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Dive team enters Sellafield pond

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For the first time in over 60 years divers have entered Sellafield's Pile Fuel Storage Pond. As they clear some of the most challenging spots to clean up, drones and robots are taking on an increasing share of hazardous work elsewhere at the site.

A diver is lowered into the pond (Image: Sellafield Ltd)

Lowered on a shielded platform, divers work in shifts for up to 3.5 hours to clear sludge and debris from parts of the pond that other techniques could not reach. Built in the 1940s as part of the UK nuclear weapons programme, the open-air pond suffered build-ups of algae as well as the decay of nuclear fuel elements and other debris, making it one of the most complex clean-up challenges in the world. The Nuclear Decommissioning Authority (NDA) said that its records indicate the last time divers entered the pond was in 1958.

The current sequence of dives began in December 2022 when Josh Everett, a diver from specialist US nuclear diving team Underwater Construction Corporation Ltd (UCC), entered the pond. While robots have been extensively used in the pond, human divers remain more dexterous and are still the only option to deal with small features within the pond, said Sellafield Ltd. The pond water itself provides the divers with significant shielding from radiation.

A diver uses a vacuum to remove sludge and debris from areas that are too hard for robots to access (Image: Sellafield Ltd)

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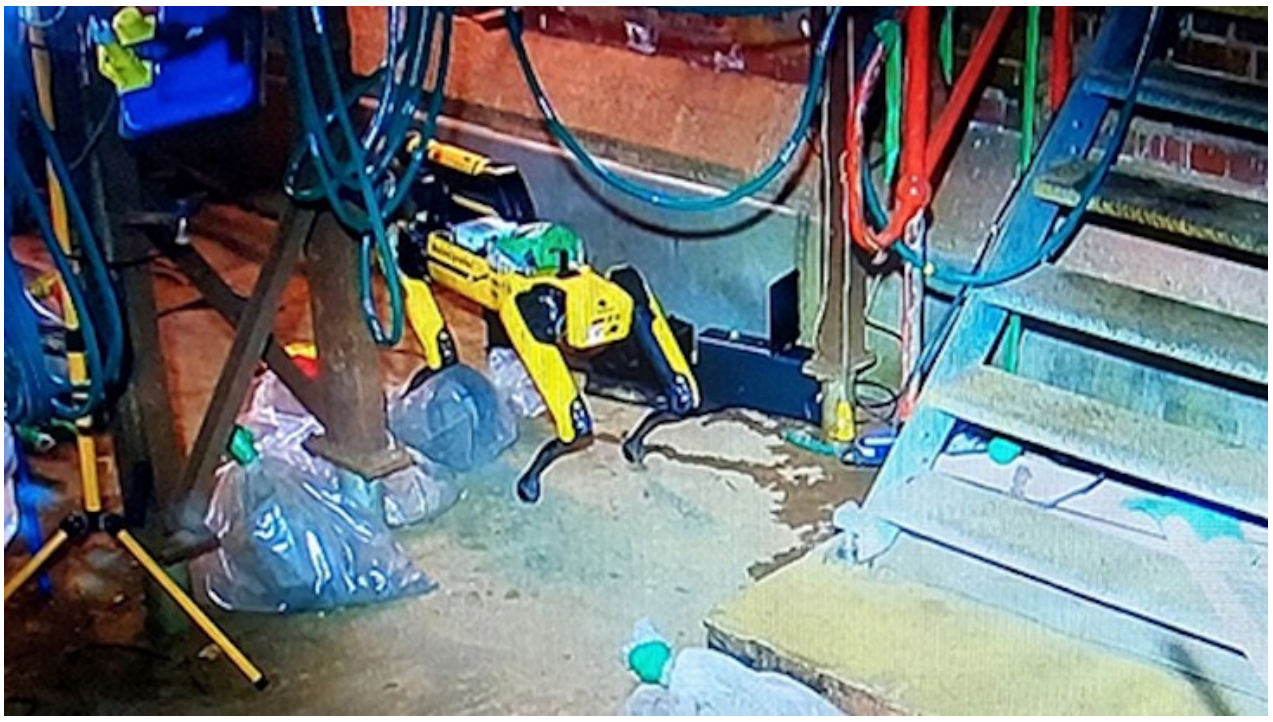
Carl Carruthers, Sellafield Ltd head of programme delivery for legacy ponds, said the work of Everett and his colleagues "has helped us make real progress in cleaning up the pond and our site mission to deal with the nuclear legacy and create a clean and safe environment for future generations."

"Since the 1970s, our nuclear diving experience has shown that the safe use of divers lowers overall programme radiation exposure, reduces overall schedule and cost, and is regulator endorsed, proven, and repeatable," said Philip McDermott, Chief Operating Officer of UCC UK Ltd. "I congratulate our team of nuclear divers and supervisors, as well as the collective effort of everyone involved in this project, for successfully developing this highly specialised solution to support Sellafield Ltd's nuclear decommissioning efforts. The pilot has proven that nuclear diving is a beneficial addition to the waste retrievals programme within the ponds."

Once all radioactive material has been removed, the pond structure will be demolished. This is currently scheduled for 2039.

Rise of the robots

Elsewhere at Sellafield an increasing amount of hazardous work is being taken on by drones and robots, which the NDA said will contribute to its aim of halving the number of high hazard decommissioning activities directly carried out by people by 2030.



Robots have facilitated cleanup (Image: Sellafield Ltd)

Peter Allport, head of remote technologies within engineering and maintenance at Sellafield, said that robots have been able to enter areas that were previously inaccessible and move material so that it can be accessed and processed through existing waste routes.

But the hazards in question are not all radiation related. For example, one of the main benefits of drones - unmanned aerial vehicles, or UAVs - is avoiding the need for people to work at height. Allport said, "UAVs have become an essential tool in supporting routine operations on the Sellafield site for both internal and external inspections."

NDA, Sellafield Ltd and the Office for Nuclear Regulation (ONR) engaged in dialogue to bring these innovations into routine operation. Paolo Picca, ONR's lead on robotics and autonomous systems within the Sellafield decommissioning, fuel and waste division, said: "By engaging in an open and transparent manner, ONR and Sellafield Ltd managed to overcome a number of perceived blockers and clarify the regulatory position to enable the effective and safe deployment of these technologies". NDA said it worked to create a "positive environment that enables open discussions" so that innovation could accelerate and reduce the cost of decommissioning.

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