

## Sing the body electric

It is mid-August as I write this, and I find it difficult to believe that summer is coming to an end. Every year seems to get shorter and shorter. Looking back, it has been a full five months since the 2018 Waste Management Conference in Phoenix, Ariz., a report on which begins on page 51, but to me, it may as well have been last week.

The theme of the WM2018 was “Nuclear and Industrial Robotics, Remote Systems, and Other Emerging Technologies,” and this issue of *Radwaste Solutions* contains three articles based on papers from the conference with that theme in mind. Following Moore’s Law, which predicts the growth rate of technological progress, advancements in robotics and remote systems have been happening at breakneck speed. At least, that is how it appears to those of us watching from the sidelines.

The question—which the conference tried, quite successfully I thought, to answer—is what role can robotic and remote system technologies play in safely and efficiently performing decontamination and decommissioning work. It is not a new question, but one that is becoming ever more front and center as more commercial nuclear reactors are being transitioned to decommissioning status and the Department of Energy works to complete its most challenging cleanup tasks at sites such as Hanford, Savannah River, and Portsmouth/Paducah.

*As robotics and advanced technologies evolve, so does their role in accomplishing D&D work.*

In the opening feature, “Portsmouth D&D Technology Progress: Are We There Yet?” starting on page 20, Marty Reibold discusses DOE initiatives to adapt new technologies to facilitate the department’s cleanup mission at Ohio’s Portsmouth Site. While Reibold showcases several new robotic systems that are successfully being deployed at Portsmouth, such as the Brokk 400 machine and the RadPiper pipe-crawling robot, he makes two points that are worth highlighting.

First, Reibold makes the case that when introducing a new technology to a D&D project, it’s important not to put the cart before the horse. That is, the job should dictate the technology, and not the other way around. No matter how cool the new machine is, if it cannot be utilized effectively, it’s not a good fit. Second, worker acceptance is a key factor in bringing in a new technology. Reibold notes that Portsmouth is fortunate in that its workforce has been accepting of new technologies, seeing them not as a threat to job security (the systems still require human operators) but as a way to make their jobs safer and easier.

The ability of advanced technologies to streamline cleanup work is also explored in the features “Autonomous Radiation Survey Inside Contaminated Buildings at Fukushima Daiichi with the RISER UAV” (page 28) and “Aerial Lidar and Geomorphic Change Detection Software: Tools for Monitoring Canyon Sediments at LANL”



(page 39). Both articles demonstrate how lidar—light detection and ranging—can be used in very different ways. At Fukushima, it is being used in conjunction with a semi-autonomous drone to survey otherwise inaccessible areas, while at Los Alamos, aerial lidar surveys are being used to help track low-level contamination in the open environment.

We round out this issue with two photo-essay features. The first, “A D&D Trifecta” (page 34), is on three different decommissioning projects that are nearing completion, and the second, “Cleaning Up in Canada” (page 46), is on the environmental remediation of the Port Hope area on the shore of Lake Ontario.

And of course, starting on page 56, you’ll find our annual buyers guide, an indispensable resource on radwaste-related products, materials, and services, along with the vendors supplying them.—*Tim Gregoire, Editor*