
Total to design robots for autonomous industrial site inspections

June 13, 2018 // By Julien Happich



Following the completion of the ARGOS Challenge it launched back in 2013 in partnership with the French national research agency (ANR), gas and oil extraction group Total is nearing its goal to have autonomous robots perform routine inspection tasks at its extraction sites and refineries.

Ultimately, the company wants such rugged autonomous robots to go everywhere operators can and carry out inspections, read and record measurements, but also in area where human operators would be at risk, reducing their exposure to potentially dangerous situations. By automating routine inspection tasks the robots would help the company streamline the operation of its onshore and offshore facilities, optimising their efficiency while cutting costs.

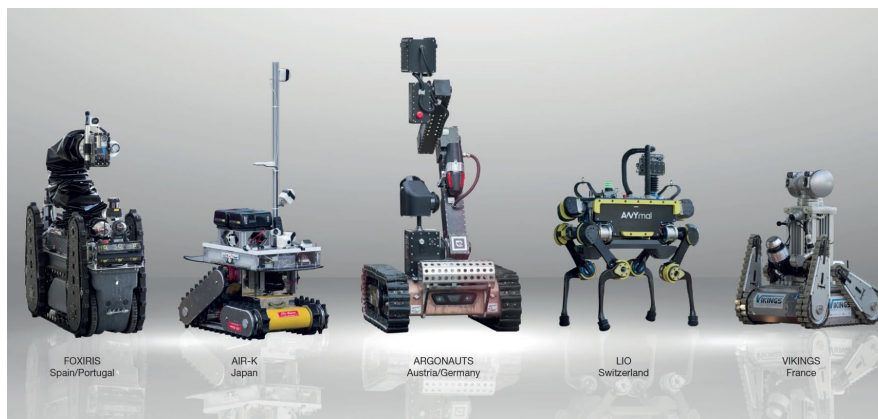
Here, ARGOS stands for Autonomous Robot for Gas & Oil Sites. In 2014, Total selected five teams out of 30 projects submissions from 15 different countries, and assigned to each one of them a global budget of up to €600,000 to conduct their research and development work within a three-year period.

Then from June 2015 to March 2017, the five teams from Austria and Germany (ARGONAUTS), Spain and Portugal (FOXIRIS), France (VIKINGS), Japan (AIR-K) and Switzerland (LIO) were able to test their prototypes in Lacq (South West France) on a competition site representative of Total's facilities and operating conditions.

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The five robot prototypes that competed in the ARGOS challenge.

Among the specifications set by Total, the winning robot had to be able to navigate (move over unknown obstacles, climb stairs, detect operators) and perform inspections autonomously in a potentially explosive atmosphere (ATEX standard) to deliver reliable information and analyses.

The robots were also tested for critical case scenarios such as malfunctions, emergency shut-downs, low-battery, but also for their capability to operate in difficult situation (loss of WiFi connection), detect anomalies at inspection points or monitor their environment through sound analysis (including sound-based predictive maintenance for operating pumps).

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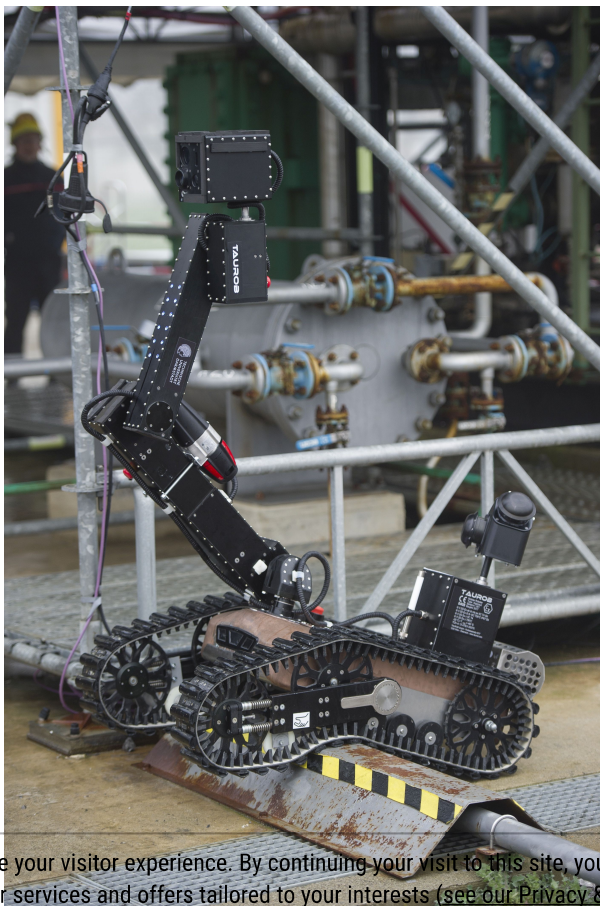


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The last competition held in May 2017 saw the ARGONAUTS team win with a prototype robot able to take measurements through vision-based and sound-based sensors while capable of navigating autonomously over the steps and stairs of a multiple stories plant.

After they won the ARGOS challenge,

the ARGONAUTS team made up of



The ARGONAUTS under test at a competition site

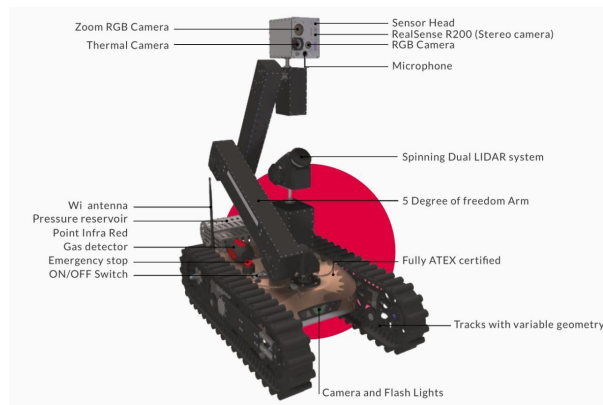
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Austrian start-up *in Lacq (South West France).*
 Taurob GmbH (for the hardware) and researchers from Darmstadt University of Technology (for the autonomous robotics software and system optimization) were offered to partner with Total to turn their prototype into an industrial-grade robot. Early 2018, Total signed a development contract with Taurob for an industrial grade robot to be run in the United Kingdom on the West Shetland site and later on an offshore UK platform. That means preparing the ground with onsite connectivity (4G), creating 3D models of the different sites, setting an onshore operations room and training Total's operators.

Total anticipates it will be able to kick-off of the industrial pilot in Shetland, then on the offshore platform by late 2019.



Technical specifications of the ARGONAUTS.

Next on its roadmap, Total aims to involve other Oil & Gas operators, seeking their collaboration through a Joint Industry Project to add more advanced handling capacities to the robots. By 2022, the group

hopes to be able to deliver an industrial-scale robotics solution not only suitable for oil and gas sites but also for all forms of industrial facilities worldwide.

Total doesn't intend to keep this technology for its own use only. Taurob and Darmstadt University will be free to commercialize the robot without restriction too, we were told.

More info about the Argos project at <http://argos.ep.total.com/en/>

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