

Pressurized Water Reactor (PWR)

In a Pressurized Water Reactor (PWR), like those at Beaver Valley and Davis-Besse, the coolant water that is heated by the uranium fuel does not turn to steam, because it is pressurized, but carries the heat to a separate “loop” of water that becomes the steam.

Purified water inside the reactor vessel is heated by the nuclear fuel, but is kept under pressure to prevent it from boiling. The heated water is circulated inside the first, or primary, loop. The heat from the water is transferred to a separate, secondary loop of water that becomes steam. The heat transfer occurs in a steam generator, where the pipes of the two closed loops are located side-by-side.

Because the water that circulates in the primary loop runs through the reactor vessel, it becomes radioactive. Water that becomes steam in the secondary loop, however, is not radioactive because the two loops do not mix. The steam in the secondary loop is cooled and condensed back into water by cooling water in a separate third loop of piping, which then flows to the cooling tower.

