

Russia Building First Floating Nuclear Plant

by Marsha Freeman

At a ceremony on April 15, attended by the head of Russia's Federal Atomic Energy Agency, First Deputy Prime Minister Sergei Ivanov, and the President of Kurchatov Institute, Yevgeny Velikhov, Russia inaugurated a program to construct the first series of floating nuclear power plants. Such stand-alone nuclear facilities, which can bring electric power and process heat to remote regions and underdeveloped nations, have been planned for decades. Now the world's first floating nuclear plant is finally under construction.

The first pair of ship-mounted 35-megawatt nuclear reactors, modelled on the units in operation for decades in Russia's submarines and nuclear-powered ice breakers, will be completed in 2010. They will supply power to the Sevmash shipyard, which builds nuclear-powered submarines, and where the ship for the floating plants is under construction. Some of the electricity from the nuclear plants will also be supplied to a nearby municipality.

As a commentator for *RIA Novosti* noted on April 14, floating nuclear power plants "are the dream of power-hungry regions and large industrial enterprises that require an uninterrupted power supply, when no centralized source is available." The first seven floating nuclear plant units are being designated for remote sites in Russia that are chronically short of power. These are scheduled to be on line by 2015. Reportedly, the natural gas giant Gazprom is considering units for its Arctic oil extraction operations.

Nuclear Power for All

But the real promise of this "new Russian technological wonder," is the introduction of nuclear power to developing nations. At the ceremony, where a commemorative plaque was dedicated, Russian nuclear officials reported that a dozen nations in Asia and Africa have expressed interest in obtaining floating nuclear power plants. In fact, Russia has offered to provide such technology to many countries, including Indonesia, China, Malaysia, Algeria, Argentina, and also Namibia, with which it is negotiating agreements to secure uranium for fuel.

The first ship-borne plants, named for Russian scientist Mikhail Lomonosov (1711-1765), are being built at the shipyard in Severodvinsk and will serve as a working model to be visited and examined by other nations, which are potential importers of the plants.

Responding to criticism about safety, nuclear agency head

Sergei Kiriyyenko stated that the safety guarantee "is the tremendous expertise built up by the Russian nuclear ice-breaking fleet, with its 7,000 reactor-years" of safe operations. The \$200-300 million Lomonosov will drop anchor in the White Sea, with an expected service life of 38 years.

When operating in other countries, the reactor units would be returned to Russia for defueling and maintenance. Russia will own and be responsible for the facilities, selling the plant's output to the customer. The plant is capable of supplying the power needs for a city of 200,000, and when used for desalination, can produce 240,000 cubic meters of fresh water daily.

When the ship arrives at its destination, towed by a tug boat, a minimum of infrastructure is needed beforehand. Transformer units for the power, pumps, and other auxiliary equipment will all be on the barge. It is estimated that one floating nuclear power plant will replace up to 200,000 tons of coal, or 100,000 tons of petroleum, per year.

Reactors on Barges

The concept of placing nuclear reactors on barges, that can be situated in the ocean, on shore, and in estuaries, is not a new one. In 1972, Public Service Electric and Gas Company of New Jersey, signed a contract with Offshore Power Systems, owned by Westinghouse, to purchase two floating nuclear plants. A few months later, the utility exercised an option to buy two additional units. Two years after that, an application was submitted to the regulatory agency to build the Atlantic Generating Station, 2.8 miles off the New Jersey coast, about 11 miles northeast of Atlantic City. The first plant was to come on line in mid-1988.

Between 1972 and 1978, Offshore Power Systems spent \$100 million for dredging, construction, and materials purchases at the Blount Island factory, near Jacksonville, Florida, to prepare for the manufacture of the world's first floating nuclear power plants. The concept was to place a conventional plant on top of a barge and float it to the desired location. Other electric utilities, on the East and West coasts, expressed interest.

These plants were never built. Even before the accident in 1979 at Three Mile Island, political sabotage by the well-funded neo-Malthusian anti-nuclear movement had led to the demise of nuclear power. Floating nuclear plants eventually went the way of the more than 100 cancelled conventional reactors, and the never-built next-generation breeder reactors and high-temperature gas-cooled nuclear power plants.

Since 1998, Russia has been trying to rebuild, modernize, and reorganize its nuclear power industry. But this effort could not begin in earnest, until President Putin more recently reasserted Russia's national sovereignty, wresting control of strategic enterprises from privatizing oligarchs. While Russia is building new conventional nuclear power plants in Iran, China, and India, it is also making the most modern nuclear technology available for export.