

Yukon Town Studies Option—30 Years of Clean Nuclear Energy

A Japanese corporation wants to bring a new type of nuclear power plant—and with it international attention—to the tiny Alaskan community of Galena.

The small plant could provide light and heat to the village on the Yukon River for 30 years, without causing any pollution and without taking up any more space than a large spruce tree.

Several more plants also could be brought in to power other municipalities and commercial facilities in Alaska, cutting fuel costs by more than 75 percent.

Toshiba's 4S plant design, which stands for "super-safe, small and simple," could completely change the energy picture for a sparsely populated, rural area, where electricity costs are among the highest in the country, owing to diesel-fired generators that serve as the prime energy source for the small village.

The Washington, D.C., law firm ShawPittman has been hired by Galena to assist in its search for an alternative to diesel-generated electricity. The firm has worked with Toshiba on other nuclear issues unrelated to the 4S plant. Upon studying the region's energy situation, ShawPittman attorney Doug Rosinski said the 4S system "fit like a glove."

Rosinski pointed out that hundreds of millions of gallons of diesel fuel must travel throughout Alaska, mostly by barge, and then only when ice isn't blocking waterways. Apart from the transportation expenses, the diesel generators produce very costly electricity and have well-known adverse environmental impacts.

"They use about 2 million gallons of diesel a year and get four to five megawatts of power—at a cost of between 20 and 32 cents per kilowatt hour in Galena. It gets to 60 below zero in Galena, cold enough to freeze propane, so energy and heat are important. In some parts of Alaska, the cost of electricity can go up to \$1 a kilowatt hour," he said. "In addition, extensive military installations in the area use a lot of the polluting diesel."

The 4S is an advanced design nuclear reactor cooled by liquid sodium. Small enough to be built in a factory and transported to the generation site,



the reactor would be transported by barge.

Toshiba designers compare it to a "nuclear battery," since it is self-contained, with no moving parts needed to ensure safe shutdown and no need for workers to operate the plant. Unlike standard large-scale nuclear plants, the 4S does not refuel. Instead, it runs for a pre-set operating period—about 30 years. This allows for safe, underground installation of the plant, with only a concrete lid and some secondary pipes at the surface.

Providing 10 megawatts of power—much less than the 1,000-megawatt average of large-scale nuclear plants—the plant could provide plenty of electricity to meet Galena's needs, Rosinski said.

"A system like the 4S is estimated to put costs at about 6 to 8 cents per kilowatt hour. This would turn the whole picture upside down for them. Electricity would be an inexpensive, instead of prohibitively expensive, resource," he added.

Capital costs for the first 4S reactor for Galena

are estimated at \$20 million to \$30 million, assuming some cost-sharing with a construction consortium and, perhaps, the government, Rosinski said.

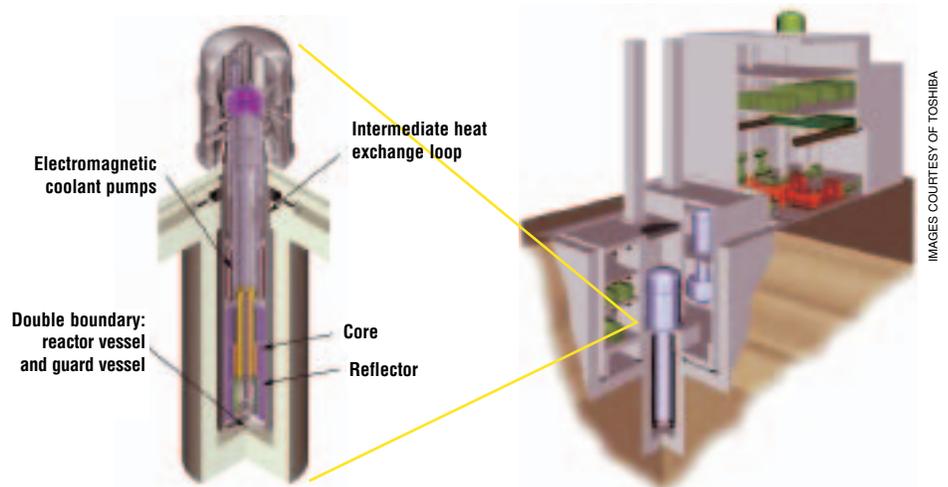
The construction and operating costs for the first-of-a-kind reference plant in Galena would likely be higher than subsequent plants, he said. But, he added, even with the expected higher costs for the first plant, the cost is competitive with other energy sources under consideration by Galena, particularly proposals to put a large coal-fired power plant near a coal seam somewhere in Alaska and run power lines to Galena over long distances.

"Putting hundreds of miles of power lines through virgin forests is not a good idea. Up there a small nuclear plant makes a lot of sense—you save money and it's environmentally friendly."

Alaska officials are listening. Toshiba first met with Galena officials in 2003 to present their plan. Alaska Gov. Frank Murkowski and the staffs of the Alaska federal delegation have been briefed, Rosinski said.

It could be the governor is convinced: He's interested in building not just one, but five or more 4S plants. And a recent Department of Energy review of the economic and environmental impacts of a broad array of possible energy sources for Galena rated the 4S plant as the preferred choice in both categories.

Environmentally Safe Toshiba 4S Technology



The Toshiba 4S features a sodium-cooled reactor that requires no refueling during its 30-year lifespan.