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8 SRS parcels to be offered for 'mini-reactor' research

By **Rob Pavey**

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Eight locations within Savannah River Site have been identified as venues for the development of small, portable nuclear reactors that could become commercially available in 10 to 20 years.



Special/Hyperion

This drawing shows the Hyperion Power Module, a proposed mini nuclear reactor designed to power remote mining operations, large government facilities or isolated communities. Hyperion, based in Denver, is one of several firms hoping to use vacant land at Savannah River Site for nuclear research and development.

“We have the land and the expertise,” said Jim Giusti, a U.S. Department of Energy spokesman at the 310-square-mile site. “They’re going to tell us what their needs are, and then we tell them if we can meet it.”

DOE announced agreements last week with three firms interested in using SRS as a home base to study and develop mini reactor technology. The projects would combine private investor funding with government land and help from the site’s well-equipped Savannah River National Laboratory.

The companies – Hyperion Power Generation, Holtec International subsidiary SMR and NuScale Power – could later be joined by as many as five other mini-reactor firms now in discussions about using the South Carolina site.

Giusti said the process will move slowly, with no guarantees that each interested firm would someday market a portable reactor design.

“We’re starting a marathon race and this is the beginning,” he said. “Some of these companies will make it to the

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end of the race and actually build reactors, and some of them will drop out.”

The parcels to be offered to the companies are mostly in areas that once housed nuclear-weapons facilities and have already undergone suitability studies related to water table, geology, earthquake resistance and other factors. Some have undergone recent

cleanups and closures that make them available for new missions.

The new agreements include a timetable in which land-lease details and an assistance agreement with the national lab would be devised.

“It is basically to get a framework of what everyone would bring to then table,” Giusti said.

The concept of small, modular reactors is to create prefabricated units that could be built in one site and moved – by truck or rail car – to an area where they could be rapidly installed and deployed. They would have benefits in small or remote populations; and in sites where temporary power is needed, such as remote mining operations and military deployments.

The cost of bringing a concept reactor through design and licensing to production has been estimated at \$150 million to \$200 million all the way up to the \$750 million to \$1 billion range.

Though it is too early to forecast effects such as creation of jobs in the region, the longterm hope is that facilities to manufacture mini reactors would be established in or near SRS, where the research technology remains intact.

“We know this is technology that has strong international interest and there is a definite market for them,” Giusti said. “We want to make sure the technology to make these reactors resides in the U.S. and we want to help move that objective forward.”

By offering the national lab’s array of technical assistance and a secure site in which to develop the projects, DOE hopes to stimulate investor interest that will help the private companies finance their projects.

Part of that process will involve licensing of new reactor designs – a function managed by the U.S. Nuclear Regulatory Commission.

“Whenever the developments at Savannah River progress to the point that any of these companies actually want to pursue actual design activities, they could come to us for licensing,” said Scott Burnell, a spokesman at the NRC’s headquarters in Rockville, Md.

Even if the projects are housed within government facilities, the reactors would still undergo the same scrutiny and regulatory oversight applied to any nuclear project.

“The same basic rules would apply as they did for the AP1000,” Burnell said, referring to the Westinghouse reactor design that has been approved – after years of study – for projects including the \$14 billion expansion of Southern Nuclear’s Plant Vogtle in Georgia.

It is likely that scale models of key components would be built and tested as part of the licensing process, he said.

“At some point there would be real world experiments done on key aspects on

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whatever design approach the companies want to take," he said.

The NRC has been approached about licensing for several mini reactor projects.

"There have been some research versions of a couple of the concepts being talked about," Burnell said. "But in terms of actual power producing, formal reactors, it hasn't happened yet."

Small reactor research at a government site also brings risks – both financial and environmental, said Tom Clements, the nonproliferation policy director for the Alliance for Nuclear Accountability.

"Any small, modular reactors being sought for Savannah River Site not only don't exist now but will be expensive," he said, noting that Congressional budgets change from year to year. "Vendors can't expect the federal government to pick up a large part of the construction costs, but that's the only way they will move forward."

He also questioned the fate of spent fuel inside mini reactors, which could be shipped back to their point of manufacture for disposal.

"SRS would be at risk of handling large amounts of high-level nuclear waste," he said. "This problem would be exacerbated if no disposal site exists for spent fuel and the public likely will rebel against more nuclear waste being stored or dumped at SRS."

In addition to the three companies that signed new partnership agreements last week, other companies possibly exploring SRS include Wilmington, N.C.-based GE Hitachi Nuclear Energy, San Diego-based General Atomics, whose proposed 240-megawatt EM2 reactor would be capable of burning surplus plutonium; and TerraPower, a firm financially supported by Microsoft founder Bill Gates. Giusti would not say whether those companies are among the five unnamed firms negotiating for SRS research aid.

According to the NRC, the Tennessee Valley Authority is working on a similar project with Babcock & Wilcox Nuclear Energy subsidiary Generation mPower, which wants to build mini reactors at TVA's vacant Clinch River site in east Tennessee.

Nuclear Regulatory Commission and its role in advanced reactor development:

www.nrc.gov/reactors/advanced.html

Savannah River National Laboratory fact sheets:

<http://srnl.doe.gov/factsht.htm>

Portable Power research and SRNL:

<http://srnl.doe.gov/>

Hyperion Power Module reactor design:

www.nrc.gov/reactors/advanced/hyperion.html

Hyperion: more about the company:

www.hyperionpowergeneration.com/

NuScale Power's reactor plan:

www.nuscalepower.com/

Holtec's proposed underground mini-reactor:

www.businesswire.com/news/home/20110201007705/en/Holtec-International-Subsidiary-SMR-LLC-Launches-Detailed

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He said the project will move

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He said the project will move "slowly", he has never spoken truer words. Anything involving the governement and especially DOE moves slow if at all.

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