The Brunswick Nuclear Plant

Nuclear security will be challenged by a major construction project and a substantial ongoing shipping and port operation directly adjacent to the power plant.

--Gene Upchurch, Vice President, State Public Affairs and Economic Development, Progress Energy

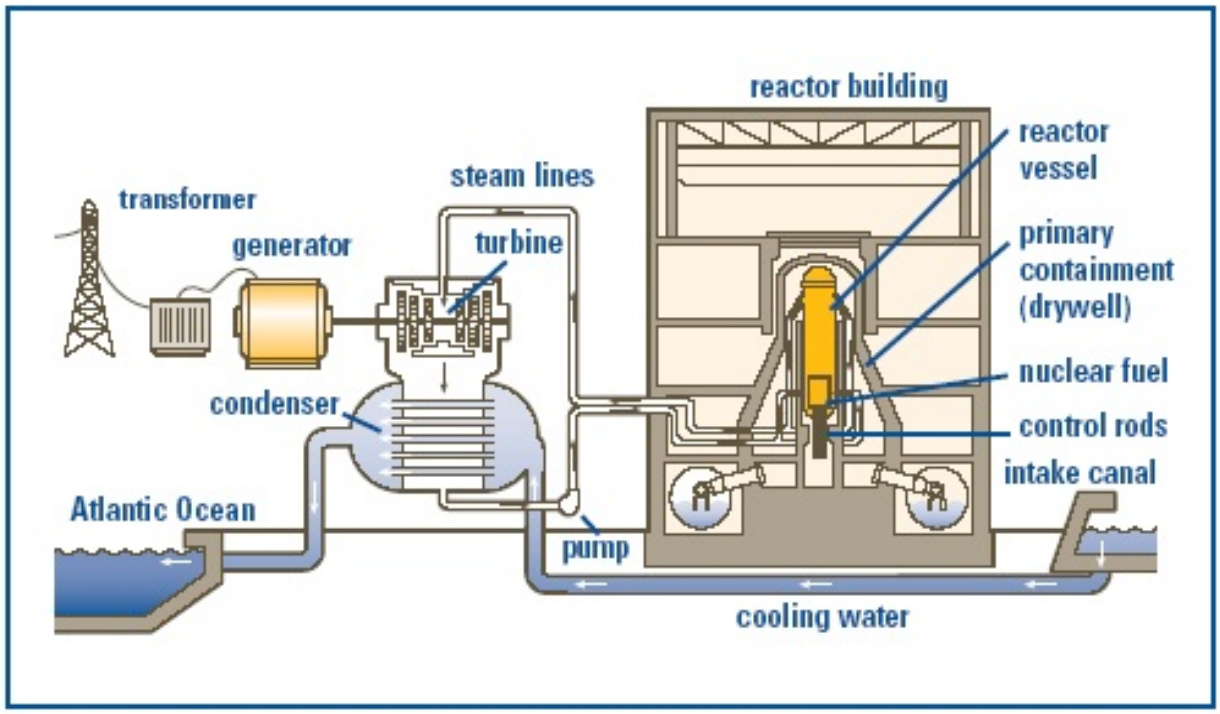
The Progress Energy property on the west and north of the site of the proposed container terminal is the location of two nuclear power plants, General Electric boiling water reactors. The two power plants were put into service in 1975 and 1977. Total output is 1,875 megawatts, sufficient for 25% of Progress Energy's 1.2 million customers in the Carolinas.

Cooling water for these plants is taken from the Cape Fear River, through a canal directly north of the site of the proposed container terminal. Progress Energy also owns an island in the Cape Fear River off the State Ports Authority site, called Snow's Marsh, through which the intake canal has been cut.

View of the State Ports Authority Property (lightened area) from the Northeast. The Brunswick Nuclear Plant is in the right background. The intake canal for cooling water is in the foreground. Snow's Marsh, cut in two by the intake canal, is in the left foreground.

The cooling water for the power plants is discharged through another canal, running south to the intracoastal waterway just west of the City of Southport limits. The canal does not discharge into the waterway; the warm water from the canal is pumped across Oak Island and 200 feet into the ocean, where it is dispersed.

Water flows through the canals at the rate of one million gallons per minute. The importance of this flow is shown in this diagram and accompanying text, from the Progress Energy publication *Brunswick Nuclear Plant 2008 Safety Information*.



The power plant uses uranium as fuel to heat water, changing it to steam. Water is pumped through the reactor core where a controlled nuclear reaction releases heat. The water inside the reactor vessel boils into superheated steam, which is directed against turbine blades to make the turbine and electric generator spin at 1800 revolutions per minute, producing electricity.

After passing through the turbine, the steam passes through a condenser where it is cooled by water drawn from the Cape Fear River, converting it back into a liquid state that is then reheated and turned to steam again. The plant water does not mix with river water and is contained withing the reactor and turbine buildings.

Regarding the cooling water canal, Progress Energy has released this statement:

> *Any plan to bridge this canal must ensure that the water supply is never interrupted or contaminated.*
>
> *We support all efforts to improve the economy of this region, but our primary concern during this discussion will be to ensure the continued safe and uninterrupted operation of the Brunswick Nuclear Plant.*

Interruption of the flow of water in either canal would require shutting the plant down. The danger to the plant from contamination would be limited to the intake canal. Thus that canal lies entirely on Progress Energy property, and is not crossed by any bridge. The discharge canal is crossed by NC87 and 211, and a railroad.

Brunswick Nuclear Plant, from the southwest. The intake canal is on the far side; the beginning of the discharge canal is at lower left. The proposed container terminal would be between the intake canal and the Cape Fear River.

The plant has an above-ground storage facility for spent fuel located to the east of the reactor building, near the cooling water intake canal. That facility is approximately 2500 feet from the western border of the site of the proposed North Carolina International Terminal.

Aerial view showing the spent fuel storage facility (white outline) and the site of the North Carolina International Terminal (yellow area). The distance is approximately 2500 feet.

The Brunswick Nuclear Plant is regulated by the United States Nuclear Regulatory Commission, which maintains inspectors on site.