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From left: Paul Hunt, Savannah River Nuclear Solutions; T. Zack Smith, U.S. Department of Energy; and Robert Trimble, PMP, Savannah River Nuclear Solutions

VENGERS

2013 PMI
PROJECT OF
THE YEAR
AWARD
FINALIST

Facing a nuclear cleanup with heightened complexity, the Savannah River project team met its objectives—and then some.

BY NOVID PARSI

PORTRAITS BY BRIAN DRESSLER





ome to an aging stockpile of nuclear waste—some of which dated back to the 1950s—the Savannah River Site near Aiken, South Carolina, USA needed a major cleanup job.


The facility was built by the U.S. government in the early 1950s, and at one time produced one-third of the nation’s weapons-grade plutonium and all of its tritium, both critical ingredients of nuclear weapons. But it also generated transuranic, or plutonium-contaminated, waste that was stored on-site—some of it since the facility began operations. And the longer the waste languished, the greater the threat of it possibly contaminating the soil and groundwater.

Before the team could get to work, though, it had to figure out what “clean” actually meant. To hammer out a definition, and thus a project scope, the team collaborated with the project sponsor, the U.S. Department of Energy (DoE), a PMI Global Executive Council member.

“We worked with the stakeholders to negotiate what it means to declare the site no longer under regulatory oversight. This was a joint effort with a very active customer,” says Paul Hunt, project manager and senior vice president of environmental management operations at Savannah River Nuclear Solutions



PHOTOS COURTESY OF SAVANNAH RIVER NUCLEAR SOLUTIONS



The project team used 4,000 strategically placed explosives to implode a cooling tower.

(SRNS), which manages the facility.

In April 2009, the US\$1.4 billion project was launched with two key objectives:

1. Remediate and dispose of 5,000 cubic meters (176,573 cubic feet) of the transuranic waste
2. Reduce the contaminated footprint of the entire site by 75 percent, or 232 square miles (601 square kilometers)

For the footprint reduction, clean would entail decontaminating and decommissioning 30 facilities and imploding a cooling tower. Adding complexity to an already difficult project, first-of-its-kind engineering would be used to decommission three reactors on-site, rather than demolishing them and moving the debris to a radioactive disposal facility.

“Past reactor closures took the entire reactor, demolished it and relocated it,” Mr. Hunt explains. But with this project, “the cost to the taxpayer to do that was prohibitive.” Instead, the team formulated a special concrete-like

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The team decontaminated and decommissioned 30 facilities, including this nuclear reactor.



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—Paul Hunt

substance to entomb the reactors, stabilizing their radioactive matter so they could be left safely in place.

The transuranic waste, however, couldn't be dealt with in the same way. "During the Cold War, we generated a lot of waste where we didn't have a disposition path, so it just built up. We built up tens of thousands of containers," says Mr. Hunt. "This project took on the last 10,000 containers."

The remediation process called for building containment facilities and processing lines so that the decaying containers could be opened, sorted to determine what they held and then repackaged so the waste could be shipped to another facility equipped to safely dispose of it.

"You're talking about touching plutonium-contaminated waste that was packaged with the expectation that nobody would ever touch it again," Mr. Hunt says. "And it has things in it that prohibited it from being shipped for final disposal."

This wasn't "just" a cleanup job, however. Because the project's funding had been authorized by the American Recovery and Reinvestment Act (ARRA), the team was expected to create jobs and funnel money into the struggling regional economy.

Yet all of this work—the footprint reduction, the 10,000 containers of waste, the economic boost—was just the baseline.

Beyond that, SRNS had its eye on another goal: clean up an additional 13

percent of the site and on top of that remediate 200 cubic meters (7,063 cubic feet) more of transuranic waste. Further adding complexity, this was waste that, at the project start, the team didn't know how to address, says Mr. Hunt. "We really had no plans in place at the beginning of the project on how to go after that last 200 cubic meters."

It was a tantalizing prospect, but the team would only be able to pursue the added scope if it went in at the start with a well-thought-out strategy. Using rolling-wave planning, team members established a baseline and a work-breakdown structure so that even as the cleanup commenced, they were already plotting future project elements.

"The first day of the project, we were actually in execution phase, and we had to do planning in parallel with that," says Robert Trimble, PMP, director of business services, SRNS. "So it was a very complex planning process: How could we make more money available and shorten up the performance period and spend less money so that we could accomplish that additional work?"

MONEY MATTERS

Dealing with a host of remediation issues would be daunting enough, but SRNS also was tasked with pumping up the local economy. Step one: retain and hire area workers and subcontractors.

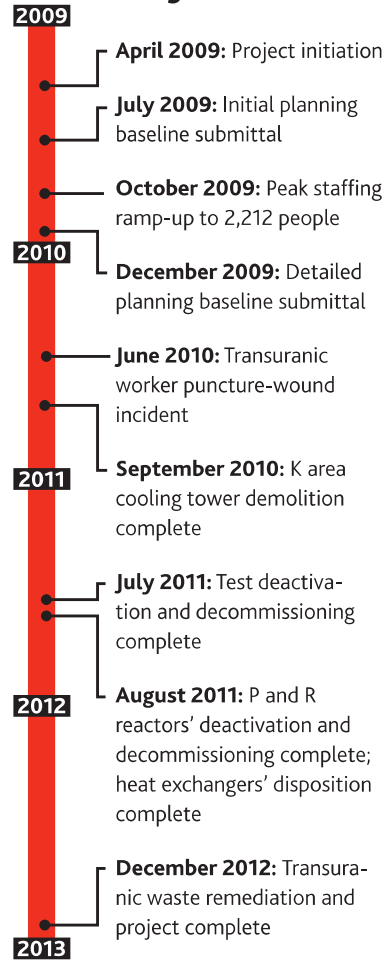
"The first day of the project, 800 SRNS workers who were most likely getting ready to be laid off were immediately transitioned into the project," says T. Zack Smith, DoE deputy manager and ARRA portfolio director. "Within a six-month period, we brought in 1,400 new workers to the site."

It wasn't enough to just boost the economy, however. The team also had to communicate that it was doing so. "The White House wanted to understand exactly how quickly we were getting money into the economy to help meet the goals of the Recovery Act project," says Mr. Trimble. So the team provided weekly performance metrics and held monthly meetings with the DoE, which relayed the progress of the project and of the stimulus efforts to the White House.

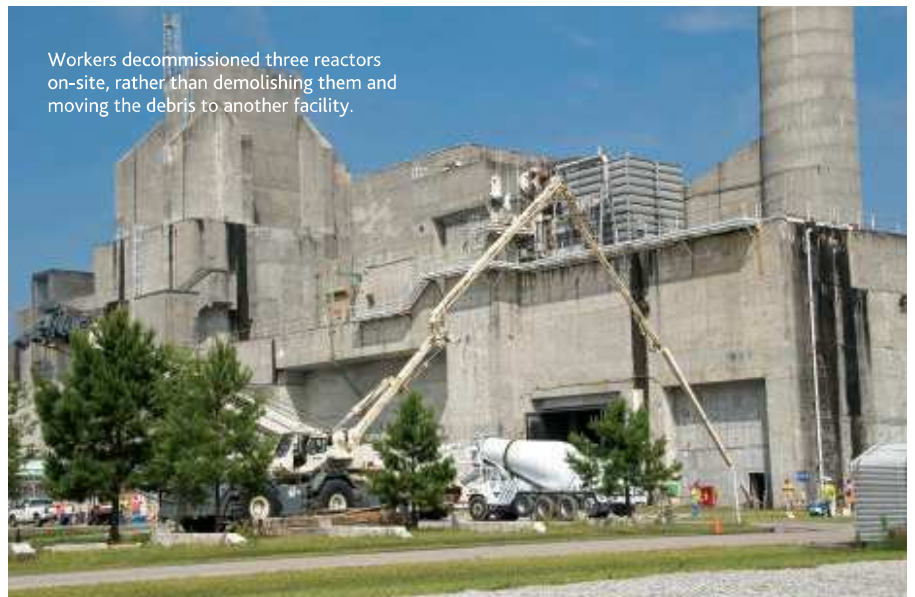
Government stakeholders also were looking to spread the word beyond the capitol. "The White House wanted people to know what was happening with the stimulus money," says Mr. Hunt. "So one of our objectives was to communicate the good work being done with the stimulus money."

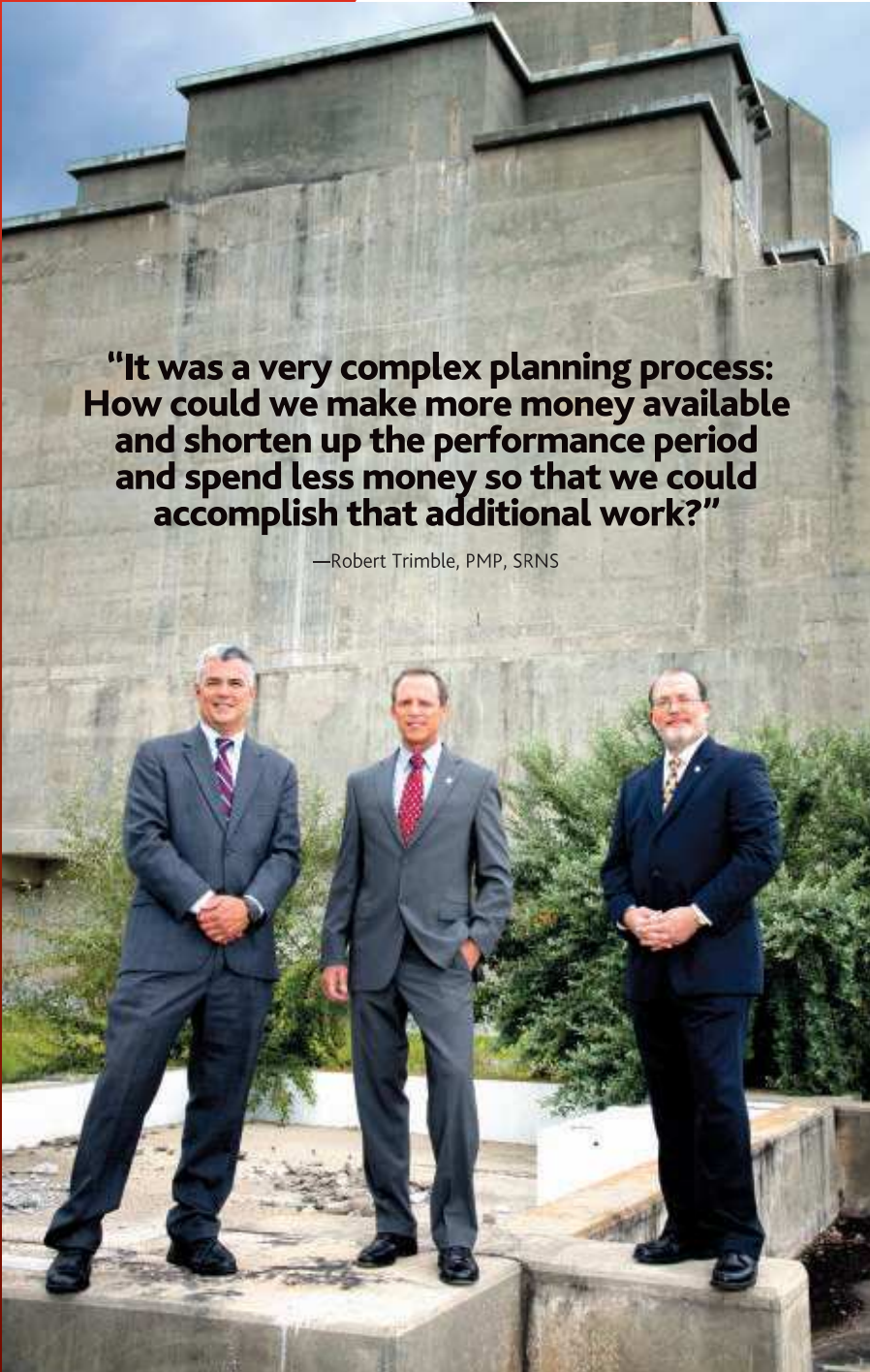
Executing its plan of "communicate, communicate, communicate," as Mr. Trimble puts it, the team disseminated news of its work through a citizens' advisory board that routinely drew area residents and the local media. The team also got the word out through town hall meetings, media tours, press releases and billboard signs.

Project Timeline



Workers decommissioned three reactors on-site, rather than demolishing them and moving the debris to another facility.





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By October 2010, the project had created or retained more than 4,100 local jobs and had a regional impact of US\$418 million, according to a study by the University of South Carolina.

RADIOACTIVE RISK

While the hundreds of new hires represented a boon to the economy, most of them had never before worked in a nuclear facility—which meant they also posed a significant project risk.

The team tackled the issue head-on during the planning phase, identifying major risks, compiling risk registers and devising mitigation plans. "The major risks that we identified were contamination of a worker, a release of either radioactive or hazardous material to the environment and the regulators not buying into our cleanup approach," says Mr. Smith.

Early on in the project, that first risk became a reality. Despite extensive safety training and protocols that embedded new workers with longtime SRNS employees, one worker suffered a puncture wound to his hand, which resulted in internal radioactive contamination. The worker recovered, but the project came to a halt as the team reevaluated its processes.

After the contamination incident, "we went back and retrained our workers," says Mr. Hunt. The team also introduced remote tooling to reduce the amount of hands-on work and significantly increased field oversight, at times giving supervisors one-on-one oversight of workers.

"We changed our processes to make sure that we wouldn't have a repeat occurrence where somebody would get injured," Mr.

Trimble says. Leveraging lessons learned, the project team experienced no other incidents of contamination.

WITHIN SIGHT

While the worker contamination "set us back many months as well as many millions of dollars in the execution of work," says Mr. Smith, the team successfully managed and mitigated 300 other risk items. As a result, the team had used only about half of its contingency and management-reserve funds on risk-based occurrences.

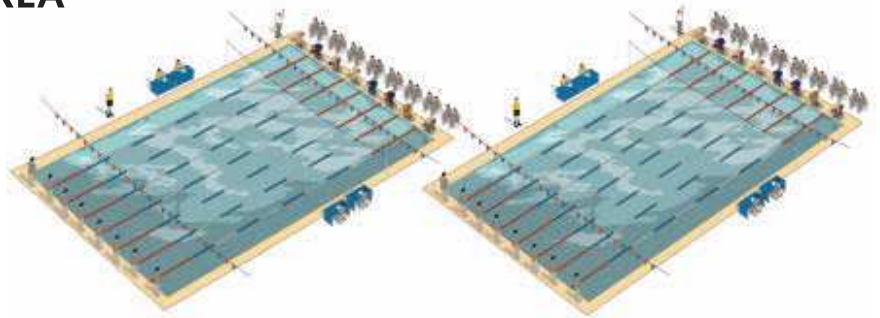
"Our risk management allowed us to recognize dollars that we would otherwise have spent doing the base program," says Mr. Trimble.

Throughout the project, the team had also relied on "really aggressive management of the schedule," says Mr. Hunt. The project team safely compressed

A LOT OF WASTE, IN A BIG AREA

Here's how the project team's cleanup stacks up

5,000
cubic meters
(176,573 cubic feet)



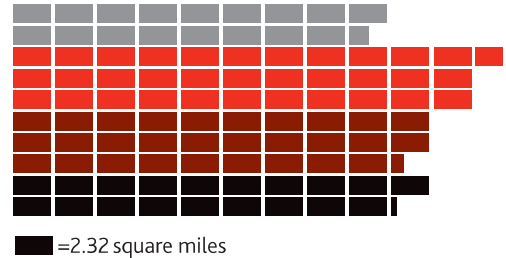
the volume of two Olympic-size pools

232
square miles
(601 square kilometers)



the size of

- Paris, France;
- Buenos Aires, Argentina;
- Washington, D.C., USA; and
- Vancouver, Canada combined



its timelines with rigorous earned value management, critical path method schedules, milestone metrics, daily meetings and stoplight charts that tracked project performance.

The additional scope was within reach.

“Our ability to go after the super-stretch work really hung on the fact that we could complete the baseline scope under cost,” says Mr. Hunt. “We brought all of our project management years of experience to bear on the baseline, and we delivered it early.”

Meanwhile, a separate dedicated group had been at work determining how to take on the additional waste. So when the team forecasted completion of the original work under budget and ahead of schedule, it was ready to dive into the added scope.

Despite initial estimates that the original project would take eight years, the team safely completed it in December 2012 after just 45 months—less than half of the estimated time.

“The project’s greatest accomplishment was our ability to do US\$100 million worth of additional work because we were very efficient at performing the work in our baseline,” says Mr. Trimble. The project sponsor agrees: The added scope was “a tremendous achievement for this project,” Mr. Smith says.

By looking beyond the baseline, the Savannah River team delivered even more ROI—for the economy and the environment. **PM**

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