Team Argonauts has won French super-major Total's robot challenge Argos (Autonomous Robot for Gas and Oil Sites).

The third and final round of the challenge, held in Lacq, France, saw five teams pitch their robotic creations against a string of tasks on a mock-platform site.

Total’s aim was for a robot, able to detect and control leaks, weighing less than 100kg, which can move between floors, and on different types of flooring, from grating and corrugated iron to cement and wet slippery surfaces, under its own power. It should have remote control functionality, be ATEX/IECEx compliant with a technology readiness level 5, and be a fully autonomous robot.

Read more: The Robot Race

The Argonauts team - with their robot pictured right - is a consortium between two partners (Germany’s Taurob and the Technical University of Darmstad) from Austria and Germany.

Alan Gaulois, the jury president, emphasized that all the expectations were exceeded in the final and that all judges voted in unison for the Argonauts as the winning team: “The Argonauts robot has the most advanced level of technological maturity of the competition. It has a very robust and well-engineered system. Moreover, the robot has been designed in a modular and adaptable way, thus allowing further enhancements in the future.”

The prize money of US$558,900 will benefit the team’s future research projects at the Department of Computer Science at TU Darmstadt as well as their cooperating partners, taurob GmbH in Vienna.

Five teams have been taking part: Air-K, Argonauts, Foxiris, LIO and Vikings, from Japan, Austria, Spain and Portugal, Switzerland, and France, respectively. The Vikings Team won second round and all five took part in the final round of the challenge, over five days, in March.
As well as being ATEX/IECEx compliant, the robots had to prove they could carry out rounds and perform one-off tasks autonomously, but also enable an operator to be able to step in and switch to remote control mode at any time.

The robot would also be expected to operate at the site of an incident, such as a hydrocarbon leak, and in potentially hazardous and harsh environments, ranging from -50°C to +50°C, hygrometry of up to 100% and sea spray, heavy rain and up to 100km/hr winds.

For the third round, instead of trying to put additional functionality into the robots, ranging from tracked to four-legged machines, Total decided to spend more time proving the existing functionality, including going up and down stairs and the autonomous functionality. The aim is to be able to “hit a button” and the robot will complete a mission autonomously.

Obstacle negotiation, included in the second round, was repeated, with the addition of a human presence – in which case the robot needs to detect there’s a human and go into standby mode. The site was also changed, so that it wouldn’t match the model with which the robot was programmed.

Communication loss was also tested – as was waterproofing as the teams had to operate in heavy rain on the first day and the ability to move up a long ramp (something some of the teams hadn’t anticipated). For one robot, false readings of heat spots were recorded (it had spotted the sun).

*Image: The Argonaut, from The Technical University of Darmstad, by Natalie Wocko.*