
PROBLEM 6-10N QUESTION

Replacement Of A Steam Generator In A PWR With A Flash Tank

Consider a "direct" cycle plant with a pressurized water-cooled reactor. This proposed design consists of using most of the typical PWR plant components except the steam generator. In place of the steam generator, a large "flash tank" is incorporated with the capability to take the primary coolant and reduce the pressure to the typical secondary side pressure. The resulting steam is separated, dried, and taken to the balance of plant, the feedwater from the condenser return to this flash tank. The primary water from the flash tank is repressurized and circulated back to the core.

Make a schematic drawing of this direct cycle plant, and discuss the benefits and/or problems with this design. Also, compare a typical PWR plant design with this direct cycle design with respect to:

- Plant thermal efficiencies (perform a numerical comparison and explain your results), and
- Nuclear plant safety (perform a qualitative comparison).