

OC Robotics is to fit its snake-arm robot onto a mobile vehicle so it can be used to inspect complex nuclear reactors in Canada.

The Bristol-based robot company has been awarded a contract by Ontario Power Generation to design and build the mobile snake arm. The manipulator will be used to inspect complex pipework and structures on the Candu (Canada deuterium uranium) nuclear reactors. There are 19 operational Candu reactors in Canada and 23 in the rest of the world.

This is the first time the 17-strong firm has been the primary contractor to a nuclear utilities company. OC Robotics was founded in 1997 by two engineers working from a garage. Dr Rob Buckingham, managing director of OC Robotics, said: "Our expectation is that this contract will increase awareness of our products throughout the nuclear world. Life extension is a critical issue for power generation and we aim to provide capable solutions to some challenging problems."



The snake arm will be 2m in length and will have a rectangular cross-section measuring 25mm in width and 50mm in height. It will be equipped with tip cameras for pipe inspection in the first instance, said the company. Snake-arm robots can be equipped with a variety of tools to perform maintenance operations.

The snake-arm robot has been designed as a mobile platform once before for the Ministry of Defence. Being mobile and remotely operated makes it easier to use the robot in confined and hazardous spaces, making it suitable for use in the nuclear industry, said the company.

The structure of a snake-arm robot is similar to a human spine in that it is comprised of vertebrae. It is a tendon-driven arm with wires terminating at various points along its length, allowing the joints to be controlled independently.

A motor is used to control the length of each wire independently. The control software calculates the necessary lengths of all the wires to produce the desired shape.

While the operator uses a joystick to drive the tip, the computer does the maths to make the arm follow. This tip-following capability enables the robot to avoid obstacles and "follow its nose" into complex structures.