

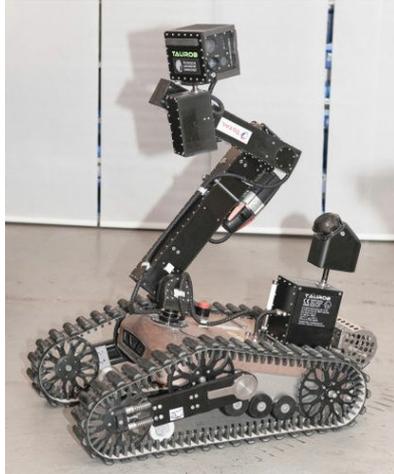
Issue 62

## Total-backed robot takes next steps

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*ARGOS Challenge winners will trial their winning autonomous robot design at Total facilities, including the offshore Alwyn platform*

Last year InnovOil covered the results of operator Total's long-running ARGOS (Autonomous Robot for Gas and Oil Sites) Challenge. After several gruelling rounds of competitive tasks – including navigation, leak detection and stair-climbing – which stretched the capabilities of self-propelled robots to their absolute limits, Austro-German team ARGONAUTS emerged victorious.



Designed by robotics expert taurob and Germany's Technische Universität Darmstadt (TU Darmstadt), the robot – aptly named "Autonomous ATEX Certified Robot for Oil & Gas Industry" – is based on a tracked crawler design, with an extendable camera and inspection arm. It is capable of reading pointer instruments, fill level displays and valve positions using cameras and laser scanners, while additional sensors can measure temperatures and gas concentrations, as well as detect abnormal noises, obstacles and people around it. Moreover, it can safely manoeuvre on wet stairs, meaning offshore conditions such as heavy rain, extreme temperatures and wind speeds should not pose a problem.

As the ARGONAUTS remarked to this magazine last year, "The mere complexity and difficult requirements made it [the] most demanding project we have

encountered in our professional robotic life."

Following its success in the ARGOS Challenge, Total E&P has now announced its intention to deploy the machine to work autonomously on two of its sites, including an offshore platform, as part of a world-first project with Aberdeen's Oil & Gas Technology Centre (OGTC). The 18-month initiative will see the partners develop and trial the robot for autonomous operational inspection of facilities on Total's onshore Shetland Gas Plant, and later its Alwyn offshore platform.

This will be the first time an autonomous ground-based robot will be used on an operational oil and gas installation. In that regard, it marks an important step towards the unmanned and robotic future that the oil and gas industry has talked about for some time.

"In the initial case, the robot will be used for visual inspection and form part of the asset's routine maintenance programme. We also propose to trial other forms of data capture under the various mission scenarios," Total E&P UK's head of technology innovation, Dave MacKinnon, explained to InnovOil via email.



The project will see Total, taurob and TU Darmstadt build a further two versions of the ATEX-compliant ARGOS champion, albeit using more robust and reliable designs with additional functionality. Control systems may also be simplified, so that offshore workers would be able to operate the robot without the need for dedicated on-site robotics experts.

Commenting on how the robot would be adapted for greater reliability, MacKinnon added: "We are moving from a demonstration scenario to an industrial pilot, which requires the robot to encompass many more of the standards necessary for the oil and gas industry and the harsh weather and marine environment. The development process will seek to further address discreet systems and complements under FMEA. We will also continue to develop the safety and integrity aspects of certification, particularly the progress of 'self-certification'."

Alwyn itself has already been a site of major innovation. Having been installed in the mid-1980s, the project was overhauled in the early 2010s to include a raft of new surveying and production technologies, including 7,000m extended reach drilling and an automated Full Control of Well system (FCW).

MacKinnon said in this case that the platform was chosen on account of ongoing 4G infrastructure pilots, suitable ingress/egress access to modules, specific use-case scenarios and its accommodation capacity.

A successful offshore trial next year could mean the industry will see fully functional offshore robots deployed commercially by the early 2020s – a genuinely transformative prospect for the notoriously conservative industry. Provided it performs as expected, taurob and its partners look to have proved that even stairs cannot halt the robotic revolution.

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