

July ~ August 2012 Centerfold

TERRY A. MICHALSKE SAVANNAH RIVER NATIONAL LAB

Before arriving at SRNS, Michalske served as director of energy and security systems at Sandia National Laboratories, an engineering and science lab managed by Sandia Corporation, a Lockheed Martin corporation, for DOE's National Nuclear Security Administration.

Upon assuming his current leadership role at the SRNL, where he is responsible for the management, operations and planned growth of the laboratory and its 900 employees, Michalske quickly realized that many people fail to understand a national lab's purpose and significance.

"It's a very special kind of joint public/private partnership. The DOE National Laboratories are operated for the U.S. government to focus on challenges that are important to energy, the environment and national security," said Michalske. "While we are focused on national problems, we live here in this community. The opportunity for us to bridge the national and international work we do with local businesses, universities and community leaders is the value that we offer."

One example of a SRNL project that has roots in South Carolina but impacts clean energy technology on a global level is its partnership with the Clemson University Restoration Institute Drivetrain Testing Facility in North Charleston. SRNL is designing and operating the testing facility's information and communications systems so commercial entities that test their equipment can make sure their data and product specifications are kept confidential.

Another area of clean energy expertise for SRNL is the handling and storage of hydrogen. SRNL worked with Aiken County to establish the 60,000-square-foot Center for Hydrogen Research, a county-owned research park adjacent to the Savannah River Site that houses SRNL's Hydrogen Technology Research Laboratory. Part of the research this facility focuses on is the storage and transportation of hydrogen for hydrogen fuel vehicles, which has led to partnerships with companies like Ford Motor Company.

In addition, SRNL is focusing on the next generation of nuclear power plants with its research and development of small modular reactors. In March, DOE, Savannah River Site and SRNL announced three separate agreements with private companies SMR LLC (a subsidiary of Holtec International), Hyperion Power Generation Inc. and NuScale Power LLC to develop small modular reactor technologies at SRS facilities.

"What's really important about this next generation of nuclear reactors is because they're much smaller than today's larger reactors, the manufacturing can be done in a factory environment. This gives us the opportunity in this country, particularly in this state, to lead the world in manufacturing small modular reactors, which would supply not only a domestic need but an international need for this clean energy resource," said Michalske.

SRNL has also partnered with Boeing to help the law enforcement community. Law enforcement officials use GPS technology for tracking purposes, but they often lose a signal under a bridge, inside a building or in heavily wooded areas.

"We worked with Boeing in taking a capability they operate – a cluster of communications satellites called the Iridium satellite cluster. It's like GPS but these satellites get into lower orbit than GPS satellites do," said Michalske.

Working closely with Boeing, SRNL brought together other technology suppliers and designed a system that was tested with law enforcement in Alaska. The satellite tracking and locating system was selected last year by the Office of the Director of National Intelligence as one of the most important advances in technology that will improve national security. SRNL is currently working with the Darla Moore School of Business at the University of South Carolina and Boeing on a market study to determine other ways this technology can be implemented and commercialized.

SRNL's expertise in handling nuclear materials has allowed it to work closely with the FBI and the Department of Homeland Security.

"We became for the FBI a laboratory that is the world's only nuclear capable crime forensic laboratory. What that means is any type of analysis they would do in their labs in Virginia, they can do right here in our lab, including everything it takes when it involves nuclear materials or contamination," said Michalske.

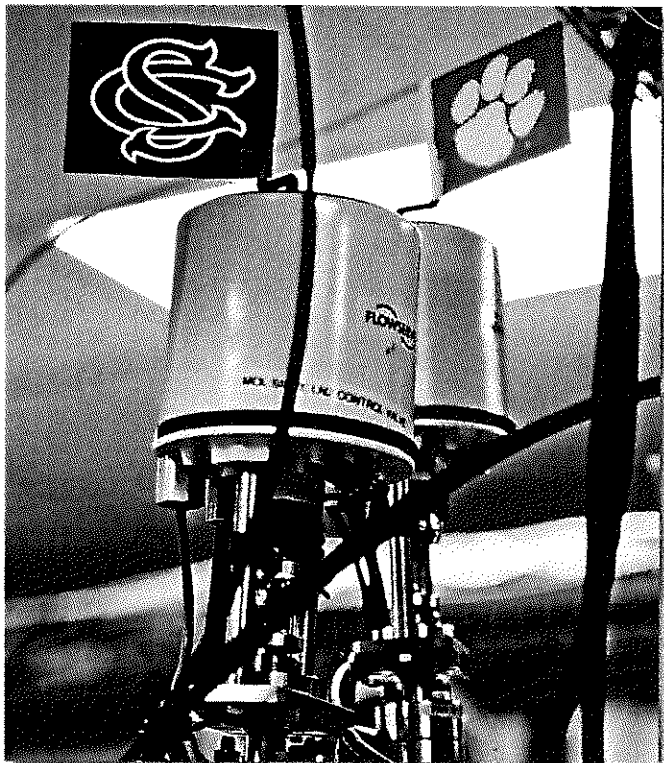
FBI agents work side-by-side with SRNL's scientists and engineers, receiving training on how to work within a nuclear contaminated crime scene. Michalske said 700 FBI agents have been trained at SRNL.

Tracking nuclear materials that could be sent into the country via the nation's port systems is an ongoing concern that SRNL has been able to address. SRNL set up a mock port of entry on its site that included all of the same containers, cranes and carriers that would be found at a commercial port. Using its On-Dock Rail radiation detection system, SRNL was able to improve the process of scanning port containers.

"The way inspections are done today, they take containers off of ships, put them in rows and then they drive through there with a detector. What we developed is a device that picks the container up, moves it onto the train and drives through a portal that does the inspection. They never have to set it down and pick it back up – it's one continuous motion," said Michalske.

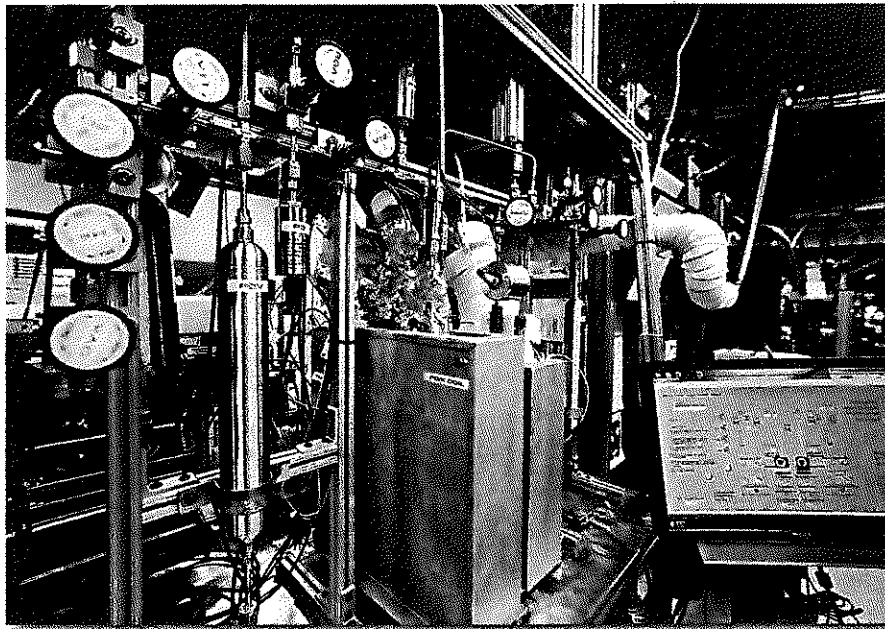
SRNL was able to use real nuclear materials during its tests. Once these tests were conducted, SRNL worked with the Department of Homeland Security and the Port of Virginia to deploy the On-Dock Rail system in an actual commercial port. SRNL is currently analyzing the data collected from the exercise and working towards more widespread deployment of this technology.

Environmental stewardship is another important focus at SRNL. The lab's expertise at cleaning up the environment prompted the Tokyo Electric Power



Electric motors drive the computer controlled valves on the liquid nitrogen cooling system for the Micro-TCAP Hydrogen Isotope Separation System. The flags were a suggested improvement offered by the summer interns from schools that are assisting SRNL.

PHOTOGRAPH BY SARGY ANDREWS



Over-the-road shipment of tritium gas mixtures will no longer be necessary with the Micro-TCAP System.

Company (TEPCO), owners of the Fukushima Daiichi Nuclear Power Plant, to seek guidance on how to begin its cleanup process after last year's tragic earthquake and tsunami. While visiting TEPCO leadership in Japan, Deputy Secretary of Energy Daniel Poneman suggested they come and visit SRNL and the Pacific Northwest National Laboratory in the state of Washington, as both labs have experience in environmental restoration.

"We were able to host a group of engineers and business leaders and show them how we approach each problem, how we've developed and applied technology and how we work closely with the community so that there's a great transparency about what's being done," said Michalske.

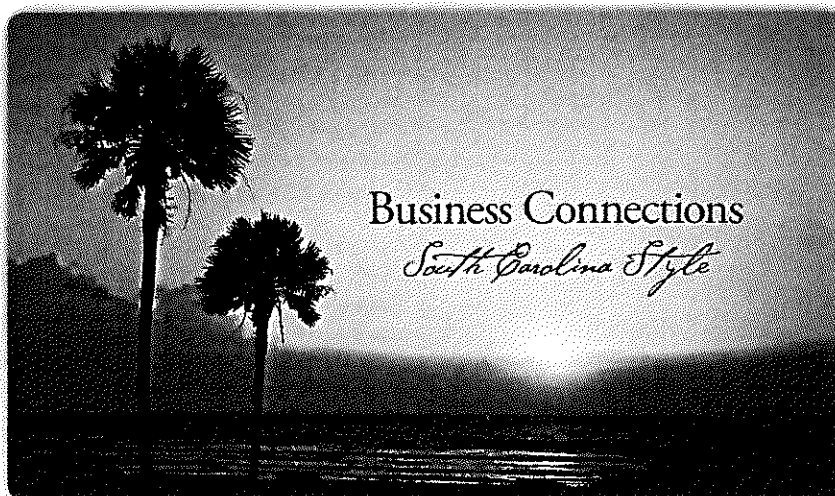
Michalske acknowledges that SRNL's global reach wouldn't be possible without close partnerships with South Carolina research universities, which have been an integral part of many of its research and development projects.

"That community is the lifeblood of our laboratory," said Michalske. "The value of having a national lab in this region is its ability to add to that intellectual capital that ultimately underpins our ability to drive the economy forward."

Growing up on his family's grape farm and helping out at his family's store taught Michalske the importance of community at an early age. Today, he wants that sense of community to exist between SRNL and South Carolina's business community.

"Our goal is to continue to be important in that national and international arena but to very aggressively pursue opportunities for our expertise to contribute to innovative, new developments in the local economy," said Michalske.

Matthew Gregory is the multimedia coordinator at the South Carolina Chamber of Commerce and editor of South Carolina Business.



Successful business expansion plans are all about connecting the dots. As the nation's second largest publicly owned net generator of electricity, Santee Cooper can provide you access to all of the power and the resources of South Carolina's Power Team. Composed of Santee Cooper and all 20 of the state's electric cooperatives, the Power Team is dedicated to building strategic relationships with smart, forward-thinking businesses that are looking to expand within the state. We back this commitment by delivering quality service and reliable power at some of the lowest rates in the nation. Get connected in South Carolina. Visit www.scpriemsite.com/SCB.