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EDWIN I. HATCH

HATCH ELECTRIC GENERATING PLANT

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GP0200606

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Electric Generating Plant

Situated on the Appling County banks of Altamaha, Georgia's largest river, the Edwin I. Hatch Electric Generating Plant has the capacity to produce up to 1,848,000 kilowatts of electric power. From this region of Spanish moss and white-tailed deer, Plant Hatch's electricity courses along miles and miles of transmission lines to distribution points – homes, factories, schools – all across the state.

A nuclear-powered electric generating station, Plant Hatch has supplied an average of more than 10 percent of Georgia's total electricity needs in the years since it began operating in 1975. Managed and run by the Southern Nuclear Operating Company, the plant is owned by the Oglethorpe Power Corporation (power supplier to 39 of Georgia's 42 consumer-owned electric membership corporations), the Municipal Electric Authority of Georgia (comprising 47 member participants), the City of Dalton, and Georgia Power. Among them, these joint owners of Plant Hatch provide electricity to millions of Georgians spread over 57,000 of the state's 59,000 square miles.

Plant Hatch sits on a 2,244-acre tract that accommodates two reactor units in massive containment buildings, eight cooling towers, a turbine room the size of two football fields, a state-of-the-art control room, an environmental lab, a high-voltage switching yard or substation, and a visitors' center that is open to the public year-round.

Nearly 900 people – engineers, mechanics, control room operators, lab technicians, instrument and control technicians, electricians, security officers, and others – oversee the plant's operations and maintain its system and facilities.

How A Nuclear Power Plant Operates

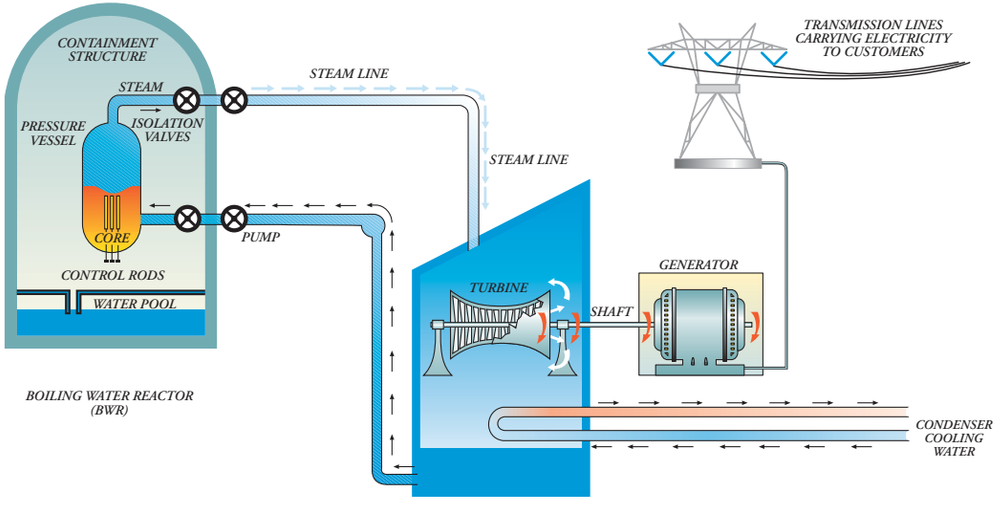
A nuclear power plant such as Plant Hatch works in much the same way as other steam generating plants. A fuel – coal, oil, or uranium – is used to produce heat, and the heat boils water to make steam. The steam then turns a turbine to generate electricity.

There are two kinds of reactors commonly used in nuclear electric generating plants – boiling water reactors and pressurized water reactors. Plant Hatch's two units each have a boiling water reactor. The simplified diagram below shows how the steam generating process works.

Fuel rods in the reactor core contain uranium oxide pellets. In a neutron chain reaction inside the reactor vessel, the uranium atoms fission, or split, creating heat. When water is pumped from the bottom of the reactor up around the hot fuel rods, it is vaporized into steam. The steam turns the turbine generator, just as in any other steam-based electric generating plant.

After the steam turns the turbine, it is funneled into a condenser to be cooled into liquid again and sent back through the reactor to make more steam. This way, in a closed cycle, the same water is used over and over again.

At Plant Hatch, a separate, non-radioactive loop of water drawn from the Altamaha River serves as the coolant in the condenser. After its trip through the condenser, this "cooling water" is pumped through the plant's huge cooling



Influent pipe at one of the plant cooling towers

Employees working at Plant Hatch refueling floor

towers until it cools off enough to be run through the condenser again. Like the radiator water that cools a car engine, the cooling water at Plant Hatch runs in a closed cycle but must be replenished with more water from the river.

Nuclear Safety

Nuclear power plants are designed with many redundant safety systems, sometimes called "defense in depth."

Fuel pellets, which are about 3 percent fissionable uranium 235, are sealed in zircaloy tubes. The fuel assemblies are then contained in a reactor vessel which has six-inch-thick steel walls and weighs 505 tons. This, in turn, is contained in a "drywell" which is made up of an inch and a half of steel covered with 5 feet of reinforced concrete. All of this is housed in a reactor building, the thinnest wall of which is two feet thick.

Because of the low concentration of U-235, the fuel in a nuclear electric steam generating station cannot explode like an atomic bomb.

There are several redundant cooling systems to minimize the possibility of overheating the reactor core.

A nuclear reactor operating at full power can be shut down in only a few seconds by rapidly inserting the control rods to stop the fission process. The many cooling systems are then used to cool the reactor core. There is even a system that can be used to inject a neutron-absorbing liquid to stop the fission process should the control rods fail.

The Human Factor

All structural and mechanical safety features of Plant Hatch are monitored continually by extensively trained and licensed nuclear power plant operators and engineers. Two full-time, on-site inspectors from the U.S. Nuclear Regulatory Commission check the plant to be sure it is maintained and operated safely, efficiently, and in accordance with established nuclear operating procedures.

No Harmful Radiation

The combined effect of the structural, mechanical, and human safety systems built into Plant Hatch means that a person living within a few miles of its reactors receives less radiation from its presence than from watching color television.

Radiation to the human body is measured in millirems; the average "background" radiation from our natural environment (sunlight, food, stones, soil) adds up to around 110 to 200 millirems a year, depending on where we live. Other, manmade sources of low-level radiation add greatly to this total.

A typical intestinal X-ray adds 210 millirems; a jet airplane flight from New York to California and back again adds 5 millirems. And fallout from nuclear weapons testing adds about 4 millirems of exposure per year to everyone, worldwide.

Living within a 5-mile radius of a nuclear power plant can add .002 millirems of radiation exposure per year. The amount of color TV that the average American watches adds 1 millirem a year.

Although there have been incidents involving nuclear power plants, no significant radiation has been released into the environment. Even during the Three Mile Island incident, labeled the worst in history, the greatest release was the equivalent of a person smoking about three packages of cigarettes, or receiving one chest X-ray.

Environmental Care

Because nuclear plants do not burn coal, oil, or other fossil fuels, they do not emit soot, sulfur, or fly ash into the air. Nor do they require dams and vast flooding of surrounding acreage as do hydroelectric plants. In fact, the nuclear electric generating process, carefully contained inside the plant's walls, may even be considered ecologically preferable to many current industrial practices because it is completely isolated from the outside environment.

At Plant Hatch, there is a multitude of safeguards that guarantee continued environmental protection. Georgia Power's environmental and health-physics specialists monitor the area's air, ground water, botanical specimens, and wildlife as well as the Altamaha River and its aquatic life.

Health physics technician surveying barrels for radiological contamination

Tests on the environmental samplings are performed at Georgia Power and at independent laboratories.

Spent fuel from Plant Hatch is currently stored under water at the plant. And at the plant's independent spent fuel storage installation, which is the on-site dry fuel storage facility. The federal Nuclear Waste Policy Act of 1982 has established a timetable and procedures for permanent storage – and possibly reprocessing – of spent fuel in U.S. Department of Energy repositories by 2010.

The volume of high-level nuclear waste from commercial power plants is small and has been handled with great care since the very beginning of the nuclear power industry in the late 1950s. Most of this waste remains in specially designed storage pools and dry storage canisters awaiting federal handling and disposal.

Nuclear power plants also generate some low-level waste material such as contaminated trash, broken tools, and water processing resins. These are carefully packaged and buried in disposal areas licensed by the federal government.

Decommissioning

The useful life of a nuclear power plant, like most electric generating plants, is estimated to be around 40 years, perhaps longer. "Decommissioning," in utility industry jargon, refers to the safe and proper closing down of a plant when it is retired from service.

With a nuclear power plant, the first step is to remove the spent fuel and store it in a licensed federal repository according to the terms of the Nuclear Waste Policy Act of 1982. Then, following Nuclear Regulatory Commission guidelines, the plant facilities may be either:

1) dismantled, with various parts transported to appropriate waste sites and other, non-radioactive parts salvaged for use elsewhere;
2) "mothballed," or sealed off and guarded for several decades until radioactivity levels have decayed somewhat and dismantling is easier; or
3) entombed in a massive protective shield of concrete indefinitely, with continual surveillance and environmental monitoring.

Decommissioning plans for Plant Hatch call for dismantlement within 10 years after the plant is shut down.

The Nuclear Advantage

The fuel costs for nuclear power are significantly lower than fuel costs for coal- or oil-fired generation. During 2000, Plant Hatch produced 12.2 percent of Georgia's total electricity, at a fuel cost of 0.49 cents per kilowatt-hour. Had that energy been produced by coal-fired plants instead of a nuclear one, it would have cost nearly 1.51 cents per kilowatt-hour – more than 3 times as much. Plant Hatch has saved its owners more than $500 million in fuel costs, compared to a typical coal-fired plant.

Plant Hatch is situated along the banks of the Altamaha River

About Georgia Power…

Relying on a combination of coal, nuclear and hydro energy sources, Georgia Power has maintained a reputation as a reliable and efficient electric utility for more than 50 years. The company operates 38 generating plants in the state that yield a combined generating capacity of more than 15 million kilowatts. Our system's operating availability is one of the highest in the nation. And our residential electricity rates consistently rank among the nation's lowest.

Georgia Power owns 51 percent of Plant Hatch and operates the entire facility under contract with the co-owners. Georgia Power is the largest of five operating companies belonging to The Southern Company, one of the nation's largest investor-owned electric utility companies. Extending throughout Georgia, the panhandle of Florida, Alabama, and southeastern Mississippi, the

Plant Hatch control room

Southern electric system consists of Georgia Power, Alabama Power, Mississippi Power, Gulf Power and Savannah Electric. The Southern electric system includes a total of 290 generating units serving some 3.9 million customers.

About Oglethorpe Power Corporation…

Oglethorpe Power Corporation is the power supply cooperative providing electricity to 39 of Georgia's 42 consumer-owned electric membership corporations (EMCs). These EMCs serve more than 2.8 million Georgians in about 71 percent of the state's land area.

Oglethorpe is the nation's largest generation and transmission cooperative in assets, annual kilowatt-hour sales and ultimate consumers served. Since its founding, Oglethorpe has invested about $5 billion in generation and transmission facilities, including co-ownership in nine major power plants now operating or under construction.

Students viewing electrical insulator at the visitor center

The Municipal Electric Authority of Georgia was created by the 1975 Georgia General Assembly to provide a low-cost, dependable source of electric energy to its 48 participants. The Authority became the power supplier to these 48 political subdivisions on February 7, 1977. Areas served by these participants have a population of approximately 500,000, or nearly 10 percent of the state's population.

MEAG's primary power sources are the eight generating units operating or under construction at four plants in Georgia jointly owned with three other power suppliers. The Authority also owns more than 1,000 miles of transmission lines and more than 100 substations which are part of the state's Integrated Transmission System. Since its inception, MEAG's rates have ranked among the lowest in the Southeast.

About the City of Dalton…

The City of Dalton, Georgia, is an incorporated municipality of approximately 28,000 people in northwestern Georgia. Dalton's Board of Water, Light, and Sinking Fund Commissioners operates an electric distribution system serving the city's 13.8 square miles plus certain adjacent portions of Whitfield County. This system serves some 10,200 customers who had a 1985 peak demand of approximately 139 megawatts.

Between 1977 and 1980, Dalton contracted to purchase capacity ownership of approximately 120 megawatts in Georgia Power Plants Hatch, Wansley, Scherer and Vogtle. The portion of Dalton's electrical requirements not met by its owned capacity is supplied at wholesale rates by the Southeastern Power Administration and by Georgia Power.

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