

What Is a Steam Generator, and How Does It Work?

Steam generators are large heat exchangers where heat is transferred from one water loop to another, converting the water in the second loop into steam that is then used to drive turbines and electric generators. Southern California Edison's San Onofre Nuclear Generating Station (SONGS) has two steam generators for each reactor, which are the largest components of the station.

What is a steam generator?

A steam generator is the piece of equipment where steam is created to drive the plant's large turbines to create electricity. There are two steam generators in each operating unit at SONGS. Each steam generator is 65 feet in height, 22 feet in width (around the upper portion known as the steam dome), and weigh more than 600 tons.

How do they work?

Steam generators act much like the radiator in a car. They take water heated by the nuclear reactor and transfer the heat through 9,727 tubes (per steam generator) to a second source of water to create steam.

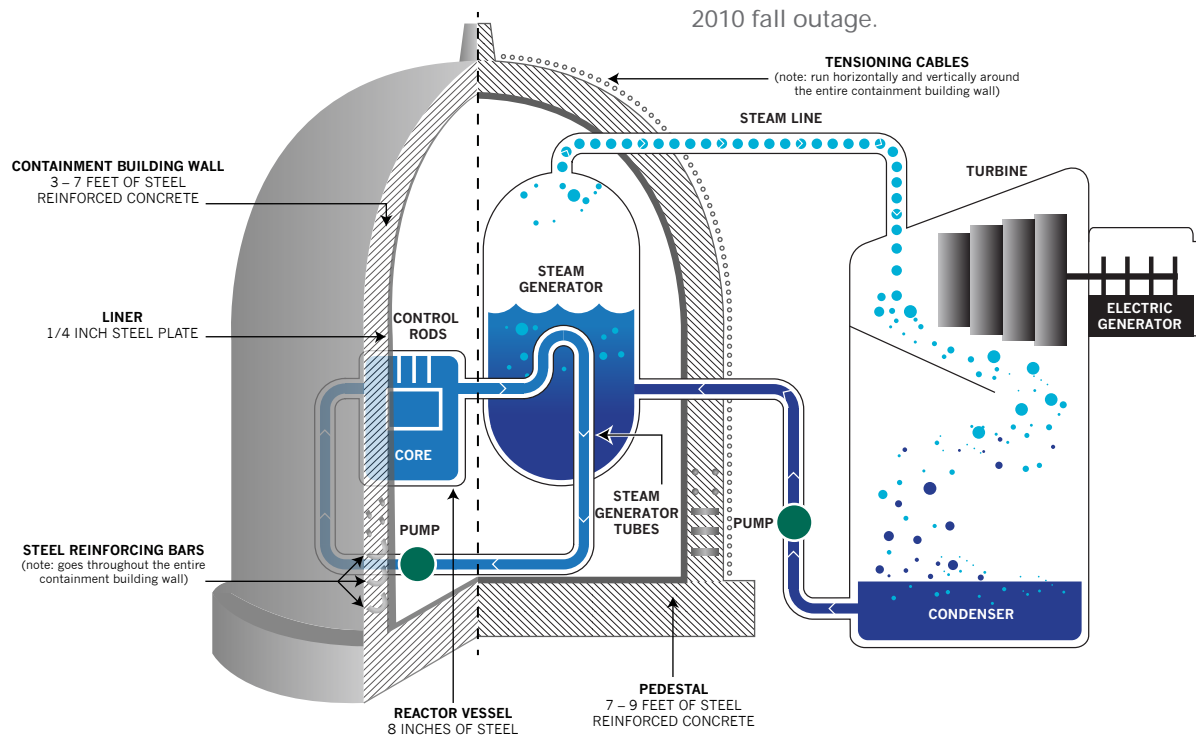
The high-pressure steam then enters turbines, where propeller-like blades spin to create electricity.

Each of these water systems is a closed loop. (See graphic below.) Both the reactor vessel and steam generators, along with the fuel rods, are housed inside concrete containment domes that are steel reinforced. The turbines and electric generators are part of the non-nuclear part of the plant.

Steam generators provide an additional safety barrier because they allow for the indirect removal of heat from the first closed loop to the second, and keep the radioactive and non-radioactive sides separate.

When were the steam generators at SONGS last replaced?

The Unit 2 steam generators were replaced during the refueling and maintenance outage in the fall of 2009. The Unit 3 generators were replaced during a 2010 fall outage.



For more information, please visit www.songscommunity.com.

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