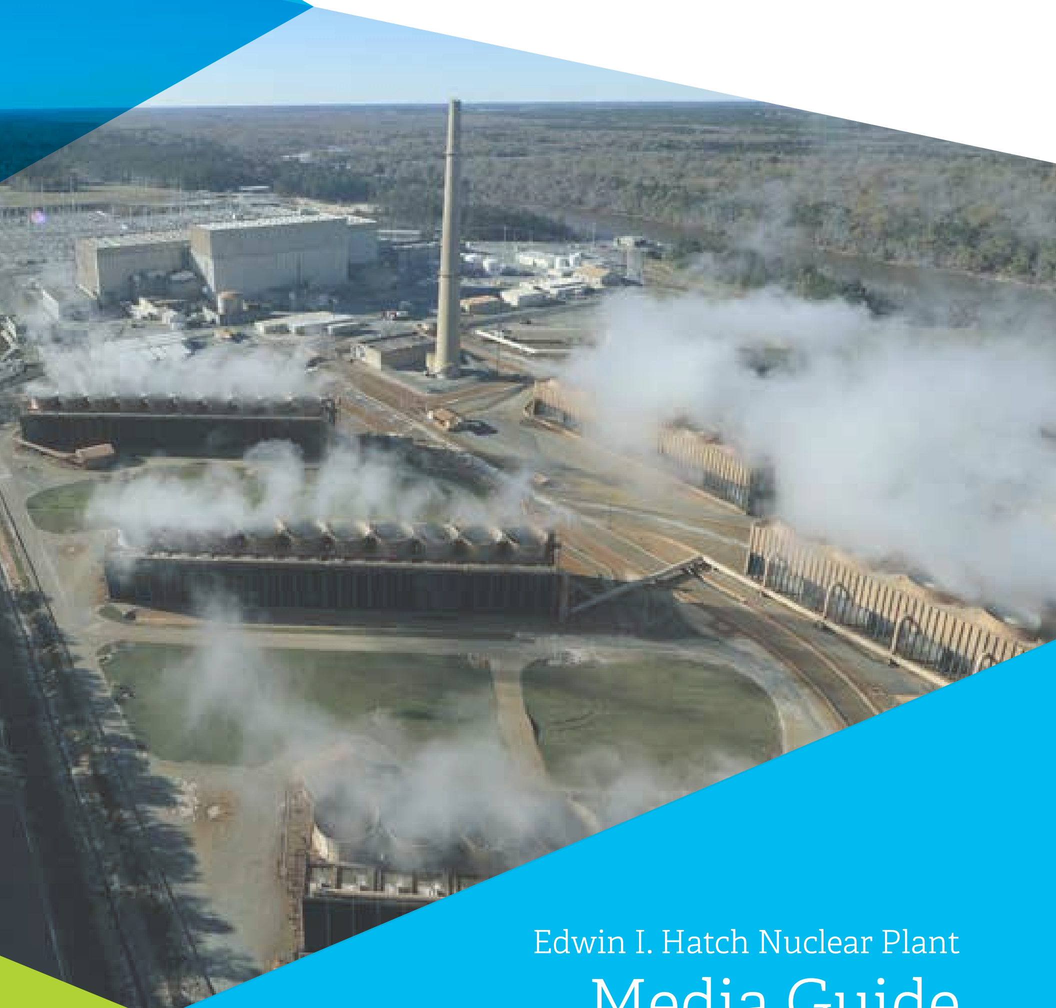
Plant Hatch



Edwin I. Hatch Nuclear Plant

Media Guide

Table of Contents

A guide for journalists

Covering the news related to nuclear power can be challenging for reporters. The nuclear power industry is one of the most highly regulated industries in America. We developed this media guide for the Edwin I. Hatch Nuclear Plant to help journalists cover the many aspects related to the plant and nuclear power in general.

We strive to give honest, straightforward answers to questions from the media about our nuclear power plants. And we pride ourselves on being available to the media when you need us. In fact, our media lines are available 24 hours a day. After hours and on the weekends, a media relations representative always is on call and will call you back promptly.

This media guide is designed to provide quick, specific information about Plant Hatch's two nuclear units, as well as helpful information on the benefits of nuclear power, safety and security, emergency planning, nuclear physics, nuclear fuel and other topics related to nuclear power generation. The illustrations and explanations will help you understand how certain components and systems work in a nuclear power plant. Many terms commonly used in the nuclear power industry are defined.

We hope this information will help you when you cover stories about Plant Hatch or the nuclear power industry. Our company needs you, because you are a very important source of information to our customers and neighbors living near the plant. In the unlikely event of an emergency, your role in informing the public with timely, accurate information would be vital.

Please take time to read this media guide and call us with any questions you have. Tours of Plant Hatch are available, and you are encouraged to set up an appointment to visit us.

Southern Nuclear

Media Line: 205-992-5395

Georgia Power

Media Line: 404-506-7676

Plant Hatch introduction

Southern Nuclear Operating Company, headquartered in Birmingham, Ala., operates Southern Company's six nuclear units at three locations: the Alvin W. Vogtle Electric Generating Plant near Waynesboro, Ga.; the Edwin I. Hatch Nuclear Plant near Baxley, Ga.; and the Joseph M. Farley Nuclear Plant near Dothan, Ala. Plant Vogtle and Plant Hatch were built by and are co-owned by Georgia Power, Oglethorpe Power Corporation, Municipal Electric Authority of Georgia, and Dalton Utilities. Together, these two nuclear power plants generate approximately 20 percent of Georgia Power's electricity. Plant Farley was built and is owned by Alabama Power, and the plant generates approximately 19 percent of Alabama Power's electricity.

Southern Nuclear, Georgia Power and Alabama Power each are wholly owned subsidiaries of Atlanta-based Southern Company *(NYSE: SO)*. Southern Company is America's premier energy company, with 44,000 MW of generating capacity and 1,500 billion cubic feet of combined natural gas consumption and throughput volume serving 9 million electric and gas utility customers through its subsidiaries. The company provides clean, safe, reliable and affordable energy through electric utilities in four states, natural gas distribution utilities in seven states, a competitive generation company serving wholesale customers across America and a nationally recognized provider of customized energy solutions, as well as fiber optics and wireless communications. Southern Company brands are known for excellent customer service, high reliability and affordable prices that are below the national average. Through an industry-leading commitment to innovation, Southern Company and its subsidiaries are inventing America's energy future by developing the full portfolio of energy resources, including carbon-free nuclear, 21st century coal, natural gas, renewables and energy efficiency, and creating new products and services for the benefit of customers. Southern Company has been named by the U.S. Department of Defense and G.I. Jobs magazine as a top military employer, recognized among the Top 50 Companies for Diversity by DiversityInc, listed by Black Enterprise magazine as one of the 40 Best Companies for Diversity and designated a Top Employer for Hispanics by Hispanic Network. The company has earned a National Award of Nuclear Science and History from the National Atomic Museum Foundation for its leadership and commitment to nuclear development and is continually ranked among the top utilities in Fortune's annual World's Most Admired Electric and Gas Utility rankings. Visit our website at www.southerncompany.com.

Georgia Power is the largest subsidiary of Southern Company, one of the nation's largest generators of electricity. The company is an investor-owned, tax-paying utility, serving its 2.5 million customers in all but four of Georgia's 159 counties. Visit Georgia Power's website at www.georgiapower.com.

Oglethorpe Power Corporation is one of the nation's largest power supply cooperatives with more than $8 billion in assets. The corporation provides wholesale electric power to 39 Electric Membership Corporations *(EMCs)* in Georgia, which, in turn, provide retail electric service to more than 4.1 million residents. For more information, visit the Oglethorpe Power website at www.opc.com.

The Municipal Electric Authority of Georgia *(MEAG Power)* is a public generation and transmission organization providing wholesale electric power to 49 Georgia communities, with over $700 million in annual electric sales and 10.3 million megawatt-hours of delivered energy in 2013. MEAG Power has assets of more than $7.3 billion, co-owns two nuclear and two coal-fired generating plants and is the sole owner of a combined cycle facility with a total capacity of 2,069 megawatts, and co-owns Georgia's Integrated Transmission System *(ITS)*. Visit MEAG Power's website at www.meagpower.org.

Dalton Utilities has operated as a public utility since 1889 and provides potable water, electrical, natural gas and wastewater treatment services to approximately 65,000 customers in the City of Dalton and portions of Whitfield, Murray, Gordon, Catoosa and Floyd counties. In 2003, Dalton Utilities launched its OptiLink family of telecommunication services and now provides broadband, cable tv, telephone and internet services to area residents and businesses. Visit Dalton Utilities' website at www.dutil.com.

Safety and emergency planning

Safety is the first priority in operating our nuclear plants. Safety was emphasized during plant design and construction, and safety continues to be emphasized daily in oversight of operations, training of employees, validation of monitoring instruments and controls, testing of safety systems, and communication between operators, utilities, system suppliers and regulators. In the unlikely event of an emergency at any of our nuclear plants, emergency plans would be implemented to protect the safety of the general public surrounding the plant.

The Plant Hatch emergency plan specifies procedures for Southern Nuclear, Georgia Power, and county, state and federal governments in responding to an emergency and to the needs of the public. Southern Nuclear has overall responsibility for the plant's emergency plan, which also involves the public and the news media.

The role of the news media during an emergency

The news media plays an important role in informing the public about nuclear power. That role becomes even more critical in the unlikely event of an emergency.

If an emergency occurred at Plant Hatch, information would initially come from the Georgia Power Corporate Media Center at the Georgia Power headquarters in Atlanta, Ga., until the Joint Information Center *(JIC)* near Vidalia, Ga., was activated. Once the JIC is activated it serves as a joint information center for the use of the news media. Southern Nuclear, Georgia Power and county, state and federal officials responding to the emergency would disseminate information and hold joint news briefings from the JIC which is located at 111 Fowler St., Vidalia, Georgia 30474. Phone numbers for key contacts and directions to the facility are listed in the section called "News Media Contacts and Directions."

If you are assigned to cover events at Plant Hatch, now or during the unlikely event of an emergency, it's important for you to develop basic understanding of nuclear safety systems, radiation and the emergency plans in place to protect the public

Joint Information Center (JIC)

111 Fowler St., Vidalia, Georgia 30474

A look at Plant Hatch's control room simulator

An instructor prepares a training scenario for the control room operators

The benefits of nuclear power

The benefits of clean nuclear power are many. First and foremost, nuclear power is a clean, safe, affordable and reliable source of electricity. Nuclear power provides 16 percent of Southern Company's generation, and we have been operating nuclear plants safely and reliably for more than 40 years. Our nuclear energy facilities produce 76 percent of Alabama's emission-free electricity and 91 percent in Georgia. We operate our facilities at high levels of reliability with an average three-year fleet capacity factor of 93.7 percent, exceeding the U.S. average of 92 percent for the years 2014-2016. Capacity factor means the percent of time the unit is available to provide power to the electrical grid. Nuclear power has a low production cost compared with other fuel sources. Uranium is used as nuclear fuel, and it has less price volatility than other fuel sources.

We support local and state economies.

Did you know that the average nuclear plant spends approximately $40 million annually in wages? In Georgia alone, more than $908 million of materials, services and fuel are purchased annually from more than 1,000 local companies. Also, nuclear plants pay approximately $16 million in state and local taxes.

We protect the environment.

Nuclear energy produces more clean-air energy than any other energy source. It provides 91 percent of Georgia's emission-free electricity and 62 percent of all U.S. emission-free electricity. More than 23 million metric tons of carbon dioxide are prevented by Georgia's nuclear facilities. This is equal to what would be released by more than 4.4 million passenger cars. That's more than all the cars registered in the state of Georgia!

We care about your safety.

Nuclear facilities are held to the highest of standards by the federal government and its inspectors. There are comprehensive plans in place – in partnership with local, state and federal agencies – that prepare for the unexpected and provide layer upon layer of redundant safety features.

We are the most reliable.

Nearly 100 nuclear facilities in the U.S. provide about 20 percent of all electricity in the country. These facilities generate electricity 24 hours a day, seven days a week.

Efficiency is the core.

One uranium fuel pellet is about the size of a pencil eraser and creates as much energy as one ton of coal or 17,000 cubic feet of natural gas. A typical large nuclear energy facility produces enough electricity for nearly 723,000 homes while using only 20 metric tons of uranium fuel each year.

News media contacts and directions

On-call media representatives

Southern Nuclear
205-992-5395

Georgia Power
404-506-7676 or 800-282-1696

Websites

www.southernnuclear.com
www.georgiapower.com

Social media channels

fb.com/southernnuclear

@southernnuclear

@southernnuclear

linkedin.com/company/southernnuclear

During an emergency

Plant Hatch Joint Information Center (JIC)
(Activated only in the event of an emergency at the plant)
912-537-2811

Georgia Power Corporate Media Center
404-506-7676 or 800-282-1696

Plant Hatch recorded information line with most current update
(Activated only in the event of an emergency at the plant)
888-847-1186

Contacts for federal, state and local agencies

Federal agencies

Nuclear Regulatory Commission
Public Affairs, Region II, Atlanta
opa2@nrc.gov or 404-562-4416 or 4417 *(during business hours)*

After hours, call the NRC Headquarters Operations Officer
in Rockville, Md.: 301-816-5100
www.nrc.gov

Federal Emergency Management Agency
770-220-5200 *(24 hours)*
www.fema.gov

State agencies

Georgia Emergency Management & Homeland Security Agency
Public Information Officer, Atlanta
800-879-4362 or 800-TRY-GEMA
www.gema.ga.gov

Local emergency management agencies

Appling County Emergency Management Agency
912-367-8170
applingema.com

Jeff Davis County Emergency Management Agency
912-375-6628
jeffdavisema.com

Tattnall County Emergency Management Agency
912-557-6820
tattnallcountyga.com/emergency-management-agency.cfm

Toombs County Emergency Management Agency
912-526-6424

Directions to Plant Hatch Joint Information Center (JIC)

(Activated only in the event of an emergency at Plant Hatch, where media should go in an emergency)

111 Fowler St., Vidalia, Georgia 30474

Once this facility is activated, media calls should be directed to 912-277-2900.

Spokespersons from Southern Nuclear, Georgia Power, Georgia Emergency Management Agency, and the affected county, state and federal agencies responding to the event will be at the Joint Information Center to discuss response activities.

From Atlanta

- Take I-75 south to Macon.
- Take I-16 out of Macon, east to the Soperton exit.
- Take GA Highway 15 south to Highway 292 in Higgston.
- Turn left *(east)* toward Vidalia.
- When you cross the railroad tracks, the JIC is immediately on your left, next to the Georgia Power Operating Headquarters.

From Atlanta Airport

- Take I-85 south to I-285 east *(Macon)*.
- Go east on I-285 to I-75.
- Take I-75 south to Macon.
- Take I-16 out of Macon, east to the Soperton exit.
- Take GA Highway 15 south to Highway 292 in Higgston.
- Turn left *(east)* toward Vidalia.
- When you cross the railroad tracks, the JIC is immediately on your left, next to the Georgia Power Operating Headquarters.

From Savannah Airport

- Take US Highway 80 west to I-95.
- Take I-95 south to I-16.
- Take I-16 west to GA Highway 297 south.
- Take GA Highway 297 south to Highway 292 in Vidalia. This is also North Street.
- Turn right onto Hwy 292 and proceed about 1 1/4 miles.
- The JIC is on your right, next to the Georgia Power Operating Headquarters, just past Vidalia High School.

From Vidalia Airport

- Exit the airport on Airport Road which dead ends at Industrial Boulevard. Turn right. Proceed to Highway 280 and turn left, traveling west.
- Go 1/2 mile to the first paved road on the right, Stockyard Road. Turn right.
- Proceed to Highway 292. Turn left *(west)*.
- On Hwy. 292 west, travel 2 1/2 miles.
- Just past Vidalia High School turn right onto Fowler St.
- The JIC is on your right, next to the Georgia Power Operating Headquarters.

Note: Media personnel should use the **front entrance.**

About Plant Hatch

Plant Hatch sits on a 2,224 acre site along the Altamaha, Georgia's largest river.

Since commercial operation began in 1975, Plant Hatch has supplied, on average, more than nine percent of Georgia's total electricity needs. The site includes two reactor units, eight cooling towers, a turbine room the size of two football fields, a state-of-the-art control room, an environmental lab and a high-voltage switching yard or substation.

About 900 people—engineers, mechanics, control room operators, lab technicians, instrument and control technicians, electricians, security officers and others—oversee the plant's operations 24 hours a day, every day of the year. Full-time, on-site inspectors from the U.S. Nuclear Regulatory Commission monitor the plant to ensure it is maintained and operated safely, efficiently and in accordance with established nuclear operating procedures.

Who was Edwin I. Hatch?

The plant is named for Edwin I. Hatch, who served as president of Georgia Power from 1963 until 1975. At that time he was named chairman of the board and chief executive officer. Under his leadership Georgia Power more than tripled its generating capacity, multiplied its construction budget five times over and increased its customer base by more than 50 percent.

At the time of his retirement in 1978, Mr. Hatch cited the development of nuclear power as a clean energy source as one of the most significant developments during his tenure.

Hatch, a native of Uniontown, Alabama, held a Bachelor of Arts degree from the University of the South and a law degree from The University of Alabama.

Edwin Hatch died in 1997 at the age of 84.

Plant facts and statistics

Owners
Georgia Power Company: 50.1%
Oglethorpe Power Company: 30.0%
Municipal Electric Authority Of Georgia: 17.7%
City of Dalton: 2.2%

Operator
Southern Nuclear

Location
11 miles north of Baxley, Georgia, in Appling County on the southern bank of the Altamaha River.

Nearest City
Baxley, Georgia, 11 miles south

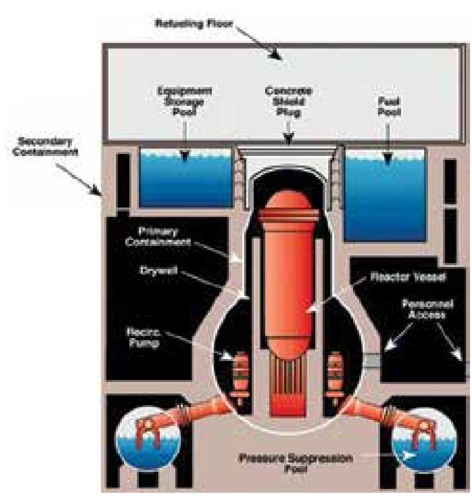
Reactors
Type: Boiling Water Reactor *(BWR)*
Size: Unit 1 – 924 megawatts; Unit 2 – 924 megawatts
Total Capacity: 1,848 megawatts

Nuclear Steam Supply System (Reactor manufacturer):
General Electric Company

Turbine Generator Manufacturer
General Electric Company

Containment
General Electric Mark 1- Pressure Suppression. The Primary Containment at Plant Hatch consists of a "drywell" and a pressure suppression chamber *(torus)*. Both are steel pressure vessels. The drywell is encased in reinforced concrete to provide shielding and additional resistance to deformation. A removable drywell head encloses the top of the drywell. The primary containment system consists of a multiple-barrier, pressure suppression type containment. The primary containment houses the reactor vessel, the reactor coolant loops, and other branch connections of the reactor primary system. Secondary containment surrounds the primary containment and is designed to provide an additional barrier. The primary containment structure is housed in the reactor building which is the secondary containment structure. Each reactor unit at Plant Hatch has a reactor building/primary containment structure.

CONTAINMENT
(Boiling Water Reactor)



Architect/Engineer
Bechtel Power Corporation
Southern Company Services, Inc.

Cost:
Unit 1 - $414 million
Unit 2 - $520 million

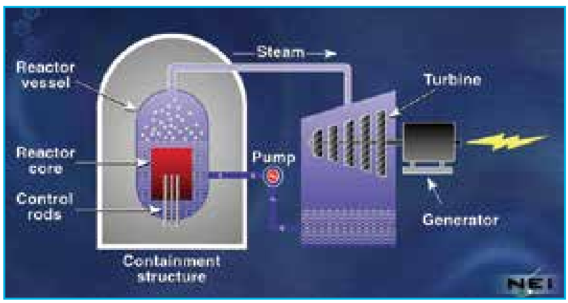
Approximate Employment:
900

Construction Start Date:
1968

Operating License:
Unit 1 - August 6, 1974
Unit 2 - June 13, 1978

Commercial Operation:
Unit 1 - December 31, 1975
Unit 2 - September 5, 1979

License Renewals:
Granted January 15, 2002
Unit 1: August 6, 2034
(Originally licensed until 2014)
Unit 2: June 13, 2038
(Originally licensed until 2018)



Typical Boiling Water Reactor *(BWR)* Design

Size Of Site:
2,224 acres

Fuel (array)
Fuel assemblies: 560
Overall length of fuel assembly: approximately 14 feet
Fuel rods per assembly: approximately 100

Control Rods
137 Rods for each unit
Absorber material composition: typically boron carbine granules and hafnium rodlets in stainless steel Cladding: Type 304 Stainless steel

Emergency Power System (safety related)
Diesel generators: 2 per unit + 1 shared between them
Rated capacity: 3 MW each

Reactor Coolant System (RCS)
The Reactor Coolant System consists of all piping directly connected to the reactor vessel inside the drywell. Operates at a nominal pressure of 1,035 psig *(pounds per square inch gauge)*.

Cooling Water System (CWS)
The condenser is cooled by the circulating water system, which transfers heat to four mechanical forced-draft cooling towers per unit. The water lost due to evaporation during the cooling process is replenished by water from the Altamaha River.

Plant Hatch achievements

In addition to major achievements such as setting safety and reliability records, Plant Hatch employees set the standard for improving the quality of life in the local community.

Plant Hatch Unit 2 set a new net generation record in 2006 of 7,641,832 MWh's *(previous best was in 2004 with 7,520,633 MWh's)*.

Capacity Factor for Unit 2 was the second best in plant history in 2006 at 98.79% *(1996 Capacity Factor of 98.81% is the unit's best)*.

Community service

Southern Nuclear and Georgia Power employees at Plant Hatch demonstrate their commitment to community service through their participation in diverse projects including educational outreach programs, local elementary schools mentoring groups, quarterly American Red Cross blood drives, Plant Hatch Kid's Safety Camp and United Way of Appling and Toombs/Montgomery County. The Hatch Santa Bag Fund purchased toys for nearly 250 disadvantaged children within the plant's ten-mile Emergency Planning Zone. Employees serve as members of the Citizens of Georgia Power - Plant Hatch Chapter, North American Young Generation in Nuclear *(NA-YGN)*, Women in Nuclear *(WIN)*, as local elected officials and as members of the United States military, both at home and abroad.

Environmental commitment

Plant Hatch has been a certified Wildlife Habitat Council site since 1994. Approximately 200 acres have been replanted with native long-leaf pine. Plant Hatch also participates in bluebird nesting programs and local environmental programs.

The plant is located in a rural area that supports diverse wildlife. Plant Hatch has management programs that enhance habitat for species such as bluebirds, wood ducks and wild turkey. Land management efforts at Plant Hatch contributed to Southern Company's certification as a member of the National Wild Turkey Federation Energy for Wildlife.

Additionally, Plant Hatch has entered into a Safe Harbor Agreement with the Georgia Department of Natural Resources for the Red-cockaded woodpecker, a federal endangered species. This Safe Harbor Agreement ensures that adequate habitat will be provided and managed properly for the red cockaded woodpecker.

Loblolly Pine

Bluebird nesting program

Emergency planning

Comprehensive plans have been developed by Southern Nuclear and approved by the Nuclear Regulatory Commission and other oversight agencies for responding in the event of an emergency at Plant Hatch, in accordance with federal requirements. Southern Nuclear has overall responsibility for the Plant Hatch Emergency Plan, which involves Southern Nuclear, Georgia Power and various county, state and federal agencies.

The emergency plan specifies the procedures, personnel and equipment which would be used to classify an emergency, to define and assign responsibilities, and to outline an effective course of action for safeguarding personnel, property and the general public.

These plans are updated regularly and maintained at all times. Drills are conducted annually to test these plans and to train and test personnel on following procedures correctly.

Managing a nuclear plant emergency

At Plant Hatch, technical staff is on duty 24 hours a day, 365 days a year. These men and women are trained to recognize and correct plant problems before they become emergencies. If an emergency does occur, plant personnel are prepared to serve as the initial on-site emergency response organization.

Depending on emergency severity, the on-site personnel would be supplemented and supported by additional Southern Nuclear and Georgia Power personnel.

In addition, emergency support is available from a variety of other organizations, including the U.S. Nuclear Regulatory Commission, the state of Georgia, the U.S. Department of Energy, other electric utility companies, the Institute of Nuclear Power Operations and the Nuclear Energy Institute.

Should an emergency occur, one of the first steps taken would be to notify off-site authorities such as the Georgia Emergency Management Agency, the U.S. Nuclear Regulatory Commission and local county officials. Communication would be maintained with these agencies to keep them fully aware of the emergency status, including on-site and off-site radiological information.

At the same time, employees would begin taking steps immediately to restore the plant to a safe condition, monitor and control radiation, and manage and coordinate all emergency activities. These activities take place in specially equipped facilities.

Information dissemination in the event of an emergency

In the event of an emergency at Plant Hatch, an Joint Information Center *(JIC)* would be established to disseminate information to the news media. The Joint Information Center is located at a separate site near the plant on 111 Fowler St., Vidalia, Georgia 30474. All emergency information would be disseminated from the Joint Information Center, which would serve as a combined communication hub for Southern Nuclear, Alabama Power and the local county, state and federal agencies involved in responding to an emergency.

A Corporate Media Center would be established at Georgia Power's Corporate Headquarters at 241 Ralph McGill Boulevard in Atlanta. The Corporate Media Center would serve as an initial information center until the Joint Information Center *(JIC)* nearer the plant site is activated.

The degree of activity at these and other off-site emergency facilities would depend on the severity of the emergency.

Kinds of emergencies

There are four classifications used to describe accident severity of nuclear power plant emergencies. From least severe to most severe, the emergency classifications are listed below.

1. **Notice of Unusual Event** – The least serious of the four NRC classifications. It means there is a minor problem at the plant. Because of strict federal regulations, many situations occur that qualify as unusual events. Unusual events pose no danger to the public. You will not need to take any actions unless directed to by state and local officials.

2. **Alert** – An event has occurred that could reduce the plant's level of safety. There should be no danger to the public. County and state officials will be involved and prepared for any necessary response. You will not need to take any actions unless directed to by state and local officials.

3. **Site Area Emergency** – An event has occurred that could involve major problems with plant systems. Local radio and television stations in the area will provide information and instructions. If you're in an affected area, you will be notified by state and local officials about any actions you need to take.

4. **General Emergency** – The most serious of the four NRC classifications. Radioactive material could be released outside the plant site. State and local authorities will take action to protect the public. Sirens may be sounded and local radio and television stations will provide information and instructions. If you're in an affected area, you will be notified by state and local officials about any actions you need to take.

Emergency notification systems

There are a variety of emergency notification systems that would alert residents near Plant Hatch if an emergency should occur.

- **Siren Systems** – Sirens have been installed within the 10-mile Emergency Planning Zone *(EPZ)* around Plant Hatch. These sirens alert residents to listen to a local radio or television station. The sirens have a sound different from emergency vehicles. They are tested frequently. They will sound briefly during Plant Hatch's annual emergency drill and during maintenance.

- **CodeRED Emergency Notification System** – The CodeRED Emergency Notification System may be utilized to contact residents by phone in the event of an emergency. For additional information, contact your local emergency management agency.

- **Transient Notifications** – State and local vehicles are available for drive-through notification and boats would be used to alert hunters, fishermen and other transient population in the area around the plant. In addition, there are signs and printed information for visitors to the emergency planning zones that instruct them where to receive further information.

Public protective actions

If an emergency occurred at Plant Hatch, state and county officials would be notified immediately. They, in turn, would determine the need for any protective measures for the public. The public within 10 miles of the plant *(known as the "10 mile Emergency Planning Zone")* would be told about an emergency immediately by a variety of emergency notification systems including sirens, CodeRed, loudspeakers and emergency workers. In addition, emergency information would be broadcast over local radio and TV stations designated as alert stations in the Emergency Alert System.

Depending on the severity of the emergency, state and county authorities would advise the public what action, if any, to take for protection against radiation. The three actions health officials might recommend are called **take shelter, go inside/stay inside** and **evacuate**.

Take shelter means to protect oneself by going inside a building and keeping out as much outside air as possible. Taking shelter would generally be advised if there were small amounts of radiation in the air. The Emergency Alert System would be the major source of information and instruction to the public.

Go inside/stay inside means protecting yourself by going inside any type of building, home or business and locking all entry points. This action will keep you safe if there is a security event occurring at the plant. Radiation levels above EPA limits are not detected under this emergency action.

Evacuation may be ordered by government authorities during an emergency at the plant if they decide that the protection provided by taking shelter is insufficient. Citizens would be told to move to pre-designated reception centers outside the emergency area. Evacuation plans are part of the overall Plant Hatch Emergency Plan. These evacuation plans have been thoroughly researched and include provisions for transporting, routing and housing the public; protecting property; and handling virtually every conceivable difficulty during an evacuation. Public officials have been specifically trained to carry out these plans.

Within 24 hours of an incident that requires emergency assistance for area residents – for example, when an evacuation has been ordered – an insurance pool supported by American Nuclear Insurers will establish a local claims office. Insurance personnel can provide emergency funds for out-of-pocket living expenses such as transportation, food, lodging, emergency medical treatment and lost wages.

In any emergency event at Plant Hatch that requires protective action guidelines to be issued, the utility and state and county officials would work closely with the media to ensure media organizations have accurate information to disseminate to the local population around the plant. **During an emergency, the media would have a key role in getting accurate information to the public in a timely manner.**

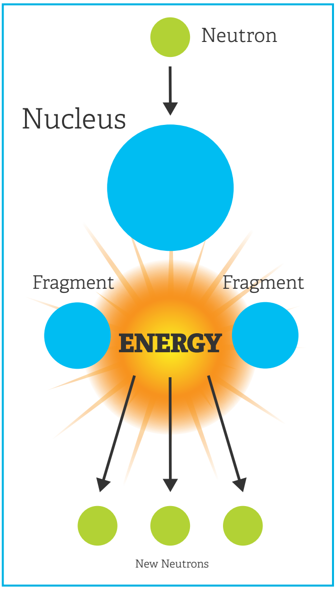
For more information on emergency procedures, view the Emergency Information Calendar found at http://bit.ly/hatch-EIC, or download directly by scanning the QR code below.

Nuclear physics

The fuel source for nuclear power plants is uranium. Unlike coal, gas and oil, uranium does not burn chemically. The heat needed to create steam in a nuclear power plant comes from the splitting of atoms, a process called fission.

Here's how it works

Like most U.S. nuclear power plants, Plant Hatch uses uranium enriched in Uranium-235 *(U-235)* as fuel. In the reactor, uranium atoms are bombarded by neutrons, which are smaller parts of an atom *(sub-atomic particles)*. Fission may occur when a uranium or plutonium atom absorbs a neutron and the atom splits. In the process, the atom produces additional neutrons *(an average of 2.5 each fission)*, which go on to split more U-235 and Pu-239 atoms, which create more neutrons, and so on. The result is a chain reaction.



Nuclear Fission

An important by-product of nuclear fission is heat. When a uranium atom is split, it releases a large amount of energy in the form of heat, which is transferred to the coolant. The fission process also produces two or more isotopes called fission fragments. These radioisotopes also contribute energy to the coolant, but most of the energy generated comes directly from the fission process.

This process occurs in the reactor core where the fuel transfers its heat to water that is then circulated to the steam generator.

Think of it another way...

If you used a magnifying glass to magnify rays from the sun, the rays could get very hot. If you could do this in a pool of water, you'd eventually have a hot tub. And if you could keep this up indefinitely, pretty soon you'd have a sauna.

Heat release is the key objective in power production, regardless of the fuel. Interestingly, while fission heat production may be a 21st-century phenomenon, the principle of using thermal energy *(heat)* to boil water to make steam to turn a turbine to produce power has been around for centuries.

Controlling fission in a nuclear reactor

The purpose of a nuclear reactor design is to create a controlled, self-sustaining chain reaction. In other words, the reaction can be turned on and maintained at a specific level.

When a nuclear power plant and its fuel are new, a neutron source *(Californium)* is used to get the fission process started. Interestingly, everything about the reactor

– the vessel itself, its assemblies and fuel – is designed in advance to produce the desired number of fissions necessary, but no more than the optimum.

Once the reactor has started, enough neutrons remain in the fuel to restart the fission process as needed – for example, after a refueling shutdown.

Control and moderation of the chain reaction are the functions of water and control rods. The water contains boron, a chemical similar in appearance to rock salt. Borated water helps control the fission process by absorbing excess neutrons. The control rods are used to absorb neutrons as needed to control the neutron chain reaction.

More about nuclear physics and fission

Nuclear power plants cannot explode like a nuclear weapon. Nuclear weapons are made of highly enriched *(or concentrated)* uranium or virtually pure plutonium. The type of fuel used in a nuclear reactor is incapable of producing the intense chain reaction of a nuclear weapon. It is physically impossible to detonate nuclear fuel that is used to produce electricity.

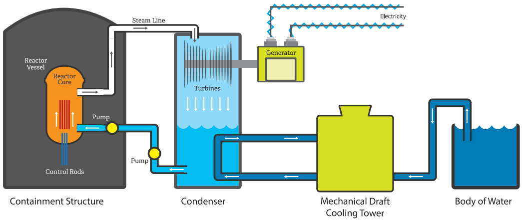
Natural uranium, as it is mined, is 99.3 percent U-238 and 0.7 percent U-235. Only U-235 is readily fissionable. However, since the concentration of U-235 is so low that it will not efficiently sustain a fission chain reaction, it must be enriched. Enrichment is a complicated physical concentration process performed at special plants. Fuel used in nuclear power generating plants is enriched to about 3 to 5 percent U-235. In contrast, weapons-grade uranium is enriched to approximately 95 percent or more. So even though they come from the same base – uranium – the two are completely different.

U-238 also plays an important role in power production. Neutrons are absorbed in U-238 and Pu-239 is created. In older fuel, a significant fraction of the core power is generated from plutonium fissions. Fission of U-238 also can occur, but it is not a significant contributor to the core power.

A small amount of uranium packs a lot of energy. In fact, a nuclear fuel pellet the size of a pencil eraser can produce approximately the same amount of energy as a ton of coal.

Nuclear power generation

Nuclear power plants generate electricity using the same engineering technology as conventional steam plants that burn fossil fuels *(coal, oil, natural gas or other combustibles)*. The difference is the heat source used to make steam. At fossil plants, a "boiler" is used to make steam, while at nuclear plants, reactors generate heat to create steam.



How Plant Hatch Works

At a nuclear plant like Hatch, fuel rods in the reactor core contain uranium oxide pellets. The uranium atoms in the pellets undergo what is called a "chain reaction," where they split, or fission, creating heat. When water is pumped from the bottom of the reactor up around the hot fuel rods, it absorbs the heat and boils. This boiling water turns to steam. The steam turns blades on a turbine generator causing it to spin a magnet inside a coil of wire. The motion causes electrons to move along the wire in a constant flow called an electric current. Cooling water from the cooling tower condenses the remaining steam and flows back to the cooling tower where excess heat is given off as a mist above the tower.

In all steam generating plants, the cycle is the same: the heat source generates steam, which turns turbines, which power the electric generator. The rotation of the generator produces electrical current, which is fed into a grid, which delivers the electricity to consumers.

Reactor controls and operation

The reactor as a heat source is a very simple machine. It has only one set of moving parts, and when in a steady state of operation, no moving parts at all. The moving parts are the control rods, which are slowly moved in and out of the reactor core *(uranium fuel)* to increase or decrease nuclear power. The heat that the reactor core produces is the by-product of a sustained fission reaction. Fission occurs when free-traveling neutrons strike the nuclei of other atoms, causing them to split, while also freeing more neutrons.

Control rods regulate the reactor power because they are made from neutron-absorbing material. If they are inserted inside the core, they absorb most free-traveling neutrons, thus prohibiting the neutrons from striking and splitting other nuclei. If all the control rods are fully inserted into the reactor core, the reactor shuts down altogether. When the control rods are withdrawn, more neutrons are free and more collisions occur, producing even more neutrons and the power level increases.

The element boron is also a neutron absorber, and varying its concentration in the cooling water adjusts the number of neutrons available to produce fissions, thus controlling the power level. Boron is used to fine tune reactor power or for shutting down the reactor during emergency shutdowns, prolonged unit outages or refueling.

By-products of operation

A reactor operating at any power level can be instantly shut down by rapidly inserting control rods into the core or by injecting boron.

However, even with reactor power at zero, the reactor core continues to emit heat. This decay heat must be removed or the temperature inside the reactor core could reach very high levels – high enough to melt the nuclear fuel rods and the nuclear fuel inside them. Because of the nuclear reactions, the reactor core becomes extremely radioactive, with additional isotopes created that give off heat by undergoing radioactive decay.

For this reason, it is extremely important that the reactor core be continuously cooled during plant operation or after shutdown. The following sections summarize Plant Hatch emergency systems that ensure the reactor core is cooled and radioactive products are contained under all types of conditions.

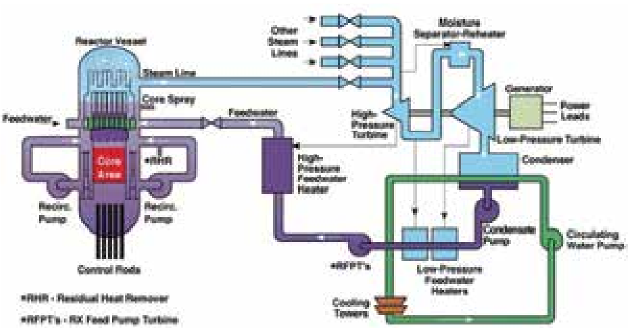
Types of light water reactors

The term, light water reactor, came into being more than 50 years ago when reactors began using normal purified water for cooling, rather than heavy water, which is used in Canada's Candu reactors.

There are two types of light water reactor, distinguished by the type of reactor cooling system they use. These are the pressurized water reactor *(PWR)* and the boiling water reactor *(BWR)*. Plant Hatch is a BWR. The figure across shows the BWR generating cycle of Hatch units 1 and 2.

STEAM SYSTEM

(Boiling Water Reactor)



In a BWR such as Plant Hatch, control rods enter the reactor from the bottom. Operators may insert the rods in a controlled, systematic manner. If there is a need to shut down the reactor quickly, all the rods may be manually or automatically inserted into the reactor core.

In a boiling water reactor like Hatch units 1 and 2, the coolant is pure water that boils inside the reactor vessel. The resulting steam-water mixture proceeds through steam separators to a turbine located outside the reactor building. The steam produced by the nuclear core is, of course, radioactive but it is contained within the main steam and feedwater systems and does not escape containment.

The major difference between boiling water reactors and pressured water reactors is that boiling occurs inside the reactor vessel in the BWR. The steam from the reactor hits the turbine blades, turning the shaft that is connected to the generator, producing electricity.

The spent steam enters a condenser where it is cooled and condensed back to water for reuse. The cooling in the condenser is supplied by water from four mechanical-draft cooling towers; makeup water to the cooling towers is taken from the Altamaha River. This external cooling tower water never comes in contact with the steam. It is warmed in the condenser and returned to the cooling tower, at a temperature about 23 degrees Fahrenheit warmer than when it was removed. This excess heat is given up to the atmosphere and surrounding water with a minimum of environmental disruption.

Now called "condensate", the cooled water leaves the condenser and is pumped through feedwater heaters back into the reactor where the cycle continues.

The BWR operates at constant pressure and maintains constant steam pressure similar to most fossil boilers.

Accident prevention

One essential point about a light water reactor is that it cannot explode like a nuclear weapon. Nuclear weapons are made of highly enriched uranium or virtually pure plutonium. No nuclear explosion is possible with the low-enriched fuel used to produce electricity.

The core of a light water reactor contains a large amount of highly radioactive material at high temperature and pressure. The chief danger is a loss of cooling water, causing a build-up of heat that would damage or melt the fuel rods.

To prevent this, commercial nuclear power plants are designed with a strategy of defense-in-depth.

The first layer of designed features is essentially self-regulating. In general, the fission process slows as the coolant temperature rises.

Other passive systems include physical barriers that restrict the spread of contamination outside the primary systems. Barriers such as the fuel's zirconium alloy cladding, the thick reactor vessel and the thick concrete containment provide protection in case of an accident.

Active systems are designed to ensure continuous core cooling and safe shutdown of the plant. Various physical barriers at Plant Hatch keep radioactive fission products from reaching the environment. Such barriers are known as: Containment, Fuel Cladding, Reactor Vessel.

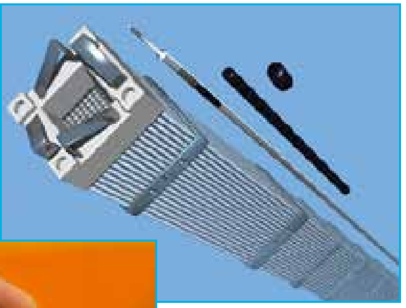
- **Containment** – Plant Hatch uses multi-barrier pressure suppression type containments consisting of a primary and a secondary containment. It is called the General Electric Mark 1 containment.

  The primary containment consists of two structures, the drywell and the suppression chamber, also known as a "torus". The reactor vessel is contained within the drywell. The drywell is connected with vent pipes to the suppression chamber. Together, the drywell and suppression chamber make up the primary containment. Their function is to contain energy and radioactivity released during a Loss of Coolant Accident *(LOCA)*.

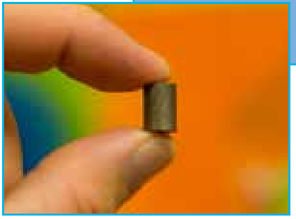
  The drywell is a steel pressure vessel with a spherical lower portion and a cylindrical upper portion resembling an inverted light bulb. The drywell is enclosed in five feet of concrete. This provides extra shielding and structural strength.

The pressure suppression chamber is a steel pressure vessel in the shape of a torus or doughnut, below and encircling the drywell. Large pipes connect the drywell and torus. Water in the torus is used to relieve pressures and quench steam in the drywell in the event of a LOCA.

The reactor building, or secondary containment, surrounds the drywell and suppression pool. The containment building is constructed to prevent the release of radioactivity to the environment under both normal operating conditions and the most severe of accident conditions. Therefore, all systems that potentially could release large amounts of radioactivity are located in the containment structure. At Hatch, the containment structure houses the reactor vessel and the reactor cooling system with reactor coolant pumps and pressurizer.



Fuel Assembly, Fuel Rod, Cladding, Fuel Pellet



Fuel Pellet

The containment building is made of thick concrete walls. The concrete is post-tensioned and reinforced with a network of steel rods *(rebar)*, each about the thickness of a human forearm. The structure is lined with thick steel and is designed to withstand extremes of temperatures and pressures which might result from a serious accident. The containment is sealed and must be entered and exited through special air-lock chambers. All penetrations such as pipes or conduits entering the containment walls have automatic valves that close at the first sign of trouble, isolating and sealing off the containment to prevent leakage. As a Category 1 Seismic structure, the containment building can withstand powerful earthquakes and high winds.It can survive tornado winds of 360 miles per hour, as well as the impact of airborne debris such as utility poles or something as massive as an automobile. In addition, a comprehensive study conducted by the Electric Power Research Institute concluded that the containment structures that house nuclear fuel are robust and protect the fuel from impacts of large commercial aircraft.

- **Fuel Cladding** – Uranium fuel used at Plant Hatch is in the form of a ceramic "pellet" which normally houses 99.99 percent of the radioactive fission products. These fuel pellets are stacked inside tubes. The tubes are arranged in fuel assemblies and are placed within the reactor vessel, comprising the core.

- **Reactor Vessel** – The reactor vessel is a barrel-like structure about 16 feet in diameter with carbon steel walls lined with stainless steel. It is located inside the lower part of the containment building. The reactor vessel with its attached pipes, reactor coolant pumps and the pressurizers comprise the primary coolant system boundary. This keeps any fission products, which may escape the cladding in the event of broken fuel tubes, from reaching the rest of the plant.

Engineered safety systems

The function of the engineered safety systems is to contain, control, mitigate, and terminate accidents and to maintain safe radiation exposure levels below applicable federal limits and guidelines. Some of the safety-related systems defined as engineered safety systems for Hatch include:

- **Reactor protection system** – The reactor protection system is designed to shut down the reactor safely. The system continuously monitors important plant parameters as well as the operation of the reactor. If a problem occurs and causes the reactor power, pressures, temperatures, or coolant flow rates to exceed prescribed limits, the reactor shuts down automatically by the immediate insertion of all control rods into the core. The reactor also can be shut down manually if the reactor operator determines that a potentially unsafe condition exists.

- **Emergency core cooling systems (ECCS)** – The most immediate action to be taken after a loss of coolant accident is to replenish cooling water back into the reactor and to assure that the core remains under water. The function of the ECCS is to provide the reactor with emergency cooling water after normal cooling water has been lost.

  There are two ECCSs, each designed to be completely redundant. Their operation is initiated either manually by an operator or automatically when the control systems in the plant detect an accident condition.

  Both the high pressure injection and low pressure injection systems can inject water for long periods, pumping water supplied either from the refueling water storage tank or through recirculation from the containment sump.

- **Suppression pool cooling** – The large volume of stored water in the suppression pool, or torus, is used as emergency water storage, as well as a heat sink for energy freed in the event of an accident. The torus water can also be cooled by heat exchangers and other external water supplies.

- **Emergency power** – During normal operations and when the plant is shut down, components that could be used in emergency situations are powered with electricity from the off-site power grid.

  Hatch units 1 and 2 have two emergency diesel generators each and share a fifth diesel generator that can supply power for either unit. Either of these generators is designed to supply the power needed for safe operation of the plant's emergency systems if off-site power is not available.

  Additionally, most of the safety-related instrumentation needed for safe shutdown of the plant can be operated by DC batteries that are constantly kept charged and ready for service if all other power sources should fail.

- **Containment isolation system** – The purpose of this system is to isolate and close all openings to the containment if a high radiation situation exists in the containment building. Automatic signals are sent to all valves and dampers to close, thus isolating all containment penetrations – except for those needed for the operation of the ECCS.

- **Habitability systems** – The control room heating, ventilation and air-conditioning *(HVAC)* system protects control room personnel from accident conditions. The atmosphere inside the control room can be isolated from the rest of the plant and the outside environment to keep out radiation, smoke, toxic substances and other harmful airborne contaminants.

- **Combustible gas control system** – The combustible gas control system consists of two hydrogen recombiner subsystems and two hydrogen monitoring subsystems. Hydrogen, which can be present after a Loss of Cooling Accident, is removed to avoid the possibility of fires and explosions.

In summary, Plant Hatch has a number of redundant safety systems to prevent an emergency at the plant or to restore the plant to a safe condition should an emergency occur.

Spent nuclear fuel

Spent nuclear fuel, also known as used fuel, is a solid material that is safely stored at nuclear power plant sites, either in steel-lined, concrete pools filled with water or in steel or steel-reinforced concrete containers with steel inner canisters. The first storage method is referred to as the spent fuel pool. The second storage method is called dry cask storage.

On-site storage of spent fuel is well protected by a combination of sturdy plant construction, state-of-the-art surveillance and detection equipment, and armed, well-trained paramilitary security forces.

Nuclear plants were designed to store at least a decade's worth of used fuel. And with dry cask storage, used fuel can be safely stored much longer. The U.S. Nuclear Regulatory Commission *(NRC)* has determined that used fuel can be safely stored at plant sites for at least 30 years beyond the licensed operating life of the plant. While used nuclear fuel can be safely stored on-site, Southern Company and the industry maintain that a permanent underground repository is the best long-term solution. Let's examine these options.

Spent fuel pool

After enough U-235 has been used up in the fission process, the fuel assemblies need to be removed and replaced with new fuel assemblies. However, the used fuel is highly radioactive. At most plants, used fuel is stored in large, steel-lined, concrete pools filled with water. These pools are known as spent fuel pools. Both water and concrete are excellent radiation shields. In these spent fuel pools, the water acts as an absorber, which prevents radiation from escaping from the pool. The water also keeps the fuel cool while the fuel decays, or becomes less radioactive over time. The water itself never leaves the inside of the plant's concrete auxiliary building.


Spent Fuel Pool

Spent fuel pools are very effective for storing used fuel safely. Uranium, in the form of small pellets, is the fuel used to generate the power to operate nuclear power plants. These fuel pellets are about the size of a pencil eraser. Fuel pellets are placed in long metal fuel rods while being used in the reactor. Once this fuel is used or partially used, it must be moved to an area called the spent fuel pool to cool.

To prevent spent fuel pools from becoming too crowded, used fuel assemblies eventually must be removed from the pool. Commercial nuclear power plants in the United States are required by law to contract with the federal government for the permanent disposal of used nuclear fuel. Southern Company nuclear plants have paid almost a billion dollars into the Nuclear Waste Fund, but the government has failed to live up to its contractual obligation to dispose of used fuel.

Dry cask storage

The government's delay in providing a permanent repository for used nuclear fuel means that nuclear plants must store more used fuel than expected and store it for longer than originally intended. Since 1986, dozens of U.S. nuclear plants have supplemented their storage capacity by building above-ground dry storage facilities. Other countries also have safely and successfully stored used fuel above ground since the mid-1970s.

Southern Nuclear uses dry cask storage at each of our plant sites.

Dry storage containers are cylindrical containers constructed of steel or steel-reinforced concrete and lead, which serve as proven, effective radiation shields. These casks effectively shield the radiation as the used fuel continues its cooling process. Once loaded with used fuel assemblies, the containers are stored horizontally in a concrete vault, or they stand upright on a thick concrete pad.

Currently, used fuel is being stored in dry cask storage as well as in the spent fuel pool at Plant Hatch.

Each dry cask storage container design must be approved by the NRC. The agency requires that dry storage containers be constantly monitored and relicensed every 20 years. The containers are designed and tested to prevent the release of radioactivity under the most extreme conditions – earthquakes, tornadoes, hurricanes, floods and sabotage – and they are naturally cooled and ventilated.

While dry cask storage is very safe for the public and the environment, it is expensive. Dry storage containers range from $500,000 to more than $1 million each. And remember, utility customers have already contributed billions of dollars into the federally mandated Nuclear Waste Fund for a national permanent repository.

Radiation and health

Radiation is a natural part of our environment. It's in the air we breathe, in the food we eat, in our homes and even in our bodies. The levels of background radiation vary greatly from one location to another. For example, the background level in Denver, Colorado, is almost twice that in the Plant Hatch area.

Man-made radiation

People also are exposed to sources of man-made radiation, such as X-ray machines, radioactive materials used in nuclear medicine and radioactive materials released in nuclear power production. Radiation from these sources is no different from natural background radiation we receive daily.

Measurement

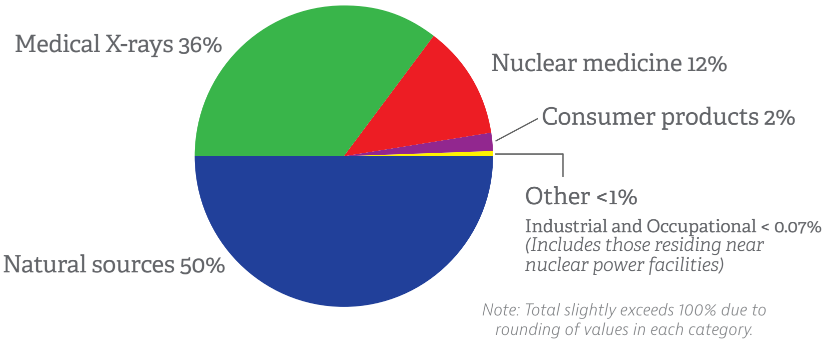
Radiation is measured in units of millirem. In the United States, the average person receives from 250 to 300 millirem a year from natural background radiation. That same person also receives about 90 millirem a year from medical care. The average person receives less than 1 millirem a year from living next to a nuclear plant. Sources of radiation are listed below.

Radiation effects

How radiation affects us depends upon the kinds of particles or rays, the amount and duration of exposure, how much of the body is exposed, how much radioactive material stays in the body, and how old we are.

Small increases in radiation exposure will not harm you. That is why people don't worry about the change in background radiation exposure when they move from one city to another. Even so, nuclear power plants operate to keep radiation exposure to the public as low as possible.

Large amounts of radiation — more than a hundred thousand millirem — could possibly harm you. The chances are very small that an accident at Plant Hatch would put out a significant amount of radiation. But if such an accident should happen, emergency plans are designed to help residents in the local community avoid receiving dangerous amounts of radiation.



This chart shows that the nuclear power industry is only a small contributor to your average radiation exposure.

Maintaining safety and security

U.S. nuclear power plants are among the most robust, secure facilities ever built. They have significantly higher design and performance requirements than other industrial stations, and they are built to withstand much larger earthquakes than any other facility.

Our company was already working with the NRC and the rest of the nuclear industry to evaluate seismic risks and hazards using new modern methods well before the 2011 event at the Japanese Fukushima Daiichi nuclear plant.

Although our plants are located in regions with low seismic activity, Southern Nuclear has regularly assessed our plants against the current state of seismic knowledge. These regular assessments have resulted in enhanced margins of safety and increased reliability.

As the state of knowledge of seismic events progresses, so do the seismic models and the tools available to assess the impact on nuclear power plant performance. We continue to reaffirm that our nuclear energy facilities are built robustly enough to safely shutdown and withstand seismic events.

Protecting critical systems

Southern Nuclear considers cyber security to be a serious issue and has allocated significant resources to develop and implement a comprehensive program to protect its critical systems from cyber attacks.

The SNC cyber security plan provides a means to achieve high assurance that digital computer and communication systems and networks associated with critical functions, including safety, security and emergency preparedness, are effectively protected against cyber attacks.

The CSP has established a defensive in depth model that places our most protected equipment behind boundary isolation devices. Our plant safety and control systems are not connected to business networks or the Internet. Comprehensive controls over the use portable media and equipment are in place.

Southern Nuclear participates with the industry and government agencies to be aware of and assess its readiness for emerging cyber threats.

Plant Vogtle units 3&4

Plant Vogtle units 3 and 4 will be the first new nuclear units built in the United States in the last three decades. As construction continues, Georgia Power remains focused on completing Vogtle units 3 and 4 with safety and quality as top priorities. Once complete, the Vogtle site will produce enough electricity to power 1 million Georgia homes and businesses.

Nuclear energy is an essential piece of Georgia Power's commitment to deliver safe, clean, reliable and affordable energy for customers. Emission-free nuclear energy, generated by the existing units at Plants Vogtle and Hatch, currently accounts for more than 20 percent of Georgia's overall electricity production every year. Once the new units come online, Plant Vogtle will be the only four-unit nuclear facility in the United States.

Economics

- The two new units at Plant Vogtle will provide customers with a new carbon-free energy source that will put downward pressure on rates for 60 to 80 years.
- The construction of the new Vogtle units is driving thousands of American jobs and will create nearly 800 new nuclear careers once operational.
- More than 7,000 workers from across the country remain on-site today working to complete the nation's first new nuclear units in 30 years.
- Georgia Power paid $37 million in ad valorem taxes to Burke County in 2017, with the majority from Plant Vogtle.
- Vogtle 3 and 4 is currently the largest construction project in Georgia, and one of the largest in the state's history.
- The new Vogtle units represent an investment in Georgia's energy future, helping drive the state's thriving economy.

New units at Plant Vogtle

Words to know

Chain Reaction — a sequence of reactions that cause themselves to repeat.

Cold Shutdown — when the cooling-water temperature in the reactor is below the boiling point and the pressure is reduced to atmospheric pressure.

Coolant — a fluid, usually water, used to cool a nuclear reactor and transfer heat energy.

Containment — the steel and concrete structure along with the various components that surround and isolate the reactor.

Contamination — the presence of radioactive material in a place where it is not desired.

Control Rods — movable rods used to slow down or stop a nuclear chain reaction by absorbing neutrons.

Core — the central part of a nuclear reactor that contains the fuel assemblies.

Curie — the basic unit used to describe the strength of radioactivity in a sample of material.

Dosimeter — a device that can be worn and used to measure the radiation a person receives over a period of time.

Emergency Core Cooling System — an emergency system designed to keep the reactor core cool if normal cooling fails.

Emergency Planning Zone (EPZ) — the 10-mile diameter around the plant. This area is required to have special emergency plans.

Fission — the splitting or breaking apart of atoms into two or more new atoms. The process releases energy and produces heat.

Fuel Assemblies — a group of fuel rods assembled into a bundle.

Fuel Pellets — pencil eraser-sized uranium oxide pellets. A reactor core may contain up to 10 million pellets.

Fuel Rods — long, hollow tubes of zirconium metal that contain stacks of fuel pellets.

Half-life — the length of time it takes for a radioactive substance to lose one-half of its radioactivity.

Millirem — a unit used to measure radiation dose.

Nuclear Regulatory Commission (NRC) — the U.S. government agency that regulates the nuclear power industry.

Plume — something such as smoke, steam or water that rises into the air in a tall, thin shape.

Radiation — energy released in the form of tiny particles or electromagnetic waves.

Reactor Core — the central portion of a nuclear reactor containing nuclear fuel, water and the control mechanism as well as the supporting structure.

Reactor Trip (SCRAM) — refers to the insertion of control rods in the fuel core of the reactor, stopping the fission process.

Reactor Vessel — the thick steel vessel that contains the fuel, control rods, and coolant.

REM — roentgen equivalent man. Common unit used for measuring human radiation doses, usually in millirem *(1,000 millirem = 1 rem)*

Shielding — any material, such as lead or concrete, used around a nuclear reactor to protect workers and equipment.

Spent Fuel — used nuclear fuel awaiting disposal.

Uranium — a radioactive element found in natural ores. Uranium is the basic fuel of a nuclear reactor.

Southern Nuclear

Media Line: 205-992-5395

Georgia Power

Media Line: 404-506-7676

fb.com/southernnuclear

@southernnuclear

@southernnuclear

linkedin.com/company/southernnuclear