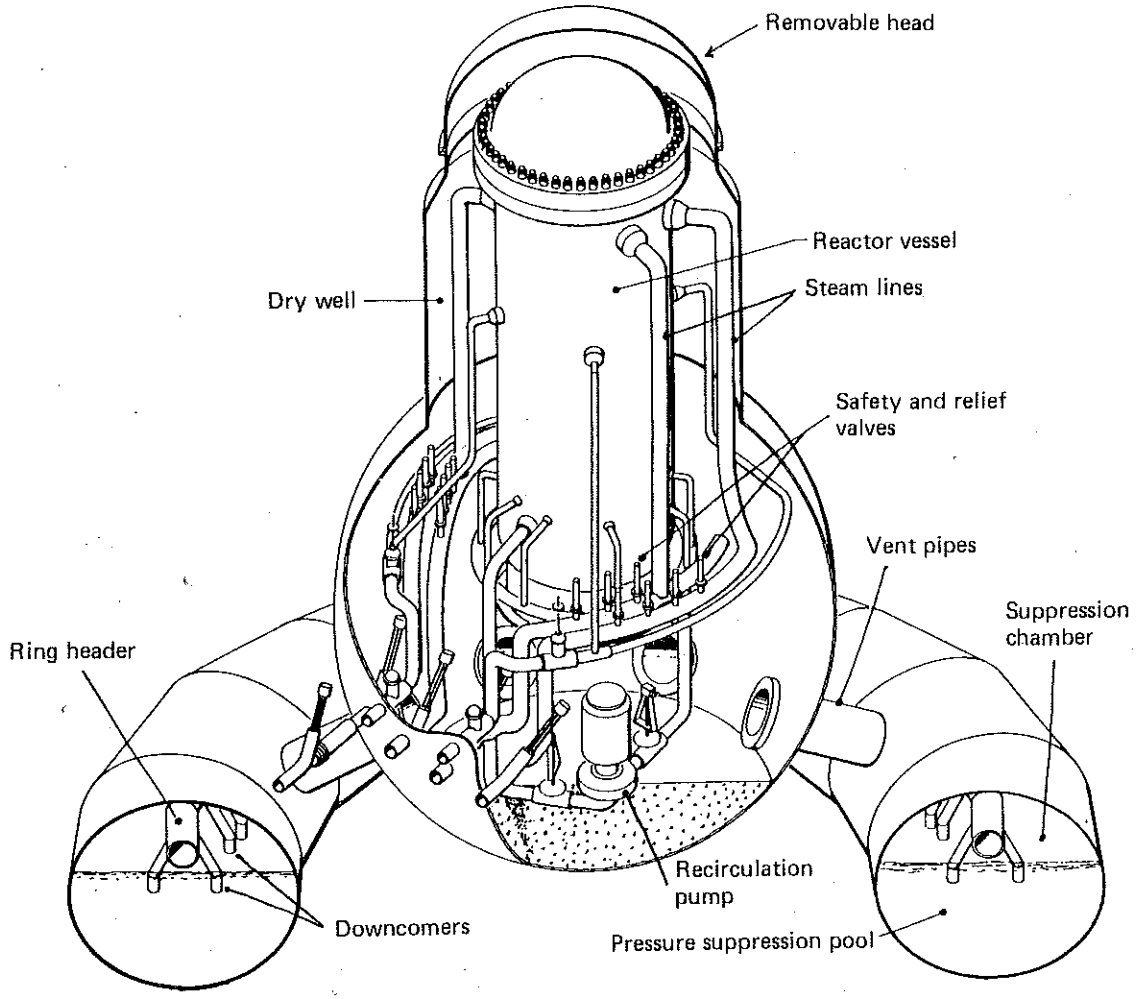

Figure 9.56. BWR primary containment system; Mark I type. This type of containment was installed in older versions of the BWR design. It is also known as the inverted light bulb. The vessel is enclosed inside a drywell which communicates with a large body of water contained in a large torus beneath the light bulb. The torus is called the pressure suppression pool. The entire structure is enclosed in the reactor building. (From WASH-1250.)

and lighter, with a design pressure of 10–15 psig. The ice contains boron poison (needed to ensure a subcritical core when the water is used for core cooling) and caustic (sodium hydroxide) for the same reasons as in the containment spray designs.

BWR Containment

The development of the BWR containment followed a somewhat different path. The first BWR plants used a steel containment in the shape of an inverted lightbulb, completely surrounding the reactor vessel pressure relief valves on the main steam lines and the recirculation system, as shown in Figure 9.56. The light bulb shell, called the drywell, is connected through a number of radially extending vent pipes to a large torus (called the wetwell), somewhat less than half filled with water. This large quantity of water is used as a heat sink to condense steam that might escape from the primary system through the opening of the relief or safety valves, or from a break in the piping. The drywell is actually connected to a ring header which runs at the center of the torus and which is provided with a large number of downcomer open-ended tubes. Should steam be released in the drywell, the pressure there would rise and the steam/air mixture would be forced through the vent pipes to the ring header and downward into the pool of water where it would mix and be condensed. The top of the light bulb forms a head which is removable during refueling. The steel light bulb is surrounded by concrete, which provides a radiation shield. The drywell and wetwell along with many other compartments are part of the reactor building as shown in Figure 9.57. The outer concrete wall of the rectangular structure provides a secondary containment. It is designed to have low leakage, and is provided with sealed joints and double door entries. The BWR containment is provided with a normal and a standby ventilation system. Under accident conditions, the normal system would be shut down and the two parallel standby systems would take over to maintain a

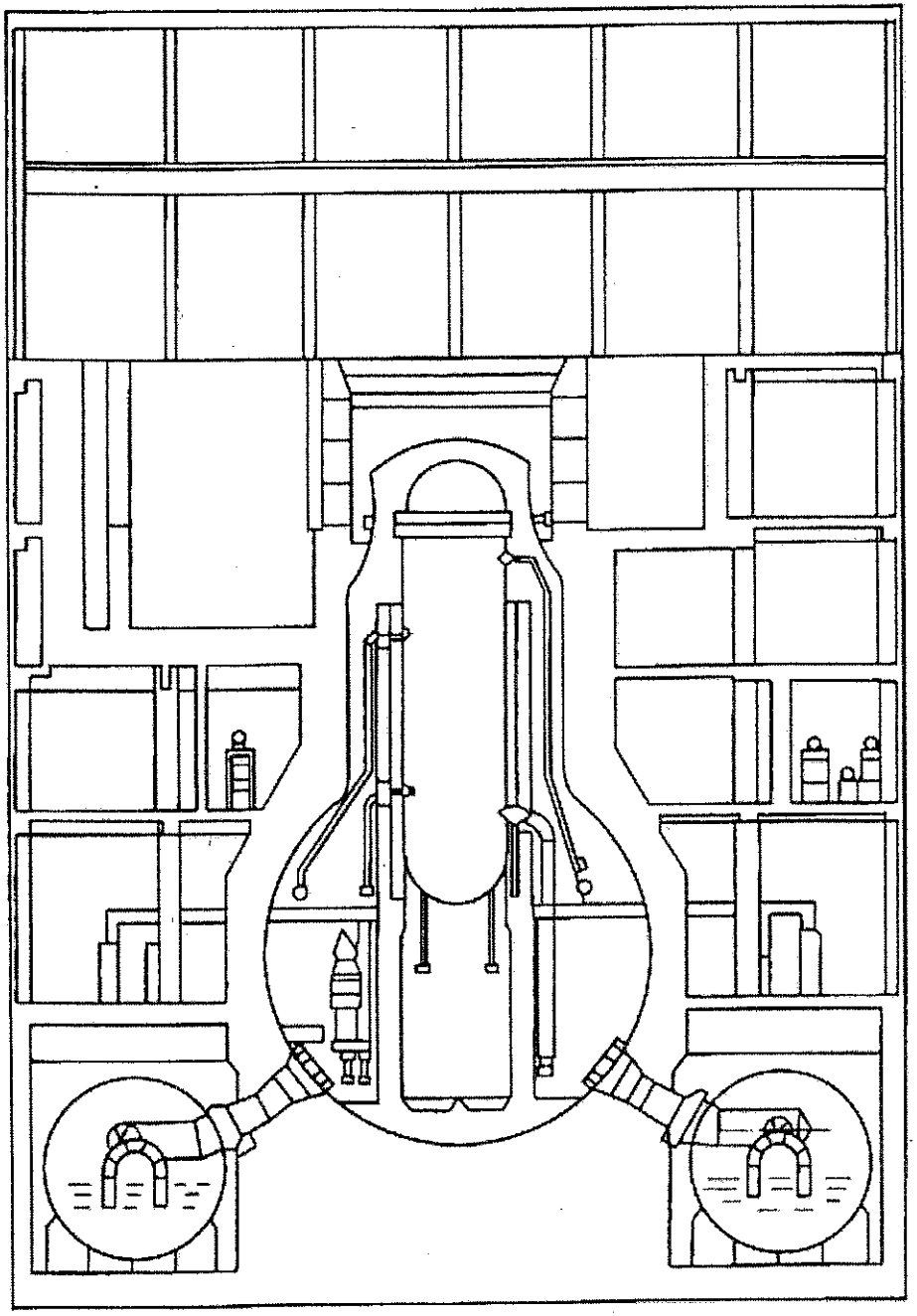

図1　Mark－I型格納容器

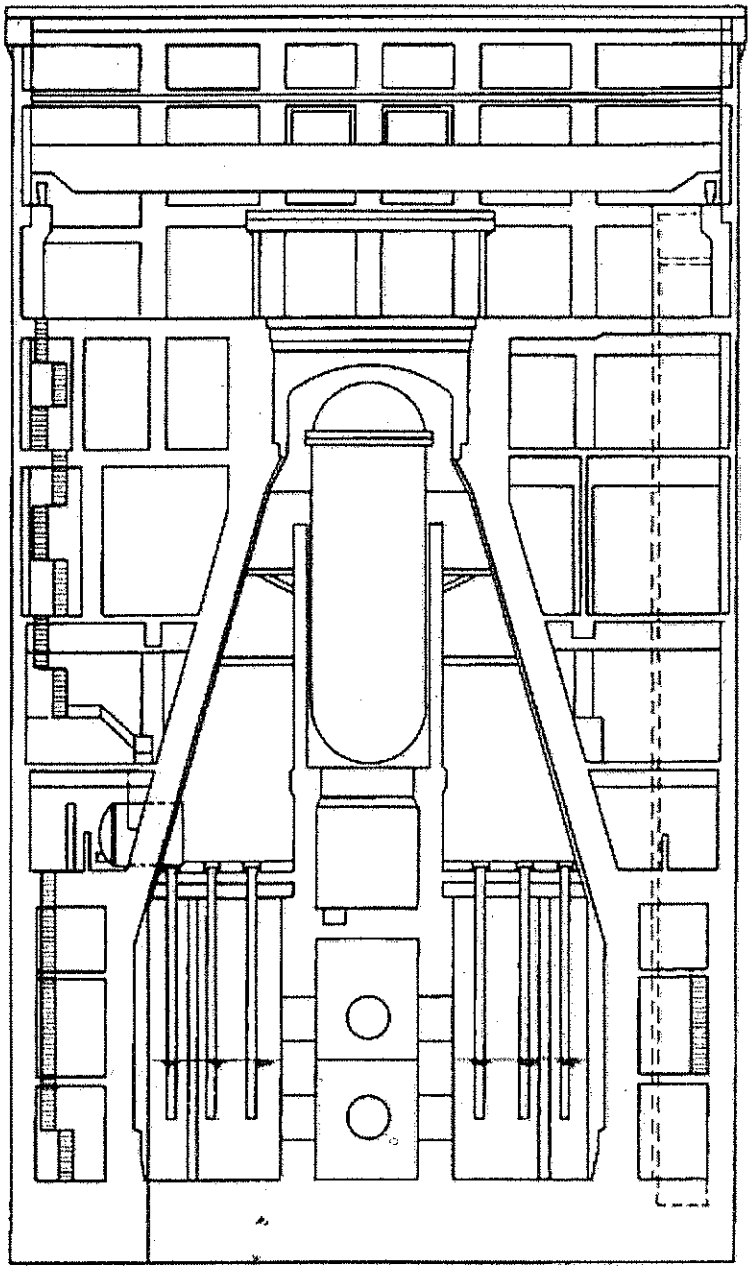

図2　Mark－II型格納容器