

Pipe robot aids enrichment plant decommissioning

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A pair of autonomous robots, developed by Carnegie Mellon University's (CMU) Robotics Institute to characterise uranium deposits in process pipes, could save tens of millions of dollars in decommissioning costs at the USA's former gaseous diffusion enrichment plants.



The RadPiper robots will first be deployed at the former Portsmouth gaseous diffusion plant, in Piketon, Ohio, which operated from 1954 to 2001 and contains over 75 miles (120 kilometres) of process pipes. Uranium deposits inside the pipes must be located before facilities can be decontaminated, decommissioned and demolished. Up to now, this has been done by external measurements carried out by human crews. This is both time-consuming and hazardous, with workers needing to wear protective clothing and use scaffolding or lifts to reach elevated pipes.

Each robot is equipped with a 'disc-collimated' radiation sensor invented at CMU, and can measure radiation levels more accurately from inside the pipes than is possible with external techniques, CMU said. The tetherless robot moves through the pipe on a pair of flexible tracks and characterises radiation levels in pipe segments of 1 foot (about 30 centimetres) in length. Segments with potentially hazardous amounts of fissile uranium-235 can then be removed and decontaminated separately. The robot will initially be used in pipes with diameters of 30 inches and 42 inches.

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<http://www.nicenter.org.tw/modules/news/article.php?storyid=12100>

The disc-collimated sensing instrument, for which CMU is seeking a patent, uses a standard sodium iodide sensor to count gamma rays. This is positioned between two large lead discs, which block gamma rays beyond the segment currently being characterised.

"With more than 15 miles of piping to be characterised in the next process building, there is a need to seek a smarter method," Rodrigo Rimando, director of technology development for DOE's Office of Environmental Management, said. "We anticipate labour savings in the order of an eight-to-one ratio for the piping accomplished by RadPiper."

Nuclear deposits will still need to be identified manually in some components, but the DOE estimates the robots could save tens of millions of dollars in completing the characterisation work at Portsmouth. They could also save some USD50 million in costs at the Paducah plant in Kentucky, which is also being decommissioned.

CMU has received USD1.4 million from DOE to develop the robots, working closely with Fluor-BWXT Portsmouth. A prototype has already been tested at the plant, to which the first RadPiper robots will be delivered in May.

source:

<http://www.world-nuclear-news.org/WR-Pipe--robot-ads-enrichment-plant-decommissioning-2203187.html>