Oconee Nuclear Station



Quick Facts

Groundbreaking: 1967

Commercial operation:
Unit 1 - 1973
Units 2 & 3 - 1974

Number of units: 3

Reactor type: Pressurized water reactor (PWR)

Station capacity: 2,554 megawatts, enough to power more than 1.9 million homes. According to the Nuclear Energy Institute (NEI), 1 MW of electricity produced by nuclear energy would produce enough electricity to power more than 750 homes.

Employees: More than 800 with additional contract workers during refueling outages

Nuclear fleet taxes: More than $264 million in 2023
(property and payroll taxes)

General Information

Oconee Nuclear Station is located on Lake Keowee in Seneca, S.C., eight miles north of Clemson.

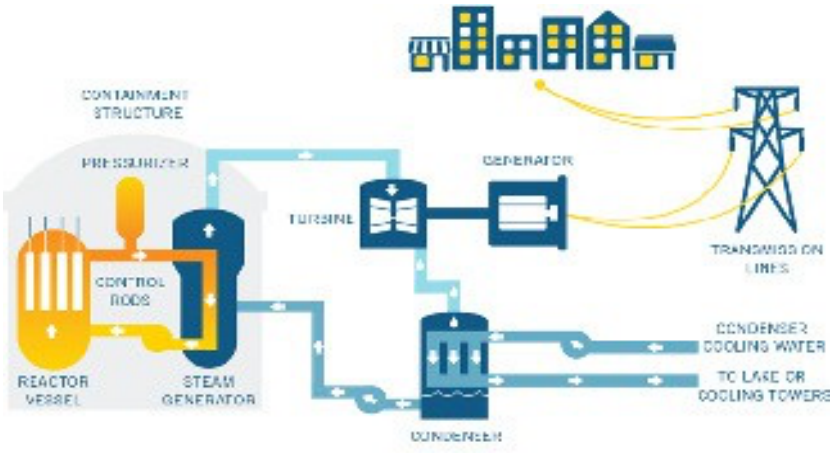
Oconee Nuclear Station personnel remain committed to operating the units safely and reliably and being a good neighbor.

Since it began operating, Oconee has accumulated many achievements:

- First accredited operator training program in the country.
- First nuclear station to generate 100 million kilowatt-hours of electricity.
- Achieved the distinction of being the second nuclear station in the U.S. to have its license renewed by the Nuclear Regulatory Commission (NRC) for an additional 20 years (the NRC initially licensed all U.S. reactors for 40 years).
- First nuclear station to achieve 3 million safe work hours.

World of Energy

Take a journey through a self-guided Story of Energy and view educational exhibits throughout the World of Energy, Oconee Nuclear Station's education center. All activities are free and open to the public. To inquire about the education center's current schedule, call 800-777-1004 or visit Duke-Energy.com/WorldOfEnergy.



Nuclear Fundamentals

Oconee Nuclear Station uses uranium as its fuel. Each uranium pellet, less than one inch long, is enclosed in metal rods 12 feet tall. There are approximately 230 pellets per rod, 208 fuel rods in a fuel assembly and 177 fuel bundles in each of the three reactor cores.

In a process called nuclear fission, a source emitting free neutrons is inserted into the uranium fuel core. The uranium fuel absorbs these free neutrons, becomes less stable and releases additional free neutrons. This movement of free neutrons creates heat used to generate electricity.

Here is how it works:

- Water circulates through the nuclear core reaching 600 degrees F by removing heat from the fission process. (Neutron-absorbing control rods are lowered into the fuel core to slow or stop this process.)
- This heated water travels to large steam generators or “heat exchangers.”
- This 600-degree F water flows through thousands of tubes inside the steam generators while cooler water circulates on the outside of these tubes and becomes steam.
- The steam flows to a turbine and spins large blades attached to a shaft and generator, producing electricity.
- This steam then flows across a set of tubes containing cool lake water that condenses the steam for reuse in the steam generators.
- This lake water flows through a cooling system before discharging back into Lake Keowee.

Conserving Resources

Because nuclear power plants do not burn fuel, they produce no greenhouse gas emissions while generating electricity. More than half of America’s carbon-free electricity comes from nuclear energy.

Nuclear Safety

- Nuclear stations have multiple, robust safety barriers in place.
- Each containment building housing the nuclear fuel core is made of concrete 3.9 feet thick with a 7/8-inch-thick steel liner.
- The reactor vessels containing the nuclear fuel weigh 660 tons and have steel walls more than 8 inches thick.
- Each unit has redundant safety systems, such as multiple pumps and backup electrical supply systems.
- Nuclear stations are built to withstand a variety of external forces, including hurricanes, tornadoes, fires, floods and earthquakes.
- Duke Energy works closely with the Nuclear Regulatory Commission (NRC), various federal agencies, state agencies and local governments to maintain emergency response plans that ensure close coordination with these groups.

Nuclear Security

- Nuclear stations have numerous security features, seen and unseen.
- Armed, highly trained security professionals provide 24-hour protection.
- Physical barriers and electronic surveillance systems surround Oconee.
- Access is tightly controlled, and nuclear employees must pass strict background, psychological and drug/alcohol screenings.

Radiation

- Radiation is a natural part of our environment.
- We receive radiation from the sun, minerals in the earth, food, etc.
- The amount of annual radiation at a nuclear plant site boundary is less than a passenger receives during a round-trip, coast-to-coast flight.