TABLE 6.2-1

CONTAINMENT SPRAY SYSTEM - CODE REQUIREMENTS

Component	Code
Spray Additive Tank	ASME Section VIII
Valves	ANSI B16.5
Piping (including headers and spray nozzles) pumps	ANSI B31.1 (1)

(1) For piping not supplied by the NSSS supplier, material inspections, fabrication and quality control conform to ANSI B31.7. Where not possible to comply with ANSI B31.7, the requirements of ASME III-1971, which incorporated ANSI B31.7, were adhered to.

TABLE 6.2-2

CONTAINMENT SPRAY PUMP DESIGN PARAMETERS

Quantity	2
Design Pressure, discharge, psig	250
Design Temperature, °F	150
Design Flow Rate, gpm	2600
Design Head, ft	450
Shutoff Head, ft	~530
Motor, hp	400
Type	Horizontal-Centrifugal

TABLE 6.2-3

SPRAY ADDITIVE TANK DESIGN PARAMETERS

Number	1
Total Volume (empty), gal.	4000
NaOH concentration, w/o	30
Design temperature, °F	300
Design pressure, psig	14
Material	Austenitic Stainless Steel

TABLE 6.2-4

SINGLE FAILURE ANALYSIS - CONTAINMENT SPRAY SYSTEM

Component	Malfunction	Comments and Consequences
A. Spray Nozzles	Clogged	Large number of nozzles render clogging of a significant number of nozzles as incredible.
B. Pumps		
1) Containment Spray Pump	Fails to start	Two provided. Evaluation based on operation of one pump in addition to three out of five containment cooling fans operating during injection phase.
2) Residual Heat Removal Pump	Fails to start	Two provided. Evaluation based on operation of one pump.
3) Service Water Pump	Fails to start	Six provided. Operation of two pumps during recirculation required.
4) Component Cooling	Fails to start	Three provided. Operation of one pump during recirculation required.
C. Automatically Operated Valves: (Open on two out of four (HiHi) containment pressure signals)		
1) Containment spray pump discharge isolation valve	Fails to open	Two complete systems provided.
D. Valves Operated From Control Room		
(a) Injection		
1) Spray Additive Tank Outlet Isolation Valve	Fails to open	Two parallel valves provided. Operation of one required.

TABLE 6.2-4 (cont)

Component	Malfunction	Comments and Consequences
(b) Recirculation		
1) Containment Sump Isolation Valve	Fails to open	Two lines in parallel. One line required.
2) Containment Spray Header Isolation Valve from Residual Heat Exchangers	Fails to open	Two complete loops provided. Operation of one required.

TABLE 6.2-5

SHARED FUNCTIONS EVALUATION

Component	Normal Operating Function	Normal Operating Arrangement	Accident Function	Accident Arrangement
Spray Additive Tank	None	Lined up for spray water diversion	Source of sodium hydroxide for spray water	Lined up for spray water diversion
Containment Spray Pumps (2)	None	Lined up to spray headers	Supply spray water to containment atmosphere	Lined up to spray headers

Note: Refer to Section 6.2 for a brief description of the refueling water storage tank, residual heat removal pumps, service water pumps, component cooling pumps, residual heat exchangers and component cooling heat exchangers which are also associated either directly or indirectly with the Containment Spray System.

TABLE 6.2-6

NET POSITIVE SUCTION HEADS FOR CONTAINMENT SPRAY

Pump	Elevation	Flow and Condition	Suction Source and Elevation	Minimum Available NPSH	Required NPSH	Maximum Water Temperature
Containment Spray	86'-3"	2600 gpm Rated flow	RWST 101'-8"	29.9'	10'	100°F
Residual Heat Removal (Unit 1 one Pump operation)	46'-10"	4850 gpm Recirculation Spray flow	Containment Sump 81'-8"	28.1'	22'	Saturation
Residual Heat Removal (Unit 2 one Pump operation)	46'-10"	4850 gpm Recirculation Spray flow	Containment Sump 81'-8"	25.7'	22'	Saturation

The available NPSH was calculated for the pumps indicated above using the following conservative assumptions:

1. All calculations assume an empty refueling water storage tank.
2. No credit is taken for RWST fluid temperature below 100°F.
3. No credit is taken for increased containment pressures following the LOCA.

TABLE 6.2-7

SINGLE FAILURE ANALYSIS - CONTAINMENT FAN COOLING SYSTEM

Component	Malfunction	Comments and Consequences
Containment Cooling Fan	Fails to start	Five provided. Evaluation based on three fans in operation and one containment spray pump operating during the injection phase.
Service Water Pumps	Fails to start	Six provided. Two required for operation.
Automatically Operated Valves	Fails to operate as required	Five RCFC units are provided. A failure of one valve to operate as required will result in no more than one RCFC becoming inoperable. Evaluations have demonstrated that three RCFC units in operation and one Containment Spray Pump operating, provide sufficient cooling during the injection phase of a LOCA event.

TABLE 6.2-8

SHARED FUNCTION EVALUATION

Component	Normal Operating Function	Normal Operating Arrangement	Accident Function	Accident Arrangement
Containment Cooling Fan Units (5)	Circulate and cool containment atmosphere	Up to four fan units in service	Circulate and cool containment atmosphere	Five fan units in service
Service Water Pumps (6)	Supply river cooling water to fan units	Four pumps in service	Supply river cooling water to fan units	Two pumps in service

TABLE 6.2-9

SPRAY EVALUATION PARAMETERS

Containment Pressure, psia	61.7
Containment Temperature °F	271
Injection Spray flow rate, gpm	2600
Recirculation Spray flow rate, gpm	1900
Injection Spray pH	8.5 to 10.0
Containment free volume, ft^3	2.6×10^6
Spray fall height, ft	116
Minimum spray coverage	0.75

Iodine spray removal coefficient λ_s credited in radiological evaluation during injection phase:

λ_s (hr^{-1}) (DF < 100) elemental	20
λ_s (hr^{-1}) (DF < 50) particulate	4.44

λ_s credited during the transition from injection phase to recirculation phase (i.e., removal is not credited):

λ_s (hr^{-1}) elemental & particulate	0.0

λ_s credited in radiological evaluation during recirculation phase:

λ_s (hr^{-1}) (DF < 100) elemental	14.6
λ_s (hr^{-1}) (DF < 50) particulate	3.24
λ_s (hr^{-1}) (DF > 100) elemental	0.0
λ_s (hr^{-1}) (DF > 50) particulate	0.32
λ_s (hr^{-1}) (>4 hours) particulate	0.0

TABLE 6.2-10
CONTAINMENT ISOLATION - MAJOR PIPING PENETRATIONS

THE INFORMATION CONTAINED IN THIS TABLE WAS RELOCATED TO THE SALEM TECHNICAL REQUIREMENTS MANUAL

TABLE 6.2-11

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TABLE 6.2-12

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TABLE 6.2-13

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TABLE 6.2-14

POST-ACCIDENT CONTAINMENT TEMPERATURE TRANSIENT
USED IN THE CALCULATION OF ALUMINUM CORROSION

Time Interval (sec)	Temperature (°F)
0 - 300	271
300 - 1000	230
1000 - 2000	188
2000 - 4000	175
> 4000	147

TABLE 6.2-15

INPUT PARAMETERS AND ALUMINUM INVENTORY
PARAMETERS USED TO DETERMINE HYDROGEN GENERATION

Plant Thermal Power Rating	3575 MWt
Containment Temperature at Accident	120°F
Containment Free Volume	2,500,000 ft^3
Weight of Zirconium	47,946 lb
Hydrogen Generated by Zirc-Water Reaction	
Based on 2 percent value	7,575 SCF
Based on 5 percent value	18,940 SCF
Corrodible Metal	Aluminum

INVENTORY OF ALUMINUM IN CONTAINMENT (NUCLEAR STEAM SUPPLY SYSTEM)

Item	Weight (lbs)	Surface Area (ft^2)
Source, Intermediate and Power	244	83
Control Rod Drive Mechanism Connectors	193	42
Paint	140	18,000
Contingency (Nuclear Steam Supply System)	250	85
Flux Mapping Drive System	122	84
Miscellaneous Valves	230	86
CRDM Ventilation System Fan Motor Rotor [23] (Unit 1 & Unit 2)	71	3
Tri-band Antennas	4	
Permanent Shielding (Carabiners)	175	

TABLE 6.2-16

CORE FISSION PRODUCT ENERGY
AFTER 830 FULL POWER DAYS

Core Fission Product Energy/[1]

Time After Reactor Trip Days	Energy Release Rate Watts/MWtx10^{-3}	Integrated Energy Release Watt-Days/MWtx10^{-4}
1	3.887	0.574
5	2.595	1.777
10	2.211	2.967
20	1.760	4.934
30	1.475	6.541
40	1.291	7.919
50	1.163	9.143
60	1.068	10.259
70	0.992	11.289
80	0.926	12.249
90	0.867	13.139
100	0.814	13.979

[1]Assumes release of 50 percent core halogens +1 percent other fission products, includes 100 percent noble gases. Values are for total (β and γ) energy.

TABLE 6.2-17

FISSION PRODUCT DECAY DEPOSITION IN SUMP SOLUTION

Time After Reactor Trip Days	50 Percent Halogens		1 Percent Other Fission Products		Total	
	Energy Release Rate Watts/MWt	Integrated Energy Release Watt-Day/MWtx10^{-2}	Energy Release Rate Watts/MWtx10^{-1}	Integrated Energy Release Watt-Day/MWtx10^{-2}	Energy Release Rate Watts/MWtx10^{-1}	Integrated Energy Release Watt-Day/MWtx10^{-3}
1	145	4.27	3.78	0.536	18.28	0.481
2	49.4	5.88	2.90	1.18	7.85	0.707
5	31.0	6.65	2.59	1.73	5.69	0.838
10	18.2	7.82	2.22	2.92	4.03	1.07
20	7.63	9.03	1.77	4.89	2.53	1.39
30	3.22	9.54	1.49	6.51	1.81	1.61
40	1.36	9.76	1.30	7.90	1.44	1.77
60	0.241	9.89	1.08	10.3	1.10	2.02
80	0.043	9.91	0.935	12.3	0.940	2.22
100	0.008	9.92	0.822	14.0	0.823	2.39