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MFN 08-760

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Subject: Response to Portion of NRC Request for Additional Information Letter Nos. 227 and 226, Related to ESBWR Design Certification Application - Auxiliary Systems - RAI Numbers 9.5-73 and RAI 9.5-75

The purpose of this letter is to submit the GE Hitachi Nuclear Energy (GEH) response to the U.S. Nuclear Regulatory Commission Request for Additional Information (RAI) sent by NRC Letters 227, dated July 18, 2008 and 226, dated July 21, 2008 (References 1 and 2). The GEH response to RAI Numbers 9.5-73 and RAI 9.5-75 are addressed in Enclosure 1.

Should you have any questions or require additional information regarding the information provided here, please contact me.

Sincerely,

Richard E. Kingston

Richard E. Kingston
Vice President, ESBWR Licensing

D068
NRO

References:

1. MFN 08-590, Letter from U.S. Nuclear Regulatory Commission to Robert E. Brown, *Request for Additional Information Letter No. 227 Related to ESBWR Design Certification Application,* July 18, 2008.
2. MFN 08-589, Letter from U.S. Nuclear Regulatory Commission to Robert E. Brown, *Request for Additional Information Letter No. 226 Related to ESBWR Design Certification Application,* July 21, 2008.

Enclosure:

1. Response to Portion of NRC Request for Additional Information Letter Nos. 227 and 226 Related to ESBWR Design Certification Application - Auxiliary Systems - RAI Numbers 9.5-73 and 9.5-75

cc:

AE Cubbage	USNRC (with enclosures)
DH Hinds	GEH (with enclosures)
RE Brown	GEH (with enclosures)
eDRF	0000-0088-8060

Enclosure 1

MFN 08-760

*Response to Portion of NRC Request for

Additional Information Letter Nos. 227 and 226

Related to ESBWR Design Certification Application

Auxiliary Systems

RAI Numbers 9.5-73 and 9.5-75

***Verified DCD changes associated with this RAI response are identified in the enclosed DCD markups by enclosing the text within a black box. The marked-up pages may contain unverified changes in addition to the verified changes resulting from this RAI response. Other changes shown in the markup(s) may not be fully developed and approved for inclusion in DCD Revision 6.**

NRC RAI 9.5-73

In DCD Tier 1 Figure 2.16.3-1 the fire protection header supply lines feeding the control building indicate that the lines will be normally isolated from the fire water supply. The fire water supply should be available at the control building hose stations by opening the hose valve at each hose station. GEH should revise this drawing or provide justification for normally isolating the fire water supply lines to the control building. (Note that this comment also applies to Tier 2 Figure 9.5-1, which replicates Figure 2.16.3-1)

GEH Response

The valves inside the Control Building on ESBWR DCD Tier 1 Figure 2.16.3-1 and Tier 2 Figure 9.5-1 do not represent header isolation valves; the purpose of these valves is to symbolize the hose valves at each hose station. Note 2 on DCD Tier 1 Figure 2.16.3-1 and Tier 2 Figure 9.5-1, indicates that no suppression systems or standpipes are shown. Therefore, a new Note will be added for the Control Building for these valves to clarify that these valves represent a typical hose station valve.

DCD Impact

DCD Tier 1 Figure 2.16.3-1 and Tier 2 Figure 9.5-1 will be revised to clarify that the closed valves represents a typical hose station valve.

NRC RAI 9.5-75

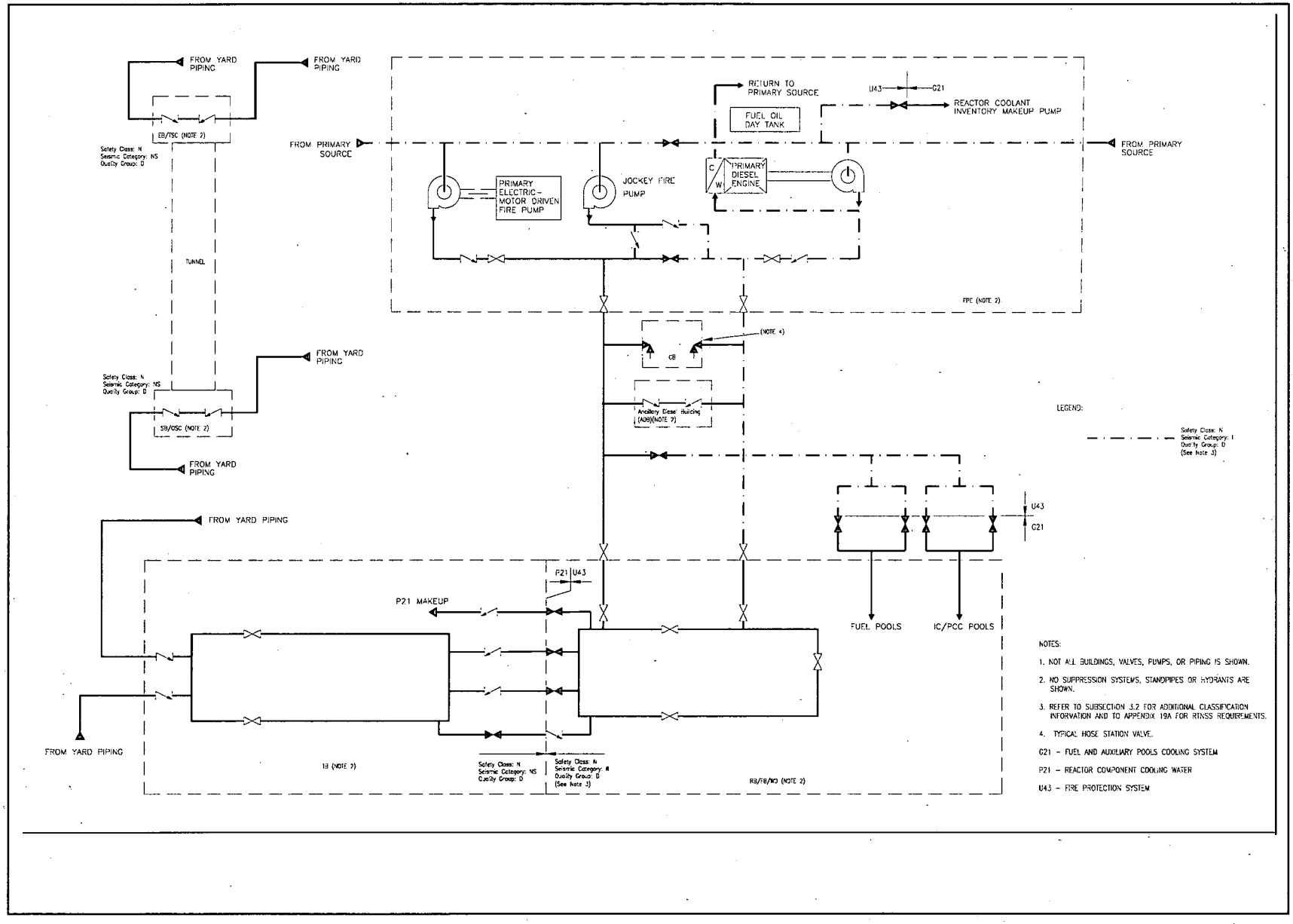
DCD Tier 2, Subsection 9.5.1.5 states that a check valve is provided in the Reactor Building to Turbine Building piping connection to prevent flow from the Turbine Building to the primary loop. There should be a design requirement to prevent flow in the opposite direction - from the Seismic Category II Reactor Building loop to the non-seismic Turbine Building loop - in order to maintain the integrity of the Reactor Building loop following an SSE. Figure 9.5-1 correctly shows normally closed gate valves to meet this requirement. The DCD should be revised to state this design requirement.

GEH Response

DCD Tier 2, Subsection 9.5.1.5 will be revised to address this issue. The design requirement is to maintain the integrity of the primary loop following an SSE to ensure the primary firewater storage tank water is available to provide post-accident makeup water to the IC/PCCS pools and Spent Fuel Pool and as required by Regulatory Position C.3.2.1.j of RG 1.189. The last sentence of the second paragraph of DCD Tier 2 Subsection 9.5.1.5 discusses this design requirement. "Isolation valves are provided between the non-seismic piping and the suspended ASME B31.1 Seismic Category II piping." The DCD discussion will be expanded to explain that these closed crosstie valves ensure functionality of the primary loop following an SSE.

DCD Impact

DCD Tier 2, Subsection 9.5.1.5 will be revised to state that closed crosstie valves ensure functionality of the primary loop following an SSE as noted in attached mark-up.


FROM YARD PIPING
FROM YARD PIPING
EB/TSC (NOTE 2)
Safety Class: N
Seismic Category: NS
Quality Group: D
TUNNEL
FROM PRIMARY SOURCE
RETURN TO PRIMARY SOURCE
U43
C21
REACTOR COOLANT INVENTORY MAKEUP PUMP
FUEL OIL DAY TANK
FROM PRIMARY SOURCE
PRIMARY ELECTRIC-MOTOR DRIVEN FIRE PUMP
JOCKEY FIRE PUMP
C/W
PRIMARY DIESEL ENGINE
FPE (NOTE 2)
(NOTE 4)
CB
Ancillary Diesel Building (ADB)(NOTE 2)
FROM YARD PIPING
Safety Class: N
Seismic Category: NS
Quality Group: D
SB/DSC (NOTE 2)
FROM YARD PIPING
LEGEND:
Safety Class: N
Seismic Category: I
Quality Group: D
(See Note 3)
FROM YARD PIPING
U43
C21
P21 U43
P21 MAKEUP
FUEL POOLS
IC/PCC POOLS
FROM YARD PIPING
TB (NOTE 2)
Safety Class: N
Seismic Category: NS
Quality Group: D
Safety Class: N
Seismic Category: II
Quality Group: D
(See Note 3)
RB/FB/WD (NOTE 2)
NOTES:
1. NOT ALL BUILDINGS, VALVES, PUMPS, OR PIPING IS SHOWN.
2. NO SUPPRESSION SYSTEMS, STANDPIPES OR HYDRANTS ARE SHOWN.
3. REFER TO SUBSECTION 3.2 FOR ADDITIONAL CLASSIFICATION INFORMATION AND TO APPENDIX 19A FOR RINSS REQUIREMENTS.
4. TYPICAL HOSE STATION VALVE.
C21 – FUEL AND AUXILIARY POOLS COOLING SYSTEM
P21 – REACTOR COMPONENT COOLING WATER
U43 – FIRE PROTECTION SYSTEM

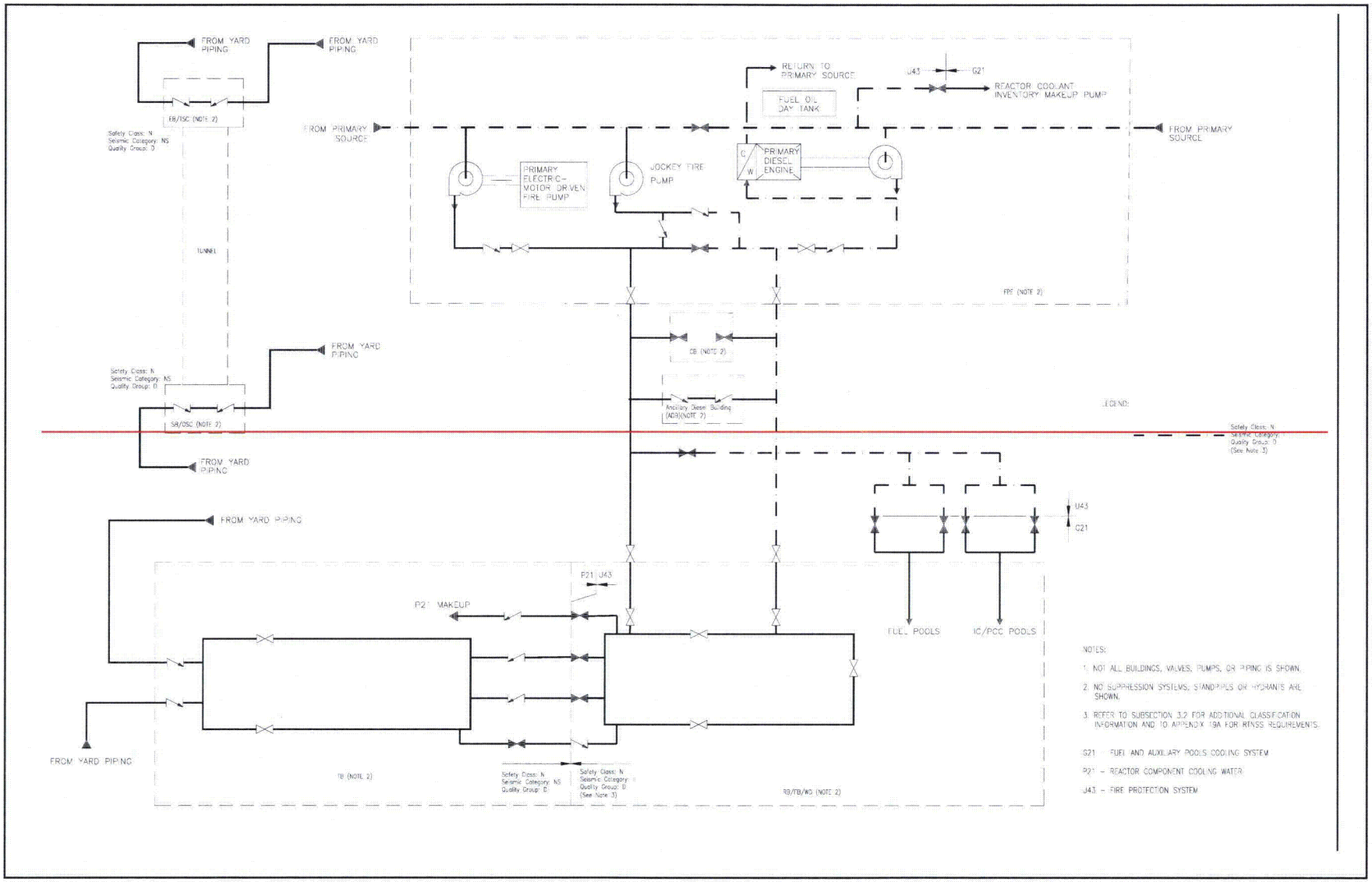
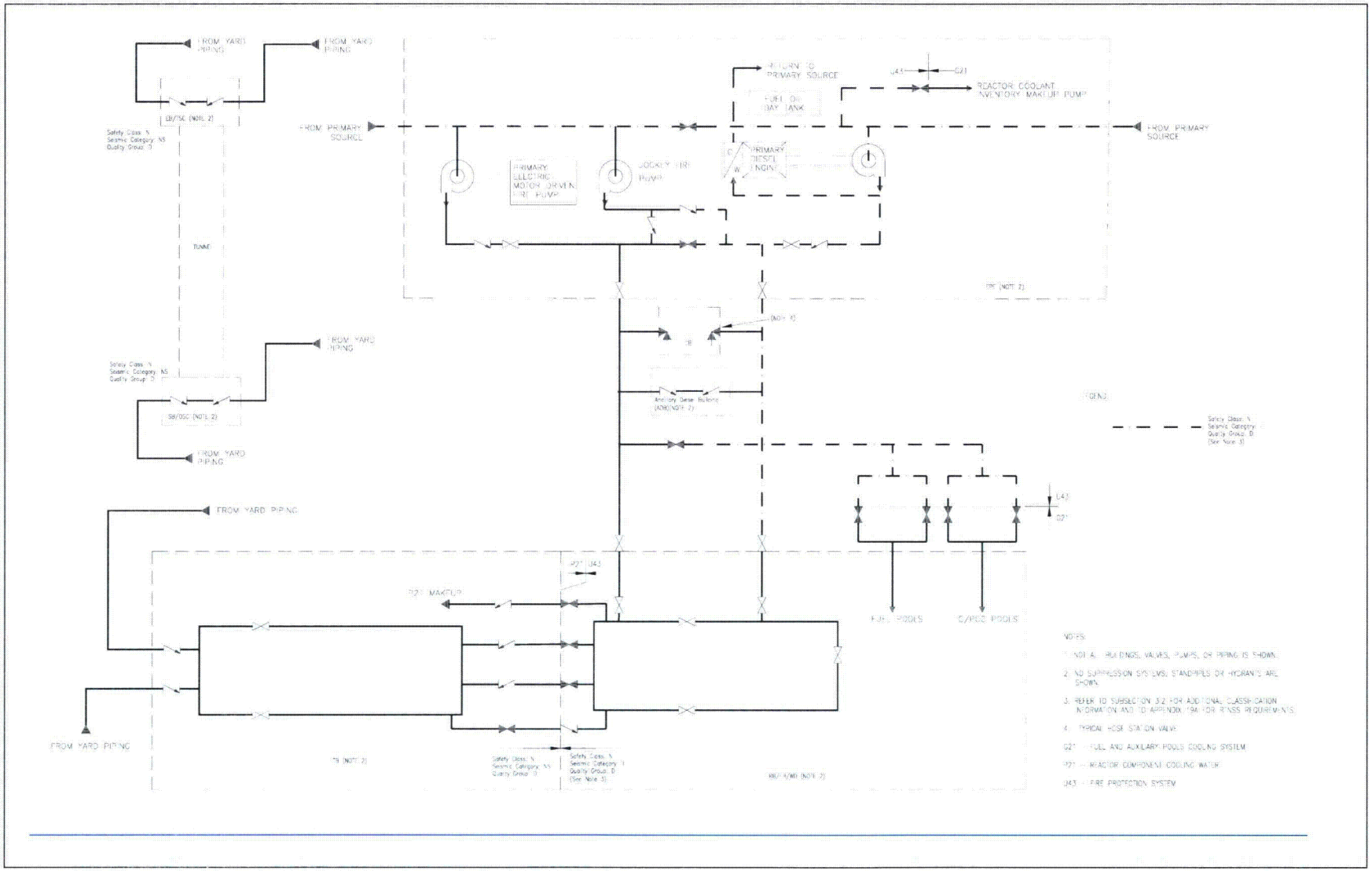


Figure 2.16.3-1. Fire Protection System


FROM YARD PIPING
FROM YARD PIPING
EB/TSC (NOTE 2)
Safety Class: N
Seismic Category: NS
Quality Group: D
FROM PRIMARY SOURCE
RETURN TO PRIMARY SOURCE
FUEL OIL DAY TANK
REACTOR COOLANT INVENTORY MAKEUP PUMP
FROM PRIMARY SOURCE
PRIMARY ELECTRIC MOTOR DRIVEN FIRE PUMP
JOCKEY FIRE PUMP
PRIMARY DIESEL ENGINE
TURBINE
FPC (NOTE 2)
(NOTE 3)
FROM YARD PIPING
Safety Class: N
Seismic Category: NS
Quality Group: D
SB/OSC (NOTE 2)
FROM YARD PIPING
Auxiliary Diesel Building (ADB) (NOTE 2)
TGEN2
Safety Class: N
Seismic Category: -
Quality Group: D
(See Note 3)
FROM YARD PIPING
G43
G21
G27 G43
G21 MAKEUP
F/P POOLS
C/PCC POOLS
FROM YARD PIPING
TB (NOTE 2)
Safety Class: N
Seismic Category: NS
Quality Group: D
Safety Class: N
Seismic Category: -
Quality Group: D
(See Note 3)
RB/FW/MB (NOTE 2)
NOTES:
1. NOT ALL BUILDINGS, VALVES, PUMPS, OR PIPING IS SHOWN.
2. NO SUPPRESSION SYSTEMS, STANDPIPES OR HYDRANTS ARE SHOWN.
3. REFER TO SUBSECTION 3.2 FOR ADDITIONAL CLASSIFICATION INFORMATION AND TO APPENDIX 19A FOR RTNSS REQUIREMENTS.
4. TYPICAL HOSE STATION VALVE.
G21 - FUEL AND AUXILIARY POOLS COOLING SYSTEM
P27 - REACTOR COMPONENT COOLING WATER
U43 - FIRE PROTECTION SYSTEM

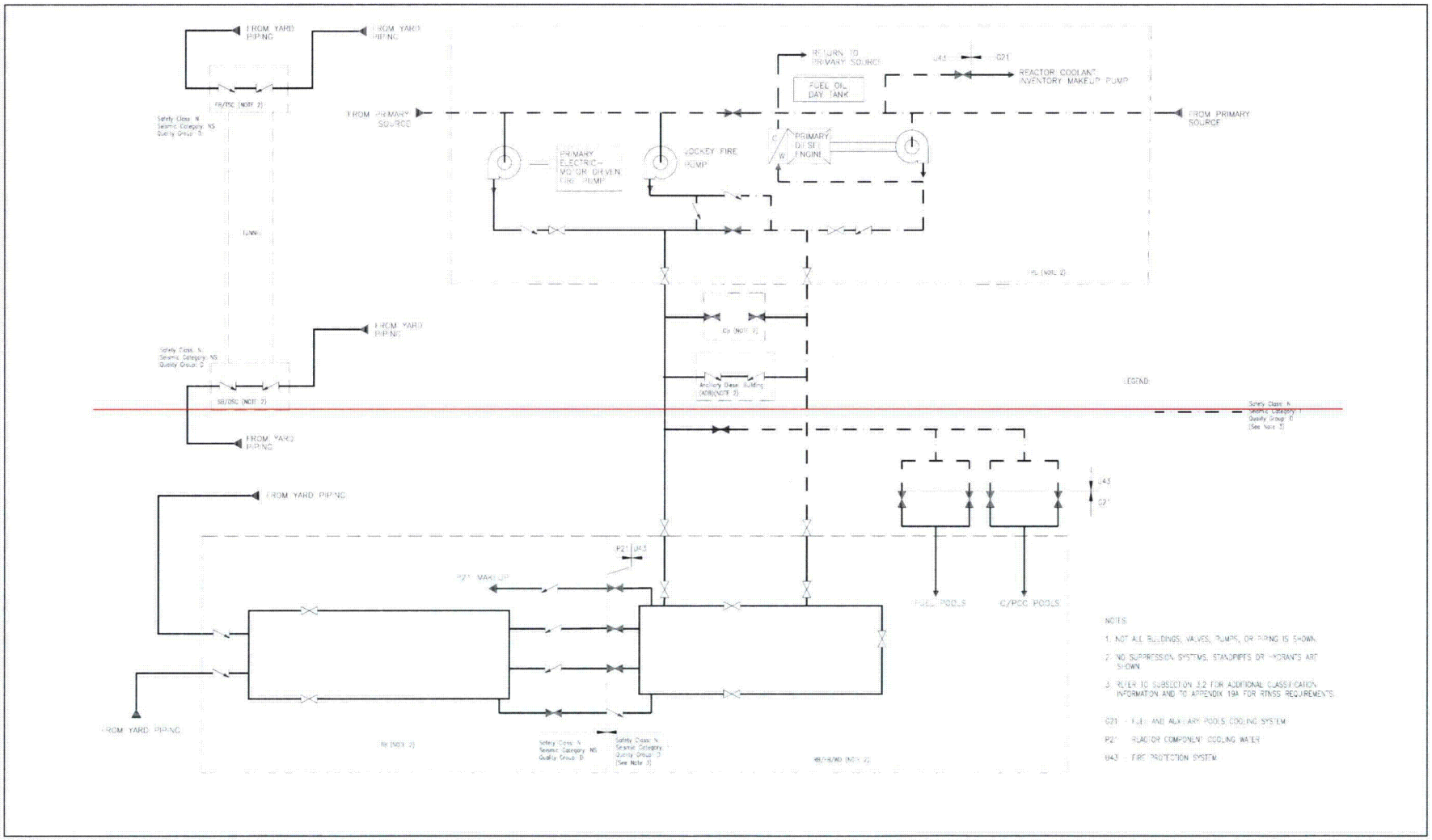


Figure 9.5-1. Fire Protection System Simplified Diagram

The firewater supply piping consists of buried non-seismic piping (yard main loop), suspended non-seismic piping, and suspended ASME B31.1, either Seismic Category I or II piping (primary piping). The Seismic Category I and II loops are designed to remain functional following a SSE. The primary fire pumps supply firewater to the Seismic Category II loop supplying firewater within the Reactor Building, Control Building, Ancillary Diesel Building and Fuel Building. The secondary fire pumps supply firewater directly to the yard main loop. Isolation valves are provided between the non-seismic piping and the suspended ASME B31.1 Seismic Category II piping to ensure functionality of the primary loop following an SSE.

The yard main loop piping is made of code compliant material that is in accordance with NFPA 24 and FM (Factory Mutual) approved for fire main service, e.g.; High-Density Polyethylene with concrete thrust blocks or cement-lined ductile iron piping. Locked open sectionalizing post-indicator valves installed in the yard main loop permit isolation of any part of the main without completely removing the system from service. Valves between connections separate individual fire pump connections from the yard main.

Check valves are provided between each building connection from the main yard piping loop. Additionally, a check valve is provided in the Reactor Building to Turbine Building piping connection to prevent flow from the Turbine Building to the primary loop.

Fire hydrants located at approximately 76.2 m (250 ft) intervals along the yard main loop provide fire-fighting capability, especially in the vicinity of buildings or structures containing combustible materials. The fire hydrants are located no closer than 12.2 m (40 ft) from the buildings and structures protected by fire hydrants.

Fire hydrants are protected against freezing and damage from vehicles.

The COL applicant shall provide simplified FPS piping and instrumentation diagrams showing complete site-specific systems (COL 9.5.1-4-A).

9.5.1.6 Manual Suppression Means

Manual suppression means are provided for all plant areas. The sprinkler systems and the hose station standpipes have separate connections to the firewater main; therefore, no single failure can impair both systems.

Standpipe and Hose Systems (Wet)

Standpipes and hose stations are provided in all major buildings. Standpipes in areas adjacent to stairways and other locations provide sufficient hose coverage. Minimum standpipe size is 102 mm (4 inch). Standpipe size for building heights exceeding 30.5 meters (100 feet) is 152 mm (6 inch).

The wet standpipes and hose stations are designed to NFPA 14 Class III Service.

Each Class III hose station is provided with a 64 mm (2.5 inch) hose valve with cap and a 38 mm (1.5 inch) hose valve. 64 mm (2.5 inch) to 38 mm (1.5-inch) reducer is utilized on the 64 mm (2.5-inch) hose valve.

Each Class III hose rack has 30.5m (100 ft) of 38 mm (1.5-inch) woven jacket, lined fire hose.

The water supply pressure maintains a gauge pressure of 448.2 kPaG (65 psig) at the most hydraulically remote 38 mm (1.5 inch) hose station and 689 kPaG (100 psig) at the most