




United States Nuclear Regulatory Commission

Protecting People and the Environment

Steam & Power Conversion System



Steam & Power Conversion System includes:

- **Main Turbine-Generator (7.2)**
- **Main Steam Supply System (7.3)**
- **Condensate & Feedwater System (7.4)**
- **Condenser Circulating Water System (7.5)**
- **Emergency Feedwater System (7.6)**



Objectives

- 1. State the purposes, and describe the operation, of the main steam supply system.**
- 2. State the purposes, and describe the operation, of the condensate & feedwater system.**
- 3. State the purposes, and describe the operation, of the condenser circulating water system.**



Objectives (cont'd)

- 4. State the purposes, and describe the operation, of the emergency feedwater system.**
- 5. Describe the major differences between the design of the US-APWR steam & power conversion system & those of currently operating Westinghouse plants.**

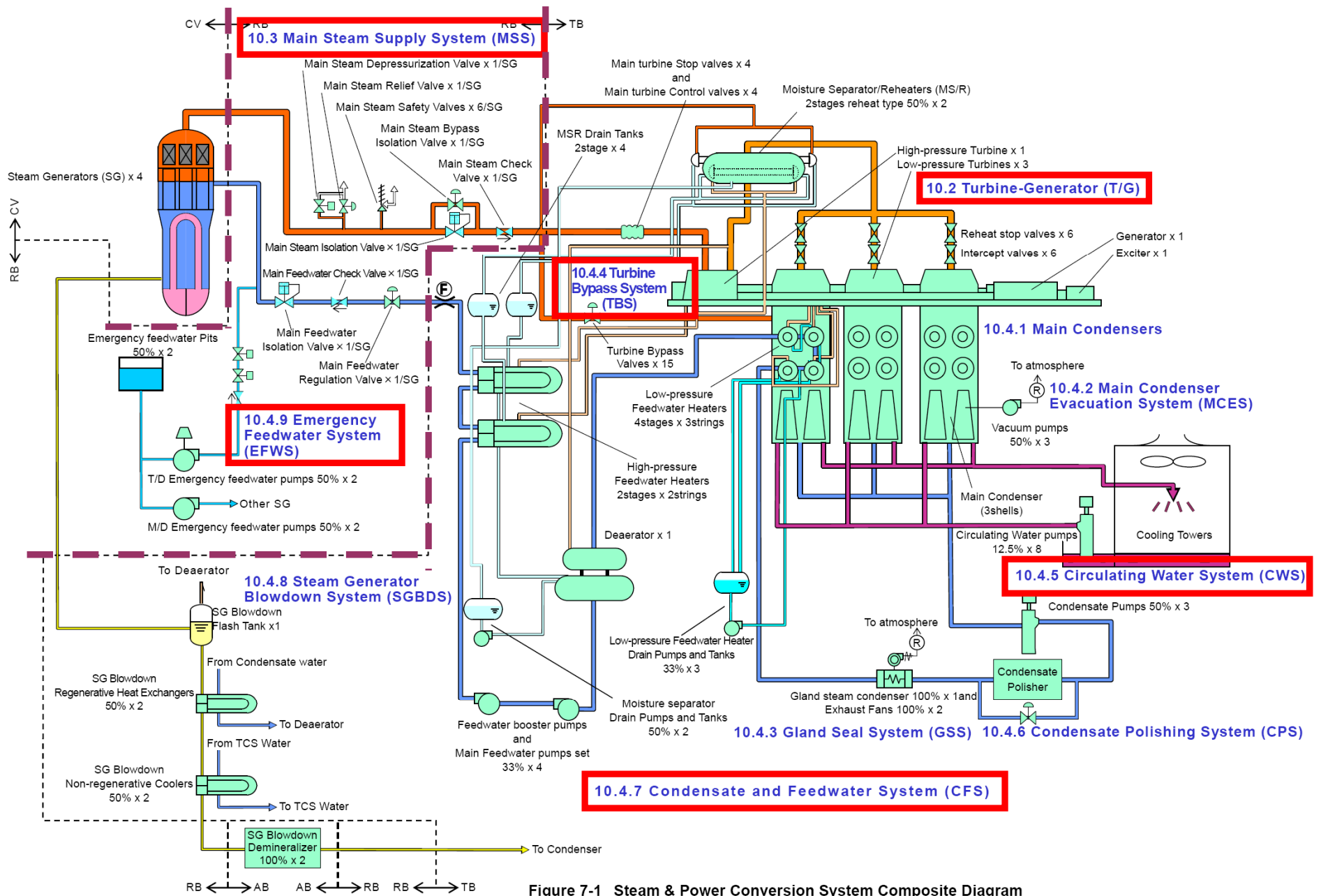


Figure 7-1 Steam & Power Conversion System Composite Diagram



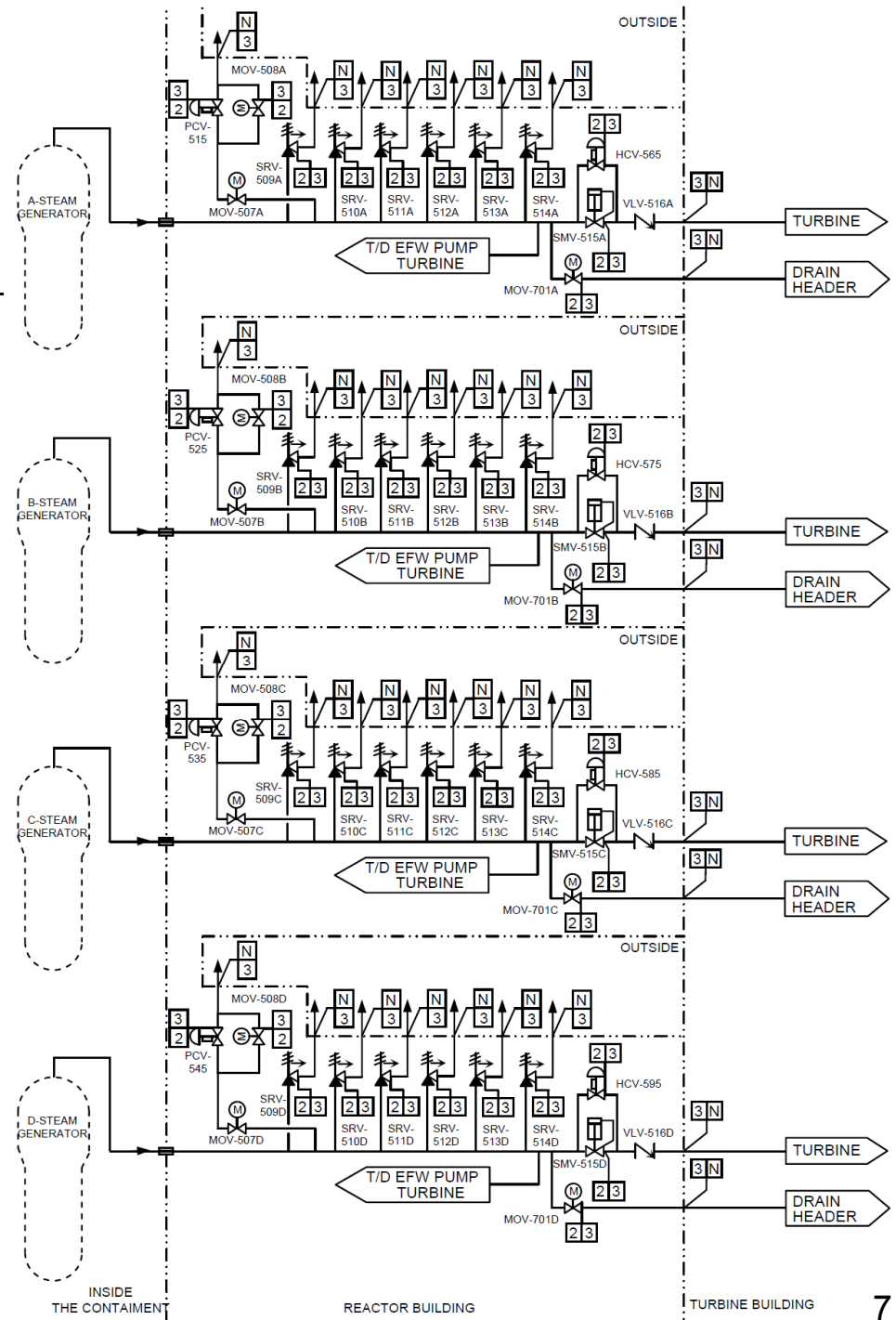
Turbine-Generator

Table 7-2 Turbine-Generator and Auxiliaries Design Parameters

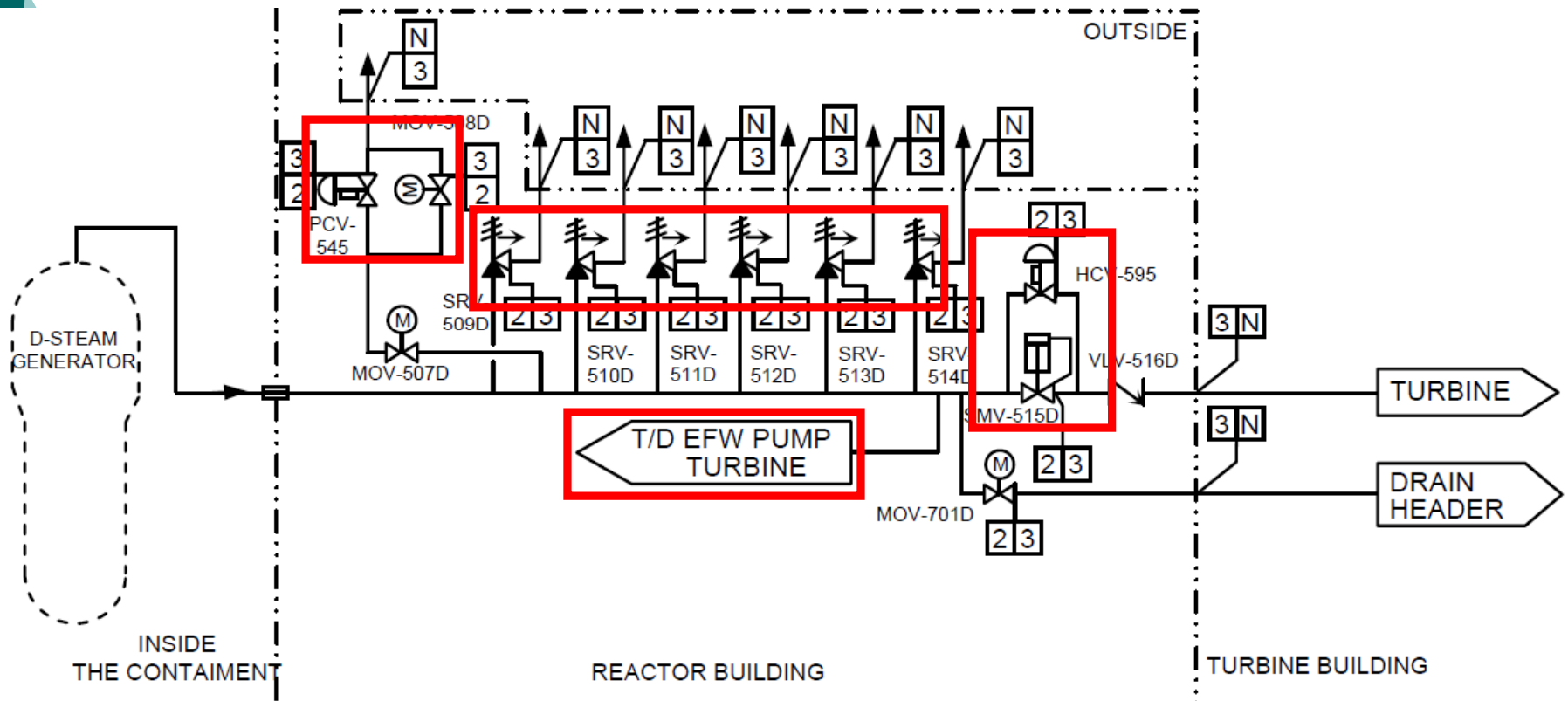
| | |
|---|----------------------------------|
| Manufacturer Mitsubishi Heavy Industries, Ltd. | |
| Turbine | |
| Type | Tandem compound six exhaust flow |
| Number of elements | 4 (one HPT and three LPTs) |
| Last-stage blade length (in.) | 74 |
| Operating speed (rpm) | 1,800 |
| Design condensing pressure (in. HgA) | 1.5 |
| Generator | |
| Expected generator output at 100% NSSS output (kW) | 1,700,000 |
| Power factor | 0.9 |
| Generator rating (kVA) | 1,900,000 |
| Hydrogen pressure (psig) | 75 |

Main Steam Supply System

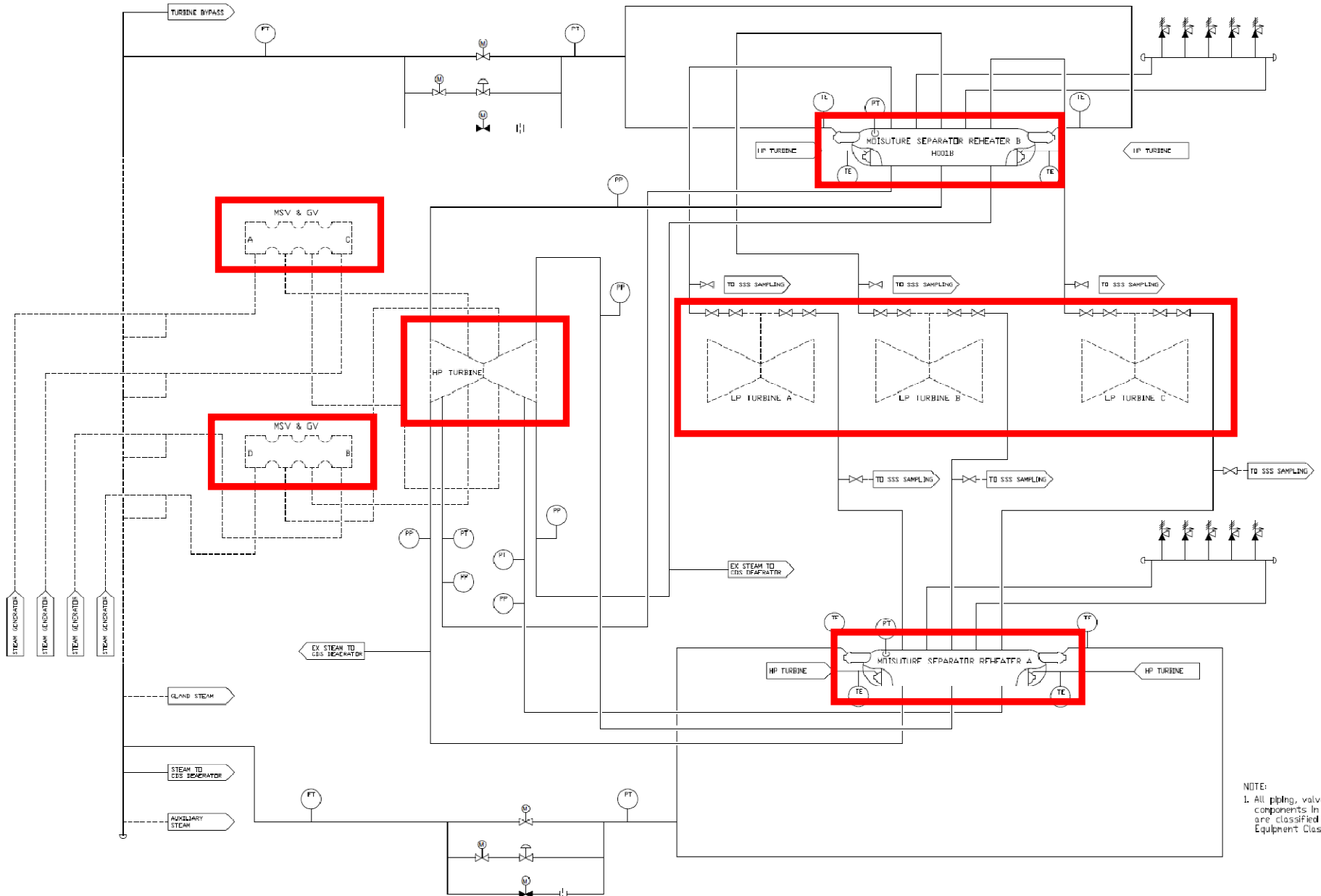
**Fig. 7-1
(Sheet 1)**



Main Steam Supply System

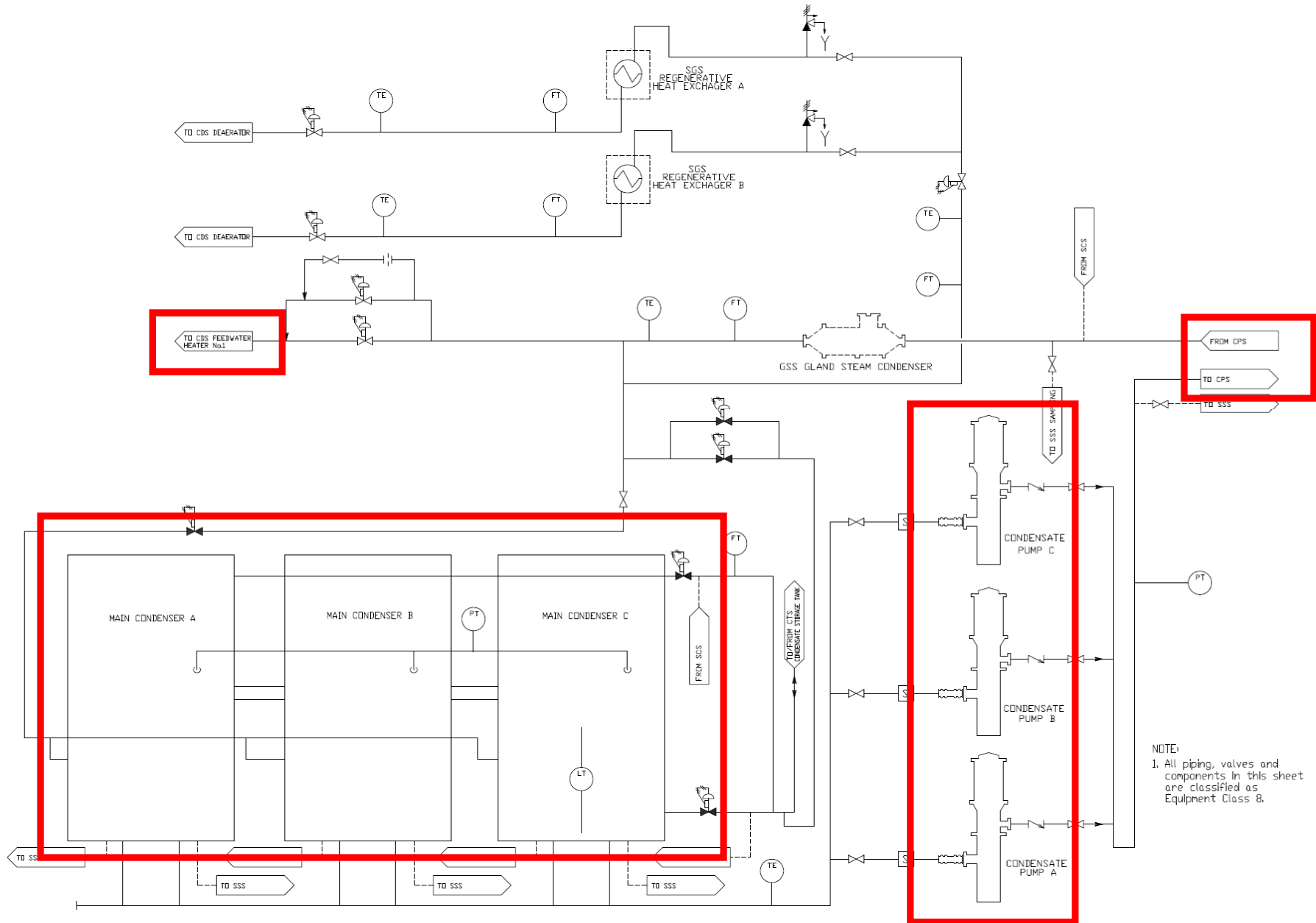


MSS Fig. 7-2 (Sheet 3)

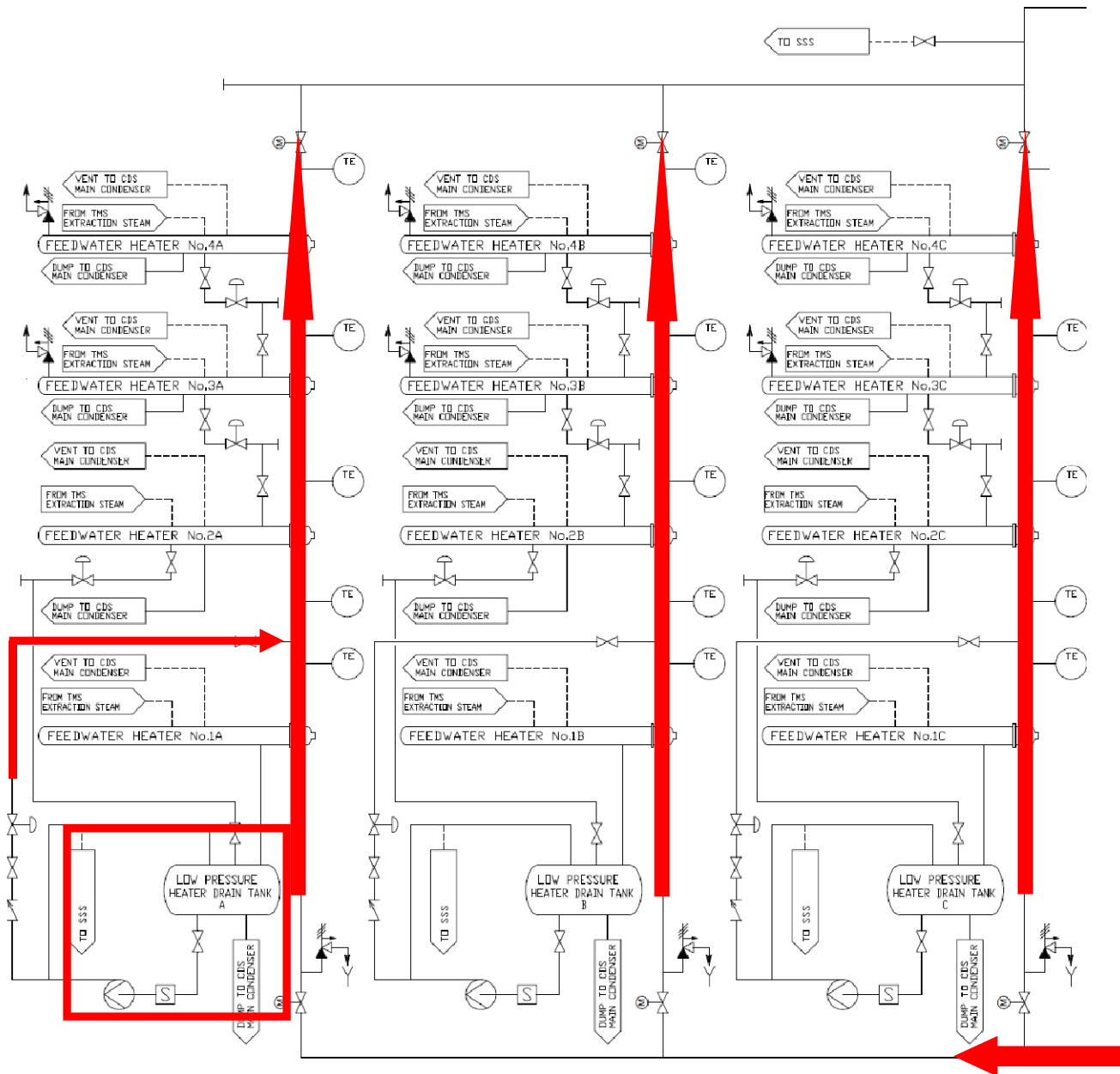


NOTE:
1. All piping, valves and components in this sheet are classified as Equipment Class 8.

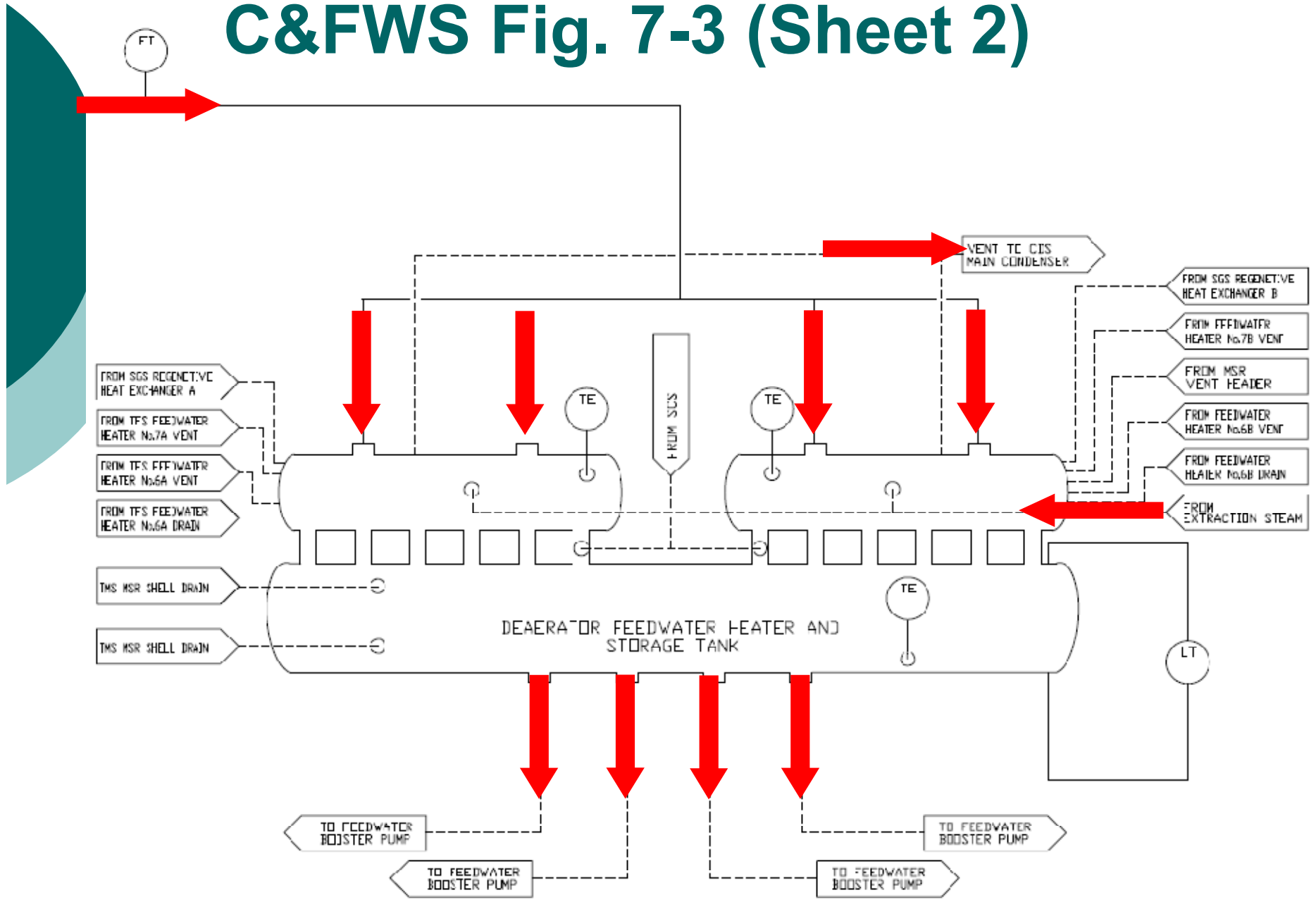
C&FWS Fig. 7-3 (Sheet 1)



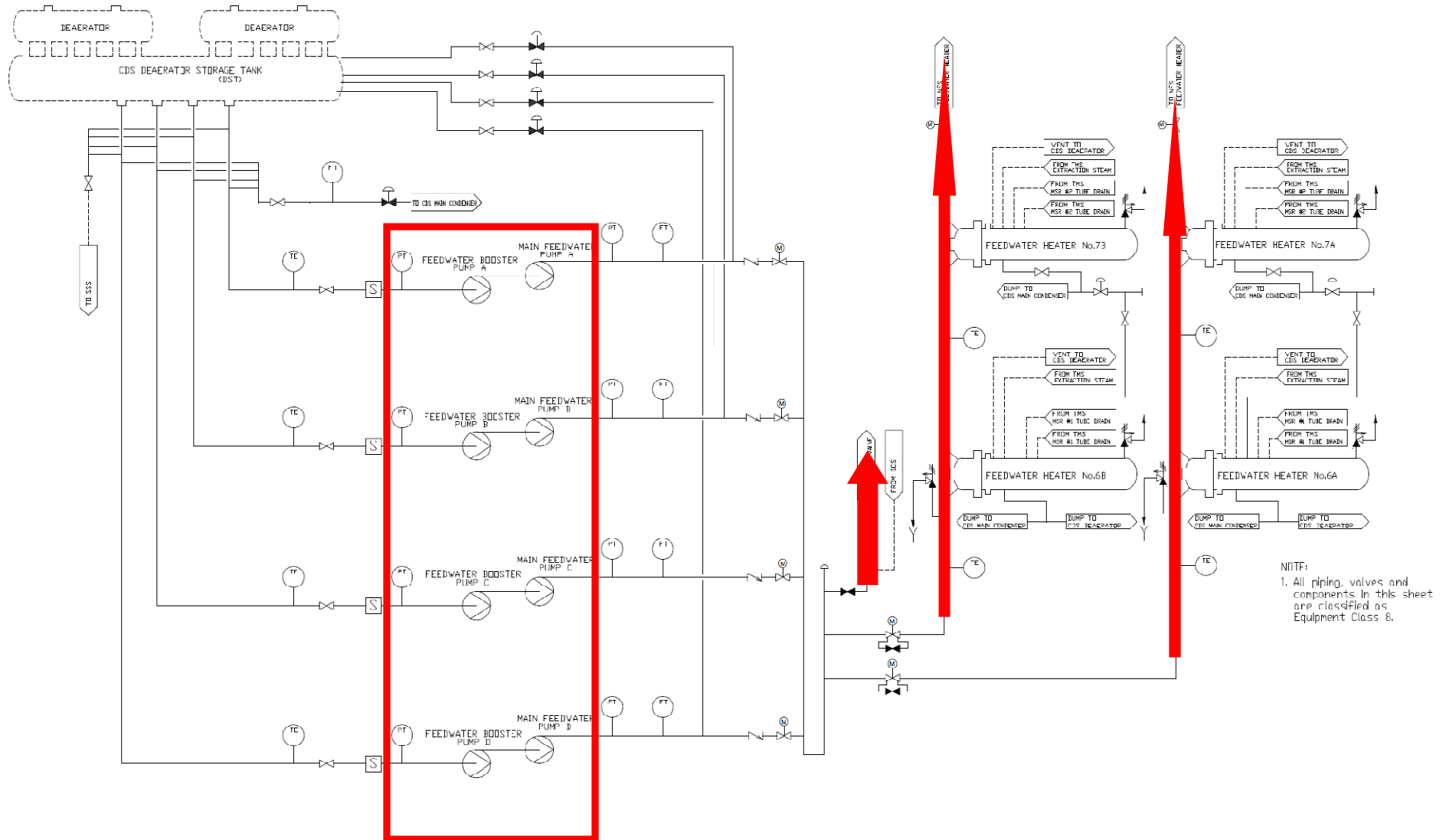
C&FWS Fig. 7-3 (Sheet 2)



C&FWS Fig. 7-3 (Sheet 2)



C&FWS Fig. 7-3 (Sheet 3)



C&FWS

Fig. 7-3 (Sheet 4)

MFRVs:

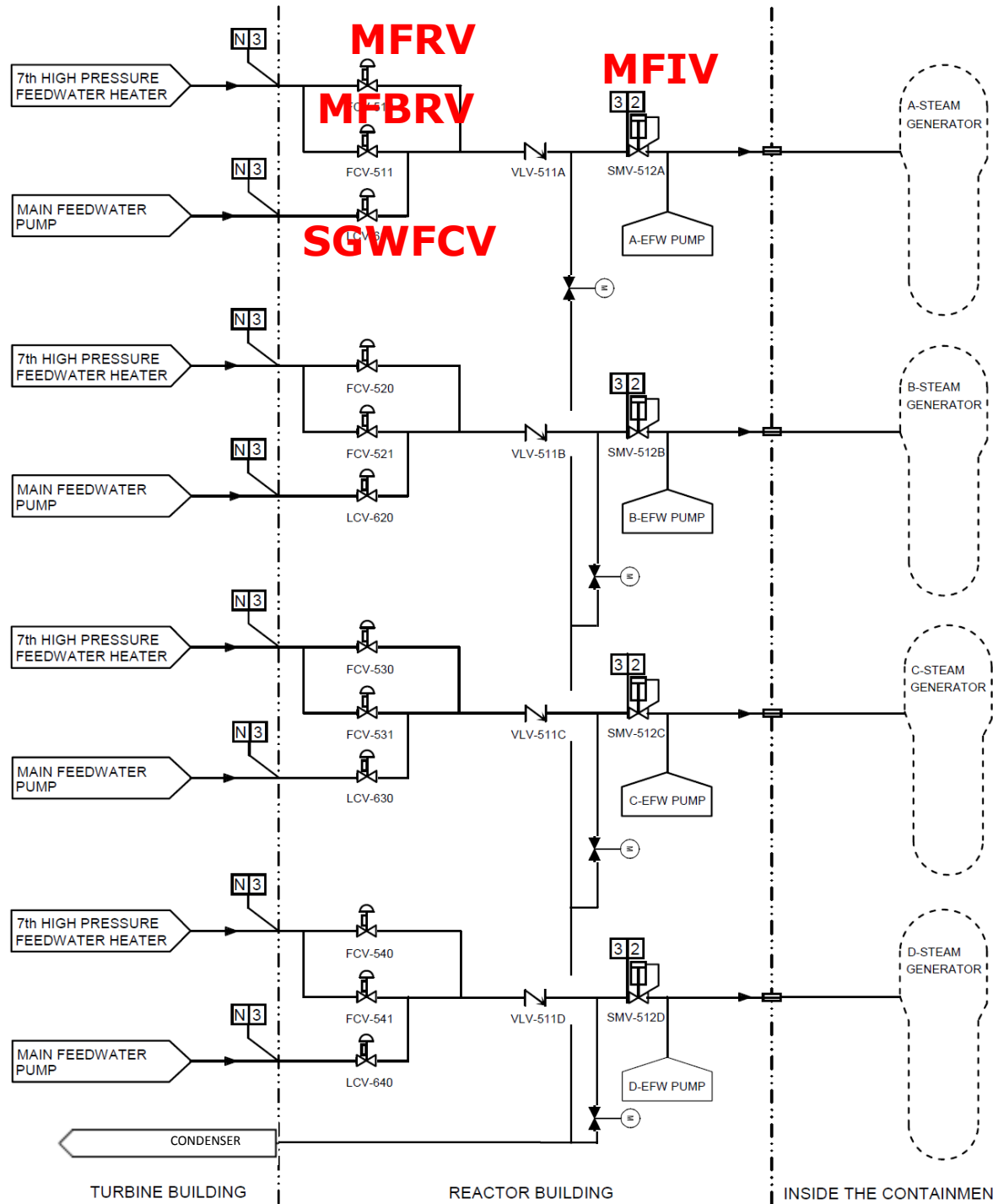
> 15%

MFBRVs:

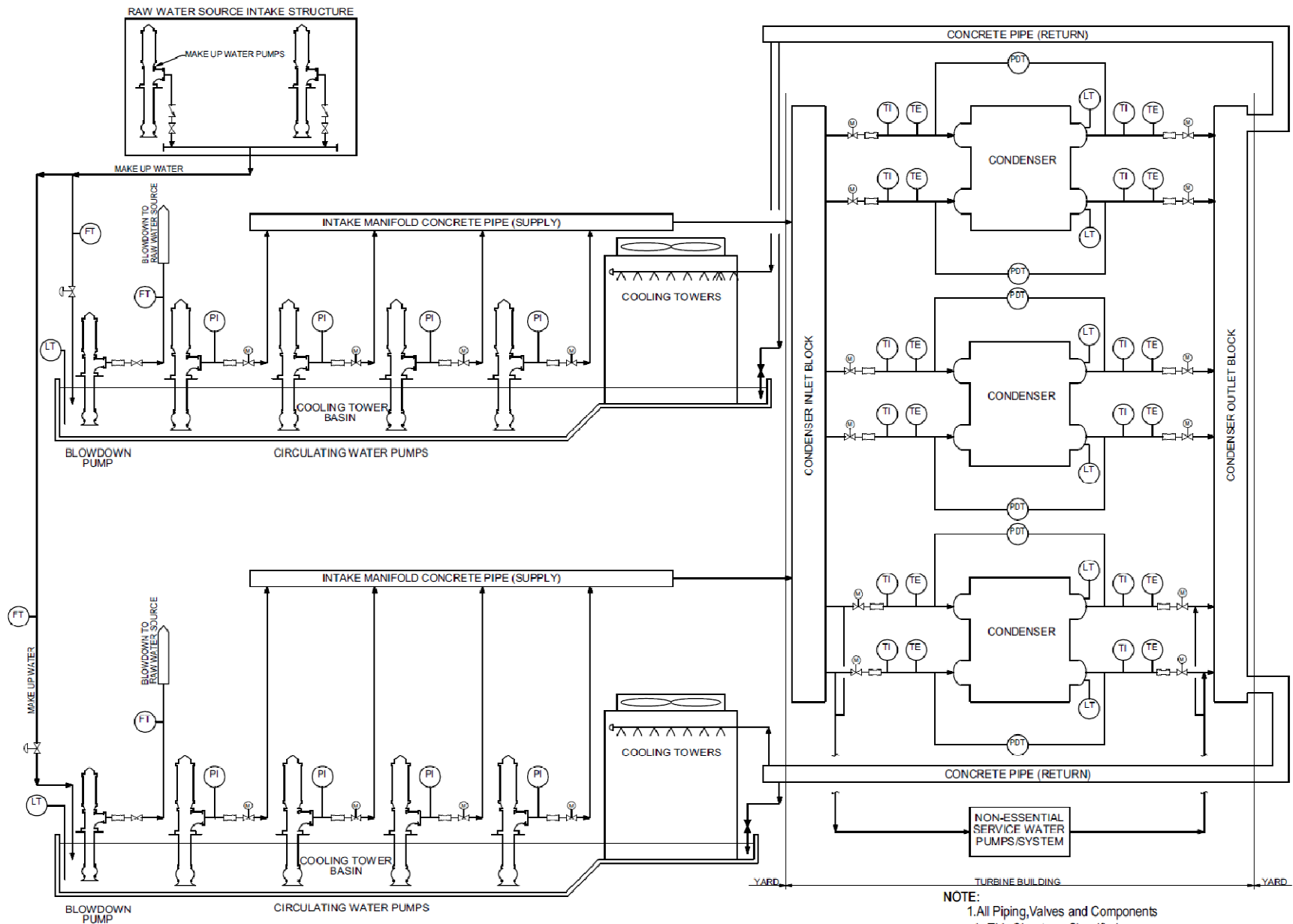
3% - 15%

SGWFCVs:

< 3%



CWS Fig. 7-4



NOTE:
1. All Piping, Valves and Components
in This Sheet are Classified as
Equipment Class 9

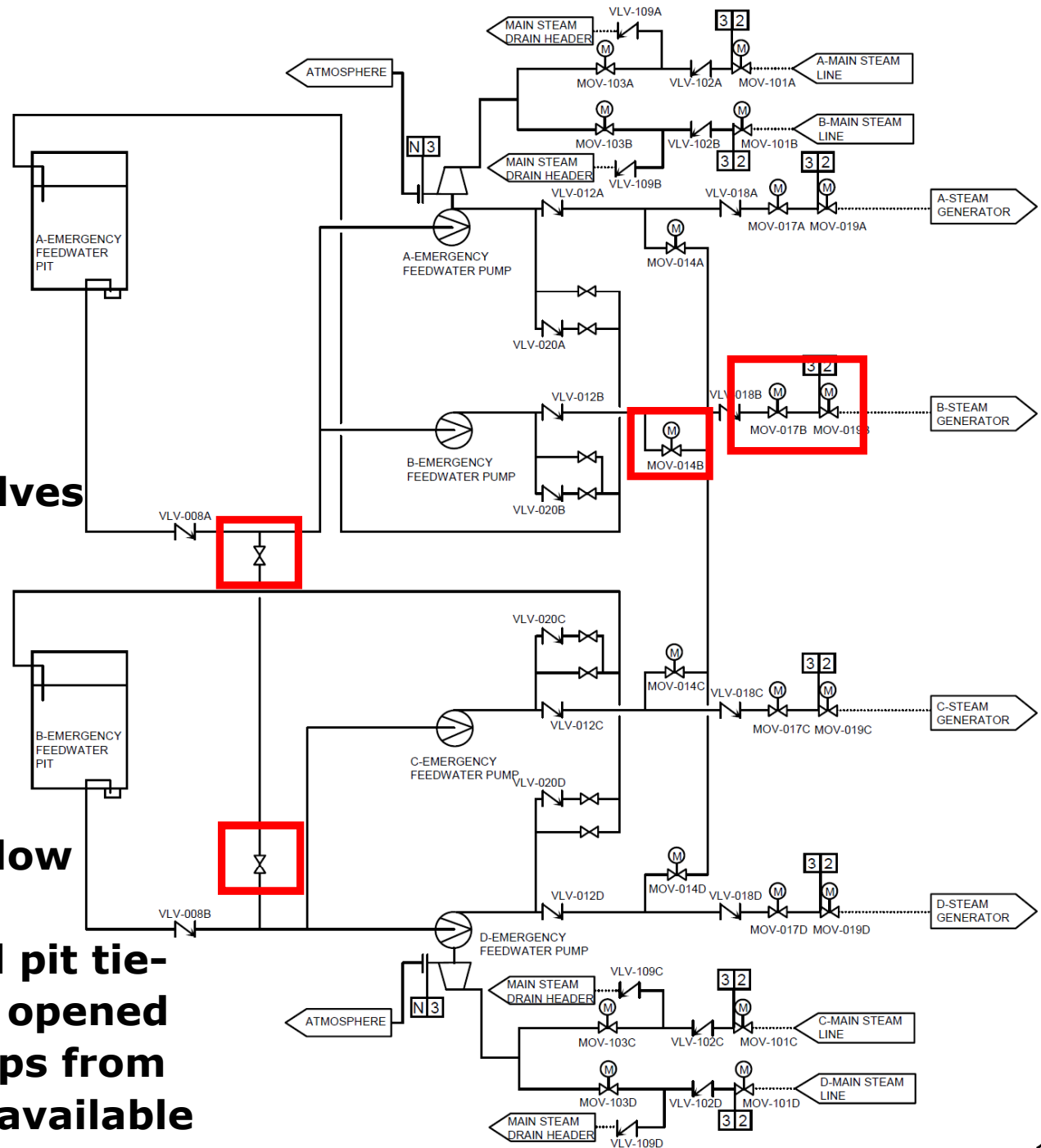
EFWS

Fig. 7-5

Preset control valves & iso. valves

Normally closed tie-line iso. valves; opened to assure 2-train flow

Normally closed pit tie-line iso. valves; opened when both pumps from same pit are unavailable





Objective 5

Major differences?

- **Use of deaerator. Not standard in existing plants. Removal of dissolved gases is an additional anticorrosion measure.**
- **All motor-driven FW pumps. FW pumps in existing plants are typically turbine driven.**
- **Parallel manual & auto MSS relief valves.**