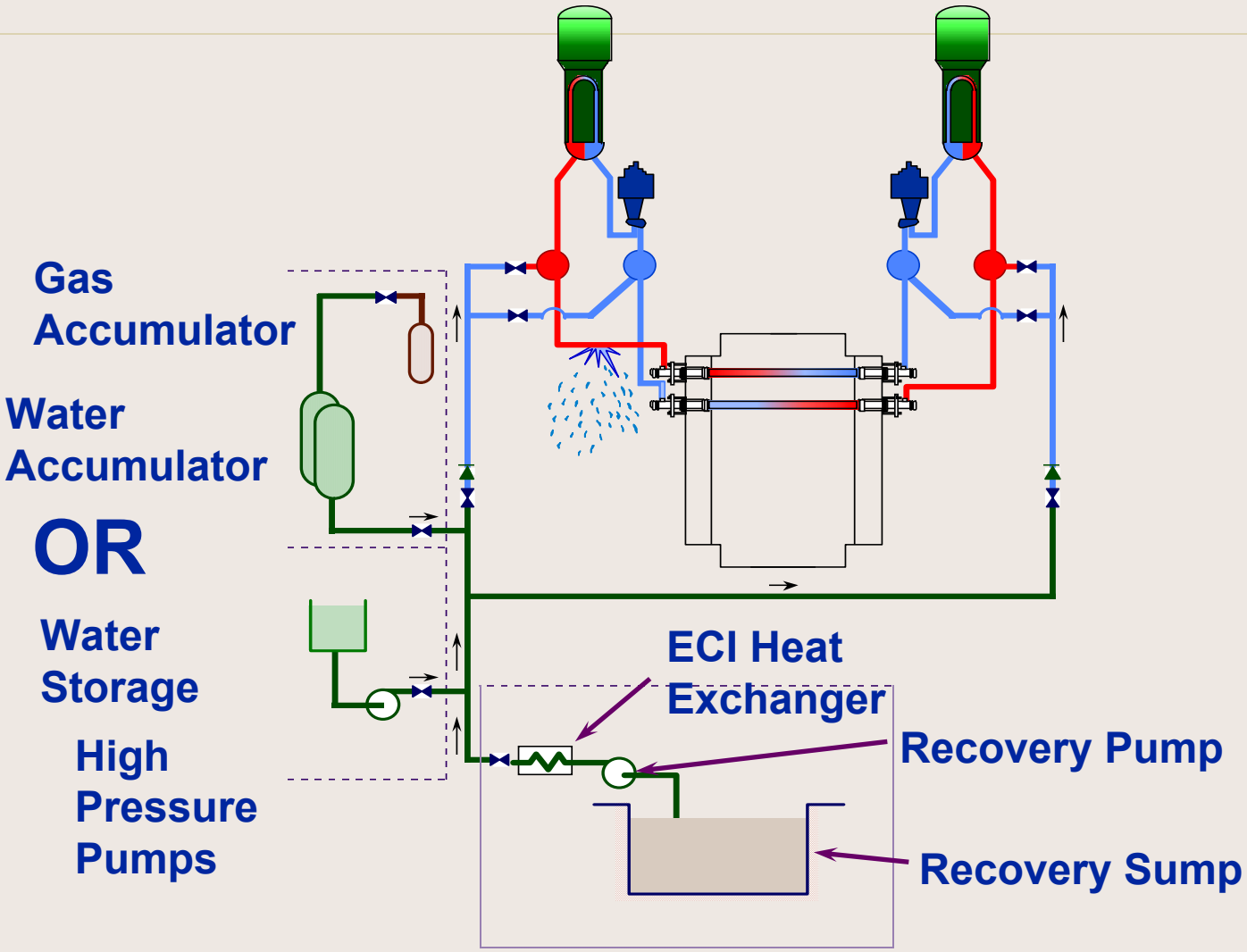
ECI & NPC

ECI

- Purpose
  - To protect the fuel
  - To provide cooling to the fuel after loss of coolant accidents
  - Provide back-up to normal HTS cooling during some none LOCA events

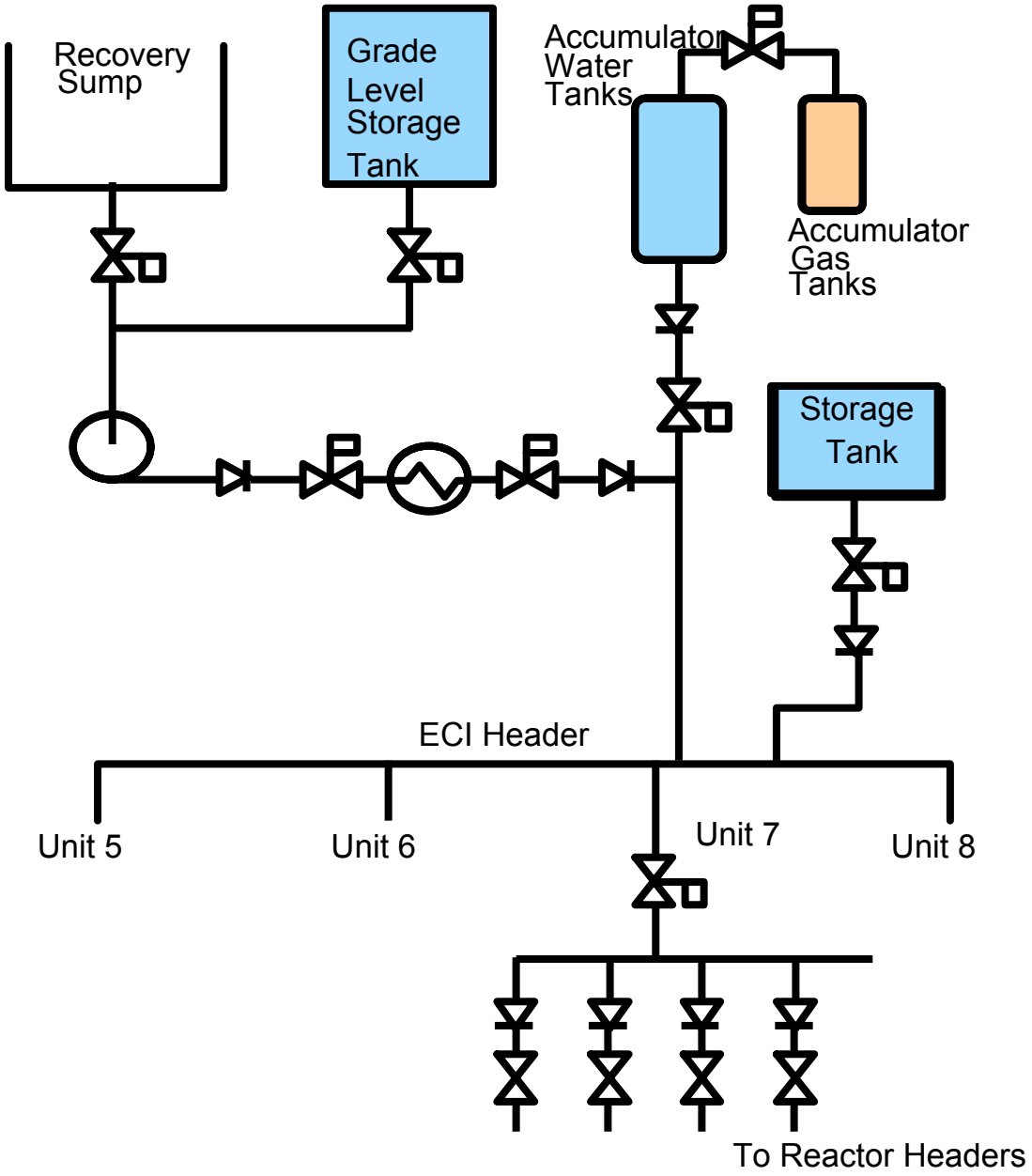
Simplified ECI



LOCA

- Large
  - HTS voids rapidly
  - Fuel heats until ECI refills HTS
  - Ultimately recovery will cool fuel
- Small
  - Fuel cooled mostly by normal HTS path
  - Crash cool-down cools HTS
  - Recovery may be used

Bruce



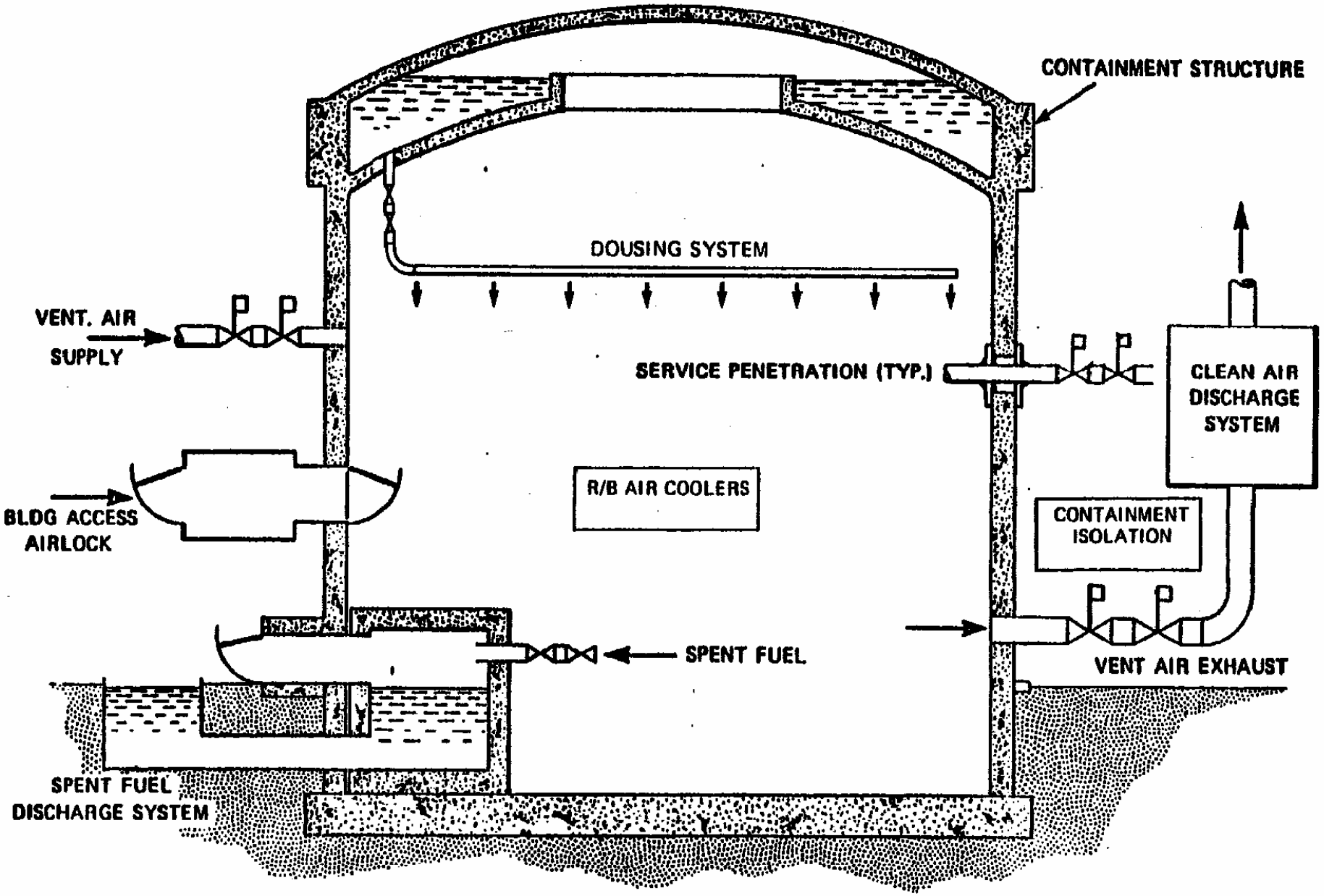
Three phases of injection

- **High pressure**
- **Low pressure**
- **Recovery**

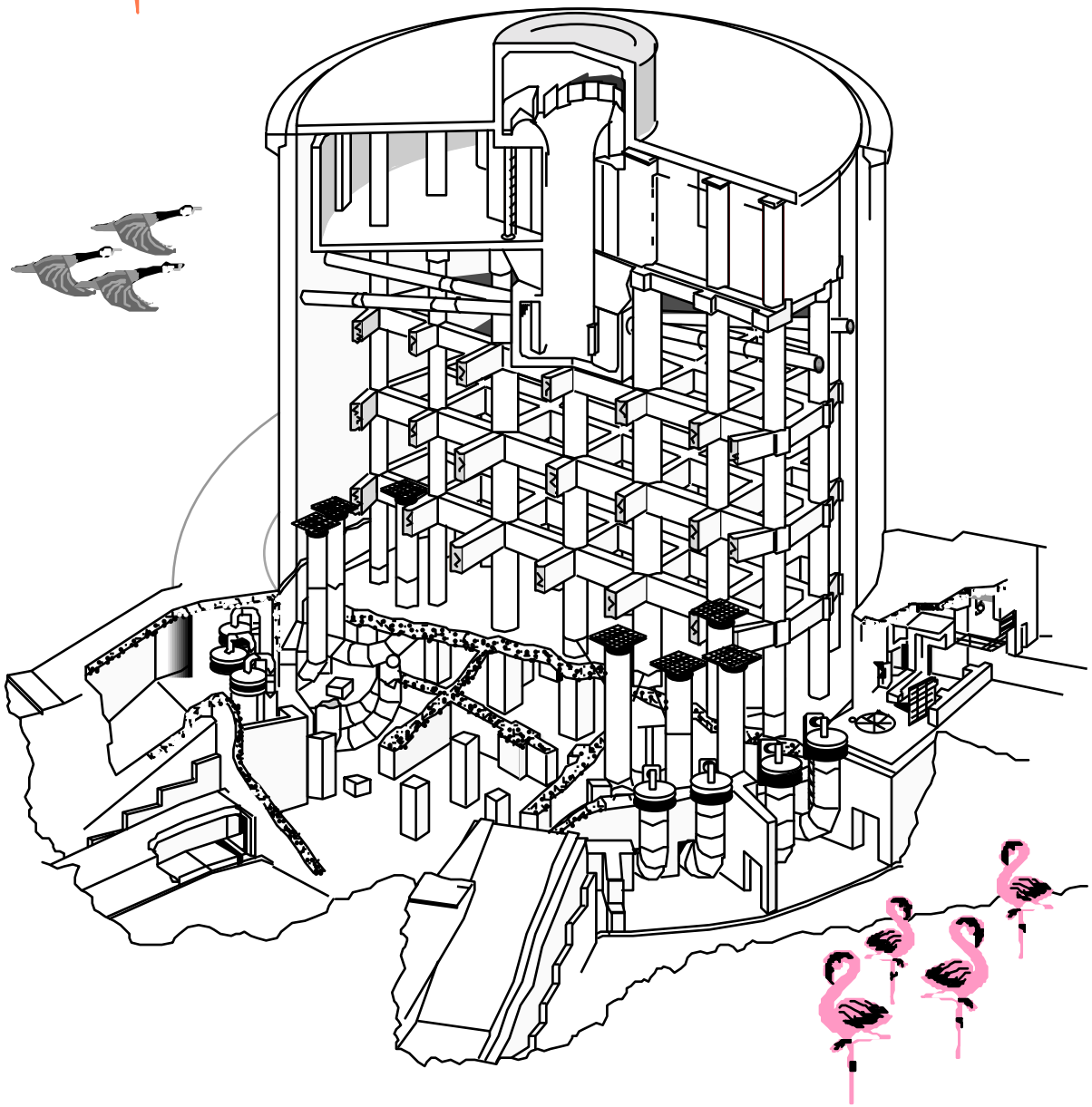
Containment

- Purpose
  - Protective envelope that contains radioactive material released from the heat transport system
  - Minimize size and duration of an overpressure in containment following a LOCA
  - Maintain containment sub-atmospheric following a LOCA

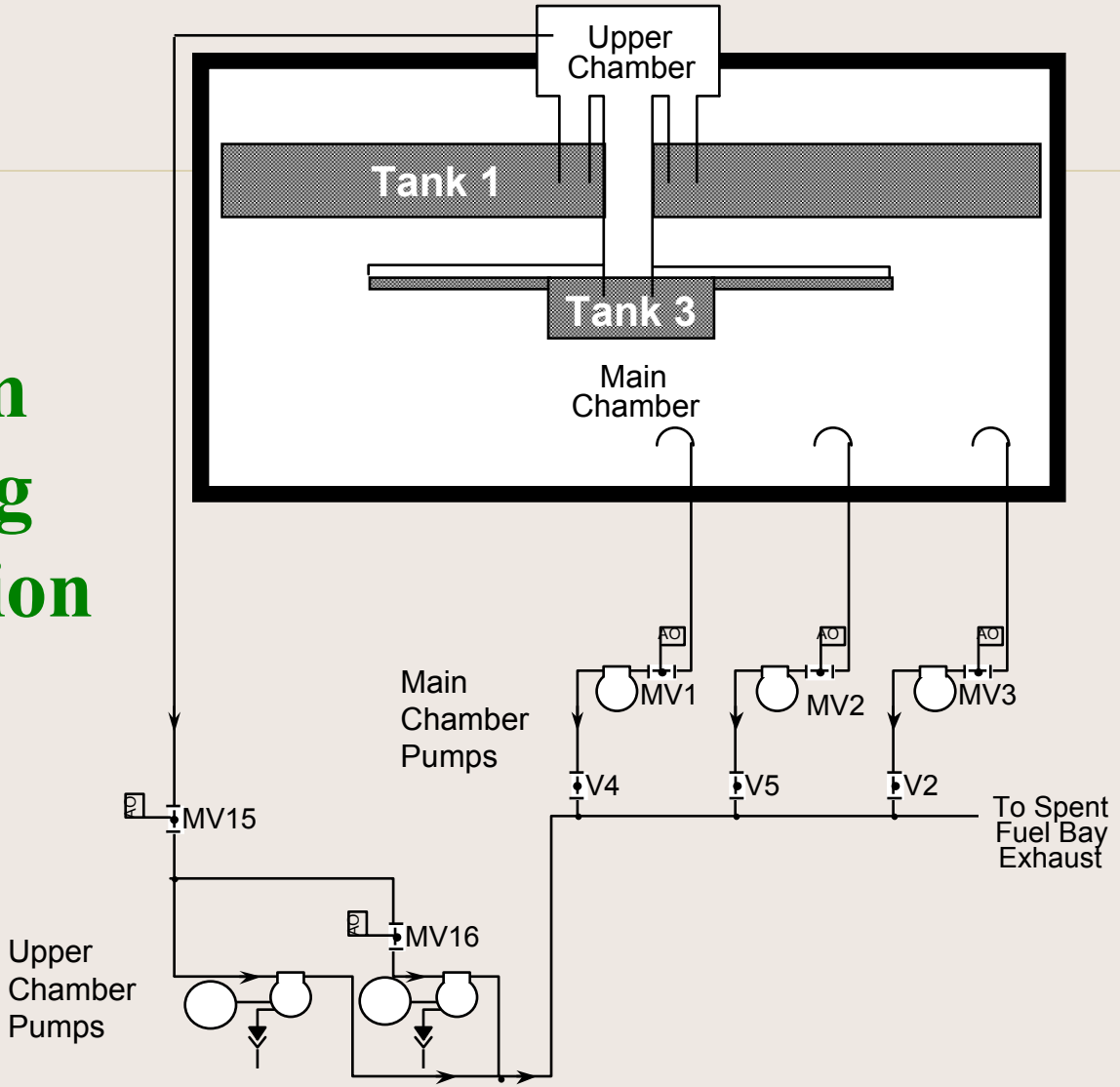
Pressure Suppression Containment



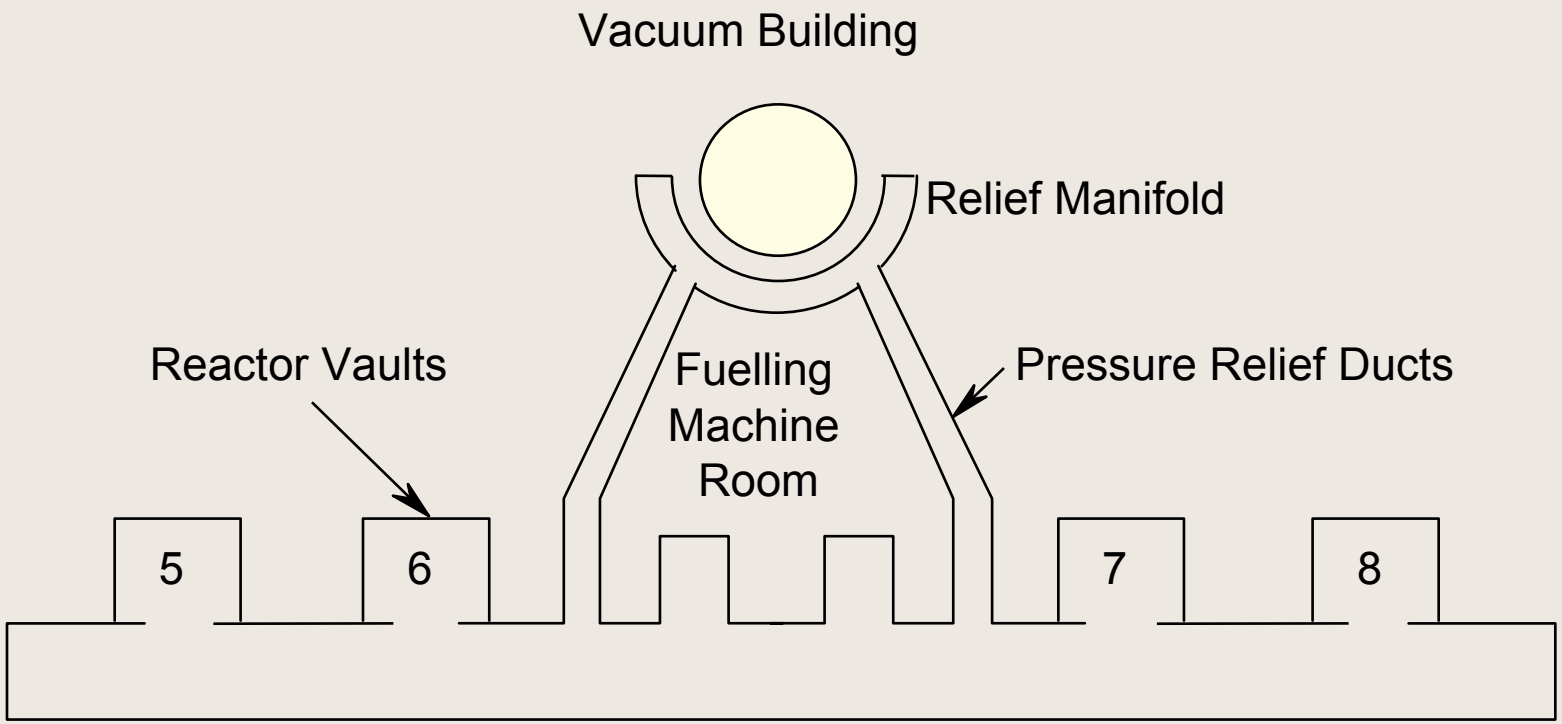
Vacuum Building



Vacuum Building Operation



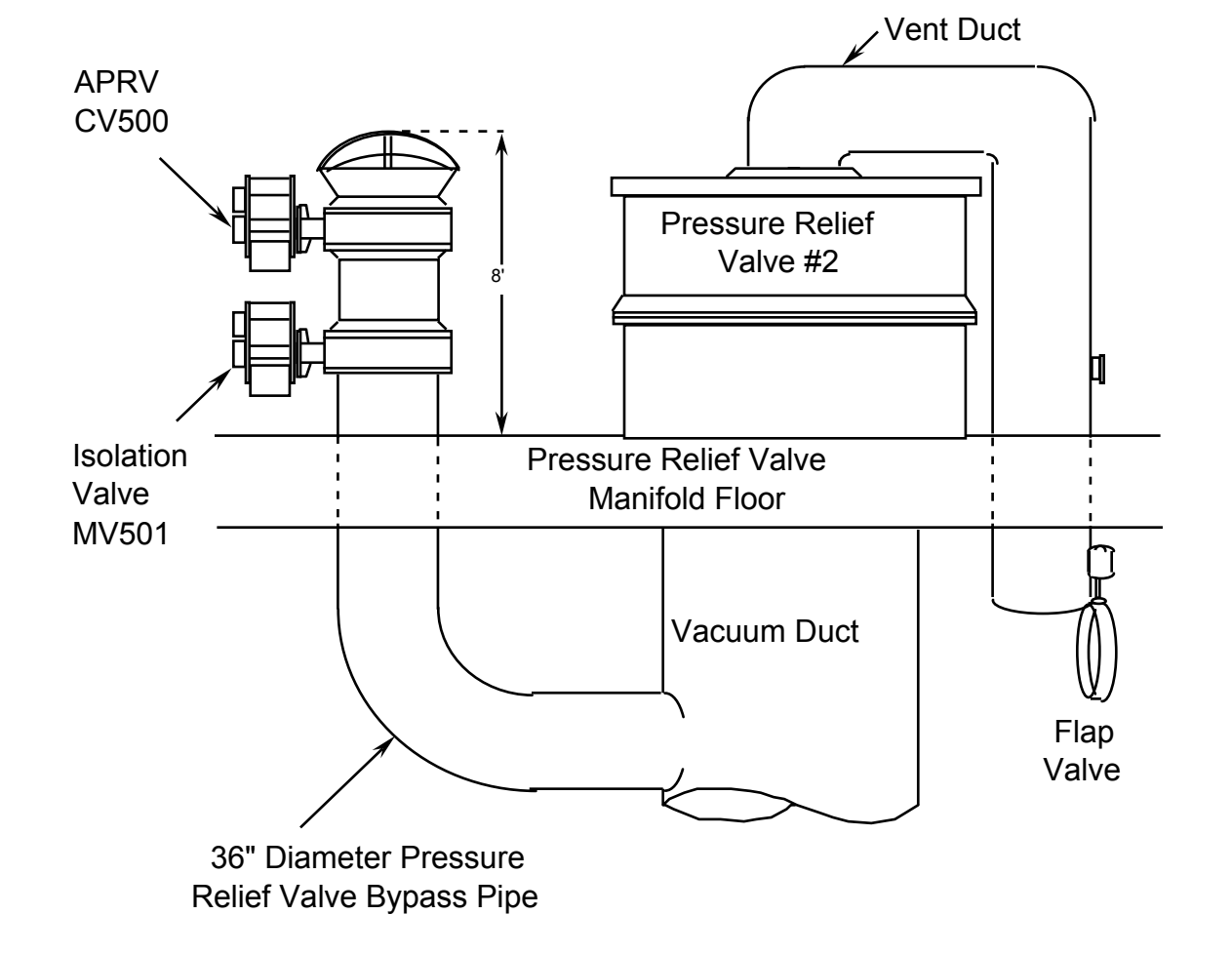
Containment Envelope



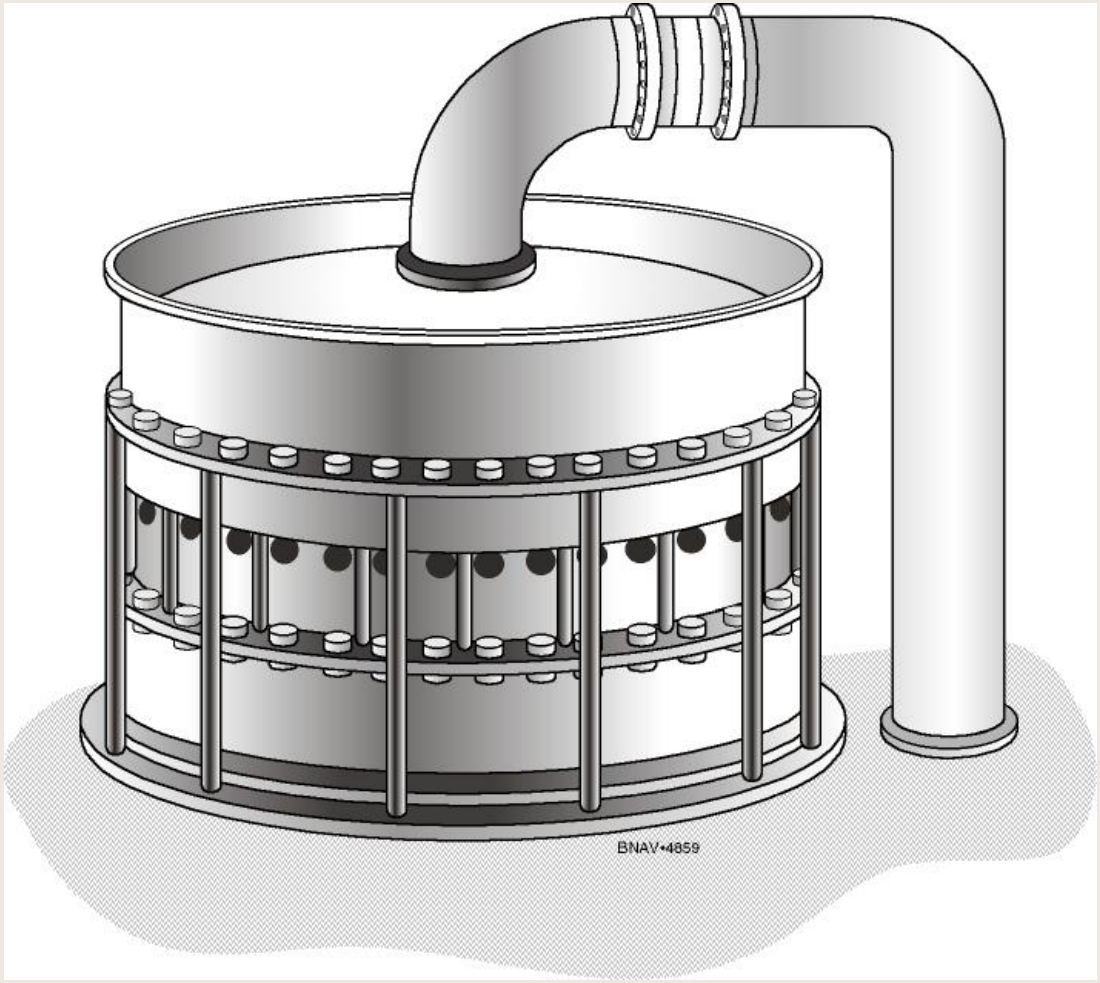
Air Locks and Transfer Chambers

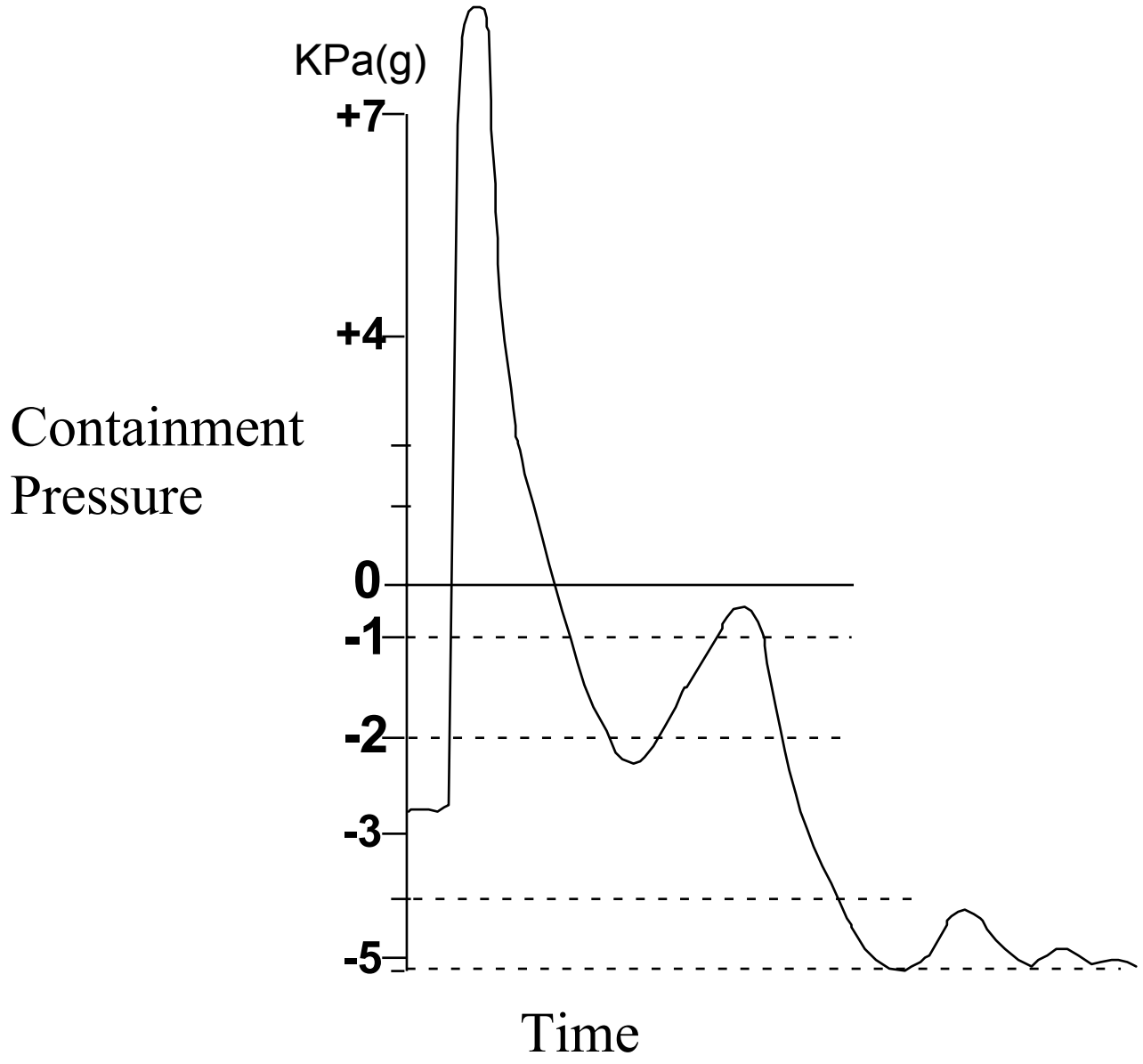
- Allow access and egress from containment
- 2 doors one of which must be properly closed at all times
- Correct procedure must be followed when operating the doors

PRV and APRV


Vent Duct
APRV
CV500
8'
Pressure Relief
Valve #2
Isolation
Valve
MV501
Pressure Relief Valve
Manifold Floor
Vacuum Duct
Flap
Valve
36" Diameter Pressure
Relief Valve Bypass Pipe

Pressure Relief Valves




KPa(g)
+7
+4
0
-1
-2
-3
-5
Containment Pressure
Time

Vault Cooling

- Normally used to maintain the vault temperature less than 40°C
- Sufficient capacity to condense steam from small LOCAs

EFADS & PARMS

- Post accident mitigation systems
- Emergency Filter Air Discharge System
  - De-misters
  - HEPA filters
  - Charcoal filters
  - Fans
- Post Accident Radiation Monitoring System
  - Measures what we release after and accident

Emergency water system EWS

- Not the same as emergency water storage system
  - EWST is the tank in the top of the vacuum building
- EWS
  - Purpose: a redundant source of cooling water for decay heat removal in the event of a loss of the normal systems
  - 3 pumps in Emergency Water & Power Supply Building
  - Suction from the CCW discharge channel