

Harris Nuclear Plant



Harris Quick Facts

Groundbreaking: 1978

Commercial operation:

Unit 1 – 1987

Number of units: 1

Reactor type: Pressurized water reactor (PWR)

Station capacity: 964 megawatts, enough to power more than 720,000 homes*

Employs: more than 400 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

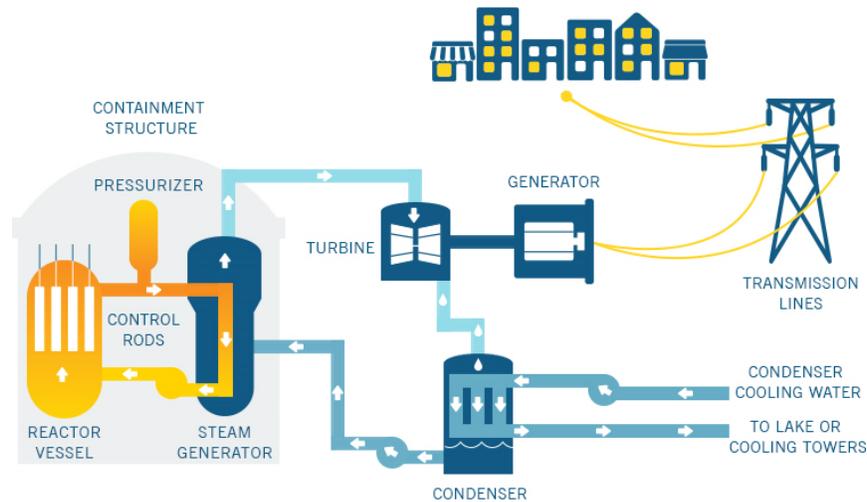
Harris Nuclear Plant is located on Harris Lake in New Hill, N.C., approximately 22 miles southwest of Raleigh.

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

- 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).
- The plant is named after Shearon Harris, former president, CEO and chairman of Carolina Power & Light.
- Harris Lake, which supplies cooling water for the plant, includes two boat ramp facilities and a county park that make the lake accessible for fishing, boating and water skiing.

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 Harris Nuclear Plant avoided the release of nearly 5.6 million tons of carbon dioxide (if that same generation was produced with coal, oil and natural gas).



Nuclear Fundamentals

Harris Nuclear Plant uses uranium as its fuel. Each uranium pellet, less than one inch long, is enclosed in metal rods 13 feet tall. There are approximately 350 pellets per rod, 264 fuel rods in a fuel assembly and 157 fuel assemblies in the 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 590 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 590-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 water that condenses the steam for reuse in the steam generators.
- This heated water is returned to a cooling tower where it cools and returns to the plant’s condenser system.

Energy & Environmental Center

The Energy & Environmental Center at Harris Nuclear Plant offers 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/eecenter.

Nuclear Safety

- Nuclear stations have multiple, robust safety barriers in place.
- The containment building housing the nuclear fuel core is 4.5 feet of reinforced concrete with a 3/8-inch-thick steel liner.
- The reactor vessel containing the nuclear fuel is 42.5 feet tall and 13 feet in diameter and constructed of 6-inch-thick steel.
- Harris has redundant safety systems, including 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 Harris.
- 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.