

Enclosure 2

MFN 08-851

**Response to Portion of NRC Request for
Additional Information Letter No. 259
Related to ESBWR Design Certification Application**

Containment Systems

RAI Numbers 6.2-198 and 6.2-199

DCD Markups

“Fail as-is” valves are acceptable because the valves are normally closed, are only opened when it is necessary to provide cooling to the suppression pool and do not communicate with the DW atmosphere. This arrangement is an exception to GDC 56, which requires that such lines contain one isolation valve outside and one isolation valve inside the containment. Such an alternative arrangement is necessary because an inboard valve could potentially be under water under certain accident conditions. Leak detection is provided for CIVs on the suppression pool suction line and the valves are located as close as possible to the containment.

Chilled Water System

The CWS effluent lines penetrating the containment each has a pneumatic-operated or equivalent shutoff valve outside containment and a pneumatic-operated or equivalent shutoff valve inside the containment.

Containment Inerting System

The penetration of the Containment Inerting System consists of two tandem quarter-turn shutoff valves (normally closed) in parallel with tandem stop or shutoff valves. All isolation valves on these lines are outside of the containment so that they are not exposed to the harsh environment of the wet well and dry well and are accessible for maintenance, inspection and testing during reactor operation. Both containment isolation valves are located as close as practical to the containment. The valve nearest to the containment is provided with a capability of detection and termination of a leak. The piping between the containment and the first isolation valve and the piping between the two isolation valves are designed as per requirements of SRP 3.6.2. These piping are also designed to:

- Meet Safety Class 2 design requirements.
- Withstand the containment design temperature.
- Withstand internal pressure from containment structural integrity test.
- Withstand loss-of-coolant accident transient and environment.
- Meet Seismic Category I design requirements.
- Are protected against a HELB outside of containment when needed for containment isolation.

Process Radiation Monitoring System

The penetrations for the fission products monitor sampling lines consist of one sampling line and one return line. Each of these two lines ~~uses three tandem stop or shutoff valves~~ contains an inboard and outboard valve. ~~One valve is a manual operated valve used for maintenance and is located close to the containment. The other~~ These two valves are pneumatic, solenoid or equivalent power operated valves and are used for isolation. These isolation valves will fail as-is. ~~All three valves are located outside the containment for easy access. The piping to these valves is considered an extension of the containment boundary.~~

6.2.4.3.2.3 Conclusion on Criterion 56

In order to ensure protection against the consequences of an accident involving release of significant amounts of radioactive materials, pipes that penetrate the containment have been

Table 6.2-36

Containment Isolation Valve Information for the Containment Inerting System

Penetration Identification	T31-MPEN-0004				T31-MPEN-0003*				
	Valve No.	F012	F011	F013	F016	F010	F011	F014	F015
Applicable Basis	GDC 56	GDC 56	GDC 56	GDC 56	GDC 56	GDC 56	GDC 56	GDC 56	GDC 56
Tier 2 Figure	6.2-299.4-14	6.2-299.4-14	6.2-299.4-14	6.2-299.4-14	6.2-299.4-14	6.2-299.4-14	6.2-299.4-14	6.2-299.4-14	6.2-299.4-14
ESF	No	No	No	No	No	No	No	No	No
Fluid	Air/N ₂	Air/N ₂	Air/N ₂	Air/N ₂	Air/N ₂	Air/N ₂	Air/N ₂	Air/N ₂	Air/N ₂
Line Size ⁺	350 mm (14 in)	500 mm (20 in)	200 mm (8 in)	200 mm (8 in)	400 mm (16 in)	500 mm (20 in)	25 mm (1 in)	25mm (1 in)	
Type C Leakage Test	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
(Deleted) Pipe Length from Cont. to Inboard/Outboard Isolation Valve	COL Holder to provide	COL Holder to provide	COL Holder to provide	COL Holder to provide	COL Holder to provide	COL Holder to provide	COL Holder to provide	COL Holder to provide	COL Holder to provide
Leakage Through Packing ^(a)	a ₁	a ₁	a ₁	a ₁	a ₁	a ₁	a ₁	a ₁	
Leakage Past Seat ^(b)	b ₂ /b ₅	b ₂ /b ₅	b ₂ /b ₅	b ₂ /b ₅	b ₂ /b ₅	b ₂ /b ₅	b ₂ /b ₅	b ₂ /b ₅	
Location	Outboard	Outboard	Outboard	Outboard	Outboard	Outboard	Outboard	Outboard	
Valve Type	QBF, QBL	QBF, QBL	QBF, QBL	QBF, QBL	QBF, QBL	QBF, QBL	QBF, QBL	GB, QBL	GB, QBL
Operator ^(c)	AO	AO	AO	AO	AO	AO	AO	AO	
Normal Position	Closed	Closed	Closed	Closed	Closed	Closed	Closed**	Closed**	
Shutdown Position	Closed**	Closed**	Closed	Closed	Closed**	Closed**	Closed**	Closed	Closed
Post-Acc Position	Closed	Closed	Closed	Closed	Closed	Closed	Closed	Closed	Closed

Table 6.2-37

Containment Isolation Valve Information for the Containment Inerting System

Penetration Identification	T31-MPEN-0002*				
	Valve No.	F008	F007	F024	F023
Applicable Basis	GDC 56	GDC 56	GDC 56	GDC 56	GDC 56
Tier 2 Figure	6.2-299.4-14	6.2-299.4-14	6.2-299.4-14	6.2-299.4-14	
ESF	No	No	No	No	
Fluid	Air/N ₂	Air/N ₂	Air/N ₂	Air/N ₂	
Line Size ⁺	500 mm (20 in)	350 mm (14 in)	25 mm (1 in)	25 mm (1 in)	
Type C Leakage Test	Yes	Yes	Yes	Yes	
(Deleted) Pipe Length from Cont. to Inboard/Outboard Isolation Valve	COL Holder to provide	COL Holder to provide	COL Holder to provide	COL Holder to provide	
Leakage Through Packing ^(a)	a ₁	a ₁	a ₁	a ₁	
Leakage Past Seat ^(b)	b ₂	b ₂	b ₂	b ₂	
Location	Outboard	Outboard	Outboard	Outboard	
Valve Type	QBF, QBL	QBF, QBL	QBL, QBF	QBL, QBF	
Operator ^(c)	AO	AO	AO	AO	
Normal Position	Closed	Closed	Open	Open	
Shutdown Position	Open	Open	Closed	Closed	
Post-Acc Position	Closed	Closed	Closed	Closed	
Power Fail Position	Closed	Closed	Closed	Closed	
Cont. Iso. Signal ^(d)	B,C,H,T	B,C,H,T	B,C,H,T	B,C,H,T	
Primary Actuation	Automatic	Automatic	Automatic	Automatic	
Secondary Actuation	Remote manual	Remote manual	Remote manual	Remote manual	
Closure Time (sec.)	< 30	< 30	< 5	< 5	
Power Source	Div. 1, 3	Div. 2, 4	Div. 2, 4	Div. 1, 3	

* Valve F008 in series with F007, valve F024 in series with F023

+ Nominal pipe size diameter

Note: For explanation of codes, see legend on Table 6.2-15.

Table 6.2-38

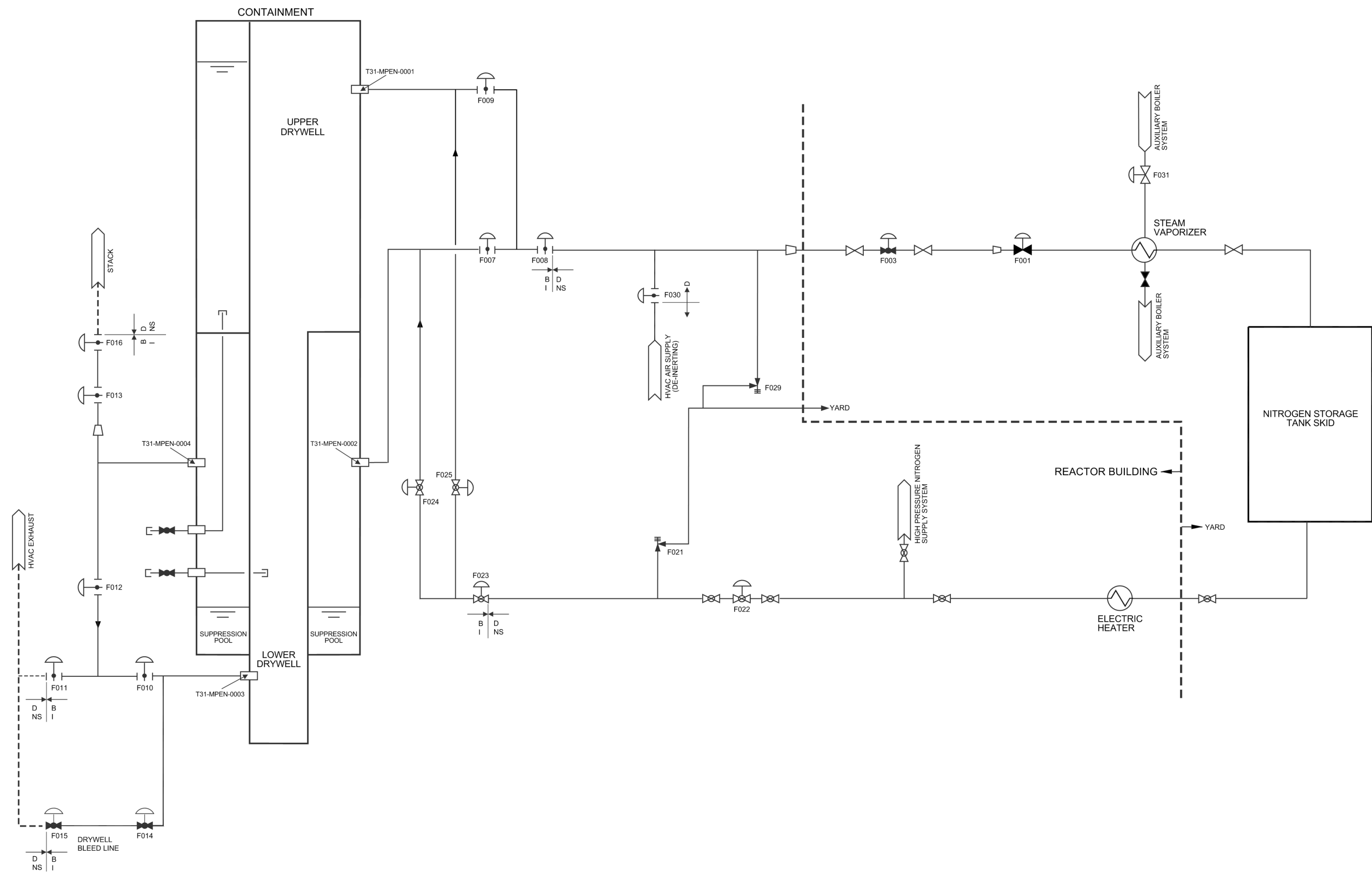
Containment Isolation Valve Information for the Containment Inerting System

Penetration Identification	T31-MPEN-0001*				
	Valve No.	F025	F023	F008	F009
Applicable Basis	GDC 56	GDC 56	GDC 56	GDC 56	GDC 56
Tier 2 Figure	6.2-299.4-14	6.2-299.4-14	6.2-299.4-14	6.2-299.4-14	6.2-299.4-14
ESF	No	No	No	No	No
Fluid	Air/N ₂	Air/N ₂	Air/N ₂	Air/N ₂	Air/N ₂
Line Size ⁺	25 mm (1 in)	25 mm (1 in)	500 mm (20 in)	350 mm (14 in)	350 mm (14 in)
Type C Leakage Test	Yes	Yes	Yes	Yes	Yes
(Deleted) Pipe Length from Cont. to Inboard/Outboard Isolation Valve	COL Holder to provide	COL Holder to provide	COL Holder to provide	COL Holder to provide	COL Holder to provide
Leakage Through Packing ^(a)	a ₁	a ₁	a ₁	a ₁	a ₁
Leakage Past Seat ^(b)	b ₂	b ₂	b ₂	b ₂	b ₂
Location	Outboard	Outboard	Outboard	Outboard	Outboard
Valve Type	QBL, QBF	QBL, QBF	QBF, QBL	QBF, QBL	QBF, QBL
Operator ^(c)	AO	AO	AO	AO	AO
Normal Position	Open	Open	Closed	Closed	Closed
Shutdown Position	Closed	Closed	Open	Open	Open
Post-Acc Position	Closed	Closed	Closed	Closed	Closed
Power Fail Position	Closed	Closed	Closed	Closed	Closed
Cont. Iso. Signal ^(d)	B,C,H,T	B,C,H,T	B,C,H,T	B,C,H,T	B,C,H,T
Primary Actuation	Automatic	Automatic	Automatic	Automatic	Automatic
Secondary Actuation	Remote manual	Remote manual	Remote manual	Remote manual	Remote manual
Closure Time (sec)	< 5	< 5	< 30	< 30	< 30
Power Source	Div. 2, 4	Div. 1, 3	Div. 1, 3	Div. 1, 3	Div. 2, 4

* Valve F008 in series with F009, valve F025 in series with F023

+ Nominal pipe size diameter

Note: For explanation of codes, see legend on Table 6.2-15.



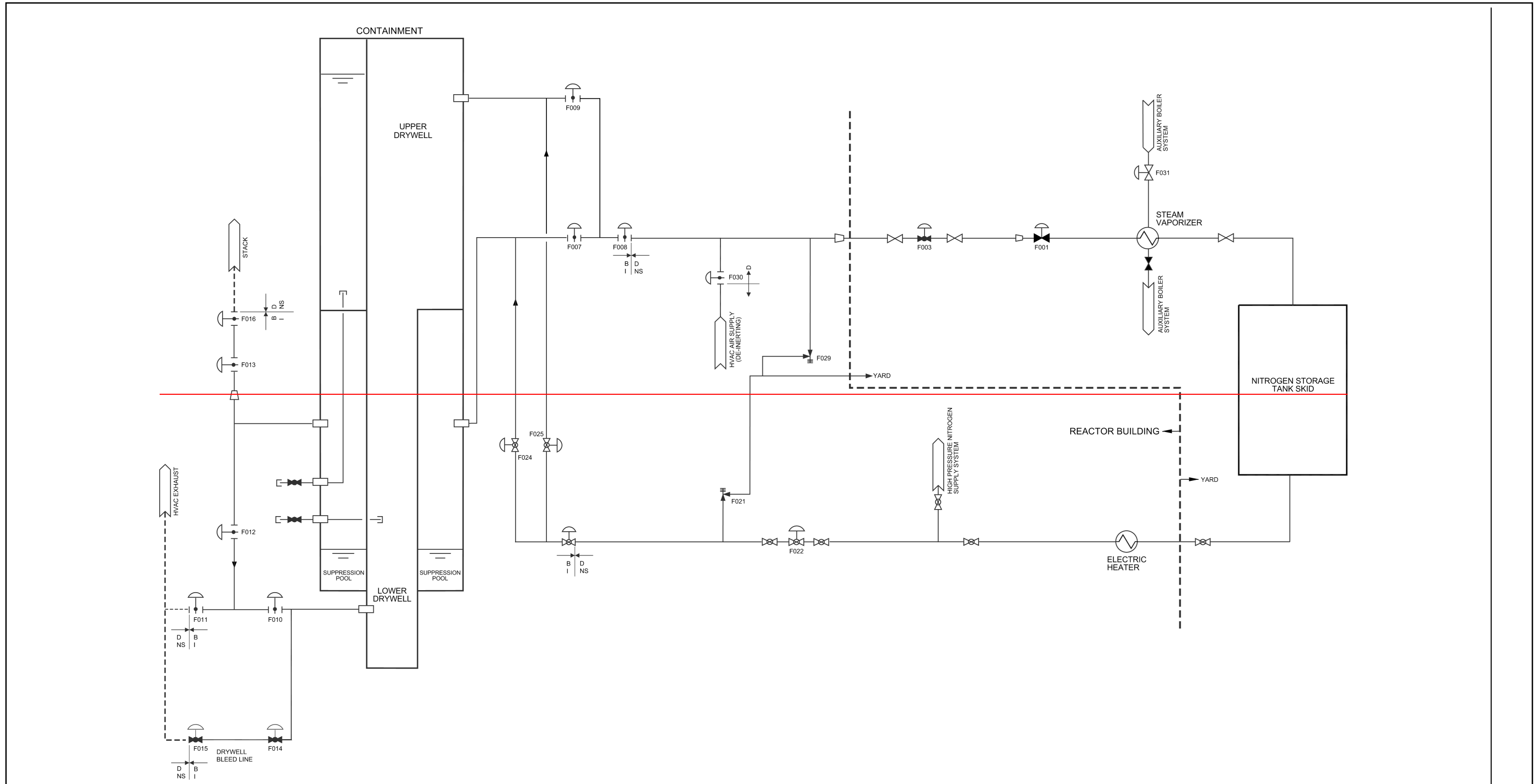


Figure 6.2-29. CIS Simplified System Diagram