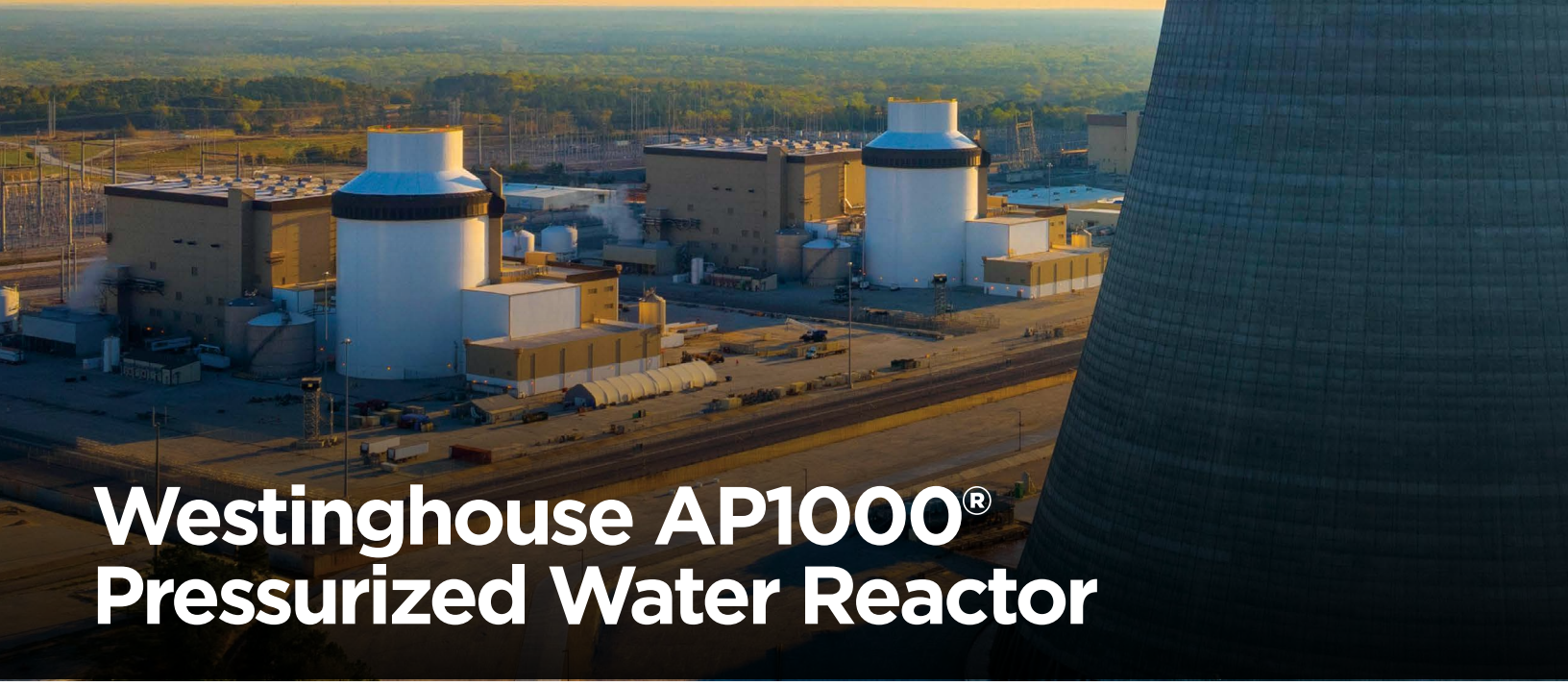


Westinghouse AP1000® Pressurized Water Reactor

Introduction

The Westinghouse AP1000® Pressurized Water Reactor (PWR) sets a new industry standard for nuclear power plants as the most advanced, proven Generation III+ technology available. Featuring innovative passive safety systems, the AP1000 reactor yields considerable capital savings and lower maintenance costs. AP1000 reactors are delivering safe, efficient, economical nuclear power solutions across the world.

The AP1000 reactor is a two-loop PWR, ideal for new baseload generation. The AP1000 delivers a gross power rating of 3,415 megawatts thermal (MWth) and a nominal net electrical output of approximately 1,200-megawatt electric (MWe).

Fast Facts:

- Fleet of 6 AP1000 reactors in commercial operation, with an additional 12 units under construction, 14 units contracted and 6 units technology selected
- First AP1000 operating units are Sanmen units 1 and 2 (China, 2018) and Haiyan units 1 and 2 (China, 2018/19), breaking records for first cycle and first refuelling outage performances.
- Vogtle units 3 and 4 in Georgia, USA (2023/24) were the first new commercial nuclear reactors to come online in the USA in 30 years.

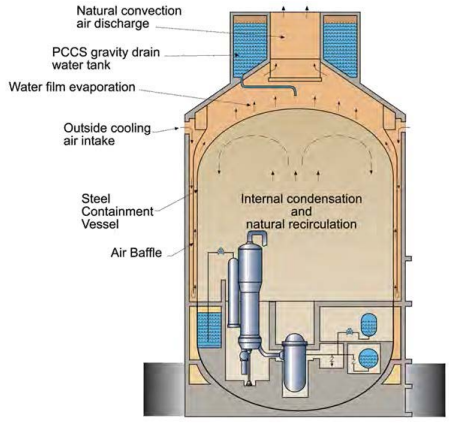
The AP1000 reactor has many unique attributes and has demonstrated exceptional operational performance.

- Only operating Gen III+ reactor relying on fully passive safety systems to mitigate design events
- Smallest footprint per MWe of any nuclear reactor
- 72+ hour coping after station blackout
- Reduced start-up test programs from 10 to 5 months or less (including 1 month at full power)
- Chemical-free load-following capability
- Load-follow mode ramp rates of +/- 5% per minute down to 15% of full power
- Set industry and national power records for first and second operating cycles
- Set industry and national performance records for first-cycle refueling outages (28 days)
- Set industry and national performance records for second-cycle refueling outages (19 days)

Advanced Passive Technology

A unique feature of the AP1000 plant is its use of natural forces—such as natural circulation, gravity and convection—to operate in the highly unlikely event of an accident, rather than having to rely on operator actions and AC power. Even with no operator actions and a complete loss of all on-site and off-site AC power (Station Blackout), as was the case in the Fukushima disaster, the AP1000 plant will safely shut down and remain cool.

The AP1000 plant has a 72-hour "Coping Period" following a Station Blackout, meaning that it cools itself down and remains safe for 3 days without any AC power or operator actions required. Following this 72-hour period, additional water supplies and resources on-site can be utilized by the operator to maintain core and containment cooling indefinitely. To illustrate the passive nature of these safety systems, the containment cooling system of the AP1000 plant is shown below:



AP1000 Plant Passive Containment Cooling System

Instead of electrical pumps and back-up diesel generators seen in older, active plants to power containment cooling sprays, the AP1000 plant uses all natural forces. Because the containment cooling water tank is located above containment in the AP1000 plant, gravity provides the only necessary force to deploy the cooling water. Together with condensation and natural circulation, containment cooling is provided without the need for any AC power.

Construction Method

The AP1000 plant has been designed to make the best use of modern, modular-construction techniques.

Modularization allows many more construction activities to proceed in parallel and improves quality and efficiency by increasing factory-based manufacturing and assembly.

Lessons learned from the construction of 6 operating AP1000 PWRs have been systematically captured and will promote delivery certainty on existing builds and all future projects.

Efficient Operation

The operational parameters of these units have exceeded design values for the AP1000 plant and have been recognized as top-performing plants worldwide.

The AP1000 nuclear power plant has been proven capable of providing safe, clean, reliable, economical electricity and stands ready for further successful global deployment.

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