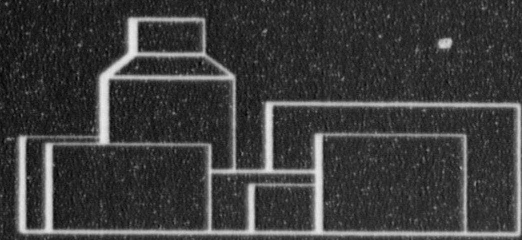
Simplified Passive Advanced
Light Water Reactor Plant Program

AP600 Certified Design Material



Prepared for
U.S. Department of Energy
San Francisco Operations Office

DE-AC03-90SF18495

9611140190 961107
PDR ADOCK 05200003
A PDR

Westinghouse Electric Corporation

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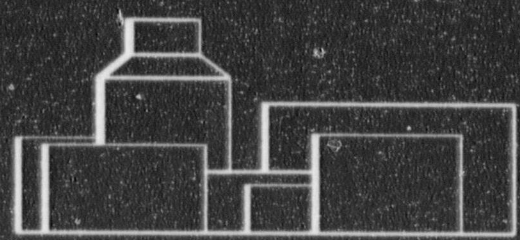

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Simplified Passive Advanced Light Water Reactor Plant Program

AP600 CERTIFIED DESIGN MATERIAL

Prepared for

U.S. Department of Energy
San Francisco Operations Office

DE-AC03-90SF18495

Revision 2

October 31, 1996

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LIST OF FIGURES

1.0 Introduction

1.1 Definitions

The following definitions apply to terms used in the design descriptions and associated inspections, tests, analyses, and acceptance criteria (ITAAC).

Acceptance Criteria means the performance, physical condition, or analysis result for a structure system, or component that demonstrates that the design commitment is met.

Analysis means a calculation, mathematical computation, or engineering or technical evaluation. Engineering or technical evaluations could include, but are not limited to, comparisons with operating experience or design of similar structures, systems, or components.

As-built means the physical properties of a structure, system, or component following the completion of its installation or construction activities at its final location at the plant site.

Cable means an electrical conductor with or without insulation, or a combination of insulated electrical conductors.

Design Commitment means that portion of the design description that is verified by ITAAC.

Design Description means that portion of the design that is certified.

Division (for electrical systems or equipment) is the designation applied to a given safety-related system or set of components that is physically, electrically, and functionally independent from other redundant sets of components.

Functional Arrangement (for a system) means the major components, interconnections between major components, and connections to other systems that collectively provide the service for which the system is intended.

Heavy Load means a load whose weight is greater than the combined weight of a single spent fuel assembly and its handling device.

Inspect or Inspection means visual observations, physical examinations, or reviews of records based on visual observation or physical examination that compare the structure, system, or component condition to one or more design commitments. Examples include walkdowns, configuration checks, measurements of dimensions, or nondestructive examinations.

Inspect for Retrievability of a display means to visually observe that the specified information appears on a monitor when summoned by the operator.

L_a is the maximum allowable containment leakage as defined in 10 CFR 50 Appendix J.

Qualified for Harsh Environment means that equipment can withstand the environmental conditions that would exist before, during, and following a design basis accident without loss of its safety function, for the time required to perform the safety function.

Safe Shutdown refers to a plant condition where the reactor is subcritical with adequate coolant inventory and core cooling, and a coolant temperature less than 420°F.

Safety-related is a classification applied to items relied upon to remain functional during or following a design basis event to provide a safety-related function. Safety-related also applies to documentation and services affecting a safety-related item.

Sensor means a transmitter, resistance temperature detector, thermocouple or other transducer plus associated cables, connectors, preamplifiers, reference junction boxes, or other signal processing equipment that is located in the immediate proximity of the sensor and subject to the same environmental conditions.

Test means the actuation, operation, or establishment of specified conditions to evaluate the performance or integrity of as-built structures, systems, or components, unless explicitly stated otherwise.

Transfer Open (Closed) means to move from a closed (open) position to an open (closed) position.

Type Test means a test on one or more sample components of the same type and manufacturer to qualify other components of the same type and manufacturer. A type test is not necessarily a test of the as-built structures, systems, or components.

UA of a heat exchanger means the product of the heat transfer coefficient and the surface area.

1.2 General Provisions

The following general provisions are applicable to the design descriptions and associated ITAAC.

Treatment of Individual Items

The absence of any discussion or depiction of an item in the design description or accompanying figures shall not be construed as prohibiting a licensee from utilizing such an item, unless it would prevent an item from performing its safety functions as discussed or depicted in the design description or accompanying figures.

If an inspections, tests, or analyses (ITA) requirement does not specify the temperature or other conditions under which a test must be run, then the test conditions are not constrained.

When the term "operate," "operates," or "operation" is used with respect to an item discussed in the acceptance criteria, it refers to the actuation and running of the item. When the term "exist," "exists," or "existence" is used with respect to an item discussed in the acceptance criteria, it means that the item is present and meets the design commitment.

Implementation of ITAAC

The ITAACs are provided in tables with the following three-column format:

Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria

Each design commitment in the left-hand column of the ITAAC tables has an associated ITA requirement specified in the middle column of the tables.

The identification of a separate ITA entry for each design commitment shall not be construed to require that separate inspections, tests, or analyses must be performed for each design commitment. Instead, the activities associated with more than one ITA entry may be combined, and a single inspection, test, or analysis may be sufficient to implement more than one ITA entry.

An ITA may be performed by the licensee of the plant or by its authorized vendors, contractors, or consultants. Furthermore, an ITA may be performed by more than a single individual or group, may be implemented through discrete activities separated by time, and may be performed at any time prior to fuel load (including before issuance of the combined operating license for those ITAACs that do not necessarily pertain to as-installed equipment). Additionally, an ITA may be performed as part of the activities that are required to be performed under 10 CFR Part 50 (including, for example, the quality assurance (QA) program required under Appendix B to Part 50); therefore, an ITA need not be performed as a separate or discrete activity.

Discussion of Matters Related to Operations

In some cases, the design descriptions in this document refer to matters that relate to operation, such as normal valve or breaker alignment during normal operation modes. Such discussions are provided solely to place the design description provisions in context (for example, to explain automatic features for opening or closing valves or breakers upon off-normal conditions). Such discussions shall not be construed as requiring operators during operation to take any particular action (for example, to maintain valves or breakers in a particular position during normal operation).

Interpretation of Figures

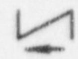
In many but not all cases, the design descriptions in Section 2 include one or more figures. The figures may represent a functional diagram, general structural representation, or another general illustration. For instrumentation and control (I&C) systems, figures also represent aspects of the relevant logic of the system or part of the system. Unless specified explicitly, the figures are not indicative of the scale, location, dimensions, shape, or spatial relationships of as-built structures, systems, and components. In particular, the as-built attributes of structures, systems, and components may vary from the attributes depicted on the figures, provided that those safety functions discussed in the design description pertaining to the figure are not adversely affected.

1.3 Figure Legend

The conventions used in this section are for figures described in the design description. The figure legend is provided for information and is not part of the Certified Design Material.

VALVES

Valve 

Check Valve 

Relief Valve 

VALVE OPERATORS

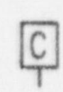
Operator Of Unspecified Type 

Motor Operator 

Solenoid Operator 

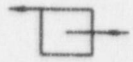
Pneumatic/Hydraulic Operator 

Pneumatic Operator 

Squib Valve 

MECHANICAL EQUIPMENT

Centrifugal Pump 

Pump Type Not Specified 

Tank 

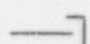
Centrifugal Fan 

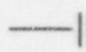
Axial Fan 

Heat Exchanger 

Vent 

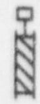
Drain 

Pipe Cap 

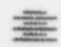
Blind Flange 

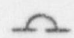
DAMPERS

Gravity Or Manually Operated Damper 

Remotely Operated Damper 

ELECTRICAL EQUIPMENT

Battery 

Circuit Breaker 

Disconnect Switch 

Isolation 

Transformer 

Fuse 

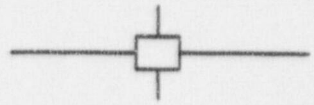
Heater 

Generator 

MISCELLANEOUS

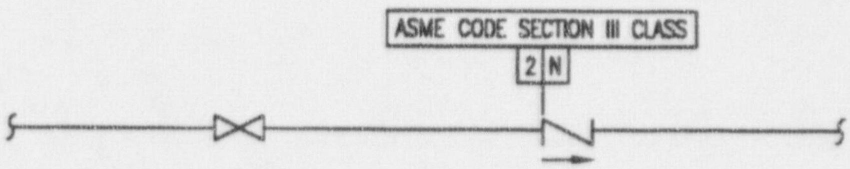
A System Or Component That Is Not Part Of A Defined System

Containment Penetration



ASME CODE CLASS BREAK

An ASME Code class break is identified by a single line to the designated location for the class break, as shown in the example below (see note 1).



NOTES:

1. The header, "ASME Code Section III Class", must appear at least once on each figure on which ASME class breaks are shown, but need not appear at every class break shown on a figure.

   [N] Indicates Non-ASME Code Section III

1.4 List of Acronyms and Abbreviations

The acronyms presented in this section are used in the Certified Design Material. The acronyms are provided for information and are not part of the Certified Design Material.

ac	Alternating Current
AC	Acceptance Criteria
ACC	Accumulator
ADS	Automatic Depressurization System
AHU	Air Handling Units
ASME	American Society of Mechanical Engineers
ATWS	Anticipated Transient Without Scram
BEACON	Best Estimate Analyzer for Core Operations - Nuclear
BOL	Beginning of Life
BOP	Balance of Plant
BTU	British Thermal Unit
CAS	Compressed Air System
CCS	Component Cooling Water System
CFR	Code of Federal Regulations
CIV	Containment Isolation Valve
CL	Cold Leg
CMT	Core Makeup Tank
CNS	Containment System
COL	Combined Operating License
CRD	Control Rod Drive
CRDM	Control Rod Drive Mechanism
CST	Condensate Storage Tank
CVS	Chemical and Volume Control System
DAC	Design Acceptance Criteria
DAS	Diverse Actuation System
DBA	Design Basis Accident
dc	Direct Current
DC	Design Commitment
DDS	Data Display and Processing System
DNB	Departure from Nucleate Boiling
DNBR	Departure form Nucleate Boiling Ratio
DOS	Standby Diesel and Auxiliary Boiler Fuel Oil System
DPU	Distributed Processing Unit
D-RAP	Design Reliability Assurance Program
DVI	Direct Vessel Injection
DWS	Demineralized Water Transfer and Storage System
ECS	Main ac Power System
EDS	Non-Class 1E dc and Uninterruptible Power Supply System
EFPD	Effective Full Power Days

List of Acronyms and Abbreviations (cont)

ELS	Plant Lighting System
EMI	Electromagnetic Interference
EOF	Emergency Offsite Facility
ERF	Emergency Response Facility
ESF	Emergency Safety Features
ESFAS	Engineering Safety Feature Actuation System
F	Fahrenheit
FHM	Fuel Handling Machine
FHS	Fuel Handling and Refueling System
FID	Fixed Incore Detector
FPS	Fire Protection System
ft	Feet
FTS	Fuel Transfer System
FWS	Main and Startup Feedwater System
gpm	Gallons per Minute
HEPA	High Efficiency Particulate Air
HFE	Human Factors Engineering
HL	Hot Leg
hr	Hour
HSI	Human-System Interface
HVAC	Heating, Ventilation, and Air Conditioning
HX	Heat Exchanger
Hz	Hertz
I&C	Instrumentation and Control
IDS	Class 1E dc and Uninterruptible Power Supply System
IIS	In-core Instrumentation System
ILRT	Integrated Leak Rate Test
IHP	Integrated Head Package
in.	Inches
I/O	Input/Output
IRC	Inside Reactor Containment
IRWST	In-Containment Refueling Water Storage Tank
ISI	Inservice Inspection
IST	Inservice Testing
ITA	Inspections, Tests, Analyses
ITAAC	Inspections, Tests, Analyses, and Acceptance Criteria
LBB	Leak Before Break
LOCA	Loss-of-Coolant Accident
LOOP	Loss of Offsite Power
LTOP	Low Temperature Overpressure Protection
LPZ	Low Population Zone

List of Acronyms and Abbreviations (cont)

MBtu	Million British Thermal Units
MCC	Motor Control Center
MCR	Main Control Room
MHS	Mechanical Handling System
MMIS	Man-Machine Interface System
MOV	Motor-Operated Valve
MPC	Maximum Permissible Concentration
MSIV	Main Steam Isolation Valve
MSLB	Main Steam Line Break
MSS	Main Steam System
MTC	Moderator Temperature Coefficient
MW	Megawatt
MWe	Megawatt Electric
MWt	Megawatt Thermal
N/A	Not Applicable
NDE	Non-Destructive Examination
NI	Nuclear Island
NRC	Nuclear Regulatory Commission
NSSS	Nuclear Steam Supply System
OCS	Operation and Control Centers System
ORC	Outside Reactor Containment
ORE	Occupational Radiation Exposure
OSC	Operations Support Center
PAR	Passive Autocatalytic Recombiner
PCCWST	Passive Containment Cooling Water Storage Tank
PCS	Passive Containment Cooling System
P&ID	Piping and Instrument Diagram
pH	Potential of Hydrogen
PLS	Plant Control System
PMS	Protection and Safety Monitoring System
PORV	Power Operated Relief Valve
PRA	Probabilistic Risk Assessment
PRHR	Passive Residual Heat Removal
psia	Pounds per Square Inch Absolute
PSS	Primary Sampling System
PXS	Passive Core Cooling System
PWR	Pressurized Water Reactor
QA	Quality Assurance
RAP	Reliability Assurance Program
RAT	Reserve Auxiliary Transformer
RCDT	Reactor Coolant Drain Tank
RCP	Reactor Coolant Pump

List of Acronyms and Abbreviations (cont)

RCPB	Reactor Coolant Pressure Boundary
RCS	Reactor Coolant System
RFI	Radio Frequency Interference
RM	Refueling Machine
RMS	Radiation Monitoring System
RNS	Normal Residual Heat Removal System
RSR	Remote Shutdown Room
RSW	Remote Shutdown Workstation
RTD	Resistance Temperature Detector
RTNSS	Regulatory Treatment of Nonsafety Systems
RXS	Reactor System
RV	Reactor Vessel
scf	Standard Cubic Feet
scfm	Standard Cubic Feet per Minute
SFP	Spent Fuel Pool
SFS	Spent Fuel Pool Cooling System
SG	Steam Generator
SGS	Steam Generator System
SSAR	Standard Safety Analysis Report
SSCs	Structures, Systems, and Components
SSE	Safe Shutdown Earthquake
SWS	Service Water System
TID	Total Integrated Dose
TSC	Technical Support Center
UAT	Unit Auxiliary Transformer
UBC	Uniform Building Code
UPS	Uninterruptible Power Supply
V	Volt
VBS	Nuclear Island Nonradioactive Ventilation System
VES	Main Control Room Emergency Habitability System
VLS	Containment Hydrogen Control System
VWS	Central Chilled Water System
VXS	Annex/Auxiliary Building Non-Radioactive Ventilation System
VZS	Diesel Generator Building Ventilation System
WLS	Liquid Radwaste System
ZOS	Onsite Standby Power System

2.1.1 Fuel Handling and Refueling System

Design Description

The fuel handling and refueling system (FHS) transfers fuel assemblies and core components during fueling operations. The FHS has the refueling machine (RM) which is located in the containment, the fuel handling machine (FHM) which is located in the fuel handling area, and the fuel transfer system (FTS) which transfers assemblies through the fuel transfer tube between the containment and the fuel handling area.

1. The FHS preserves containment integrity by isolation of the fuel transfer tube penetrating containment.

2. The RM and FHM gripper assemblies are designed to prevent opening while the weight of the fuel assembly is suspended from the gripper.

3. The lift height of the RM and FHM masts is limited such that the minimum required depth of water shielding is maintained.

4. The RM and FHM are designed to maintain their load carrying and structural integrity functions during a safe shutdown earthquake (SSE).

Inspections, Tests, Analyses, and Acceptance Criteria

Table 2.1.1-1 specifies the inspections, tests, analyses, and associated acceptance criteria for the FHS.

Table 2.1.1-1
Inspections, Tests, Analyses, and Acceptance Criteria

Design Commitment	Inspections, Test, Analyses	Acceptance Criteria
1. The FHS preserves containment integrity by isolation of the fuel transfer tube penetrating containment.	See Certified Design Material subsection 2.2.1, Containment System.	See Certified Design Material subsection 2.2.1, Containment System.
2. The RM and FHM gripper assemblies are designed to prevent opening while the weight of the fuel assembly is suspended from the gripper.	The RM and FHM will be tested by operating the open controls of the gripper while suspending a dummy fuel assembly.	The gripper will not open while suspending a dummy test assembly.
3. The lift height of the RM and FHM masts is limited such that the minimum required depth of water shielding is maintained.	The RM and FHM will be tested by attempting to raise a dummy fuel assembly.	The bottom of the dummy fuel assembly cannot be raised higher than plant elevation of 109 ft, 8 in.
4. The RM and FHM are designed to maintain their load carrying and structural integrity functions during an SSE.	i) Inspection will be performed to verify that the RM and FHM are located on the nuclear island. ii) Type test, analysis, or a combination of type tests and analyses of the RM and FHM will be performed.	i) The RM and FHM are located on the nuclear island. ii) The RM and FHM are located on the nuclear island.

2.1.2 Reactor Coolant System

Design Description

The reactor coolant system (RCS) removes heat from the reactor core and transfers it to the secondary side of the steam generators for power generation.

1. The functional arrangement of the applicable portions of the RCS is as shown in Figure 2.1.2-1.

2. The American Society of Mechanical Engineers (ASME) Code Section III components and piping shown in Figure 2.1.2-1 retain pressure boundary integrity at their design pressure.

3. The seismic Category I equipment identified in Table 2.1.2-1 can withstand seismic design basis dynamic loads without loss of safety function.

4. a) The as-built RCS ASME Code Section III piping depicted in Figure 2.1.2-1 meets applicable ASME Section III Code requirements for the RCS design conditions.

   b) Each of the as-built RCS lines identified in Table 2.1.2-2 is designed to meet leak-before-break (LBB) criteria, or an evaluation is performed of the protection from dynamic effects of a rupture of the line.

5. a) The Class 1E equipment identified in Table 2.1.2-1 as being qualified for a harsh environment can withstand the environmental conditions that would exist before, during, and following a design basis accident without loss of safety function for the time required to perform the safety function.

   b) The Class 1E components identified in Table 2.1.2-1 are powered from their respective Class 1E division.

   c) Separation is provided between RCS Class 1E divisions, and between Class 1E divisions and non-Class 1E cable.

6. The RCS provides the following safety-related functions:

   a) The pressurizer safety valves provide overpressure protection in accordance with Section III of the ASME Boiler and Pressure Vessel Code.

   b) The reactor coolant pumps have a rotating inertia to provide RCS flow coastdown on loss of power to the pumps.

   c) The RCS provides automatic depressurization during design basis events.

7. The RCS provides the following nonsafety-related functions:

   a) The RCS provides circulation of coolant to remove heat from the core.

   b) The RCS provides the means to control system pressure.

8. Safety-related displays identified in Table 2.1.2-1 can be retrieved in the main control room (MCR).

9. a) Controls exist in the MCR to cause the remotely operated valves identified in Table 2.1.2-1 to perform active functions.

   b) The valves identified in Table 2.1.2-1 as having protection and safety monitoring system (PMS) control perform an active safety function after receiving a signal from the PMS.

   c) The valves identified in Table 2.1.2-1 as having diverse actuation system (DAS) control perform an active safety function after receiving a signal from DAS.

10. a) The motor-operated valves (MOVs) identified in Table 2.1.2-1 perform an active safety-related function to change position as indicated in the table.

    b) After loss of motive power, the remotely operated valves identified in Table 2.1.2-1 assume the indicated loss of motive power position.

11. a) Controls exist in the MCR to trip the reactor coolant pumps (RCPs).

    b) The RCPs trip after receiving a signal from the PMS.

    c) The RCPs trip after receiving a signal from the DAS.

12. Controls exist in the MCR to trip the pressurizer heaters.

Inspections, Tests, Analyses, and Acceptance Criteria

Table 2.1.2-3 specifies the inspections, tests, analyses, and associated acceptance criteria for the RCS.

Table 2.1.2-1								
Equipment Name	**Tag No.**	**Seismic Cat. I**	**Remotely Operated Valve**	**Class 1E/ Qual. for Harsh Envir.**	**Safety-Related Display**	**Control PMS/ DAS**	**Active Function**	**Loss of Motive Power Position**
Steam Generator 1	RCS-MB-01	Yes	-	-/-	-	-	-	-
Steam Generator 2	RCS-MB-02	Yes	-	-/-	-	-	-	-
RCP 1A	RCS-MP-01A	Yes	-	No/No	No	Yes/Yes (pump trip)	No	-
RCP 1B	RCS-MP-01B	Yes	-	No/No	No	Yes/Yes (pump trip)	No	-
RCP 2A	RCS-MP-02A	Yes	-	No/No	No	Yes/Yes (pump trip)	No	-
RCP 2B	RCS-MP-02B	Yes	-	No/No	No	Yes/Yes (pump trip)	No	-
Pressurizer	RCS-MV-02	Yes	-	No/No (heaters)	-	Yes/No (heater trip)	-	-
Automatic Depressurization System (ADS) Sparger A	PXS-MW-01A	Yes	-	-/-	-	-/-	-	-
ADS Sparger B	PXS-MW-01B	Yes	-	-/-	-	-/-	-	-

Note: Dash (-) indicates not applicable.

Table 2.1.2-1 (cont)								
Equipment Name	**Tag No.**	**Seismic Cat. I**	**Remotely Operated Valve**	**Class 1E/ Qual. for Harsh Envir.**	**Safety-Related Display**	**Control PMS/ DAS**	**Active Function**	**Loss of Motive Power Position**
Pressurizer Safety Valve	RCS-PL-V005A	Yes	No	-/-	No	-/-	Transfer Open/ Transfer Closed	-
Pressurizer Safety Valve	RCS-PL-V005B	Yes	No	-/-	No	-/-	Transfer Open/ Transfer Closed	-
First-Stage ADS MOV	RCS-PL-V001A	Yes	Yes	Yes/Yes	Yes (Valve Position)	Yes/Yes	Transfer Open	As Is
First-Stage ADS MOV	RCS-PL-V001B	Yes	Yes	Yes/Yes	Yes (Valve Position)	Yes/Yes	Transfer Open	As Is
Second-Stage ADS MOV	RCS-PL-V002A	Yes	Yes	Yes/Yes	Yes (Valve Position)	Yes/Yes	Transfer Open	As Is
Second-Stage ADS MOV	RCS-PL-V002B	Yes	Yes	Yes/Yes	Yes (Valve Position)	Yes/Yes	Transfer Open	As Is
Third-Stage ADS MOV	RCS-PL-V003A	Yes	Yes	Yes/Yes	Yes (Valve Position)	Yes/Yes	Transfer Open	As Is

Note: Dash (-) indicates not applicable.

Table 2.1.2-1 (cont)								
Equipment Name	**Tag No.**	**Seismic Cat. I**	**Remotely Operated Valve**	**Class 1E/ Qual. for Harsh Envir.**	**Safety-Related Display**	**Control PMS/ DAS**	**Active Function**	**Loss of Motive Power Position**
Third-Stage ADS MOV	RCS-PL-V003B	Yes	Yes	Yes/Yes	Yes (Valve Position)	Yes/Yes	Transfer Open	As Is
Fourth-Stage ADS Squib Valve	RCS-PL-V004A	Yes	Yes	Yes/Yes	No	Yes/Yes	Transfer Open	As Is
Fourth-Stage ADS Squib Valve	RCS-PL-V004B	Yes	Yes	Yes/Yes	No	Yes/Yes	Transfer Open	As Is
Fourth-Stage ADS Squib Valve	RCS-PL-V004C	Yes	Yes	Yes/Yes	No	Yes/Yes	Transfer Open	As Is
Fourth-Stage ADS Squib Valve	RCS-PL-V004D	Yes	Yes	Yes/Yes	No	Yes/Yes	Transfer Open	As Is
First-Stage ADS Isolation MOV	RCS-PL-V011A	Yes	Yes	Yes/Yes	Yes (Valve Position)	Yes/Yes	Transfer Open	As Is
First-Stage ADS Isolation MOV	RCS-PL-V011B	Yes	Yes	Yes/Yes	Yes (Valve Position)	Yes/Yes	Transfer Open	As Is
Second-Stage ADS Isolation MOV	RCS-PL-V012A	Yes	Yes	Yes/Yes	Yes (Valve Position)	Yes/Yes	Transfer Open	As Is
Second-Stage ADS Isolation MOV	RCS-PL-V012B	Yes	Yes	Yes/Yes	Yes (Valve Position)	Yes/Yes	Transfer Open	As Is

Note: Dash (-) indicates not applicable.

Table 2.1.2-1 (cont)

Equipment Name	Tag No.	Seismic Cat. I	Remotely Operated Valve	Class 1E/ Qual. for Harsh Envir.	Safety-Related Display	Control PMS/ DAS	Active Function	Loss of Motive Power Position
Third-Stage ADS Isolation MOV	RCS-PL-V013A	Yes	Yes	Yes/Yes	Yes (Valve Position)	Yes/Yes	Transfer Open	As Is
Third-Stage ADS Isolation MOV	RCS-PL-V013B	Yes	Yes	Yes/Yes	Yes (Valve Position)	Yes/Yes	Transfer Open	As Is
Reactor Vessel Head Vent Valve	RCS-PL-V150A	Yes	Yes	Yes/Yes	No	Yes/No	Transfer Open	Closed
Reactor Vessel Head Vent Valve	RCS-PL-V150B	Yes	Yes	Yes/Yes	No	Yes/No	Transfer Open	Closed
Reactor Vessel Head Vent Valve	RCS-PL-V150C	Yes	Yes	Yes/Yes	No	Yes/No	Transfer Open	Closed
Reactor Vessel Head Vent Valve	RCS-PL-V150D	Yes	Yes	Yes/Yes	No	Yes/No	Transfer Open	Closed
RCS Cold Leg 1A Flow Sensor	RCS-101A	Yes	-	Yes/Yes	Yes	-/-	-	-
RCS Cold Leg 1A Flow Sensor	RCS-101B	Yes	-	Yes/Yes	Yes	-/-	-	-
RCS Cold Leg 1A Flow Sensor	RCS-101C	Yes	-	Yes/Yes	Yes	-/-	-	-
RCS Cold Leg 1A Flow Sensor	RCS-101D	Yes	-	Yes/Yes	Yes	-/-	-	-

Note: Dash (-) indicates not applicable.

Table 2.1.2-1 (cont)

Equipment Name	Tag No.	Seismic Cat. I	Remotely Operated Valve	Class 1E/ Qual. for Harsh Envir.	Safety-Related Display	Control PMS/ DAS	Active Function	Loss of Motive Power Position
RCS Cold Leg 1B Flow Sensor	RCS-102A	Yes	-	Yes/Yes	Yes	-/-	-	-
RCS Cold Leg 1B Flow Sensor	RCS-102B	Yes	-	Yes/Yes	Yes	-/-	-	-
RCS Cold Leg 1B Flow Sensor	RCS-102C	Yes	-	Yes/Yes	Yes	-/-	-	-
RCS Cold Leg 1B Flow Sensor	RCS-102D	Yes	-	Yes/Yes	Yes	-/-	-	-
RCS Cold Leg 2A Flow Sensor	RCS-103A	Yes	-	Yes/Yes	Yes	-/-	-	-
RCS Cold Leg 2A Flow Sensor	RCS-103B	Yes	-	Yes/Yes	Yes	-/-	-	-
RCS Cold Leg 2A Flow Sensor	RCS-103C	Yes	-	Yes/Yes	Yes	-/-	-	-
RCS Cold Leg 2A Flow Sensor	RCS-103D	Yes	-	Yes/Yes	Yes	-/-	-	-
RCS Cold Leg 2B Flow Sensor	RCS-104A	Yes	-	Yes/Yes	Yes	-/-	-	-
RCS Cold Leg 2B Flow Sensor	RCS-104B	Yes	-	Yes/Yes	Yes	-/-	-	-
RCS Cold Leg 2B Flow Sensor	RCS-104C	Yes	-	Yes/Yes	Yes	-/-	-	-

Note: Dash (-) indicates not applicable.

Table 2.1.2-1 (cont)								
Equipment Name	**Tag No.**	**Seismic Cat. I**	**Remotely Operated Valve**	**Class 1E/ Qual. for Harsh Envir.**	**Safety-Related Display**	**Control PMS/ DAS**	**Active Function**	**Loss of Motive Power Position**
RCS Cold Leg 2B Flow Sensor	RCS-104D	Yes	-	Yes/Yes	Yes	-/-	-	-
RCS Cold Leg 1A Narrow-Range Temperature Sensor	RCS-121A	Yes	-	Yes/Yes	Yes	-/-	-	-
RCS Cold Leg 1B Narrow-Range Temperature Sensor	RCS-121B	Yes	-	Yes/Yes	Yes	-/-	-	-
RCS Cold Leg 1B Narrow-Range Temperature Sensor	RCS-121C	Yes	-	Yes/Yes	Yes	-/-	-	-
RCS Cold Leg 1A Narrow-Range Temperature Sensor	RCS-121D	Yes	-	Yes/Yes	Yes	-/-	-	-
RCS Cold Leg 2B Narrow-Range Temperature Sensor	RCS-122A	Yes	-	Yes/Yes	Yes	-/-	-	-
RCS Cold Leg 2A Narrow-Range Temperature Sensor	RCS-122B	Yes	-	Yes/Yes	Yes	-/-	-	-
RCS Cold Leg 2A Narrow-Range Temperature Sensor	RCS-122C	Yes	-	Yes/Yes	Yes	-/-	-	-
RCS Cold Leg 2B Narrow-Range Temperature Sensor	RCS-122D	Yes	-	Yes/Yes	Yes	-/-	-	-
RCS Cold Leg 1A Wide-Range Temperature Sensor	RCS-125A	Yes	-	Yes/Yes	Yes	-/-	-	-
RCS Cold Leg 2A Wide-Range Temperature Sensor	RCS-125B	Yes	-	Yes/Yes	Yes	-/-	-	-

Note: Dash (-) indicates not applicable.

Table 2.1.2-1 (cont)								
Equipment Name	Tag No.	Seismic Cat. I	Remotely Operated Valve	Class 1E/ Qual. for Harsh Envir.	Safety-Related Display	Control PMS/ DAS	Active Function	Loss of Motive Power Position
RCS Cold Leg 1B Wide-Range Temperature Sensor	RCS-125C	Yes	-	Yes/Yes	Yes	-/-	-	-
RCS Cold Leg 2B Wide-Range Temperature Sensor	RCS-125D	Yes	-	Yes/Yes	Yes	-/-	-	-
RCS Hot Leg 1 Narrow-Range Temperature Sensor	RCS-131A	Yes	-	Yes/Yes	Yes	-/-	-	-
RCS Hot Leg 2 Narrow-Range Temperature Sensor	RCS-131B	Yes	-	Yes/Yes	Yes	-/-	-	-
RCS Hot Leg 1 Narrow-Range Temperature Sensor	RCS-131C	Yes	-	Yes/Yes	Yes	-/-	-	-
RCS Hot Leg 2 Narrow-Range Temperature Sensor	RCS-131D	Yes	-	Yes/Yes	Yes	-/-	-	-
RCS Hot Leg 1 Narrow-Range Temperature Sensor	RCS-132A	Yes	-	Yes/Yes	Yes	-/-	-	-
RCS Hot Leg 2 Narrow-Range Temperature Sensor	RCS-132B	Yes	-	Yes/Yes	Yes	-/-	-	-
RCS Hot Leg 1 Narrow-Range Temperature Sensor	RCS-132C	Yes	-	Yes/Yes	Yes	-/-	-	-
RCS Hot Leg 2 Narrow-Range Temperature Sensor	RCS-132D	Yes	-	Yes/Yes	Yes	-/-	-	-
RCS Hot Leg 1 Narrow-Range Temperature Sensor	RCS-133A	Yes	-	Yes/Yes	Yes	-/-	-	-

Note: Dash (-) indicates not applicable.

Table 2.1.2-1 (cont)								
Equipment Name	**Tag No.**	**Seismic Cat. I**	**Remotely Operated Valve**	**Class 1E/ Qual. for Harsh Envir.**	**Safety-Related Display**	**Control PMS/ DAS**	**Active Function**	**Loss of Motive Power Position**
RCS Hot Leg 2 Narrow-Range Temperature Sensor	RCS-133B	Yes	-	Yes/Yes	Yes	-/-	-	-
RCS Hot Leg 1 Narrow-Range Temperature Sensor	RCS-133C	Yes	-	Yes/Yes	Yes	-/-	-	-
RCS Hot Leg 2 Narrow-Range Temperature Sensor	RCS-133D	Yes	-	Yes/Yes	Yes	-/-	-	-
RCS Hot Leg 1 Wide-Range Temperature Sensor	RCS-135A	Yes	-	Yes/Yes	Yes	-/-	-	-
RCS Hot Leg 2 Wide-Range Temperature Sensor	RCS-135B	Yes	-	Yes/Yes	Yes	-/-	-	-
RCS Wide-Range Pressure Sensor	RCS-140A	Yes	-	Yes/Yes	Yes	-/-	-	-
RCS Wide-Range Pressure Sensor	RCS-140B	Yes	-	Yes/Yes	Yes	-/-	-	-
RCS Wide-Range Pressure Sensor	RCS-140C	Yes	-	Yes/Yes	Yes	-/-	-	-
RCS Wide-Range Pressure Sensor	RCS-140D	Yes	-	Yes/Yes	Yes	-/-	-	-
RCS Hot Leg 1 Level Sensor	RCS-160A	Yes	-	Yes/Yes	Yes	-/-	-	-
RCS Hot Leg 2 Level Sensor	RCS-160B	Yes	-	Yes/Yes	Yes	-/-	-	-

Note: Dash (-) indicates not applicable.

Table 2.1.2-1 (cont)								
Equipment Name	**Tag No.**	**Seismic Cat. I**	**Remotely Operated Valve**	**Class 1E/ Qual. for Harsh Envir.**	**Safety-Related Display**	**Control PMS/ DAS**	**Active Function**	**Loss of Motive Power Position**
Passive Residual Heat Removal (PRHR) Return Line Temperature Sensor	RCS-161	Yes	-	Yes/Yes	Yes	-/-	-	-
Pressurizer Pressure Sensor	RCS-191A	Yes	-	Yes/Yes	Yes	-/-	-	-
Pressurizer Pressure Sensor	RCS-191B	Yes	-	Yes/Yes	Yes	-/-	-	-
Pressurizer Pressure Sensor	RCS-191C	Yes	-	Yes/Yes	Yes	-/-	-	-
Pressurizer Pressure Sensor	RCS-191D	Yes	-	Yes/Yes	Yes	-/-	-	-
Pressurizer Level Reference Leg Temperature Sensor	RCS-193A	Yes	-	Yes/Yes	Yes	-/-	-	-
Pressurizer Level Reference Leg Temperature Sensor	RCS-193B	Yes	-	Yes/Yes	Yes	-/-	-	-
Pressurizer Level Reference Leg Temperature Sensor	RCS-193C	Yes	-	Yes/Yes	Yes	-/-	-	-
Pressurizer Level Reference Leg Temperature Sensor	RCS-193D	Yes	-	Yes/Yes	Yes	-/-	-	-
Pressurizer Level Sensor	RCS-195A	Yes	-	Yes/Yes	Yes	-/-	-	-
Pressurizer Level Sensor	RCS-195B	Yes	-	Yes/Yes	Yes	-/-	-	-
Pressurizer Level Sensor	RCS-195C	Yes	-	Yes/Yes	Yes	-/-	-	-
Pressurizer Level Sensor	RCS-195D	Yes	-	Yes/Yes	Yes	-/-	-	-

Note: Dash (-) indicates not applicable.

Table 2.1.2-1 (cont)								
Equipment Name	**Tag No.**	**Seismic Cat. I**	**Remotely Operated Valve**	**Class 1E/ Qual. for Harsh Envir.**	**Safety-Related Display**	**Control PMS/ DAS**	**Active Function**	**Loss of Motive Power Position**
RCP 1A Bearing Water Temperature Sensor	RCS-211A	Yes	-	Yes/Yes	Yes	-/-	-	-
RCP 1A Bearing Water Temperature Sensor	RCS-211B	Yes	-	Yes/Yes	Yes	-/-	-	-
RCP 1A Bearing Water Temperature Sensor	RCS-211C	Yes	-	Yes/Yes	Yes	-/-	-	-
RCP 1A Bearing Water Temperature Sensor	RCS-211D	Yes	-	Yes/Yes	Yes	-/-	-	-
RCP 1B Bearing Water Temperature Sensor	RCS-212A	Yes	-	Yes/Yes	Yes	-/-	-	-
RCP 1B Bearing Water Temperature Sensor	RCS-212B	Yes	-	Yes/Yes	Yes	-/-	-	-
RCP 1B Bearing Water Temperature Sensor	RCS-212C	Yes	-	Yes/Yes	Yes	-/-	-	-
RCP 1B Bearing Water Temperature Sensor	RCS-212D	Yes	-	Yes/Yes	Yes	-/-	-	-
RCP 2A Bearing Water Temperature Sensor	RCS-213A	Yes	-	Yes/Yes	Yes	-/-	-	-
RCP 2A Bearing Water Temperature Sensor	RCS-213B	Yes	-	Yes/Yes	Yes	-/-	-	-
RCP 2A Bearing Water Temperature Sensor	RCS-213C	Yes	-	Yes/Yes	Yes	-/-	-	-

Note: Dash (-) indicates not applicable.

Table 2.1.2-1 (cont)								
Equipment Name	Tag No.	Seismic Cat. I	Remotely Operated Valve	Class 1E/ Qual. for Harsh Envir.	Safety-Related Display	Control PMS/ DAS	Active Function	Loss of Motive Power Position
RCP 2A Bearing Water Temperature Sensor	RCS-213D	Yes	-	Yes/Yes	Yes	-/-	-	-
RCP 2B Bearing Water Temperature Sensor	RCS-214A	Yes	-	Yes/Yes	Yes	-/-	-	-
RCP 2B Bearing Water Temperature Sensor	RCS-214B	Yes	-	Yes/Yes	Yes	-/-	-	-
RCP 2B Bearing Water Temperature Sensor	RCS-214C	Yes	-	Yes/Yes	Yes	-/-	-	-
RCP 2B Bearing Water Temperature Sensor	RCS-214D	Yes	-	Yes/Yes	Yes	-/-	-	-
RCP 1A Pump Speed Sensor	RCS-281	Yes	-	Yes/Yes	Yes	-/-	-	-
RCP 1B Pump Speed Sensor	RCS-282	Yes	-	Yes/Yes	Yes	-/-	-	-
RCP 2A Pump Speed Sensor	RCS-283	Yes	-	Yes/Yes	Yes	-/-	-	-
RCP 2B Pump Speed Sensor	RCS-284	Yes	-	Yes/Yes	Yes	-/-	-	-

Note: Dash (-) indicates not applicable.

Table 2.1.2-2	
Line Name	**Line Number**
Hot Legs	RCS-L001A / RCS-L001B
Cold Legs	RCS-L002A / RCS-L002B / RCS-L002C / RCS-L002D
Pressurizer Surge Line	RCS-L003
ADS Inlet Headers	RCS-L004A / RCS-L006A / RCS-L030A / RCS-L020A RCS-L004B / RCS-L006B / RCS-L030B / RCS-L020B
Safety Valve Inlet Piping	RCS-L005A / RCS-L005B
ADS Second-Stage Valve Piping	RCS-L031A / RCS-L032A / RCS-L131 / RCS-L031B / RCS-L032B
ADS Third-Stage Valve Piping	RCS-L021A / RCS-L022A / RCS-L021B / RCS-L022B

Table 2.1.2-3 Inspections, Tests, Analyses, and Acceptance Criteria		
Design Commitment	**Inspections, Tests, Analyses**	**Acceptance Criteria**
1. The functional arrangement of the applicable portions of the RCS is as shown in Figure 2.1.2-1.	Inspection of the as-built system will be performed.	The as-built RCS conforms with the functional arrangement shown in Figure 2.1.2-1.
2. The ASME Code Section III components and piping shown in Figure 2.1.2-1 retain pressure boundary integrity at their design pressure.	i) A hydrostatic test will be performed on those ASME Code components of the RCS required to be hydrostatically tested by the ASME Code Section III.	i) A report exists and concludes that the results of the hydrostatic test of the ASME Code components of the RCS conform with the requirements in the ASME Code Section III.
	ii) Inspections, including nondestructive examination of the as-built pressure boundary welds, will be performed in accordance with the ASME Code Section III.	ii) A report exists and concludes that the pressure boundary integrity requirements of the ASME Code Section III are met for the quality of pressure boundary welds.
3. The seismic Category I equipment identified in Table 2.1.2-1 can withstand seismic design basis dynamic loads without loss of safety function.	i) Inspection will be performed to verify that the seismic Category I equipment and valves identified in Table 2.1.2-1 are located on the nuclear island.	i) The seismic Category I equipment identified in Table 2.1.2-1 is located on the nuclear island.
	ii) Type tests, analyses, or a combination of type tests and analyses of seismic Category I equipment will be performed.	ii) A report exists and concludes that the seismic Category I equipment can withstand seismic design basis dynamic loads without loss of safety function.
	iii) Analysis of seismic Category I equipment supports will be performed.	iii) A report exists and concludes that the seismic Category I equipment supports can withstand seismic design basis loads without loss of safety function.

Table 2.1.2-3 (cont)
Inspections, Tests, Analyses, and Acceptance Criteria

Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
4.a) The as-built RCS ASME Code Section III piping depicted on Figure 2.1.2-1 meets applicable ASME Section III Code requirements for the RCS design conditions.	i) Inspection will be performed to verify that the RCS ASME Code Section III piping depicted in Figure 2.1.2-1 is located on the nuclear island.	i) The RCS ASME Code Section III Class piping depicted in Figure 2.1.2-1 is located on the nuclear island.
	ii) A reconciliation analysis using the as-designed and as-built piping information will be performed, or an analysis of the as-built piping will be performed.	ii) The as-built piping stress report exists and includes the ASME Code Certified Stress Report.
	iii) A reconciliation analysis using the as-designed and as-built pipe support information will be performed, or an analysis of the as-built supports will be performed.	iii) The as-built pipe support stress report exists and includes the ASME Code Certified Stress Report.
4.b) Each of the as-built RCS lines identified in Table 2.1.2-2 is designed to meet LBB criteria, or an evaluation is performed of the protection from dynamic effects of a rupture of the line.	Inspection will be performed for the existence of an LBB evaluation report or an evaluation report on the protection from dynamic effects of a pipe break. Certified Design Material, Section 3.3, Nuclear Island Buildings, contains the design descriptions and inspections, tests, analyses, and acceptance criteria for protection from the dynamic effects of pipe rupture.	An LBB evaluation report exists and concludes that the LBB acceptance criteria are met by the as-built RCS piping and piping materials, or a pipe break evaluation report exists and concludes that protection from the dynamic effects of a line break is provided.

Table 2.1.2-3 (cont) Inspections, Tests, Analyses, and Acceptance Criteria		
Design Commitment	**Inspections, Tests, Analyses**	**Acceptance Criteria**
5.a) The Class 1E equipment identified in Table 2.1.2-1 as being qualified for a harsh environment can withstand the environmental conditions that would exist before, during, and following a design basis accident without loss of safety function for the time required to perform the safety function.	Type tests, analyses, or a combination of type tests and analyses will be performed on Class 1E equipment located in a harsh environment.	A report exists and concludes that the Class 1E equipment identified in Table 2.1.2-1 as being qualified for a harsh environment can withstand the environmental conditions that would exist before, during, and following a design basis accident without loss of safety function for the time required to perform the safety function.
5.b) The Class 1E components identified in Table 2.1.2-1 are powered from their respective Class 1E division.	Testing will be performed on the RCS by providing a simulated test signal in each Class 1E division.	A simulated test signal exists at the Class 1E equipment identified in Table 2.1.2-1 when the assigned Class 1E division is provided the test signal.
5.c) Separation is provided between RCS Class 1E divisions, and between Class 1E divisions and non-Class 1E cable.	See Certified Design Material, Section 3.3, Nuclear Island Buildings.	See Certified Design Material, Section 3.3, Nuclear Island Buildings.
6.a) The pressurizer safety valves provide overpressure protection in accordance with Section III of the ASME Boiler and Pressure Vessel Code.	i) Inspections will be conducted to confirm that the value of the vendor code plate rating is greater than or equal to system relief requirements. ii) Testing and analysis in accordance with ASME Code Section III will be performed to determine set pressure.	i) The sum of the rated capacities recorded on the valve ASME Code plates of the safety valves exceeds 750,000 lb/hr. ii) A report exists and concludes that the safety valves set pressure is 2485 psig $\pm$ 25 psi.
6.b) The reactor coolant pumps have a rotating inertia to provide RCS flow coastdown on loss of power to the pumps.	Inspection of as-built RCP vendor data will be performed.	The calculated rotating inertia of each RCP is no less than 5000 lb-ft^2.

Table 2.1.2-3 (cont) Inspections, Tests, Analyses, and Acceptance Criteria		
Design Commitment	**Inspections, Tests, Analyses**	**Acceptance Criteria**
6.c) The RCS provides automatic depressurization during design basis events.	i) A low pressure flow test and associated analysis will be conducted to determine the total piping flow resistance of each ADS valve group connected to the pressurizer (i.e., ADS Stages 1-3) from the pressurizer through the outlet of the downstream ADS control valves. The reactor coolant system will be at cold conditions with the pressurizer full of water. The normal residual heat removal pumps will be used to provide injection flow into the RCS discharging through the ADS valves. Inspections and associated analysis of the piping flow paths from the discharge of the ADS valve groups connected to the pressurizer (i.e., ADS Stages 1-3) to the spargers will be conducted to verify the line routings are consistent with the line routings used for design flow resistance calculations.	i) The calculated ADS piping flow resistance from the pressurizer through the sparger with valves of each ADS group open is ≤ 1.16E-6 ft/gpm^2.
	ii) Inspections and associated analysis of each fourth-stage ADS valve group (four valves and associated piping connected to each hot leg) will be conducted to verify the line routing is consistent with the line routing used for design flow resistance calculations.	ii) The calculated flow resistance for each group of fourth-stage ADS valves and piping with all valves open is ≤ 3.30E-7 ft/gpm^2.

Table 2.1.2-3 (cont) Inspections, Tests, Analyses, and Acceptance Criteria		
Design Commitment	**Inspections, Tests, Analyses**	**Acceptance Criteria**
7.a) The RCS provides circulation of coolant to remove heat from the core.	Testing and analysis to measure RCS flow with four reactor coolant pumps operating at no-load RCS pressure and temperature conditions will be performed. Analyses to convert the measured pre-fuel load flow rate to an expected post-fuel load flow rate will be performed.	The calculated post-fuel load RCS flow rate is $\geq$ 189,600 gpm.
7.b) The RCS provides the means to control system pressure.	i) Inspections will be performed to verify the rated capacity of pressurizer heater backup groups A and B. ii) Tests will be performed to verify that the pressurizer spray valves can open and close when operated from the MCR.	i) Pressurizer heater backup groups A and B each has a rated capacity of at least 166 kW. ii) Controls in the MCR operate to cause the pressurizer spray valves to open and close.
8. Safety-related displays identified in Table 2.1.2-1 can be retrieved in the MCR.	Inspection will be performed for retrievability of the safety-related displays in the MCR.	Safety-related displays identified in Table 2.1.2-1 can be retrieved in the MCR.
9.a) Controls exist in the MCR to cause the remotely operated valves identified in Table 2.1.2-1 to perform active functions.	i) Testing will be performed on the squib valves identified in Table 2.1.2-1 using controls in the MCR without stroking the valve. ii) Stroke testing will be performed on the other remotely operated valves listed in Table 2.1.2-1 using controls in the MCR.	i) Controls in the MCR operate to cause a signal at the squib valve electrical leads which is capable of actuating the squib valve. ii) Controls in the MCR operate to cause the remotely operated valves (other than squib valves) to perform active functions.

Table 2.1.2-3 (cont) Inspections, Tests, Analyses, and Acceptance Criteria		
Design Commitment	**Inspections, Tests, Analyses**	**Acceptance Criteria**
9.b) The valves identified in Table 2.1.2-1 as having PMS control perform an active safety function after receiving a signal from the PMS.	i) Testing will be performed on the squib valves identified in Table 2.1.2-1 using real or simulated signals into the PMS without stroking the valve. ii) Testing will be performed on the other remotely operated valves identified in Table 2.1.2-1 using real or simulated signals into the PMS.	i) The squib valves receive a signal at the valve electrical leads that is capable of actuating the squib valve. ii) The other remotely operated valves identified in Table 2.1.2-1 as having PMS control perform an active safety function after receiving a signal from PMS.
9.c) The valves identified in Table 2.1.2-1 as having DAS control perform an active safety function after receiving a signal from DAS.	i) Testing will be performed on the squib valves identified in Table 2.1.2-1 using real or simulated signals into the DAS without stroking the valve. ii) Testing will be performed on the other remotely operated valves identified in Table 2.1.2-1 using real or simulated signals into the DAS.	i) The squib valves receive a signal at the valve electrical leads that is capable of actuating the squib valve. ii) The other remotely operated valves identified in Table 2.1.2-1 as having DAS control perform an active safety function after receiving a signal from DAS.
10.a) The MOVs identified in Table 2.1.2-1 perform an active safety-related function to change position as indicated in the table.	Tests or type tests of motor-operated valves will be performed that demonstrate the capability of the valve to operate under its design conditions.	A test report exists and concludes that each motor-operated valve changes position as indicated in Table 2.1.2-1 under design conditions.
10.b) After loss of motive power, the remotely operated valves identified in Table 2.1.2-1 assume the indicated loss of motive power position.	Testing of the installed valves will be performed under the conditions of loss of motive power.	Upon loss of motive power, each remotely operated valve identified in Table 2.1.2-1 assumes the indicated loss of motive power position.
11.a) Controls exist in the MCR to trip the RCPs.	Testing will be performed on the RCPs using controls in the MCR.	Controls in the MCR operate to trip the RCPs.
11.b) The RCPs trip after receiving a signal from the PMS.	Testing will be performed using real or simulated signals into the PMS.	The RCPs trip after receiving a signal from the PMS.

Table 2.1.2-3 (cont)
Inspections, Tests, Analyses, and Acceptance Criteria

Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
11.c) The RCPs trip after receiving a signal from the DAS.	Testing will be performed using real or simulated signals into the DAS.	The RCPs trip after receiving a signal from the DAS.
12. Controls exist in the MCR to trip the pressurizer heaters.	Testing will be performed on the pressurizer heaters using controls in the MCR.	Controls in the MCR operate to trip the pressurizer heaters.

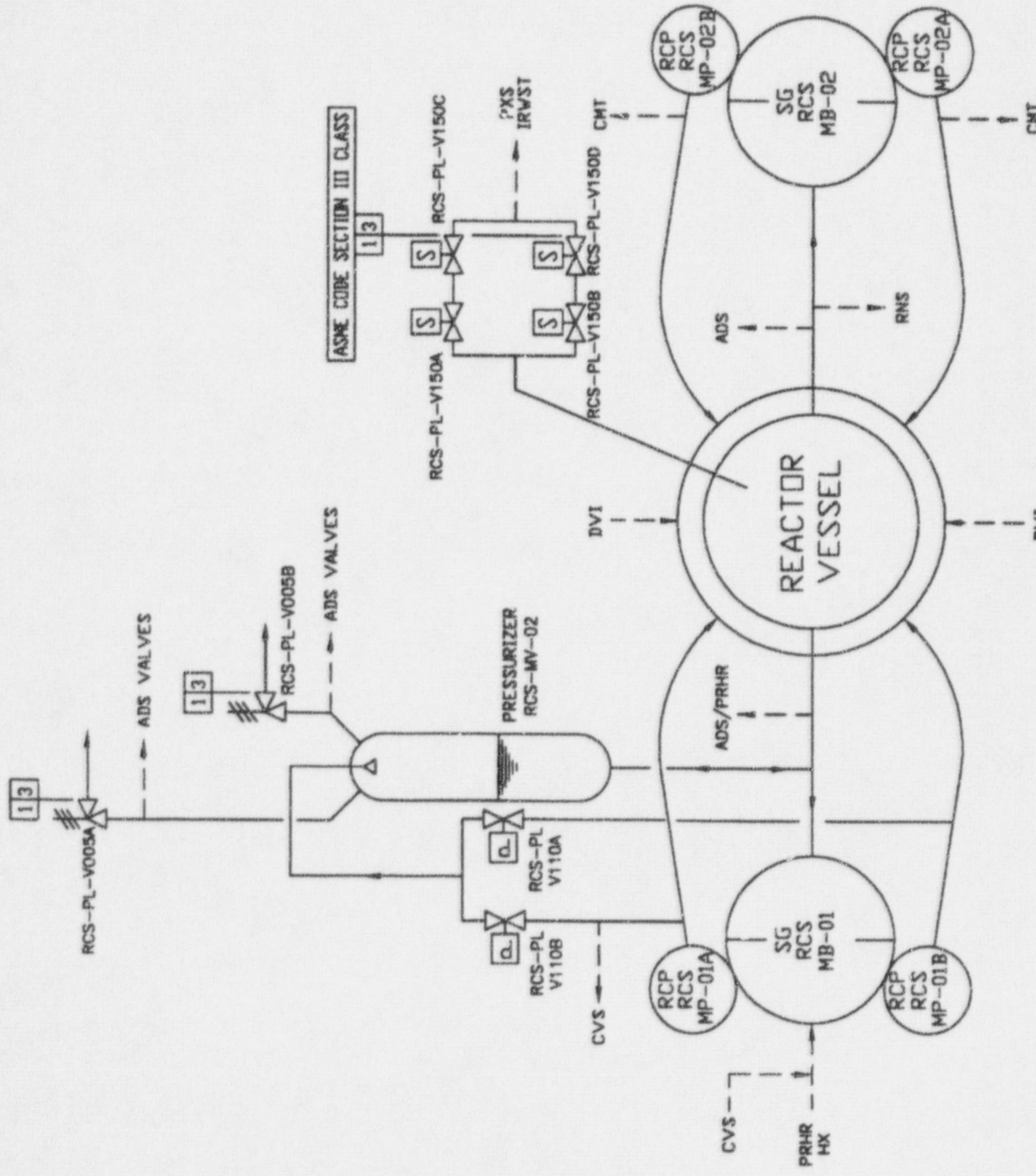


Figure 2.1.2-1 (Sheet 1 of 2)
Reactor Coolant System

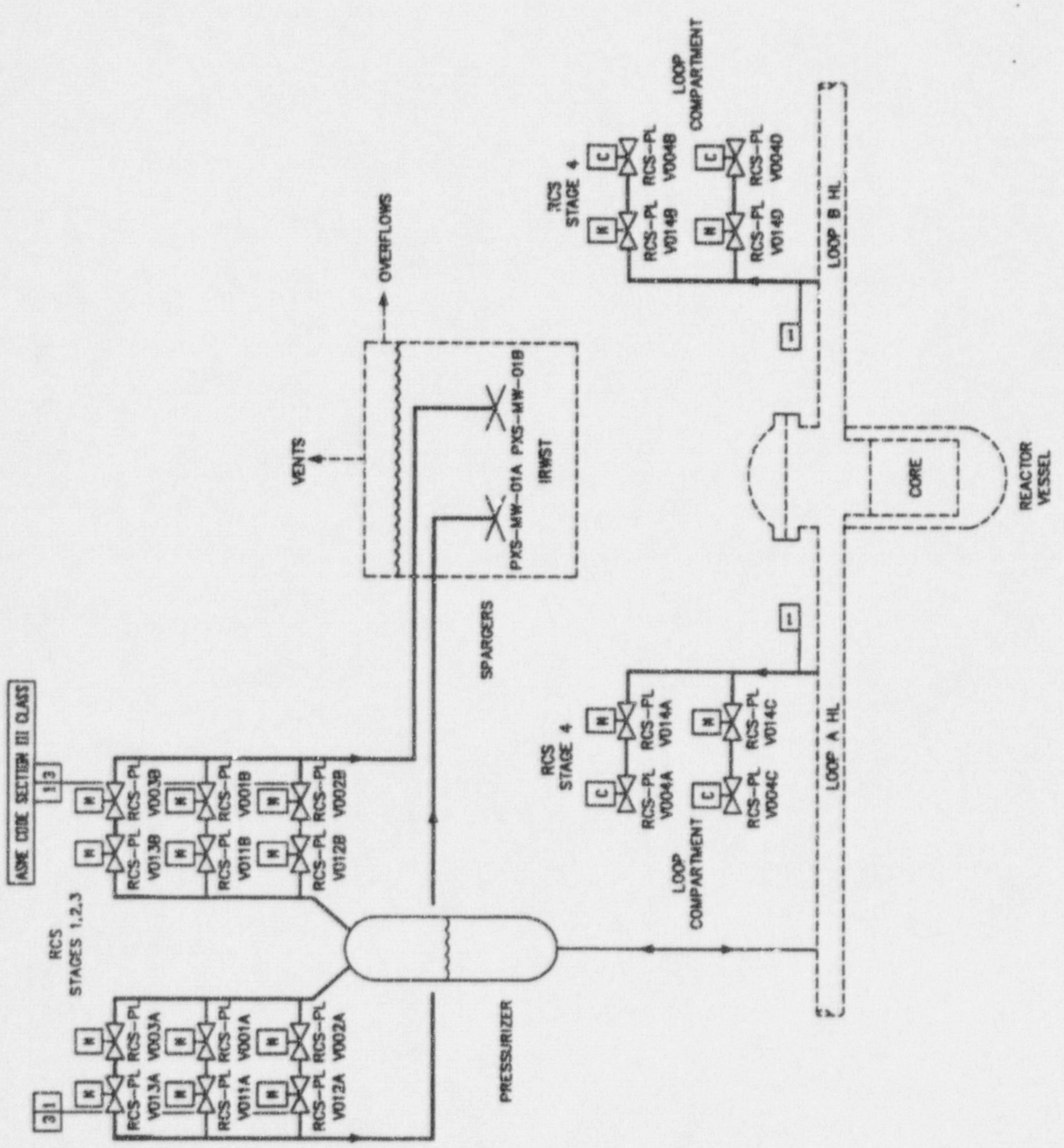


Figure 2.1.2-1 (Sheet 2 of 2)
Reactor Coolant System

2.1.3 Reactor System

Design Description

The reactor system (RXS) provides a barrier that prevents the release of fission products to the atmosphere.

1. The RXS components are identified in Table 2.1.3-1.

2. The American Society of Mechanical Engineers (ASME) Code Section III Class 1 components identified in Table 2.1.3-1 retain pressure boundary integrity at their design pressure.

3. The seismic Category I equipment identified in Table 2.1.3-1 can withstand seismic design basis dynamic loads without loss of safety function.

4. a) The Class 1E equipment identified in Table 2.1.3-1 as being qualified for a harsh environment can withstand the environmental conditions that would exist before, during, and following a design basis accident without loss of safety function for the time required to perform the safety function.

   b) The Class 1E components identified in Table 2.1.3-1 are powered from their respective Class 1E division.

   c) Separation is provided between RXS Class 1E divisions, and between Class 1E divisions and non-Class 1E cable.

5. The reactor vessel (RV) beltline material has a Charpy upper-shelf energy of no less than 75 ft-lb.

6. Safety-related displays of the RXS parameters identified in Table 2.1.3-1 can be retrieved in the main control room (MCR).

Inspections, Tests, Analysis, and Acceptance Criteria

Table 2.1.3-2 specifies the inspections, tests, analysis, and associated acceptance criteria for the RXS.

Table 2.1.3-1						
Equipment Name	**Tag No.**	**Seismic Cat. I**	**ASME Code Classification**	**Class 1E**	**Qual. for Harsh Envir.**	**Safety-Related Display**
Reactor Vessel	RXS-MV-01	Yes	Section III, Class 1	-	-	-
Reactor Vessel Supports (4)	RXS-SS-E01A/ E01B/E01C/E01D	Yes	Section III, Class NF	-	-	-
Reactor Upper Internals Assembly	RX-MI-01	Yes	Section III, CS	-	-	-
Reactor Lower Internals Assembly	RXS-MI-02	Yes	Section III, CS	-	-	-
Integrated Head Package	RXS-MV-10	Yes	Section III, NF (Shroud and Seismic Support Plate)	-	-	-
Control Rod Drive Mechanisms (CRDMs) (61 Locations)	RXS-MV-11XX ("XX" is the CRDM Location Number)	Yes	Section III, Class 1 (Latch and Rod Travel Housing)	No	No	No
Incore Guide Tubes (38 Core Locations)	IIS-G01 through G38	Yes	Section III, Class 1	-	-	-

Note: Dash (-) indicates not applicable.

Table 2.1.3-1 (cont)						
Equipment Name	**Tag No.**	**Seismic Cat. I**	**ASME Code Classification**	**Class 1E**	**Qual. for Harsh Envir.**	**Safety-Related Display**
Incore Thimble Assemblies (38 Core Locations)	IIS-01 through 038	Yes	No	Yes (Except Four Core Locations Allocated to Diverse Actuation System (DAS))	Yes (Except Four Core Locations Allocated to DAS)	Yes (Except Four Core Locations Allocated to DAS)
Source Range Detectors (4)	RXS-001A/001B/ 001C/001D	Yes	-	Yes	Yes	No
Intermediate Range Detectors (4)	RXS-002A/002B/ 002C/002D	Yes	-	Yes	Yes	Yes
Power Range Detectors - Lower (4)	RXS-003A/003B/ 003C/003D	Yes	-	Yes	Yes	No
Power Range Detectors - Upper (4)	RXS-004A/004B/ 004C/004D	Yes	-	Yes	Yes	No

Note: Dash (-) indicates not applicable.

Table 2.1.3-2 Inspections, Tests, Analysis, and Acceptance Criteria		
Design Commitment	**Inspections, Tests, Analysis**	**Acceptance Criteria**
1. The RXS components are identified in Table 2.1.3-1.	Inspection of the as-built system will be performed.	The as-built RXS has the components identified in Table 2.1.3-1.
2. The ASME Code Section III Class 1 components identified in Table 2.1.3-1 retain pressure boundary integrity at their design pressure.	A hydrostatic test will be performed on those ASME Code components of the RXS required to be hydrostatically tested by the ASME Code Section III.	The results of the hydrostatic test of the ASME Code components of the RXS conform with the requirements in the ASME Code Section III.
3. The seismic Category I equipment identified in Table 2.1.3-1 can withstand seismic design basis dynamic loads without loss of safety function.	i) Inspection will be performed to verify that the seismic Category I equipment identified in Table 2.1.3-1 is located on the nuclear island. ii) Type tests, analyses, or a combination of type tests and analyses of seismic Category I equipment will be performed. iii) Analysis of seismic Category I equipment supports will be performed.	i) The seismic Category I equipment identified in Table 2.1.3-1 is located on the nuclear island. ii) A report exists and concludes that the seismic Category I equipment can withstand seismic design basis dynamic loads without loss of safety function. iii) A report exists and concludes that the seismic Category I equipment supports can withstand seismic design basis loads without loss of safety function.
4.a) The Class 1E equipment identified in Table 2.1.3-1 as being qualified for a harsh environment can withstand the environmental conditions that would exist before, during, and following a design basis accident without loss of safety function for the time required to perform the safety function.	Type tests, analysis, or a combination of type tests and analysis will be performed on Class 1E equipment located in a harsh environment.	A report exists and concludes that the Class 1E equipment identified in Table 2.1.3-1 as being qualified for a harsh environment. This equipment can withstand the environmental conditions that would exist before, during, and following a design basis accident without loss of safety function for the time required to perform the safety function.

Table 2.1.3-2 (cont) Inspections, Tests, Analysis, and Acceptance Criteria		
Design Commitment	**Inspections, Tests, Analysis**	**Acceptance Criteria**
4.b) The Class 1E components identified in Table 2.1.3-1 are powered from their respective Class 1E division.	Testing will be performed on the RXS by providing simulated test signals in each Class 1E division.	A simulated test signal exists at Class 1E equipment identified in Table 2.1.3-1 when the assigned Class 1E division is provided the test signal.
4.c) Separation is provided between RXS Class 1E divisions, and between Class 1E divisions and non-Class 1E cable.	See Certified Design Material, Section 3.3, Nuclear Island Buildings.	See Certified Design Material, Section 3.3, Nuclear Island Buildings.
5. The RV beltline material has a Charpy upper-shelf energy of no less than 75 ft-lb.	Testing of the Charpy V-Notch specimen of the RV beltline material will be performed.	The initial RV beltline Charpy upper-shelf energy is no less than 75 ft-lb.
6. Safety-related displays of the RXS parameters identified in Table 2.1.3-1 can be retrieved in the MCR.	Inspection will be performed for retrievability of the safety-related displays in the MCR.	Safety-related displays identified in Table 2.1.3-1 can be retrieved in the MCR.

2.2.1 Containment System

Design Description

The containment system (CNS) is the collection of boundaries that separates the containment atmosphere from the outside environment subsequent to a breach in the reactor coolant pressure boundary.

1. The functional arrangement of the applicable portions of the CNS and associated systems is as shown in Figure 2.2.1-1.

2. The American Society of Mechanical Engineers (ASME) Code Section III components and piping shown in Figure 2.2.1-1 retain pressure boundary integrity at their design pressure.

3. The seismic Category I equipment identified in Table 2.2.1-1 can withstand seismic design basis dynamic loads without loss of safety function.

4. The as-built CNS ASME Code Section III piping depicted in Figure 2.2.1-1 meets applicable ASME Section III Code requirements for the CNS design conditions.

5. a) The Class 1E equipment identified in Table 2.2.1-1 as being qualified for a harsh environment can withstand the environmental conditions that would exist before, during, and following a design basis accident without loss of safety function for the time required to perform the safety function.

   b) The Class 1E components identified in Table 2.2.1-1 are powered from their respective Class 1E division.

   c) Separation is provided between CNS Class 1E divisions, and between Class 1E divisions and non-Class 1E cable.

6. The CNS provides the safety-related function of containment isolation for containment boundary integrity and provides a barrier against the release of fission products to the atmosphere.

7. Containment electrical penetration assemblies are protected against currents that are greater than the continuous ratings.

8. Safety-related displays identified in Table 2.2.1-1 can be retrieved in the main control room (MCR).

9. a) Controls exist in the MCR to cause those remotely operated valves identified in Table 2.2.1-1 to perform active functions.

   b) The valves identified in Table 2.2.1-1 as having protection and safety monitoring system (PMS) control perform an active function after receiving a signal from the PMS.

c) The valves identified in Table 2.2.1-1 as having diverse actuation system (DAS) control perform an active function after receiving a signal from the DAS.

10. a) The motor-operated and check valves identified in Table 2.2.1-1 perform an active safety-related function to change position as indicated in the table.

    b) After loss of motive power, the remotely operated valves identified in Table 2.2.1-1 assume the indicated loss of motive power position.

Inspections, Tests, Analyses, and Acceptance Criteria

Table 2.2.1-2 specifies the inspections, tests, analyses, and associated acceptance criteria for the CNS.

Table 2.2.1-1								
Equipment Name	**Tag No.**	**Seismic Cat. I**	**Remotely Operated Valve**	**Class 1E/ Qual. for Harsh Envir.**	**Safety-Related Display**	**Control PMS/DAS**	**Active Function**	**Loss of Motive Power Position**
Service Air Supply Outside Containment Isolation Valve	CAS-PL-V204	Yes	No	-/-	No	-/-	None	-
Service Air Supply Inside Containment Isolation Valve	CAS-PL-V205	Yes	No	-/-	No	-/-	None	-
Instrument Air Supply Outside Containment Isolation Valve	CAS-PL-V014	Yes	Yes	Yes/No	Yes (Valve Position)	Yes/No	Transfer Closed	Closed
Instrument Air Supply Inside Containment Isolation Valve	CAS-PL-V015	Yes	No	-/-	-	-/-	Transfer Closed	-
Component Cooling Water System (CCS) Containment Isolation Motor-operated Valve (MOV) - Inlet Line Outside Reactor Containment (ORC)	CCS-PL-V200	Yes	Yes	Yes/No	Yes (Valve Position)	Yes/No	Transfer Closed	As Is
CCS Containment Isolation Valve - Inlet Line Inside Reactor Containment (IRC)	CCS-PL-V201	Yes	No	-/-	No	-/-	Transfer Closed	-
CCS Containment Isolation MOV - Outlet Line IRC	CCS-PL-V207	Yes	Yes	Yes/Yes	Yes (Valve Position)	Yes/No	Transfer Closed	As Is
CCS Containment Isolation MOV - Outlet Line ORC	CCS-PL-V208	Yes	Yes	Yes/No	Yes (Valve Position)	Yes/No	Transfer Closed	As Is

Note: Dash (-) indicates not applicable.

Table 2.2.1-1 (cont)

Equipment Name	Tag No.	Seismic Cat. I	Remotely Operated Valve	Class 1E/ Qual. for Harsh Envir.	Safety-Related Display	Control PMS/DAS	Active Function	Loss of Motive Power Position
Demineralized Water Supply Containment Isolation Valve ORC	DWS-PL-V244	Yes	No	-/-	No	-/-	None	-
Demineralized Water Supply Containment Isolation Valve IRC	DWS-PL-V245	Yes	No	-/-	No	-/-	None	-
Fuel Transfer Tube	FHS-FT-001	Yes	-	-/-	-	-/-	-	-
Fire Water Containment Supply Isolation Valve - Outside	FPS-PL-V050	Yes	No	-/-	No	-/-	None	-
Fire Water Containment Supply Isolation Valve - Inside	FPS-PL-V052	Yes	No	-/-	No	-/-	None	-
Liquid Sample Line Containment Isolation Valve ORC	PSS-PL-V011	Yes	Yes	Yes/No	Yes (Valve Position)	Yes/No	Transfer Closed	Closed
Liquid Sample Line Containment Isolation Valve IRC	PSS-PL-V010A	Yes	Yes	Yes/Yes	Yes (Valve Position)	Yes/No	Transfer Closed	Closed
Liquid Sample Line Containment Isolation Valve IRC	PSS-PL-V010B	Yes	Yes	Yes/Yes	Yes (Valve Position)	Yes/No	Transfer Closed	Closed

Note: Dash (-) indicates not applicable.

Table 2.2.1-1 (cont)

Equipment Name	Tag No.	Seismic Cat. I	Remotely Operated Valve	Class 1E/ Qual. for Harsh Envir.	Safety-Related Display	Control PMS/DAS	Active Function	Loss of Motive Power Position
Containment Air Sample Containment Isolation Valve IRC	PSS-PL-V008	Yes	Yes	Yes/Yes	Yes (Valve Position)	Yes/No	Transfer Closed	Closed
Air Sample Line Containment Isolation Valve ORC	PSS-PL-V046	Yes	Yes	Yes/No	Yes (Valve Position)	Yes/No	Transfer Closed	Closed
Sample Return Line Containment Isolation Valve ORC	PSS-PL-V023	Yes	Yes	Yes/No	Yes (Valve Position)	Yes/No	Transfer Closed	Closed
Sample Return Containment Isolation Check Valve IRC	PSS-PL-V024	Yes	No	-/-	No	-/-	Transfer Closed	-
Spent Fuel Pool Cooling System (SFS) Discharge Line Containment Isolation Valve - IRC	SFS-PL-V037	Yes	No	-/-	No	-/-	Transfer Closed	-
SFS Discharge Line Containment Isolation MOV - IRC	SFS-PL-V038	Yes	Yes	Yes/No	Yes (Valve Position)	Yes/No	Transfer Closed	As Is
SFS Suction Line Containment Isolation MOV IRC	SFS-PL-V034	Yes	Yes	Yes/Yes	Yes (Valve Position)	Yes/No	Transfer Closed	As Is
SFS Suction Line Containment Isolation MOV ORC	SFS-PL-V035	Yes	Yes	Yes/No	Yes (Valve Position)	Yes/No	Transfer Closed	As Is

Note: Dash (-) indicates not applicable.

Table 2.2.1-1 (cont)								
Equipment Name	**Tag No.**	**Seismic Cat. I**	**Remotely Operated Valve**	**Class 1E/ Qual. for Harsh Envir.**	**Safety-Related Display**	**Control PMS/DAS**	**Active Function**	**Loss of Motive Power Position**
Containment Purge Inlet Containment Isolation Valve - ORC	VFS-PL-V003	Yes	Yes	Yes/No	Yes (Valve Position)	Yes/Yes	Transfer Closed	Closed
Containment Purge Inlet Containment Isolation Valve - IRC	VFS-PL-V004	Yes	Yes	Yes/Yes	Yes (Valve Position)	Yes/Yes	Transfer Closed	Closed
Integrated Leak Rate Testing Vent Discharge Containment Isolation Valve - ORC	VFS-PL-V008	Yes	No	-/-	No	-/-	None	-
Containment Purge Discharge Containment Isolation Valve - IRC	VFS-PL-V009	Yes	Yes	Yes/Yes	Yes (Valve Position)	Yes/Yes	Transfer Closed	Closed
Containment Purge Discharge Containment Isolation Valve - ORC	VFS-PL-V010	Yes	Yes	Yes/No	Yes (Valve Position)	Yes/Yes	Transfer Closed	Closed
Fan Coolers Return Containment Isolation Valve - IRC	VWS-PL-V082	Yes	Yes	Yes/Yes	Yes (Valve Position)	Yes/No	Transfer Closed	Closed
Fan Coolers Return Containment Isolation Valve - ORC	VWS-PL-V086	Yes	Yes	Yes/No	Yes (Valve Position)	Yes/No	Transfer Closed	Closed

Note: Dash (-) indicates not applicable.

Table 2.2.1-1 (cont)								
Equipment Name	**Tag No.**	**Seismic Cat. I**	**Remotely Operated Valve**	**Class 1E/ Qual. for Harsh Envir.**	**Safety-Related Display**	**Control PMS/DAS**	**Active Function**	**Loss of Motive Power Position**
Fan Coolers Supply Containment Isolation Valve - ORC	VWS-PL-V058	Yes	Yes	Yes/No	Yes (Valve Position)	Yes/No	Transfer Closed	Closed
Fan Coolers Supply Containment Isolation Valve - IRC	VWS-PL-V062	Yes	No	-/-	No	-/-	Transfer Closed	-
Reactor Coolant Drain Tank (RCDT) Gas Outlet Containment Isolation Valve - IRC	WLS-PL-V067	Yes	Yes	Yes/Yes	Yes (Valve Position)	Yes/No	Transfer Closed	Closed
RCDT Gas Outlet Containment Isolation Valve - ORC	WLS-PL-V068	Yes	Yes	Yes/No	Yes (Valve Position)	Yes/No	Transfer Closed	Closed
Sump Discharge Containment Isolation Valve - IRC	WLS-PL-V055	Yes	Yes	Yes/Yes	Yes (Valve Position)	Yes/Yes	Transfer Closed	Closed
Sump Discharge Containment Isolation Valve - ORC	WLS-PL-V057	Yes	Yes	Yes/No	Yes (Valve Position)	Yes/Yes	Transfer Closed	Closed
Spare Penetration	CNS-PL-P40	Yes	-	-/-	-	-/-	-	-
Spare Penetration	CNS-PL-P41	Yes	-	-/-	-	-/-	-	-
Spare Penetration	CNS-PL-P42	Yes	-	-/-	-	-/-	-	-
Main Equipment Hatch	CNS-MY-Y01	Yes	-	-/-	-	-/-	-	-

Note: Dash (-) indicates not applicable.

Table 2.2.1-1 (cont)

Equipment Name	Tag No.	Seismic Cat. I	Remotely Operated Valve	Class 1E/ Qual. for Harsh Envir.	Safety-Related Display	Control PMS/DAS	Active Function	Loss of Motive Power Position
Maintenance Hatch	CNS-MY-Y02	Yes	-	-/-	-	-/-	-	-
Personnel Hatch	CNS-MY-Y03	Yes	-	-/-	-	-/-	-	-
Personnel Hatch	CNS-MY-Y04	Yes	-	-/-	-	-/-	-	-
Containment Vessel	CNS-MV50	Yes	-	-/-	-	-/-	-	-
Electrical Penetration E01	VUS-JY-E01	Yes	-	Yes/Yes	-	-/-	-	-
Electrical Penetration E02	VUS-JY-E02	Yes	-	Yes/Yes	-	-/-	-	-
Electrical Penetration E06	VUS-JY-E06	Yes	-	Yes/Yes	-	-/-	-	-
Electrical Penetration E09	VUS-JY-E09	Yes	-	Yes/Yes	-	-/-	-	-
Electrical Penetration E10	VUS-JY-E10	Yes	-	Yes/Yes	-	-/-	-	-
Electrical Penetration E11	VUS-JY-E11	Yes	-	Yes/Yes	-	-/-	-	-
Electrical Penetration E12	VUS-JY-E12	Yes	-	Yes/Yes	-	-/-	-	-
Electrical Penetration E13	VUS-JY-E13	Yes	-	Yes/Yes	-	-/-	-	-
Electrical Penetration E14	VUS-JY-E14	Yes	-	Yes/Yes	-	-/-	-	-
Electrical Penetration E15	VUS-JY-E15	Yes	-	Yes/Yes	-	-/-	-	-
Electrical Penetration E16	VUS-JY-E16	Yes	-	Yes/Yes	-	-/-	-	-
Electrical Penetration E18	VUS-JY-E18	Yes	-	Yes/Yes	-	-/-	-	-
Electrical Penetration E21	VUS-JY-E21	Yes	-	Yes/Yes	-	-/-	-	-
Electrical Penetration E22	VUS-JY-E22	Yes	-	Yes/Yes	-	-/-	-	-
Electrical Penetration E23	VUS-JY-E23	Yes	-	Yes/Yes	-	-/-	-	-

Note: Dash (-) indicates not applicable.

Table 2.2.1-1 (cont)								
Equipment Name	**Tag No.**	**Seismic Cat. I**	**Remotely Operated Valve**	**Class 1E/ Qual. for Harsh Envir.**	**Safety-Related Display**	**Control PMS/DAS**	**Active Function**	**Loss of Motive Power Position**
Electrical Penetration E24	VUS-JY-E24	Yes	-	Yes/Yes	-	-/-	-	-
Electrical Penetration E25	VUS-JY-E25	Yes	-	Yes/Yes	-	-/-	-	-
Electrical Penetration E26	VUS-JY-E26	Yes	-	Yes/Yes	-	-/-	-	-
Electrical Penetration E27	VUS-JY-E27	Yes	-	Yes/Yes	-	-/-	-	-
Electrical Penetration E28	VUS-JY-E28	Yes	-	Yes/Yes	-	-/-	-	-
Electrical Penetration E29	VUS-JY-E29	Yes	-	Yes/Yes	-	-/-	-	-
Electrical Penetration E30	VUS-JY-E30	Yes	-	Yes/Yes	-	-/-	-	-
Electrical Penetration E31	VUS-JY-E31	Yes	-	Yes/Yes	-	-/-	-	-
Electrical Penetration E32	VUS-JY-E32	Yes	-	Yes/Yes	-	-/-	-	-

Note: Dash (-) indicates not applicable.

Table 2.2.1-2
Inspections, Tests, Analyses, and Acceptance Criteria

Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
1. The functional arrangement of the applicable portions of the CNS and associated systems is as shown in Figure 2.2.1-1.	Inspection of the as-built system will be performed.	The as-built CNS conforms with the functional arrangement shown in Figure 2.2.1-1.
2. The ASME Code Section III components and piping shown in Figure 2.2.2-1 retain pressure boundary integrity at their design pressure.	i) A pressure test will be performed on those ASME Code components of the CNS required to be pressure tested by the ASME Code Section III.	i) A report exists and concludes that the results of the pressure tests of the ASME Code components of the CNS conform with the requirements in the ASME Code Section III.
	ii) Inspections, including nondestructive examination of the as-built pressure boundary welds, will be performed in accordance with the ASME Code Section III.	ii) A report exists and concludes that the pressure boundary integrity requirements of the ASME Code Section III are met for the quality of pressure boundary welds.
	iii) Testing of the containment vessel will be performed in accordance with the ASME Code Section III.	iii) A report exists and concludes that the containment vessel conforms with the requirements of the ASME Code Section III.
3. The seismic Category I equipment identified in Table 2.2.1-1 can withstand seismic design basis dynamic loads without loss of safety function.	i) Inspection will be performed to verify that the seismic Category I equipment and valves identified in Table 2.2.1-1 are located on the nuclear island.	i) The seismic Category I equipment identified in Table 2.2.1-1 is located on the nuclear island.
	ii) Type tests, analyses, or a combination of type tests and analyses of seismic Category I equipment will be performed.	ii) A report exists and concludes that the seismic Category I equipment can withstand seismic design basis dynamic loads without loss of safety function.

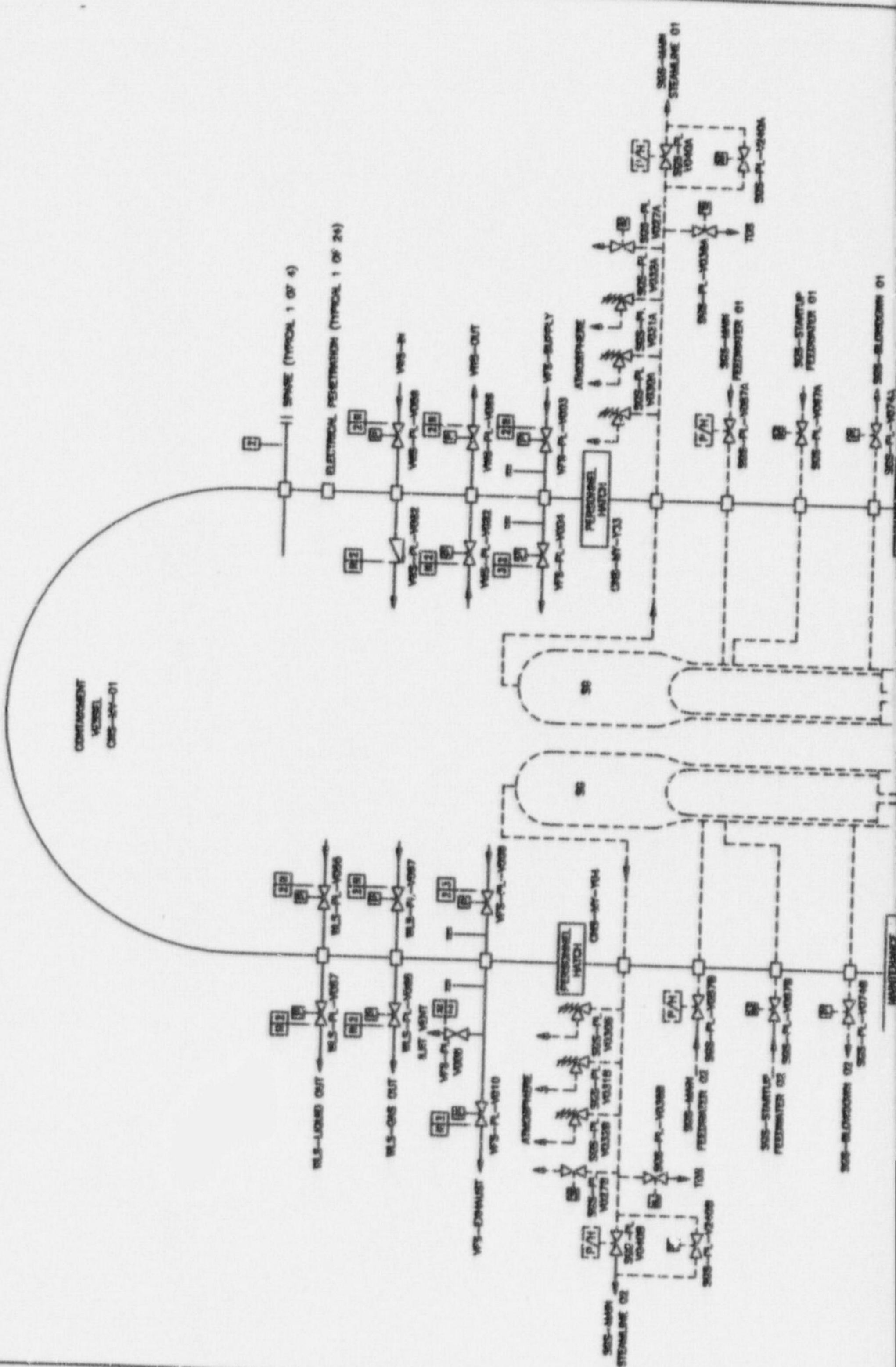
Table 2.2.1-2 (cont)
Inspections, Tests, Analyses, and Acceptance Criteria

Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
4. The as-built CNS ASME Code Section III piping depicted in Figure 2.2.1-1 meets applicable ASME Section III Code requirements for the CNS design conditions.	i) Inspection will be performed to verify that the CNS ASME Code Section III piping depicted in Figure 2.2.1-1 is located on the nuclear island.	i) The CNS ASME Code Section III piping depicted in Figure 2.2.1-1 is located on the nuclear island.
	ii) A reconciliation analysis using the as-designed and as-built piping information will be performed, or an analysis of the as-built piping will be performed.	ii) The as-built piping stress report exists and includes the ASME Code Certified Stress Report.
	iii) A reconciliation analysis using the as-designed and as-built pipe support information will be performed, or an analysis of the as-built supports will be performed.	iii) The as-built pipe support stress report exists and includes the ASME Code Certified Stress Report.
5.a) The Class 1E equipment identified in Table 2.2.1-1 as being qualified for a harsh environment can withstand the environmental conditions that would exist before, during, and following a design basis accident without loss of safety function for the time required to perform the safety function.	Type tests, analyses, or a combination of type tests and analyses will be performed on Class 1E equipment located in a harsh environment.	A report exists and concludes that the Class 1E equipment identified in Tables 2.2.1-1 as being qualified for a harsh environment can withstand the environmental conditions that would exist before, during, and following a design basis accident without loss of safety function for the time required to perform the safety function.
5.b) The Class 1E components identified in Table 2.2.1-1 are powered from their respective Class 1E division.	Testing will be performed on the CNS by providing a simulated test signal in each Class 1E division.	A simulated test signal exists at the Class 1E equipment identified in Table 2.2.1-1 when the assigned Class 1E division is provided the test signal.
5.c) Separation is provided between CNS Class 1E divisions, and between Class 1E divisions and non-Class 1E cable.	See Certified Design Material, Section 3.3, Nuclear Island Buildings.	See Certified Design Material, Section 3.3, Nuclear Island Buildings.

Table 2.2.1-2 (cont)
Inspections, Tests, Analyses, and Acceptance Criteria

Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
6. The CNS provides the safety-related function of containment isolation for containment boundary integrity and provides a barrier against the release of fission products to the atmosphere.	A containment integrated leak rate test will be performed.	The leakage rate from containment for the integrated leak rate test is less than L_a.
7. Containment electrical penetration assemblies are protected against currents that are greater than the continuous ratings.	An analysis for the as-built containment electrical penetration assemblies will be performed to demonstrate (1) that the maximum current of the circuits does not exceed the continuous rating of the containment electrical penetration assembly, or (2) that the circuits have redundant protection devices in series and that the redundant current protection devices are coordinated with the containment electrical penetration assembly's rated short circuit thermal capacity data and prevent current from exceeding the continuous current rating of the containment electrical penetration assembly.	Analysis exists for the as-built containment electrical penetration assemblies and concludes that the penetrations are protected against currents which are greater than their continuous ratings.
8. Safety-related displays identified in Table 2.2.1-1 can be retrieved in the MCR.	Inspection will be performed for retrievability of the safety-related displays in the MCR.	Safety-related displays identified in Table 2.2.1-1 can be retrieved in the MCR.
9.a) Controls exist in the MCR to cause those remotely operated valves identified in Table 2.2.1-1 to perform active functions.	Stroke testing will be performed on remotely operated valves identified in Table 2.2.1-1 using the controls in the MCR.	Controls in the MCR operate to cause remotely operated valves identified in Table 2.2.1-1 to perform active functions.
9.b) The valves identified in Table 2.2.1-1 as having PMS control perform an active safety function after receiving a signal from PMS.	Testing will be performed using real or simulated signals into the PMS.	The valves identified in Table 2.2.1-1 as having PMS control perform an active function after receiving a signal from PMS.

Table 2.2.1-2 (cont) Inspections, Tests, Analyses, and Acceptance Criteria		
Design Commitment	**Inspections, Tests, Analyses**	**Acceptance Criteria**
9.c) The valves identified in Table 2.2.1-1 as having DAS control perform an active function after receiving a signal from DAS.	Testing will be performed using real or simulated signals into the DAS.	The valves identified in Table 2.2.1-1 as having DAS control perform an active function after receiving a signal from DAS.
10.a) The motor-operated and check valves identified in Table 2.2.1-1 perform an active safety-related function to change position as indicated in the table.	i) Tests or type tests of motor-operated valves will be performed that demonstrate the capability of each valve to operate under design conditions. ii) Exercise testing of the check valves with an active safety function identified in Table 2.2.1-1 will be performed.	i) A test report exists and concludes that each motor-operated valve changes position as indicated in Table 2.2.1-1 under design conditions. ii) Each check valve changes position.
10.b) After loss of motive power, the remotely operated valves identified in Table 2.2.1-1 assume the indicated loss of motive power position.	i) Testing of the installed valves will be performed under the conditions of loss of motive power.	i) After loss of motive power, each remotely operated valve identified in Table 2.2.1-1 assumes the indicated loss of motive power position.



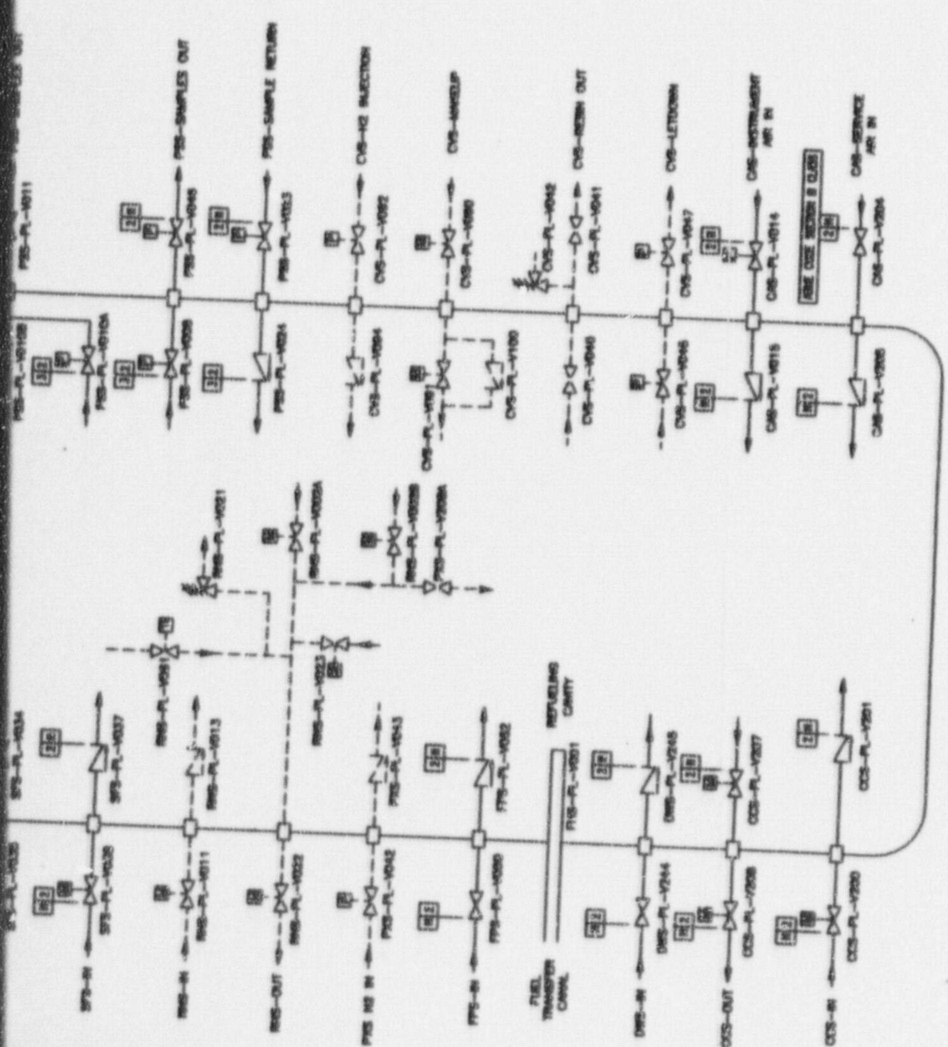


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Figure 2.2.1-1
Containment System

2.2.2 Passive Containment Cooling System

Design Description

The passive containment cooling system (PCS) provides heat removal from the containment during design basis events.

1. The functional arrangement of the applicable portions of the PCS is as shown in Figure 2.2.2-1.

2. The American Society of Mechanical Engineers (ASME) Code Section III components and piping shown in Figure 2.2.2-1 retain pressure boundary integrity at their design pressure.

3. The seismic Category I equipment identified in Table 2.2.2-1 can withstand seismic design basis dynamic loads without loss of safety function.

4. The as-built PCS ASME Code Section III piping depicted in Figure 2.2.2-1 meets applicable ASME Section III Code requirements for the PCS design conditions.

5. a) The Class 1E equipment identified in Table 2.2.2-1 as being qualified for a harsh environment can withstand the environmental conditions that would exist before, during, and following a design basis accident without loss of safety function for the time required to perform the safety function.

   b) The Class 1E components identified in Table 2.2.2-1 are powered from their respective Class 1E division.

   c) Separation is provided between PCS Class 1E divisions, and between Class 1E divisions and non-Class 1E cable.

6. The PCS provides the following safety-related functions:

   a) The PCS provides the delivery of water to the outside of the containment vessel.

   b) The PCS provides wetting of the outside surface of the containment vessel.

   c) The PCS provides air flow over the outside of the containment shell by a natural circulation air flow path from the air inlets to the discharge structure.

   d) The PCS provides drainage of the excess water from the outside of the containment vessel through the two upper annulus drains.

   e) The PCS provides a passive containment cooling water storage tank (PCCWST) initial inventory of at least 72 hours of cooling water.

   f) The PCS provides a flow path for long-term makeup to the PCCWST.

7. Safety-related displays identified in Table 2.2.2-1 can be retrieved in the main control room (MCR).

8. a) Controls exist in the MCR to cause those remotely operated valves identified in Table 2.2.2-1 to perform active functions.

   b) The valves identified in Table 2.2.2-1 as having protection and safety monitoring system (PMS) control perform an active safety function after receiving a signal from the PMS.

   c) The valves identified in Table 2.2.2-1 as having diverse actuation system (DAS) control perform an active safety function after receiving a signal from the DAS.

9. a) The motor-operated valves (MOVs) identified in Table 2.2.2-1 perform an active safety-related function to change position as indicated in the table.

   b) After loss of motive power, the remotely operated valves identified in Table 2.2.2-1 assume the indicated loss of motive power position.

Inspections, Tests, Analyses, and Acceptance Criteria

Table 2.2.2-2 specifies the inspections, tests, analyses, and associated acceptance criteria for the PCS.

Table 2.2.2-1								
Equipment Name	**Tag No.**	**Seismic Cat. I**	**Remotely Operated Valve**	**Class 1E/ Qual. for Harsh Envir.**	**Safety-Related Display**	**Control PMS/DAS**	**Active Function**	**Loss of Motive Power Position**
PCCWST	PCS-MT-01	Yes	-	-	-	-	-	-
Water Distribution Bucket	PCS-MT-03	Yes	-	-	-	-	-	-
Water Collection Troughs	PCS-MT-04	Yes	-	-	-	-	-	-
PCCWST Isolation Valve	PCS-PL-V001A	Yes	Yes	Yes/No	No	Yes/Yes	Transfer Open	Open
PCCWST Isolation Valve	PCS-PL-V001B	Yes	Yes	Yes/No	No	Yes/Yes	Transfer Open	Open
PCCWST Isolation Block MOV	PCS-PL-V002A	Yes	Yes	Yes/No	Yes (Valve Position)	Yes/No	Transfer Open	As Is
PCCWST Isolation Block MOV	PCS-PL-V002B	Yes	Yes	Yes/No	Yes (Valve Position)	Yes/No	Transfer Open	As Is
PCS Recirculation Loop Isolation Valve	PCS-PL-V023	Yes	-	No	No	-	Transfer Close	-
PCCWST Supply to Fire Protection System Isolation Valve	PCS-PL-V005	Yes	-	No	No	-	Transfer Close	-
Water Makeup Isolation Valve	PCS-PL-V014A	Yes	-	No	No	-	Transfer Open	-
PCS Water Delivery Flow Sensor	PCS-001	Yes	-	Yes/No	Yes	-	-	-
PCS Water Delivery Flow Sensor	PCS-002	Yes	-	Yes/No	Yes	-	-	-

Note: Dash (-) indicates not applicable.

Table 2.2.2-1 (cont)

Equipment Name	Tag No.	Seismic Cat. I	Remotely Operated Valve	Class 1E/ Qual. for Harsh Envir.	Safety-Related Display	Control PMS/DAS	Active Function	Loss of Motive Power Position
PCS Water Delivery Flow Sensor	PCS-003	Yes	-	Yes/No	Yes	-	-	-
Containment Pressure Sensor	PCS-005	Yes	-	Yes/Yes	Yes	-	-	-
Containment Pressure Sensor	PCS-006	Yes	-	Yes/Yes	Yes	-	-	-
Containment Pressure Sensor	PCS-007	Yes	-	Yes/Yes	Yes	-	-	-
Containment Pressure Sensor	PCS-008	Yes	-	Yes/Yes	Yes	-	-	-
PCCWST Water Level Sensor	PCS-010	Yes	-	Yes/No	Yes	-	-	-
PCCWST Water Level Sensor	PCS-011	Yes	-	Yes/No	Yes	-	-	-
High-Range Containment Pressure Sensor	PCS-012	Yes	-	Yes/Yes	Yes	-	-	-
High-Range Containment Pressure Sensor	PCS-013	Yes	-	Yes/Yes	Yes	-	-	-
High-Range Containment Pressure Sensor	PCS-014	Yes	-	Yes/Yes	Yes	-	-	-

Note: Dash (-) indicates not applicable.

Table 2.2.2-2
Inspections, Tests, Analyses, and Acceptance Criteria

Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
1. The functional arrangement of the applicable portions of the PCS is as shown in Figure 2.2.2-1.	Inspection of the as-built system will be performed.	The as-built PCS conforms with the functional arrangement shown in Figure 2.2.2-1.
2. The ASME Code Section III components and piping shown in Figure 2.2.2-1 retain pressure boundary integrity at their design pressure.	i) A hydrostatic test will be performed on those ASME Code components required to be hydrostatically tested by the ASME Code Section III.	i) A report exists and concludes that the results of the hydrostatic test of the ASME Code components of the PCS conform with the requirements in the ASME Code Section III.
	ii) Inspections, including nondestructive examination of the as-built pressure boundary welds, will be performed in accordance with the ASME Code Section III.	ii) A report exists and concludes that the pressure boundary integrity requirements of the ASME Code Section III are met for the quality of pressure boundary welds.
3. The seismic Category I equipment identified in Table 2.2.2-1 can withstand seismic design basis dynamic loads without loss of safety function.	i) Inspection will be performed to verify that the seismic Category I equipment and valves identified in Table 2.2.2-1 are located on the nuclear island.	i) The seismic Category I equipment identified in Table 2.2.2-1 is located on the nuclear island.
	ii) Type tests, analyses, or a combination of type tests and analyses of seismic Category I equipment will be performed.	ii) A report exists and concludes that the seismic Category I equipment can withstand seismic design basis dynamic loads without loss of safety function.

Table 2.2.2-2 (cont)
Inspections, Tests, Analyses, and Acceptance Criteria

Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
4. The as-built PCS ASME Code Section III piping depicted in Figure 2.2.2-1 meets applicable ASME Section III Code requirements for the PCS design conditions.	i) Inspection will be performed to verify that the PCS ASME Code Section III Class 3 piping depicted in Figure 2.2.2-1 is located on the nuclear island.	i) The PCS ASME Code Section III Class 3 piping depicted in Figure 2.2.2-1 is located on the nuclear island.
	ii) A reconciliation analysis using the as-designed and as-built piping information will be performed, or an analysis of the as-built piping will be performed.	ii) The as-built piping stress report exists and includes the ASME Code Certified Stress Report.
	iii) A reconciliation analysis using the as-designed and as-built pipe support information will be performed, or an analysis of the as-built supports will be performed.	iii) The as-built pipe support stress report exists and includes the ASME Code Certified Stress Report.
5.a) The Class 1E equipment identified in Table 2.2.2-1 as being qualified for a harsh environment can withstand the environmental conditions that would exist before, during, and following a design basis accident without loss of safety function for the time required to perform the safety function.	Type tests, analyses, or a combination of type tests and analyses will be performed on Class 1E equipment located in a harsh environment.	A report exists and concludes that the Class 1E equipment identified in Tables 2.2.2-1 as being qualified for a harsh environment can withstand the environmental conditions that would exist before, during, and following a design basis accident without loss of safety function for the time required to perform the safety function.
5.b) The Class 1E components identified in Table 2.2.2-1 are powered from their respective Class 1E division.	Testing will be performed on the PCS by providing a simulated test signal in each Class 1E division.	A simulated test signal exists at the Class 1E equipment identified in Table 2.2.2-1 when the assigned Class 1E division is provided the test signal.
5.c) Separation is provided between PCS Class 1E divisions, and between Class 1E divisions and non-Class 1E cable.	See Certified Design Material, Section 3.3, Nuclear Island Buildings.	See Certified Design Material, Section 3.3, Nuclear Island Buildings.

Table 2.2.2-2 (cont)
Inspections, Tests, Analyses, and Acceptance Criteria

Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
6.a) The PCS provides the delivery of water to the outside of the containment vessel.	Testing will be performed to measure the PCCWST delivery rate from each of the two parallel flow paths.	When tested separately, each of the two flow paths delivers greater than or equal to: • 436 gpm at a PCCWST water level of 20.2 ft ± 0.5 ft above the bottom of the tank • 110 gpm at a PCCWST water level of 17.2 ft ± 0.5 ft above the bottom of the tank • 55 gpm at a PCCWST water level of 1.2 ft ± 0.5 ft above the bottom of the tank
6.b) The PCS provides wetting of the outside surface of the containment vessel.	Testing will be performed to measure the wetted surface of the containment vessel from either of the two parallel flow paths to the containment vessel.	With a PCCWST water level of 1.2 ft ± 0.5 ft above the bottom of the tank, water delivery to the containment shell provides greater than 35% of its circumference wetted at the upper spring line. The wetted coverage will be verified with each of the two parallel paths tested separately.
6.c) The PCS provides air flow over the outside of the containment shell by a natural circulation air flow path from the air inlets to the discharge structure.	Inspections of the air flow path segments will be performed.	Flow paths exist at each of the following locations: • air inlets • base of the outer annulus • base of the inner annulus • discharge structure
6.d) The PCS provides drainage of the excess water from the outside of the containment vessel through the two upper annulus drains.	Testing will be performed to verify the upper annulus drain flow performance.	With a water flow of no less than 450 gpm into the upper annulus for at least 3 hours, the water level in the annulus does not exceed 10 in. above either drain.
6.e) The PCS provides a PCCWST initial inventory of at least 72 hours of cooling water.	Inspection of the PCCWST will be performed.	The volume of the PCCWST is greater than or equal to 350,000 gal.
6.f) The PCS provides a flow path for long-term makeup to the PCCWST.	See item 1 in this table.	See item 1 in this table.

Table 2.2.2-2 (cont) Inspections, Tests, Analyses, and Acceptance Criteria		
Design Commitment	**Inspections, Tests, Analyses**	**Acceptance Criteria**
7. Safety-related displays identified in Table 2.2.2-1 can be retrieved in the MCR.	Inspection will be performed for retrievability of the safety-related displays in the MCR.	Safety-related displays identified in Table 2.2.2-1 can be retrieved in the MCR.
8.a) Controls exist in the MCR to cause those remotely operated valves identified in Table 2.2.2-1 to perform active functions.	Stroke testing will be performed on the remotely operated valves identified in Table 2.2.2-1 using the controls in the MCR.	Controls in the MCR operate to cause remotely operated valves identified in Table 2.2.2-1 to perform active functions.
8.b) The valves identified in Table 2.2.2-1 as having PMS control perform an active safety function after receiving a signal from the PMS.	Testing will be performed using real or simulated signals into the PMS.	The valves identified in Table 2.2.2-1 as having PMS control perform an active safety function after receiving a signal from the PMS.
8.c) The valves identified in Table 2.2.2-1 as having DAS control perform an active safety function after receiving a signal from the DAS.	Testing will be performed using real or simulated signals into the DAS.	The valves identified in Table 2.2.2-1 as having DAS control perform an active safety function after receiving a signal from the DAS.
9.a) The MOVs identified in Table 2.2.2-1 perform an active safety-related function to change position as indicated in the table.	Tests or type tests of MOVs will be performed that demonstrate the capability of the valve to operate under design conditions.	A test report exists and concludes that each MOV changes position as indicated in Table 2.2.2-1 under design conditions.
9.b) After loss of motive power, the remotely operated valves identified in Table 2.2.2-1 assume the indicated loss of motive power position.	Testing of installed valves will be performed under the conditions of loss of motive power.	After loss of motive power, each remotely operated valve identified in Table 2.2.2-1 assumes the indicated loss of motive power position.

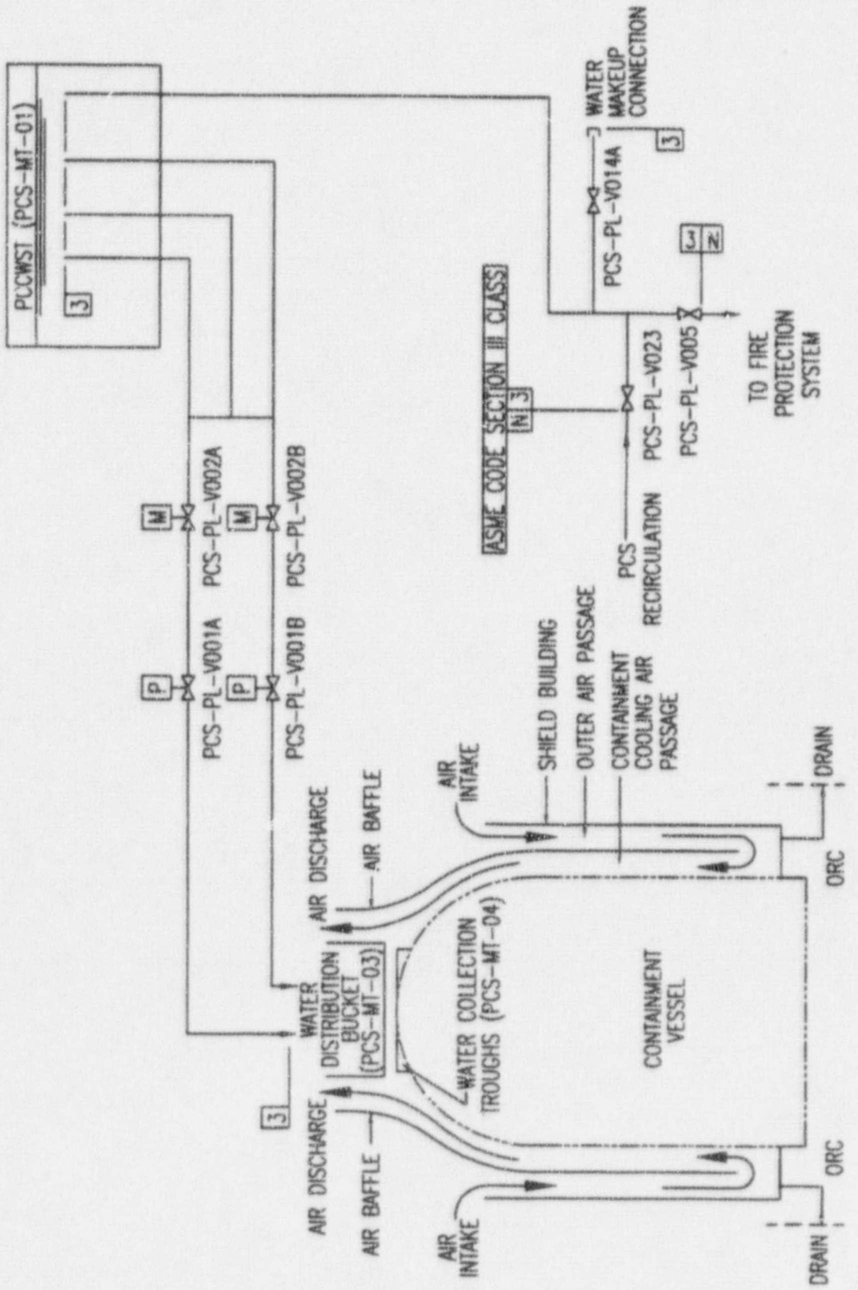


Figure 2.2.2-1
Passive Containment Cooling System

2.2.3 Passive Core Cooling System

Design Description

The passive core cooling system (PXS) provides emergency core cooling during design basis events.

1. The functional arrangement of the applicable portion of the PXS is as shown in Figure 2.2.3-1.

2. The American Society of Mechanical Engineers (ASME) Code Section III components and piping shown in Figure 2.2.3-1 retain pressure boundary integrity at their design pressure.

3. The seismic Category I equipment identified in Table 2.2.3-1 can withstand seismic design basis dynamic loads without loss of safety function.

4. a) The as-built PXS ASME Code Section III piping depicted in Figure 2.2.3-1 meets applicable ASME Code Section III requirements for the PXS design conditions.

   b) Each of the as-built PXS lines identified in Table 2.2.3-2 is designed to meet leak-before-break (LBB) criteria, or an evaluation is performed of the protection from dynamic effects of a rupture of the line.

5. a) The Class 1E equipment identified in Table 2.2.3-1 as being qualified for a harsh environment can withstand the environmental conditions that would exist before, during, and following a design basis accident without loss of safety function for the time required to perform the safety function.

   b) The Class 1E components identified in Table 2.2.3-1 are powered from their respective Class 1E division.

   c) Separation is provided between PXS Class 1E divisions, and between Class 1E divisions and non-Class 1E cable.

6. The PXS provides the following safety-related functions:

   a) The PXS provides isolation of the PXS lines penetrating the containment.

   b) The PXS provides core decay heat removal during design basis events.

   c) The PXS provides reactor coolant system (RCS) makeup, boration, and safety injection during design basis events.

   d) The PXS provides pH adjustment of water flooding the containment following design basis accidents.

7. The PXS provides a function to drain the in-containment refueling water storage tank (IRWST) into the containment.

8. Safety-related displays identified in Table 2.2.3-1 can be retrieved in the main control room (MCR).

9. a) Controls exist in the MCR to cause the remotely operated valves identified in Table 2.2.3-1 to perform their active functions.

   b) The valves identified in Table 2.2.3-1 as having protection and safety monitoring system (PMS) control perform their active function after receiving a signal from the PMS.

   c) The valves identified in Table 2.2.3-1 as having diverse actuation system (DAS) control perform their active function after receiving a signal from the DAS.

10. a) The motor-operated and check valves identified in Table 2.2.3-1 perform an active safety-related function to change position as indicated in the table.

    b) After loss of motive power, the remotely operated valves identified in Table 2.2.3-1 assume the indicated loss of motive power position.

Inspection, Tests, Analyses, and Acceptance Criteria

Table 2.2.3-3 specifies the inspections, tests, analyses, and associated acceptance criteria for the PXS.

Table 2.2.3-1								
Equipment Name	**Tag No.**	**Seismic Cat. I**	**Remotely Operated Valve**	**Class 1E/ Qual. Harsh Envir.**	**Safety-Related Display**	**Control PMS/ DAS**	**Active Function**	**Loss of Motive Power Position**
Passive Residual Heat Removal Heat Exchanger (PRHR HX)	PXS-ME-01	Yes	-	- / -	-	- / -	-	-
Accumulator Tank A	PXS-MT-01A	Yes	-	- / -	-	- / -	-	-
Accumulator Tank B	PXS-MT-01B	Yes	-	- / -	-	- / -	-	-
Core Makeup Tank (CMT) A	PXS-MT-02A	Yes	-	- / -	-	- / -	-	-
CMT B	PXS-MT-02B	Yes	-	- / -	-	- / -	-	-
IRWST	PXS-MT-03	Yes	-	- / -	-	- / -	-	-
IRWST Screen A	PXS-MY-Y01A	Yes	-	- / -	-	- / -	-	-
IRWST Screen B	PXS-MY-Y01B	Yes	-	- / -	-	- / -	-	-
Containment Recirculation Screen A	PXS-MY-Y02A	Yes	-	- / -	-	- / -	-	-
Containment Recirculation Screen B	PXS-MY-Y02B	Yes	-	- / -	-	- / -	-	-
pH Adjustment Basket A	PXS-MY-Y03A	Yes	-	- / -	-	- / -	-	-
pH Adjustment Basket B	PXS-MY-Y03B	Yes	-	- / -	-	- / -	-	-
CMT A Inlet Isolation Motor-operated Valve	PXS-PL-V002A	Yes	Yes	Yes/Yes	Yes	Yes/No	None	As Is
CMT B Inlet Isolation Motor-operated Valve	PXS-PL-V002B	Yes	Yes	Yes/Yes	Yes	Yes/No	None	As Is

Note: Dash (-) indicates not applicable.

Table 2.2.3-1 (cont)								
Equipment Name	**Tag No.**	**Seismic Cat. I**	**Remotely Operated Valve**	**Class 1E/ Qual. Harsh Envir.**	**Safety-Related Display**	**Control PMS/ DAS**	**Active Function**	**Loss of Motive Power Position**
CMT A Discharge Isolation Valve	PXS-PL-V014A	Yes	Yes	Yes/Yes	No	Yes/Yes	Transfer Open	Open
CMT B Discharge Isolation Valve	PXS-PL-V014B	Yes	Yes	Yes/Yes	No	Yes/Yes	Transfer Open	Open
CMT A Discharge Isolation Valve	PXS-PL-V015A	Yes	Yes	Yes/Yes	No	Yes/Yes	Transfer Open	Open
CMT B Discharge Isolation Valve	PXS-PL-V015B	Yes	Yes	Yes/Yes	No	Yes/Yes	Transfer Open	Open
CMT A Discharge Check Valve	PXS-PL-V016A	Yes	No	- / -	No	- / -	Transfer Open/ Transfer Closed	-
CMT B Discharge Check Valve	PXS-PL-V016B	Yes	No	- / -	No	- / -	Transfer Open/ Transfer Closed	-
CMT A Discharge Check Valve	PXS-PL-V017A	Yes	No	- / -	No	- / -	Transfer Open/ Transfer Closed	-
CMT B Discharge Check Valve	PXS-PL-V017B	Yes	No	- / -	No	- / -	Transfer Open/ Transfer Closed	-

Note: Dash (-) indicates not applicable.

Table 2.2.3-1 (cont)								
Equipment Name	**Tag No.**	**Seismic Cat. I**	**Remotely Operated Valve**	**Class 1E/ Qual. Harsh Envir.**	**Safety-Related Display**	**Control PMS/ DAS**	**Active Function**	**Loss of Motive Power Position**
Accumulator A Pressure Relief Valve	PXS-PL-V022A	Yes	No	- / -	No	- / -	Transfer Open/ Transfer Closed	-
Accumulator B Pressure Relief Valve	PXS-PL-V022B	Yes	No	- / -	No	- / -	Transfer Open/ Transfer Closed	-
Accumulator A Discharge Check Valve	PXS-PL-V028A	Yes	No	- / -	No	- / -	Transfer Open	-
Accumulator B Discharge Check Valve	PXS-PL-V028B	Yes	No	- / -	No	- / -	Transfer Open	-
Accumulator A Discharge Check Valve	PXS-PL-V029A	Yes	No	- / -	No	- / -	Transfer Open	-
Accumulator B Discharge Check Valve	PXS-PL-V029B	Yes	No	- / -	No	- / -	Transfer Open	-
Nitrogen Supply Containment Isolation Valve	PXS-PL-V042	Yes	Yes	Yes/Yes	Yes (position)	Yes/No	Transfer Closed	Close
Nitrogen Supply Containment Isolation Check Valve	PXS-PL-V043	Yes	No	- / -	No	- / -	Transfer Closed	-
PRHR HX Inlet Isolation Motor-operated Valve	PXS-PL-V101	Yes	Yes	Yes/Yes	Yes (position)	Yes/No	None	As Is

Note: Dash (-) indicates not applicable.

Table 2.2.3-1 (cont)								
Equipment Name	**Tag No.**	**Seismic Cat. I**	**Remotely Operated Valve**	**Class 1E/ Qual. Harsh Envir.**	**Safety-Related Display**	**Control PMS/ DAS**	**Active Function**	**Loss of Motive Power Position**
PRHR HX Control Valve	PXS-PL-V108A	Yes	Yes	Yes/Yes	No	Yes/Yes	Transfer Open	Open
PRHR HX Control Valve	PXS-PL-V108B	Yes	Yes	Yes/Yes	No	Yes/Yes	Transfer Open	Open
Containment Recirculation A Isolation Motor-operated Valve	PXS-PL-V117A	Yes	Yes	Yes/Yes	Yes (position)	Yes/Yes	Transfer Open	As Is
Containment Recirculation B Isolation Motor-operated Valve	PXS-PL-V117B	Yes	Yes	Yes/Yes	Yes (position)	Yes/Yes	Transfer Open	As Is
Containment Recirculation A Squib Valve	PXS-PL-V118A	Yes	Yes	Yes/Yes	No	Yes/Yes	Transfer Open	As Is
Containment Recirculation B Squib Valve	PXS-PL-V118B	Yes	Yes	Yes/Yes	No	Yes/Yes	Transfer Open	As Is
Containment Recirculation A Check Valve	PXS-PL-V119A	Yes	No	- / -	No	- / -	Transfer Open	-
Containment Recirculation B Check Valve	PXS-PL-V119B	Yes	No	- /	No	- / -	Transfer Open	-
Containment Recirculation A Squib Valve	PXS-PL-V120A	Yes	Yes	Yes/Yes	No	Yes/Yes	Transfer Open	As Is
Containment Recirculation B Squib Valve	PXS-PL-V120B	Yes	Yes	Yes/Yes	No	Yes/Yes	Transfer Open	As Is

Note: Dash (-) indicates not applicable.

Table 2.2.3-1 (cont)								
Equipment Name	Tag No.	Seismic Cat. I	Remotely Operated Valve	Class 1E/ Qual. Harsh Envir.	Safety-Related Display	Control PMS/ DAS	Active Function	Loss of Motive Power Position
IRWST Injection A Check Valve	PXS-PL-V122A	Yes	No	- / -	No	- / -	Transfer Open	-
IRWST Injection B Check Valve	PXS-PL-V122B	Yes	No	- / -	No	- / -	Transfer Open	-
IRWST Injection A Squib Valve	PXS-PL-V123A	Yes	Yes	Yes/Yes	No	Yes/Yes	Transfer Open	As Is
IRWST Injection B Squib Valve	PXS-PL-V123B	Yes	Yes	Yes/Yes	No	Yes/Yes	Transfer Open	As Is
IRWST Injection A Check Valve	PXS-PL-V124A	Yes	No	- / -	No	- / -	Transfer Open	-
IRWST Injection B Check Valve	PXS-PL-V124B	Yes	No	- / -	No	- / -	Transfer Open	-
IRWST Injection A Squib Valve	PXS-PL-V125A	Yes	Yes	Yes/Yes	No	Yes/Yes	Transfer Open	As Is
IRWST Injection B Squib Valve	PXS-PL-V125B	Yes	Yes	Yes/Yes	No	Yes/Yes	Transfer Open	As Is
CMT A Level Sensor	PXS-011	Yes	-	Yes/Yes	Yes	- / -	-	-
CMT B Level Sensor	PXS-012	Yes	-	Yes/Yes	Yes	- / -	-	-
CMT A Level Sensor	PXS-013	Yes	-	Yes/Yes	Yes	- / -	-	-
CMT B Level Sensor	PXS-014	Yes	-	Yes/Yes	Yes	- / -	-	-
CMT A Level Sensor	PXS-015	Yes	-	Yes/Yes	Yes	- / -	-	-

Note: Dash (-) indicates not applicable.

Table 2.2.3-1 (cont)								
Equipment Name	**Tag No.**	**Seismic Cat. I**	**Remotely Operated Valve**	**Class 1E/ Qual. Harsh Envir.**	**Safety-Related Display**	**Control PMS/ DAS**	**Active Function**	**Loss of Motive Power Position**
CMT B Level Sensor	PXS-016	Yes	-	Yes/Yes	Yes	- / -	-	-
CMT A Level Sensor	PXS-017	Yes	-	Yes/Yes	Yes	- / -	-	-
CMT B Level Sensor	PXS-018	Yes	-	Yes/Yes	Yes	- / -	-	-
IRWST Level Sensor	PXS-045	Yes	-	Yes/Yes	Yes	- / -	-	-
IRWST Level Sensor	PXS-046	Yes	-	Yes/Yes	Yes	- / -	-	-
IRWST Level Sensor	PXS-047	Yes	-	Yes/Yes	Yes	- / -	-	-
IRWST Level Sensor	PXS-048	Yes	-	Yes/Yes	Yes	- / -	-	-
PRHR HX Flow Sensor	PXS-049A	Yes	-	Yes/Yes	Yes	- / -	-	-
PRHR HX Flow Sensor	PXS-049B	Yes	-	Yes/Yes	Yes	- / -	-	-
Containment Floodup Level Sensor	PXS-050	Yes	-	Yes/Yes	Yes	- / -	-	-
Containment Floodup Level Sensor	PXS-051	Yes	-	Yes/Yes	Yes	- / -	-	-
Containment Floodup Level Sensor	PXS-052	Yes	-	Yes/Yes	Yes	- / -	-	-

Note: Dash (-) indicates not applicable.

Table 2.2.3-2	
Line Name	**Line Number**
PRHR HX inlet line from hot leg and outlet line to steam generator channel head	RCS-L134, PXS-L102, PXS-L103, PXS-L104A, PXS-L104B, PXS-L105, PXS-L107, RCS-L114, RCS-L113
CMT A inlet line from cold leg C and outlet line to reactor vessel direct vessel injection (DVI) nozzle A	RCS-L118A, PXS-L007A, PXS-L015A, PXS-L016A, PXS-L017A, PXS-L018A, PXS-L019A, PXS-L020A, PXS-L021A, PXS-L070A
CMT B inlet line from cold leg D and outlet line to reactor vessel DVI nozzle B	RCS-L118B, PXS-L007B, PXS-L015B, PXS-L016B, PXS-L017B, PXS-L018B, PXS-L019B, PXS-L020B, PXS-L021B, PXS-L070B
Accumulator A discharge line to DVI line A	PXS-L025A
Accumulator B discharge line to DVI line B	PXS-L025B
IRWST injection line A to DVI line A	PXS-L125A, PXS-L127A
IRWST injection line B to DVI line B	PXS-L125B, PXS-L127B

Table 2.2.3-3
Inspections, Tests, Analyses, and Acceptance Criteria

Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
1. The functional arrangement of the applicable portion of the PXS is as shown in Figure 2.2.3-1.	Inspection of the as-built system will be performed.	The as-built PXS conforms with the functional arrangement as shown in Figure 2.2.3-1.
2. The ASME Code Section III components and piping shown in Figure 2.2.3-1 retain pressure boundary integrity at their design pressure.	i) A hydrostatic test will be performed on the ASME Code components of the PXS required to be hydrostatically tested by the ASME Code Section III.	i) A report exists and concludes that the results of the hydrostatic test of the ASME Code components of the PXS conform with the requirements in the ASME Code Section III.
	ii) Inspections, including non-destructive examination of the as-built pressure boundary welds, will be performed in accordance with the ASME Code Section III.	ii) A report exists and concludes that the pressure boundary integrity requirements of the ASME Code Section III are met for the quality of pressure boundary welds.
3. The seismic Category I equipment identified in Table 2.2.3-1 can withstand seismic design basis dynamic loads without loss of safety function.	i) Inspection will be performed to verify that the seismic Category I equipment and valves identified in Table 2.2.3-1 is located on the nuclear island.	i) The seismic Category I equipment identified in Table 2.2.3-1 is located on the nuclear island.
	ii) Type tests, analyses, or a combination of type tests and analyses of seismic Category I equipment will be performed.	ii) A report exists and concludes that the seismic Category I equipment can withstand seismic design basis dynamic loads without loss of safety function.
	iii) Analysis of seismic Category I equipment supports will be performed.	iii) A report exists and concludes that the seismic Category I equipment supports can withstand seismic design basis loads without loss of safety function.

Table 2.2.3-3 (cont)
Inspections, Tests, Analyses, and Acceptance Criteria

Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
4.a) The as-built PXS ASME Code Section III piping depicted in Figure 2.2.3-1 meets applicable ASME Code Section III requirements for the PXS conditions.	i) Inspection will be performed to verify that the PXS ASME Code Section III piping depicted in Figure 2.2.3-1 is located on the nuclear island.	i) The PXS ASME Code Section III piping depicted on Figure 2.2.3-1 is located on the nuclear island.
	ii) A reconciliation analysis using the as-designed and as-built piping information will be performed, or an analysis of the as-built piping will be performed.	ii) The as-built piping stress report exists and includes the ASME Code Certified Stress Report.
	iii) A reconciliation analysis using the as-designed and as-built pipe support information will be performed, or an analysis of the as-built supports will be performed.	iii) The as-built pipe support stress report exists and includes the ASME Code Certified Stress Report.
4.b) Each of the as-built PXS lines identified in Table 2.2.3-2 is designed to meet LBB criteria, or an evaluation is performed of the protection from dynamic effects of a rupture of the line.	Inspection will be performed for the existence of an LBB evaluation report, or an evaluation report on the protection from dynamic effects of a pipe break. Certified Design Material, Section 3.3, Nuclear Island Buildings, contains the design descriptions and inspections, tests, analyses, and acceptance criteria for protection from the dynamic effects of pipe rupture.	An LBB evaluation report exists and concludes that the LBB acceptance criteria are met by the as-built PXS piping and piping materials, or a pipe break evaluation report exists and concludes that protection from the dynamic effects of a line break is provided.

Table 2.2.3-3 (cont) Inspections, Tests, Analyses, and Acceptance Criteria		
Design Commitment	**Inspections, Tests, Analyses**	**Acceptance Criteria**
5.a) The Class 1E equipment identified in Table 2.2.3-1 as being qualified for a harsh environment can withstand the environmental conditions that would exist before, during, and following a design basis accident without loss of safety function for the time required to perform the safety function.	Type tests, analyses, or a combination of type tests and analyses will be performed on Class 1E equipment located in a harsh environment.	A report exists and concludes that the Class 1E equipment identified in Table 2.2.3-1 as being qualified for a harsh environment can withstand the environmental conditions that would exist before, during, and following a design basis accident without loss of safety function for the time required to perform the safety function.
5.b) The Class 1E components identified in Table 2.2.3-1 are powered from their respective Class 1E division.	Testing will be performed on the RCS by providing a simulated test signal in each Class 1E division.	A simulated test signal exists at the Class 1E equipment identified in Table 2.2.3-1 when the assigned Class 1E division is provided the test signal.
5.c) Separation is provided between PXS Class 1E divisions, and between Class 1E divisions and non-Class 1E cable.	See Certified Design Material, Section 3.3, Nuclear Island Buildings.	See Certified Design Material, Section 3.3, Nuclear Island Buildings.
6.a) The PXS provides containment isolation of the PXS lines penetrating the containment.	See Certified Design Material, subsection 2.2.1, Containment System.	See Certified Design Material, subsection 2.2.1, Containment System.
6.b) The PXS provides core decay heat removal during design basis events.	A heat removal performance test of the PRHR HX will be conducted to determine the heat transfer from the HX. The RCS will be initially at ≥ 540°F with the reactor coolant pumps stopped. The IRWST water level will be above the top of the HX.	A test report exists and concludes that the PRHR HX heat transfer rate with an inlet temperature of 520°F and an IRWST temperature of 120°F is ≥ 4.12×10^5 Btu/hr.
6.c) The PXS provides RCS makeup, boration, and safety injection during design basis events.	i) A low-pressure injection test for each CMT, each accumulator, each IRWST injection line, and each containment recirculation line will be conducted. Each test is initiated by opening isolation valve(s) in the line being tested.	i) The injection line flow resistance from each source is as follows:

Table 2.2.3-3 (cont) Inspections, Tests, Analyses, and Acceptance Criteria		
Design Commitment	**Inspections, Tests, Analyses**	**Acceptance Criteria**
	CMTs: Each CMT will be initially filled with water. All valves in these lines will be open during the test.	CMTs: The calculated flow resistance between each CMT and the reactor vessel downcomer is $\geq 3.07 \times 10^{-5}$ ft/gpm^2 and $\leq 3.84 \times 10^{-5}$ ft/gpm^2.
	Accumulators: Each accumulator will be partially filled with water and pressurized with nitrogen. All valves in these lines will be open during the test. Sufficient flow will be provided to fully open the check valves.	Accumulators: The calculated flow resistance between each accumulator and the reactor vessel downcomer is $\geq 1.49 \times 10^{-5}$ ft/gpm^2 and $\leq 1.86 \times 10^{-5}$ ft/gpm^2.
	IRWST Injection: The IRWST will be partially filled with water. All valves in these lines will be open during the test. Sufficient flow will be provided to fully open the check valves.	IRWST Injection: The calculated flow resistance for each IRWST injection line between the IRWST and the reactor vessel downcomer is $\geq 1.33 \times 10^{-5}$ ft/gpm^2 and $\leq 2.66 \times 10^{-5}$ ft/gpm^2.
	Containment Recirculation: A temporary water supply will be connected to the recirculation lines. All valves in these lines will be open during the test. Sufficient flow will be provided to fully open the check valves.	Containment Recirculation: The calculated flow resistance for each containment recirculation line between the containment and the reactor vessel downcomer is $\geq 1.08 \times 10^{-5}$ ft/gpm^2 and $\leq 2.17 \times 10^{-5}$ ft/gpm^2.
	ii) A low-pressure test will be conducted for each CMT to determine piping flow resistance from the cold leg to the CMT. The test will be performed by filling the CMT via the cold leg balance line by operating the normal residual heat removal pumps.	ii) The flow resistance from the cold leg to the CMT is $\leq 7.69 \times 10^{-6}$ ft/gpm^2.

Table 2.2.3-3 (cont) Inspections, Tests, Analyses, and Acceptance Criteria		
Design Commitment	**Inspections, Tests, Analyses**	**Acceptance Criteria**
	iii) Inspections of the elevation of the following tanks will be conducted: • CMTs • IRWST iv) Inspections of each of the following tanks will be conducted: • CMTs • Accumulators • IRWST	iii) The elevation of the bottom inside tank surface is higher than the direct vessel injection nozzle centerline by the following: • CMTs ≥ 7.5 ft • IRWST ≥ 3.4 ft iv) The calculated volume of each of the following tanks is as follows: • CMTs ≥ 2000 ft^3 • Accumulators ≥ 2000 ft^3 • IRWST ≥ 557,000 gal between the tank outlet connection and the tank overflow.
6.d) The PXS provides pH adjustment of water flooding the containment following design basis accidents.	Inspections of the pH adjustment baskets will be conducted.	Two pH adjustment baskets exist, each with a calculated volume ≥ 72.5 ft^3. The pH baskets are located below plant elevation 107 ft, 2 in.
7. The PXS provides a function to drain the IRWST into the containment.	A flow test for each IRWST drain line to the containment will be conducted. The test is initiated by opening the isolation valves in each line.	The calculated flow resistance for each IRWST drain line between the IRWST and the containment is ≤ 1.38 x 10^{-5} ft/gpm^2.
8. Safety-related displays of the PXS parameters identified in Table 2.2.3-1 can be retrieved in the MCR.	Inspection will be performed for the retrievability of the safety-related displays in the MCR.	Safety-related displays identified in Table 2.2.3-1 can be retrieved in the MCR.
9.a) Controls exist in the MCR to cause the remotely operated valves identified in Table 2.2.3-1 to perform their active function(s).	i) Testing will be performed on the squib valves identified in Table 2.2.3-1 using controls in the MCR, without stroking the valve.	i) Controls in the MCR operate to cause a signal at the squib valve electrical leads that is capable of actuating the squib valve.

Table 2.2.3-3 (cont) Inspections, Tests, Analyses, and Acceptance Criteria		
Design Commitment	**Inspections, Tests, Analyses**	**Acceptance Criteria**
	ii) Stroke testing will be performed on remotely operated valves other than squib valves identified in Table 2.2.3-1 using the controls in the MCR.	ii) Controls in the MCR operate to cause remotely operated valves other than squib valves to perform their active functions.
9.b) The valves identified in Table 2.2.3-1 as having PMS control perform their active function after receiving a signal from the PMS.	i) Testing will be performed on the squib valves identified in Table 2.2.3-1 using real or simulated signals into the PMS without stroking the valve. ii) Testing will be performed on the remotely operated valves other than squib valves identified in Table 2.2.3-1 using real or simulated signals into the PMS.	i) Squib valves receive an electrical signal at the valve electrical leads that is capable of actuating the valve after a signal is input to the PMS. ii) Remotely operated valves other than squib valves perform their active functions after a signal is input to the PMS.
9.c) The valves identified in Table 2.2.3-1 as having DAS control perform their active function after receiving a signal from the DAS.	i) Testing will be performed on the squib valves identified in Table 2.2.3-1 using real or simulated signals into the DAS without stroking the valve. ii) Testing will be performed on the remotely operated valves other than squib valves identified in Table 2.2.3-1 using real or simulated signals into the DAS.	i) Squib valves receive an electrical signal at the valve electrical leads that is capable of actuating the valve after a signal is input to the DAS. ii) Remotely operated valves other than squib valves perform their active functions after a signal is input to the DAS.
10.a) The motor-operated and check valves identified in Table 2.2.3-1 perform an active safety-related function to change position as indicated in the table.	i) Tests or type tests of motor-operated valves will be performed that demonstrate the capability of the valve to operate under its design conditions. ii) Exercise testing of the check valves with active safety functions identified in Table 2.2.3-1 will be performed.	i) A test report exists and concludes that each motor-operated valve changes position as indicated in Table 2.2.3-1 under design conditions. ii) Each check valve changes position.
10.b) After loss of motive power, the remotely operated valves identified in Table 2.2.3-1 assume the indicated loss of motive power position.	Testing of the installed valves will be performed under the conditions of loss of motive power.	After loss of motive power, each remotely operated valve identified in Table 2.2.3-1 assumes the indicated loss of motive power position.

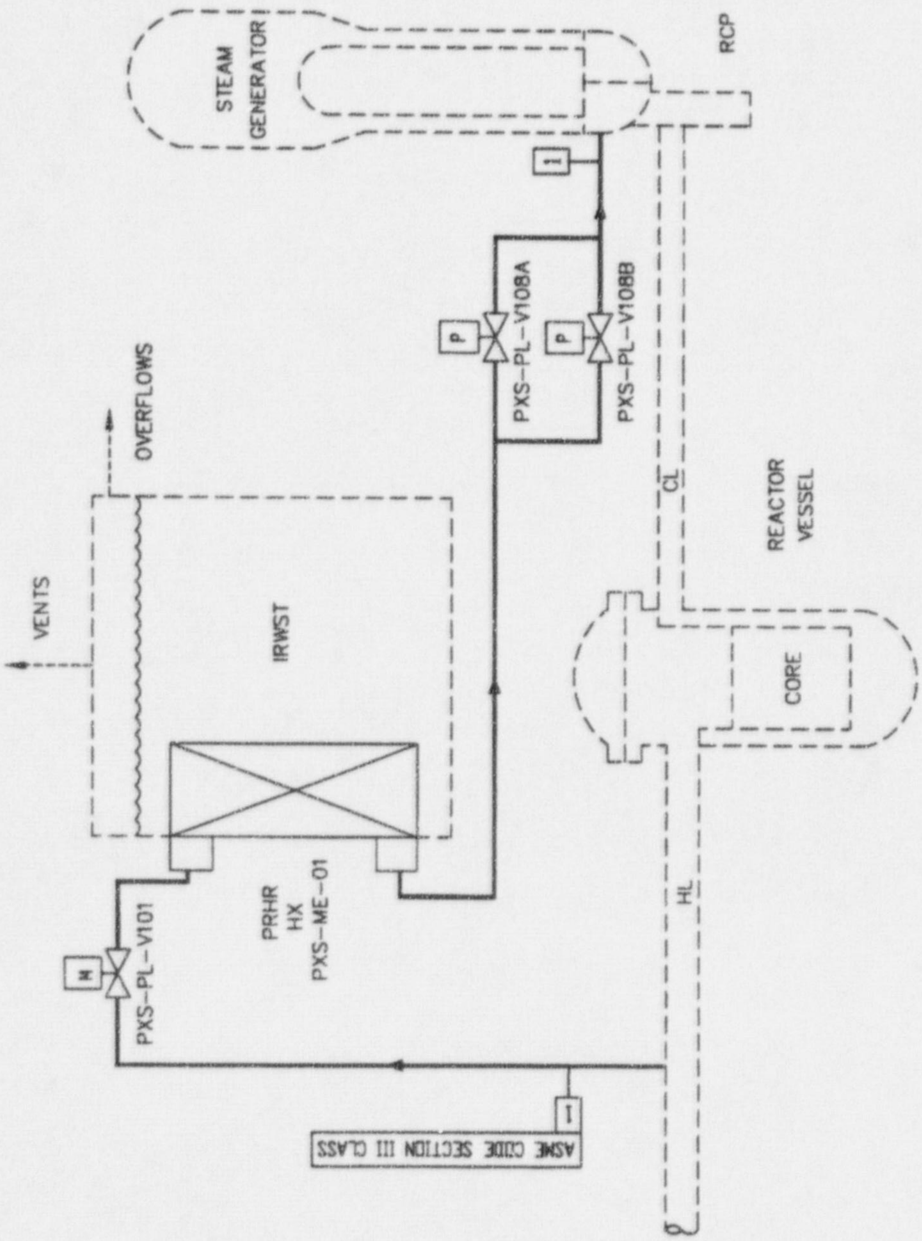
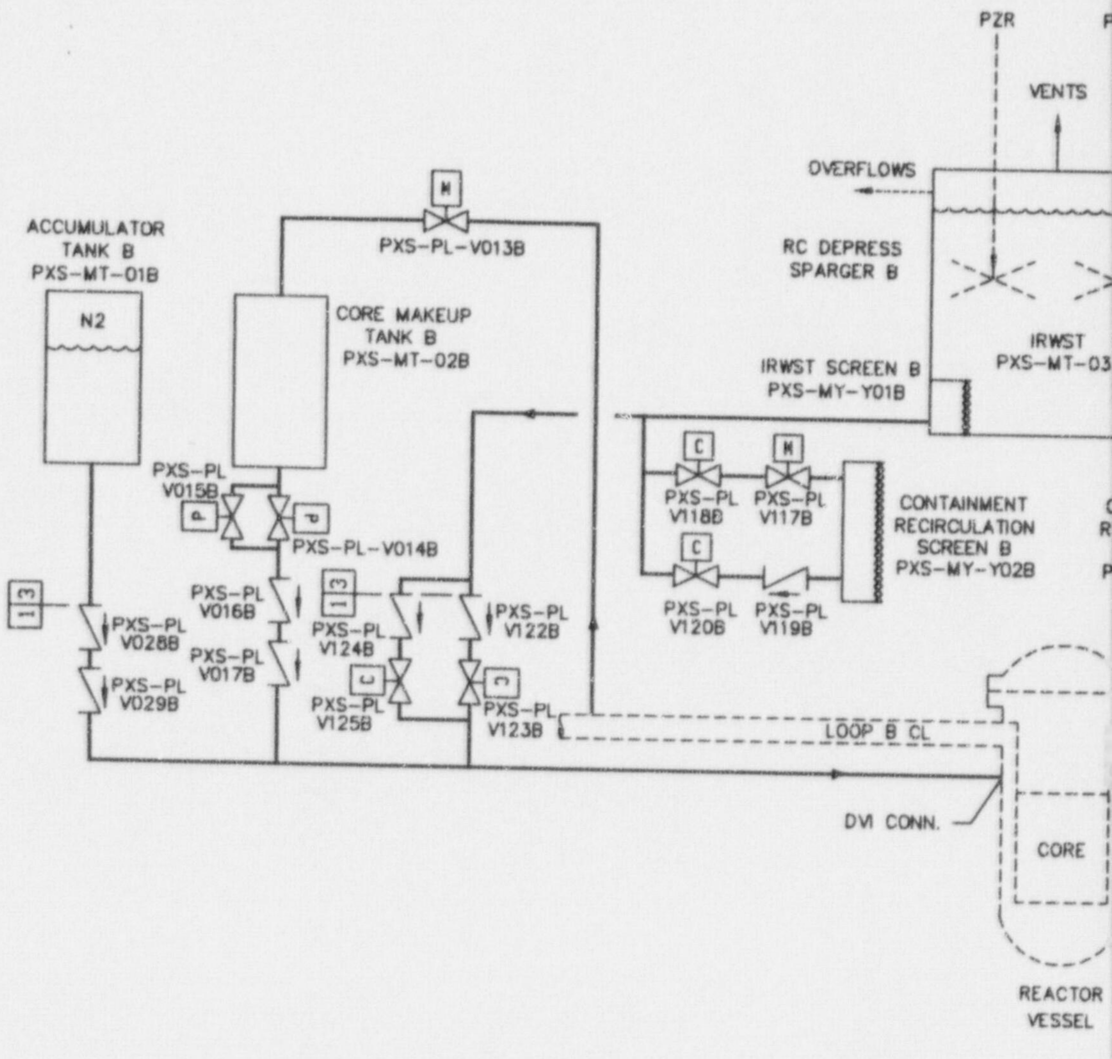


Figure 2.2.3-1 (Sheet 1 of 2)
Passive Core Cooling System


PZR
VENTS
OVERFLOWS
ACCUMULATOR
TANK B
PXS-MT-01B
N2
PXS-PL-V013B
CORE MAKEUP
TANK B
PXS-MT-02B
RC DEPRESS
SPARGER B
IRWST
IRWST SCREEN B
PXS-MY-Y01B
PXS-PL
V015B
PXS-PL-V014B
PXS-PL
V118B
PXS-PL
V117B
CONTAINMENT
RECIRCULATION
SCREEN B
PXS-MY-Y02B
PXS-PL
V016B
PXS-PL
V028B
PXS-PL
V017B
PXS-PL
V029B
PXS-PL
V124B
PXS-PL
V122B
PXS-PL
V125B
PXS-PL
V123B
PXS-PL
V120B
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V119B
LOOP B CL
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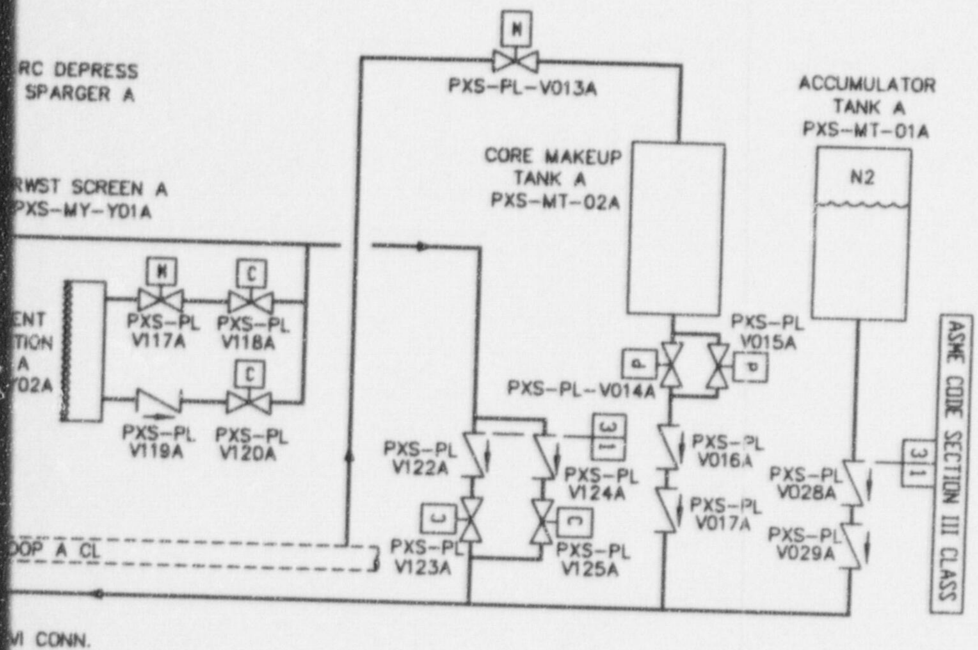

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Figure 2.2.3-1 (Sheet 2 of 2)
Passive Core Cooling System

2.2.4 Steam Generator System

Design Description

The steam generator system (SGS) and portions of the other associated systems transport and control feedwater from the feedwater system to the steam generators, transport steam from the steam generators to the main steam system, and isolate the steam generators from the main steam and feedwater system.

1. The functional arrangement of the applicable portions of the SGS and other associated systems is as shown in Figure 2.2.4-1.

2. The American Society of Mechanical Engineers (ASME) Code Section III components and piping shown in Figure 2.2.4-1 retain pressure boundary integrity at their design pressure.

3. The seismic Category I equipment identified in Table 2.2.4-1 can withstand seismic design basis dynamic loads without loss of safety function.

4. a) The as-built SGS ASME Code Section III piping depicted in Figure 2.2.4-1 meets applicable ASME Section III Code requirements for the SGS design conditions.

   b) Each of the as-built SGS lines identified in Table 2.2.4-2 is designed to meet leak-before-break (LBB) criteria, or an evaluation is performed of the protection from dynamic effects of a rupture of the line.

5. a) The Class 1E equipment identified in Table 2.2.4-1 as being qualified for a harsh environment can withstand the environmental conditions that would exist before, during, and following a design basis accident without loss of safety function for the time required to perform the safety function.

   b) The Class 1E components identified in Table 2.2.4-1 are powered from their respective Class 1E division.

   c) Separation is provided between SGS Class 1E divisions, and between Class 1E divisions and non-Class 1E cable.

6. The SGS provides the following safety-related functions:

   a) The SGS provides a heat sink for the reactor coolant system (RCS) and provides overpressure protection in accordance with Section III of the ASME Boiler and Pressure Vessel Code.

   b) During design basis events, the SGS in conjunction with associated portions of the main steam system, feedwater system, and the main turbine system limits steam generator blowdown and feedwater flow to the steam generator.

c) The SGS preserves containment integrity by isolation of the SGS lines penetrating the containment. The inside containment isolation function (isolating the RCS and containment atmosphere from the environment) is provided by the steam generator, tubes, and SGS lines inside containment while isolation outside containment is provided by manual and automatic valves.

7. The SGS provides the following nonsafety-related functions:

   a) Components within the main steam system, main and startup feedwater system, and the main turbine system identified in Table 2.2.4-3 provide backup isolation of the SGS to limit steam generator blowdown and feedwater flow to the steam generator.

   b) During shutdown operations, the SGS removes decay heat by delivery of startup feedwater to the steam generator and venting of steam from the steam generators to the atmosphere.

8. Safety-related displays identified in Table 2.2.4-1 can be retrieved in the main control room (MCR).

9. a) Controls exist in the MCR to cause those remotely operated valves identified in Table 2.2.4-1 to perform active functions.

   b) The valves identified in Table 2.2.4-1 as having PMS control perform an active safety function after receiving a signal from the PMS.

10. a) The motor-operated valves identified in Table 2.2.4-1 perform an active safety-related function to change position as indicated in the table.

   b) After loss of motive power, the remotely operated valves identified in Table 2.2.4-1 assume the indicated loss of motive power position.

Inspections, Tests, Analyses, and Acceptance Criteria

Table 2.2.4-4 specifies the inspections, tests, analyses, and associated acceptance criteria for the SGS.

Table 2.2.4-1

Equipment Name	Tag No.	Seismic Cat. I	Remotely Operated Valve	Class 1E/ Qual. for Harsh Envir.	Safety-Related Display	Control PMS	Active Function	Loss of Motive Power Position
Main Steam Safety Valve SG01	SGS-PL-V030A	Yes	-	-/-	No	-	Transfer Open/ Transfer Closed	-
Main Steam Safety Valve SG02	SGS-PL-V030B	Yes	-	-/-	No	-	Transfer Open/ Transfer Closed	-
Main Steam Safety Valve SG01	SGS-PL-V031A	Yes	-	-/-	No	-	Transfer Open/ Transfer Closed	-
Main Steam Safety Valve SG02	SGS-PL-V031B	Yes	-	-/-	No	-	Transfer Open/ Transfer Closed	-
Main Steam Safety Valve SG01	SGS-PL-V032A	Yes	-	-/-	No	-	Transfer Open/ Transfer Closed	-
Main Steam Safety Valve SG02	SGS-PL-V032B	Yes	-	-/-	No	-	Transfer Open/ Transfer Closed	-

Note: Dash (-) indicates not applicable.

Table 2.2.4-1 (cont)								
Equipment Name	**Tag No.**	**Seismic Cat. I**	**Remotely Operated Valve**	**Class 1E/ Qual. for Harsh Envir.**	**Safety-Related Display**	**Control PMS**	**Active Function**	**Loss of Motive Power Position**
Power-Operated Relief Valve Block MOV Steam Generator 01	SGS-PL-V027A	Yes	Yes	Yes/Yes	Yes (Valve Position)	Yes	Transfer Closed	As Is
Power-Operated Relief Valve Block MOV Steam Generator 02	SGS-PL-V027B	Yes	Yes	Yes/Yes	Yes (Valve Position)	Yes	Transfer Closed	As Is
Steam Line Condensate Drain Isolation Valve	SGS-PL-V036A	Yes	Yes	Yes/Yes	Yes (Valve Position)	Yes	Transfer Closed	Closed
Steam Line Condensate Drain Isolation Valve	SGS-PL-V036B	Yes	Yes	Yes/Yes	Yes (Valve Position)	Yes	Transfer Closed	Closed
Main Steam Line Isolation Valve	SGS-PL-V040A	Yes	Yes	Yes/Yes	Yes (Valve Position)	Yes	Transfer Closed	As Is
Main Steam Line Isolation Valve	SGS-PL-V040B	Yes	Yes	Yes/Yes	Yes (Valve Position)	Yes	Transfer Closed	As Is
Steam Line Condensate Drain Control Valve	SGS-PL-V086A	Yes	Yes	Yes/Yes	No	Yes	Transfer Closed	Closed
Steam Line Condensate Drain Control Valve	SGS-PL-V086B	Yes	Yes	Yes/Yes	No	Yes	Transfer Closed	Closed

Note: Dash (-) indicates not applicable.

Table 2.2.4-1 (cont)

Equipment Name	Tag No.	Seismic Cat. I	Remotely Operated Valve	Class 1E/ Qual. for Harsh Envir.	Safety-Related Display	Control PMS	Active Function	Loss of Motive Power Position
Main Feedwater Isolation Valve	SGS-PL-V057A	Yes	Yes	Yes/Yes	Yes (Valve Position)	Yes	Transfer Closed	As Is
Main Feedwater Isolation MOV	SGS-PL-V057B	Yes	Yes	Yes/Yes	Yes (Valve Position)	Yes	Transfer Closed	As Is
Startup Feedwater Isolation MOV	SGS-PL-V067A	Yes	Yes	Yes/Yes	Yes (Valve Position)	Yes	Transfer Closed	As Is
Startup Feedwater Isolation Valve	SGS-PL-V067B	Yes	Yes	Yes/Yes	Yes (Valve Position)	Yes	Transfer Closed	As Is
Steam Generator Blowdown Isolation Valve	SGS-PL-V074A	Yes	Yes	Yes/Yes	Yes (Valve Position)	Yes	Transfer Closed	Closed
Steam Generator Blowdown Isolation Valve	SGS-PL-V074B	Yes	Yes	Yes/Yes	Yes (Valve Position)	Yes	Transfer Closed	Closed
Steam Generator Blowdown Isolation Valve	SGS-PL-V075A	Yes	Yes	Yes/Yes	No	Yes	Transfer Closed	Closed
Steam Generator Blowdown Isolation Valve	SGS-PL-V075B	Yes	Yes	Yes/Yes	No	Yes	Transfer Closed	Closed

Note: Dash (-) indicates not applicable.

Table 2.2.4-1 (cont)								
Equipment Name	**Tag No.**	**Seismic Cat. I**	**Remotely Operated Valve**	**Class 1E/ Qual. for Harsh Envir.**	**Safety-Related Display**	**Control PMS**	**Active Function**	**Loss of Motive Power Position**
Power-Operated Relief Valve	SGS-PL-V233A	Yes	Yes	Yes/Yes	No	Yes	Transfer Closed	Closed
Power-Operated Relief Valve	SGS-PL-V233B	Yes	Yes	Yes/Yes	No	Yes	Transfer Closed	Closed
Main Steam Isolation Valve Bypass Isolation	SGS-PL-V240A	Yes	Yes	Yes/Yes	Yes (Valve Position)	Yes	Transfer Closed	Closed
Main Steam Isolation Valve Bypass Isolation	SGS-PL-V240B	Yes	Yes	Yes/Yes	Yes (Valve Position)	Yes	Transfer Closed	Closed
Main Feedwater Control Valve	SGS-PL-V250A	Yes	Yes	Yes/Yes	No	Yes	Transfer Closed	Closed
Main Feedwater Control Valve	SGS-PL-V250B	Yes	Yes	Yes/Yes	No	Yes	Transfer Closed	Closed
Startup Feedwater Control Valve	SGS-PL-V255A	Yes	Yes	Yes/Yes	No	Yes	Transfer Closed	Closed
Startup Feedwater Control Valve	SGS-PL-V255B	Yes	Yes	Yes/Yes	No	Yes	Transfer Closed	Closed

Note: Dash (-) indicates not applicable.

Table 2.2.4-1 (cont)								
Equipment Name	**Tag No.**	**Seismic Cat. I**	**Remotely Operated Valve**	**Class 1E/ Qual. for Harsh Envir.**	**Safety-Related Display**	**Control PMS**	**Active Function**	**Loss of Motive Power Position**
Steam Generator 1 Narrow-Range Level Sensor	SGS-001	Yes	-	Yes/Yes	Yes	-	-	-
Steam Generator 1 Narrow-Range Level Sensor	SGS-002	Yes	-	Yes/Yes	Yes	-	-	-
Steam Generator 1 Narrow-Range Level Sensor	SGS-003	Yes	-	Yes/Yes	Yes	-	-	-
Steam Generator 1 Narrow-Range Level Sensor	SGS-004	Yes	-	Yes/Yes	Yes	-	-	-
Steam Generator 2 Narrow-Range Level Sensor	SGS-005	Yes	-	Yes/Yes	Yes	-	-	-
Steam Generator 2 Narrow-Range Level Sensor	SGS-006	Yes	-	Yes/Yes	Yes	-	-	-
Steam Generator 2 Narrow-Range Level Sensor	SGS-007	Yes	-	Yes/Yes	Yes	-	-	-

Note: Dash (-) indicates not applicable.

Table 2.2.4-1 (cont)								
Equipment Name	**Tag No.**	**Seismic Cat. I**	**Remotely Operated Valve**	**Class 1E/ Qual. for Harsh Envir.**	**Safety-Related Display**	**Control PMS**	**Active Function**	**Loss of Motive Power Position**
Steam Generator 2 Narrow-Range Level Sensor	SGS-008	Yes	-	Yes/Yes	Yes	-	-	-
Steam Generator 1 Wide-Range Level Sensor	SGS-011	Yes	-	Yes/Yes	Yes	-	-	-
Steam Generator 1 Wide-Range Level Sensor	SGS-012	Yes	-	Yes/Yes	Yes	-	-	-
Steam Generator 2 Wide-Range Level Sensor	SGS-013	Yes	-	Yes/Yes	Yes	-	-	-
Steam Generator 2 Wide-Range Level Sensor	SGS-014	Yes	-	Yes/Yes	Yes	-	-	-
Steam Generator 1 Wide-Range Level Sensor	SGS-015	Yes	-	Yes/Yes	Yes	-	-	-
Steam Generator 1 Wide-Range Level Sensor	SGS-016	Yes	-	Yes/Yes	Yes	-	-	-
Steam Generator 2 Wide-Range Level Sensor	SGS-017	Yes	-	Yes/Yes	Yes	-	-	-

Note: Dash (-) indicates not applicable.

Table 2.2.4-1 (cont)

Equipment Name	Tag No.	Seismic Cat. I	Remotely Operated Valve	Class 1E/ Qual. for Harsh Envir.	Safety-Related Display	Control PMS	Active Function	Loss of Motive Power Position
Steam Generator 2 Wide-Range Level Sensor	SGS-018	Yes	-	Yes/Yes	Yes	-	-	-
Main Steam Line Steam Generator 1 Pressure Sensor	SGS-030	Yes	-	Yes/Yes	Yes	-	-	-
Main Steam Line Steam Generator 1 Pressure Sensor	SGS-031	Yes	-	Yes/Yes	Yes	-	-	-
Main Steam Line Steam Generator 1 Pressure Sensor	SGS-032	Yes	-	Yes/Yes	Yes	-	-	-
Main Steam Line Steam Generator 1 Pressure Sensor	SGS-033	Yes	-	Yes/Yes	Yes	-	-	-
Main Steam Line Steam Generator 2 Pressure Sensor	SGS-034	Yes	-	Yes/Yes	Yes	-	-	-
Main Steam Line Steam Generator 2 Pressure Sensor	SGS-035	Yes	-	Yes/Yes	Yes	-	-	-
Main Steam Line Steam Generator 2 Pressure Sensor	SGS-036	Yes	-	Yes/Yes	Yes	-	-	-

Note: Dash (-) indicates not applicable.

Table 2.2.4-1 (cont)								
Equipment Name	**Tag No.**	**Seismic Cat. I**	**Remotely Operated Valve**	**Class 1E/ Qual. for Harsh Envir.**	**Safety-Related Display**	**Control PMS**	**Active Function**	**Loss of Motive Power Position**
Main Steam Line Steam Generator 2 Pressure Sensor	SGS-037	Yes	-	Yes/Yes	Yes	-	-	-
Steam Generator 1 Startup Feedwater Flow Sensor	SGS-55A	Yes	-	Yes/Yes	Yes	-	-	-
Steam Generator 1 Startup Feedwater Flow Sensor	SGS-55B	Yes	-	Yes/Yes	Yes	-	-	-
Steam Generator 2 Startup Feedwater Flow Sensor	SGS-56A	Yes	-	Yes/Yes	Yes	-	-	-
Steam Generator 2 Startup Feedwater Flow Sensor	SGS-56B	Yes	-	Yes/Yes	Yes	-	-	-

Note: Dash (-) indicates not applicable.

Table 2.2.4-2	
Line Name	**Line Number**
Main Steam Lines Within Containment	SGS-L006A/SGS-L006B
Main Feedwater Lines Within Containment	SGS-L003A/SGS-L003B

Table 2.2.4-3	
Equipment Name	**Tag No.**
Turbine Stop Valve	MTS-PL-V001A
Turbine Stop Valve	MTS-PL-V001B
Turbine Stop Valve	MTS-PL-V003A
Turbine Stop Valve	MTS-PL-V003B
Turbine Bypass Control Valve	MSS-PL-V001
Turbine Bypass Control Valve	MSS-PL-V002
Turbine Bypass Control Valve	MSS-PL-V003
Turbine Bypass Control Valve	MSS-PL-V004
Main Steam to Auxiliary Steam Header Isolation Valve	MSS-PL-V020
Moisture Separator Reheat Supply Steam Control Valve	MSS-PL-V016
Main to Startup Feedwater Crossover Valve	FWS-PL-097
Main Feedwater Pump	FWS-MP-02A
Main Feedwater Pump	FWS-MP-02B
Startup Feedwater Pump	FWS-MP-03A
Startup Feedwater Pump	FWS-MP-03B

Table 2.2.4-4
Inspections, Tests, Analyses, and Acceptance Criteria

Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
1. The functional arrangement of the applicable portions of the SGS and other associated systems is as shown in Figure 2.2.4-1.	Inspection of the as-built system will be performed.	The as-built SGS conforms with the functional arrangement shown in Figure 2.2.4-1.
2. The ASME Code Section III components and piping shown in Figure 2.2.4-1 retain pressure boundary integrity at their design pressure.	i) A hydrostatic test will be performed on those ASME Code components required to be hydrostatically tested by the ASME Code Section III.	i) A report exists and concludes that the results of the hydrostatic test of the ASME Code components conform with the requirements in the ASME Code Section III.
	ii) Inspections, including nondestructive examination of the as-built pressure boundary welds, will be performed in accordance with the ASME Code Section III.	ii) A report exists and concludes that the pressure boundary integrity requirements of the ASME Code Section III are met for the quality of pressure boundary welds.
3. The seismic Category I equipment identified in Table 2.2.4-1 can withstand seismic design basis dynamic loads without loss of safety function.	i) Inspection will be performed to verify that the seismic Category I equipment identified in Table 2.2.4-1 is located on the nuclear island.	i) The seismic Category I equipment identified in Table 2.2.4-1 is located on the nuclear island.
	ii) Type tests, analyses, or a combination of type tests and analyses of seismic Category I equipment will be performed.	ii) A report exists and concludes that the seismic Category I equipment can withstand seismic design basis dynamic loads without loss of safety function.

Table 2.2.4-4 (cont)
Inspections, Tests, Analyses, and Acceptance Criteria

Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
4.a) The as-built SGS ASME Code Section III Class 2 or 3 piping depicted in Figure 2.2.4-1 meets applicable ASME Section III Code requirements for the SGS design conditions.	i) Inspection will be performed to verify that the SGS ASME Code Section III Class 2 or 3 piping depicted in Figure 2.2.4-1 is located on the nuclear island.	i) The SGS ASME Code Section III Class 2 or 3 piping depicted in Figure 2.2.4-1 is located on the nuclear island.
	ii) A reconciliation analysis using the as-designed and as-built piping information will be performed, or an analysis of the as-built piping will be performed.	ii) The as-built piping stress report exists and includes the ASME Code Certified Stress Report.
	iii) A reconciliation analysis using the as-designed and as-built pipe support information will be performed, or an analysis of the as-built supports will be performed.	iii) The as-built pipe support stress report exists and includes the ASME Code Certified Stress Report.
4.b) Each of the as-built SGS lines identified in Table 2.2.4-2 is designed to meet LBB criteria, or an evaluation is performed of the protection from dynamic effects of a rupture of the line.	Inspection will be performed for the existence of a LBB evaluation report, or an evaluation report on the protection from dynamic effects of a pipe break. Certified Design Material, Section 3.3, Nuclear Island Buildings, contains the design descriptions and inspections, tests, analyses and acceptance criteria for protection from the dynamic effects of pipe rupture.	A LBB evaluation report exists and concludes that the LBB acceptance criteria are met by the as-built SGS piping and piping materials, or a pipe break evaluation report exists and concludes that protection from the dynamic effects of a line break is provided.

Table 2.2.4-4 (cont)
Inspections, Tests, Analyses, and Acceptance Criteria

Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
5.a) The Class 1E equipment identified in Table 2.2.4-1 as being qualified for a harsh environment can withstand the environmental conditions that would exist before, during, and following a design basis accident without loss of safety function for the time required to perform the safety function.	Type tests, analyses, or a combination of type tests and analyses will be performed on Class 1E equipment located in a harsh environment.	A report exists and concludes that the Class 1E equipment identified in Table 2.2.4-1 as being qualified for a harsh environment can withstand the environmental conditions that would exist before, during, and following a design basis accident without loss of safety function for the time required to perform the safety function.
5.b) The Class 1E components identified in Table 2.2.4-1 are powered from their respective Class 1E division.	Testing will be performed on the SGS by providing a simulated test signal in each Class 1E division.	A simulated test signal exists at the Class 1E equipment identified in Table 2.2.4-1 when the assigned Class 1E division is provided the test signal.
5.c) Separation is provided between SGS Class 1E divisions, and between Class 1E divisions and non-Class 1E cable.	See Certified Design Material, Section 3.3, Nuclear Island Buildings.	See Certified Design Material, Section 3.3, Nuclear Island Buildings.
6.a) The SGS provides a heat sink for the RCS and provides overpressure protection in accordance with Section III of the ASME Boiler and Pressure Vessel Code.	i) Inspections will be conducted to confirm that the value of the vendor code plate rating of the steam generator safety valves is greater than or equal to system relief requirements. ii) Testing and analyses in accordance with ASME Code Section III will be performed to determine set pressure.	i) The sum of the rated capacities recorded on the valve vendor code plates of the steam generator safety valves exceeds 4,600,000 lb/hr per steam generator. ii) A report exists to indicate the set pressure of the valves is less than 1195 psig.
6.b) During design basis events, the SGS in conjunction with associated portions of the main steam system, feedwater system, and the main turbine system, limits steam generator blowdown and feedwater flow to the steam generator.	Testing will be performed to confirm isolation of the main feedwater, startup feedwater, blowdown, and main steam lines. See item 9 in this table.	See item 9 in this table.

Table 2.2.4-4 (cont)
Inspections, Tests, Analyses, and Acceptance Criteria

Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
6.c) The SGS preserves containment integrity by isolation of the SGS lines penetrating the containment.	See Certified Design Material, subsection 2.2.1, Containment System.	See Certified Design Material, subsection 2.2.1, Containment System.
7.a) Components within the main steam system, main and startup feedwater system, and the main turbine system identified in Table 2.2.4-3 provide backup isolation of the SGS to limit steam generator blowdown and feedwater flow to the steam generator.	i) Testing will be performed to confirm closure of the valves identified in Table 2.2.4-3. ii) Testing will be performed to confirm the trip of the pumps identified in Table 2.2.4-3.	i) The valves identified in Table 2.2.4-3 close after a signal is generated by the PMS. ii) The pumps identified in Table 2.2.4-3 trip after a signal is generated by the PMS.
7 b) During shutdown operations, the SGS removes decay heat by delivery of startup feedwater to the steam generator and venting of steam from the steam generators to the atmosphere.	i) Tests will be performed to demonstrate the startup feedwater system's ability to provide feedwater to the steam generators. ii) Tests and analyses will be performed to demonstrate the ability of the power operated relief valves to discharge steam from the steam generators to the atmosphere	i) See Certified Design Material, subsection 2.4.1, Main and Startup Feedwater System. ii) The power-operated relief valve will relieve greater than 200,000 lb/hr at 1003 psia $\pm$10 psi.
8. Safety-related display identified in Table 2.2.4-1 can be retrieved in the MCR.	Inspection will be performed for retrievability of the safety-related displays in the MCR.	Safety-related displays identified in Table 2.2.4-1 can be retrieved in the MCR.
9.a) Controls exist in the MCR to cause those remotely-operated valves identified in Table 2.2.4-1 to perform active functions.	Stroke testing will be performed on the remotely operated valves identified in Table 2.2.4-1 using the controls in the MCR.	Controls in the MCR operate to cause remotely operated valves identified in Table 2.2.4-1 to perform active functions.
9.b) The valves identified in Table 2.2.4-1 as having PMS control perform an active safety function after receiving a signal from PMS.	Testing will be performed using real or simulated signals into the PMS.	The valves identified in Table 2.2.4-1 as having PMS control perform an active safety function after receiving a signal from PMS.

Table 2.2.4-4 (cont)
Inspections, Tests, Analyses, and Acceptance Criteria

Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
10.a) The motor-operated valves identified in Table 2.2.4-1 perform an active safety-related function to change position as indicated in the table.	Tests or type tests of motor-operated valves will be performed that demonstrate the capability of the valve to operate under its design conditions.	A test report exists and concludes that each motor-operated valve changes position as indicated in Table 2.2.4-1 under design conditions.
10.b) After loss of motive power, the remotely operated valves identified in Table 2.2.4-1 assume the indicated loss of motive power position.	Testing of installed valves will be performed under the conditions of loss of motive power.	After loss of motive power, each remotely operated valve identified in Table 2.2.4-1 assumes the indicated loss of motive power position.

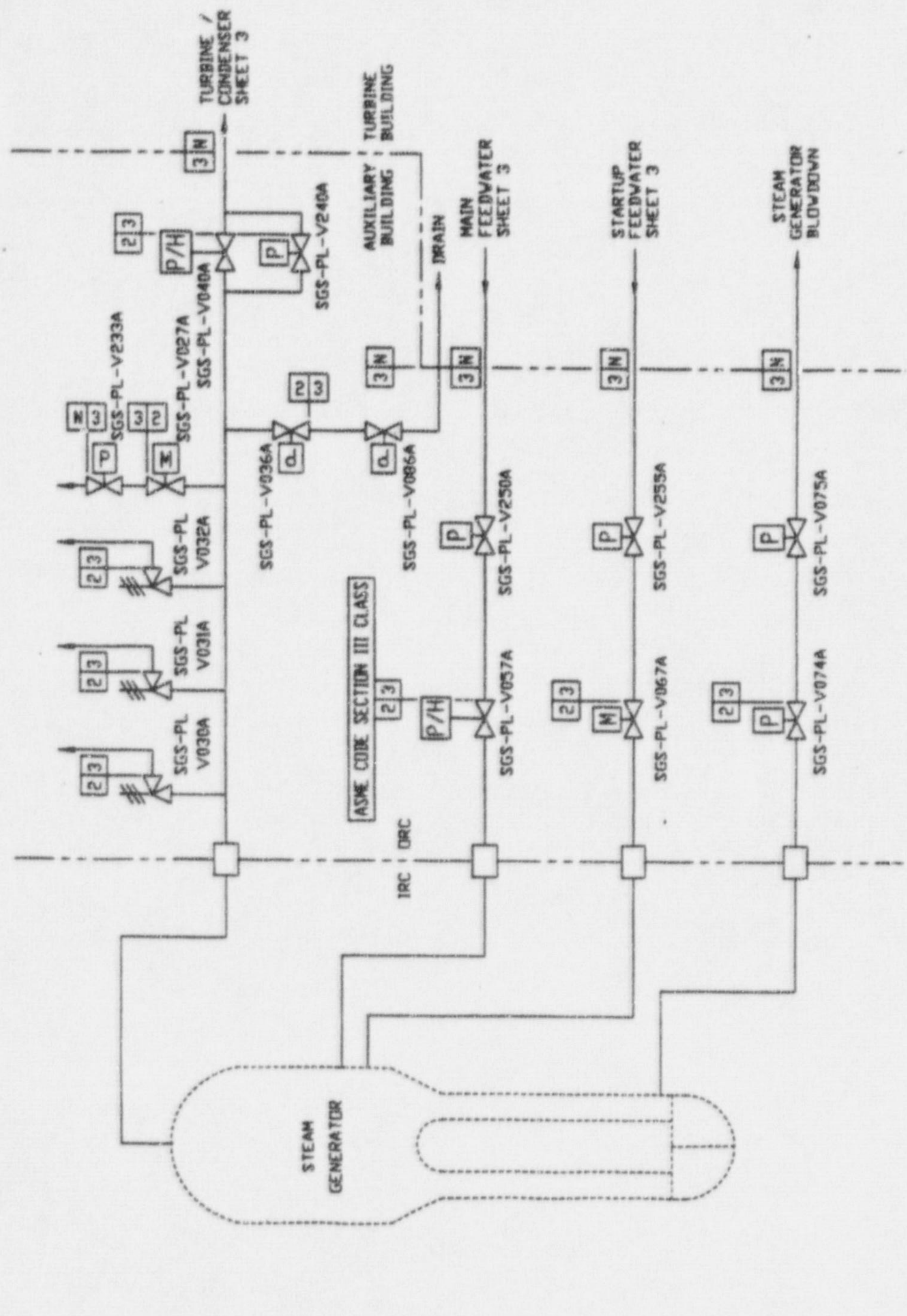

Figure 2.2.4-1 (Sheet 1 of 3)
Steam Generator System

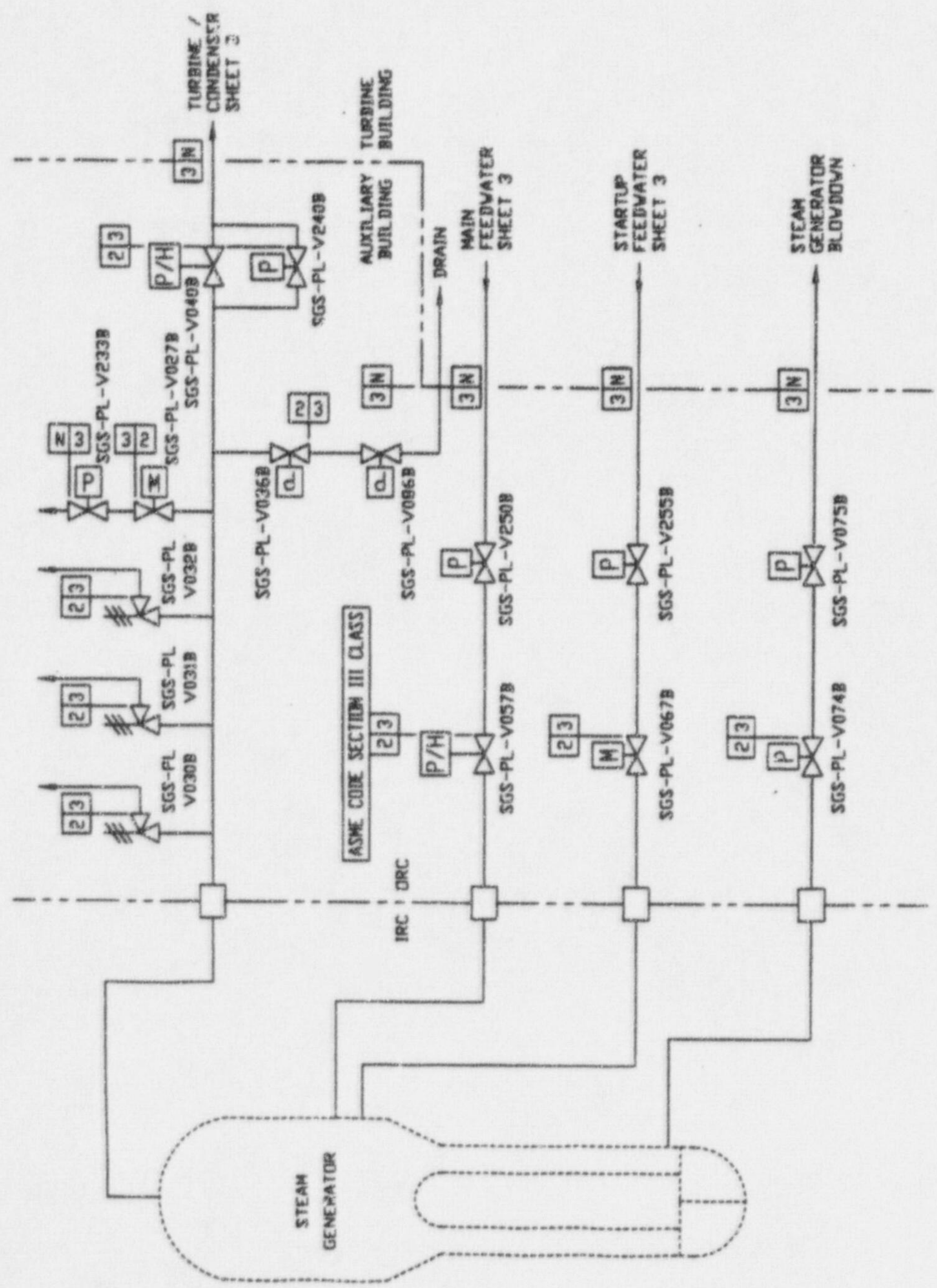

Figure 2.2.4-1 (Sheet 2 of 3)
Steam Generator System

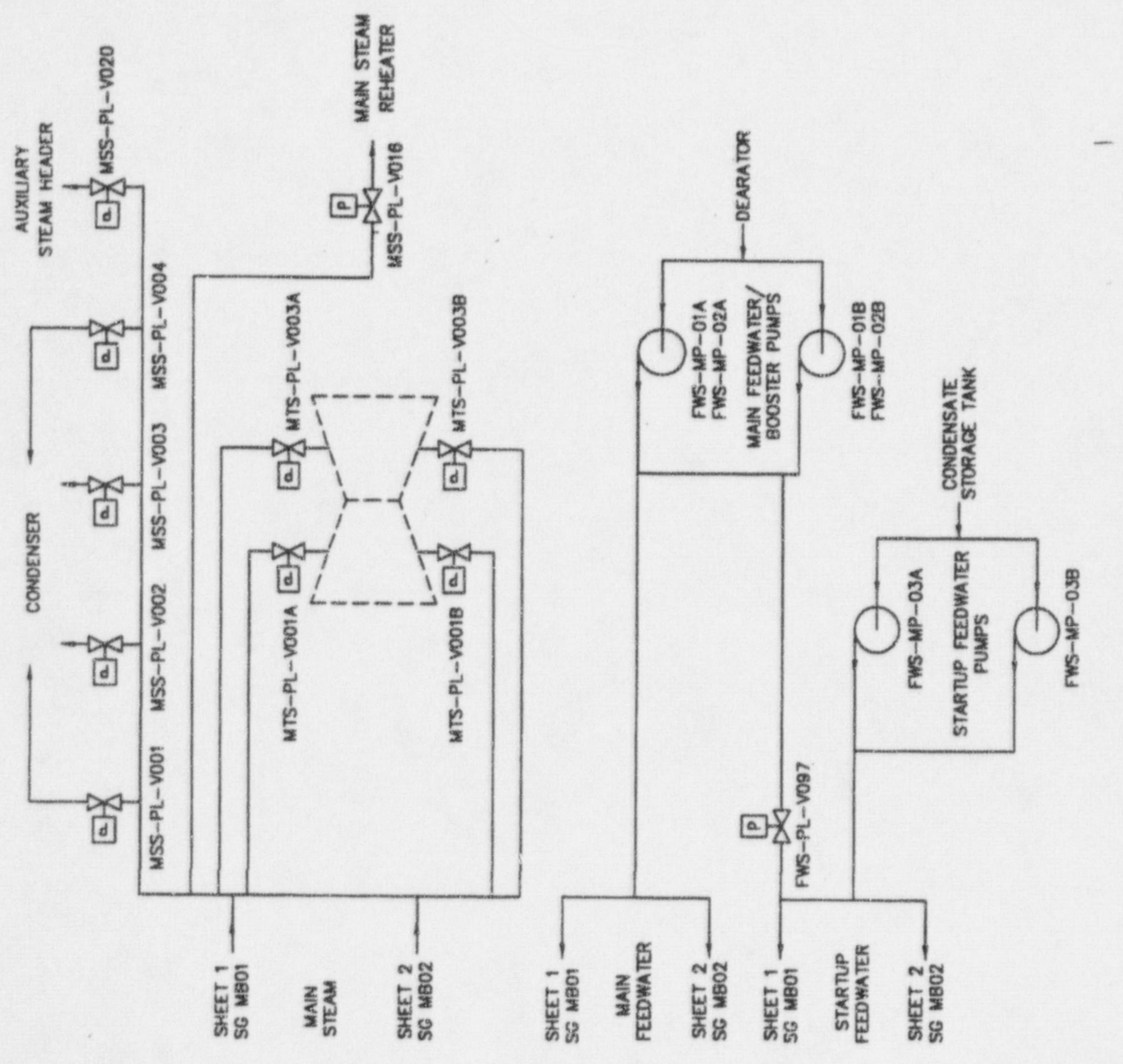

Figure 2.2.4-1 (Sheet 3 of 3)
Steam Generator System

2.2.5 Main Control Room Emergency Habitability System

Design Description

The main control room emergency habitability system (VES) provides a supply of breathable air for the main control room (MCR) occupants and maintains the MCR at a positive pressure with respect to the surrounding areas. The VES also limits the heatup of the MCR, the instrumentation and control (I&C) equipment rooms, and the Class 1E dc equipment rooms by using the heat capacity of surrounding structures.

1. The functional arrangement of the applicable portions of the VES is as shown in Figure 2.2.5-1.

2. The American Society of Mechanical Engineers (ASME) Code Section III components and piping shown in Figure 2.2.5-1 retain pressure boundary integrity at their design pressure.

3. The seismic Category I equipment identified in Table 2.2.5-1 can withstand seismic design basis dynamic loads without loss of safety function.

4. The as-built VES ASME Code Section III piping depicted in Figure 2.2.5-1 meets applicable ASME Section III Code requirements for the VES design conditions.

5. a) The Class 1E equipment identified in Table 2.2.5-1 as being qualified for a harsh environment can withstand the environmental conditions that would exist before, during, and following a design basis accident without loss of safety function for the time required to perform the safety function.

   b) The Class 1E components identified in Table 2.2.5-1 are powered from their respective Class 1E division.

   c) Separation is provided between VES Class 1E divisions, and between Class 1E divisions and non-Class 1E cable.

6. The VES provides the following safety-related functions:

   a) The VES provides a 72-hour supply of breathable quality air for the occupants of the MCR.

   b) The VES maintains the MCR pressure boundary at a positive pressure with respect to the surrounding areas.

   c) The VES limits the heatup of the MCR, the I&C equipment rooms, and the Class 1E dc equipment rooms.

7. Safety-related displays identified in Table 2.2.5-1 can be retrieved in the MCR.

8. a) Controls exist in the MCR to cause those remotely operated valves identified in Table 2.2.5-1 to perform their active functions.

   b) The valves identified in Table 2.2.5-1 as having protection and safety monitoring system (PMS) control perform their active safety function after receiving a signal from the PMS.

9. a) The check valves identified in Table 2.2.5-1 perform an active safety-related function to change position as indicated in the table.

   b) After loss of motive power, the remotely operated valves identified in Table 2.2.5-1 assume the indicated loss of motive power position.

Inspections, Tests, Analyses, and Acceptance Criteria

Table 2.2.5-2 specifies the inspections, tests, analyses, and associated acceptance criteria for the VES.

Table 2.2.5-1

Equipment Name	Tag No.	Seismic Cat. I	Remotely Operated Valve	Class 1E/ Qual. for Harsh Envir.	Safety-Related Display	Control PMS	Active Function	Loss of Motive Power Position
Emergency Air Storage Tank 01A	VES-MT-01A	Yes	-	-/-	-	-	-	-
Emergency Air Storage Tank 02A	VES-MT-02A	Yes	-	-/-	-	-	-	-
Emergency Air Storage Tank 03A	VES-MT-03A	Yes	-	-/-	-	-	-	-
Emergency Air Storage Tank 04A	VES-MT-04A	Yes	-	-/-	-	-	-	-
Emergency Air Storage Tank 05A	VES-MT-05A	Yes	-	-/-	-	-	-	-
Emergency Air Storage Tank 06A	VES-MT-06A	Yes	-	-/-	-	-	-	-
Emergency Air Storage Tank 07A	VES-MT-07A	Yes	-	-/-	-	-	-	-
Emergency Air Storage Tank 08A	VES-MT-08A	Yes	-	-/-	-	-	-	-
Emergency Air Storage Tank 09A	VES-MT-09A	Yes	-	-/-	-	-	-	-
Emergency Air Storage Tank 10A	VES-MT-10A	Yes	-	-/-	-	-	-	-

Note: Dash (-) indicates not applicable.

Table 2.2.5-1 (cont)								
Equipment Name	**Tag No.**	**Seismic Cat. I**	**Remotely Operated Valve**	**Class 1E/ Qual. for Harsh Envir.**	**Safety-Related Display**	**Control PMS**	**Active Function**	**Loss of Motive Power Position**
Emergency Air Storage Tank 11A	VES-MT-11A	Yes	-	-/-	-	-	-	-
Emergency Air Storage Tank 12A	VES-MT-12A	Yes	-	-/-	-	-	-	-
Emergency Air Storage Tank 01B	VES-MT-01B	Yes	-	-/-	-	-	-	-
Emergency Air Storage Tank 02B	VES-MT-02B	Yes	-	-/-	-	-	-	-
Emergency Air Storage Tank 03B	VES-MT-03B	Yes	-	-/-	-	-	-	-
Emergency Air Storage Tank 04B	VES-MT-04B	Yes	-	-/-	-	-	-	-
Emergency Air Storage Tank 05B	VES-MT-05B	Yes	-	-/-	-	-	-	-
Emergency Air Storage Tank 06B	VES-MT-06B	Yes	-	-/-	-	-	-	-
Emergency Air Storage Tank 07B	VES-MT-07B	Yes	-	-/-	-	-	-	-
Emergency Air Storage Tank 08B	VES-MT-08B	Yes	-	-/-	-	-	-	-

Note: Dash (-) indicates not applicable.

Table 2.2.5-1 (cont)								
Equipment Name	**Tag No.**	**Seismic Cat. I**	**Remotely Operated Valve**	**Class 1E/ Qual. for Harsh Envir.**	**Safety-Related Display**	**Control PMS**	**Active Function**	**Loss of Motive Power Position**
Emergency Air Storage Tank 09B	VES-MT-09B	Yes	-	-/-	-	-	-	-
Emergency Air Storage Tank 10B	VES-MT-10B	Yes	-	-/-	-	-	-	-
Emergency Air Storage Tank 11B	VES-MT-11B	Yes	-	-/-	-	-	-	-
Emergency Air Storage Tank 12B	VES-MT-12B	Yes	-	-/-	-	-	-	-
Pressure Regulating Valve A	VES-PL-V002A	Yes	No	-/-	No	-	Throttle Flow	-
Pressure Regulating Valve B	VES-PL-V002B	Yes	No	-/-	No	-	Throttle Flow	-
MCR Air Delivery Isolation Valve A	VES-PL-V005A	Yes	Yes	Yes/No	No	Yes	Transfer Open	Open
MCR Air Delivery Isolation Valve B	VES-PL-V005B	Yes	Yes	Yes/No	No	Yes	Transfer Open	Open
MCR Pressure Relief Isolation Valve A	VES-PL-V022A	Yes	Yes	Yes/No	Yes (valve position)	Yes	Transfer Open/ Transfer Closed	Open

Note: Dash (-) indicates not applicable.

Table 2.2.5-1 (cont)

Equipment Name	Tag No.	Seismic Cat. I	Remotely Operated Valve	Class 1E/ Qual. for Harsh Envir.	Safety-Related Display	Control PMS	Active Function	Loss of Motive Power Position
MCR Pressure Relief Isolation Valve B	VES-PL-V022B	Yes	Yes	Yes/No	Yes (valve position)	Yes	Transfer Open/ Transfer Closed	Open
Refill Check Valve A	VES-PL-V008A	Yes	No	-/-	No	-	Transfer Open/ Transfer Closed	-
Refill Check Valve B	VES-PL-V008B	Yes	No	-/-	No	-	Transfer Open/ Transfer Closed	-
MCR Air Delivery Line Flow Sensor	VES-003A	Yes	-	Yes/No	Yes	-	-	-
MCR Air Delivery Line Flow Sensor	VES-003B	Yes	-	Yes/No	Yes	-	-	-
MCR Differential Pressure Sensor A	VES-004A	Yes	-	Yes/No	Yes	-	-	-
MCR Differential Pressure Sensor B	VES-004B	Yes	-	Yes/No	Yes	-	-	-
MCR Differential Pressure Sensor C	VES-004C	Yes	-	Yes/No	Yes	-	-	-

Note: Dash (-) indicates not applicable.

Table 2.2.5-2
Inspections, Tests, Analyses, and Acceptance Criteria

Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
1. The functional arrangement of the applicable portions of the VES is as shown in Figure 2.2.5-1.	Inspection of the as-built system will be performed.	The as-built VES conforms with the functional arrangement shown in Figure 2.2.5-1.
2. The ASME Code Section III components and piping shown in Figure 2.2.5-1 retain pressure boundary integrity at their design pressure.	i) A hydrostatic test will be performed on those ASME Code components required to be hydrostatically tested by the ASME Code Section III.	i) A report exists and concludes that the results of the hydrostatic test of the ASME Code components conform with the requirements in the ASME Code Section III.
	ii) Inspections, including nondestructive examination of the as-built pressure boundary welds, will be performed in accordance with the ASME Code Section III.	ii) A report exists and concludes that the pressure boundary integrity requirements of the ASME Code Section III are met for the quality of pressure boundary welds.
3. The seismic Category I equipment identified in Table 2.2.5-1 can withstand seismic design basis dynamic loads without loss of safety function.	i) Inspection will be performed to verify that the seismic Category I equipment identified in Table 2.2.5-1 is located on the nuclear island.	i) The seismic Category I equipment identified in Table 2.2.5-1 is located on the nuclear island.
	ii) Type tests, analyses, or a combination of type tests and analyses of seismic Category I equipment will be performed.	ii) A report exists and concludes that the seismic Category I equipment can withstand seismic design basis dynamic loads without loss of safety function.
	iii) Analysis of seismic Category I equipment supports will be performed.	iii) A report exists and concludes that the seismic Category I equipment supports can withstand seismic design basis loads without loss of safety function.

Table 2.2.5-2 (cont)
Inspections, Tests, Analyses, and Acceptance Criteria

Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
4. The as-built VES ASME Code Section III piping depicted in Figure 2.2.5-1 meets applicable ASME Section III Code requirements for the VES design conditions.	i) Inspection will be performed to verify that the VES ASME Code Section III piping depicted in Figure 2.2.5-1 is located on the nuclear island. ii) A reconciliation analysis using the as-designed and as-built piping information will be performed, or an analysis of the as-built piping will be performed. iii) A reconciliation analysis using the as-designed and as-built pipe support information will be performed, or an analysis of the as-built supports will be performed.	i) The VES ASME Code Section III piping depicted in Figure 2.2.5-1 is located on the nuclear island. ii) The as-built piping stress report exists and includes the ASME Code Certified Stress Report. iii) The as-built pipe support stress report exists and includes the ASME Code Certified Stress Report.
5.a) The Class 1E equipment identified in Tables 2.2.5-1 as being qualified for a harsh environment can withstand the environmental conditions that would exist before, during, and following a design basis accident without loss of safety function for the time required to perform the safety function.	Type tests, analyses, or a combination of type tests and analyses will be performed on Class 1E equipment located in a harsh environment.	A report exists and concludes that the Class 1E equipment identified in Table 2.2.5-1 as being qualified for a harsh environment can withstand the environmental conditions that would exist before, during, and following a design basis accident without loss of safety function for the time required to perform the safety function.
5.b) The Class 1E components identified in Table 2.2.5-1 are powered from their respective Class 1E division.	Testing will be performed on the VES by providing a simulated test signal in each Class 1E division.	A simulated test signal exists at the Class 1E equipment identified in Table 2.2.5-1 when the assigned Class 1E division is provided the test signal.
5.c) Separation is provided between VES Class 1E divisions, and between Class 1E divisions and non-Class 1E cable.	See Certified Design Material, Section 3.3, Nuclear Island Buildings.	See Certified Design Material, Section 3.3, Nuclear Island Buildings.

Table 2.2.5-2 (cont)
Inspections, Tests, Analyses, and Acceptance Criteria

Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
6.a) The VES provides a 72-hour supply of breathable quality air for the occupants of the MCR.	i) Testing will be performed to confirm that the required amount of air flow is delivered to the MCR. ii) Analysis of storage capacity of each 12-tank subset will be performed based on as-built manufacturers data.	i) The air flow rate from each 12-tank subset of the VES is at least 23 scfm and not more than 27 scfm. ii) The calculated storage capacity of each 12-tank subset is greater than 116,640 scf.
6.b) The VES maintains the MCR pressure boundary at a positive pressure with respect to the surrounding areas.	Testing will be performed with VES flowrate between 23 and 27 scfm to confirm that the MCR is capable of maintaining the required pressurization of the pressure boundary.	The MCR pressure boundary is pressurized to greater than or equal to 1/8-in. water gauge with respect to the surrounding area.
6.c) The VES limits the heatup of the MCR, the I&C equipment rooms, and the Class 1E dc equipment rooms.	A heat sink capacity analysis will be performed using as-built information and design basis heat loads and maximum normal room temperatures for the: i) MCR ii) I&C equipment rooms iii) Class 1E dc equipment rooms	A report exists and concludes that: i) The temperature rise for the MCR is less than or equal to 15°F for the 72-hour period. ii) The maximum temperature for the 72-hour period for the I&C rooms is less than or equal to 125°F. iii) The maximum temperature for the 72-hour period for the Class 1E dc equipment rooms is less than or equal to 125°F.
7. Safety-related displays identified in Table 2.2.5-1 can be retrieved in the MCR.	Inspection will be performed for retrievability of the safety-related displays in the MCR.	Safety-related displays identified in Table 2.2.5-1 can be retrieved in the MCR.
8.a) Controls exist in the MCR to cause remotely operated valves identified in Table 2.2.5-1 to perform their active functions.	Stroke testing will be performed on remotely operated valves identified in Table 2.2.5-1 using the controls in the MCR.	Controls in the MCR operate to cause remotely operated valves identified in Table 2.2.5-1 to perform their active functions.

Table 2.2.5-2 (cont)
Inspections, Tests, Analyses, and Acceptance Criteria

Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
8.b) The valves identified in Table 2.2.5-1 as having PMS control perform their active safety function after receiving a signal from the PMS.	Testing will be performed using real or simulated signals into the PMS.	The valves identified in Table 2.2.5-1 as having PMS control perform their active safety function after receiving a signal from the PMS.
9.a) The check valves identified in Table 2.2.5-1 perform an active safety-related function to change position as indicated in the table.	Exercise testing of the check valve active safety functions identified in Table 2.2.5-1 will be performed.	Each check valve changes position as indicated.
9.b) After loss of motive power, the remotely operated valves identified in Table 2.2.5-1 assume the indicated loss of motive power position.	Testing of the installed valves will be performed under the conditions of loss of motive power.	After loss of motive power, the remotely operated valves identified in Table 2.2.5-1 assume the indicated loss of motive power position.

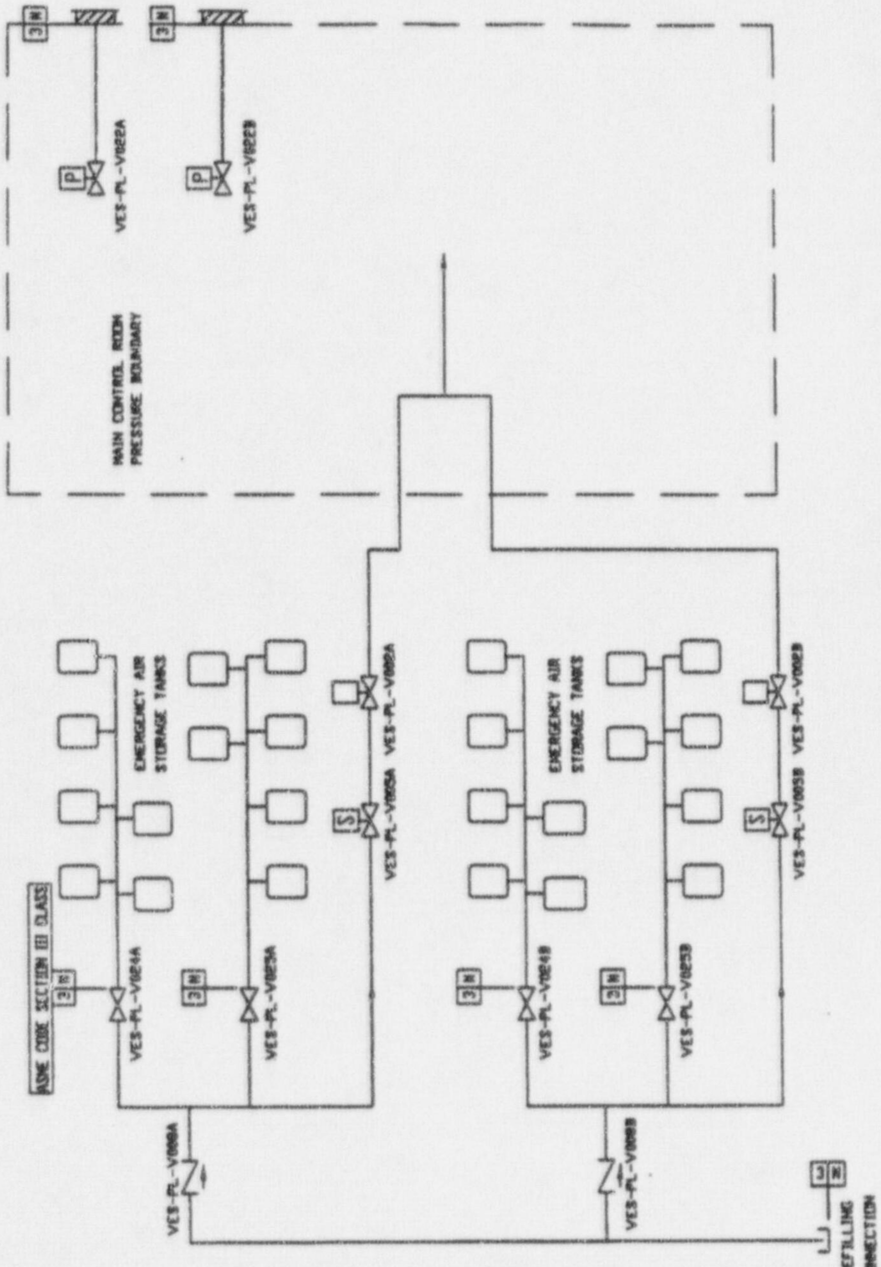

Figure 2.2.5-1
Main Control Room Emergency Habitability System

2.3.1 Component Cooling Water System

Design Description

The component cooling water system (CCS) removes heat from various plant components and transfers this heat to the service water system (SWS).

1. The functional arrangement of the applicable portions of the CCS is as shown in Figure 2.3.1-1.

2. The CCS preserves containment integrity by isolation of the CCS lines penetrating the containment.

3. The CCS provides the nonsafety-related functions of removing decay heat released by fuel in the core during shutdown and decay heat released by fuel in the spent fuel pool.

4. Controls exist in the main control room (MCR) to cause the pumps identified in Table 2.3.1-1 to perform listed functions.

5. Displays of the CCS parameters identified in Table 2.3.1-1 can be retrieved in the MCR.

Inspections, Tests, Analyses, and Acceptance Criteria

Table 2.3.1-2 specifies the inspections, tests, analyses, and associated acceptance criteria for the CCS.

Table 2.3.1-1			
Equipment Name	**Tag No.**	**Display**	**Control Function**
CCS Pump 1A	CCS-MP-01A	Yes (Run Status)	Start
CCS Pump 1B	CCS-MP-01B	Yes (Run Status)	Start
CCS Discharge Header Flow Sensor	CCS-101	Yes	–
CCS to Normal Residual Heat Removal Heat Exchanger (RNS HX) A Flow Sensor	CCS-301	Yes	–
CCS to RNS HX B Flow Sensor	CCS-302	Yes	–
CCS to Spent Fuel Pool Cooling System (SFS) HX A Flow Sensor	CCS-341	Yes	–
CCS to SFS HX B Flow Sensor	CCS-342	Yes	–

Note: Dash (-) indicates not applicable.

Table 2.3.1-2 Inspections, Tests, Analyses, and Acceptance Criteria		
Design Commitment	**Inspections, Tests, Analyses**	**Acceptance Criteria**
1. The functional arrangement of the applicable portions of the CCS is as shown in Figure 2.3.1-1.	Inspection of the as-built system will be performed.	The as-built CCS conforms with the functional arrangement shown in Figure 2.3.1-1.
2. The CCS preserves containment integrity by isolation of the CCS lines penetrating the containment.	See Certified Design Material, subsection 2.2.1, Containment System.	See Certified Design Material, subsection 2.2.1, Containment System.
3. The CCS provides the nonsafety-related functions of removing decay heat released by fuel in the core during shutdown and decay heat released by fuel in the spent fuel pool.	i) Inspection will be performed for the existence of a report that determines the heat transfer capability of the CCS heat exchangers. ii) Testing will be performed to confirm that the CCS can provide cooling water to the RNS HXs while providing cooling water to the SFS HXs.	i) A report exists and concludes that the UA of each CCS heat exchanger is greater than or equal to 9.4 million Btu/hr-°F. ii) Each pump of the CCS can provide at least 2520 gpm of cooling water to one RNS HX and 720 gpm of cooling water to one SFS HX while providing 1160 gpm to other users of cooling water.
4. Controls exist in the MCR to cause the pumps identified in Table 2.3.1-1 to perform listed functions.	Testing will be performed to actuate the pumps identified in Table 2.3.1-1 using controls in the MCR.	Controls in the MCR cause pumps identified in Table 2.3.1-1 to perform the listed actions.
5. Displays of the CCS parameters identified in Table 2.3.1-1 can be retrieved in the MCR.	Inspection will be performed for retrievability in the MCR of the displays identified in Table 2.3.1-1.	Displays of the CCS parameters identified in Table 2.3.1-1 are retrieved in the MCR.

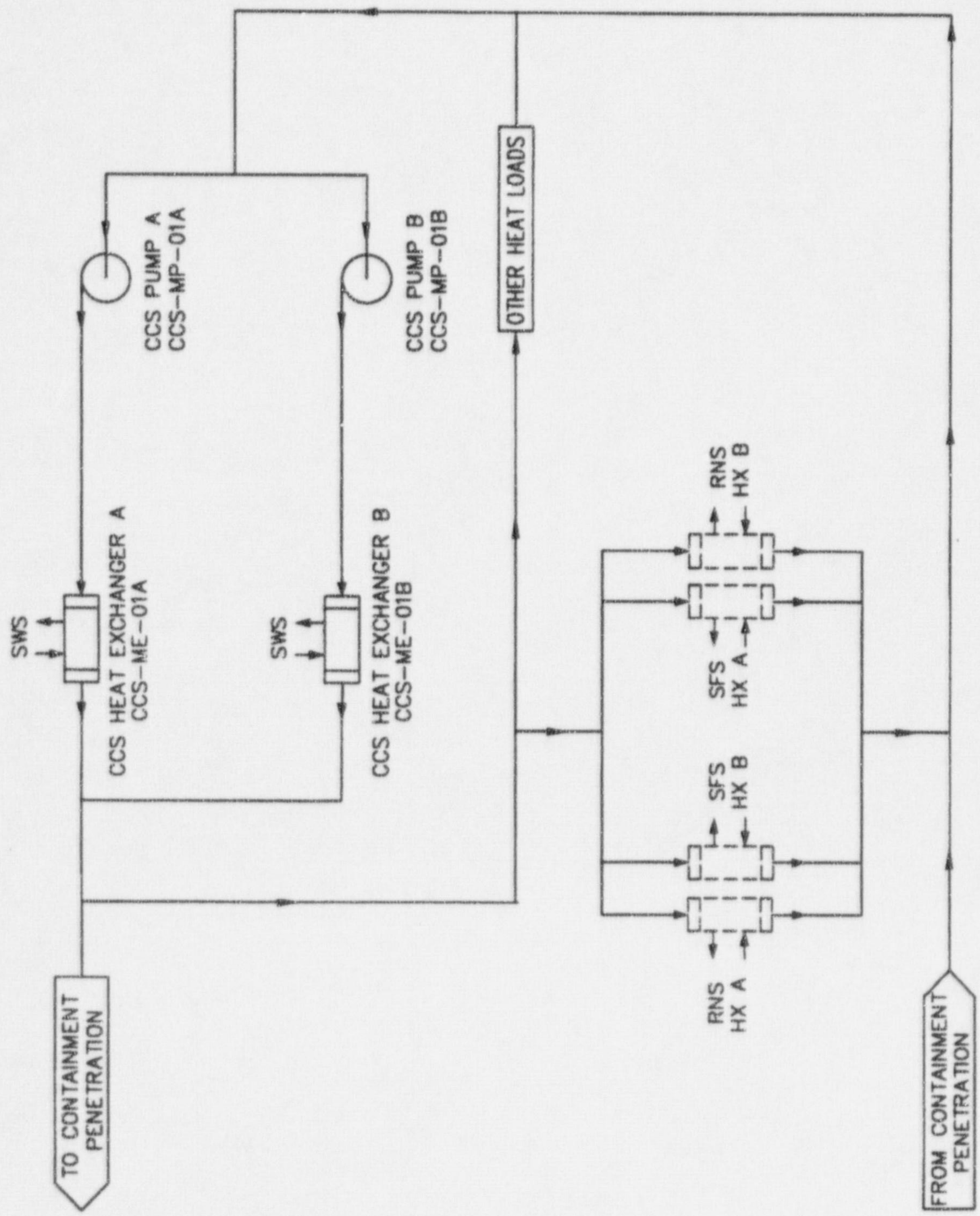

Figure 2.3.1-1
Component Cooling Water System

2.3.2 Chemical and Volume Control System

Design Description

The chemical and volume control system (CVS) maintains the coolant inventory in the reactor coolant system (RCS) and provides for auxiliary pressurizer spray.

1. The functional arrangement of the applicable portions of the CVS is as shown in Figure 2.3.2-1.

2. The American Society of Mechanical Engineers (ASME) Code Section III components and piping shown in Figure 2.3.2-1 retain pressure boundary integrity at their design pressure.

3. The seismic Category I equipment identified in Table 2.3.2-1 can withstand seismic design basis dynamic loads without loss of safety function.

4. The as-built CVS ASME Code Section III piping depicted on Figure 2.3.2-1 meets applicable ASME Section III Code requirements for the CVS design conditions.

5. a) The Class 1E equipment identified in Table 2.3.2-1 as being qualified for a harsh environment can withstand the environmental conditions that would exist before, during, and following a design basis accident without loss of safety function for the time required to perform the safety function.

   b) The Class 1E components identified in Table 2.3.2-1 are powered from their respective Class 1E division.

   c) Separation is provided between CVS Class 1E divisions, and between Class 1E divisions and non-Class 1E cable.

6. The CVS provides the following safety-related functions:

   a) The CVS preserves containment integrity by isolation of the CVS lines penetrating the containment.

   b) The CVS provides termination of an inadvertent RCS boron dilution by isolating demineralized water from the RCS.

   c) The CVS provides isolation of makeup to the RCS.

7. The CVS provides the following nonsafety-related functions:

   a) The CVS provides makeup water to the RCS.

   b) The CVS provides coolant to the pressurizer auxiliary spray line.

8. Safety-related displays in Table 2.3.2-1 can be retrieved in the main control room (MCR).

9. a) Controls exist in the MCR to cause the remotely operated valves identified in Table 2.3.2-1 to perform active functions.

   b) The valves identified in Table 2.3.2-1 as having protection and safety monitoring system (PMS) control perform an active safety function after receiving a signal from the PMS.

10. a) The motor-operated and check valves identified in Table 2.3.2-1 perform an active safety-related function to change position as indicated in the table.

    b) After a loss ¯f motive power, the remotely operated valves identified in Table 2.3.2-1 assume the indicated loss of motive power position.

11. Controls exist in the MCR to cause the pumps identified in Table 2.3.2-2 to perform the listed function.

12. Displays of the CVS parameters identified in Table 2.3.2-2 can be retrieved in the MCR.

Inspections, Tests, Analyses, and Acceptance Criteria

Table 2.3.2-3 specifies the inspections, tests, analyses, and associated acceptance criteria for the CVS.

Table 2.3.2-1								
Equipment Name	**Tag No.**	**Seismic Cat. I**	**Remotely Operated Valve**	**Class 1E/ Qual. for Harsh Envir.**	**Safety-Related Display**	**Control PMS**	**Active Function**	**Loss of Motive Power Position**
RCS Purification Motor-Operated Isolation Valve	CVS-PL-V001	Yes	Yes	Yes/Yes	Yes (Valve Position)	Yes	Transfer Closed	As Is
RCS Purification Motor-Operated Isolation Valve	CVS-PL-V002	Yes	Yes	Yes/Yes	Yes (Valve Position)	Yes	Transfer Closed	As Is
CVS Demineralizer Resin Flush Line Containment Isolation Thermal Relief Valve	CVS-PL-V042	Yes	No	- / -	-	-	Transfer Open/ Transfer Closed	-
CVS Letdown Containment Isolation Valve	CVS-PL-V045	Yes	Yes	Yes/Yes	Yes (Valve Position)	Yes	Transfer Closed	Closed
CVS Letdown Containment Isolation Valve	CVS-PL-V047	Yes	Yes	Yes/No	Yes (Valve Position)	Yes	Transfer Closed	Closed
CVS Purification Return Line Pressure Boundary Isolation Check Valve	CVS-PL-V081	Yes	No	- / -	-	-	Transfer Closed	-
CVS Purification Return Line Pressure Boundary Check Valve	CVS-PL-V082	Yes	No	- / -	-	-	Transfer Closed	-

Note: Dash (-) indicates not applicable.

Table 2.3.2-1 (cont)

Equipment Name	Tag No.	Seismic Cat. I	Remotely Operated Valve	Class1E/ Qual. for Harsh Envir.	Safety-Related Display	Control PMS	Active Function	Loss of Motive Power Position
CVS Auxiliary Pressurizer Spray Line Pressure Boundary Valve	CVS-PL-V084	Yes	Yes	Yes/Yes	No	Yes	Transfer Closed	Closed
CVS Auxiliary Pressurizer Spray Line Pressure Boundary Check Valve	CVS-PL-V085	Yes	No	Yes/Yes	-	-	Transfer Closed	-
CVS Makeup Line Containment Isolation Motor-Operated Valve	CVS-PL-V090	Yes	Yes	Yes/No	Yes (Valve Position)	Yes	Transfer Closed	As Is
CVS Makeup Line Containment Isolation Motor-Operated Valve	CVS-PL-V091	Yes	Yes	Yes/Yes	Yes (Valve Position)	Yes	Transfer Closed	As Is
CVS Hydrogen Addition Line Containment Isolation Valve	CVS-PL-V092	Yes	Yes	Yes/Yes	Yes (Valve Position)	Yes	Transfer Closed	Closed
CVS Hydrogen Addition Line Containment Isolation Check Valve	CVS-PL-V094	Yes	No	- / -	-	-	Transfer Closed	-
CVS Makeup Line Containment Isolation Thermal Relief Valve	CVS-PL-V100	Yes	No	- / -	-	-	Transfer Open/ Transfer Closed	-

Note: Dash (-) indicates not applicable.

Table 2.3.2-1 (cont)								
Equipment Name	Tag No.	Seismic Cat. I	Remotely Operated Valve	Class 1E/ Qual. for Harsh Envir.	Safety-Related Display	Control PMS	Active Function	Loss of Motive Power Position
CVS Demineralized Water Isolation Valve	CVS-PL-V136A	Yes	Yes	Yes/No	Yes (Valve Position)	Yes	Transfer Closed	Closed
CVS Demineralized Water Isolation Valve	CVS-PL-V136B	Yes	Yes	Yes/No	Yes (Valve Position)	Yes	Transfer Closed	Closed

Note: Dash (-) indicates not applicable.

Table 2.3.2-2			
Equipment	Tag No.	Display	Control Function
CVS Makeup Pump 1A	CVS-MP-01A	Yes (Run Status)	Start
CVS Makeup Pump 1B	CVS-MP-01B	Yes (Run Status)	Start
Makeup Pump Discharge Flow Sensor	CVS-157	Yes	-

Note: Dash (-) indicates not applicable.

Table 2.3.2-3
Inspections, Tests, Analyses, and Acceptance Criteria

Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
1. The functional arrangement of the applicable portions of the CVS is as shown in Figure 2.3.2-1.	Inspection of the as-built system will be performed.	The as-built CVS conforms with the functional arrangement shown in Figure 2.3.2-1.
2. The ASME Code Section III components and piping shown in Figure 2.3.2-1 retain pressure boundary integrity at their design pressure.	i) A hydrostatic test will be performed on those ASME Code components required to be hydrostatically tested by the ASME Code Section III.	i) A report exists and concludes that the results of the hydrostatic test of the ASME Code components conform with the requirements in the ASME Code Section III.
	ii) Inspections, including nondestructive examination of the as-built pressure boundary welds, will be performed in accordance with the ASME Code Section III.	ii) A report exists and concludes that the pressure boundary integrity requirements of the ASME Code Section III are met for the quality of pressure boundary welds.
3. The seismic Category I equipment identified in Table 2.3.2-1 can withstand seismic design basis dynamic loads without loss of safety function.	i) Inspection will be performed to verify that the seismic Category I equipment identified in Table 2.3.2-1 is located on the nuclear island.	i) The seismic Category I equipment identified in Table 2.3.2- is located on the nuclear island.
	ii) Type tests, analyses or a combination of type tests and analyses of seismic Category I equipment will be performed.	ii) A report exists and concludes that the seismic Category I equipment can withstand seismic design basis dynamic loads without loss of safety function.
4. The as-built CVS ASME Code Section III piping depicted on Figure 2.3.2-1 meets applicable ASME Section III Code requirements for the CVS design conditions.	i) Inspection will be performed to verify that the CVS ASME Code Section III piping depicted in Figure 2.3.2-1 is located on the nuclear island.	i) The CVS ASME Code Section III piping depicted in Figure 2.3.2-1 is located on the nuclear island.
	ii) A reconciliation analysis using the as designed and as-built piping information will be performed, or an analysis of the as-built piping will be performed.	ii) The as-built piping stress report exists and includes the ASME Code Certified Stress Report.

Table 2.3.2-3 (cont) Inspections, Tests, Analyses, and Acceptance Criteria		
Design Commitment	**Inspections, Tests, Analyses**	**Acceptance Criteria**
	iii) A reconciliation analysis using the as designed and as-built pipe support information will be performed, or an analysis of the as-built supports will be performed.	iii) The as-built pipe support stress report exists and includes the ASME Code Certified Stress Report.
5.a) The Class 1E equipment identified in Table 2.3.2-1 as being qualified for a harsh environment can withstand the environmental conditions that would exist before, during, and following a design basis accident without loss of safety function for the time required to perform the safety function.	Type tests, analyses, or a combination of type tests and analyses will be performed on Class 1E equipment located in a harsh environment.	A report exists and concludes that the Class 1E equipment identified in Table 2.3.2-1 as being qualified for a harsh environment can withstand the environmental conditions that would exist before, during, and following a design basis accident without loss of safety function for the time required to perform the safety function.
5.b) The Class 1E components identified in Table 2.3.2-1 are powered from their respective Class 1E division.	Testing will be performed on the CVS by providing a simulated test signal in each Class 1E division.	A simulated test signal exists at the Class 1E equipment identified in Table 2.3.2-1 when the assigned Class 1E division is provided the test signal.
5.c) Separation is provided between Class 1E divisions, and between Class 1E divisions and non-Class 1E cable.	See Certified Design Material, Section 3.3, Nuclear Island Buildings.	See Certified Design Material, Section 3.3, Nuclear Island Buildings.
6.a) The CVS preserves containment integrity by isolation of the CVS lines penetrating the containment.	See Certified Design Material, subsection 2.2.1, Containment System.	See Certified Design Material, subsection 2.2.1, Containment System.
6.b) The CVS provides termination of an inadvertent RCS boron dilution by isolating demineralized water from the RCS.	See item 9b in this table.	See item 9b in this table.
6.c) The CVS provides isolation of makeup to the RCS.	See item 9b in this table.	See item 9b in this table.

Table 2.3.2-3 (cont)
Inspections, Tests, Analyses, and Acceptance Criteria

Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
7.a) The CVS provides makeup water to the RCS.	i) Testing will be performed by aligning a flow path from each CVS makeup pump, actuating makeup flow to the RCS, and measuring the flow rate in the makeup pump discharge line with each pump suction aligned to the boric acid tank at RCS pressure greater than or equal to 2000 psia. ii) Inspection of the boric acid tank volume will be performed.	i) Each CVS makeup pump provides a flow rate of greater than or equal to 100 gpm. ii) The volume in the boric acid tank is 55,000 gallons between the tank outlet and the low level alarm setpoint.
7.b) The CVS provides coolant to the pressurizer auxiliary spray line.	Testing will be performed by aligning a flow path from each CVS makeup pump to the pressurizer auxiliary spray and measuring the flow rate in the makeup pump discharge line with each pump suction aligned to the boric acid tank at RCS pressure greater than or equal to 2000 psia.	Each CVS makeup pump provides a flow rate of greater than or equal to 100 gpm.
8. Safety-related displays identified in Table 2.3.2-1 can be retrieved in the MCR.	Inspection will be performed for retrievability of the safety-related displays in the MCR.	Safety-related displays identified in Table 2.3.2-1 can be retrieved in the MCR.
9.a) Controls exist in the MCR to cause the remotely operated valves identified in Table 2.3.2-1 to perform active functions.	Stroke testing will be performed on the remotely operated valves identified in Table 2.3.2-1 using the controls in the MCR.	Controls in the MCR operate to cause the remotely operated valves identified in Table 2.3.2-1 to perform active functions.
9.b) The valves identified in Table 2.3.2-1 as having PMS control perform an active safety function after receiving a signal from the PMS.	Testing will be performed using real or simulated signals into the PMS.	The valves identified in Table 2.3.2-1 as having PMS control perform an active safety function after receiving a signal from the PMS.

Table 2.3.2-3 (cont)
Inspections, Tests, Analyses, and Acceptance Criteria

Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
10.a) The motor-operated and check valves identified in Table 2.3.2-1 perform an active safety-related function to change position as indicated in the table.	i) Tests or type tests of motor-operated valves will be performed that demonstrate the capability of the valve to operate under its design conditions. ii) Exercise testing of the check valve active safety functions identified in Table 2.3.2-1 will be performed.	i) A test report exists and concludes that each motor-operated valve changes position as indicated in Table 2.3.2-1 under design conditions. ii) Each check valve changes position.
10.b) After loss of motive power, the remotely operated valves identified in Table 2.3.2-1 assume the indicated loss of motive power position.	Testing of the installed valves will be performed under the conditions of loss of motive power.	Upon loss of motive power, each remotely operated valve identified in Table 2.3.2-1 assumes the indicated loss of motive power position.
11. Controls exist in the MCR to cause the pumps identified in Table 2.3.2-2 to perform the listed function.	Testing will be performed to actuate the pumps identified in Table 2.3.2-2 using controls in the MCR.	Controls in the MCR cause pumps identified in Table 2.3.2-2 to perform the listed function.
12. Displays of the CVS parameters identified in Table 2.3.2-2 can be retrieved in the MCR.	Inspection will be performed for retrievability of the displays identified in Table 2.3.2-2 in the MCR.	Displays identified in Table 2.3.2-2 can be retrieved in the MCR.

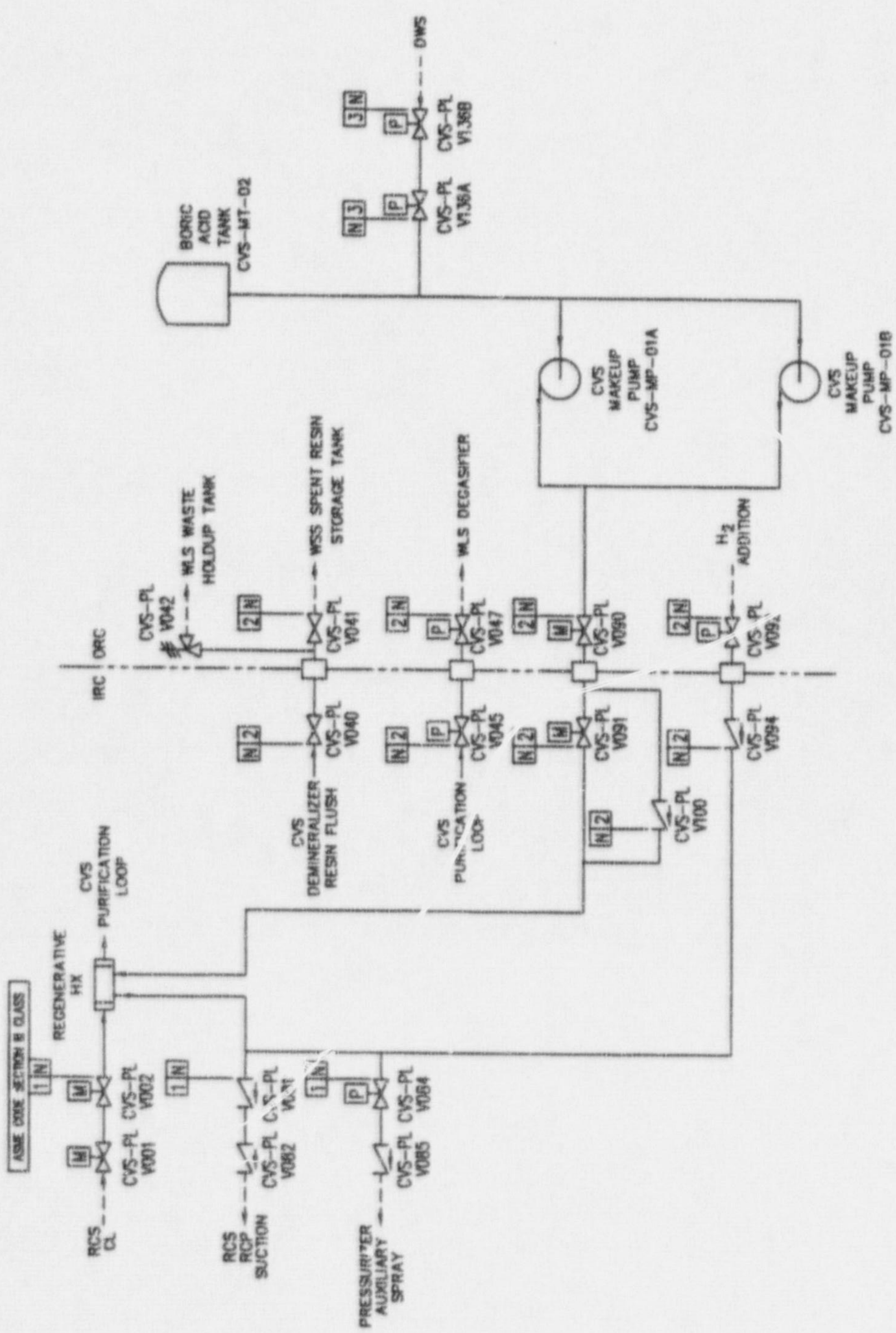

Figure 2.3.2-1
Chemical and Volume Control System

2.3.3 Standby Diesel and Auxiliary Boiler Fuel Oil System

Design Description

A portion of the standby diesel and auxiliary boiler fuel oil system (DOS) supplies diesel fuel oil for the onsite standby power system.

1. The functional arrangement of the applicable portions of the DOS is as shown in Figure 2.3.3-1.

2. The applicable portion of the DOS provides the following nonsafety-related functions:

   a) Each fuel oil storage tank provides for at least 7 days of continuous operation of the associated standby diesel generator.

   b) The fuel oil flow rate to the day tank of each standby diesel generator provides for continuous operation of the associated diesel generator.

3. Controls exist in the main control room (MCR) to cause the pumps identified in Table 2.3.3-1 to perform the listed function.

4. Displays of the DOS parameters identified in Table 2.3.3-1 can be retrieved in the MCR.

Inspections, Tests, Analyses, and Acceptance Criteria

Table 2.3.3-2 specifies the inspections, tests, analyses, and associated acceptance criteria for the DOS.

Table 2.3.3-1			
Equipment Name	Tag No.	Display	Control Function
Diesel Fuel Oil Pump 1A (Motor)	DOS-MP-01A	Yes (Run Status)	Start
Diesel Fuel Oil Pump 1B (Motor)	DOS-MP-01B	Yes (Run Status)	Start
Diesel Generator Fuel Oil Day Tank A Level	DOS-016A	Yes	-
Diesel Generator Fuel Oil Day Tank B Level	DOS-016B	Yes	-

Note: Dash (-) indicates not applicable.

Table 2.3.3-2 Inspections, Tests, Analyses, and Acceptance Criteria		
Design Commitment	**Inspections, Tests, Analyses**	**Acceptance Criteria**
1. The functional arrangement of the applicable portions of the DOS is as shown in Figure 2.3.3-1.	Inspection of the as-built system will be performed.	The as-built DOS conforms with the functional arrangement shown in Figure 2.3.3-1.
2.a) Each fuel oil storage tank provides for at least 7 days of continuous operation of the associated standby diesel generator.	Inspection of each fuel oil storage tank will be performed.	The volume of each fuel oil storage tank is greater than or equal to 55,000 gallons between the diesel generator fuel oil day tank supply connection and the auxiliary boiler supply connection.
2.b) The fuel oil flow rate to the day tank of each standby diesel generator provides for continuous operation of the associated diesel generator.	Testing will be performed to determine the flow rate.	The flow rate delivered to each day tank is 18 gpm or greater.
3. Controls exist in the MCR to cause the pumps identified in Table 2.3.3-1 to perform the listed function.	Testing will be performed to actuate the pumps identified in Table 2.3.3-1 using controls in the MCR.	Controls in the MCR cause pumps identified in Table 2.3.3-1 to perform the listed action.
4. Displays of the DOS parameters identified in Table 2.3.3-1 can be retrieved in the MCR.	Inspection will be performed for retrievability in the MCR of the displays identified in Table 2.3.3-1.	Displays of the DOS parameters identified in Table 2.3.3-1 are retrieved in the MCR.

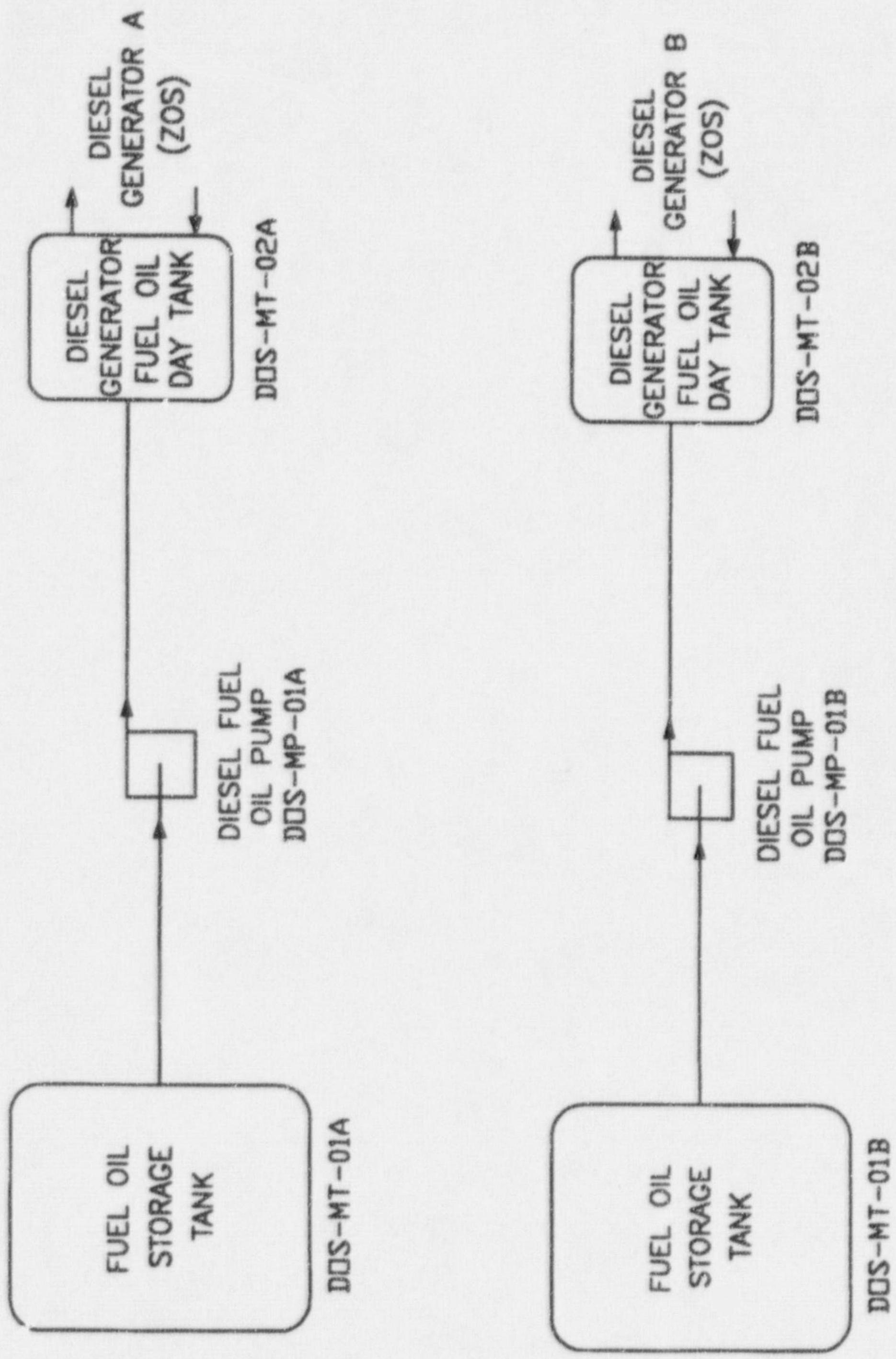

Figure 2.3.3-1
Standby Diesel and Auxiliary Boiler Fuel Oil System

2.3.4 Fire Protection System

Design Description

A portion of the fire protection system (FPS) provides equipment for manual fire fighting in plant areas that contain equipment required for safe shutdown.

1. The functional arrangement of the applicable portions of the FPS is as shown in Figure 2.3.4-1.

2. The FPS piping depicted in Figure 2.3.4-1 remains functional following a safe shutdown earthquake.

3. The applicable portions of the FPS provide the safety-related function of preserving containment integrity by isolation of the FPS line penetrating the containment.

4. The applicable portions of the FPS provide for manual fire fighting capability in plant areas containing equipment required for safe shutdown.

Inspections, Tests, Analyses, and Acceptance Criteria

Table 2.3.4-1 specifies the inspections, tests, analyses, and associated acceptance criteria for the FPS.

Table 2.3.4-1 Inspections, Tests, Analyses, and Acceptance Criteria		
Design Commitment	**Inspections, Tests, Analyses**	**Acceptance Criteria**
1. The functional arrangement of the applicable portions of the FPS is as shown in Figure 2.3.4-1.	Inspection of the as-built system will be performed.	The as-built FPS conforms with the functional arrangement shown in Figure 2.3.4-1.
2. The FPS piping depicted in Figure 2.3.4-1 remains functional following a safe shutdown earthquake.	i) Inspection will be performed to verify that the piping depicted in Figure 2.3.4-1 is located on the nuclear island. ii) A reconciliation analysis using the as-designed and as-built piping information will be performed, or an analysis of the as-built piping will be performed. iii) A reconciliation analysis using the as-designed and as-built pipe support information will be performed, or an analysis of the as-built supports will be performed.	i) The piping depicted in Figure 2.3.4-1 is located on the nuclear island. ii) The as-built piping stress report exists and concludes that the piping remains functional following a safe shutdown earthquake. iii) The as-built pipe support stress report exists and concludes that the piping remains functional following a safe shutdown earthquake.
3. The applicable portions of the FPS provide the safety-related function of preserving containment integrity by isolation of the FPS line penetrating the containment.	See Certified Design Material, subsection 2.2.1, Containment System.	See Certified Design Material, subsection 2.2.1, Containment System.
4. The applicable portions of the FPS provide for manual fire fighting capability in plant areas containing equipment required for safe shutdown.	i) Inspection of the passive containment cooling system (PCS) storage tank will be performed. ii) Testing will be performed by measuring the water flow rate as it is simultaneously discharged from the two highest fire-hose stations and when the water for the fire is supplied from the PCS storage tank. Each standpipe will be individually tested.	i) The volume of the PCS tank available to supply the FPS is at least 18,000 gal. ii) Water is simultaneously discharged from each of the two highest fire-hose stations at not less than 75 gpm.

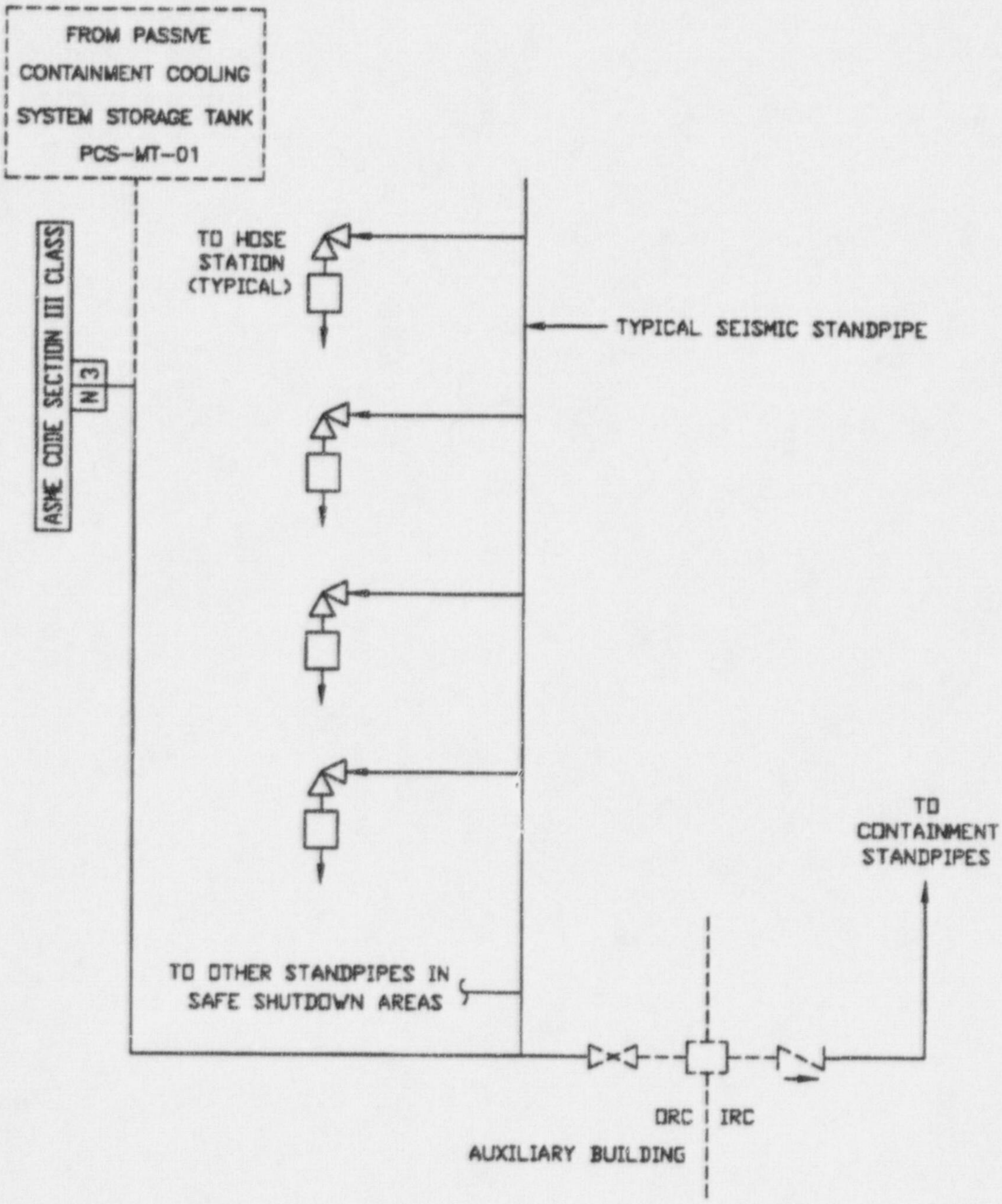

Figure 2.3.4-1
Fire Protection System

2.3.5 Mechanical Handling System

Design Description

The mechanical handling system (MHS) provides for lifting heavy loads.

1. The seismic Category I equipment identified in Table 2.3.5-1 can withstand seismic design basis dynamic loads without loss of safety function.

2. The applicable portion of the MHS provides the following safety-related functions:

   a) The containment polar crane prevents the uncontrolled lowering of a heavy load.

   b) The equipment hatch hoist prevents the uncontrolled lowering of a heavy load.

Inspections, Tests, Analyses, and Acceptance Criteria

Table 2.3.5-2 specifies the inspections, tests, analyses, and associated acceptance criteria for the MHS.

Table 2.3.5-1				
Equipment Name	Tag No.	Seismic Cat. I	Class 1E/ Qual. for Harsh Envir.	Safety Function
Containment Polar Crane	MHS-MH-01	Yes	No/No	Avoid uncontrolled lowering of heavy load
Equipment Hatch Hoist	MHS-MH-05	Yes	No/No	Avoid uncontrolled lowering of heavy load

Table 2.3.5-2
Inspections, Tests, Analyses, and Acceptance Criteria

Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
1. The seismic Category I equipment identified in Table 2.3.5-1 can withstand seismic design basis dynamic loads without loss of safety function.	i) Inspection will be performed to verify that the seismic Category I equipment identified in Table 2.3.5-1 is located on the nuclear island.	i) The seismic Category I equipment identified in Table 2.3.5-1 is located on the nuclear island.
	ii) Type tests, analyses, or a combination of type tests and analyses of seismic Category I equipment will be performed.	ii) A report exists and concludes that the seismic Category I equipment can withstand seismic design basis dynamic loads without loss of safety function.
	iii) Analysis of seismic Category I equipment supports will be performed.	iii) A report exists and concludes that the seismic Category I equipment supports can withstand seismic design basis loads without loss of safety function.
2.a) The containment polar crane prevents the uncontrolled lowering of a heavy load.	Load testing of the main and auxiliary hoists that handle heavy loads will be performed. The test load shall be at least equal to the weight of the reactor vessel head and integrated head package, but not more than 125% of the weight of the reactor vessel head and integrated head package.	The crane lifts the test load, lowers, stops, and holds the test load with the hoist holding brakes.
2.b) The equipment hatch hoist prevents the uncontrolled lowering of a heavy load.	Testing of the redundant hoist holding mechanisms for the main hoist that handles heavy loads will be performed by lowering the hatch at the maximum operating speed.	Each hoist holding mechanism stops and holds the hatch.

2.3.6 Normal Residual Heat Removal System

The normal residual heat removal system (RNS) removes heat from the core and reactor coolant system (RCS) at reduced RCS pressure and temperature conditions after shutdown.

1. The functional arrangement of the applicable portions of the RNS is as shown in Figure 2.3.6-1.

2. The American Society of Mechanical Engineers (ASME) Code Section III components and piping shown in Figure 2.3.6-1 retain pressure boundary integrity at their design pressure.

3. The seismic Category I equipment identified in Table 2.3.6-1 can withstand seismic design basis dynamic loads without loss of safety function.

4. a) The as-built RNS ASME Code Section III piping depicted in Figure 2.3.6-1 meets applicable ASME Section III Code requirements for the RNS design conditions. The RNS design pressure is 900 psi.

   b) Each of the as-built RNS lines identified in Table 2.3.6-2 is designed to meet leak-before-break (LBB) criteria, or an evaluation is performed of the protection from dynamic effects of a rupture of the line.

5. a) The Class 1E equipment identified in Table 2.3.6-1 as being qualified for a harsh environment can withstand the environmental conditions that would exist before, during, and following a design basis accident without loss of safety function for the time required to perform the safety function.

   b) The Class 1E components identified in Table 2.3.6-1 are powered from their respective Class 1E division.

   c) Separation is provided between RNS Class 1E divisions, and between Class 1E divisions and non-Class 1E cable.

6. The RNS provides the following safety-related functions:

   a) The RNS preserves containment integrity by isolation of the RNS lines penetrating the containment.

   b) The RNS provides a flow path for long-term, post-accident makeup to the RCS.

7. The RNS provides the following nonsafety-related functions:

   a) The RNS provides low temperature overpressure protection for the RCS during shutdown operations.

b) The RNS provides heat removal from the reactor coolant during shutdown operations.

c) The RNS provides low pressure makeup flow from the in-containment refueling water storage tank (IRWST) to the RCS for scenarios following actuation of the automatic depressurization system (ADS).

8. Safety-related displays identified in Table 2.3.6-1 can be retrieved in the main control room (MCR).

9. a) Controls exist in the MCR to cause those remotely operated valves identified in Table 2.3.6-1 to perform active functions.

   b) The valves identified in Table 2.3.6-1 as having protection and safety monitoring system (PMS) control perform active safety functions after receiving a signal from the PMS.

10. a) The motor-operated and check valves identified in Table 2.3.6-1 perform an active safety-related function to change position as indicated in the table.

    b) After loss of motive power, the remotely operated valves identified in Table 2.3.6-1 assume the indicated loss of motive power position.

11. Controls exist in the MCR to cause the pumps identified in Table 2.3.6-3 to perform the listed function.

12. Displays of the RNS parameters identified in Table 2.3.6-3 can be retrieved in the MCR.

Inspections, Tests, Analyses, and Acceptance Criteria

Table 2.3.6-4 specifies the inspections, tests, analyses, and associated acceptance criteria for the RNS.

Table 2.3.6-1

Equipment Name	Tag No.	Seismic Cat. I	Remotely Operated Valve	Class 1E/ Qual. for Harsh Envir.	Safety-Related Display	Control PMS	Active Function	Loss of Motive Power Position
RNS Pump 1A (Pressure Boundary)	RNS-MP-01A	Yes	-	-/-	-	-	No	-
RNS Pump 1B (Pressure Boundary)	RNS-MP-01B	Yes	-	-/-	-	-	No	-
RNS Heat Exchanger 1A (Tube Side)	RNS-ME-01A	Yes	-	-/-	-	-	-	-
RNS Heat Exchanger 1B (Tube Side)	RNS-ME-01B	Yes	-	-/-	-	-	-	-
RCS Inner Hot Leg Suction Motor-Operated Isolation Valve	RNS-PL-V001A	Yes	Yes	Yes/Yes	Yes (Valve Position)	Yes	Transfer Closed	As Is
RCS Inner Hot Leg Suction Motor-Operated Isolation Valve	RNS-PL-V001B	Yes	Yes	Yes/Yes	Yes (Valve Position)	Yes	Transfer Closed	As Is
RCS Outer Hot Leg Suction Motor-Operated Isolation Valve	RNS-PL-V002A	Yes	Yes	Yes/Yes	Yes (Valve Position)	Yes	Transfer Closed	As Is
RCS Outer Hot Leg Suction Motor-Operated Isolation Valve	RNS-PL-V002B	Yes	Yes	Yes/Yes	Yes (Valve Position)	Yes	Transfer Closed	As Is

Note: Dash (-) indicates not applicable.

Table 2.3.6-1 (cont)								
Equipment Name	**Tag No.**	**Seismic Cat. I**	**Remotely Operated Valve**	**Class 1E/ Qual. for Harsh Envir.**	**Safety-Related Display**	**Control PMS**	**Active Function**	**Loss of Motive Power Position**
RCS Pressure Boundary Thermal Relief Check Valve	RNS-PL-V003A	Yes	No	-/-	No	-	Transfer Open/ Transfer Closed	-
RCS Pressure Boundary Thermal Relief Check Valve	RNS-PL-V003B	Yes	No	-/-	No	-	Transfer Open/ Transfer Closed	-
RNS Discharge Motor-Operated Containment Isolation Valve	RNS-PL-V011	Yes	Yes	Yes/No	Yes (Valve Position)	Yes	Transfer Closed	As Is
RNS Discharge Header Containment Isolation Check Valve	RNS-PL-V013	Yes	No	-/-	No	-	Transfer Closed	-
RNS Discharge RCS Pressure Boundary Check Valve	RNS-PL-V015A	Yes	No	-/-	No	-	Transfer Closed	-
RNS Discharge RCS Pressure Boundary Check Valve	RNS-PL-V015B	Yes	No	-/-	No	-	Transfer Closed	-
RNS Discharge RCS Pressure Boundary Check Valve	RNS-PL-V017A	Yes	No	-/-	No	-	Transfer Closed	-
RNS Discharge RCS Pressure Boundary Check Valve	RNS-PL-V017B	Yes	No	-/-	No	-	Transfer Closed	-

Note: Dash (-) indicates not applicable.

Table 2.3.6-1 (cont)								
Equipment Name	Tag No.	Seismic Cat. I	Remotely Operated Valve	Class 1E/ Qual. for Harsh Envir.	Safety-Related Display	Control PMS	Active Function	Loss of Motive Power Position
RNS Hot Leg Suction Pressure Relief Valve	RNS-PL-V021	Yes	No	-/-	No	-	Transfer Open/ Transfer Closed	-
RNS Suction Header Motor-Operated Containment Isolation Valve	RNS-PL-V022	Yes	Yes	Yes/No	Yes (Valve Position)	Yes	Transfer Closed	As Is
RNS Suction from IRWST Motor-Operated Isolation Valve	RNS-PL-V023	Yes	Yes	Yes/Yes	Yes (Valve Position)	Yes	Transfer Closed	As Is
RNS Heat Exchanger A Channel Head Drain Valve	RNS-PL-V046	Yes	No	-/-	No	-	Transfer Open	-
RNS Return from CVS Containment Isolation Check Valve	RNS-PL-V061	Yes	No	-/-	No	-	Transfer Closed	-

Note: Dash (-) indicates not applicable.

Table 2.3.6-2	
Line Name	**Line No.**
RNS Suction Line, from the RCS Hot Leg Connection to the RCS Side of Valves RNS-PL-V001A and RNS-PL-V001B	RNS-BTA-L001 RNS-BTA-L002A RNS-BTA-L002B

Table 2.3.6-3			
Equipment Name	**Tag No.**	**Display**	**Control Function**
RNS Pump 1A (Motor)	RNS-MP-01A	Yes (Run Status)	Start
RNS Pump 1B (Motor)	RNS-MP-01B	Yes (Run Status)	Start
RNS Flow Sensor	RNS-01A	Yes	-
RNS Flow Sensor	RNS-01B	Yes	-

Note: Dash (-) indicates not applicable.

Table 2.3.6-4
Inspections, Tests, Analyses, and Acceptance Criteria

Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
1. The functional arrangement of the applicable portions of the RNS is as shown in Figure 2.3.6-1.	Inspection of the as-built system will be performed.	The as-built RNS conforms with the functional arrangement shown in Figure 2.3.6-1.
2. The ASME Code Section III components and piping shown in Figure 2.3.6-1 retain pressure boundary integrity at their design pressure.	i) A hydrostatic test will be performed on those ASME Code components required to be hydrostatically tested by the ASME Code Section III.	i) A report exists and concludes that the results of the hydrostatic test of the ASME Code components conform with the requirements in the ASME Code Section III.
	ii) Inspections, including nondestructive examination of the as-built pressure boundary welds, will be performed in accordance with the ASME Code Section III.	ii) A report exists and concludes that the pressure boundary integrity requirements of the ASME Code Section III are met for the quality of pressure boundary welds.
3. The seismic Category I equipment identified in Table 2.3.6-1 can withstand seismic design basis dynamic loads without loss of safety function.	i) Inspection will be performed to verify that the seismic Category I equipment identified in Table 2.3.6-1 is located on the nuclear island.	i) The seismic Category I equipment identified in Table 2.3.6-1 is located on the nuclear island.
	ii) Type tests, analyses, or a combination of type tests and analyses of seismic Category I equipment will be performed.	ii) A report exists and concludes that the seismic Category I equipment can withstand seismic design basis dynamic loads without loss of safety function.
	iii) Analysis of seismic Category I equipment supports will be performed.	iii) A report exists and concludes that the seismic Category I equipment supports can withstand seismic design basis loads without loss of their safety function.

Table 2.3.6-4 (cont) Inspections, Tests, Analyses, and Acceptance Criteria		
Design Commitment	**Inspections, Tests, Analyses**	**Acceptance Criteria**
4.a) The as-built RNS ASME Code Section III piping depicted in Figure 2.3.6-1 meets applicable ASME Section III Code requirements for the RNS design conditions. The RNS design pressure is 900 psi.	i) Inspection will be performed to verify that the RNS ASME Code Section III piping depicted in Figure 2.3.6-1 is located on the nuclear island.	i) The RNS ASME Code Section III piping depicted in Figure 2.3.6-1 is located on the nuclear island.
	ii) A reconciliation analysis using the as-designed and as-built piping information will be performed, or an analysis of the as-built piping will be performed.	ii) The as-built piping stress report exists and includes the ASME Code Certified Stress Report.
	iii) A reconciliation analysis using the as-designed and as-built pipe support information will be performed, or an analysis of the as-built supports will be performed.	iii) The as-built pipe support stress report exists and includes the ASME Code Certified Stress Report.
4.b) Each of the as-built RNS lines identified in Table 2.3.6-2 is designed to meet LBB criteria, or an evaluation is performed of the protection from dynamic effects of a rupture of the line.	Inspection will be performed for the existence of a LBB evaluation report, or an evaluation report on the protection from dynamic effects of a pipe break. Certified Design Material, Section 3.3, Nuclear Island Buildings, contains the design descriptions and inspections, tests, analyses, and acceptance criteria for protection from the dynamic effects of pipe rupture.	A LBB evaluation report exists and concludes that the LBB acceptance criteria are met by the as-built RNS piping and piping materials, or a pipe break evaluation report exists and concludes that protection from the dynamic effects of a line break is provided.

Table 2.3.6-4 (cont) Inspections, Tests, Analyses, and Acceptance Criteria		
Design Commitment	**Inspections, Tests, Analyses**	**Acceptance Criteria**
5.a) The Class 1E equipment identified in Tables 2.3.6-1 as being qualified for a harsh environment can withstand the environmental conditions that would exist before, during, and following a design basis accident without loss of safety function for the time required to perform the safety function.	Type tests, analyses or a combination of type tests and analyses will be performed on Class 1E equipment located in a harsh environment.	A report exists and concludes that the Class 1E equipment identified in Table 2.3.6-1 as being qualified for a harsh environment can withstand the environmental conditions that would exist before, during, and following a design basis accident without loss of safety function for the time required to perform the safety function.
5.b) The Class 1E components identified in Table 2.3.6-1 are powered from their respective Class 1E division.	Testing will be performed on the RNS by providing a simulated test signal in each Class 1E division.	A simulated test signal exists at the Class 1E equipment identified in Table 2.3.6-1 when the assigned Class 1E division is provided the test signal.
5.c) Separation is provided between RNS Class 1E divisions, and between Class 1E divisions and non-Class 1E cable.	See Certified Design Material, Section 3.3, Nuclear Island Buildings.	See Certified Design Material, Section 3.3, Nuclear Island Buildings.
6.a) The RNS preserves containment integrity by isolation of the RNS lines penetrating the containment.	See Certified Design Material, subsection 2.2.1, Containment System.	See Certified Design Material, subsection 2.2.1, Containment System.
6.b) The RNS provides a flow path for long term, post-accident makeup to the RCS.	See item 1 in this table.	See item 1 in this table.
7.a) The RNS provides low temperature overpressure protection for the RCS during shutdown operations.	i) Inspections will be conducted on the low temperature overpressure protection relief valve to confirm that the capacity of the vendor code plate rating is greater than or equal to system relief requirements. ii) A test will be performed to demonstrate that the relief valve opens at the set pressure.	i) The rated capacity recorded on the valve vendor code plate equals or exceeds the capacity assumed in the low temperature overpressure protection analysis. ii) The relief valve opens at a pressure less than or equal to the value assumed in the low temperature overpressure protection analysis.

Table 2.3.6-4 (cont) Inspections, Tests, Analyses, and Acceptance Criteria		
Design Commitment	**Inspections, Tests, Analyses**	**Acceptance Criteria**
7.b) The RNS provides heat removal from the reactor coolant during shutdown operations.	i) Inspection will be performed for the existence of a report that determines the heat removal capability of the RNS heat exchangers. ii) Testing will be performed to confirm that the RNS can provide flow through the RNS heat exchangers when the pump suction is aligned to the RCS hot leg and the discharge is aligned to both passive core cooling system (PXS) and direct vessel injection (DVI) lines.	i) A report exists and concludes that the UA of each RNS heat exchanger is greater than or equal to 2.0 million Btu/hr-°F. ii) Each RNS pump provides at least 900 gpm net flow to the RCS.
7.c) The RNS provides low pressure makeup flow from the IRWST to the RCS for scenarios following actuation of the ADS.	Testing will be performed to confirm that the RNS can provide low pressure makeup flow from the IRWST to the RCS when the pump suction is aligned to the IRWST and the discharge is aligned to both PXS DVI lines with RCS at atmospheric pressure.	Each RNS pump provides at least 925 gpm net flow to the RCS.
8. Safety-related displays identified in Table 2.3.6-1 can be retrieved in the MCR.	Inspection will be performed for retrievability of the safety-related displays in the MCR.	Safety-related displays identified in Table 2.3.6-1 can be retrieved in the MCR.
9.a) Controls exist in the MCR to cause those remotely operated valves identified in Table 2.3.6-1 to perform active functions.	Stroke testing will be performed on the remotely operated valves identified in Table 2.3.6-1 using the controls in the MCR.	Controls in the MCR operate to cause those remotely operated valves identified in Table 2.3.6-1 to perform active functions.
9.b) The valves identified in Table 2.3.6-1 as having PMS control perform an active safety function after receiving a signal from the PMS.	Testing will be performed using real or simulated signals into the PMS.	The valves identified in Table 2.3.6-1 as having PMS control perform an active safety function after receiving a signal from the PMS.

Table 2.3.6-4 (cont)
Inspections, Tests, Analyses, and Acceptance Criteria

Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
10.a) The motor-operated and check valves identified in Table 2.3.6-1 perform an active safety-related function to change position as indicated in the table.	i) Tests or type tests of motor-operated valves will be performed that demonstrate the capability of the valve to operate under its design conditions. ii) Exercise testing of the check valves active safety functions identified in Table 2.3.6-1 will be performed.	i) A test report exists and concludes that each motor-operated valve changes position as indicated in Table 2.3.6-1 under design conditions. ii) Each check valve changes position.
10.b) After loss of motive power, the remotely operated valves identified in Table 2.3.6-1 assume the indicated loss of motive power position.	Testing of the installed valves will be performed under the conditions of loss of motive power.	Upon loss of motive power, each remotely operated valve identified in Table 2.3.6-1 assumes the indicated loss of motive power position.
11. Controls exist in the MCR to cause the pumps identified in Table 2.3.6-3 to perform the listed function.	Testing will be performed to actuate the pumps identified in Table 2.3.6-3 using controls in the MCR.	Controls in the MCR cause pumps identified in Table 2.3.6-3 to perform the listed action.
12. Displays of the RNS parameters identified in Table 2.3.6-3 can be retrieved in the MCR.	Inspection will be performed for retrievability in the MCR of the displays identified in Table 2.3.6-3.	Displays of the RNS parameters identified in Table 2.3.6-3 are retrieved in the MCR.

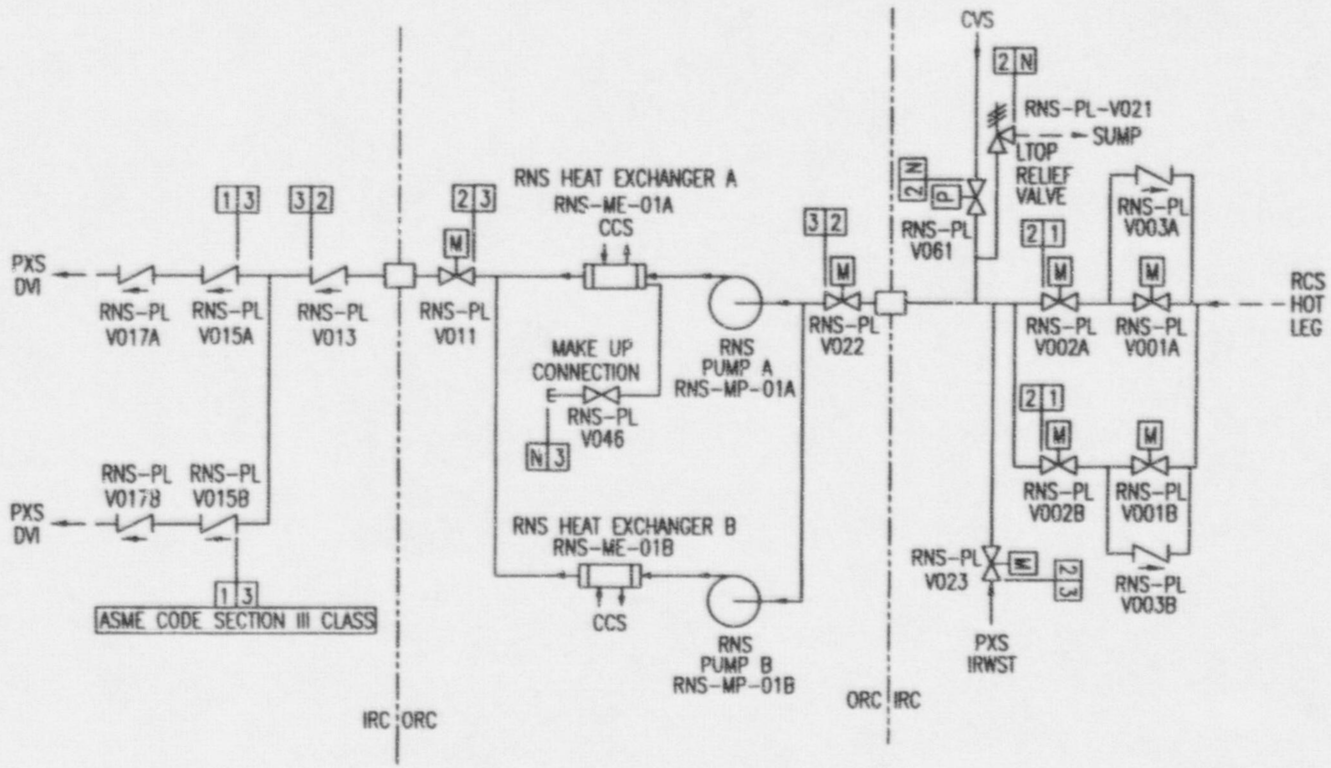

Figure 2.3.6-1
Normal Residual Heat Removal System

2.3.7 Spent Fuel Pool Cooling System

Design Description

The spent fuel pool cooling system (SFS) removes decay heat from the water in the spent fuel pool and transfers the heat to the component cooling water system.

1. The functional arrangement of the applicable portions of the SFS is as shown in Figure 2.3.7-1.

2. The American Society of Mechanical Engineers (ASME) Code Section III components and piping shown in Figure 2.3.7-1 retain pressure boundary integrity at their design pressure.

3. The seismic Category I equipment identified in Table 2.3.7-1 can withstand seismic design basis dynamic loads without loss of safety function.

4. The as-built SFS ASME Code Section III piping depicted in Figure 2.3.7-1 meets applicable ASME Section III Code requirements for the SFS design conditions.

5. a) The Class 1E equipment identified in Table 2.3.7-1 as being qualified for a harsh environment can withstand the environmental conditions that would exist before, during, and following a design basis accident without loss of safety function for the time required to perform the safety function.

   b) The Class 1E components identified in Table 2.3.7-1 are powered from their respective Class 1E division.

   c) Separation is provided between SFS Class 1E divisions, and between Class 1E divisions and non-Class 1E cable.

6. The SFS provides the following safety-related functions:

   a) The SFS preserves containment integrity by isolation of the SFS lines penetrating the containment.

   b) The SFS provides sufficient inventory in the spent fuel pool (SFP) for 72 hours of spent fuel cooling following loss of normal spent fuel pool cooling.

   c) The SFS provides a flow path for long-term makeup to the spent fuel pool.

7. The SFS provides the nonsafety-related function of removing spent fuel decay heat.

8. Safety-related displays of the SFS parameters identified in Table 2.3.7-1 can be retrieved in the main control room (MCR).

9. Controls exist in the MCR to cause the pumps identified in Table 2.3.7-2 to perform their listed functions.

10. Displays of the SFS parameters identified in Table 2.3.7-2 can be retrieved in the MCR.

Inspections, Tests, Analyses, and Acceptance Criteria

Table 2.3.7-3 specifies the inspections, tests, analyses, and associated acceptance criteria for the SFS.

Table 2.3.7-1

Equipment Name	Tag No.	Seismic Cat. I	Class 1E/ Qual. for Harsh Envir.	Safety-Related Display
Spent Fuel Pool Level Sensor	SFS-019A	Yes	Yes/Yes	Yes
Spent Fuel Pool Level Sensor	SFS-019B	Yes	Yes/Yes	Yes

Table 2.3.7-2

Equipment Name	Tag No.	Display	Control Function
SFS Pump 1A	SFS-MP-01A	Yes (Run Status)	Start
SFS Pump 1B	SFS-MP-01B	Yes (Run Status)	Start
SFS Flow Sensor	SFS-13A	Yes	–
SFS Flow Sensor	SFS-13B	Yes	–

Note: Dash (-) indicates not applicable.

Table 2.3.7-3
Inspections, Tests, Analyses, and Acceptance Criteria

Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
1. The functional arrangement of the applicable portions of the SFS is as shown in Figure 2.3.7-1.	Inspection of the as-built system will be performed.	The as-built SFS conforms with the functional arrangement shown in Figure 2.3.7-1.
2. The ASME Code Section III components and piping shown in Figure 2.3.7-1 retain pressure boundary integrity at their design pressure.	i) A hydrostatic test will be performed on those ASME Code components required to be hydrostatically tested by the ASME Code Section III. ii) Inspections, including nondestructive examination of the as-built pressure boundary welds, will be performed in accordance with the ASME Code Section III.	i) A report exists and concludes that the results of the hydrostatic test of the ASME Code components conform with the requirements in the ASME Code Section III. ii) A report exists and concludes that the pressure boundary integrity requirements of the ASME Code Section III are met for the quality of pressure boundary welds.
3. The seismic Category I equipment identified in Table 2.3.7-1 can withstand design basis dynamic loads without loss of safety function.	i) Inspection will be performed to verify that the seismic Category I equipment identified in Table 2.3.7-1 is located on the nuclear island. ii) Type tests, analyses, or a combination of type tests and analyses of seismic Category I equipment will be performed.	i) The seismic Category I equipment identified in Table 2.3.7-1 is located on the nuclear island. ii) A report exists and concludes that the seismic Category I equipment can withstand seismic design basis dynamic loads without loss of safety function.

Table 2.3.7-3 (cont) Inspections, Tests, Analyses, and Acceptance Criteria		
Design Commitment	**Inspections, Tests, Analyses**	**Acceptance Criteria**
4. The as-built SFS ASME Code Section III piping depicted in Figure 2.3.7-1 meets applicable ASME Code Section III requirements for the SFS design conditions.	i) Inspection will be performed to verify that the SFS ASME Code Section III piping depicted in Figure 2.3.7-1 is located on the nuclear island. ii) A reconciliation analysis using the as-designed and as-built piping information will be performed, or an analysis of the as-built piping will be performed. iii) A reconciliation analysis using the as-designed and as-built pipe support information will be performed, or an analysis of the as-built supports will be performed.	i) The SFS ASME Code Section III piping depicted in Figure 2.3.7-1 is located on the nuclear island. ii) The as-built piping stress report exists and includes the ASME Code Certified Stress Report. iii) The as-built pipe support stress report exists and includes the ASME Code Certified Stress Report.
5.a) The Class 1E equipment identified in Table 2.3.7-1 as being qualified for a harsh environment can withstand the environmental conditions that would exist before, during, and following a design basis accident without loss of safety function for the time required to perform the safety function.	Type tests, analyses, or a combination of type tests and analyses will be performed on Class 1E equipment located in a harsh environment.	A report exists and concludes that the Class 1E equipment identified in Table 2.3.7-1 as being qualified for a harsh environment can withstand the environmental conditions that would exist before, during, and following a design basis accident without loss of safety function for the time required to perform the safety function.
5.b) The Class 1E components identified in Table 2.3.7-1 are powered from their respective Class 1E division.	Testing will be performed on the SFS by providing a simulated test signal in each Class 1E division.	A simulated test signal exists at the Class 1E components identified in Table 2.3.7-1 when the assigned Class 1E division is provided the test signal.
5.c) Separation is provided between SFS Class 1E divisions, and between Class 1E divisions and non-Class 1E cable.	See Certified Design Material, Section 3.3, Nuclear Island Buildings.	See Certified Design Material, Section 3.3, Nuclear Island Buildings.
6.a) The SFS preserves containment integrity by isolation of the SFS lines penetrating the containment.	See Certified Design Material, subsection 2.2.1, Containment System.	See Certified Design Material, subsection 2.2.1, Containment System.

Table 2.3.7-3 (cont) Inspections, Tests, Analyses, and Acceptance Criteria		
Design Commitment	**Inspections, Tests, Analyses**	**Acceptance Criteria**
6.b) The SFS provides sufficient inventory in the SFP for 72 hours of spent fuel cooling following loss of normal spent fuel pool cooling.	Inspection will be performed to verify that the SFP includes sufficient volume of water to provide 72 hours of spent fuel cooling.	The combined volume of the spent fuel pool, fuel transfer canal, and gate area–which connects the pool and canal between the elevations of the normal spent fuel cooling system pump suction connection to the pool and the bottom of the gate–is at least 58,000 gallons.
6.c) The SFS provides a flow path for long-term makeup to the spent fuel pool.	See item 1 in this table.	See item 1 in this table.
7. The SFS provides the nonsafety-related function of removing spent fuel decay heat.	i) Inspection will be performed for the existence of a report that determines the heat removal capability of the SFS heat exchangers. ii) Testing will be performed to confirm that each SFS pump provides flow through its heat exchanger when taking suction from the SFP and returning flow to the SFP.	i) A report exists and concludes that the heat transfer characteristic, UA, of each SFS heat exchanger is greater than or equal to 1.48 million Btu/hr-°F. ii) Each SFS pump produces at least 675 gpm through its heat exchanger.
8. Safety-related displays identified in Table 2.3.7-1 can be retrieved in the MCR.	Inspection will be performed for retrievability of the safety-related displays in the MCR.	Safety-related displays identified in Table 2.3.7-1 can be retrieved in the MCR.
9. Controls exist in the MCR to cause the pumps identified in Table 2.3.7-2 to perform their listed functions.	Testing will be performed to actuate the pumps identified in Table 2.3.7-2 using controls in the MCR.	Controls in the MCR cause pumps identified in Table 2.3.7-2 to perform the listed functions.
10. Displays of the SFS parameters identified in Table 2.3.7-2 can be retrieved in the MCR.	Inspection will be performed for retrievability in the MCR of the displays identified in Table 2.3.7-2.	Displays of the SFS parameters identified in Table 2.3.7-2 are retrieved in the MCR.

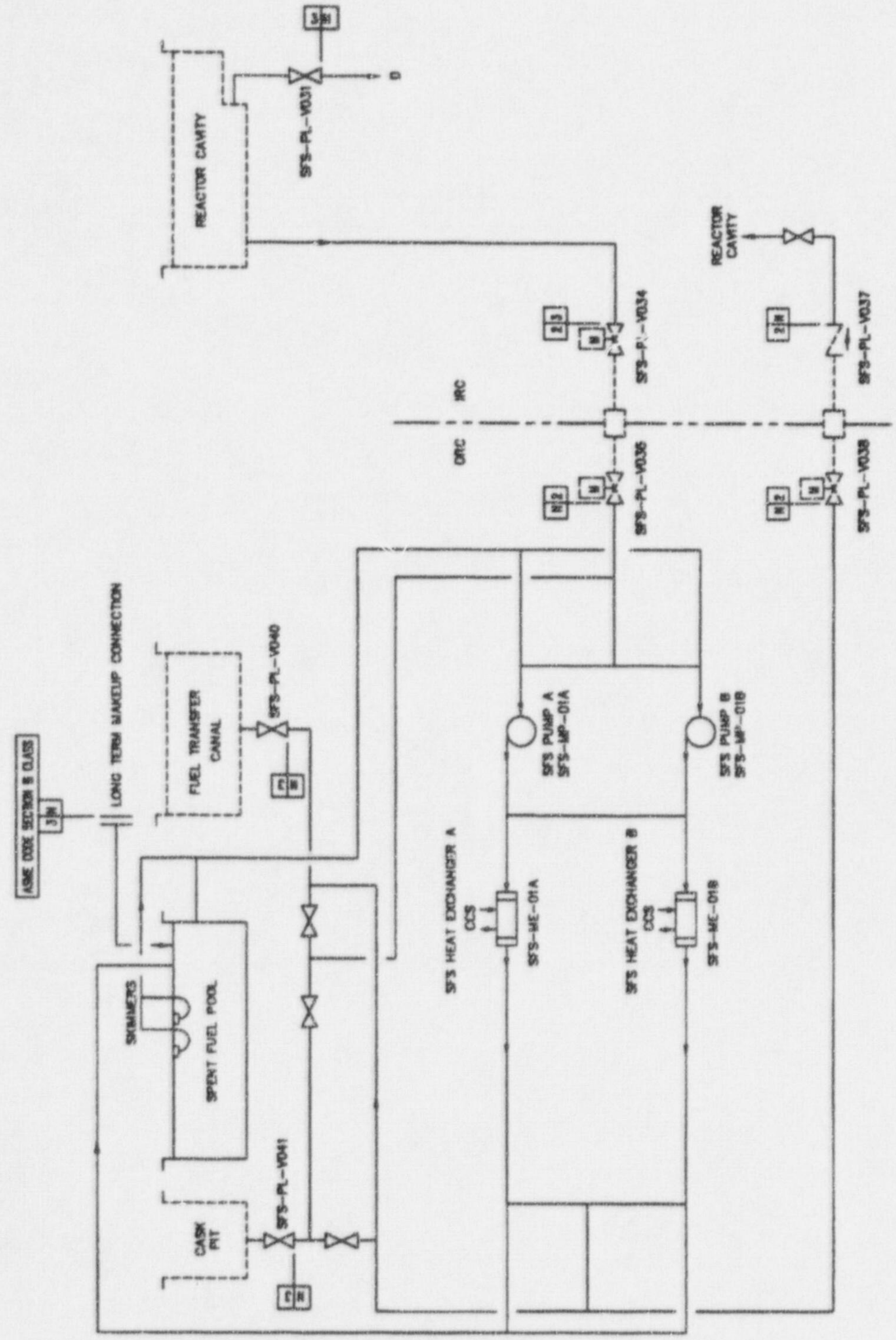

Figure 2.3.7-1
Spent Fuel Pool Cooling System

2.3.8 Service Water System

Design Description

The service water system (SWS) transfers heat from the component cooling water heat exchangers to the atmosphere.

1. The functional arrangement of the SWS is as shown in Figure 2.3.8-1.

2. The SWS provides the following nonsafety-related functions:

   a) The SWS provides flow through the component cooling water system (CCS) component cooling water heat exchangers.

   b) The SWS cooling tower transfers heat from the SWS to the surrounding atmosphere.

   c) The SWS provides for a storage capacity of water.

3. Controls exist in the main control room (MCR) to cause the equipment identified in Table 2.3.8-1 to perform the listed function.

4. Displays of the SWS parameters identified in Table 2.3.8-1 can be retrieved in the MCR.

Inspections, Tests, Analyses, and Acceptance Criteria

Table 2.3.8-2 specifies the inspections, tests, analyses, and associated acceptance criteria for the SWS.

Table 2.3.8-1			
Equipment Name	**Tag No.**	**Display**	**Control Function**
Service Water Pump A (Motor)	SWS-MP-01A	Yes (Run Status)	Start
Service Water Pump B (Motor)	SWS-MP-01B	Yes (Run Status)	Start
Service Water Cooling Tower Fan A (Motor)	SWS-MA-01A	Yes (Run Status)	Start
Service Water Cooling Tower Fan B (Motor)	SWS-MA-01A	Yes (Run Status)	Start
Service Water Pump 1A Flow Sensor	SWS-004A	Yes	-
Service Water Pump 1B Flow Sensor	SWS-004B	Yes	-
Secondary Fire Water Tank Level	FPS-03B	Yes	-

Note: Dash (-) indicates not applicable.

Table 2.3.8-2
Inspections, Tests, Analyses, and Acceptance Criteria

Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
1. The functional arrangement of the SWS is as shown in Figure 2.3.8-1.	Inspection of the as-built system will be performed.	The as-built SWS conforms with the functional arrangement shown in Figure 2.3.8-1.
2.a) The SWS provides flow through the CCS component cooling water heat exchangers.	Testing will be performed to confirm that the SWS can provide cooling water to the CCS heat exchangers.	Each SWS pump can provide at least 6200 gpm of cooling water through its CCS heat exchanger.
2.b) The SWS cooling tower transfers heat from the SWS to the surrounding atmosphere.	Inspection will be performed for the existence of a report that determines the heat transfer capability of each cooling tower cell.	A report exists and concludes that the heat transfer rate of each cooling tower cell is greater than or equal to 86.5 million Btu/hr at a 80°F ambient wet bulb temperature and a cold water temperature of 88.5°F.
2.c) The SWS provides for a storage capacity of water.	Inspection of the service water cooling tower basin and the secondary fire water tank will be performed.	The volume of the secondary fire water tank above the fire protection system (FPS) standpipe and the volume service water cooling tower basin combined is greater than or equal to 150,000 gallons.
3. Controls exist in the MCR to cause the equipment identified in Table 2.3.8-1 to perform the listed function.	Testing will be performed to actuate the equipment identified in Table 2.3.8-1 using controls in the MCR.	Controls in the MCR cause the equipment identified in Table 2.3.8-1 to perform the listed action.
4. Displays of the SWS parameters identified in Table 2.3.8-1 can be retrieved in the MCR.	Inspection will be performed for retrievability in the MCR of the displays identified in Table 2.3.8-1.	Displays of the SWS parameters identified in Table 2.3.8-1 are retrieved in the MCR.

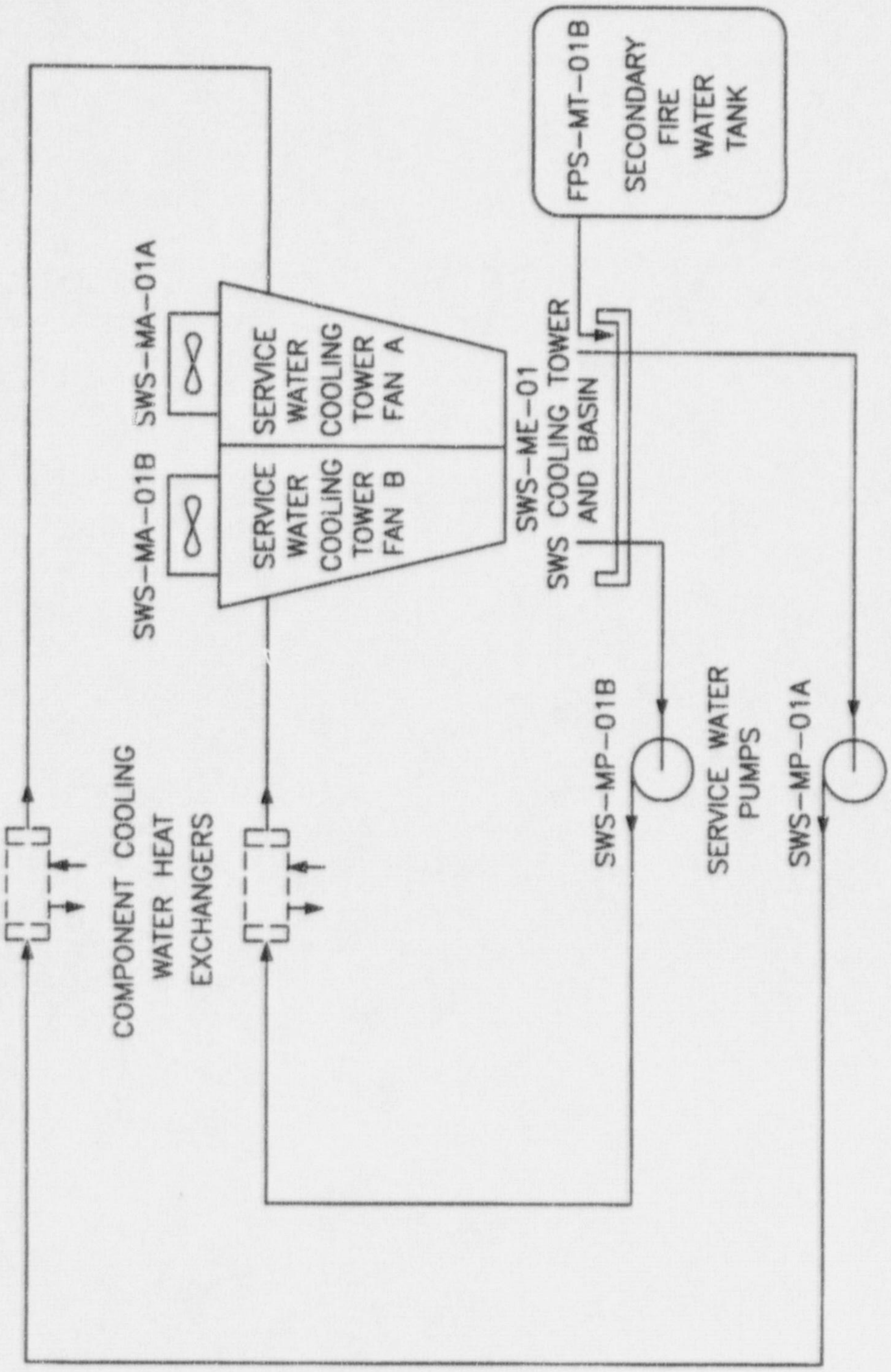

Figure 2.3.8-1
Service Water System

2.3.9 Containment Hydrogen Control System

The containment hydrogen control system (VLS) limits hydrogen gas concentration in containment during accidents.

1. The seismic Category I equipment identified in Table 2.3.9-1 can withstand seismic design basis dynamic loads without loss of safety function.

2. a) The Class 1E equipment identified in Table 2.3.9-1 as being qualified for a harsh environment can withstand the environmental conditions that would exist before, during, and following a design basis accident without loss of safety function for the time required to perform the safety function.

   b) The Class 1E components identified in Table 2.3.9-1 are powered from their respective Class 1E division.

   c) Separation is provided between VLS Class 1E divisions, and between Class 1E divisions and non-Class 1E cable.

3. The VLS provides the following safety-related functions:

   a) The VLS provides hydrogen monitors for indication of the containment hydrogen concentration.

   b) The VLS provides passive autocatalytic recombiner (PAR) devices for control of the containment hydrogen concentration during and following a design basis accident.

4. The VLS provides the following nonsafety-related functions:

   a) The VLS provides hydrogen igniters for control of the containment hydrogen concentration for beyond design basis accidents.

   b) Controls exist in the main control room (MCR) to operate the igniters.

   c) The igniters energize after receiving a signal from the diverse actuation system (DAS).

5. Safety-related displays identified in Table 2.3.9-1 can be retrieved in the MCR.

Inspections, Tests, Analyses, and Acceptance Criteria

Table 2.3.9-2 specifies the inspections, tests, analyses, and associated acceptance criteria for the VLS.

Table 2.3.9-1

Equipment Name	Tag No.	Seismic Cat. I	Class 1E/ Qual. for Harsh Envir.	Safety-Related Display
Catalytic Hydrogen Recombiner A	VLS-MY-E01A	Yes	-/-	-
Catalytic Hydrogen Recombiner B	VLS-MY-E01B	Yes	-/-	-
Containment Hydrogen Monitor	VLS-001	Yes	Yes/Yes	Yes
Containment Hydrogen Monitor	VLS-003	Yes	Yes/Yes	Yes
Containment Hydrogen Monitor	VLS-009	Yes	Yes/Yes	Yes

Note: Dash (-) indicates not applicable.

Table 2.3.9-2 Inspections, Tests, Analyses, and Acceptance Criteria		
Design Commitment	**Inspections, Tests, Analyses**	**Acceptance Criteria**
1. The seismic Category I equipment identified in Table 2.3.9-1 can withstand seismic design basis dynamic loads without loss of safety function.	i) Inspection will be performed to verify that the seismic Category I equipment identified in Table 2.3.9-1 is located on the nuclear island.	i) The seismic Category I equipment identified in Table 2.3.9-1 is located on the nuclear island.
	ii) Type tests, analyses, or a combination of type tests and analyses of seismic Category I equipment will be performed.	ii) A report exists and concludes that the seismic Category I equipment can withstand seismic design basis dynamic loads without loss of safety function.
	iii) Analysis of seismic Category I equipment supports will be performed.	iii) A report exists and concludes that the seismic Category I equipment supports can withstand seismic design basis loads without loss of safety function.
2.a) The Class 1E equipment identified in Table 2.3.9-1 as being qualified for a harsh environment can withstand the environmental conditions that would exist before, during, and following a design basis accident without loss of safety function for the time required to perform the safety function.	Type tests, analyses, or a combination of type tests and analyses will be performed on Class 1E equipment located in a harsh environment.	A report exists and concludes that the Class 1E equipment identified in Table 2.3.9-1 as being qualified for a harsh environment can withstand the environmental conditions that would exist before, during, and following a design basis accident without loss of safety function for the time required to perform the safety function.
2.b) The Class 1E components identified in Table 2.3.9-1 are powered from their respective Class 1E division.	Testing will be performed on the VLS by providing a simulated test signal in each Class 1E division.	A simulated test signal exists at the Class 1E equipment identified in Table 2.3.9-1 when the assigned Class 1E division is provided the test signal.
2.c) Separation is provided between VLS Class 1E divisions, and between Class 1E divisions and non-Class 1E cable.	See Certified Design Material, Section 3.3, Nuclear Island Buildings.	See Certified Design Material, Section 3.3, Nuclear Island Buildings.

Table 2.3.9-2 (cont) Inspections, Tests, Analyses, and Acceptance Criteria		
Design Commitment	**Inspections, Tests, Analyses**	**Acceptance Criteria**
3.a) The VLS provides hydrogen monitors for indication of the containment hydrogen concentration.	Inspection for the existence of three Class 1E hydrogen monitors inside containment will be performed.	Three hydrogen monitors powered by a Class 1E power source are provided inside containment.
3.b) The VLS provides PAR devices for control of the containment hydrogen concentration during and following a design basis accident.	i) Inspection for the existence of two PAR devices inside containment will be performed. ii) Type tests, analyses, or a combination of type tests and analyses will be performed on the PARs.	i) Two PAR devices are provided inside containment. ii) A report exists and concludes that the PAR depletion rate for a single full-size PAR is greater than or equal to 1 scfm of hydrogen at a prevailing concentration of 3 volume-percent for a test conducted at atmospheric pressure +2 psi and an ambient temperature of 120°F.
4.a) The VLS provides hydrogen igniters for control of the containment hydrogen concentration for beyond design basis accidents.	Inspection for the number of igniters will be performed.	At least 58 hydrogen igniters are provided inside containment.
4.b) Controls exist in the MCR to operate the igniters.	Testing will be performed on the igniters using the controls in the MCR.	Controls in the MCR operate to energize the igniters.
4.c) The igniters energize after receiving a signal from DAS.	Testing will be performed on the igniters using the DAS controls.	The igniters energize after receiving a signal from DAS.
5. Safety-related displays identified in Table 2.3.9-1 can be retrieved in the MCR.	Inspection will be performed for retrievability of the safety-related displays in the MCR.	Safety-related displays identified in Table 2.3.9-1 can be retrieved in the MCR.

2.3.10 Liquid Radwaste System

Design Description

The liquid radwaste system (WLS) receives, stores, processes, and discharges radioactive wastewater.

1. The functional arrangement of the applicable portions of the WLS is as shown in Figure 2.3.10-1.

2. The American Society of Mechanical Engineers (ASME) Code Section III components and piping shown in Figure 2.3.10-1 retain pressure boundary integrity at their design pressure.

3. The seismic Category I equipment identified in Table 2.3.10-1 can withstand seismic design basis dynamic loads without loss of safety function.

4. The as-built WLS ASME Code Section III piping depicted in Figure 2.3.10-1 meets applicable ASME Code Section III requirements for the WLS design conditions.

5. The WLS provides the following safety-related functions:

   a) The WLS preserves containment integrity by isolation of the WLS lines penetrating the containment.

   b) Check valves in drain lines to the containment sump prevent cross flooding of compartments.

6. The WLS provides the nonsafety-related function of detecting unidentified leaks within containment to the containment sump.

7. The check valves identified in Table 2.3.10-1 perform an active safety-related function to change position as indicated in the table.

Inspections, Tests, Analyses, and Acceptance Criteria

Table 2.3.10-2 specifies the inspections, tests, analyses, and associated acceptance criteria for the WLS.

Table 2.3.10-1						
Equipment Name	**Tag No.**	**Seismic Cat. I**	**Remotely Operated Valve**	**Class 1E/ Qual. for Harsh Envir.**	**Safety-Related Display**	**Active Function**
WLS Containment Sump Level Sensor	WLS-034	Yes	No	No/No	No	-
WLS Containment Sump Level Sensor	WLS-035	Yes	No	No/No	No	-
WLS Drain from Passive Core Cooling System (PXS) Compartment A Check Valve	WLS-PL-V071B	Yes	No	-/-	No	Transfer Closed
WLS Drain from PXS Compartment A Check Valve	WLS-PL-V072B	Yes	No	-/-	No	Transfer Closed
WLS Drain from PXS Compartment B Check Valve	WLS-PL-V071C	Yes	No	-/-	No	Transfer Closed
WLS Drain from PXS Compartment B Check Valve	WLS-PL-V072C	Yes	No	-/-	No	Transfer Closed
WLS Drain from Chemical and Volume Control System (CVS) Compartment Check Valve	WLS-PL-V071A	Yes	No	-/-	No	Transfer Closed
WLS Drain from CVS Compartment Check Valve	WLS-PL-V072A	Yes	No	-/-	No	Transfer Closed

Note: Dash (-) indicates not applicable.

Table 2.3.10-2
Inspections, Tests, Analyses, and Acceptance Criteria

Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
1. The functional arrangement of the applicable portions of the WLS is as shown in Figure 2.3.10-1.	Inspection of the as-built system will be performed.	The as-built WLS conforms with the functional arrangement shown in Figure 2.3.10-1.
2. The ASME Code Section III components and piping shown in Figure 2.3.10-1 retain pressure boundary integrity at their design pressure.	i) A hydrostatic test will be performed on those ASME Code components required to be hydrostatically tested by the ASME Code Section III.	i) A report exists and concludes that the results of the hydrostatic test of the ASME Code components conform with the requirements in the ASME Code Section III.
	ii) Inspections, including nondestructive examination of the as-built pressure boundary welds, will be performed in accordance with the ASME Code Section III.	ii) A report exists and concludes that the pressure boundary integrity requirements of the ASME Code Section III are met for the quality of pressure boundary welds.
3. The seismic Category I equipment identified in Table 2.3.10-1 can withstand seismic design basis dynamic loads without loss of safety function.	i) Inspection will be performed to verify that the seismic Category I equipment identified in Table 2.3.10-1 is located on the nuclear island.	i) The seismic Category I equipment identified in Table 2.3.10-1 is located on the nuclear island.
	ii) Type tests, analyses, or a combination of type tests and analyses of seismic Category I equipment will be performed.	ii) A report exists and concludes that the seismic Category I equipment can withstand seismic design basis dynamic loads without loss of safety function.

Table 2.3.10-2 (cont) Inspections, Tests, Analyses, and Acceptance Criteria		
Design Commitment	**Inspections, Tests, Analyses**	**Acceptance Criteria**
4. The as-built WLS ASME Code Section III piping depicted in Figure 2.3.10-1 meets applicable ASME Code Section III requirements for the WLS design conditions.	i) Inspection will be performed to verify that the WLS ASME Code Section III piping depicted in Figure 2.3.10-1 is located on the nuclear island.	i) The WLS ASME Code Section III piping depicted in Figure 2.3.10-1 is located on the nuclear island.
	ii) A reconciliation analysis using the as-designed and as-built piping information will be performed, or an analysis of the as-built piping will be performed.	ii) The as-built piping stress report exists and includes the ASME Code Certified Stress Report.
	iii) A reconciliation analysis using the as-designed and as-built pipe support information will be performed, or an analysis of the as-built supports will be performed.	iii) The as-built pipe support stress report exists and includes the ASME Code Certified Stress Report.
5.a) The WLS preserves containment integrity by isolation of the WLS lines penetrating the containment.	See Certified Design Material, subsection 2.2.1, Containment System.	See Certified Design Material, subsection 2.2.1, Containment System.
5.b) Check valves in drain lines to the containment sump prevent cross flooding of compartments.	Refer to item 7 in this table.	Refer to item 7 in this table.
6. The WLS provides the nonsafety-related function of detecting unidentified leaks within containment to the containment sump.	Inspection will be performed for retrievability of the displays in the MCR.	Nonsafety-related displays of WLS containment sump level channels WLS-034 and WLS-035 can be retrieved in the MCR.
7. The check valves identified in Table 2.3.10-1 perform an active safety-related function to change position as indicated in the table.	Exercise testing of the check valves active safety functions identified in Table 2.3.10-1 will be performed.	Each check valve changes position.

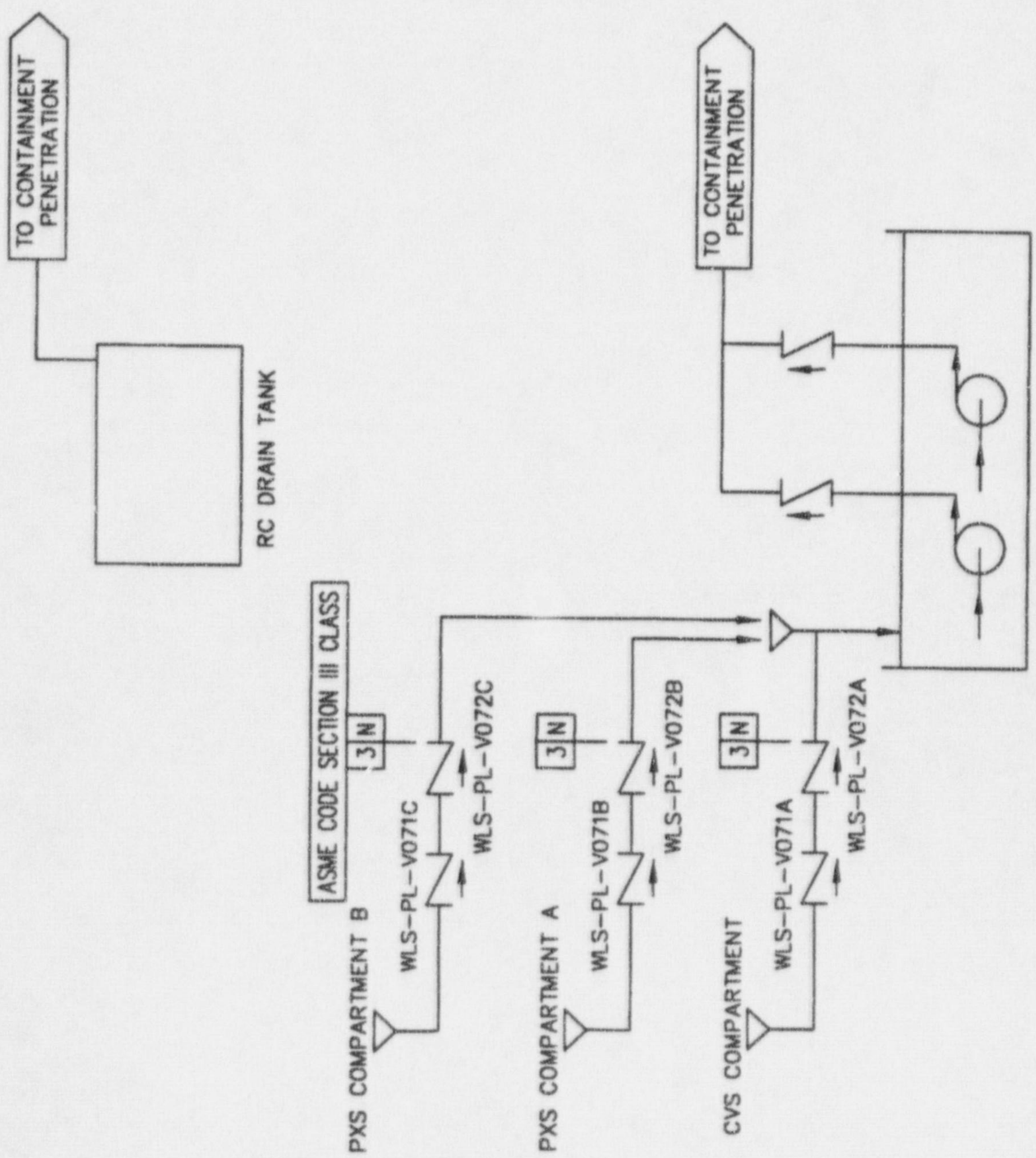

Figure 2.3.10-1
Liquid Radwaste System

2.4.1 Main and Startup Feedwater System

Design Description

The main and startup feedwater system (FWS) provides feedwater flow to the steam generator system (SGS) for heat removal from the reactor coolant system (RCS).

1. The functional arrangement of the applicable portions of the FWS is as shown in Figure 2.4.1-1.

2. The FWS provides the following nonsafety-related functions:

   a) The FWS provides startup feedwater flow from the condensate storage tank (CST) to the SGS for heat removal from the RCS.

   b) The demineralized water transfer and storage system (DWS) CST provides a water supply to the FWS startup feedwater pumps.

3. Controls exist in the main control room (MCR) to cause the equipment identified in Table 2.4.1-1 to perform the listed function.

4. Displays of the FWS parameters identified in Table 2.4.1-1 can be retrieved in the MCR.

Inspections, Tests, Analyses, and Acceptance Criteria

Table 2.4.1-2 specifies the inspections, tests, analyses, and associated acceptance criteria for the FWS.

Table 2.4.1-1			
Equipment Name	**Tag No.**	**Display**	**Control Function**
Startup Feedwater Pump A (Motor)	FWS-MP-03A	Yes (Run Status)	Start
Startup Feedwater Pump B (Motor)	FWS-MP-03B	Yes (Run Status)	Start
Startup Feedwater Pump A Flow Sensor	FWS-015A	Yes	-
Startup Feedwater Pump B Flow Sensor	FWS-015B	Yes	-

Note: Dash (-) indicates not applicable.

Table 2.4.1-2
Inspections, Tests, Analyses, and Acceptance Criteria

Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
1. The functional arrangement of the applicable portions of the FWS is as shown in Figure 2.4.1-1.	Inspection of the as-built system will be performed.	The as-built FWS conforms with the functional arrangement shown in Figure 2.4.1-1.
2.a) The FWS provides startup feedwater flow from the CST to the SGS for heat removal from the RCS.	Testing will be performed to confirm that each of the startup feedwater pumps can provide water from the CST to both steam generators.	Each FWS startup feedwater pump provides a flow rate greater than or equal to 190 gpm to each steam generator system at a steam generator secondary side pressure of at least 1003 psia.
2.b) The DWS CST provides a water supply to the FWS startup feedwater pumps.	Inspection of the DWS CST will be performed.	The volume of the CST is greater than or equal to 200,000 gallons between the tank overflow and the startup feedwater pumps supply connection.
3. Controls exist in the MCR to cause the equipment identified in Table 2.4.1-1 to perform the listed function.	Testing will be performed to actuate the equipment identified in Table 2.4.1-1 using controls in the MCR.	Controls in the MCR cause the equipment identified in Table 2.4.1-1 to perform the listed action.
4. Displays of the FWS parameters identified in Table 2.4.1-1 can be retrieved in the MCR.	Inspection will be performed for retrievability in the MCR of the displays identified in Table 2.4.1-1.	Displays of the FWS parameters identified in Table 2.4.1-1 are retrieved in the MCR.

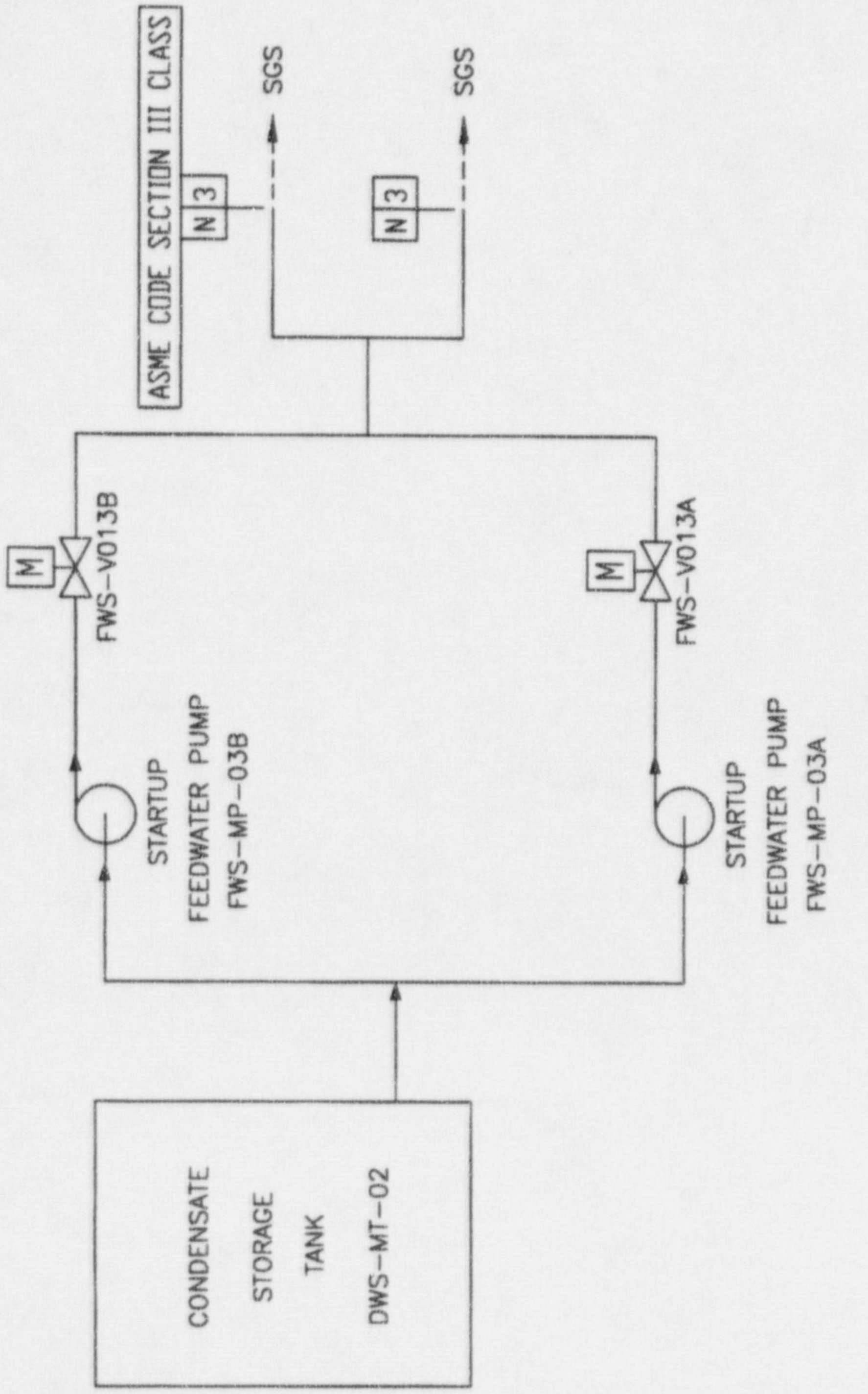

Figure 2.4.1-1
Main and Startup Feedwater System

2.5.1 Diverse Actuation System

Design Description

The diverse actuation system (DAS) initiates reactor trip, actuates selected functions, and provides plant information to the operator.

1. The DAS signal processing equipment cabinets are not physically located in a room that contains protection and safety monitoring system (PMS) equipment cabinets.

2. The DAS provides the following nonsafety-related functions:

   a) The DAS provides an automatic reactor trip on low wide-range steam generator water level or on low pressurizer water level separate from the PMS, plant control system (PLS), or data display and processing system (DDS).

   b) The DAS provides automatic actuation of selected functions, as identified in Table 2.5.1-1, separate from the PMS, PLS, or DDS.

   c) The DAS provides manual initiation of reactor trip and selected functions, as identified in Table 2.5.1-2, separate from the PMS, PLS, or DDS. These manual initiation functions are implemented in a manner that bypasses the signal processing equipment of the DAS.

   d) The DAS provides main control room (MCR) displays of selected plant parameters, as identified in Table 2.5.1-3, separate from the PMS, PLS, or DDS.

3. The DAS has the following features:

   a) The signal processing hardware of the DAS uses input modules, output modules, and microprocessor boards that are different than those used in the PMS.

   b) The display hardware of the DAS uses a different display device than that used in the PMS.

   c) Software used in the DAS uses an operating system and a programming language that are different than those used in the PMS.

Inspections, Tests, Analyses, and Acceptance Criteria

Table 2.5.1-4 specifies the inspections, tests, analyses, and associated acceptance criteria for the DAS.

Table 2.5.1-1 Functions Automatically Actuated by the DAS
1. Turbine Trip on Low Wide-range Steam Generator Water Level
2. Reactor Coolant Pump Trip on Low Pressurizer Water Level
3. Passive Residual Heat Removal (PRHR) Actuation on Low Wide-range Steam Generator Water Level or on High Hot Leg Temperature
4. Core Makeup Tank (CMT) Actuation on Low Pressurizer Water Level
5. Isolation of Selected Containment Penetrations and Initiation of Passive Containment Cooling System (PCS) on High Containment Temperature

Table 2.5.1-2 Functions Manually Actuated by the DAS
1. Reactor and Turbine Trip
2. PRHR Actuation
3. CMT Actuation
4. First-stage Automatic Depressurization System (ADS) Valve Actuation
5. Second-stage ADS Valve Actuation
6. Third-stage ADS Valve Actuation
7. Fourth-stage ADS Valve Actuation
8. PCS Actuation
9. Isolation of Selected Containment Penetrations
10. Containment Hydrogen Ignitor Actuation
11. In-containment Refueling Water Storage Tank (IRWST) Injection Actuation
12. Containment Recirculation Actuation
13. Actuate IRWST Drain to Containment

Table 2.5.1-3
DAS Displays

Equipment Name	Tag Number
Reactor Coolant System (RCS) Hot Leg Temperature	RCS-300A
RCS Hot Leg Temperature	RCS-300B
Steam Generator 1 Wide-Range Level	SGS-044
Steam Generator 1 Wide-Range Level	SGS-045
Steam Generator 2 Wide-Range Level	SGS-046
Steam Generator 2 Wide-Range Level	SGS-047
Pressurizer Water Level	RCS-305A
Pressurizer Water Level	RCS-305B
Containment Temperature	VCS-053A
Containment Temperature	VCS-053B
Core Exit Temperature	IIS-006
Core Exit Temperature	IIS-011
Core Exit Temperature	IIS-029
Core Exit Temperature	IIS-032
Containment Hydrogen Concentration	VLS-015
Containment Hydrogen Concentration	VLS-016

Table 2.5.1-4
Inspections, Tests, Analyses, and Acceptance Criteria

Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
1. The DAS signal processing equipment cabinets are not physically located in a room that contains PMS equipment cabinets.	Inspection of the as-built system will be performed.	The DAS signal processing equipment cabinets are not physically located in a room that contains PMS equipment cabinets.
2.a) The DAS provides an automatic reactor trip on low wide-range steam generator water level or on low pressurizer water level separate from the PMS, PLS, or DDS.	Electrical power to the PMS, PLS, and DDS equipment will be disconnected and an operational test of the as-built DAS will be performed using real or simulated test signals.	The field breakers of the control rod motor-generator sets open after the test signal reaches the specified limit.
2.b) The DAS provides automatic actuation of selected functions, as identified in Table 2.5.1-1, separate from the PMS, PLS, or DDS.	Electrical power to the PMS, PLS, and DDS equipment will be disconnected and an operational test of the as-built DAS will be performed using real or simulated test signals.	Appropriate DAS output signals are generated after the test signal reaches the specified limit.
2.c) The DAS provides manual initiation of reactor trip and selected functions, as identified in Table 2.5.1-2, separate from the PMS, PLS, or DDS. These manual initiation functions are implemented in a manner that bypasses the signal processing equipment of the DAS.	Electrical power to the PMS, PLS, DDS, and DAS signal processing equipment will be disconnected and an operational test of the as-built system will be performed using the DAS manual actuation controls.	i) The field breakers of the control rod motor-generator sets open after reactor and turbine trip manual initiation controls are actuated. ii) Appropriate DAS output signals are generated after the manual initiation controls are actuated.
2.d) The DAS provides MCR displays of selected plant parameters, as identified in Table 2.5.1-3, separate from the PMS, PLS, or DDS.	Electrical power to the PMS, PLS, and DDS equipment will be disconnected and inspection will be performed for retrievability of the selected plant parameters in the MCR.	The selected plant parameters can be retrieved in the MCR.

Table 2.5.1-4 (cont)
Inspections, Tests, Analyses, and Acceptance Criteria

Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
3.a) The signal processing hardware of the DAS uses input modules, output modules, and microprocessor boards that are different than those used in the PMS.	Inspection of the as-built DAS and PMS signal processing hardware will be performed.	The DAS signal processing equipment uses input modules, output modules, and microprocessor boards that are different than those used in the PMS. The difference may be a different design, use of different component types, or different manufacturers.
3.b) The display hardware of the DAS uses a different display device than that used in the PMS.	Inspection of the as-built DAS and PMS display hardware will be performed.	The DAS display hardware is different than the display hardware used in the PMS. The difference may be a different design, use of different component types, or different manufacturers.
3.c) Software used in the DAS uses an operating system and a programming language that are different than those used in the PMS.	Inspection of the DAS and PMS design documentation will be performed.	The DAS operating system and programming language are different than those used in the PMS.

2.5.2 Protection and Safety Monitoring System

Design Description

The protection and safety monitoring system (PMS) initiates reactor trip and actuation of engineered safety features in response to plant conditions monitored by process instrumentation and provides safety-related displays.

1. The PMS has the equipment identified in Table 2.5.2-1.

2. The seismic Category I equipment, identified in Table 2.5.2-1, can withstand seismic design basis dynamic loads without loss of safety function.

3. The Class 1E equipment, identified in Table 2.5.2-1, can withstand the electromagnetic interference (EMI) and radio frequency interference (RFI) conditions that would exist before, during, and following a design basis accident without loss of safety function for the time required to perform the safety function.

4. a) The Class 1E equipment, identified in Table 2.5.2-1, is powered from their respective Class 1E division.

   b) Separation is provided between PMS Class 1E divisions, and between Class 1E divisions and non-Class 1E cable.

5. The PMS provides the following safety-related functions:

   a) The PMS initiates an automatic reactor trip, as identified in Table 2.5.2-2, when plant process signals reach specified limits.

   b) The PMS initiates automatic actuation of engineered safety features, as identified in Table 2.5.2-3, when plant process signals reach specified limits.

   c) The PMS provides manual initiation of reactor trip and selected engineered safety features as identified in Table 2.5.2-4.

6. The PMS provides the following nonsafety-related functions:

   a) The PMS provides process signals to the plant control system (PLS) through isolation devices.

   b) The PMS provides process signals to the data display and processing system (DDS) through isolation devices.

7. The PMS, in conjunction with the operator workstations, provides the following functions:

   a) The PMS provides for the minimum inventory of displays and fixed position controls, as identified in Table 2.5.2-5, in the main control room (MCR).

   b) The PMS provides for the transfer of control capability from the MCR to the remote shutdown room (RSR).

   c) The PMS provides for the minimum inventory of displays and controls, as identified in Table 2.5.2-5, in the RSR. The controls in the RSR do not need to be fixed position.

8. a) The PMS automatically removes blocks of reactor trip and engineered safety features actuation when the plant approaches conditions for which the associated function is designed to provide protection. These blocks are identified in Table 2.5.2-6.

   b) The PMS automatically produces a reactor trip or engineered safety feature initiation upon an attempt to bypass more than two channels of a function that uses two-out-of-four initiation logic.

   c) The PMS provides the interlock functions identified in Table 2.5.2-7.

9. Setpoints are determined using a methodology which accounts for loop inaccuracies, response testing, and maintenance or replacement of instrumentation.

10. The PMS hardware and software are verified and validated through a program that provides confirmation that system functional requirements are properly and correctly implemented in the delivered hardware and software.

Inspections, Tests, Analyses, and Acceptance Criteria

Table 2.5.2-8 specifies the inspections, tests, analyses, and associated acceptance criteria for the PMS.

Table 2.5.2-1
PMS Equipment Name and Classification

Equipment Name	Seismic Cat. I	Class 1E	Qual. for Harsh Envir.
Integrated Protection Cabinets, Division A	Yes	Yes	No
Integrated Protection Cabinets, Division B	Yes	Yes	No
Integrated Protection Cabinets, Division C	Yes	Yes	No
Integrated Protection Cabinets, Division D	Yes	Yes	No
Engineered Safety Features Actuation Cabinets, Division A	Yes	Yes	No
Engineered Safety Features Actuation Cabinets, Division B	Yes	Yes	No
Engineered Safety Features Actuation Cabinets, Division C	Yes	Yes	No
Engineered Safety Features Actuation Cabinets, Division D	Yes	Yes	No
Protection Logic Cabinets, Division A	Yes	Yes	No
Protection Logic Cabinets, Division B	Yes	Yes	No
Protection Logic Cabinets, Division C	Yes	Yes	No
Protection Logic Cabinets, Division D	Yes	Yes	No
Reactor Trip Switchgear, Division A	Yes	Yes	No
Reactor Trip Switchgear, Division B	Yes	Yes	No
Reactor Trip Switchgear, Division C	Yes	Yes	No
Reactor Trip Switchgear, Division D	Yes	Yes	No
Multiplexer Cabinets, Division A	Yes	Yes	No
Multiplexer Cabinets, Division B	Yes	Yes	No
Multiplexer Cabinets, Division C	Yes	Yes	No
Multiplexer Cabinets, Division D	Yes	Yes	No
MCR/RSR Transfer Panels	Yes	Yes	No
Safety-Related Display Processing Cabinets	Yes	Yes	No
Safety-Related Display Input/Output (I/O) Cabinets	Yes	Yes	No
MCR Safety-Related Displays	Yes	Yes	No
MCR Safety-Related Controls	Yes	Yes	No
Remote Shutdown Workstation	No	No	No

Table 2.5.2-2 PMS Automatic Reactor Trips
Source Range Reactor Trip
Intermediate Range Reactor Trip
Power Range (Low Setpoint) Trip
Power Range (High Setpoint) Trip
High Positive Flux Rate Trip
Reactor Coolant Pump High Bearing Water Temperature Trip
Overtemperature Delta-T Trip
Overpower Delta-T Trip
Pressurizer Low Pressure Trip
Pressurizer High Pressure Trip
Pressurizer High Water Level Trip
Low Reactor Coolant Flow Trip
Reactor Coolant Pump Underspeed Trip
Low Steam Generator Water Level Trip
High Steam Generator Water Level Trip

Table 2.5.2-3
PMS Automatically Actuated Engineered Safety Features

Containment Isolation
Automatic Depressurization
Main Feedwater Isolation
Reactor Coolant Pump Trip
Core Makeup Tank Injection
Turbine Trip
Steam Line Isolation
Steam Generator Blowdown System Isolation
Containment Cooling
Startup Feedwater Isolation
Passive Residual Heat Removal
Block of Boron Dilution
Chemical and Volume Control System Makeup Line Isolation
Steam Dump Block
Main Control Room Isolation and Air Supply Initiation
Chemical and Volume Control System Purification Line Isolation
Containment Air Filtration System Isolation
Normal Residual Heat Removal Isolation
Spent Fuel Pool Isolation
In-Containment Refueling Water Storage Tank Injection
Containment Recirculation

Table 2.5.2-4
PMS Manually Actuated Functions

Reactor Trip
Safeguards Actuation
Containment Isolation (Selected)
Stage 1, 2, and 3 Automatic Depressurization
Stage 4 Automatic Depressurization
Main Feedwater Isolation
Core Makeup Tank Injection
Steam Line Isolation
Containment Cooling
Passive Residual Heat Removal
In-Containment Refueling Water Storage Tank Injection
Containment Recirculation

Table 2.5.2-5
Minimum Inventory of Displays and Fixed Position Controls

Description	Control	Display
Neutron Flux	-	Yes
Reactor Coolant System (RCS) Pressure	-	Yes
Wide-Range Hot Leg Temperature	-	Yes
Wide-Range Cold Leg Temperature	-	Yes
Containment Water Level	-	Yes
Containment Pressure	-	Yes
Pressurizer Water Level	-	Yes
Pressurizer Reference Leg Temperature	-	Yes
Pressurizer Pressure	-	Yes
Core Exit Temperature	-	Yes
RCS Subcooling	-	Yes
In-Containment Refueling Water Storage Tank (IRWST) Water Level	-	Yes
Passive Residual Heat Removal (PRHR) Flow	-	Yes
PRHR Outlet Temperature	-	Yes
Passive Containment Cooling System (PCS) Storage Tank Water Level	-	Yes
PCS Cooling Flow	-	Yes
IRWST to Normal Residual Heat Removal System (RNS) Suction Valve Status	-	Yes
Containment Isolation Valve Position (Selected)	-	Yes
Containment Area High-Range Radiation Level	-	Yes
Containment Pressure (Extended Range)	-	Yes
Containment Hydrogen Concentration	-	Yes
Manual Reactor Trip	Yes	-
Manual Safeguards Actuation	Yes	-
Manual Core Makeup Tank Actuation	Yes	-

Note: Dash (-) indicates not applicable.

Table 2.5.2-5 (cont) Minimum Inventory of Displays and Fixed Position Controls		
Description	Control	Display
Automatic Depressurization System (ADS) Stages 1, 2, and 3 Initiation	Yes	-
ADS Stage 4 Initiation	Yes	-
Manual PRHR Actuation	Yes	-
Manual Containment Cooling Actuation	Yes	-
Manual IRWST Injection Actuation	Yes	-
Manual Containment Recirculation Actuation	Yes	-
Manual Containment Isolation (Selected)	Yes	-
Manual Main Steam Line Isolation	Yes	-
Manual Feedwater Isolation	Yes	-
Manual Containment Hydrogen Igniter (Nonsafety-Related)	Yes	-

Note: Dash (-) indicates not applicable.

Table 2.5.2-6 PMS Blocks
Reactor Trip Functions:
Source Range Reactor Trip
Intermediate Range Reactor Trip
Power Range (Low Setpoint) Trip
Reactor Coolant Pump High Bearing Water Temperature Trip
Pressurizer Low Pressure Trip
Pressurizer High Water Level Trip
Low Reactor Coolant Flow Trip
Reactor Coolant Pump Underspeed Trip
High Steam Generator Water Level Trip
Engineered Safety Features:
Containment Isolation
Main Feedwater Isolation
Reactor Coolant Pump Trip
Core Makeup Tank Injection
Turbine Trip
Steam Line Isolation
Startup Feedwater Isolation
Block of Boron Dilution
Chemical Volume Control System Makeup Line Isolation
Steam Dump Block
Chemical Volume Control System Purification Line Isolation

Table 2.5.2-7 PMS Interlocks
RNS Suction Valve
PRHR Heat Exchanger Isolation Valve
CMT Cold Leg Balance Line Isolation Valve

Table 2.5.2-8 Inspections, Tests, Analyses, and Acceptance Criteria		
Design Commitment	**Inspections, Tests, Analyses**	**Acceptance Criteria**
1. The PMS has the equipment identified in Table 2.5.2-1.	Inspection of the as-built system will be performed.	The PMS has the equipment identified in Table 2.5.2-1.
2. The seismic Category I equipment, identified in Table 2.5.2-1, can withstand seismic design basis dynamic loads without loss of safety function.	i) Inspection will be performed to verify that the seismic Category I equipment is located on the nuclear island. ii) Type tests, analyses, or a combination of type tests and analyses of seismic Category I equipment will be performed.	i) The seismic Category I equipment identified in Table 2.5.2-1 is located on the nuclear island. ii) A report exists and concludes that the seismic Category I equipment can withstand seismic design basis dynamic loads without loss of safety function.
3. The Class 1E equipment, identified in Table 2.5.2-1, can withstand the EMI and RFI conditions that would exist before, during, and following a design basis accident without loss of safety function for the time required to perform the safety function.	Type tests, analyses, or a combination of type tests and analyses will be performed on the equipment.	A report exists and concludes that the Class 1E equipment identified in Table 2.5.2-1 can withstand the EMI and RFI conditions that would exist before, during, and following a design basis accident without loss of safety function for the time required to perform the safety function.
4.a) The Class 1E equipment, identified in Table 2.5.2-1, is powered from their respective Class 1E division.	Tests will be conducted on the installed equipment by providing a test signal in each Class 1E division.	A simulated test signal exists at the Class 1E equipment identified in Table 2.5.2-1 when the assigned Class 1E division is provided the test signal.
4.b) Separation is provided between PMS Class 1E divisions, and between Class 1E divisions and non-Class 1E cable.	See Certified Design Material, Section 3.3, Nuclear Island Buildings.	See Certified Design Material, Section 3.3, Nuclear Island Buildings.

Table 2.5.2-8 (cont)
Inspections, Tests, Analyses, and Acceptance Criteria

Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
5.a) The PMS initiates an automatic reactor trip, as identified in Table 2.5.2-2, when plant process signals reach specified limits.	An operational test of the as-built PMS will be performed using real or simulated test signals.	i) The reactor trip switchgear opens after the test signal reaches the specified limit. This only needs to be verified for one automatic reactor trip function. ii) PMS output signals to the reactor trip switchgear are generated after the test signal reaches the specified limit. This needs to be verified for each automatic reactor trip function.
5.b) The PMS initiates automatic actuation of engineered safety features, as identified in Table 2.5.2-3, when plant process signals reach specified limits.	An operational test of the as-built PMS will be performed using real or simulated test signals.	Appropriate PMS output signals are generated after the test signal reaches the specified limit.
5.c) The PMS provides manual initiation of reactor trip and selected engineered safety features as identified in Table 2.5.2-4.	An operational test of the as-built PMS will be performed using the PMS manual actuation controls.	i) The reactor trip switchgear opens after manual reactor trip controls are actuated. ii) Appropriate PMS output signals are generated after the manual initiation controls are actuated.
6.a) The PMS provides process signals to the PLS through isolation devices.	Type tests, analyses, or a combination of type tests and analyses of the isolation devices will be performed.	A report exists and concludes that the isolation devices prevent credible faults from propagating into the PMS.
6.b) The PMS provides process signals to the DDS through isolation devices.	Type tests, analyses, or a combination of type tests and analyses of the isolation devices will be performed.	A report exists and concludes that the isolation devices prevent credible faults from propagating into the PMS.
7.a) The PMS provides for the minimum inventory of displays and fixed position controls, as identified in Table 2.5.2-5, in the MCR.	i) Inspection will be performed for retrievability of the selected plant parameters in the MCR. ii) An operational test of the as-built system will be performed using the MCR fixed position controls.	i) The selected plant parameters can be retrieved in the MCR. ii) Appropriate output signals are generated after the MCR fixed position controls are actuated.

Table 2.5.2-8 (cont)
Inspections, Tests, Analyses, and Acceptance Criteria

Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
7.b) The PMS provides for the transfer of control capability from the MCR to the RSR.	An operational test of the as-built system will be performed to demonstrate the transfer of control capability from the MCR to the RSR.	Actuation of the transfer switches results in an alarm in the MCR and RSR, the activation of operator control capability from the RSR, and the deactivation of operator control capability from the MCR.
7.c) The PMS provides for the minimum inventory of displays and controls, as identified in Table 2.5.2-5, in the RSR. The controls in the RSR do not need to be fixed position.	i) Inspection will be performed for retrievability of the selected plant parameters in the RSR. ii) An operational test of the as-built system will be performed using the controls in the RSR.	i) The selected plant parameters can be retrieved in the RSR. ii) Appropriate output signals are generated after the controls in the RSR are actuated.
8.a) The PMS automatically removes blocks of reactor trip and engineered safety features actuation when the plant approaches conditions for which the associated function is designed to provide protection. These blocks are identified in Table 2.5.2-6.	An operational test of the as-built PMS will be performed using real or simulated test signals.	The PMS blocks are automatically removed when the test signal reaches the specified limit.
8.b) The PMS automatically produces a reactor trip or engineered safety feature initiation upon an attempt to bypass more than two channels of a function that uses two-out-of-four initiation logic.	An operational test of the as-built PMS will be performed.	Appropriate PMS output signals are automatically initiated after an attempt to bypass more than two channels of a function that uses two-out-of-four initiation logic.
8.c) The PMS provides the interlock functions identified in Table 2.5.2-7.	An operational test of the as-built PMS will be performed using real or simulated test signals.	Appropriate PMS output signals are generated.
9. Setpoints are determined using a methodology which accounts for loop inaccuracies, response testing, and maintenance or replacement of instrumentation.	Inspection will be performed for a document that describes the methodology and input parameters used to determine the PMS setpoints.	A report exists and concludes that the PMS setpoints are determined using a methodology which accounts for loop inaccuracies, response testing, and maintenance or replacement of instrumentation.

Table 2.5.2-8 (cont)
Inspections, Tests, Analyses, and Acceptance Criteria

Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
10. The PMS hardware and software are verified and validated through a program that provides confirmation that system functional requirements are properly and correctly implemented in the delivered hardware and software.	Inspection will be performed for a document that describes the verification and validation program for the PMS.	A report exists and concludes that the PMS hardware and software were verified and validated.

2.6.1 Main ac Power System

Design Description

The main ac power system (ECS) provides electrical ac power to nonsafety-related loads.

1. The functional arrangement of the applicable portions of the ECS is as shown in Figure 2.6.1-1.

2. The seismic Category I equipment identified in Table 2.6.1-1 can withstand seismic design basis dynamic loads without loss of safety function.

3. a) The Class 1E controls for the equipment identified in Table 2.6.1-1 are powered from their respective Class 1E division.

   b) Separation is provided between ECS Class 1E divisions, and between Class 1E divisions and non-Class 1E cable.

4. The ECS provides the following nonsafety-related functions:

   a) The ECS provides the capability for distributing non-Class 1E ac power from onsite sources to selected nonsafety-related loads.

   b) The ECS provides an electrical grounding system for: (1) instrument/computer grounding; (2) system grounding of the neutral points of the main generator, main step-up transformers, auxiliary transformers, load center transformers, and onsite standby diesel generators; (3) equipment grounding of equipment enclosures, metal structures, metallic tanks, ground bus of switchgear assemblies, load centers, motor control centers, and control cabinets; and (4) lightning protection is provided for exposed structures and buildings housing safety-related and fire protection equipment. Each grounding system and lightning protection system is separately grounded to the station grounding grid.

   c) The 4160 Vac circuit breakers in switchgear ECS-ES-1 and ECS-ES-2 open after receiving a signal from the onsite standby power system.

   d) Each standby diesel generator 4160 Vac circuit breaker closes after receiving a signal from the onsite standby power system.

5. Displays of bus voltage and circuit breaker position for switchgear ECS-ES-1 and ECS-ES-2 can be retrieved in the main control room (MCR).

6. Controls exist in the MCR for the 4160 Vac circuit breakers in switchgear ECS-ES-1 and ECS-ES-2.

Inspections, Tests, Analyses, and Acceptance Criteria

Table 2.6.1-2 specifies the inspections, tests, analyses, and associated acceptance criteria for the ECS.

Table 2.6.1-1				
Equipment Name	Tag No.	Seismic Category I	Class 1E/ Qual. for Harsh Envir.	Safety-Related Display
Reactor Coolant Pump Circuit Breaker	ECS-ES-51	Yes	Yes/No	No
Reactor Coolant Pump Circuit Breaker	ECS-ES-52	Yes	Yes/No	No
Reactor Coolant Pump Circuit Breaker	ECS-ES-53	Yes	Yes/No	No
Reactor Coolant Pump Circuit Breaker	ECS-ES-54	Yes	Yes/No	No
Reactor Coolant Pump Circuit Breaker	ECS-ES-61	Yes	Yes/No	No
Reactor Coolant Pump Circuit Breaker	ECS-ES-62	Yes	Yes/No	No
Reactor Coolant Pump Circuit Breaker	ECS-ES-63	Yes	Yes/No	No
Reactor Coolant Pump Circuit Breaker	ECS-ES-64	Yes	Yes/No	No

Table 2.6.1-2
Inspections, Tests, Analyses, and Acceptance Criteria

Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
1. The functional arrangement of the applicable portions of the ECS is as shown in Figure 2.6.1-1.	Inspection of the as-built system will be performed.	The as-built ECS conforms with the functional arrangement shown in Figure 2.6.1-1.
2. The seismic Category I equipment identified in Table 2.6.1-1 can withstand seismic design basis dynamic loads without loss of safety function.	i) Inspection will be performed to verify that the seismic Category I equipment identified in Table 2.6.1-1 is located on the nuclear island. ii) Type tests, analyses, or a combination of type tests and analyses of seismic Category I equipment will be performed. iii) Analysis of seismic Category I equipment supports will be performed.	i) The seismic Category I equipment identified in Table 2.6.1-1 is located on the nuclear island. ii) A report exists and concludes that the seismic Category I equipment can withstand seismic design basis dynamic loads without loss of safety function. iii) A report exists and concludes that the seismic Category I equipment supports can withstand seismic design basis loads without loss of safety function.
3.a) The Class 1E controls for the equipment identified in Table 2.6.1-1 are powered from their respective Class 1E division.	Testing will be performed on the ECS by providing a simulated test signal in each Class 1E division.	A simulated test signal exists at the Class 1E equipment identified in Table 2.6.1-1 when the assigned Class 1E division is provided the test signal.
3.b) Separation is provided between ECS Class 1E divisions, and between Class 1E divisions and non-Class 1E cable.	See Certified Design Material, Section 3.3, Nuclear Island Buildings.	See Certified Design Material, Section 3.3, Nuclear Island Buildings.
4.a) The ECS provides the capability for distributing non-Class 1E ac power from onsite sources to selected nonsafety-related loads.	Tests will be performed using a test signal to confirm that an electrical path exists for each selected load from an ECS-ES-1 or ECS-ES-2 bus. Each test may be a single test or a series of over-lapping tests.	A test signal exists at the terminals of each selected load.

Table 2.6.1-2 (cont) Inspections, Tests, Analyses, and Acceptance Criteria		
Design Commitment	**Inspections, Tests, Analyses**	**Acceptance Criteria**
4.b) The ECS provides an electrical grounding system for: (1) instrument/computer grounding; (2) system grounding of the neutral points of the main generator, main step-up transformers, auxiliary transformers, load center transformers, and onsite standby diesel generators; (3) equipment grounding of equipment enclosures, metal structures, metallic tanks, ground bus of switchgear assemblies, load centers, motor control centers, and control cabinets; and (4) lightning protection is provided for exposed structures and buildings housing safety-related and fire protection equipment. Each grounding system and lightning protection system is separately grounded to the station grounding grid.	Inspections of the as-built grounding and lightning protection systems will be performed.	The as-built (1) instrument/computer grounding, (2) system grounding, (3) equipment grounding, and (4) lightning protection systems are separately grounded to the station grounding grid.
4.c) The 4160 Vac circuit breakers in switchgear ECS-ES-1 and ECS-ES-2 open after receiving a signal from the onsite standby power load system.	Testing will be performed using real or simulated signals from the standby diesel load system.	The 4160 Vac circuit breakers in switchgear ECS-ES-1 and ECS-ES-2 open after receiving a signal from the standby diesel system.
4.d) Each standby diesel generator 4160 Vac circuit breaker closes after receiving a signal from the onsite standby power system.	Testing will be performed using real or simulated signals from the standby diesel load system.	Each standby diesel generator 4160 Vac circuit breaker closes after receiving a signal from the standby diesel system.
5. Displays of bus voltage and circuit breaker position for switchgear ECS-ES-1 and ECS-ES-2 can be retrieved in the MCR.	Inspection will be performed for retrievability of the displays in the MCR.	Displays of bus voltage and circuit breaker position for switchgear ECS-ES-1 and ECS-ES-2 can be retrieved in the MCR.
6. Controls exist in the MCR for the 4160 Vac circuit breakers in switchgear ECS-ES-1 and ECS-ES-2.	A test will be performed to verify that controls in the MCR can operate the circuit breakers in switchgear ECS-ES-1 and ECS-ES-2.	Controls in the MCR cause the circuit breakers in switchgear ECS-ES-1 and ECS-ES-2 to operate.

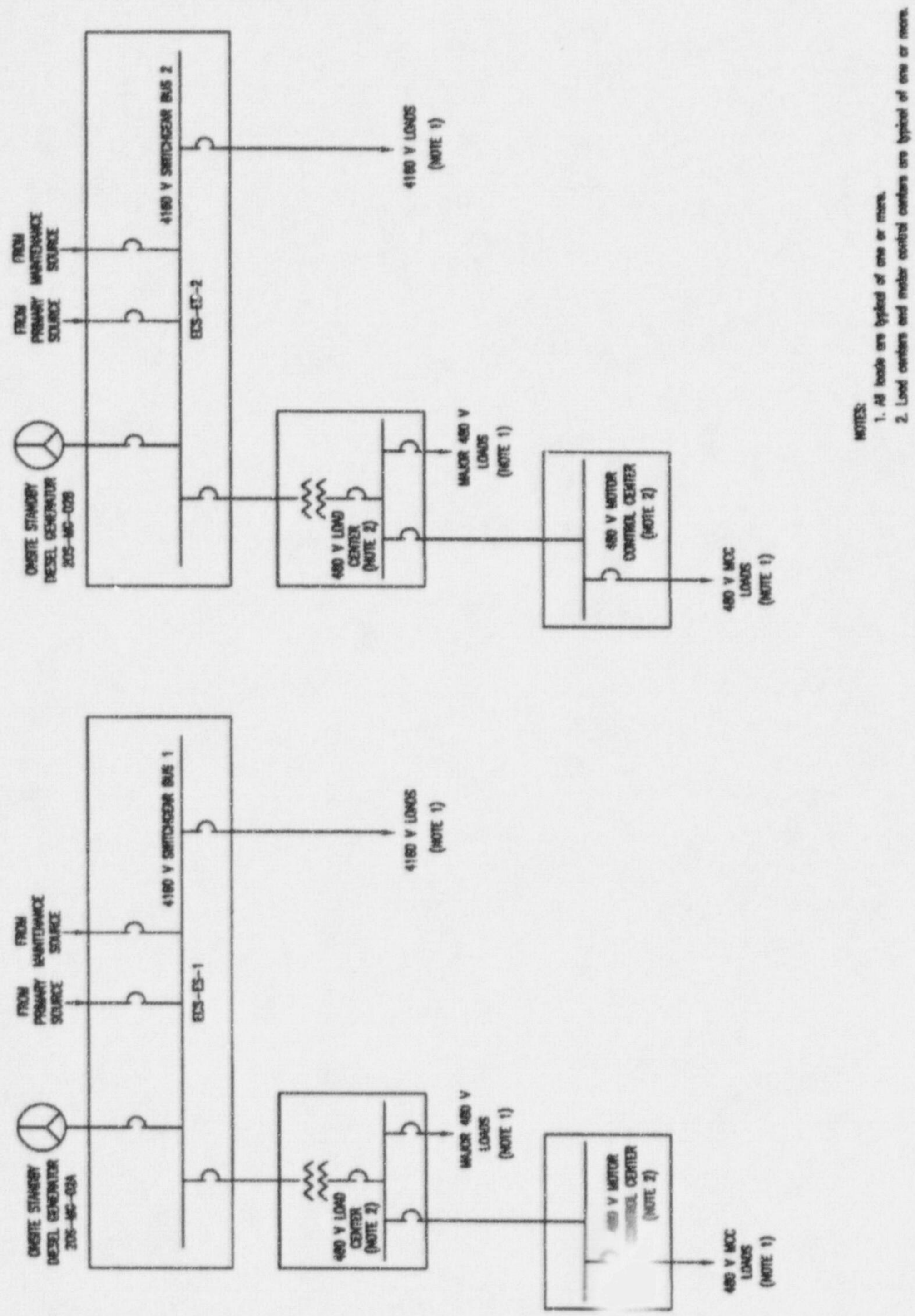

Figure 2.6.1-1 (Sheet 1 of 2)
Main ac Power System

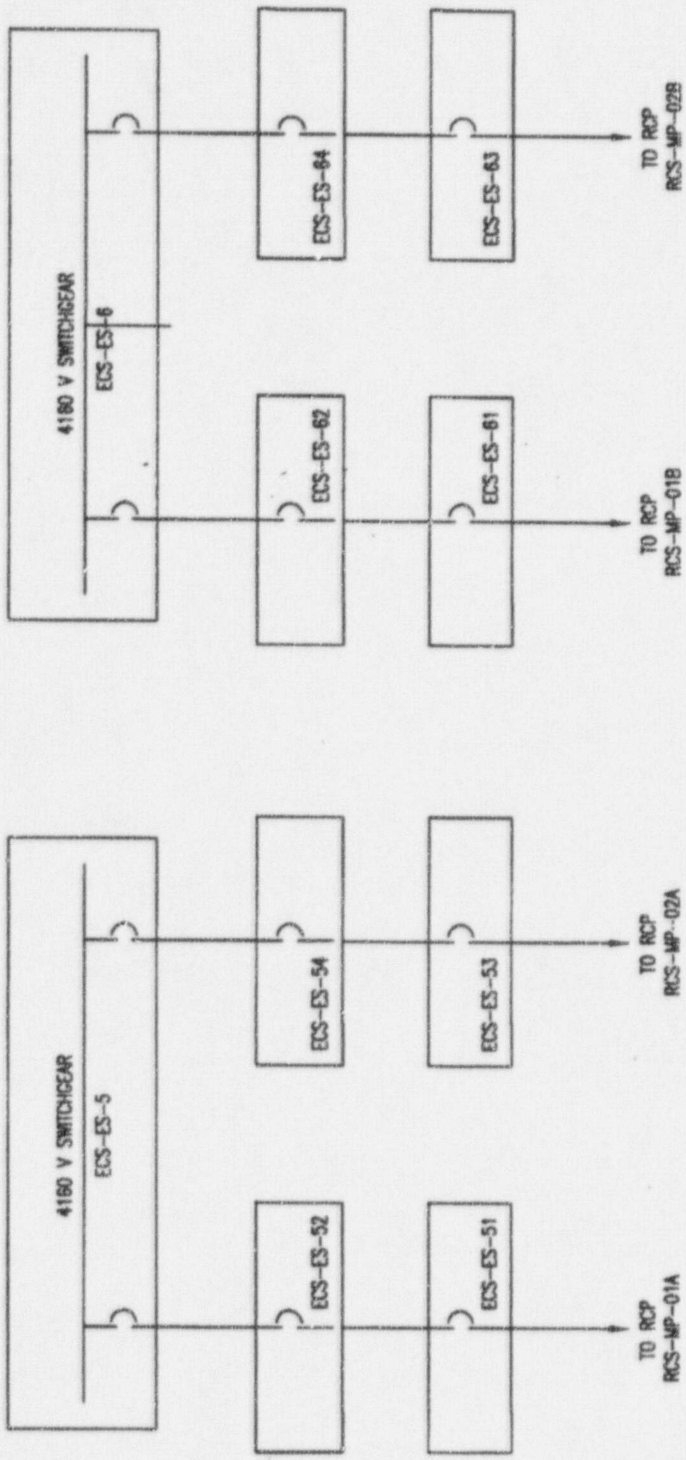

Figure 2.6.1-1 (Sheet 2 of 2)
Main ac Power System

2.6.2 Non-Class 1E dc and Uninterruptible Power Supply System

Design Description

The non-Class 1E dc and uninterruptible power supply system (EDS) provides dc and uninterruptible ac electrical power to nonsafety-related loads.

1. The functional arrangement of the applicable portions of the EDS is as shown in Figure 2.6.2-1.

2. The EDS provides the following nonsafety-related functions:

   a) Each EDS load group 1, 2, and 3 battery charger supplies the corresponding dc switchboard bus load while maintaining the corresponding battery charged.

   b) Each EDS load group 1, 2, and 3 battery supplies the corresponding dc switchboard bus load for a period of 1 hour without recharging.

   c) Each EDS load group 1, 2, and 3 inverter supplies the corresponding ac load.

Inspections, Tests, Analyses, and Acceptance Criteria

Table 2.6.2-1 specifies the inspections, tests, analyses, and associated acceptance criteria for the EDS.

Table 2.6.2-1
Inspections, Tests, Analyses, and Acceptance Criteria

Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
1. The functional arrangement of the applicable portions of the EDS is as shown in Figure 2.6.2-1.	Inspection of the as-built system will be performed.	The as-built EDS conforms with the functional arrangement shown in Figure 2.6.2-1.
2.a) Each EDS load group 1, 2, and 3 battery charger supplies the corresponding dc switchboard bus load while maintaining the corresponding battery charged.	Testing of each as-built battery charger will be performed by applying a simulated or real load, or a combination of simulated or real loads.	Each battery charger provides an output current of at least 550 amps with an output voltage in the range 105 to 140 V.
2.b) Each EDS load group 1, 2, and 3 battery supplies the corresponding dc switchboard bus load for a period of 1 hour without recharging.	Testing of each as-built battery will be performed by applying a simulated or real load, or a combination of simulated or real loads. The test will be conducted on a battery that has been fully charged and has been connected to a battery charger maintained at 135 ± 1 V for a period of no less than 24 hours prior to the test.	The battery terminal voltage is greater than or equal to 105 V after a period of no less than 1 hour, with an equivalent load of 500 ± 5 amps.
2.c) Each EDS load group 1, 2, and 3 inverter supplies the corresponding ac load.	Testing of each as-built inverter will be performed by applying a simulated or real load, or a combination of simulated or real loads, equivalent to a resistive load of 35 ±1 kW.	Each inverter provides a line-to-line output voltage of 208 ± 2% V at a frequency of 60 ± 0.5% Hz.

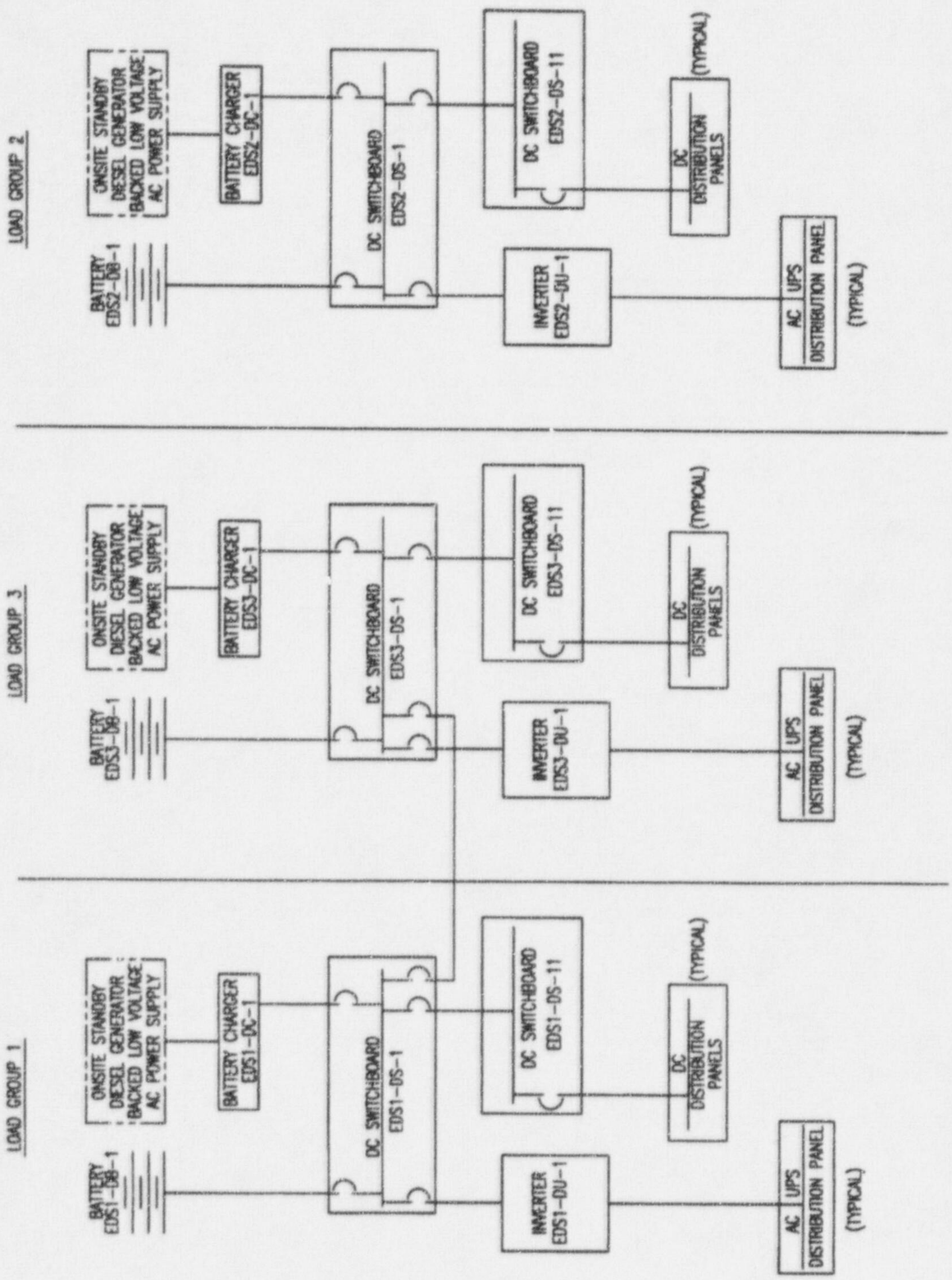

Figure 2.6.2-1
Non-Class 1E dc and
Uninterruptible Power Supply System

2.6.3 Class 1E dc and Uninterruptible Power Supply System

Design Description

The Class 1E dc and uninterruptible power supply system (IDS) provides dc and uninterruptible ac electrical power for safety-related equipment and provides the normal and emergency lighting in the main control room (MCR) and at the remote shutdown workstation (RSW).

1. The functional arrangement of the applicable portions of the IDS is as shown in Figure 2.6.3-1.

2. The seismic Category I equipment identified in Table 2.6.3-1 can withstand seismic design basis dynamic loads without loss of safety function.

3. Separation is provided between Class 1E divisions, and between Class 1E divisions and non-Class 1E cables.

4. The IDS provides the following safety-related functions:

   a) The IDS provides electrical independence between the Class 1E divisions.

   b) The IDS provides electrical isolation between the non-Class 1E ac power system and the non-Class 1E lighting in the MCR.

   c) Each IDS 24-hour battery bank, the parallel combination of two 24-hour batteries, supplies a dc switchboard bus load for a period of 24 hours without recharging.

   d) Each IDS 72-hour battery bank, the parallel combination of two 72-hour batteries, supplies a dc switchboard bus load for a period of 72 hours without recharging.

   e) The IDS spare battery bank, the parallel combination of batteries IDSS-DB-1A and IDSS-DB-1B, supplies a dc load equal to or greater than the largest 24-hour switchboard bus load for a period of 24 hours without recharging.

   f) Each IDS 24-hour inverter supplies its ac load.

   g) Each IDS 72-hour inverter supplies its ac load.

   h) The IDS Divisions B and C regulating transformers supply their post-72-hour ac loads when powered from a portable generator.

   i) Each IDS 24-hour battery charger provides the protection and safety monitoring system (PMS) with two loss-of-ac input voltage signals.

j) The IDS supplies an operating voltage at the terminals of the Class 1E motor-operated valves identified in Certified Design Material subsections 2.1.2, 2.2.1, 2.2.2, 2.2.3, 2.2.4, 2.3.2, and 2.3.6 that is greater than or equal to the minimum specified voltage.

5. The IDS provides the following nonsafety-related functions:

   a) Each IDS 24-hour battery charger supplies a dc switchboard bus load while maintaining the corresponding battery charged.

   b) Each IDS 72-hour battery charger supplies a dc switchboard bus load while maintaining the corresponding battery charged.

   c) Each IDS regulating transformer supplies an ac load when powered from the 480 V motor control center (MCC).

   d) The IDS provides emergency lighting at the MCR workstations and the RSW by six groups of lights. Each group is powered by one of the Class 1E inverters.

   e) The IDS provides lighting at the MCR safety panels by four groups of lights. Each group is powered by one of the Class 1E inverters in Divisions B and C (one 24-hour and one 72-hour inverter in each division).

6. Safety-related displays identified in Table 2.6.3-1 can be retrieved in the MCR.

Inspections, Tests, Analyses, and Acceptance Criteria

Table 2.6.3-2 specifies the inspections, tests, analyses, and associated acceptance criteria for the IDS.

Table 2.6.3-1				
Equipment Name	Tag No.	Seismic Cat. I	Class 1E/ Qual. for Harsh Envir.	Safety-Related Display
Division A 125 Vdc 24-Hour Battery 1A	IDSA-DB-1A	Yes	Yes/No	No
Division A 125 Vdc 24-Hour Battery 1B	IDSA-DB-1B	Yes	Yes/No	No
Division B 125 Vdc 24-Hour Battery 1A	IDSB-DB-1A	Yes	Yes/No	No
Division B 125 Vdc 24-Hour Battery 1B	IDSB-DB-1B	Yes	Yes/No	No
Division B 125 Vdc 72-Hour Battery 2A	IDSB-DB-2A	Yes	Yes/No	No
Division B 125 Vdc 72-Hour Battery 2B	IDSB-DB-2B	Yes	Yes/No	No
Division C 125 Vdc 24-Hour Battery 1A	IDSC-DB-1A	Yes	Yes/No	No
Division C 125 Vdc 24-Hour Battery 1B	IDSC-DB-1B	Yes	Yes/No	No
Division C 125 Vdc 72-Hour Battery 2A	IDSC-DB-2A	Yes	Yes/No	No
Division C 125 Vdc 72-Hour Battery 2B	IDSC-DB-2B	Yes	Yes/No	No
Division D 125 Vdc 24-Hour Battery 1A	IDSD-DB-1A	Yes	Yes/No	No
Division D 125 Vdc 24-Hour Battery 1B	IDSD-DB-1B	Yes	Yes/No	No
Spare 125 Vdc Battery 1A	IDSS-DB-1A	Yes	Yes/No	No
Spare 125 Vdc Battery 1B	IDSS-DB-1B	Yes	Yes/No	No
Division A 24-Hour Battery Charger 1	IDSA-DC-1	Yes	Yes/No	No
Division B 24-Hour Battery Charger 1	IDSB-DC-1	Yes	Yes/No	No
Division B 72-Hour Battery Charger 2	IDSB-DC-2	Yes	Yes/No	No
Division C 24-Hour Battery Charger 1	IDSC-DC-1	Yes	Yes/No	No
Division C 72-Hour Battery Charger 2	IDSC-DC-2	Yes	Yes/No	No
Division D 24-Hour Battery Charger 1	IDSD-DC-1	Yes	Yes/No	No
Spare Battery Charger 1	IDSS-DC-1	Yes	Yes/No	No
Division A 125 Vdc Distribution Panel	IDSA-DD-1	Yes	Yes/No	No
Division B 125 Vdc Distribution Panel	IDSB-DD-1	Yes	Yes/No	No
Division C 125 Vdc Distribution Panel	IDSC-DD-1	Yes	Yes/No	No

Table 2.6.3-1 (cont)				
Equipment Name	Tag No.	Seismic Cat. I	Class 1E/ Qual. for Harsh Envir.	Safety-Related Display
Division D 125 Vdc Distribution Panel	IDSD-DD-1	Yes	Yes/No	No
Division A 120 Vac Distribution Panel 1	IDSA-EA-1	Yes	Yes/No	No
Division A 120 Vac Distribution Panel 2	IDSA-EA-2	Yes	Yes/No	No
Division B 120 Vac Distribution Panel 1	IDSB-EA-1	Yes	Yes/No	No
Division B 120 Vac Distribution Panel 2	IDSB-EA-2	Yes	Yes/No	No
Division B 120 Vac Distribution Panel 3	IDSB-EA-3	Yes	Yes/No	No
Division C 120 Vac Distribution Panel 1	IDSC-EA-1	Yes	Yes/No	No
Division C 120 Vac Distribution Panel 2	IDSC-EA-2	Yes	Yes/No	No
Division C 120 Vac Distribution Panel 3	IDSC-EA-3	Yes	Yes/No	No
Division D 120 Vac Distribution Panel 1	IDSD-EA-1	Yes	Yes/No	No
Division D 120 Vac Distribution Panel 2	IDSD-EA-2	Yes	Yes/No	No
Division A Fuse Panel 4	IDSA-EA-4	Yes	Yes/No	No
Division B Fuse Panel 4	IDSB-EA-4	Yes	Yes/No	No
Division B Fuse Panel 5	IDSB-EA-5	Yes	Yes/No	No
Division B Fuse Panel 6	IDSB-EA-6	Yes	Yes/No	No
Division C Fuse Panel 4	IDSC-EA-4	Yes	Yes/No	No
Division C Fuse Panel 5	IDSC-EA-5	Yes	Yes/No	No
Division C Fuse Panel 6	IDSC-EA-6	Yes	Yes/No	No
Division D Fuse Panel 4	IDSD-EA-4	Yes	Yes/No	No
Division A Fused Transfer Switch Box 1	IDSA-DF-1	Yes	Yes/No	No
Division B Fused Transfer Switch Box 1	IDSB-DF-1	Yes	Yes/No	No
Division B Fused Transfer Switch Box 2	IDSB-DF-2	Yes	Yes/No	No
Division C Fused Transfer Switch Box 1	IDSC-DF-1	Yes	Yes/No	No
Division C Fused Transfer Switch Box 2	IDSC-DF-2	Yes	Yes/No	No
Division D Fused Transfer Switch Box 1	IDSD-DF-1	Yes	Yes/No	No

Table 2.6.3-1 (cont)				
Equipment Name	Tag No.	Seismic Cat. I	Class 1E/ Qual. for Harsh Envir.	Safety-Related Display
Spare Fused Transfer Switch Box 1	IDSS-DF-1	Yes	Yes/No	No
Division A 125 Vdc MCC	IDSA-DK-1	Yes	Yes/No	No
Division B 125 Vdc MCC	IDSB-DK-1	Yes	Yes/No	No
Division C 125 Vdc MCC	IDSC-DK-1	Yes	Yes/No	No
Division D 125 Vdc MCC	IDSD-DK-1	Yes	Yes/No	No
Division A 125 Vdc Switchboard 1	IDSA-DS-1	Yes	Yes/No	Yes (Bus Voltage)
Division B 125 Vdc Switchboard 1	IDSB-DS-1	Yes	Yes/No	Yes (Bus Voltage)
Division B 125 Vdc Switchboard 2	IDSB-DS-2	Yes	Yes/No	Yes (Bus Voltage)
Division C 125 Vdc Switchboard 1	IDSC-DS-1	Yes	Yes/No	Yes (Bus Voltage)
Division C 125 Vdc Switchboard 2	IDSC-DS-2	Yes	Yes/No	Yes (Bus Voltage)
Division D 125 Vdc Switchboard 1	IDSD-DS-1	Yes	Yes/No	Yes (Bus Voltage)
Division A Regulating Transformer	IDSA-DT-1	Yes	Yes/No	No
Division B Regulating Transformer	IDSB-DT-1	Yes	Yes/No	No
Division C Regulating Transformer	IDSC-DT-1	Yes	Yes/No	No
Division D Regulating Transformer	IDSD-DT-1	Yes	Yes/No	No
Division A 24-Hour Inverter 1	IDSA-DU-1	Yes	Yes/No	No
Division B 24-Hour Inverter 1	IDSB-DU-1	Yes	Yes/No	No
Division B 24-Hour Inverter 2	IDSB-DU-2	Yes	Yes/No	No
Division C 24-Hour Inverter 1	IDSC-DU-1	Yes	Yes/No	No
Division C 24-Hour Inverter 2	IDSC-DU-2	Yes	Yes/No	No
Division D 24-Hour Inverter 1	IDSD-DU-1	Yes	Yes/No	No

Table 2.6.3-1 (cont)				
Equipment Name	Tag No.	Seismic Cat. I	Class 1E/ Qual. for Harsh Envir.	Safety-Related Display
Spare Termination Box 2	IDSS-DF-2	Yes	Yes/No	No
Spare Termination Box 3	IDSS-DF-3	Yes	Yes/No	No
Spare Termination Box 4	IDSS-DF-4	Yes	Yes/No	No
Spare Termination Box 5	IDSS-DF-5	Yes	Yes/No	No
Spare Termination Box 6	IDSS-DF-6	Yes	Yes/No	No

Table 2.6.3-2
Inspections, Tests, Analyses, and Acceptance Criteria

Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
1. The functional arrangement of the IDS is as shown in Figure 2.6.3-1.	Inspection of the as-built system will be performed.	The as-built IDS conforms with the functional arrangement shown in Figure 2.6.3-1.
2. The seismic Category I equipment identified in Table 2.6.3-1 can withstand seismic design basis dynamic loads without loss of safety function.	i) Inspection will be performed to verify that the seismic Category I equipment identified in Table 2.6.3-1 is located on the nuclear island. ii) Type tests, analyses, or a combination of type tests and analyses of seismic Category I equipment will be performed. iii) Analysis of seismic Category I equipment supports will be performed.	i) The seismic Category I equipment identified in Table 2.6.3-1 is located on the nuclear island. ii) A report exists and concludes that the seismic Category I equipment can withstand seismic design basis dynamic loads without loss of safety function. iii) A report exists and concludes that the seismic Category I equipment supports can withstand seismic design basis loads without loss of safety function.
3. Separation is provided between Class 1E divisions, and between Class 1E divisions and non-Class 1E cables.	See Certified Design Material, Section 3.3, Nuclear Island Buildings.	See Certified Design Material, Section 3.3, Nuclear Island Buildings.
4.a) The IDS provides electrical independence between the Class 1E divisions.	Testing will be performed on the IDS by providing a simulated test signal in each Class 1E division.	A simulated test signal exists at the Class 1E equipment identified in Table 2.6.3-1 when the assigned Class 1E division is provided the test signal.
4.b) The IDS provides electrical isolation between the non-Class 1E ac power system and the non-Class 1E lighting in the MCR.	Type tests, analyses, or a combination of type tests and analyses of the isolation devices will be performed.	A report exists and concludes that the battery chargers, regulating transformers, and isolation fuses prevent credible faults from propagating into the IDS.

Table 2.6.3-2 (cont)
Inspections, Tests, Analyses, and Acceptance Criteria

Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
4.c) Each IDS 24-hour battery bank, the parallel combination of two 24-hour batteries, supplies a dc switchboard bus load for a period of 24 hours without recharging.	Testing of each 24-hour as-built battery bank will be performed by applying a simulated or real load, or a combination of simulated or real loads. The test will be conducted on a battery that has been fully charged and has been connected to a battery charger maintained at 135 ± 1 V for a period of no less than 24 hours prior to the test.	The battery terminal voltage is greater than or equal to 105 V after a period of no less than 24 hours with an equivalent load greater than 150 A.
4.d) Each IDS 72-hour battery bank, the parallel combination of two 72-hour batteries, supplies a dc switchboard bus load for a period of 72 hours without recharging.	Testing of each 72-hour as-built battery bank will be performed by applying a simulated or real load, or a combination of simulated or real loads. The test will be conducted on a battery that has been fully charged and has been connected to a battery charger maintained at 135 ± 1 V for a period of no less than 24 hours prior to the test.	The battery terminal voltage is greater than or equal to 105 V after a period of no less than 72 hours with an equivalent load greater than 50 A.
4.e) The IDS spare battery bank, the parallel combination of batteries IDSS-DB-1A and IDSS-DB-1B, supplies a dc load equal to or greater than the largest 24-hour switchboard bus load for a period of 24 hours without recharging.	Testing of the as-built spare battery bank will be performed by applying a simulated or real load, or a combination of simulated or real loads. The test will be conducted on a battery that has been fully charged and has been connected to a battery charger maintained at 135 ± 1 V for a period of no less than 24 hours prior to the test.	The battery terminal voltage is greater than or equal to 105 V after a period of no less than 24 hours with an equivalent load greater than 150 A.
4.f) Each IDS 24-hour inverter supplies its ac load.	Testing of each 24-hour as-built inverter will be performed by applying a simulated or real load, or a combination of simulated or real loads, equivalent to a resistive load greater than 12 kW.	Each 24-hour inverter supplies a line-to-line output voltage of 208 ± 2% V at a frequency of 60 ± 0.5% Hz.

Table 2.6.3-2 (cont)
Inspections, Tests, Analyses, and Acceptance Criteria

Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
4.g) Each IDS 72-hour inverter supplies its ac load.	Testing of each 72-hour as-built inverter will be performed by applying a simulated or real load, or a combination of simulated or real loads, equivalent to a resistive load greater than 6 kW.	Each 72-hour inverter supplies a line-to-line output voltage of 208 ± 2% V at a frequency of 60 ± 0.5% Hz.
4.h) The IDS Divisions B and C regulating transformers supply their post-72-hour ac loads when powered from a portable generator.	See item 1 of this table.	See item 1 of this table.
4.i) Each IDS 24-hour battery charger provides the PMS with two loss-of-ac input voltage signals.	Testing will be performed by simulating a loss of input voltage to each 24-hour battery charger.	Two PMS input signals exist from each 24-hour battery charger indicating loss of ac input voltage when the loss-of-input voltage condition is simulated.
4.j) The IDS supplies an operating voltage at the terminals of the Class 1E motor operated valves identified in Certified Design Material subsections 2.1.2, 2.2.1, 2.2.2, 2.2.3, 2.2.4, 2.3.2, and 2.3.6 that is greater than or equal to the minimum specified voltage.	Testing will be performed by stroking each specified motor-operated valve and measuring the terminal voltage with the equipment operating.	The terminal voltage is greater than or equal 100 Vdc with the motor operating.
5.a) Each IDS 24-hour battery charger supplies a dc switchboard bus load while maintaining the corresponding battery charged.	Testing of each as-built 24-hour battery charger will be performed by applying a simulated or real load, or a combination of simulated or real loads.	Each 24-hour battery charger provides an output current of at least 300 A with an output voltage in the range 105 to 140 V.
5.b) Each IDS 72-hour battery charger supplies a dc switchboard bus load while maintaining the corresponding battery charged.	Testing of each 72-hour as-built battery charger will be performed by applying a simulated or real load, or a combination of simulated or real loads.	Each 72-hour battery charger provides an output current of at least 250 A with an output voltage in the range 105 to 140 V.

Table 2.6.3-2 (cont) Inspections, Tests, Analyses, and Acceptance Criteria		
Design Commitment	**Inspections, Tests, Analyses**	**Acceptance Criteria**
5.c) Each IDS regulating transformer supplies an ac load when powered from the 480 V MCC.	Testing of each as-built regulating transformer will be performed by applying a simulated or real load, or a combination of simulated or real loads, equivalent to a resistive load greater than 30 kW when powered from the 480 V MCC.	Each regulating transformer supplies a line-to-line output voltage of 208 ± 2% V.
5.d) The IDS provides emergency lighting at the MCR workstations and the RSW by six groups of lights. Each group is powered by one of the Class 1E inverters.	Testing of the as-built system will be performed using one Class 1E inverter at a time.	Each of the six as-built emergency lighting groups is supplied power from its respective Class 1E inverter.
5.e) The IDS provides lighting at the MCR safety panels by four groups of lights. Each group is powered by one of the Class 1E inverters in Divisions B and C (one 24-hour and one 72-hour inverter in each division).	Testing of the as-built system will be performed using one Class 1E inverter at a time.	Each of the four as-built panel lighting groups is supplied power from its respective Class 1E inverter.
6. Safety-related displays identified in Table 2.6.3-1 can be retrieved in the MCR.	Inspection will be performed for retrievability of the safety-related displays in the MCR.	Safety-related displays identified in Table 2.6.3-1 can be retrieved in the MCR.

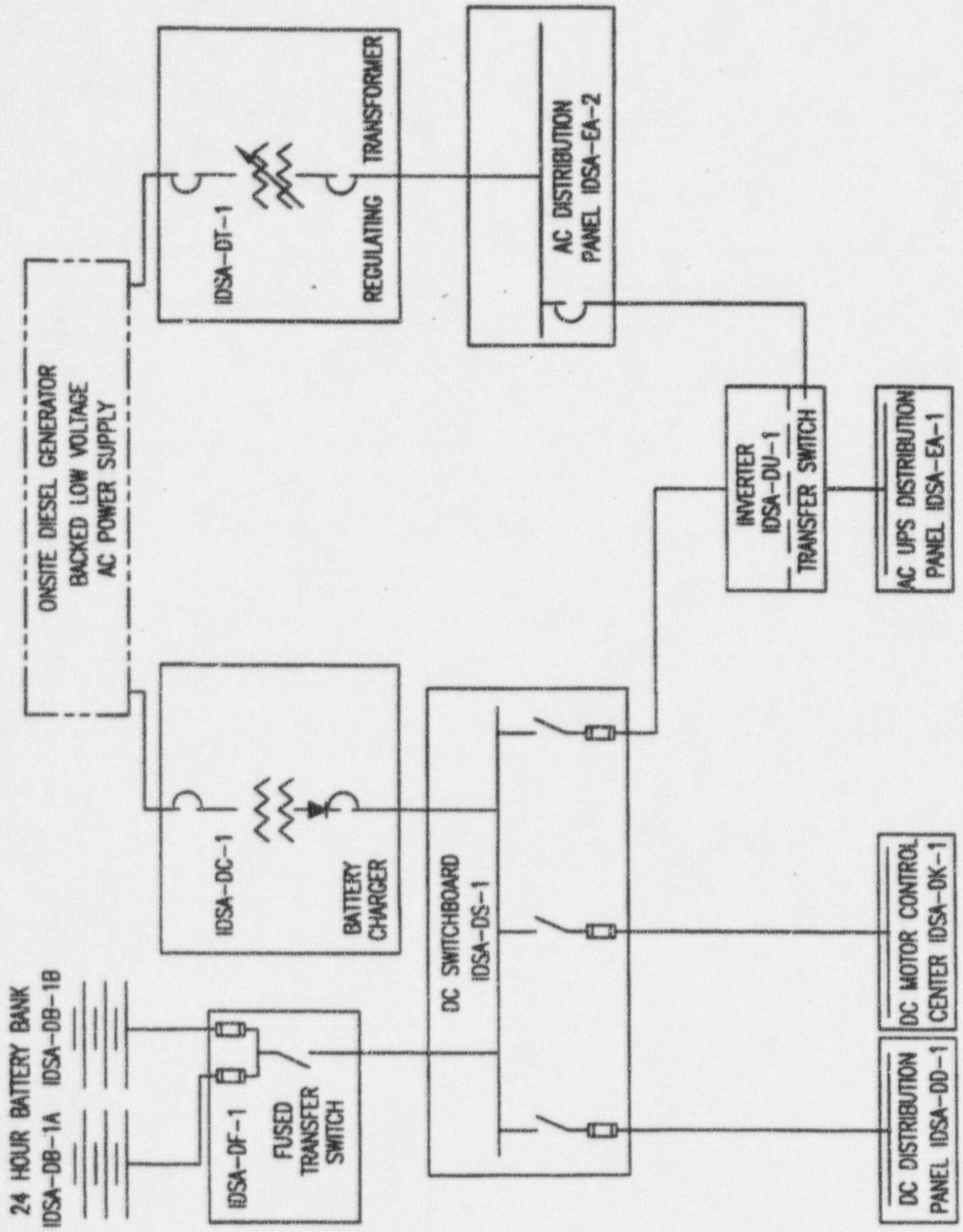

Figure 2.6.3-1 (Sheet 1 of 4)
Class 1E dc and Uninterruptible Power Supply System (Division A)

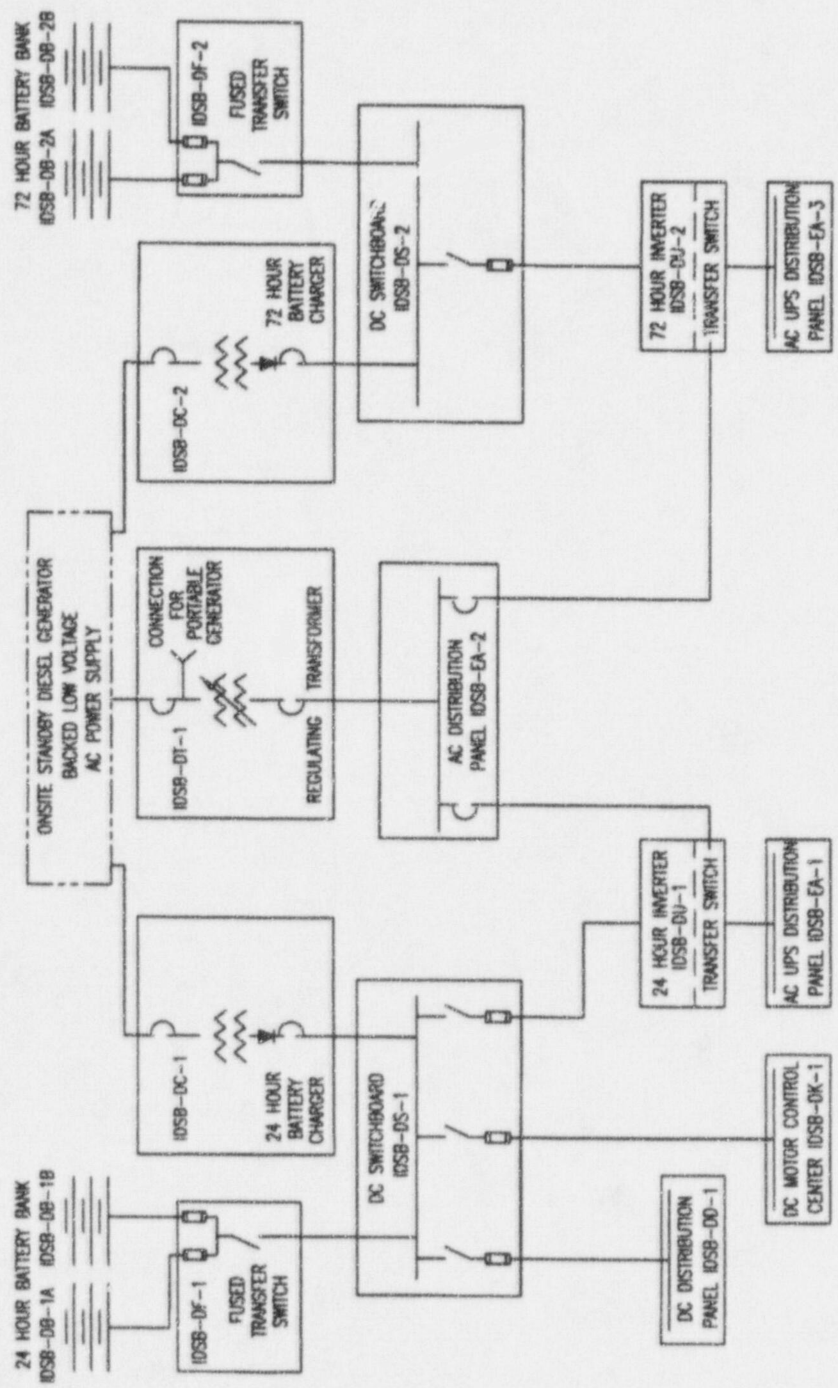

Figure 2.6.3-1 (Sheet 2 of 4)
Class 1E dc and Uninterruptible Power Supply System (Division B)

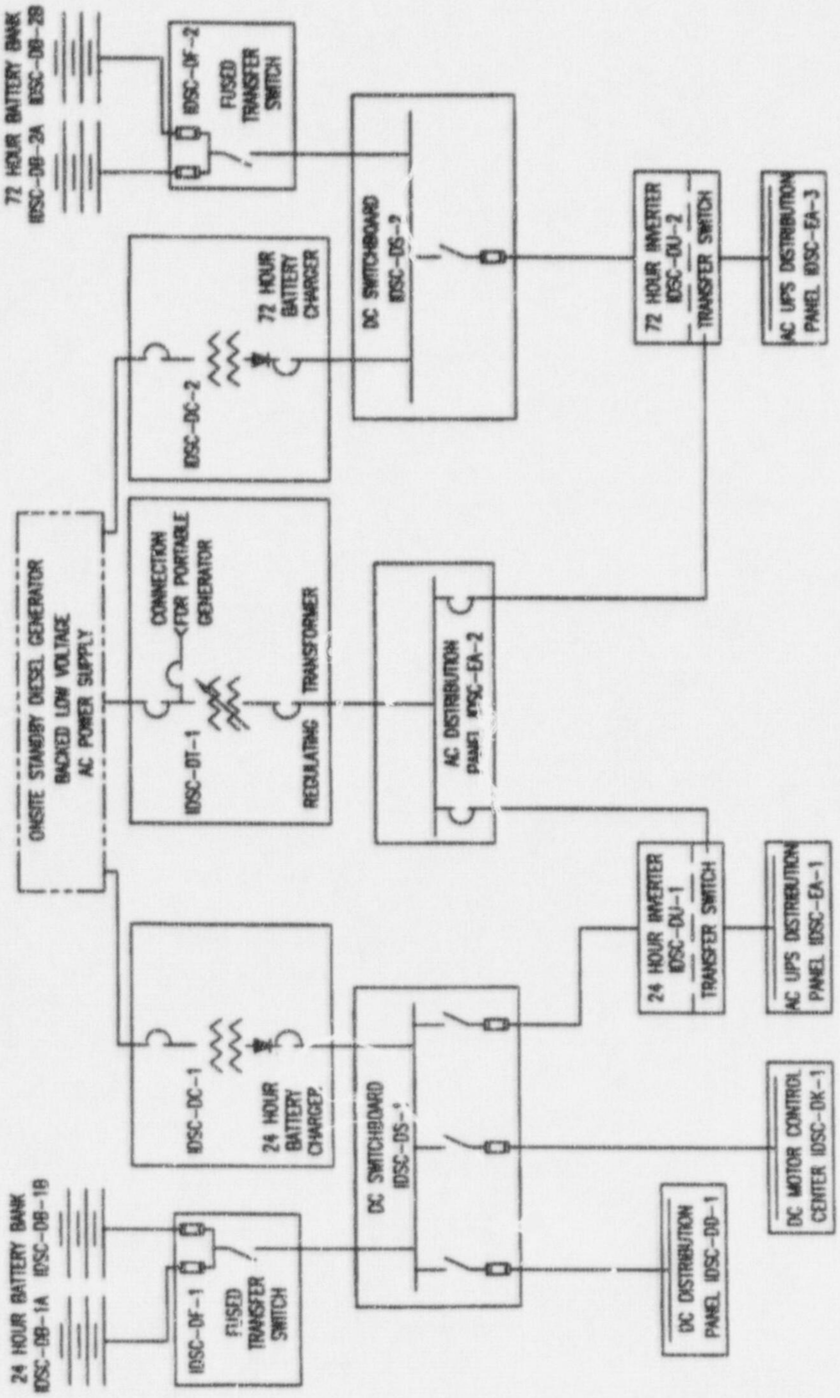

Figure 2.6.3-1 (Sheet 3 of 4)
Class 1E dc and Uninterruptible Power Supply System (Division C)

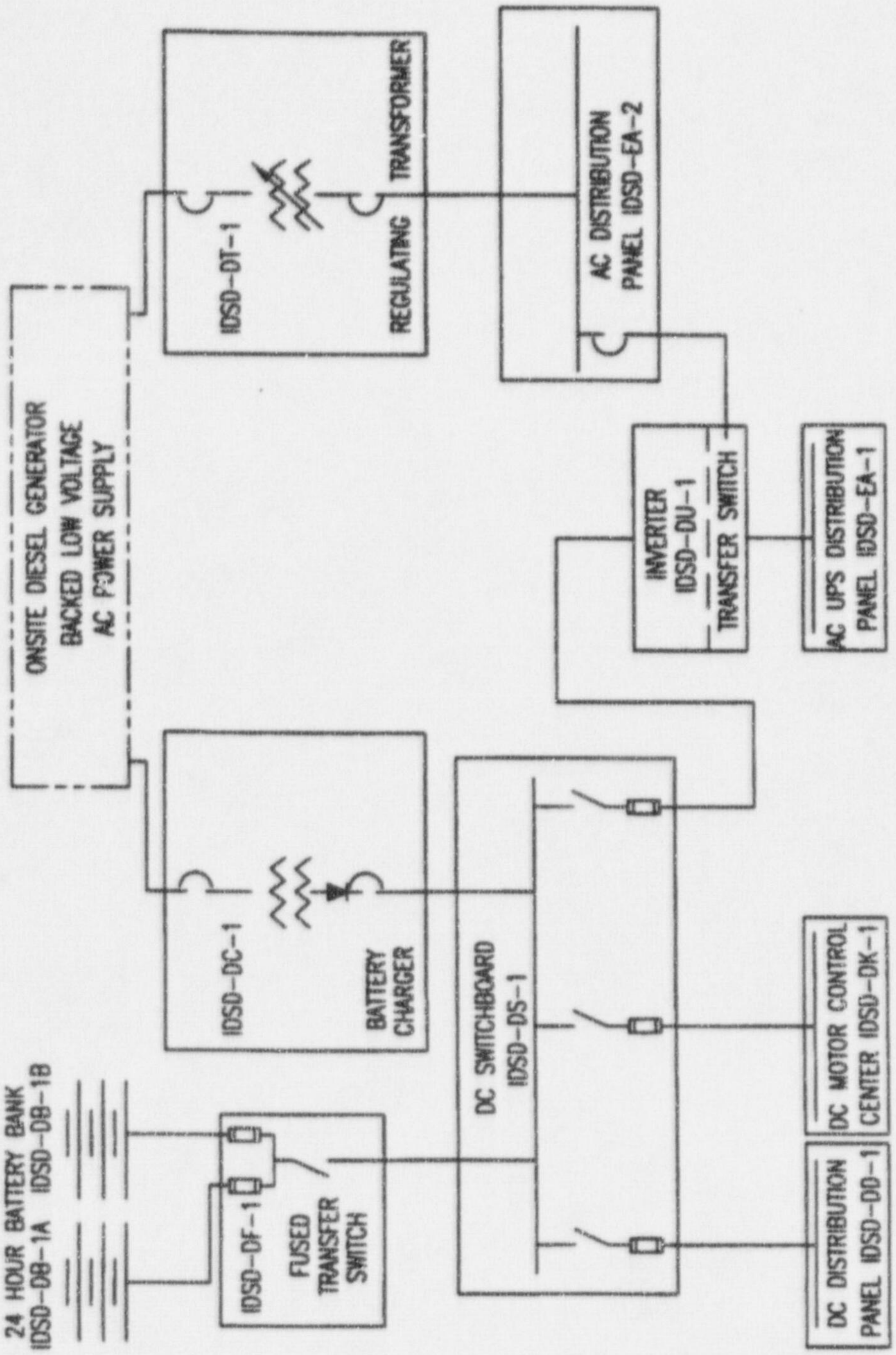

Figure 2.6.3-1 (Sheet 4 of 4)
Class 1E dc and Uninterruptible Power Supply System (Division D)

2.6.4 Onsite Standby Power System

Design Description

The onsite standby power system (ZOS) provides ac electrical power for nonsafety-related loads.

1. The ZOS has two standby diesel generator units.

2. The ZOS provides the following nonsafety-related functions:

   a) On loss of power to a 4160 volt diesel-backed bus, the associated diesel generator automatically starts and produces ac power at rated voltage and frequency. The normal source circuit breaker and bus load circuit breakers are opened, and the generator is connected to the bus.

   b) Each diesel generator unit is sized to supply power to the selected nonsafety-related electrical components.

   c) Automatic-sequence loads are sequentially loaded on the associated buses.

3. Displays of diesel generator status (running/not running) and electrical output power (watts) can be retrieved in the main control room (MCR).

4. Controls exist in the MCR to start and stop each diesel generator.

Inspections, Tests, Analyses, and Acceptance Criteria

Table 2.6.4-1 specifies the inspections, tests, analyses, and associated acceptance criteria for the ZOS.

Table 2.6.4-1
Inspections, Tests, Analyses, and Acceptance Criteria

Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
1. The ZOS has two standby diesel generator units.	Inspection of the as-built system will be performed.	The as-built ZOS has two diesel generator units.
2.a) On loss of power to a 4160 volt diesel-backed bus, the associated diesel generator automatically starts and produces ac power at rated voltage and frequency. The normal source circuit breaker and bus load circuit breakers are opened, and the generator is connected to the bus.	Tests on the as-built ZOS system will be conducted by providing a simulated loss-of-voltage signal.	Each as-built diesel generator automatically starts on receiving a simulated loss-of-voltage signal and attains a voltage of 4160 ± 10% V and frequency 60 ± 2% Hz after the start signal is initiated and provides signals to open main ac power system breakers.
2.b) Each diesel generator unit is sized to supply power to the selected nonsafety-related electrical components.	Each diesel generator will be operated with a load of 3800 kW and a power factor between 0.9 and 1.0 for a time period required to reach engine temperature equilibrium plus 2.5 hours.	Each diesel provides power to the load with a generator terminal voltage of 4160 ± 10% V and a frequency of 60 ± 2% Hz.
2.c) Automatic-sequence loads are sequentially loaded on the associated buses.	An actual or simulated signal is initiated to start the load sequencer operation. Output signals will be monitored to determine the operability of the load sequencer. Time measurements are taken to determine the load stepping intervals.	The load sequencer initiates a closure signal within ±5 seconds of the set intervals to connect the loads.
3. Displays of diesel generator status (running/not running) and electrical output power (watts) can be retrieved in the MCR.	Inspection will be performed for retrievability of the displays in the MCR.	Displays of diesel generator status and electrical output power can be retrieved in the MCR.
4. Controls exist in the MCR to start and stop each diesel generator.	A test will be performed to verify that controls in the MCR can start and stop each diesel generator.	Controls in the MCR operate to start and stop each diesel generator.

2.7.1 Nuclear Island Nonradioactive Ventilation System

Design Description

A portion of the nuclear island nonradioactive ventilation system (VBS) maintains the main control room (MCR), technical support center (TSC), Class 1E electrical rooms, and Class 1E battery rooms within their normal room design temperature ranges.

1. The functional arrangement of the applicable portions of the VBS servicing the MCR is as shown in Figure 2.7.1-1.

2. The seismic Category I equipment identified in Table 2.7.1-1 can withstand seismic design basis dynamic loads without loss of safety function.

3. a) The Class 1E components identified in Table 2.7.1-1 are powered from their respective Class 1E division.

   b) Separation is provided between VBS Class 1E divisions, and between Class 1E divisions and non-Class 1E cable.

4. The VBS provides the safety-related function to isolate the ducts that penetrate the MCR pressure boundary.

5. The VBS provides the following nonsafety-related functions:

   a) The VBS provides cooling to the MCR, TSC, and Class 1E electrical rooms.

   b) The VBS provides ventilation cooling to the Class 1E battery rooms.

   c) The VBS maintains MCR habitability when radioactivity is detected.

6. Safety-related displays identified in Table 2.7.1-1 can be retrieved in the MCR.

7. a) Controls exist in the MCR to cause those remotely operated dampers identified in Table 2.7.1-1 to perform their active functions.

   b) The dampers identified in Table 2.7.1-1 as having protection and safety monitoring system (PMS) control perform their active safety function after receiving a signal from the PMS.

8. After loss of motive power, the dampers identified in Table 2.7.1-1 assume the indicated loss of motive power position.

9. Controls exist in the MCR to cause the fans identified in Table 2.7.1-2 to perform their listed function.

10. Displays of the VBS parameters identified in Table 2.7.1-2 can be retrieved in the MCR.

Inspections, Tests, Analyses, and Acceptance Criteria

Table 2.7.1-3 specifies the inspections, tests, analyses, and associated acceptance criteria for the VBS.

Table 2.7.1-1

Equipment Name	Tag No.	Seismic Cat. I	Remotely Operated Damper	Class 1E/ Qual. for Harsh Envir.	Safety-Related Display	Control PMS	Active Function	Loss of Motive Power Position
MCR Supply Air Isolation Damper	VBS-MD-D214	Yes	Yes	Yes/No	Yes (Damper Position)	Yes	Transfer Closed	Closed
MCR Supply Air Isolation Damper	VBS-MD-D215	Yes	Yes	Yes/No	Yes (Damper Position)	Yes	Transfer Closed	Closed
MCR Return Air Isolation Damper	VBS-MD-D216	Yes	Yes	Yes/No	Yes (Damper Position)	Yes	Transfer Closed	Closed
MCR Return Air Isolation Damper	VBS-MD-D217	Yes	Yes	Yes/No	Yes (Damper Position)	Yes	Transfer Closed	Closed
MCR Exhaust Air Isolation Damper	VBS-MD-D220	Yes	Yes	Yes/No	Yes (Damper Position)	Yes	Transfer Closed	Closed
MCR Exhaust Air Isolation Damper	VBS-MD-D221	Yes	Yes	Yes/No	Yes (Damper Position)	Yes	Transfer Closed	Closed

Table 2.7.1-2			
Equipment	**Tag No.**	**Display**	**Control Function**
Supplemental Air Filtration Unit Fan A	VBS-MA-03A	Yes (Run Status)	Start
Supplemental Air Filtration Unit Fan B	VBS-MA-03B	Yes (Run Status)	Start
MCR/TSC Supply Air Handling Units (AHU) A Fans	VBS-MA-01A VBS-MA-02A	Yes (Run Status)	Start
MCR/TSC Supply AHU B Fans	VBS-MA-01B VBS-MA-02B	Yes (Run Status)	Start
Division "A" and "C" Class 1E Electrical Room AHU A Fans	VBS-MA-05A VBS-MA-06A	Yes (Run Status)	Start
Division "A" and "C" Class 1E Electrical Room AHU C Fans	VBS-MA-05C VBS-MA-06C	Yes (Run Status)	Start
Division "B" and "D" Class 1E Electrical Room AHU B Fans	VBS-MA-05B VBS-MA-06B	Yes (Run Status)	Start
Division "B" and "D" Class 1E Electrical Room AHU D Fans	VBS-MA-05D VBS-MA-06D	Yes (Run Status)	Start
Division "A" and "C" Class 1E Battery Room Exhaust Fans	VBS-MA-07A VBS-MA-07C	Yes (Run Status)	Start
Division "B" and "D" Class 1E Battery Room Exhaust Fans	VBS-MA-07B VBS-MA-07D	Yes (Run Status)	Start

Table 2.7.1-3
Inspections, Tests, Analyses, and Acceptance Criteria

Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
1. The functional arrangement of the applicable portions of the VBS servicing the MCR is as shown in Figure 2.7.1-1.	Inspection of the as-built system will be performed.	The as-built VBS conforms with the functional arrangement shown in Figure 2.7.1-1.
2. The seismic Category I equipment identified in Table 2.7.1-1 can withstand seismic design basis dynamic loads without loss of safety function.	i) Inspection will be performed to verify that the seismic Category I equipment identified in Table 2.7.1-1 is located on the nuclear island. ii) Type tests, analyses, or a combination of type tests and analyses of seismic Category I equipment will be performed.	i) The seismic Category I equipment identified in Table 2.7.1-1 is located on the nuclear island. ii) A report exists and concludes that the seismic Category I equipment identified in Table 2.7.1-1 can withstand seismic design basis dynamic loads without loss of safety function.
3.a) The Class 1E components identified in Table 2.7.1-1 are powered from their respective Class 1E division.	Testing will be performed on the VBS by providing a simulated test signal in each Class 1E division.	A simulated test signal exists at the Class 1E equipment identified in Table 2.7.1-1 when the assigned Class 1E division is provided the test signal.
3.b) Separation is provided between VBS Class 1E divisions, and between Class 1E divisions and non-Class 1E cable.	See Certified Design Material, Section 3.3, Nuclear Island Buildings.	See Certified Design Material, Section 3.3, Nuclear Island Buildings.
4. The VBS provides the safety-related function to isolate the ducts that penetrate the MCR pressure boundary.	See item 7.b in this table.	See item 7.b in this table.
5.a) The VBS provides cooling to the MCR, TSC, and Class 1E electrical rooms.	See item 9 in this table.	See item 9 in this table.
5.b) The VBS provides ventilation cooling to the Class 1E battery rooms.	See item 9 in this table.	See item 9 in this table.

Table 2.7.1-3 (cont) Inspections, Tests, Analyses, and Acceptance Criteria		
Design Commitment	**Inspections, Tests, Analyses**	**Acceptance Criteria**
5.c) The VBS maintains MCR habitability when radioactivity is detected.	See item 9 in this table.	See item 9 in this table.
6. Safety-related displays of the VBS parameters identified in Table 2.7.1-1 can be retrieved in the MCR.	Inspection will be performed for retrievability of the safety-related displays in the MCR.	Safety-related displays identified in Table 2.7.1-1 can be retrieved in the MCR.
7.a) Controls exist in the MCR to cause those remotely operated dampers identified in Table 2.7.1-1 to perform their active functions.	Stroke testing will be performed on the remotely operated dampers identified in Table 2.7.1-1 using the controls in the MCR.	Controls in the MCR operate to cause those remotely operated dampers identified in Table 2.7.1-1 to perform their active functions.
7.b) The dampers identified in Table 2.7.1-1 as having PMS control perform their active safety function after receiving a signal from the PMS.	Testing will be performed using real or simulated signals into the PMS.	The dampers identified in Table 2.7.1-1 as having PMS control perform their active safety function after receiving a signal from PMS.
8. After loss of motive power, the dampers identified in Table 2.7.1-1 assume the indicated loss of motive power position.	Testing of the installed dampers will be performed under the conditions of loss of motive power.	Upon loss of motive power, each remotely operated dampers identified in Table 2.7.1-1 assumes the indicated loss of motive power position.
9. Controls exist in the MCR to cause the fans identified in Table 2.7.1-2 to perform their listed function.	Testing will be performed to actuate the fans identified in Table 2.7.1-2 using controls in the MCR.	Controls in the MCR cause fans identified in Table 2.7.1-2 to perform the listed function.
10. Displays of the VBS parameters identified in Table 2.7.1-2 can be retrieved in the MCR.	Inspection will be performed for retrievability of the displays identified in Table 2.7.1-2 in the MCR.	Displays identified in Table 2.7.1-2 can be retrieved in the MCR.

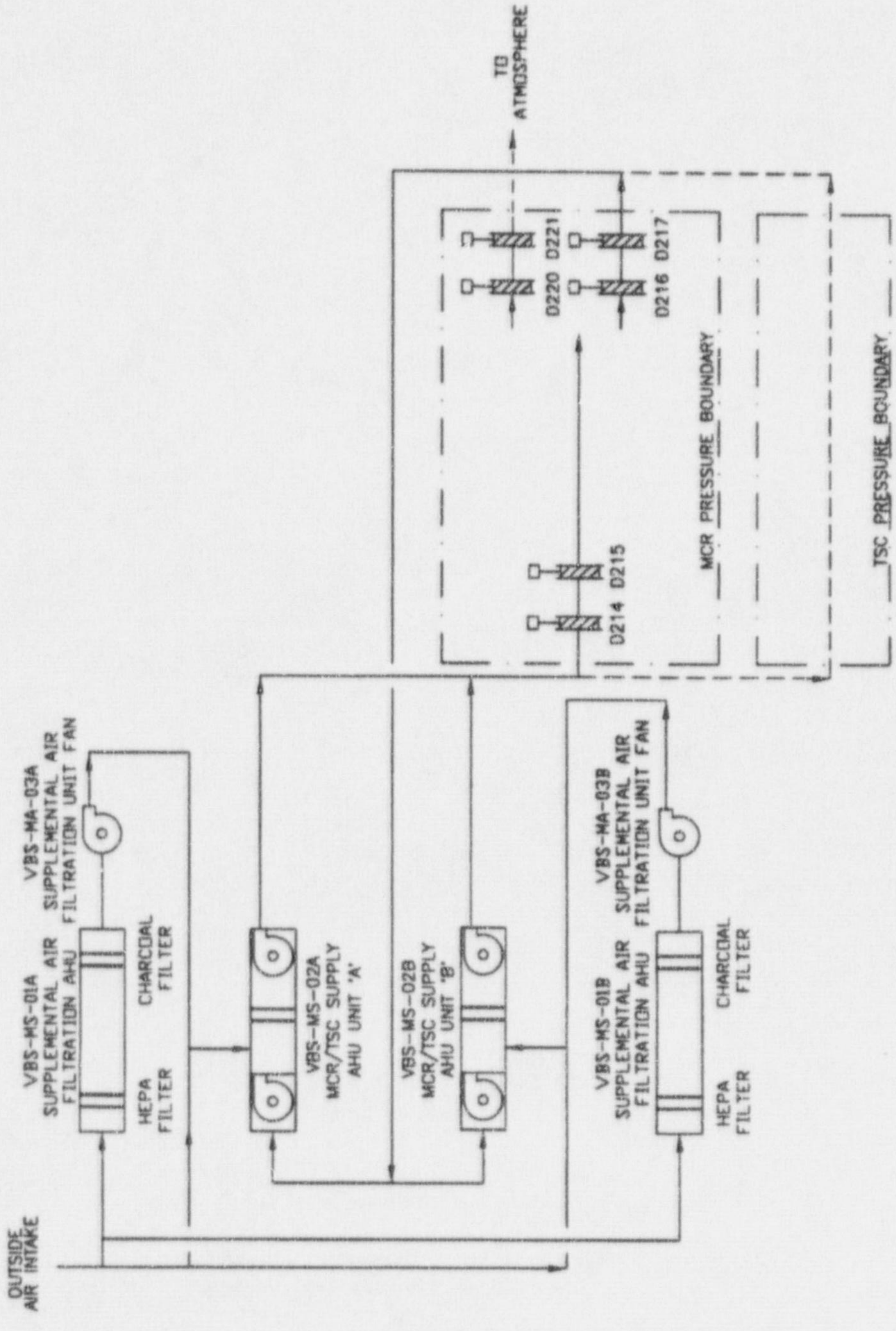

Figure 2.7.1-1 (Sheet 1 of 2)
Nuclear Island Nonradioactive Ventilation System

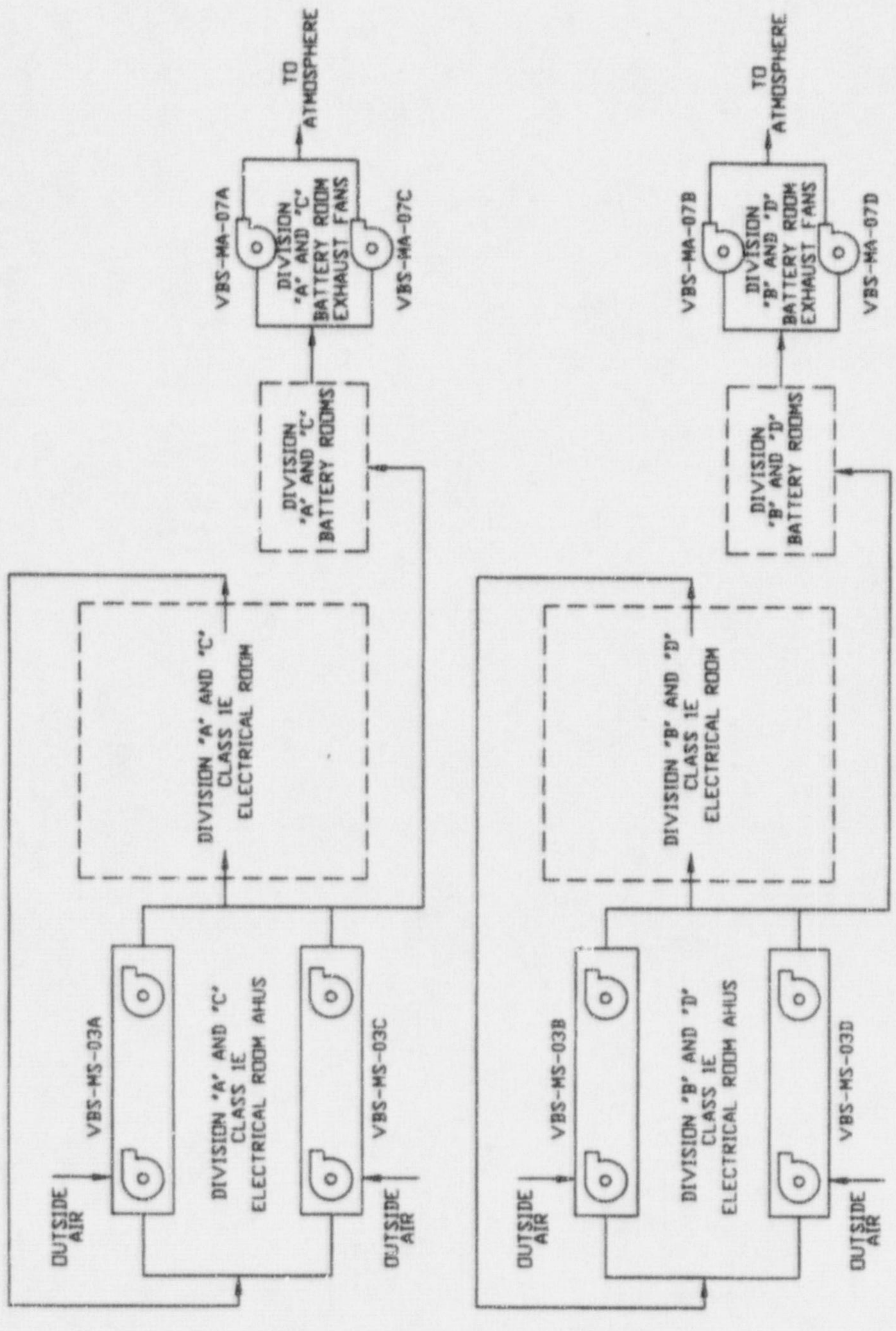

Figure 2.7.1-1 (Sheet 2 of 2)
Nuclear Island Nonradioactive Ventilation System

2.7.2 Central Chilled Water System

Design Description

A portion of the central chilled water system (VWS) and portions of the other associated systems remove heat from supply air handling units serving the main control room (MCR), the Class 1E electrical rooms, and the unit coolers located in the normal residual heat removal system (RNS) and chemical and volume control system (CVS) pump rooms.

1. The functional arrangement of the applicable portions of the VWS and other associated systems is as shown in Figure 2.7.2-1.

2. The applicable portions of the VWS provide the safety-related function of preserving containment integrity by isolation of the VWS lines penetrating the containment.

3. The applicable portions of the VWS provide the following nonsafety-related functions:

   a) The VWS provides chilled water to the supply air handling units serving the MCR, the Class 1E electrical rooms, and the unit coolers serving the RNS and CVS pump rooms.

   b) The VWS provides cooling to the RNS and CVS pump rooms during pump operation.

   c) The VWS air-cooled chillers transfer heat from the VWS to the surrounding atmosphere.

4. Controls exist in the MCR to cause the equipment identified in Table 2.7.2-1 to perform the listed function.

5. Displays of the VWS parameters identified in Table 2.7.2-1 can be retrieved in the MCR.

Inspections, Tests, Analyses, and Acceptance Criteria

Table 2.7.2-2 specifies the inspections, tests, analyses, and associated acceptance criteria for the VWS.

Table 2.7.2-1			
Equipment Name	**Tag No.**	**Display**	**Control Function**
Air-Cooled Chiller	VWS-MS-02	Yes (Run Status)	Start
Air-Cooled Chiller	VWS-MS-03	Yes (Run Status)	Start
Air-Cooled Chiller Pump	VWS-MP-01A	Yes (Run Status)	Start
Air-Cooled Chiller Pump	VWS-MP-01B	Yes (Run Status)	Start
CVS Pump Room Unit Cooler Fan A	VAS-MA-07A	Yes (Run Status)	Start
CVS Pump Room Unit Cooler Fan B	VAS-MA-07B	Yes (Run Status)	Start
RNS Pump Room Unit Cooler Fan A	VAS-MA-08A	Yes (Run Status)	Start
RNS Pump Room Unit Cooler Fan B	VAS-MA-08B	Yes (Run Status)	Start

Note: Dash (-) indicates not applicable.

Table 2.7.2-2
Inspections, Tests, Analyses, and Acceptance Criteria

Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
1. The functional arrangement of the applicable portions of the VWS is as shown in Figure 2.7.2-1.	Inspection of the applicable portions of the as-built system will be performed.	The applicable portions of the as-built VWS conforms with the functional arrangement shown in Figure 2.7.2-1.
2. The applicable portions of the VWS provide the safety-related function of preserving containment integrity by isolation of the VWS lines penetrating the containment.	See Certified Design Material, subsection 2.2.1, Containment System.	See Certified Design Material, subsection 2.2.1, Containment System.
3.a) The VWS provides chilled water to the supply air handling units serving the MCR, the Class 1E electrical rooms, and the unit coolers serving the RNS and CVS pump rooms.	Testing will be performed by measuring the flow rates to the chilled water cooling coils.	The water flow to each cooling coil equals or exceeds the following: Coil — Flow (gpm) VBS MY C01A/B — 99 VBS MY C02A/C — 130 VBS MY C02B/D — 85 VAS MY C07A/B — 19 VAS MY C12A/B — 12 VAS MY C06A/B — 12
3.b) The VWS provides cooling to the RNS and CVS pump rooms during pump operation.	Testing will be performed to actuate the equipment identified in Table 2.7.2-1 using controls in the MCR.	Controls in the MCR cause equipment identified in Table 2.7.2-1 to perform the listed action.
3.c) The VWS air-cooled chillers transfer heat from the VWS to the surrounding atmosphere.	Inspection will be performed for the existence of a report that determines the heat transfer capability of each air-cooled chiller.	A report exists and concludes that the heat transfer rate of each air-cooled chiller is greater than or equal to 230 tons.
4. Controls exist in the MCR to cause the equipment identified in Table 2.7.2-1 to perform the listed function.	Testing will be performed to actuate the equipment identified in Table 2.7.2-1 using controls in the MCR.	Controls in the MCR cause equipment identified in Table 2.7.2-1 to perform the listed action.
5. Displays of the VWS parameters identified in Table 2.7.2-1 can be retrieved in the MCR.	Inspection will be performed for retrievability in the MCR of the displays identified in Table 2.7.2-1.	Displays of the VWS parameters identified in Table 2.7.2-1 are retrieved in the MCR.

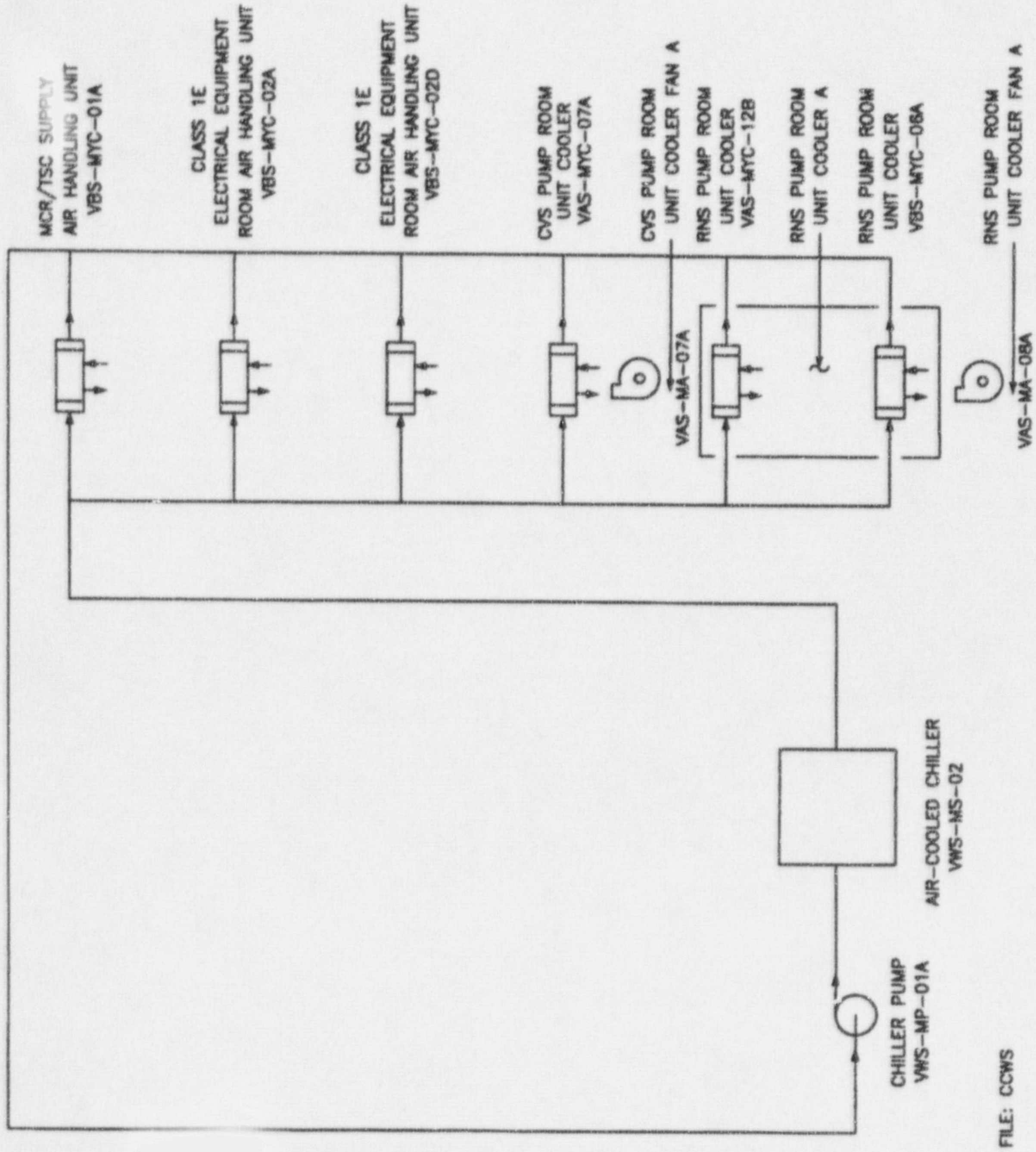

Figure 2.7.2-1 (Sheet 1 of 2)
Central Chilled Water System

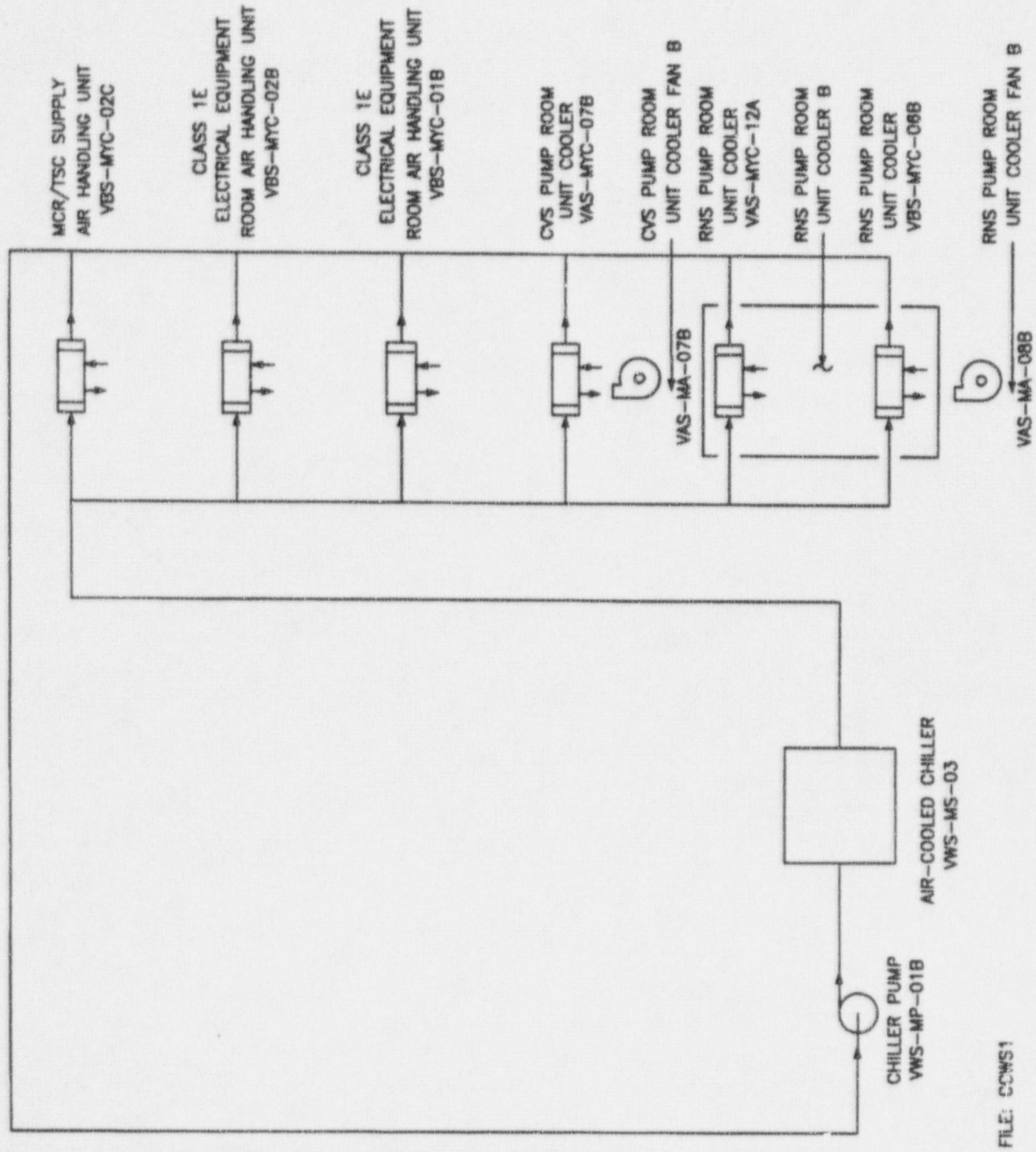

Figure 2.7.2-1 (Sheet 2 of 2)
Central Chilled Water System

2.7.3 Annex/Auxiliary Building Nonradioactive Ventilation System

Design Description

A portion of the annex/auxiliary building nonradioactive ventilation system (VXS) provides ventilation to the switchgear rooms, the battery charger rooms, and the annex building north air handling equipment room to support the electrical equipment that is required for the onsite standby power system.

1. The functional arrangement of the applicable portions of the VXS is as shown in Figure 2.7.3-1.

2. The applicable portions of the VXS provide the following nonsafety-related functions:

   a) The VXS provides cooling to the electrical switchgear, the battery charger, and the north air handling equipment rooms when the onsite standby power system (ZOS) operates and chilled water is available.

   b) The VXS provides ventilation cooling to the electrical switchgear, the battery charger, and the north air handling equipment rooms when the ZOS operates during a loss of offsite power coincident with loss of chilled water.

3. Controls exist in the main control room (MCR) to cause the equipment identified in Table 2.7.3-1 to perform its listed function.

4. Displays of the VXS parameters identified in Table 2.7.3-1 can be retrieved in the MCR.

Inspections, Tests, Analyses, and Acceptance Criteria

Table 2.7.3-2 specifies the inspections, tests, analyses, and associated acceptance criteria for the VXS.

Table 2.7.3-1			
Equipment Name	**Tag No.**	**Display**	**Control Function**
Switchgear Room Air Handling Units (AHU) A Fans	VXS-MA-05A VXS-MA-06A	Yes (Run Status)	Start
Switchgear Room AHU B Fans	VXS-MA-05B VXS-MA-06B	Yes (Run Status)	Start
Equipment Room AHU A Fans	VXS-MA-01A VXS-MA-02A	Yes (Run Status)	Start
Equipment Room AHU B Fans	VXS-MA-01B VXS-MA-02B	Yes (Run Status)	Start

Table 2.7.3-2
Inspections, Tests, Analyses, and Acceptance Criteria

Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
1. The functional arrangement of the applicable portions of the VXS is as shown in Figure 2.7.3-1.	Inspection of the applicable portions of the as-built system will be performed.	The applicable portions of the as-built VXS conform with the functional arrangement shown in Figure 2.7.3-1.
2.a) The VXS provides cooling to the electrical switchgear, the battery charger, and the north air handling equipment rooms when the ZOS operates and chilled water is available.	See item 3 in this table.	See item 3 in this table.
2.b) The VXS provides ventilation cooling to the electrical switchgear, the battery charger, and the north air handling equipment rooms when the ZOS operates during a loss of offsite power coincident with loss of chilled water.	See item 3 in this table.	See item 3 in this table.
3. Controls exist in the MCR to cause the equipment identified in Table 2.7.3-1 to perform its listed function.	Testing will be performed to actuate the equipment identified in Table 2.7.3-1 using controls in the MCR.	Controls in the MCR cause equipment identified in Table 2.7.3-1 to perform the listed action.
4. Displays of the VXS parameters identified in Table 2.7.3-1 can be retrieved in the MCR.	Inspection will be performed for retrievability in the MCR of the displays identified in Table 2.7.3-1.	Displays of the VXS parameters identified in Table 2.7.3-1 are retrieved in the MCR.

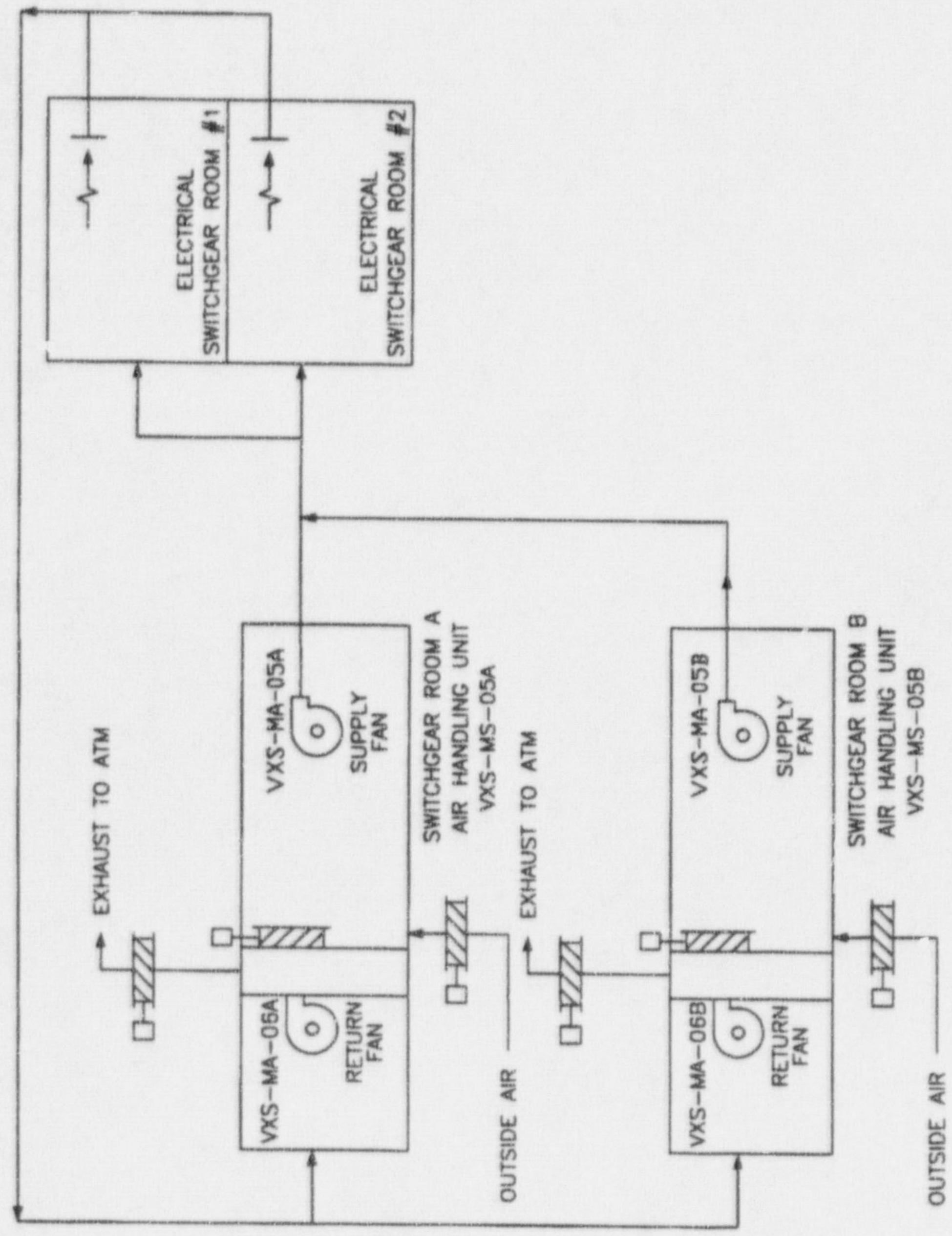

Figure 2.7.3-1 (Sheet 1 of 2)
Annex/Auxiliary Building Nonradioactive Ventilation System

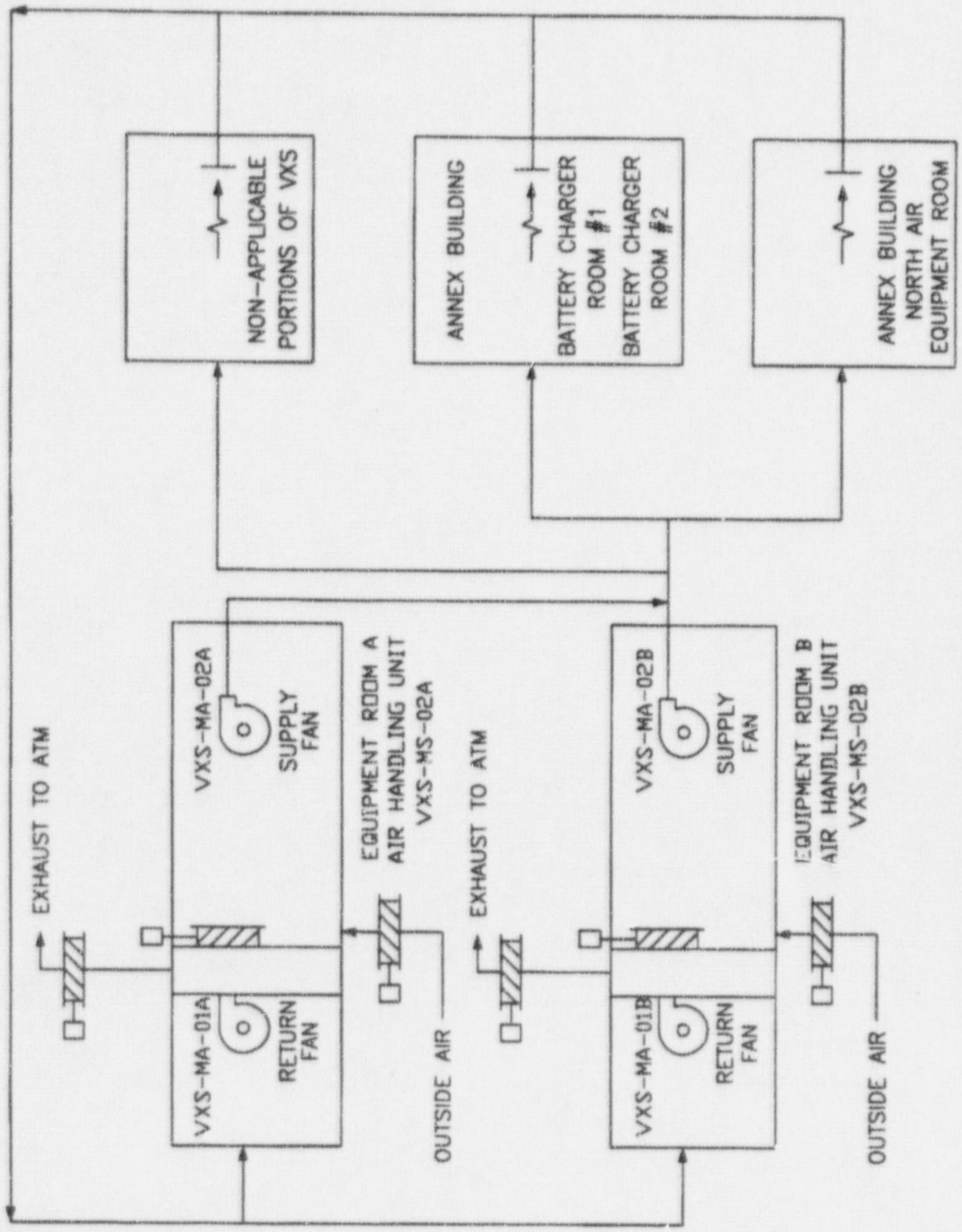

Figure 2.7.3-1 (Sheet 2 of 2)
Annex/Auxiliary Building Nonradioactive Ventilation System

2.7.4 Diesel Generator Building Ventilation System

Design Description

The diesel generator building ventilation system (VZS) provides ventilation cooling of the diesel generator building for the onsite standby power system. The VZS also provides heating and ventilation within the diesel oil transfer module enclosure.

1. The functional arrangement of the VZS is as shown in Figure 2.7.4-1.

2. The VZS provides the following nonsafety-related functions:

   a) The VZS provides ventilation cooling to the diesel generator rooms when the diesel generators are operating.

   b) The VZS provides ventilation cooling to the electrical equipment service modules when the diesel generators are operating.

   c) The VZS provides normal heating and ventilation to the diesel oil transfer module enclosure.

3. Controls exist in the main control room (MCR) to cause the equipment identified in Table 2.7.4-1 to perform the listed functions.

4. Displays of the VZS parameters identified in Table 2.7.4-1 can be retrieved in the MCR.

Inspections, Tests, Analyses, and Acceptance Criteria

Table 2.7.4-2 specifies the inspections, tests, analyses, and associated acceptance criteria for the VZS.

Table 2.7.4-1			
Equipment Name	**Tag No.**	**Display**	**Control Function**
Diesel Generator Room A Standby Exhaust Fans	VZS-MY-V01A VZS-MY-V02A	Yes (Run Status)	Start
Diesel Generator Room B Standby Exhaust Fans	VZS-MY-V01B VZS-MY-V02B	Yes (Run Status)	Start
Service Module A Air Handling Units (AHU) Fan	VZS-MA-01A	Yes (Run Status)	Start
Service Module B AHU Fan	VZS-MA-01B	Yes (Run Status)	Start
Diesel Oil Transfer Module Enclosure A Fan	VZS-MY-V03A	Yes (Run Status)	Start
Diesel Oil Transfer Module Enclosure A Electric Unit Heater	VZS-MY-U03A	Yes (Run Status)	Energize
Diesel Oil Transfer Module Enclosure B Fan	VZS-MY-V03B	Yes (Run Status)	Start
Diesel Oil Transfer Module Enclosure B Electric Unit Heater	VZS-MY-U03B	Yes (Run Status)	Energize

Note: Dash (-) indicates not applicable.

Table 2.7.4-2
Inspections, Tests, Analyses, and Acceptance Criteria

Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
1. The functional arrangement of the VZS is as shown in Figure 2.7.4-1.	Inspection of the as-built system will be performed.	The as-built VZS conforms with the functional arrangement shown in Figure 2.7.4-1.
2.a) The VZS provides ventilation cooling to the diesel generator rooms when the diesel generators are operating.	See item 3 in this table.	See item 3 in this table.
2.b) The VZS provides ventilation cooling to the electrical equipment service modules when the diesel generators are operating.	See item 3 in this table.	See item 3 in this table.
2.c) The VZS provides normal heating and ventilation to the diesel oil transfer module enclosure.	See item 3 in this table.	See item 3 in this table.
3. Controls exist in the MCR to cause the equipment identified in Table 2.7.4-1 to perform the listed functions.	Testing will be performed to actuate the equipment identified in Table 2.7.4-1 using controls in the MCR.	Controls in the MCR cause equipment identified in Table 2.7.4-1 to perform the listed actions.
4. Displays of the VZS parameters identified in Table 2.7.4-1 can be retrieved in the MCR.	Inspection will be performed for retrievability in the MCR of the displays identified in Table 2.7.4-1.	Displays of the VZS parameters identified in Table 2.7.4-1 are retrieved in the MCR.

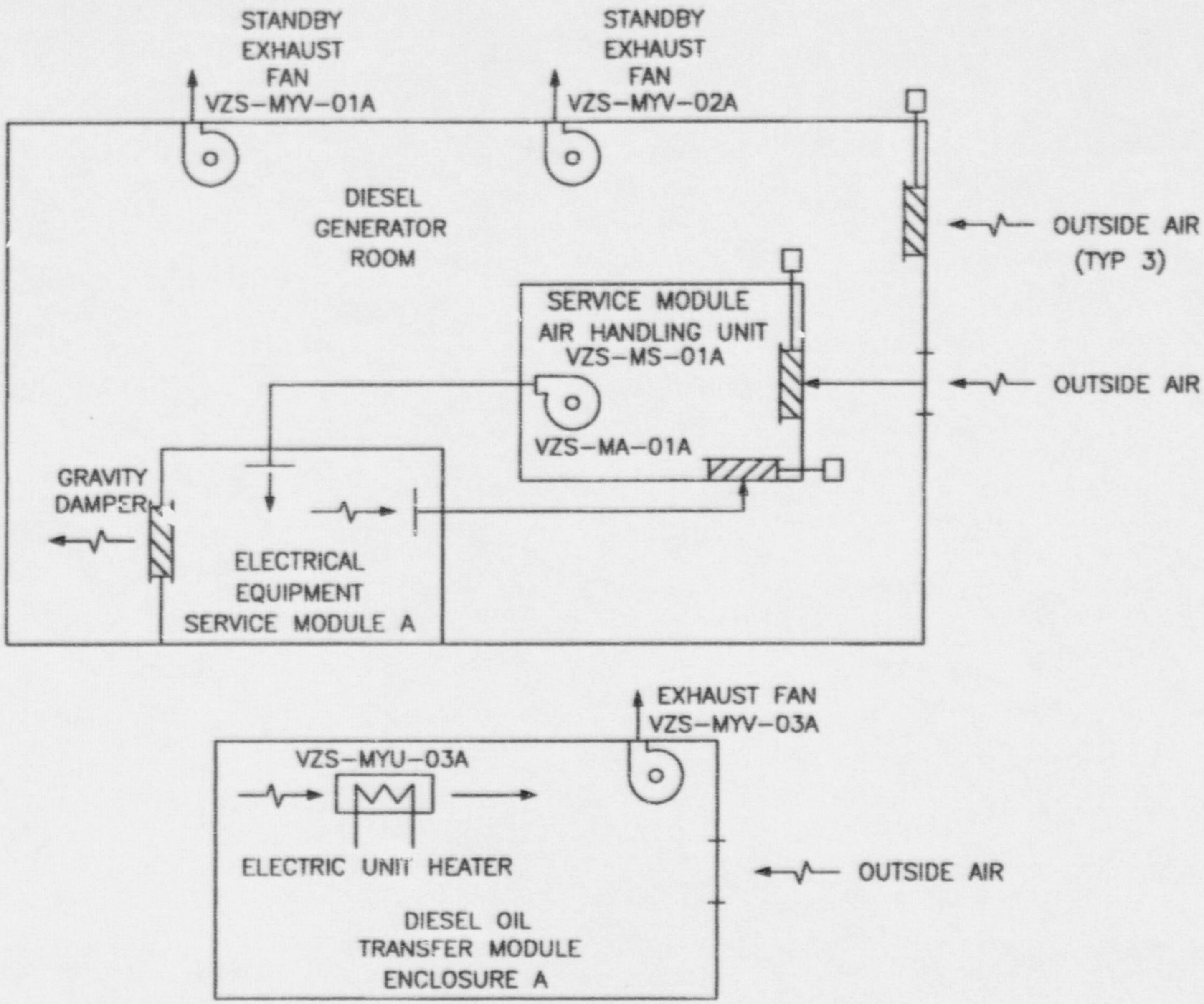

Figure 2.7.4-1 (Sheet 1 of 2)
Diesel Generator Building Ventilation System

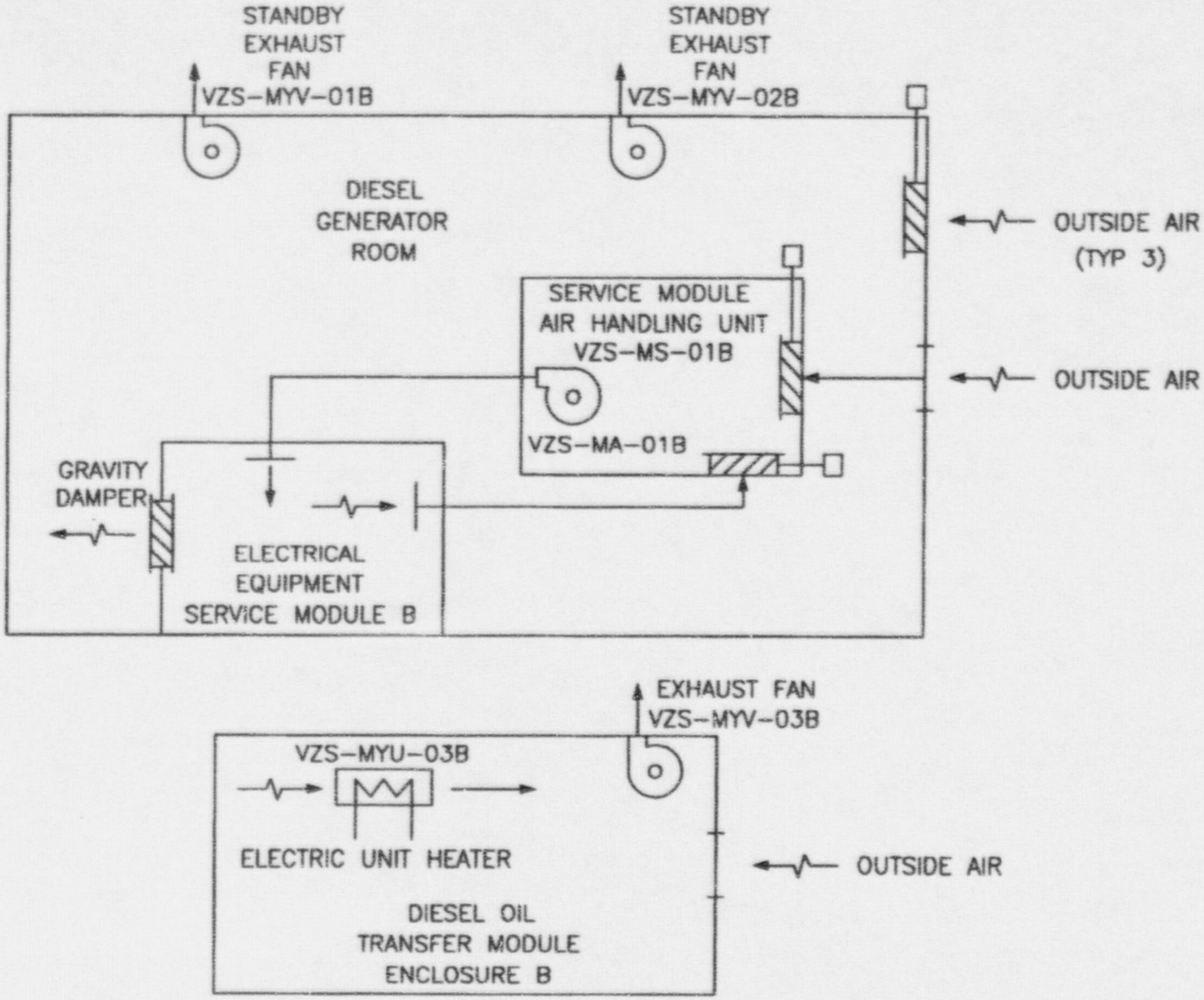

Figure 2.7.4-1 (Sheet 2 of 2)
Diesel Generator Building Ventilation System

3.1 Emergency Response Facilities

Design Description

The technical support center (TSC) is a facility from which management and technical support is provided to main control room (MCR) personnel during emergency conditions. The operations support center (OSC) provides an assembly area where operations support personnel report in an emergency.

1. The TSC has floor space of at least 75 square feet per person for a minimum of 25 persons.

2. The TSC has voice communication equipment for communication with the MCR, emergency operations facility, OSC, and the U.S. Nuclear Regulatory Commission (NRC).

3. The displays listed in Table 2.5.2-5, minimum inventory table, in subsection 2.5.2, Protection and Safety Monitoring System (PMS), can be retrieved in the TSC.

4. The OSC has voice communication equipment for communication with the MCR and TSC.

Inspections, Tests, Analyses, and Acceptance Criteria

Table 3.1-1 specifies the inspections, tests, analyses, and associated acceptance criteria for the emergency response facilities.

Table 3.1-1
Inspections, Tests, Analyses, and Acceptance Criteria

Design Commitment	Inspections, Test, Analyses	Acceptance Criteria
1. The TSC has floor space of at least 75 square feet per person for a minimum of 25 persons.	An inspection will be performed on the floor space in the TSC.	The TSC has at least 1875 square feet of floor space.
2. The TSC has voice communication equipment for communication with the MCR, emergency operations facility, OSC, and the NRC.	An inspection and test will be performed of the TSC voice communication equipment.	Communications equipment is installed, and voice transmission and reception are accomplished.
3. The displays listed in Table 2.5.2-5, minimum inventory table, in subsection 2.5.2, PMS, can be retrieved in the TSC.	An inspection will be performed for retrievability of the displays in the TSC.	The displays listed in Table 2.5.2-5, minimum inventory table, in subsection 2.5.2, PMS, are retrieved in the TSC.
4. The OSC has voice communication equipment for communication with the MCR and TSC.	An inspection and test will be performed of the OSC voice communication equipment.	Communications equipment is installed, and voice transmission and reception are accomplished.

3.2 Human Factors Engineering

Design Description

The main control room (MCR) provides a facility and resources for the safe control and operation of the plant.

1. The MCR provides a suitable workspace environment for use by MCR operators.

2. The MCR includes two reactor operator workstations, one senior reactor operator workstation, safety-related displays, and safety-related controls.

3. The human-system interface (HSI) resources available to the MCR operators include the alarm system, plant information system, computerized procedure system, safety-related displays, wall panel information system, and controls (soft and dedicated).

4. The MCR and the available HSI permit execution of MCR tasks by MCR operators to operate the plant and maintain plant safety.

Inspection, Test, Analyses, and Acceptance Criteria

Table 3.2-1 specifies the inspections, tests, analyses, and associated acceptance criteria for the MCR.

Table 3.2-1 Inspections, Tests, Analyses, and Acceptance Criteria		
Design Commitment	**Inspections, Test, Analyses**	**Acceptance Criteria**
1. The MCR provides a suitable workspace environment for use by the MCR operators.	i) See Certified Design Material, subsection 2.7.1, Nuclear Island Non-radioactive Ventilation System. ii) See Certified Design Material, subsection 2.2.5, MCR Emergency Habitability System. iii) See Certified Design Material, subsection 2.6.3, Class 1E dc and UPS System.	i) See Certified Design Material, subsection 2.7.1, Nuclear Island Non-radioactive Ventilation System. ii) See Certified Design Material, subsection 2.2.5, MCR Emergency Habitability System. iii) See Certified Design Material, subsection 2.6.3, Class 1E dc and UPS System.
2. The MCR includes two reactor operator workstations, one senior reactor operator workstation, safety-related displays, and safety-related controls.	An inspection of the MCR workstations and control panels will be performed.	The MCR includes two reactor operator workstations, one senior reactor operator workstation, safety-related displays, and safety-related controls.
3. The HSI resources available to the MCR operators include the alarm system, plant information system, computerized procedure system, safety-related displays, wall panel information system, and controls (soft and dedicated).	An inspection of the HSI resources available in the MCR for the MCR operators will be performed.	The as-built HSI includes an alarm system, plant information system, computerized procedure system, safety-related displays, wall panel information system, and controls (soft and dedicated).

Table 3.2-1 (cont)
Inspections, Tests, Analyses, and Acceptance Criteria

Design Commitment	Inspections, Test, Analyses	Acceptance Criteria
4. The MCR and the available HSI permit execution of MCR tasks by MCR operators to operate the plant and maintain plant safety.	Tests and analyses of the following plant evolutions and transients, using a facility that physically represents the MCR configuration and dynamically represents the MCR HSI and the operating characteristics and responses of the AP600 design, will be performed:	The test and analysis results demonstrate that the MCR operators can perform the following:
	i) Normal plant heatup and startup to 100% power	i) Heat up and start up the plant to 100% power
	ii) Normal plant shutdown and cooldown to cold shutdown	ii) Shut down and cool down the plant to cold shutdown
	iii) Transients: reactor trip and turbine trip	iii) Bring the plant to safe shutdown following the specified transients
	iv) Accidents: - small-break loss-of-coolant accident - large-break loss-of-coolant accident - steam line break - feedwater line break - steam generator tube rupture	iv) Bring the plant to a safe, stable state following the specified accidents

3.3 Nuclear Island Buildings

Design Description

The nuclear island (NI) structures include the containment, and the shield and auxiliary buildings.

1. The NI structures are seismic Category I. These structures are designed to accommodate design basis loads associated with the following:

   - Normal plant operations (including dead, live, lateral earth pressure, and equipment loads, including the effects of temperature)
   - External events (including rain, snow, wind, flood, tornado, tornado-generated missiles, and earthquake)
   - Internal events (including flood and pipe rupture)

2. a) The shield building wall provides shielding of the main control room (MCR). The shield building has a wall thickness of at least 34 in. from elevation 82 ft, 6 in. to 240 ft except for designed openings or penetrations.

   b) The internal auxiliary building walls between rooms 12411/12412 and 12401 provide shielding of the MCR from elevation 117 ft, 6 in. to 133 ft, 3 in. The internal auxiliary building wall between rooms 12412 and 12401 has a wall thickness of at least 22 inches except for designed openings or penetrations. The wall between rooms 12411 and 12401 has a wall thickness of at least 11 in. except for designed openings or penetrations.

   c) The internal auxiliary building floor and ceiling of room 12401 provide shielding of the MCR at elevation 117 ft, 6 in. and at elevation 135 ft, 3 in. The internal auxiliary building floor and ceiling of room 12401 have a wall thickness of at least 22 in. except for designed openings or penetrations.

3. a) Exterior walls and the basemat of the NI have a water barrier up to plant elevation 100 ft (design plant grade).

   b) The boundaries between mechanical equipment rooms and the electrical and instrumentation and control (I&C) equipment rooms of the auxiliary building as identified in Table 3.3-1 are designed to prevent flooding of rooms that contain safety-related equipment up to the maximum flood level for each room defined in Table 3.3-1.

   c) The boundaries between the following rooms which contain safety-related equipment – passive core cooling system (PXS) valve/accumulator room A (11205), PXS valve/accumulator room B (11207), and chemical and volume system (CVS) room (11209) – are designed to prevent flooding between these rooms.

4. a) Class 1E cables and raceways are identified according to applicable color-coded Class 1E divisions.

   b) Class 1E divisional cables are routed in their respective divisional raceways.

   c) Separation is maintained between Class 1E divisions and between Class 1E divisions and non-Class 1E cables in accordance with the fire areas as identified in Table 3.3-2.

5. Systems and components required for safe shutdown are protected from the dynamic effects of postulated pipe breaks (using pipe whip restraints) for piping systems located in rooms identified in Table 3.3-3.

Inspections, Tests, Analyses, and Acceptance Criteria

Table 3.3-4 specifies the inspections, tests, analyses, and associated acceptance criteria for the NI buildings.

Table 3.3-1
NI Building Room Boundaries
Required to Have Flood Barrier Floors and Walls

Boundary/ Maximum Flood Level (inches)	Between Room Number to Room Number	
Floor/36	12306	12211
Floor/3	12303	12203/12207
Floor/3	12313	12203/12207
Floor/1	12300	12201/12202/12207 12203/12204/12205
Floor/3	12312	12212
Wall/36	12306	12305
Floor/1	12401	12301/12302/12303 12312/12313
Wall/1	12401	12411/12412
Floor/36	12404	12304
Floor/12	12405	12305
Floor/36	12406	12306
Wall/36	12404	12401
Wall/1	12421	12452
Floor/3	12501	12401/12411/12412
Floor/3	12555	12421/12423/12422
Wall/36	12156/12158	12111/12112

Table 3.3-2
Class 1E Divisions in NI Fire Areas

Fire Area Number	Class 1E Divisions			
	A	C	B	D
1200 AF 01	Yes	Yes	-	-
1200 AF 02	Yes	Yes	Yes	-
1200 AF 03	-	-	Yes	Yes
1200 AF 04	Yes	Yes	-	-
1201 AF 02	-	-	Yes	-
1201 AF 03	-	-	-	Yes
1201 AF 04	-	-	-	Yes
1201 AF 05	-	-	Yes	Yes
1201 AF 06	-	-	Yes	Yes
1202 AF 03	-	Yes	-	-
1202 AF 04	Yes	-	-	-
1204 AF 01	Yes	-	-	-
1220 AF 01	-	-	Yes	Yes
1220 AF 02	-	-	-	Yes
1230 AF 01	Yes	Yes	-	-
1242 AF 02	Yes		-	

Note: Dash (-) indicates not applicable.

Table 3.3-4
Inspections, Tests, Analyses, and Acceptance Criteria

Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
1. The NI structures are seismic Category I and are designed to withstand design basis loads, which apply to the structure, without loss of safety function.	Inspection for the existence of structural analysis report will be performed.	A structural analysis report exists that concludes that the seismic Category I buildings can withstand the seismic design basis loads, which apply to the structure, without loss of their safety function.
2.a) The as-built shield building wall from elevation 82 ft, 6 in. to 240 ft has a thickness of at least 34 in. except for designed openings or penetrations.	Inspection of the as-built shield building wall thickness will be performed.	The as-built inspection report exists and concludes that the shield building wall is a minimum thickness of 34 in.
2.b) The as-built internal auxiliary building walls between rooms 12411/12412 and 12401 provide shielding of the MCR from elevation 117 ft, 6 in. to 133 ft, 3 in. The walls between rooms 12412 and 12401 have a wall thickness of at least 22 in. except for designed openings or penetrations. The wall between rooms 12411 and 12401 has a wall thickness of at least 11 in. except for designed openings or penetrations.	Inspection of the as-built internal auxiliary building wall thickness between rooms 12411/12412 and 12401 will be performed.	The as-built inspection report exists and concludes that the internal auxiliary building walls between rooms 12412 and 12401 have a minimum thickness of 22 in., and the wall between rooms 12411 and 12401 has a minimum thickness of 11 in.
2.c) The internal auxiliary building floor and ceiling of room 12401 provide shielding of the MCR at elevation 117 ft, 6 in. and at elevation 135 ft, 3 in. The internal auxiliary building floor and ceiling of room 12401 have a wall thickness of at least 22 in. except for designed openings or penetrations.	Inspection of the as-built internal auxiliary building floor and ceiling thickness of room 12401 wall will be performed.	The as-built inspection report exists and concludes that the internal auxiliary building floor and ceiling of room 12401 have a minimum thickness of 22 in.

Table 3.3-4 (cont)
Inspections, Tests, Analyses, and Acceptance Criteria

Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
3.a) Exterior walls and the basemat of the NI have a water barrier up to plant elevation 100 ft (design plant grade).	Inspection of the as-built exterior walls and the basemat of the NI up to plant elevation 100 ft, 0 in. for application of water barrier will be performed during construction before the walls are poured.	An as-built inspection report exists that confirms that a water barrier exists on the NI exterior walls up to plant elevation of 100 ft and below the basemat.
3.b) The boundaries between rooms identified in Table 3.3-1 of the auxiliary building are designed to prevent flooding of rooms that contain safety-related equipment.	Inspection of the rooms identified in Table 3.3-1 will be performed to confirm that the floors and walls prevent flooding up to the maximum flood level in the room.	An as-built inspection report exists that confirms floors and walls as identified on Table 3.3-1 have provisions to prevent flooding up to the maximum flood elevations.
3.c) The boundaries between the following rooms which contain safety-related equipment – PXS valve/accumulator room A (11205), PXS valve/accumulator room B (11207), and CVS room (11209) – are designed to prevent flooding between these rooms.	Inspection of the boundaries between the following rooms which contain safety-related equipment – PXS Valve/ Accumulator Room A (11205), PXS Valve/Accumulator Room B (11207), and CVS Room (11209) – will be performed to confirm that the floors and walls prevent flooding of the other rooms to a maximum flood level of 108 ft.	An as-built inspection report exists that confirms that provisions to prevent flooding are provided.
4.a) Class 1E cables and raceways are identified according to applicable color-coded Class 1E divisions.	Inspections of the as-built Class 1E cables and raceways will be conducted.	Class 1E cables and raceways are identified by the appropriate color code.
4.b) Class 1E divisional cables are routed in their respective divisional raceways.	Inspections of the as-built Class 1E divisional cables and raceways will be conducted.	Class 1E cables are routed in raceways assigned to the same division. There are no other safety division cables in a raceway assigned to a different division.

Table 3.3-4 (cont)
Inspections, Tests, Analyses, and Acceptance Criteria

Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
4.c) Separation is maintained between Class 1E divisions and between Class 1E divisions and non-Class 1E cables in accordance with the fire areas as identified in Table 3.3-2.	i) Inspections of the as-built Class 1E division cables and raceways located in the fire areas identified on Table 3.3-2 will be conducted.	i) Results of the inspection will confirm that the separation between Class 1E divisions is consistent with Table 3.3-2.
	ii) Inspections of the as-built Class 1E raceways identified on Table 3.3-2 will be performed to confirm that the separation between different Class 1E raceways is consistent with the following: Within general plant areas, the minimum vertical separation is 12 in. and the minimum horizontal separation is 6 in. for open top cable trays. – Where minimum separation distances are not maintained, the circuits are run in enclosed raceways or barriers are provided. – Separation distances less than those specified above are based on analysis. – Non-Class 1E wiring – not separated from Class 1E or associated wiring by the minimum separation or by a barrier or analyzed – is considered as associated circuits and subject to Class 1E requirements.	ii) Results of the inspection will confirm that the separation between Class 1E divisions is consistent with the following: – Within general plant areas, vertical separation is 12 in. and horizontal separation is 6 in. for open top cable trays. – Where minimum separation distances are not met, the circuits are run in enclosed raceways or barriers are provided. – A report exists and concludes that separation distances less than 12 in. vertical and 6 in. horizontal and not provided with enclosed raceways or barriers have been analyzed. – Non-Class 1E wiring – not separated from Class 1E or associated wiring by the minimum separation distance or by a barrier or analyzed – meets the requirements listed above.

Table 3.3-4 (cont)
Inspections, Tests, Analyses, and Acceptance Criteria

Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
5. Systems and components required for safe shutdown are protected from the dynamic effects of postulated pipe breaks (using pipe whip restraints) for piping systems located in rooms identified in Table 3.3-3.	An inspection of the as-built high energy pipe break pipe whip restraints features for piping systems located in rooms identified in Table 3.3-3 will be performed.	An as-built pipe rupture hazards report exists and concludes that equipment required for safe shutdown located in rooms identified in Table 3.3-3 can withstand the effects of postulated pipe rupture without loss of required safety function.

3.4 Initial Test Program

Design Description

This section represents a commitment that combined license applicants referencing the AP600 certified design will implement an initial test program. Inspections, tests, analyses, and acceptance criteria (ITAAC) aimed at verification of the initial test program are not necessary because other ITAAC described in the Certified Design Material address all appropriate ITAAC requirements.

An initial test program is performed during the initial startup of each AP600 plant. The initial test program consists of a series of tests categorized as construction and installation, preoperational (prior to fuel load), and startup (during and after fuel load). All ITAAC will be completed prior to fuel load; therefore, no ITAAC are performed during the startup test phase of the initial test program.

3.5 Radiation Monitoring

Design Description

Radiation monitoring is provided for those plant areas where there is a significant potential for airborne contamination and for those process and effluent streams where contamination is possible.

1. The seismic Category I equipment identified in Table 3.5-1 can withstand seismic design basis dynamic loads without loss of safety function.

2. The Class 1E equipment identified in Table 3.5-1 as being qualified for a harsh environment can withstand the environmental conditions that would exist before, during, and following a design basis accident without loss of safety function for the time required to perform the safety function.

3. Separation is provided between system Class 1E divisions, and between Class 1E divisions and non-Class 1E cable.

4. Safety-related displays identified in Table 3.5-1 can be retrieved in the main control room (MCR).

5. The process radiation monitors listed in Table 3.5-2 are provided.

6. The effluent radiation monitors listed in Table 3.5-3 are provided.

Inspections, Tests, Analyses, and Acceptance Criteria

Table 3.5-4 specifies the inspections, tests, analyses, and associated acceptance criteria for radiation monitoring.

Table 3.5-1 Airborne Radiation Monitors					
Equipment Name	**Tag No.**	**Seismic Cat. I**	**Class 1E**	**Qual. for Harsh Envir.**	**Safety-Related Display**
Containment High-Range Monitor	PXS-RE160	Yes	Yes	Yes	Yes
Containment High-Range Monitor	PXS-RE161	Yes	Yes	Yes	Yes
Containment High-Range Monitor	PXS-RE162	Yes	Yes	Yes	Yes
Containment High-Range Monitor	PXS-RE163	Yes	Yes	Yes	Yes
MCR Radiation Monitoring Package A	VBS-01A	Yes	Yes	No	Yes
MCR Radiation Monitoring Package B	VBS-01B	Yes	Yes	No	Yes
Containment Atmosphere Monitor (N13)	PSS-RE027	Yes	No	No	No

Table 3.5-2
Process Radiation Monitors

Equipment List	Equipment No.
Steam Generator Blowdown	BDS-RE010
Steam Generator Blowdown	BDS-RE011
Component Cooling Water	CCS-RE001
Main Steam Line	SGS-RE026
Main Steam Line	SGS-RE027
Service Water Blowdown	SWS-RE008
Primary Sampling System Liquid Sample	PSS-RE050
Primary Sampling System Gaseous Sample	PSS-RE052
Containment Air Filtration Exhaust	VFS-RE001
Gaseous Radwaste Discharge	WGS-RE017
Containment Atmosphere (Gaseous)	PSS-RE026

Table 3.5-3
Effluent Radiation Monitors

Equipment List	Equipment No.
Plant Vent (Normal-Range Particulate)	VFS-RE101
Plant Vent (Normal-Range Iodine)	VFS-RE102
Plant Vent (Normal-Range Radiogas)	VFS-RE103
Plant Vent (High-Range Radiogas)	VFS-RE104A
Plant Vent (Mid-Range Radiogas)	VFS-RE104B
Turbine Island Vent	TDS-RE001
Liquid Radwaste Discharge	WLS-RE229
Wastewater Discharge	WWS-RE021

Table 3.5-4 Inspections, Tests, Analyses, and Acceptance Criteria		
Design Commitment	**Inspections, Tests, Analyses**	**Acceptance Criteria**
1. The seismic Category I equipment identified in Table 3.5-1 can withstand seismic design basis dynamic loads without loss of safety function.	i) Inspection will be performed to verify that the seismic Category I equipment identified in Table 3.5-1 is located on the nuclear island. ii) Type tests, analyses, or a combination of type tests and analyses of seismic Category I equipment will be performed.	i) The seismic Category I equipment identified in Table 3.5-1 is located on the nuclear island. ii) A report exists and concludes that the seismic Category I equipment can withstand seismic design basis dynamic loads without loss of safety function.
2. The Class 1E equipment identified in Table 3.5-1 as being qualified for a harsh environment can withstand the environmental conditions that would exist before, during, and following a design basis accident without loss of safety function for the time required to perform the safety function.	Type tests, analyses, or a combination of type tests and analyses will be performed on Class 1E equipment located in a harsh environment.	A report exists and concludes that Class 1E equipment identified in Table 3.5-1 as being located in a harsh environment can withstand the environmental conditions that would exist before, during, and following a design basis accident without loss of safety function for the time required to perform the safety function.
3. Separation is provided between system Class 1E divisions, and between Class 1E divisions and non-Class 1E cable.	See Certified Design Material, Section 3.3, Nuclear Island Buildings.	See Certified Design Material, Section 3.3, Nuclear Island Buildings.
4. Safety-related displays identified in Table 3.5-1 can be retrieved in the MCR.	Inspection will be performed for retrievability of the displays in the MCR.	Safety-related displays identified in Table 3.5-1 can be retrieved in the MCR.
5. The process radiation monitors listed in Table 3.5-2 are provided.	Inspection for the existence of the monitors will be performed.	Each of the monitors listed in Table 3.5-2 exists.
6. The effluent radiation monitors listed in Table 3.5-3 are provided.	Inspection for the existence of the monitors will be performed.	Each of the monitors listed in Table 3.5-3 exists.

4.0 Interface Requirements

The 10 CFR 52.47 (a)(1)(vii) requires identification of the interface requirements to be met by those portions of the plant for which the application does not seek certification. The 10 CFR 52.47 (a)(1)(viii) requires justification that these interfaces be verifiable through inspection, testing (either in the plant or elsewhere), or analysis. An applicant for a combined operating license (COL) that references the Certified Design must provide design features or characteristics that comply with the interface requirements for the plant design and inspections, tests, analyses, and acceptance criteria (ITAAC) for the site-specific portion of the facility design, in accordance with 10 CFR 52.79 (c).

No interfaces need to be identified between or among the AP600 Certified Design power block structures, including the entire nuclear island, the annex buildings and associated equipment, the diesel/generator building and associated equipment, the turbine generator building, the turbine/generator equipment, and the radwaste facilities.

There are no safety-related interfaces between the AP600 Certified Design and other portions of a facility having a combined license under 10 CFR Part 52.

There are no defense-in-depth interfaces between the AP600 Certified Design and other portions of a facility having a combined license under 10 CFR Part 52.

The AP600 site parameters are described in Section 5.0.

5.0 Site Parameters

Table 5.0-1 identifies the key site parameters that are specified for the design of safety-related aspects of structures, systems, and components for the AP600. An actual site is acceptable if its site characteristics fall within the AP600 plant site design parameters in Table 5.0-1. For cases where a site characteristic exceeds the stated parameter, it is necessary for the combined license applicant referencing the AP600 to demonstrate that the site characteristic does not exceed the capability of the design.

SITE PARAMETERS
Revision: 2
Effective: 10/31/96

AP600

Table 5.0-1
Site Parameters

Maximum Ground Water Level	Plant elevation 100 ft (design grade elevation)
Maximum Flood Level	Plant elevation 100 ft (design grade elevation)
Precipitation	
Rain	19.4 in./hr (6.3 in./5 min)
Snow/Ice	Ground snow load of 75 lb/ft^2 with exposure factor of 1.0 and importance factor of 1.2
Air Temperature	Limits based on historical data excluding peaks of less than 2 hours duration Maximum temperature of 115° dry bulb/80°F coincident wet bulb Maximum wet bulb 81°F (noncoincident) Minimum temperature of -40°F
Tornado Wind Speed	Maximum wind speed of 300 mph
Tornado Missile Spectra	4000-lb automobile at 105 mph horizontal, 74 mph vertical 275-lb, 8-in. shell at 105 mph horizontal, 74 mph vertical 1-in.-diameter steel ball at 105 mph horizontal and vertical
Soil	
Bearing Strength	Soils must support the AP600 under specified conditions. The average static bearing reaction due to the dead weight of the AP600 nuclear island is about 8000 lb/ft^2; the maximum static bearing reaction at a corner is about 12,000 lb/ft^2.
Shear Wave Velocity	Greater than or equal to 1000 ft/sec based on low-strain, best-estimate soil properties or acceptable comparison of floor response spectra to the certified design based upon site-specific soil structure interaction analyses
Liquefaction Potential	None
Safe Shutdown Earthquake (SSE)	SSE free field peak ground acceleration of 0.30 g with Regulatory Guide 1.60 response spectra

Table 5.0-1 (cont) Site Parameters		
Atmospheric Dispersion Factors (X/Q)		
Site Boundary	0 to 2 hour time interval	≤1.0×10^{-3} sec/m^3
Low Population Zone Boundary	0 to 8 hours	≤1.35×10^{-4} sec/m^3
	8 to 24 hours	≤1.0×10^{-4} sec/m^3
	24 to 96 hours	≤5.4×10^{-5} sec/m^3
	96 to 720 hours	≤2.2×10^{-5} sec/m^3