria: 54, 55

→ (DRN 04-1139, R13-A)

VALVE TAG NO.:	UNID	SI MVA506 A	SI MVA510 A	SI MVA5101 A
VALVE TYPE		GLOBE	CHECK	GLOBE
VALVE OPERATOR ^(g)		ELECTRIC	SELF	MANUAL
ACTUATION MODE ^(z) :	PRIMARY	REMOTE MANUAL	NOT APPLICABLE	MANUAL
	SECONDARY	MANUAL	NONE	NONE
VALVE POSITION ^(f) :				
NORMAL		LOCKED CLOSED	NOT APPLICABLE	LOCKED CLOSE
SHUTDOWN		LOCKED CLOSED	NOT APPLICABLE	LOCKED CLOSE/OPEN
POST-ACCIDENT		CLOSED/OPEN	NOT APPLICABLE	LOCKED CLOSE
LOSS OF POWER TO ACTUATOR		AS IS	NOT APPLICABLE	NOT APPLICABLE
ACTUATION SIGNAL ^(e) :		NONE	NONE	NONE
MAXIMUM CLOSURE TIME (SEC.)		NOT APPLICABLE	NOT APPLICABLE	NOT APPLICABLE
LINE SIZE (INCH)		3	3	1
ESSENTIAL ^(d) :		YES	NOT APPLICABLE	NO
FLOW DIRECTION ^(b) :		INFLUENT TO CONTAINMENT	INFLUENT TO CONTAINMENT	INFLUENT TO CONTAINMENT
LOCATION REFERENCE TO CONTAINMENT ^(c) :		OUTSIDE	INSIDE	INSIDE
POWER SOURCE (AC/DC)		AC-SA	NONE	NONE
APPROXIMATE LENGTH OF PIPE (FT.-IN.) ^(h) :		76 – 3	NOT APPLICABLE	NOT APPLICABLE
TYPE "C" TESTS ⁽ⁱ⁾ :		NO	NO ^(r)	NO
TEST ARRANGEMENT ^(o) :		NOT APPLICABLE	NOT APPLICABLE	NOT APPLICABLE
SYSTEM		SAFETY INJECTION HOT LEG INJECTION	SAFETY INJECTION HOT LEG INJECTION	SAFETY INJECTION HOT LEG INJECTION

REMARKS

← (DRN 99-2371, R11; 04-1139, R13-A)

WSES-FSAR-UNIT-3

TABLE 6.2-32 (SHEET 79 OF 85)

Revision 13-A (09/04)

CONTAINMENT PENETRATIONS AND ISOLATION VALVES

→ (DRN 99-2371, R11)

PENETRATION NO.: 70 (MODIFIED) TYPE^(j): III CLASS: D VENTED/DRAINED FOR TYPE "A" TEST^(k): NO^(m) TYPE FLUID^(a): BORATED WATER
 General Design Criteria: 54, 55

→ (DRN 04-1139, R13-A)

VALVE TAG NO.:	UNID	SI MVA506 B	SI MVA510 B	SI MVA5101 B
VALVE TYPE		GLOBE	CHECK	GLOBE
VALVE OPERATOR ^(g)		ELECTRIC	SELF	MANUAL
ACTUATION MODE ^(z) :	PRIMARY SECONDARY	REMOTE MANUAL MANUAL	NOT APPLICABLE NONE	MANUAL NONE
VALVE POSITION ^(f) :				
NORMAL		LOCKED CLOSED	NOT APPLICABLE	LOCKED CLOSE
SHUTDOWN		LOCKED CLOSED	NOT APPLICABLE	LOCKED CLOSE/OPEN
POST-ACCIDENT		CLOSED/OPEN	NOT APPLICABLE	LOCKED CLOSE
LOSS OF POWER TO ACTUATOR		AS IS	NOT APPLICABLE	NOT APPLICABLE
ACTUATION SIGNAL ^(e) :		NONE	NONE	NONE
MAXIMUM CLOSURE TIME (SEC.)		NOT APPLICABLE	NOT APPLICABLE	NOT APPLICABLE
LINE SIZE (INCH)		3	3	1
ESSENTIAL ^(d) :		YES	NOT APPLICABLE	NO
FLOW DIRECTION ^(b) :		INFLUENT TO CONTAINMENT	INFLUENT TO CONTAINMENT	INFLUENT TO CONTAINMENT
LOCATION REFERENCE TO CONTAINMENT ^(c) :		OUTSIDE	INSIDE	INSIDE
POWER SOURCE (AC/DC)		AC-SB	NONE	NONE
APPROXIMATE LENGTH OF PIPE (FT.-IN.) ^(h) :		55 – 7	NOT APPLICABLE	NOT APPLICABLE
TYPE "C" TESTS ⁽ⁱ⁾ :		NO	NO ^(r)	NO
TEST ARRANGEMENT ^(o) :		NOT APPLICABLE	NOT APPLICABLE	NOT APPLICABLE
SYSTEM		SAFETY INJECTION HOT LEG INJECTION	SAFETY INJECTION HOT LEG INJECTION	SAFETY INJECTION HOT LEG INJECTION

REMARKS

← (DRN 99-2371, R11; 04-1139, R13-A)

TABLE 6.2-32 (SHEET 80 OF 85)

Revision 11 (05/01)

CONTAINMENT PENETRATIONS AND ISOLATION VALVES

→ (DRN 99-2371)

PENETRATION NO.: 71 TYPE^(j): III CLASS: A2 VENTED/DRAINED FOR TYPE "A" TEST^(k): YES TYPE FLUID^(a): DEMINERALIZED WATER
 General Design Criteria: 54, 56

VALVE TAG NO.: UNID	CMUMVAAA244	CMUMVAAA245
VALVE TYPE	GLOBE	CHECK
VALVE OPERATOR ^(g)	MANUAL	SELF
ACTUATION MODE ^(z) : PRIMARY	MANUAL	NOT APPLICABLE
SECONDARY	NONE	NONE
VALVE POSITION ^(f) :		
NORMAL	LOCKED CLOSED	NOT APPLICABLE
SHUTDOWN	LOCKED CLOSED/OPEN	NOT APPLICABLE
POST-ACCIDENT	LOCKED CLOSED/OPEN	NOT APPLICABLE
LOSS OF POWER TO ACTUATOR	NOT APPLICABLE	NOT APPLICABLE
ACTUATION SIGNAL ^(e) :	NONE	NONE
MAXIMUM CLOSURE TIME (SEC.)	NOT APPLICABLE	NOT APPLICABLE
LINE SIZE (INCH)	1 - ½	1 - ½
ESSENTIAL ^(d) :	NO	NOT APPLICABLE
FLOW DIRECTION ^(b) :	INFLUENT TO CONTAINMENT	INFLUENT TO CONTAINMENT
LOCATION REFERENCE TO CONTAINMENT ^(c) :	OUTSIDE	INSIDE
POWER SOURCE (AC/DC)	NONE	NONE
APPROXIMATE LENGTH OF PIPE (FT.-IN.) ^(h) :	5	NOT APPLICABLE
TYPE "C" TESTS ⁽ⁱ⁾ :	YES	YES
TEST ARRANGEMENT ^(o) :	1	1
SYSTEM	DEMINERALIZED WATER	DEMINERALIZED WATER
REMARKS		HAND OPERATED

← (DRN 99-2371)

CONTAINMENT PENETRATIONS AND ISOLATION VALVES

→ (DRN 99-2371)

PENETRATION NO.: 72 TYPE^(j): SPARE CLASS: _____ VENTED/DRAINED FOR TYPE "A" TEST^(k): _____ TYPE FLUID^(a): _____

General Design Criteria

VALVE TAG NO.: UNID

VALVE TYPE

VALVE OPERATOR^(g)

ACTUATION MODE^(z): PRIMARY
SECONDARY

VALVE POSITION^(f):

NORMAL

SHUTDOWN

POST-ACCIDENT

LOSS OF POWER TO ACTUATOR

ACTUATION SIGNAL^(e):

MAXIMUM CLOSURE TIME (SEC.)

LINE SIZE (INCH)

ESSENTIAL^(d):

FLOW DIRECTION^(b):

LOCATION REFERENCE TO CONTAINMENT^(c):

POWER SOURCE (AC/DC)

APPROXIMATE LENGTH OF PIPE (FT.-IN.)^(h):

TYPE "C" TESTS⁽ⁱ⁾:

TEST ARRANGEMENT^(o):

SYSTEM

REMARKS

← (DRN 99-2371)

CONTAINMENT PENETRATIONS AND ISOLATION VALVES

→ (DRN 99-2371)

PENETRATION NO.: 73 TYPE^(j): SPARE CLASS: VENTED/DRAINED FOR TYPE "A" TEST^(k): TYPE FLUID^(a):

General Design Criteria

VALVE TAG NO.: UNID

VALVE TYPE

VALVE OPERATOR^(g)

ACTUATION MODE^(z): PRIMARY
SECONDARY

VALVE POSITION^(f):

NORMAL

SHUTDOWN

POST-ACCIDENT

LOSS OF POWER TO ACTUATOR

ACTUATION SIGNAL^(e):

MAXIMUM CLOSURE TIME (SEC.)

LINE SIZE (INCH)

ESSENTIAL^(d):

FLOW DIRECTION^(b):

LOCATION REFERENCE TO CONTAINMENT^(c):

POWER SOURCE (AC/DC)

APPROXIMATE LENGTH OF PIPE (FT.-IN.)^(h):

TYPE "C" TESTS⁽ⁱ⁾:

TEST ARRANGEMENT^(o):

SYSTEM

REMARKS

← (DRN 99-2371)

CONTAINMENT PENETRATIONS AND ISOLATION VALVES

→ (DRN 99-2371)

PENETRATION NO.: 74 TYPE^(j): SPARE CLASS: _____ VENTED/DRAINED FOR TYPE "A" TEST^(k): _____ TYPE FLUID^(a): _____

General Design Criteria

VALVE TAG NO.: UNID

VALVE TYPE

VALVE OPERATOR^(g)

ACTUATION MODE^(z): PRIMARY
SECONDARY

VALVE POSITION^(f):

NORMAL

SHUTDOWN

POST-ACCIDENT

LOSS OF POWER TO ACTUATOR

ACTUATION SIGNAL^(e):

MAXIMUM CLOSURE TIME (SEC.)

LINE SIZE (INCH)

ESSENTIAL^(d):

FLOW DIRECTION^(b):

LOCATION REFERENCE TO CONTAINMENT^(c):

POWER SOURCE (AC/DC)

APPROXIMATE LENGTH OF PIPE (FT.-IN.)^(h):

TYPE "C" TESTS⁽ⁱ⁾:

TEST ARRANGEMENT^(o):

SYSTEM

REMARKS

← (DRN 99-2371)

CONTAINMENT PENETRATIONS AND ISOLATION VALVES

→ (DRN 99-2371)

NOTES:

- a) The chemistry of the primary coolant is given in Subsection 9.3.4
The chemistry of the secondary coolant is given in Subsection 10.3.5
The chemistry of the demineralized water is given in Subsection 9.2.3
The chemistry of the borated water used in safety injection and containment spray is given in Section 6.3.
- b) Flow Direction

Effluent from the containment
Influent to the containment
- c) Location inside the containment
Location outside the containment
- d) Engineered Safety Feature Systems include Containment Spray System, Containment Cooling System, Safety Injection System, Emergency Feedwater System, Shield Building Ventilation System and Combustible Gas Control Systems. Valves are considered essential if they perform a safety function in the open position.
- e) MSIS - Main Steam Isolation Signal
SIAS - Safety Injection Actuation Signal
HDP - High Differential Pressure Between Containment and Annulus
RAS - Recirculation Actuation Signal
CSAS - Containment Spray Actuation Signal
EFAS - Emergency Feedwater Actuation Signal
CPIS - Containment Purge Isolation Signal
(Class IE Radiation Monitors)
CIAS - Containment Isolation Actuation Signal
- f) Closed
Open
As is
Locked closed
Locked open
Not applicable
- g) Electric motor operated
pneumatic cylinder or diaphragm, or piston operated
Solenoid operated
Manually operated
Hydraulic cylinder operated
Self - Actuated by the fluid pressure
- h) Length of pipe from steel containment to outermost isolation valve outside containment.
- i) Type C testing is defined in 10CFR50, Appendix J.

← (DRN 99-2371)

CONTAINMENT PENETRATIONS AND ISOLATION VALVES

→ (DRN 99-2371, R11)

- j) Penetration types are described in Subsection 3.8.2.
- k) Portions of the system open to containment atmosphere and part of the reactor coolant pressure boundary will be vented and/or drained for Type "A" test.
- l) System required to maintain plant in safe shutdown condition.
- m) ESF system for which fluid flow and/or water seal is needed for post-LOCA.
- n) System not open to containment during post-LOCA.
- o) Testing arrangement as shown in Figures 6.2-65, 6.2-66, 6.2-67 and 6.2-68.
- p) Operators will manually isolate these valves on high radiation alarms.
- q) Manual override provided.
- r) These valves are leak tested to ensure leaktight integrity in accordance with GDC 32.
- s) These valves fail open to ensure that single active failure will not preclude availability of the RCPs. In the event that the safe position is closed, a failure to the open position will not compromise isolation because of the isolation valves inside containment (see response to Question 480.44).

→(DRN 04-631, R13-B; 03-2060, R14)

- t) The fail open position of the outside isolation valve assures of the availability of the charging system.

←(DRN 04-631, R13-B; 03-2060, R14)

- u) No credit is taken for these isolation valves in meeting the requirements of GDC 55 through 57.
- v) Leak test valve is located at elevation (-) 4.00' RAB wing area.
- w) The post-accident position of these valves would be closed if a MSIS had been actuated.
- x) CADP - Containment - Ambient Differential Pressure Signal
- y) DELETED
- z) Actuation Mode Definitions:

For power-operated valves which automatically operate upon receipt of a containment isolation signal, the primary actuation mode is the automatic initiating signal, and the secondary actuation mode is a remote manual initiation from the main control room. The purpose is to ensure closure capability.

For power-operated valves which do not receive a containment isolation signal, the primary mode is a remote manual initiation. Those valves outside the containment have a local secondary mode of operation, e.g., handwheel. Those valves inside containment aren't required to have a secondary mode of operation.

Manual valves and simple check valves have only one mode of operation. (Check valve Primary Mode is listed as Not Applicable.)

← (DRN 99-2371, R11)

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TABLE 6.2-32a (Sheet 1 of 2) Revision 10 (10/99)

FLUID SYSTEM PIPING DRAWINGS FOR CONTAINMENT
PENETRATIONS AND ISOLATION VALVES

<u>Penetration No.</u>	<u>Fluid System Piping Drawing FSAR Figure Number</u>
1	10.2-4 Sh.1
2	10.2-4 Sh.1
3	10.4-2 Sh.2
4	10.4-2 Sh.2
5	10.4-5
6	10.4-5
7	9.2-2
→	
8	9.3-1 (for Fig. 9.3-1, Sht. 3, refer to Dwg. G152, Sht. 3 and for Fig. 9.3-1, Sht. 4, refer to Dwg. G152, Sht. 4)
9	9.3-1 (for Fig. 9.3-1, Sht. 3, refer to Dwg. G152, Sht. 3, and for Fig. 9.3-1, Sht. 4, refer to Dwg. G152, Sht. 4)
←	
10	9.4-7
11	9.4-7
12	9.4-7
13	9.4-7
14	LOU 1564-G-204 Sh 1
15	9.2-1 Sh.1
16	9.2-1 Sh.1
17	9.2-1 Sh.1
18	9.2-1 Sh.1
19	9.2-1 Sh.1
20	9.2-1 Sh.1
21	9.2-1 Sh.1
22	9.2-1 Sh.1
23	9.2-1 Sh.1
24	9.2-1 Sh.1
25	3.8-5
26	9.6-1 Sh.1
→	
27	9.3-6 Sh.1 (for Fig. 9.3-6, Sht. 1, refer to Dwg. G168, Sht. 1)
28	9.3-2 (for Fig. 9.3-2, Sht 3, refer to Dwg. G162, Sht. 3)
29	9.3-2 (for Fig. 9.3-2, Sht 3, refer to Dwg. G162, Sht. 3)
30	9.3-2 (for Fig. 9.3-2, Sht 3, refer to Dwg. G162, Sht. 3)
31	11.3-1
32	Dwg. G163
33	Dwg. G163
34A	Dwg. G163
34B	Dwg. G163
35A	Dwg. G163
35B	Dwg. G163
36	Dwg. G167, Sht. 1
37	Dwg. G167, Sht. 1
←	

WSES-FSAR-UNIT-3

TABLE 6.2-32a (Sheet 2 of 2) Revision 12-B (04/03)

FLUID SYSTEM PIPING DRAWINGS FOR CONTAINMENT
PENETRATIONS AND ISOLATION VALVES

<u>Penetration No.</u>	<u>Fluid System Piping Drawing FSAR Figure Number</u>
38	6.3-1 Sh.2
39	6.3-1 Sh.2
40	6.3-1 Sh.2
41	6.3-1 Sh.2
42	9.3-3 (for Fig. 9.3-3, Sht. 1, refer to Dwg. G173, Sht. 1)
43	11.2-1 Sh.1
→ (DRN 03-274, R12-B)	
44	9.3-6 Sh.2 (for Fig. 9.3-6, Sht. 2, refer to Dwg. G168, Sht. 2)
← (DRN 03-274, R12-B)	
45	9.4-7
46	9.4-7
47	9.4-7
48	9.4-7
49	LOU-1564-B-430 Sh.SP-11 (Refer to Table 1.7-1)
50	_*
51	Dwg. G163
51	9.3-1 (for Fig. 9.3-1, Sht. 3, refer to Dwg. G152, Sht. 3 and for Fig. 9.3-1, Sht. 4, refer to Dwg. G152, Sht. 4)
53	LOU-1564-B-431 Sh.283F (Refer to Table 1.7-1)
54	LOU-1564-B-431 Sh.283F (Refer to Table 1.7-1)
55	6.3-1 Sh.2
56	6.3-1 Sh.2
57	6.3-1 Sh.2
58	6.3-1 Sh.2
59	6.3-1 Sh.2
60	V-1
61	V-1
62	Dwg. G163
63	10.4-5
64	_*
65	10.4-5
66	LOU-1564-B-430 Sh-sp-01 (Refer to Table 1.7-1)
67	LOU-1564-B-430 Sh-sp-01 (Refer to Table 1.7-1)
68	9.3-2 (for Fig. 9.3-2, Sht 3, refer to Dwg. G162, Sht. 3)
69	6.3-2 Sh.2
70	6.3-2 Sh.2
71	9.2-2
72	_*

* - Spare Penetrations

DESIGN DATA FOR HYDROGEN ANALYZER SYSTEM

A) Analyzing Panel

1) Approximate Dimensions:

Height, ft.	6.0
Width, ft.	5.0
Depth, ft.	2.6
Weight, lbm	1150

2) Specifications for the thermal conductivity analyzer:

Sensitivity	0.2 percent H ₂ by volume
Accuracy	±2.5 percent of full scale
Range	0-10 percent H ₂ by volume
Calibration	Passing known gaseous mixture through analyzer.

B) Control and Power Supply

1) Electric Power Supply	120 Volt, 1 phase, 60 Hz 480 Volt, 3 phase, 60 Hz
--------------------------	--

2) Control valves (solenoids)	Sample points in the containment
-------------------------------	----------------------------------

C) Piping (Inside containment up to and inclusive of the outermost containment isolation valves for sample feed and return lines)

Size	3/8 Inch
Material	ASME-SA-213 Type 316 GR
Design Temperature	350° F
Design Pressure	100 psig
Code	ASME Section III, Class 2 (1974 Edition)

D) Valves (Inside containment up to and inclusive of the outermost containment isolation valves for sample feed and return lines)

Size	3/8 Inch
Material	ASME SA-240 Type 304 (Solenoid Valves)

→

ASME SA-182 Type 316 or ASME SA-351 Gr. CF8M (Check Valves)

←

Design Temperature	350° F
Design Pressure	100 psig
Code	ASME Section III, Class 2

WSES-FSAR-UNIT-3

Table 6.2-33 (Sheet 2 of 2)

DESIGN DATA FOR HYDROGEN ANALYZER SYSTEM

1977 Edition, Summer 1977 Addenda
(Solenoid Valves)
1971 Edition, Winter 1973 Addenda
(Check Valves)

E)	Pumps	
	Type	Diaphragm
	Pump material	Type 316 SS
	Required H.P.	2.5
	Design Flowrate	0.5 cfm
F)	Cooler	
	Material in contact with sample	Type 304 SS
	Type	
	First Stage	Air Cooled
	Second Stage	Thermoelectric

DESIGN DATA FOR HYDROGEN RECOMBINER SYSTEM

→(EC-6494, R302)

NOTE: With the implementation of Waterford 3 Operating License Amendment No. 192, Elimination of Design Basis Hydrogen Release and Requirements for Hydrogen Recombiners, the information concerning hydrogen generation and the description and design evaluation of the Hydrogen Recombiner portions of the Combustible Gas Control System is historical in nature and is not required to be updated.

←(EC-6494, R302)

A) Recombiner Unit

1. Approximate Dimensions:

Height	9.0 ft.
Width (skid)	4.3 ft.
Depth (skid)	5.3 ft.
Weight	6200 lb.

2. Capacity: 100 to 120 scfm

3. Heaters:

Number	5 banks
Maximum sheath temperature	1550° F

4. Gas Temperatures:

Inlet	150° F
Outlet of heater section	1150° F to 1400° F Exhaust Approximately 50° F above ambient

5. Materials:

Outer structure	Type 300 SS
Inner structure	Inconel 600
Heater element sheath	Incolloy 800

6. Power:

Maximum	75 kw
Nominal	50 kw

7. Recombination 100%

B) Control and Power Supply

1. Electric Power Supply 480 Volt,3 phase,60 Hz

2. Thermocouple leads 3 pair (Chromel-Alumel)

WSES-FSAR-UNIT-3

TABLE 6.2-35 (Sheet 1 of 2)

DESIGN DATA FOR CONTAINMENT ATMOSPHERE RELEASE SYSTEM COMPONENTS

A. CARS Supply System

Fan identification S-3(3A-SA) & S-3(3B-SB)

1. Fans

Quantity 2, (1 standby)
 Type Centrifugal type, direct-driven
 Materials: Housing Cast Iron
 Motor base and bracing Cast Iron
 Wheel Carbon Steel

Actual airflow @ inlet, per fan, cfm 110

Air density, lb/ft³ .065

Static pressure, in wg 3.68

Codes Air Moving and Conditioning Association Inc. (AMCA),
 Anti-Friction Bearing Manufacturer's Association (AFBMA)

2. Motors

Quantity 2, one per fan
 Type 1-1/2 h.p, 460 volt, 60 Hz, 3 phase horizontal induction type

Insulation Type H
 Enclosure Totally enclosed fan cooled
 Code IEEE-323-1974
 IEEE-334-1974

B. CARS Exhaust System

Fan Identification E-18(3A-SA) & E-18(3B-SB)

1. Fans

Quantity 2,
 Type Centrifugal type, direct-driven
 Materials: Housing Cast Iron
 Motor base and bracing Cast Iron
 Wheel Aluminum

WSES-FSAR-UNIT-3

TABLE 6.2-35 (Sheet 2 of 2)

DESIGN DATA FOR CONTAINMENT ATMOSPHERE RELEASE SYSTEM COMPONENTS

B. CARS Exhaust System (Cont'd)

Actual air flow at inlet, per fan, cfm	110
Air density, lb /ft. ³	0.065
Static pressure, in wg	6.18
Codes	AMCA and AFBMA

2. Motors

Quantity	2, one per fan
Type	1-1/2 h.p., 460 volt, 60 Hz, 3 Phase horizontal induction type
Insulation	Type H
Enclosure	Totally enclosed fan cooled
Code	IEEE-323-1974 IEEE-334-1974

WSES-FSAR-UNIT-3

TABLE 6.2-36 (Sheet 1 of 2) Revision 302 (12/08)

PARAMETERS FOR ANALYSIS OF HYDROGEN GENERATION AND CONTROL

→(EC-6494, R302)

NOTE: With the implementation of Waterford 3 Operating License Amendment No. 192, Elimination of Design Basis Hydrogen Release and Requirements for Hydrogen Recombiners, the information concerning hydrogen generation and the description and design evaluation of the Hydrogen Recombiner portions of the Combustible Gas Control System is historical in nature and is not required to be updated.

←(EC-6494, R302)

Hydrogen Dissolved in Reactor Coolant	1.9 lbm
Release Rate for Dissolved Hydrogen	Instantaneous
Oxygen Dissolved in Reactor Coolant	0.04 lbm
Amount of Zircaloy in core	64092 lbm
Fraction of Zirconium Oxidized During Design Basis Accident	0.8%
Fraction of Zirconium Assumed to Oxidize for Purposes of Hydrogen Generation Analysis	4%
Release Rate from Zirconium-Water Reaction	Instantaneous
Fission Product Distribution Model	50% of the halogens and 1% of the solids present in the core are intimately mixed with the coolant water. All noble gases are released to the containment. All other fission products remain in fuel rods.
Fraction of Fission Product Radiation Energy Absorbed by the Coolant	(a) Beta (1) Betas from fission products in the fuel rods: 0.0 (2) Betas from fission products intimately mixed with coolant:1.0

WSES-FSAR-UNIT-3

TABLE 6.2-36 (Sheet 2 of 2)

PARAMETERS FOR ANALYSIS OF HYDROGEN GENERATION AND CONTROL

<p>Fraction of Fission Product Radiation Energy Absorbed by the coolant</p>	<p>(b) Gamma (1) Gammas from fission products in the fuel rods, coolant in core region: 0.1 (2) Gammas from fission products intimately mixed with coolant, all coolant: 1.0</p>
<p>Hydrogen Yield Rate G(H₂)</p>	<p>0.5 molecule per 100 Ev</p>
<p>Oxygen Yield Rate G(O₂)</p>	<p>0.25 molecule per 100 Ev</p>
<p>Reactor Thermal Power</p>	<p>104%</p>
<p>Inventory of Corrodible Metal</p>	<p>Table 6.2-37</p>
<p>Assumed Hydrogen Generation Rate Due to Aluminum Corrosion</p>	<p>Figure 6.2-55a</p>
<p>Assumed Hydrogen Generation Rate Due to Zinc-Base Paint</p>	<p>None</p>
<p>Assumed Hydrogen Generation Rate Due to Zinc-Base Paint per NRC Question No. 022.22</p>	<p>Figure 6.2-55b</p>
<p>Assumed Hydrogen Generation Rate Due to Zinc Corrosion</p>	<p>Figure 6.2-55a</p>
<p>Containment Net Free Volume, ft³</p>	<p>2,677,000</p>
<p>Initial Containment Temperature, F</p>	<p>120</p>
<p>Initial Containment Pressure, psia</p>	<p>14.7</p>

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TABLE 6.2-37 (Sheet 1 of 2)

Revision 302 (12/08)

CONTAINMENT ZINC AND ALUMINUM INVENTORY

→(EC-6494, R302)

NOTE: With the implementation of Waterford 3 Operating License Amendment No. 192, Elimination of Design Basis Hydrogen Release and Requirements for Hydrogen Recombiners, the information concerning hydrogen generation and the description and design evaluation of the Hydrogen Recombiner portions of the Combustible Gas Control System is historical in nature and is not required to be updated.

←(EC-6494, R302)

A. Inventory of Aluminum in Containment

	<u>Weight (lb)</u>	<u>Surface Area (ft.²)</u>
Valve operators	280	56
Reactor coolant pump heat exchangers	14	4.8
Refueling equipment	48	19.8
Movable in-core detector drives	80	46
Instrument housing	32	12
Fuel mast rotate motor	24	4.5
CEA mast rotate motor	24	4.5
CEA mast rotate LS	2.8	0.6
Fuel mast rotate LS	1.2	0.5
CEA hoist reducer flange	4.1	0.25
Fuel hoist motor brake	4.2	0.6
Fuel hoist redundant brake	13.5	1.7
Bridge and trolley brakes (2)	10.0	1.9
Bridge and trolley LS (9)	6.75	3.75
Bridge and trolley encoders (2)	1.3	0.7
Transfer system winch	43.2	6.9
Dry sipping system pump	18.5	6.25
Readout unit face plates (3)	1.5	0.7
Misc. electrical fittings, legend plates, bezel rings etc.	2.0	0.7
Receptacles and plugs	80	60
Helix cable	<u>3.69</u>	=
Total	694.69	232

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TABLE 6.2-37 (Sheet 2 of 2)

Revision 10 (10/99)

CONTAINMENT ZINC AND ALUMINUM INVENTORY

B. Zinc Inventory in Containment

	<u>Weight (lb)</u>	<u>Surface Area (ft.2)</u>
→		
Ductwork	2118	75308
Conduits	6909	93084
Cable Trays	4790	32270
Electrical Equipment Boxes	642	8648
Decking Formwork	195	5000
←		
In-core Detector Drives	10	30
Refueling Equipment	9	160
→		
Galvanized Steel	22.3	150
←		
Scaffolding Clamps	156	1088
Elevators	5	-
→		
Total	14,700.3	214,650

C. Inventory of Zinc-Base Paint in Containment

See Table 6.1-3.

D. Inventories of Aluminum and Zinc Metal assumed for Figure 6.2-54 Design Analysis:

	<u>Weight (lb)</u>	<u>Surface Area (ft.²)</u>
→		
Zinc	17,252	429,300
←		
Aluminum	1040	464

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TABLE 6.2-38

FAILURE MODE AND EFFECTS ANALYSIS
HYDROGEN ANALYZER SYSTEM

<u>Component</u>	<u>Failure Mode</u>	<u>Effects on System</u>	<u>Method of Detection</u>	<u>Monitor</u>	<u>Remarks</u>
Sample line	Break or Plug	Loss of sample flow	Low flow alarm	CRI*	Redundant hydrogen analyzer available
Sample Pump	Fails	Loss of sample flow returned to service	Low flow alarm	CRI	Redundant hydrogen analyzer can be repaired available
Hydrogen Analyzer	Fails	Loss of use of analyzer can be isolated from system	Analyzer inoperative alarm	CRI	Redundant hydrogen analyzer available

*Main control room indication

FAILURE MODE AND EFFECTS ANALYSIS - HYDROGEN RECOMBINER

→(EC-6494, R302)

NOTE: With the implementation of Waterford 3 Operating License Amendment No. 192, Elimination of Design Basis Hydrogen Release and Requirements for Hydrogen Recombiners, the information concerning hydrogen generation and the description and design evaluation of the Hydrogen Recombiner portions of the Combustible Gas Control System is historical in nature and is not required to be updated.

←(EC-6494, R302)

<u>Component</u>	<u>Failure Mode</u>	<u>Effect on System</u>	<u>Method of Detection</u>	<u>Monitor</u>	<u>Remarks</u>
<u>Control Panel</u>					
Temperature Readout	Incorrect Reading	Recombiner temp- indicated higher or lower than actual; Operator not aware of possible recombiner malfunction.	Anomalous indication from hydrogen sampling system and off standard wattmeter reading	CRI*	Redundant recombiner
Wattmeter	Incorrect Reading	Recombiner power indicated higher or lower than actual; Operator not aware of possible recombiner malfunction.	Anomalous indication from hydrogen sampling system and off standard tempera- ture reading.	CRI	Redundant recombiner
<u>Power Supply</u>	Bus failure or low power.	No power or low power to recombiner; subse- quent loss or degrada- tion of function.	Low Wattmeter reading	CRI	Redundant recombiner powered from separate bus
<u>Power Cables</u>	Break or short circuit.	No power to recombiner; subsequent loss of function.	Low or high Wattmeter reading	CRT	Redundant recombiner
<u>Recombiner</u>					
Heater Banks	≤ 20 kw of heater capacity fail.	Slight reduction of recombiner performance.	None required	CRI	None required - recombiner designed to maintain tempera- ture with up to 20 kw heater capacity failure.
	> 20 kw of heater capacity fails	Reduction of recombiner performance.	Low or high Wattmeter reading or low tempera- ture indication.	CRI	Redundant recombiner.
The two thermo- couples	Banks - no signal.	No temperature indica- tion at control panel.	Operator can distinguish from recombiner failure	CRI	None required, or operator may switch to other recombiner.

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TABLE 6.2-40

FAILURE MODE AND EFFECTS ANALYSIS - CARS

<u>Component</u>	<u>Failure Mode</u>	<u>Effect on System</u>	<u>Method of Detection</u>	<u>Monitor</u>	<u>Remarks</u>
Supply and Exhaust Fan and Isolation Valves	Diesel-Generator A or B fails to start	No power to one CARS subsequent loss of function	Class IE status indicating light	CRI*	100 percent redundant standby system remains operational.
Supply or Exhaust Fan	One fan fails to operate.	Supply fan - no effect Exhaust fan - loss of	Class IE status indicating light	CRI	100 percent redundant standby system remains operational.
Isolation Valve	Isolation valve fails closed.	Associated fan will not start	Class IE status indicating light. Class IE isolation valve indication.	CRI	100 percent redundant standby system remains operational.

*Main control room indication

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TABLE 6.2-41 (Sheet 1 of 2) Revision 6 (12/92)

A. ELECTRICAL PENETRATION AND ASSEMBLIES

<u>Number</u>	<u>Function</u>	<u>Test Pressure Psig</u>
101	480 V Power Cables - System SA (Class 1E & Associated)	44
102	6.9 KV RCP1A Motor Leads	44
105	Spare	-
106	6.9 KV RCP2A Motor Leads	44
109	480 V Pressurizer Heaters - System A (Non-Class 1E)	44
111	480 V Power Cables - System A (Non-Class 1E)	44
112	480 V Power Cables - System A (Non-Class 1E)	44
113	480 V Power Cables - System SA (Class 1E & Associated)	44
118	480 V Power Cables - System SA (Class 1E & Associated)	44
121	N.I.S. Excure Detector Cables Reactor Prot. Cables - Channel (SMA)	44
124	N.I.S. Excure Detector Cables Reactor Prot. Cables - Channel (SMC)	44
126	N.I.S. Excure Detector, Speed SWS (Control) Channel E	44
127	CEA Position Indication (Reed Switches) Channel SMC - Type II	44
133	CEA Position Indication (Reed Switches) Channel SMC - Type II	44
134	Position Indication (Reed Switches) - Channel SMA - Type I - Cont Fan Cooler Instr - System SA	44
137	Non-Safety Low Level Cables - System A	44
139	Non-Safety Low Level Cables - System A	44
141	Safety Related Control Cables - System SA	44
143	N.I.S. Incore Detector, Speed SWS (Safety) - Radiation Mon. - Channel SMC	44
144	Non-Safety Control Cables - System A	44
147	TV Monitoring, Telephone, Paging, Radiation Mon. - System A	44
148	N.I.S. Incore Detector, Speed SWS (Safety) - Radiation Mon - Channel SMA	44
149	Containment Leakage Test - System A	44
150	Spare	-
103	Spare	-
104	6.9 KV RCP1B Motor Leads	44
107	480 V Power Cables - System SB (Class 1E & Associated)	44
108	6.9 KV RCP2B Motor Leads	44
110	480 V Pressurizer Heaters - System B (Non-Class 1E)	44
114	480 V Power Cables - System B (Non-Class 1E)	44
115	480 V Power Cables - System B (Non-Class 1E)	44
116	480 V Power Cables - System SB (Class 1E & Associated)	44
117	480 V Power Cables - System SB (Class 1E & Associated)	44
119	N.I.S. Incore Detector Speed SWS (Safety) - Radiation Mon-Channel SMB	44
120	N.I.S. Incore Detector Speed SWS (Safety) - Radiation Mon-Channel SMD	44
122	N.I.S. Excure Detector Cables - Reactor Prot. Cables - Channel SMD	44
123	N.I.S. Excure Detector Cables - Reactor Prot. Cables - Channel SMB	44
125	N.I.S. Excure Detector Speed SWS (Control) - Channel F	44
128	Magnetic Jacks	44
129	Magnetic Jacks	44
130	Magnetic Jacks	44
131	Magnetic Jacks	44
132	Magnetic Jacks	44

WSES-FSAR-UNIT-3

TABLE 6.2-41 (Sheet 2 of 2) Revision 309 (06/16)

A. ELECTRICAL PENETRATION AND ASSEMBLIES (Cont'd)

<u>Number</u>	<u>Function</u>	<u>Test Pressure</u> <u>Psig</u>
→(LBDCR 15-044, R309)		
135	CEA Position Indication (Reed Switches) - Channel SMB - Type I	44
136	CEA Position Indication (Reed Switches) - Channel SMD - Type II Cont. Fan Clr Instr System SB	44
138	Radiation Monitoring System B and Communication / Network Cables	44
140	Non-Safety Low Level Cables - System B	44
142	Safety Related Control Cables - System SB	44
145	Non-Safety Low Level Cables - System B	44
146	Non-Safety Control Cables - System B	44
151	Containment Leakage Test - System B	44
152	Spare	-
PEL1	Cont. Personnel Air Lock (Ext. Door) Non-Safety - System B	
PEL2	Cont. Personnel Air Lock Safety-Related - System SB	
ESL1	Cont. Escape Air Lock (Ext. Door) Non-Safety - System B	
ESL2	Cont. Escape Air Lock Safety-Related - System SB	

←(LBDCR 15-044, R309)

NOTE: LOU 1564-B-316, Sh. 3

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TABLE 6.2-42

HATCHES AND AIR LOCKS

<u>Penetration Service</u>	<u>Penetration Test Type "B" Required</u>	<u>Pressure (psig)</u>	<u>Comment</u>
1. Personnel Lock	Yes	44*	Pressurize double gaskets on doors and interspace between doors.
2. Equipment Hatch	Yes	44	Pressurize between double gaskets.
3. Construction Hatch	No	-	Seal welded door. No Type B leak testing required.
4. Escape Lock	Yes	44*	Pressurize double gaskets on doors and interspace between doors.

*Pressurize the double gaskets on the door to 10 psig for a reduced pressure test and 44 psig for a full pressure test.

PENETRATIONS NOR REQUIRING TYPE C LEAK TESTING

<u>Penetration</u>	<u>Justification</u>
<p>→</p> <p>1, 2, 3, 4, 5, 6, 52 & 68</p>	<p>The main steam, feedwater, blowdown and main steam sampling lines form a closed seismic Category I system subsequent to a LOCA. Isolation valves in these penetrations will not be exposed to containment atmosphere during a LOCA. The steam generators provide a primary to secondary barrier; the main steam isolation valves and main steam sampling valves are closed on MSIS; the main safeties and relief valves are normally closed and will not open due to a LOCA; the main feedwater isolation valves are closed on MSIS; and there is one seismic Category I check valve (internals removed) in each feedwater line. The steam generator blowdown and steam generator sampling isolation valves close on CIAS. Thus subsequent to a LOCA there is a seismic Category I closed boundary within containment that is isolated to retain steam generator pressure and inventory. Any loss in inventory is made up by the Emergency Feedwater System.</p>
<p>←</p>	<p>The pressure in the steam generator will be greater than that in the Reactor Coolant System (RCS) subsequent to a LOCA and the steam generators will have a substantial water inventory that can be maintained or increase. Minor tube leaks may be encountered during normal operation of the facility. These represent a potential primary to secondary leakage path. Tube leakage operation will be limited to comply with technical specification requirements. During post-LOCA conditions the steam generators are initially at a pressure and temperature considerably greater than that in the RCS. Thus the steam generator inventory is expected to function as a water seal that includes primary to secondary leakage via tube defects.</p>

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TABLE 6.2-43 (Sheet 2 of 2) Revision 13 (04/04)

15, 16, 17, 18, 19, 20, 21, 22

The Component Cooling Water Supply and return to the Containment Fan Cooler Units form a closed seismic Category I system inside of containment. Isolation valves in these penetrations will not be exposed to the containment atmosphere during a loss of coolant accident.

→(DRN 03-1014, R13)

27, 32, 33, 34, 35, 36, 37, 38,
39, 55, 56, 57, 58, 69, 70

The Charging (27), ECCS Sump Suction (32, 33), Containment Spray (34,35), Low and High Pressure Safety Injection (36-39) and 55-58) and Hot Let Injection (69,70) penetrations are all connected to closed seismic category 1, safety class 2 systems outside of containment. These ECCS system penetrations will be in operation during a loss of coolant accident (LOCA). The piping systems are designed for pressure and temperature equal to or greater than containment design pressure and temperature. In penetrations 36-39 and 55-58, safety injection flow can be guaranteed to exist under all LOCA conditions, even considering single failure criteria. Penetrations 32 and 33 can be guaranteed to have a loop seal under post-LOCA conditions. Penetrations 27, 34, 35, 69 and 70 can be guaranteed to contain sufficient water volume such that a water barrier will exist for at least 30 days post-accident.

←(DRN 03-1014, R13)

25

Per the requirements of 10CFR50 APP J, II-G, this penetration will be Type B tested.

50,64,72,73,74

These penetrations are welded blank spares containing no piping or valves.

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This penetration, used to monitor containment pressure, is a sealed fluid system.

WSES-FSAR-UNIT-3

TABLE 6.2-44

Revision 13-A (09/04)

CONTAINMENT ISOLATION VALVE WITH APPLIED TEST PRESSURE IN
OPPOSITE DIRECTIONS

PENETRATION NUMBER	VALVE TAG NUMBER	TYPE OF VALVE
7	2DW-V609 A/B (PMU 151)	Globe
10	2HV-BI52A (CAP 104)	Butterfly
11	2HV-BI53B (CAP 203)	Butterfly
→(DRN 00-1162; 01-478, R12) 24	CC MVAAA7102	Relief *
26	CVC MVAAA1081	Relief *
→(DRN 03-1543, R13-A) 40	SI MVAAA406B	Relief
41	SI MVAAA406A	Relief
←(DRN 03-1543, R13-A)		
42	SP MVAAA1051	Relief *
43	BM MVAAA1091	Relief *
44	RC MVAAA6061	Relief *
←(DRN 00-1162; 01-478, R12)		
47	2HV-F254B (CAR 201B)	Butterfly
47	2HV-F228A (CAR 200B)	Ball
48	2HV-F253A (CAR 201A)	Butterfly
→(DRN 01-478, R12) 59	SI MVAAA3434	Relief *
←(DRN 01-478, R12)		
60	2FP-FI27 (FP 601A)	Globe
61	2FP-FI29 (FP 601B)	Globe
71	2DW-V642 (CMU 244)	Globe
65A	2SA-V609 (LRT 202)	Globe
65B	2SA-V611 (LRT 204)	Globe

→(DRN 01-478, R12)

* - Testing of these valves from the inlet to outlet has been determined conservatively acceptable in demonstrating the ability to withstand the required outlet to inlet post-LOCA conditions.

←(DRN 01-478, R12)

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TABLE 6.2-45

TYPICAL COMPONENTS

CALCULATED AND QUALIFICATIONS TEMPERATURES

	<u>Max Calculated Surface Mass Diffusion Method</u>	<u>Temp (F) USNRC Method</u>	<u>Qualification Temp (F)</u>
a) Electronic Transmitter	268	239	350
b) Electric Instrumentation Cable			
1) At surface	401	386	340
2) At Insulation (.045 in below surface)	330	318	340
c) Fan Cooler Motor	--	218	315