



COLUMBIA GENERATING STATION

Overview

Columbia Generating Station is the only nuclear power plant currently in operation in the Northwest. A boiling water reactor, it uses nuclear fission to heat water into steam. The steam spins turbines connected to a generator that produces electricity. Uranium, a naturally occurring element, is the primary fuel source.

Reliable, Affordable Power

The production cost of nuclear power is relatively inexpensive. Columbia Generating Station's cost of power for fiscal year 2005 was 3.34 cents per kilowatt-hour.

Columbia Generating Station power is also extremely reliable. Unlike hydro, wind, and solar generation facilities, Columbia Generating Station is not dependent on weather conditions—it can produce electricity twenty-four hours a day, seven days a week. In addition, operators are able to adjust power levels to meet the Bonneville Power Administration's needs. This is referred to as "load following."

Refueling and maintenance outages occur every two years during the spring, when the river system has ample water supplies to generate electricity through the Columbia and Snake River dam system.

Environmental Attributes

Nuclear plants do not create greenhouse gases, so nuclear power is considered "clean energy." Each year the U.S. fleet of 103 operating nuclear plants avoids the harmful emissions of traditional coal and other carbon-based fuels. In 2004, those avoided emissions equalled:

- 3.4 million tons of sulfur dioxide.
- 697 million metric tons of carbon dioxide.
- 1.1 million short tons of nitrogen oxide.

During a typical calendar year, Columbia Generating Station, alone, saves the environment from the following quantities of air pollutants:

- 62,000 tons of sulfur dioxide.
- 5,320,000 tons of carbon dioxide.
- 28,000 tons of nitrogen oxide.

All commercial nuclear plants do, however, create radioactive waste, much of which is stored in indoor pools specially designed to hold the spent fuel rods. Like many plants, Energy Northwest also has an on-site dry cask storage facility that allows for storage of spent fuel rods in specially designed concrete and steel casks. Moving spent fuel into dry storage casks makes room in the spent fuel pool for receipt of new fuel and the off-loading of used fuel.

How It Works

Fission occurs when a subatomic particle called a neutron strikes and is absorbed into the nucleus of a uranium atom. This causes the nucleus of the atom to become

Type

Boiling Water Reactor (nuclear)

Generating Capacity

1,157 megawatts net

Location

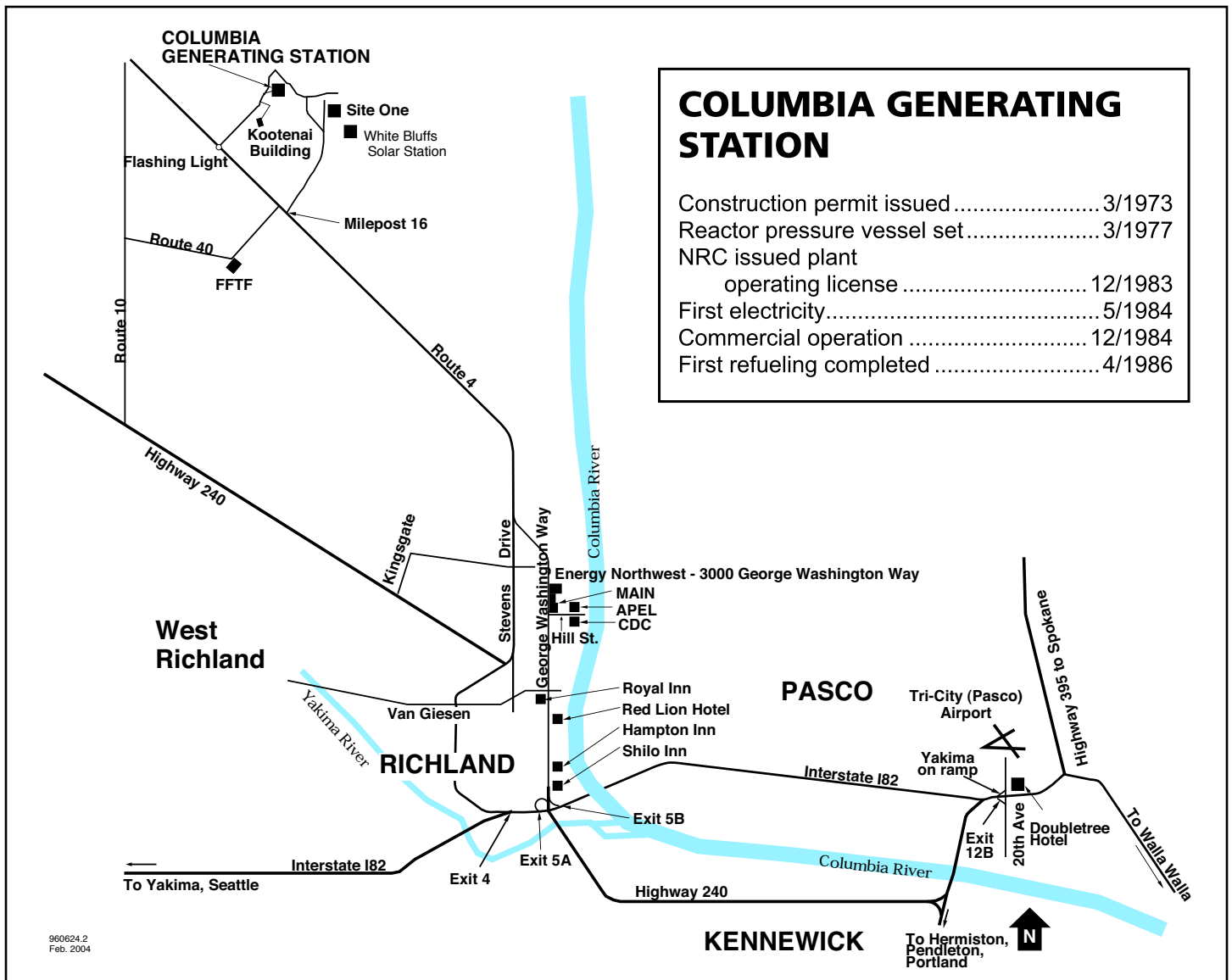
Near Richland, Washington

Site Size

~1,089 acres

unstable and to split, producing heat and additional neutrons and other fission products. These additional neutrons, in turn, bombard other uranium atoms, causing them to fission, and resulting in a self-sustaining chain reaction. Each splitting of a uranium atom releases a relatively small amount of heat. In a nuclear reactor, there are billions of atoms in the fuel core splitting every second, producing the large amount of heat needed to boil water.

Heat generated in the fuel core turns water into high-pressure steam. The steam is then piped to the large turbines, where it flows through the turbine blades and causes the turbine shaft to spin at high speed



(1,800 rpm). This, in turn, causes an electromagnetized generator rotor to spin, generating electricity. After flowing through the turbines, the steam moves through a condenser where it is cooled and condensed back into water.

The condensed water is then pumped back to the reactor to be reheated and turned back into steam, continuing the cycle. A separate, non-radioactive water system carries the heat from the condenser to six cooling towers located outside the plant. The clean heat from the non-radioactive water is released into the atmosphere by the cooling towers. All of Columbia Generating Station's power is sold at cost to the Bonneville Power Administration, which transmits it to where it is needed in the region.

Energy Northwest

Energy Northwest is a public power joint operating agency headquartered near Richland, Washington. The company actively explores and develops resource generation opportunities and a wide range of energy and business services. Currently, Energy Northwest operates four power plants: Columbia Generating Station, Packwood Lake Hydroelectric Project, Nine Canyon Wind Project, and White Bluffs Solar Station.

As with all Energy Northwest projects, Columbia Generating Station is ISO-14001: 2004 certified.

INFORMATION CONTACT:

Communications
(509) 372-5860

Energy Northwest
P.O. Box 968
Richland, WA 99352-0968

www.energy-northwest.com