Robinson Nuclear Plant



Quick Facts

Groundbreaking: 1967

Commercial operation: Unit 2 - 1971

Number of units: 1

Reactor type: Pressurized water reactor (PWR)

Station capacity: 759 megawatts, enough to power more than 569,000 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 450 with additional contract workers during refueling outages

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

General Information

Robinson Nuclear Plant is located on Lake Robinson near Hartsville, S.C.

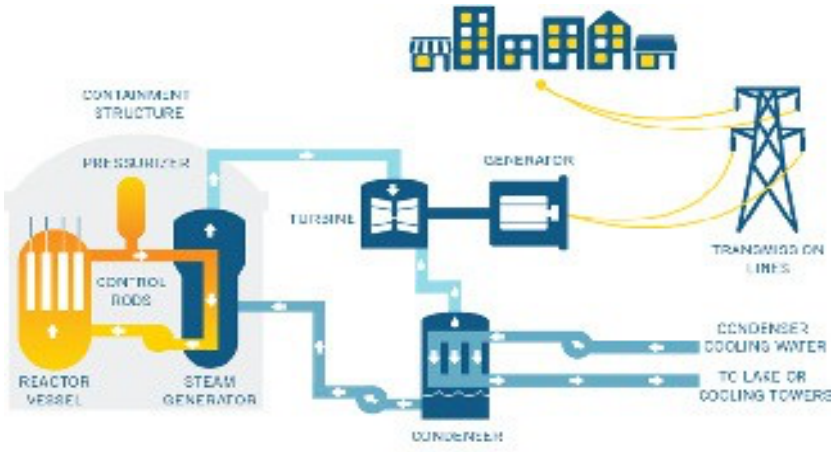
Robinson Nuclear Plant personnel remain committed to operating the unit safely and reliably and being a good neighbor.

Since it began operating, Robinson has accumulated many achievements:

- Awarded industry recognition for innovation.
- Issued a 20-year extension on its license by the Nuclear Regulatory Commission or NRC (all U.S. reactors were initially licensed for 40 years).
- First nuclear plant in the southeast to enter commercial service.

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 2022, operation of Robinson Nuclear Plant avoided the release of nearly 3 million tons of carbon dioxide (if that same generation was produced with coal, oil and natural gas).



Nuclear Fundamentals

Robinson Nuclear Plant uses uranium as its fuel. Each uranium pellet, less than one inch long, is enclosed in metal rods 12 feet tall. There are 157 assemblies, each comprised of 204 rods containing a total of 67 metric tons of uranium.

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 tubes containing cool lake water that condenses the steam for reuse in the steam generators.
- This lake water flows down a cooling system before discharging back into Lake Robinson.

Nuclear Safety

- Nuclear stations have multiple, robust safety barriers in place.
- The containment building housing the nuclear fuel core is made of concrete 3.5 feet thick with a 3/8-inch-thick steel liner.
- The reactor vessel containing the nuclear fuel is 42 feet tall, 13 feet in diameter and constructed of 9-inch-thick steel.
- Robinson 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 Robinson.
- 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.