

AMORAC

Autonomous Mobile Robot for Automated Clearance of buildings and structures

The AMORAC robot provides agile, mobile, automated radiation measurements and documentation

Challenge

Accessing areas to collect critical measurements during clearance of buildings can mean time-consuming work with unnecessary dose rates for staff. Precision measurements are required when clearing small and large structures (some can measure up to 150 000 m²), and the laborious and repetitive workload in such conditions can also result in safety and accuracy issues when attempting the project manually. In addition, larger projects require larger workforce and finding qualified staff adds further challenges for our customers.

Solution

The AMORAC robot by Framatome employs state-of-the-art technology to generate a 3D map of the environment and completely automate measurements and documentation. For example, the robot can automate the determination and documentation of α and β surface contamination on flat building surfaces to achieve precision measurements required for the release of building structures. To achieve this, the robot is equipped with contamination monitors with ZnS scintillators for measuring radioactivity.

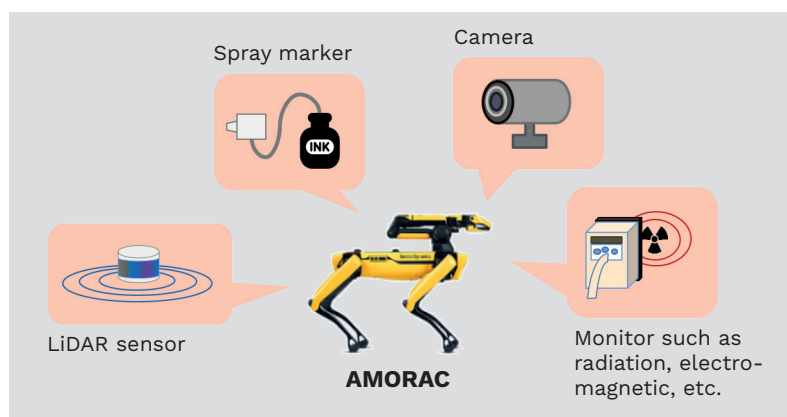
During the measurement process, the contamination monitor is guided along the surface to be measured. The robot can be equipped with a variety of tools like radiation monitors, cameras, electromagnetic sensors, temperature sensors, acoustic sensors, etc., to serve a wide range of functions.

Once the measurement is performed, all information is automatically stored in digital documentation. If a hotspot is detected, the robot uses its marking system to physically indicate precisely where the sensitive areas are located.

Customer benefits

Overall reduced manual workload, project costs and schedule, and radiation exposure of the workforce. Highly qualified specialists' time is used safely and more efficiently by:

- Smooth management of clearance operations thanks to cutting-edge technologies supporting Decommissioning and Dismantling activities
- Saving qualified resources for value-added tasks instead of laborious and repetitive work
- A trusted source of information with high accuracy within automatically updated digital documentation reflecting high precision measurements and hotspot location identification
- Automatic physical marking of hot spot surfaces for simplified management
- The creation of a 3D map of the facilities as inputs for other valuable use cases (training, maintenance, etc.)
- A customized solution that takes into consideration each site's constraints



Key figures

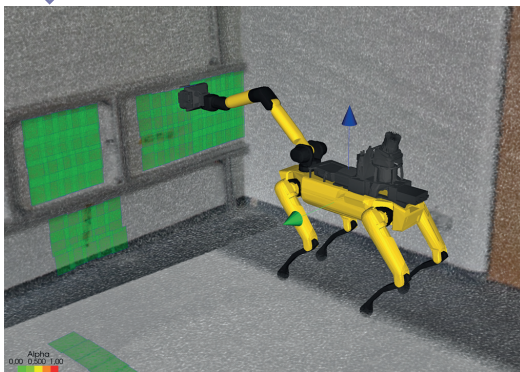
24/7 operation possible

Heightened agility due to **100%** autonomous functionality of the tasks

1 operator can handle a fleet of several AMORAC robots for parallel operation

Use case: Automated clearance process of nuclear power plant building

- 1
 - Spatial exploration through LiDAR sensor
 - Processing (3D room-mapping, segmentation)
- 2
 - Gridding of segmented wall elements
- 3
 - Radiological measurement performed autonomously
 - Hotspots identified automatically
- 4
 - Digital documentation of measurement results generated
- 5
 - Radiological hotspots marked, grids are marked and additional information documented



3D map with heatmap of measured radiation



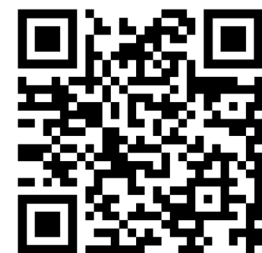
Autonomous grid radiation measurements



Shown here equipped with hardware added including a detector with ZnS scintillator for automated contamination evaluation.

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Your performance
is **our** everyday **commitment**



Scan the QR code to watch a video featuring the AMORAC robot, or click this hyperlink:

>> AMORAC: Autonomous MOBILE Robot for Automated Clearance - YouTube

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