

McGuire Nuclear Station Fact Sheet



McGuire Quick Facts

Groundbreaking: 1971

Commercial operation:

Unit 1 – 1981

Unit 2 – 1984

Number of units: 2

Reactor type: Pressurized water reactor (PWR)

Station capacity: 2,316 megawatts, enough to power 1.7 million homes

General Information

McGuire Nuclear Station is located on Lake Norman in Mecklenburg County, N.C.

McGuire station personnel remain committed to operating the units safely, reliably and maintaining a good relationship with the community.

- Lake Norman is the state's largest manmade lake, built by Duke Energy in 1963 by damming the Catawba River with Cowans Ford Hydroelectric Station.
- Issued a 20-year extension on its license by the NRC (all U.S. reactors were initially licensed for 40 years).
- McGuire has upgraded plant equipment, including the generator stator and transformer in the past few years, ensuring safe and efficient operation of its two units.

Nuclear Safety

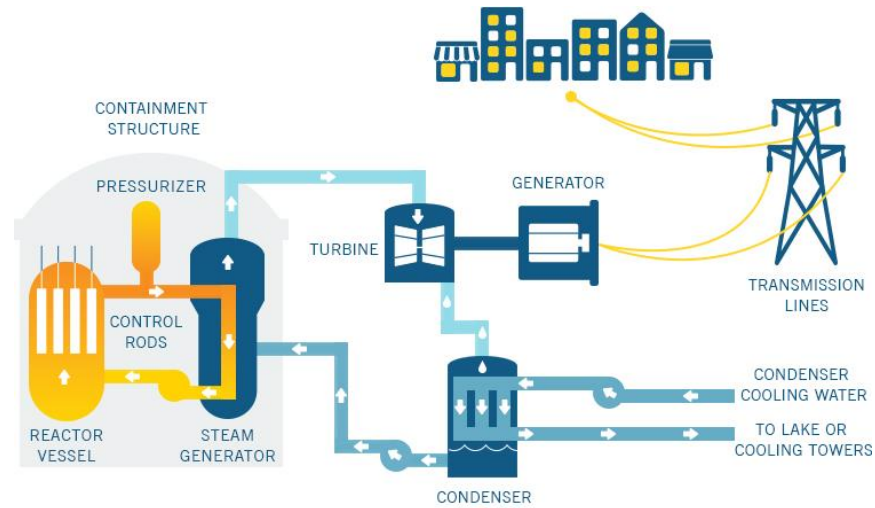
- Nuclear stations have multiple, robust safety barriers in place.
- Each containment building housing the nuclear fuel core is made of concrete 3 feet thick with a 3/4 inch-thick steel liner.
- The reactor vessels containing the nuclear fuel are 44 feet tall and 14 feet in diameter and constructed of 8 1/2-inch-thick steel.
- Each unit 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 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 McGuire.
- 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.



Nuclear Fundamentals

McGuire 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 230 pellets per rod, 264 fuel rods in a fuel assembly and 193 fuel bundles in each of the two 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 down a cooling canal before discharging back into Lake Norman.

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.

EnergyExplorium

The EnergyExplorium is McGuire Nuclear Station’s education center, offering fun experiences for everyone. The EnergyExplorium is available by appointment only Tuesday through Friday, 9 a.m. to 3 p.m., for groups of all sizes.

All activities are free. To make a reservation, please call 980.875.5600. For more information, visit duke-energy.com/energyexplorium.

