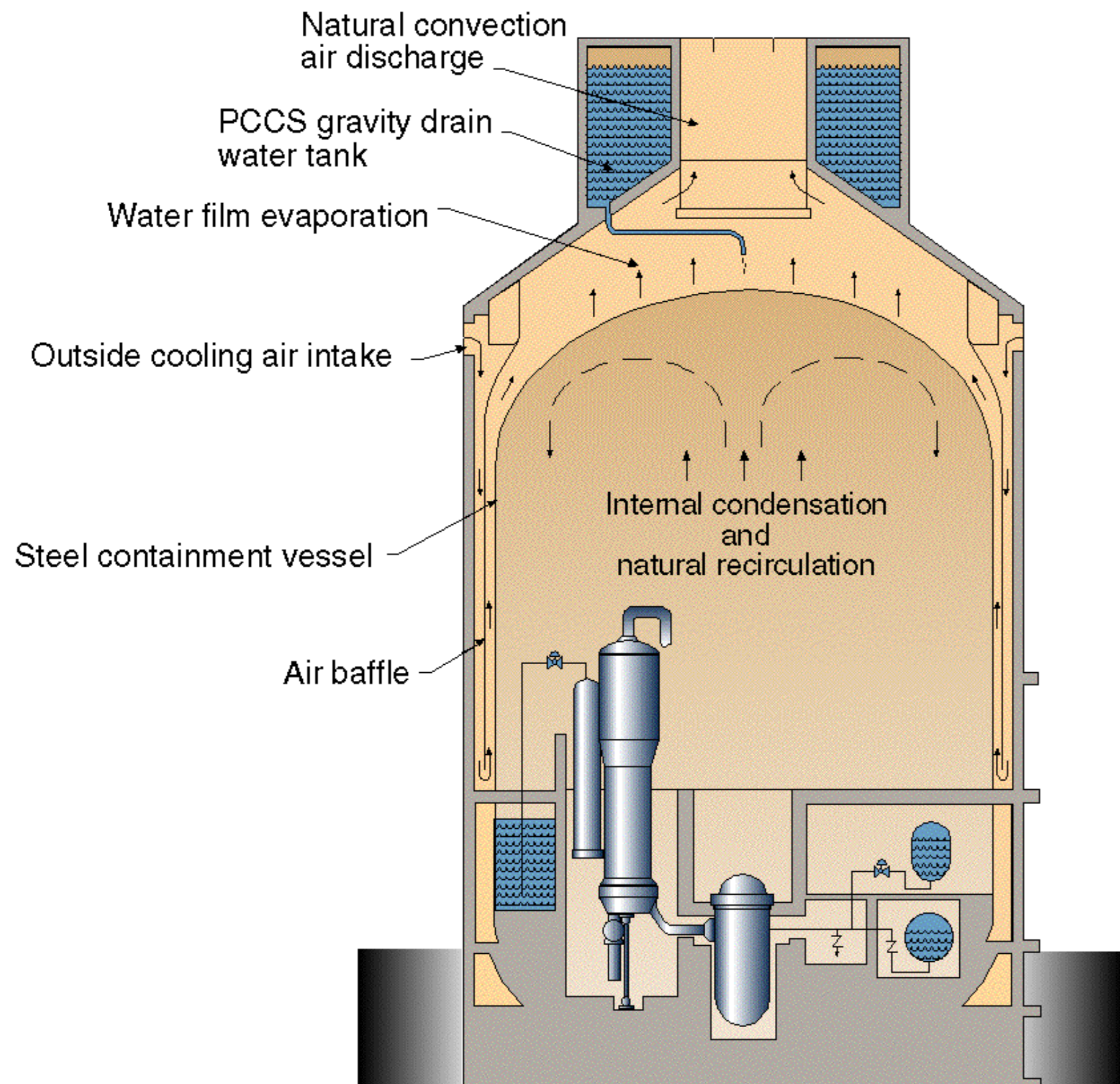


# AP1000™ Nuclear Power Plant - Passive Safety System

## Actuation using Explosively Opening “Squib Valves”

### Passive Containment Cooling System

The ultimate heat sink of the AP1000™ safety systems is the environment. Steam is condensed at the containment vessel wall and heat is removed to the atmosphere via natural convection.

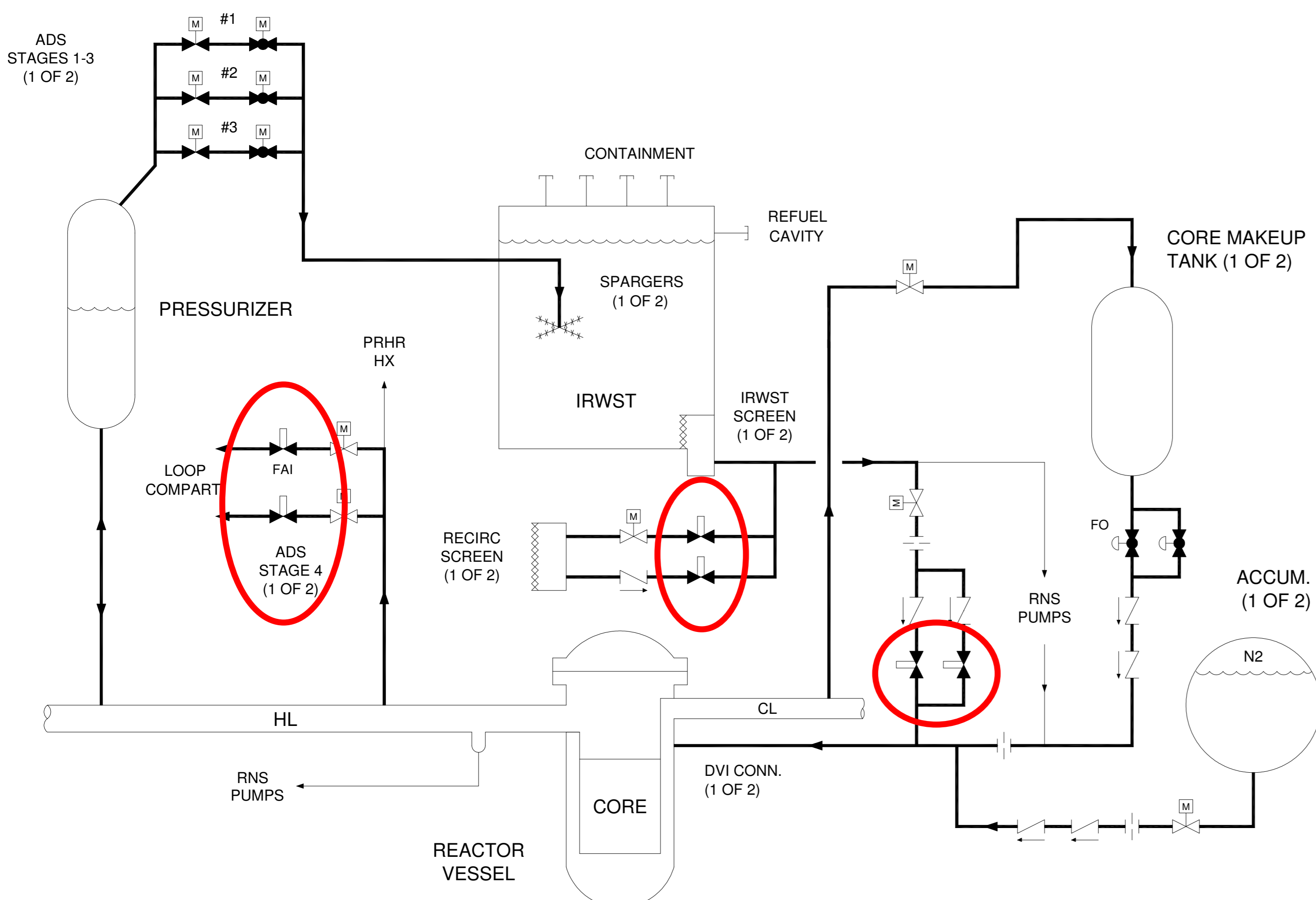


Containment Cooling System of AP1000™

### Squib Valves in Safety Systems

Safety injection from passive low pressure systems can only be provided after depressurization of the primary circuit.

The Automatic Depressurization System (ADS) releases the pressure from the reactor coolant system using motor operated valves and Squib Valves, which open on actuation of an explosive charge. Safety injection from the In-containment Refueling Water Storage Tank and Sump Recirculation are activated by Squib Valves.



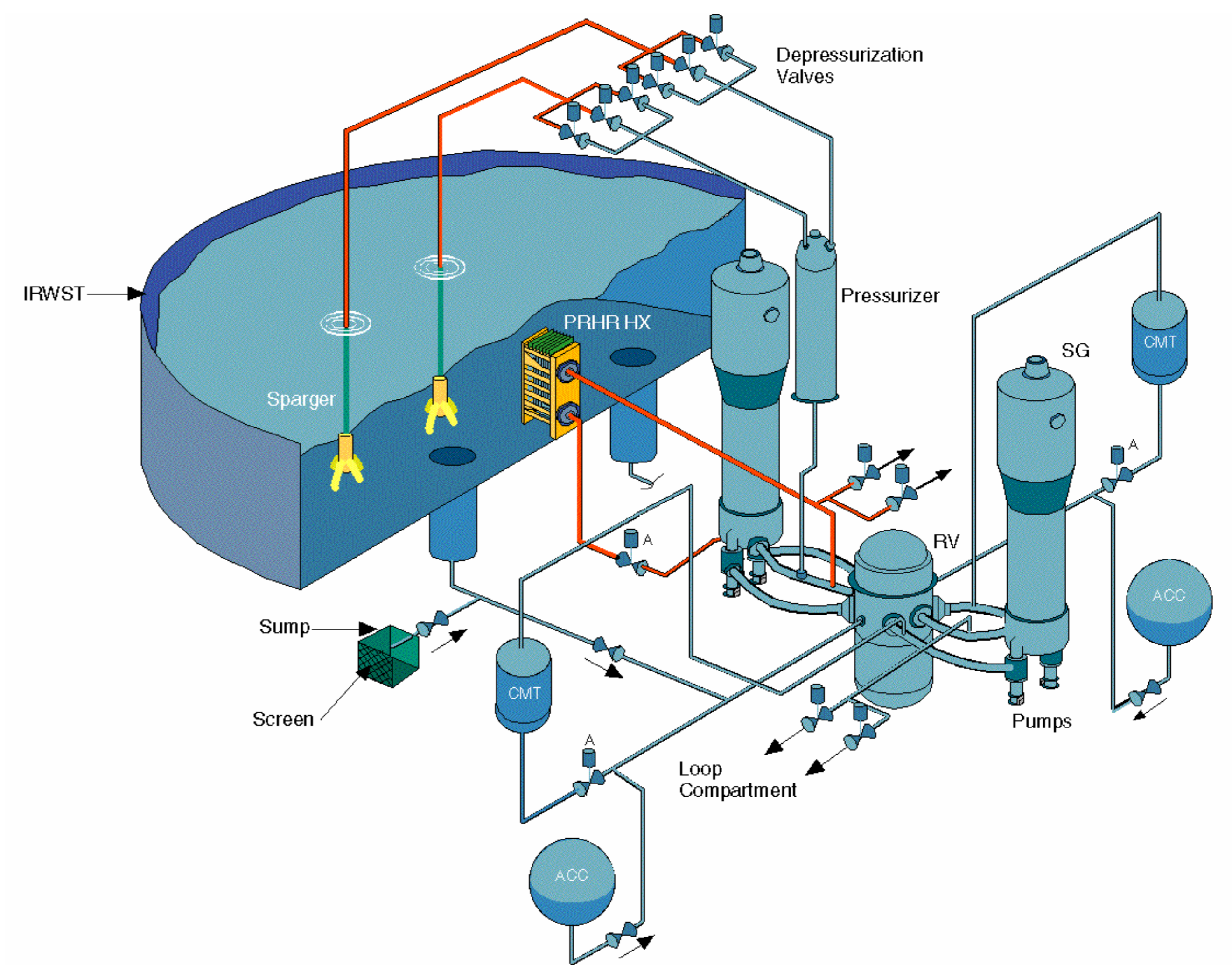
Passive Safety Injection with Squib Valves (marked by red circles)

### Passive Core Cooling System

The Passive Core Cooling System (PXS) of the AP1000™ plant performs:

- Emergency core decay heat removal
- Reactor coolant system emergency makeup and boration
- Containment pH control
- **Safety injection**

All safety functions of the AP1000™ rely on natural forces like natural circulation, gravity, convection, evaporation, condensation and compressed gas.



Passive Core Cooling System of AP1000™

### Design Features of Squib Valves

- Actuation provided by three independent igniters.
- Simple design
- Few ways to fail
- Failure probability (failure to operate) ~ 5.8E-04 per demand
- Redundant configuration (four valves in ADS)
- Provide diversity to motor operated valves
- Leak-before-break criteria fulfilled

