

# Oconee Nuclear Station



## Oconee 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\*

**Employs:** more than 600 people with additional contingent workers during refueling outages

**Nuclear fleet taxes:** More than \$240.6 million in 2020 (property and payroll taxes)

\*According to the Nuclear Energy Institute, 1 MW of electricity produced by nuclear energy would supply electricity to power more than 750 homes.

## General Information

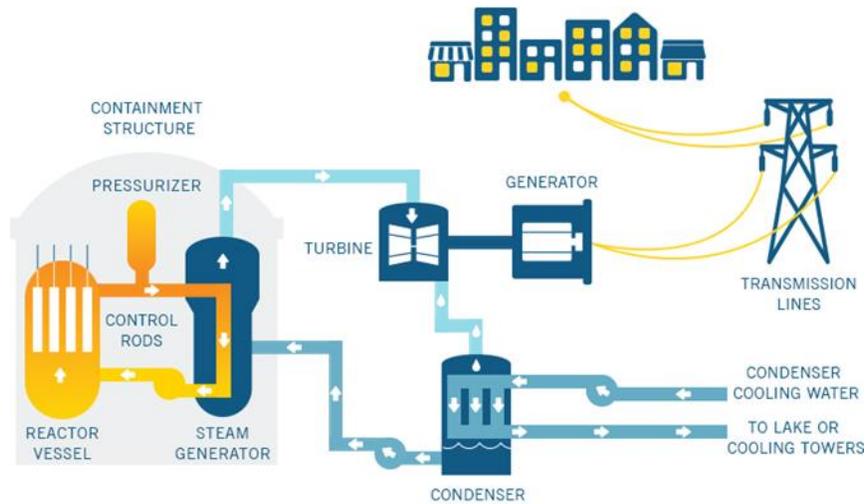
Oconee Nuclear Station is located on Lake Keowee in Seneca, S.C., eight miles north of Clemson.

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 or 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.

## Conserving Resources

Because nuclear power plants do not burn fuel, they produce no greenhouse gas emissions while generating electricity. In fact, more than half of America's carbon-free electricity comes from nuclear energy. In 2020, operation of Oconee Nuclear Station avoided the release of nearly 14.5 million tons of carbon dioxide (if that same generation was produced with coal, oil and natural gas).



## 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 assemblies in each reactor core.

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 that is 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 metal 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.

## World of Energy

The World of Energy is Oconee Nuclear Station’s education center, offering fun experiences for everyone. While it is temporarily closed to the public, we are still offering virtual presentations and events. For more information, visit [duke-energy.com/worldofenergy](http://duke-energy.com/worldofenergy).

## 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 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 airplane flight.