Straight Talk

About The Brunswick Nuclear Plant

CP&L

It's time for some straight talk about the Brunswick Nuclear Plant:

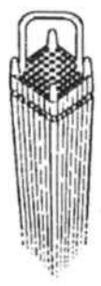
The Brunswick Plant has two General Electric boiling water reactors. Each of the two units operates independent of the other. Unit 2 is currently operating. Unit 1 is in a refueling outage.

News about a crack in a component of Unit 1 got national attention last week. Some of the stories led to public concerns that are not justified by the facts. Here are the facts:

- First, neither of our reactor vessels is cracked. The crack that caused all the headlines is in a piece of equipment that is completely enclosed inside the thick steel walls of the reactor vessel.
- The crack does not cause a leak of radioactive material. The piece of equipment that has the crack directs the flow of water inside the reactor.
- Past operation of the plant was unaffected by this problem. We are modifying the equipment so the crack will not be a problem in the future.
- We identified this crack through an inspection program designed to identify and deal with potential problems before they become problems.

How The Brunswick Plant works

The Brunswick Plant makes electricity. We use nuclear fuel to boil water and make steam, and then we use that steam to turn the big turbines that power the generators that make electricity to supply power to CP&L customers across our state.



Fuel bundle

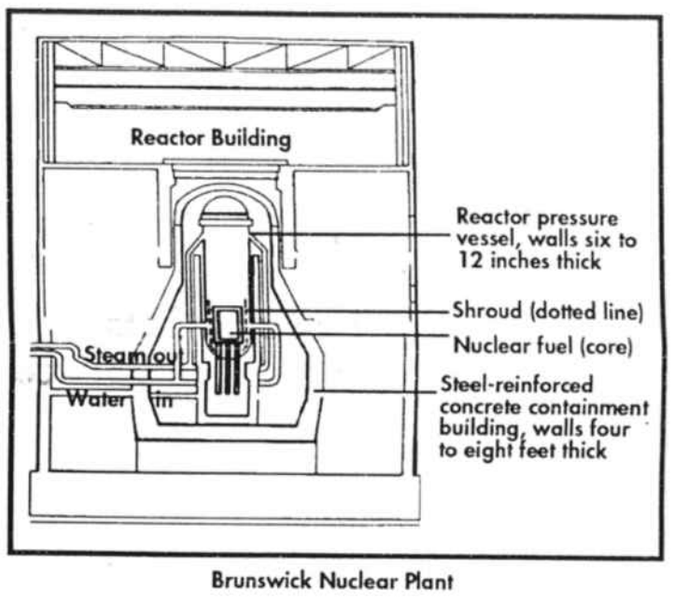
The process is really pretty simple, but the equipment we use is a little more complex.

All of the heat to boil the water comes from uranium fuel that is contained in bundles of half-inch wide tubes full of uranium pellets, which are assembled here in Wilmington. The bundles of tubes are about eight inches wide on each side, and about 12 feet long.

There are 540 of these bundles of fuel in the plant. They are what we call the "core" of the reactor.

This core sits on supports inside the *reactor vessel.* The reactor vessel is a very large steel pressure vessel that is 69 feet tall, with walls that are 12 inches thick at the ends, and almost six inches thick along the sides.

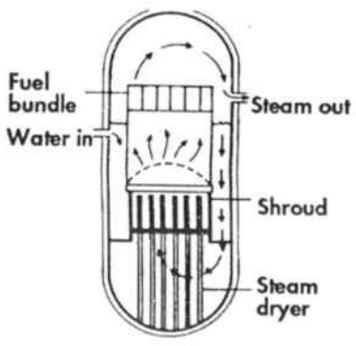
This nuclear core generates heat. In order to use this heat to make electricity, we pump water into the reactor vessel. When this water absorbs heat it becomes steam, and this steam is piped out of the reactor to drive a turbine. It is then recycled back through the reactor. The reactor vessel and the pumps and piping used to circulate water through the reactor core sit inside a steel and concrete containment with walls from four to eight feet thick.



Brunswick Nuclear Plant

The Shroud

The shroud is a piece of equipment that sits inside the six-inch thick reactor pressure vessel. It is a large stainless steel cylinder that encircles the nuclear core. The walls of the shroud direct water to flow down between the shroud and the reactor vessel wall, and up through the nuclear fuel core, where the water is heated to form steam.



Shroud inside vessel, including core, and flow diagrams

In July of this year, we were inspecting the shroud of Unit 1. The fuel is out of the Unit 1 reactor, so right now, the inside of the reactor is just a big tank filled with water.

During this inspection, we found evidence of what is called "intergranular stress corrosion cracking" on the inner wall of the shroud, near the top. This is a type of hairline cracking that attacks stainless steel.

We have examined this cracking using specially designed equipment. The shroud crack is not a problem today. However, if the crack on the inner wall of the shroud grew over the next several years of operation, the shroud might not withstand an extremely severe earthquake.

Based on this information, we are planning to modify the shroud by replacing a welded connection to the top with a bolted connection. This modification is designed to last the life of the plant.

We have also looked at the shroud in Unit 2, which is now operating. When we identified this cracking in Unit 1, we went back to video tapes of a 1991 inspection of Unit 2. We found some very small cracks in that shroud. Analysis of these cracks showed that they do not affect the safety margins of the shroud, so we are continuing to operate the unit. We will inspect Unit 2 again next spring when we come down for a refueling outage. We will do this to measure any changes that may have occurred during this fuel cycle.

Unit 2 is currently operating, and over the hottest part of the summer, the unit produced about 13 percent of the total electricity generated by CP&L power plants.

During the Unit 1 outage, we have completed about 50 major modifications. This work is nearing completion, and the unit will be ready to return to service once the shroud is modified and fuel is reloaded into the reactor.

Dear Neighbors,

The Brunswick Nuclear Plant has made a lot of headlines during the past week. And some of the news has sounded downright scary.

This may have caused some of our neighbors in Brunswick and New Hanover Counties to be a little confused...maybe even frightened.

The fact is that we have an engineering issue that has received a lot of publicity. This is not an issue of current safety of the plant. Instead, it deals with future plant operations and the longevity of plant equipment. That is why we are making modifications now.

This issue did not pose a threat to your safety. You are not in danger from the plant. We have a technical problem at Brunswick, and we are working to fix it. Our 1100 employees live here too, and we all want our plant to operate safely.

Our mission is the safe, reliable, economic and environmentally compatible generation of electricity from nuclear fuel. If we aren't living up to this goal, then tell me. If your time permits, come and visit us. We have an information center located on Highway 87, just in front of the plant.

I hope you will take the time to read the information we have prepared here, and that you will come visit us. Thank you for your time and interest in Brunswick Plant.

Sincerely,

Roy A. Anderson
Vice President,
Brunswick Nuclear Plant

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