

# New technology to speed cleanup of nuclear contaminated sites

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Members of the engineering faculty at Oregon State University have invented a new type of radiation detection and measurement device that will be particularly useful for cleanup of sites with radioactive contamination, making the process faster, more accurate and less expensive.

A patent has been granted on this new type of radiation spectrometer, and the first production of devices will begin soon. The advance has also led to creation of a Corvallis-based spinoff company, Avicenna Instruments, based on the OSU research. The market for these instruments may ultimately be global, and thousands of them could be built, researchers say.

Hundreds of millions of dollars are spent on cleanup of some major sites contaminated by radioactivity, primarily from the historic production of [nuclear weapons](#) during and after World War II. These include the Hanford site in Washington, Savannah River site in South Carolina, and Oak Ridge National Laboratory in Tennessee.

"Unlike other detectors, this spectrometer is more efficient, and able to measure and quantify both gamma and beta radiation at the same time," said David Hamby, an OSU professor of health physics. "Before this two different types of detectors and other chemical tests were needed in a time-consuming process."

"This system will be able to provide accurate results in 15 minutes that previously might have taken half a day," Hamby said. "That saves steps, time and money."

The spectrometer, developed over 10 years by Hamby and Abi Farsoni, an assistant professor in the College of Engineering, can quickly tell the type and amount of radionuclides that are present in something like a soil sample – contaminants such as cesium 137 or strontium 90 - that were produced from reactor operations. And it can distinguish between gamma rays and beta particles, which is necessary to determine the level of contamination.

"Cleaning up [radioactive contamination](#) is something we can do, but the process is costly, and often the question when working in the field is how clean is clean enough," Hamby said. "At some point the remaining level of radioactivity is not a concern. So we need the ability to do frequent and accurate testing to protect the environment while also controlling costs."

This system should allow that, Hamby said, and may eventually be used in monitoring processes in the nuclear energy industry, or possibly

medical applications in the use of radioactive tracers.

The OSU College of Engineering has contracted with Ludlum Instruments, a Sweetwater, Texas, manufacturer, to produce the first instruments, and the OSU Office of Technology Transfer is seeking a licensee for commercial development. The electronic systems for the spectrometers will be produced in Oregon by Avicenna Instruments, the researchers said.

Provided by Oregon State University

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