



## Pioneering autonomous robot used to inspect ALEGrO's HVDC converter station in Belgium

- The ALEGrO Robot is the first autonomous robot in Europe to be used to inspect a high-voltage direct current (HVDC) converter station
- After two years of testing, the robot has now been deployed in the HVDC converter station that lies at the Belgian end of ALEGrO, the Belgian-German interconnector
- Several sensors carried by the robot are being used to continuously monitor the operational converter hall
- The use of the robot lowers the risk of undiscovered defects and unplanned outages

**LIXHE | Last week an autonomous robot was installed in Elia's main HVDC converter hall in Lixhe during the hall's yearly outage period of one week. The hall has since been re-energised, meaning that no humans can safely enter it, and the robot is currently inspecting the hall on a 24/7 basis. The installation and deployment of the robot in the hall is the culmination of a two-year collaboration that Elia Group launched with Siemens Energy, Ross Robotics and Nemo Link. This involved a long research and development phase which included countless iterations and tests in challenging environments.**

The ALEGrO robot is the first robot in Europe to be used to undertake frequent automated inspections of an HVDC hall. The robot can move around independently, but can also be controlled from a distance, meaning that the electricity supply in the HVDC hall does not need to be interrupted. The robot carries smart sensors, which help to detect potential issues in the hall, so reducing the risk of unexpected outages and minimising its downtime for ad hoc repair work to be carried out. This maximises the operation time of the converter hall and supports the continuous flow of green electricity across Elia Group's grid.

The sensors installed on the robot's base include an RGB camera; a high-grade thermal imaging camera; a high-precision industrial strength pan-tilt unit which holds the cameras; an audio sensor; a microphone; and a range of environmental sensors to monitor features of the hall such as its temperature, relative humidity and illumination.

*The robot carries multiple advantages. The first of these is that it allows assets to be continuously monitored so that their condition can be checked and so that we can assess whether we need to take any action or undertake preventive maintenance. The second advantage is that if we ever detect an anomaly in one of our assets, we can remotely control the robot, to be able to more closely investigate what the anomaly is.*

**Mark Vaes, Asset Manager – HVDC at Elia**

*This robot is the result of a four-year journey. We started with an idea for it and followed this through to its deployment. It's a pioneering moment and it's a demonstration of a productive collaboration between Innovation Department and Asset Management Division. It's exciting to see how much we have learned from a very concrete use case that has been successfully commissioned.*

**Loïc Tilman – Head of Innovation at Elia Group**

### **Collaboration**

Two years ago, Elia Group launched a collaboration with Siemens Energy, Ross Robotics and Nemo Link to develop autonomous robots with electromagnetic compatibility (EMC). The four partners developed an autonomous robot which is fully compatible with electromagnetic fields, meaning it can be used in a converter hall environment. The robot being used in ALEGrO's converter hall is an adapted version of a robot originally developed by Ross Robotics. Siemens Energy contributed its expertise in developing electronic components which can be used in harsh EMC conditions to the project.

### **Next steps**

Over the next few months, another robot will be installed and deployed in Nemo Link's converter hall; following this, in 2024, a third robot will be installed and deployed in a converter hall belonging to 50Hertz in Germany.

## About Elia Group

### One of Europe's top five TSOs

Elia Group is a key player in electricity transmission. We ensure that production and consumption are balanced around the clock, supplying 30 million end users with electricity. Through our subsidiaries in Belgium (Elia) and the north and east of Germany (50Hertz), we operate 19,349 km of high-voltage connections, meaning that we are one of Europe's top 5 transmission system operators. With a reliability level of 99.99%, we provide society with a robust power grid, which is important for socio-economic prosperity. We also aspire to be a catalyst for a successful energy transition, helping to establish a reliable, sustainable and affordable energy system.

### We are making the energy transition happen

By expanding international high-voltage connections and incorporating ever-increasing amounts of renewable energy into our grid, we are promoting both the integration of the European energy market and the decarbonisation of society. We also continuously optimise our operational systems and develop new market products so that new technologies and market parties can access our grid, thus further facilitating the energy transition.

### In the interest of society

As a key player in the energy system, Elia Group is committed to working in the interest of society. We are responding to the rapid increase in renewable energy by constantly adapting our transmission grid. We also ensure that investments are made on time and within budget, with a maximum focus on safety. In carrying out our projects, we manage stakeholders proactively by establishing two-way communication channels between all relevant parties very early on in the development process. We also offer our expertise to different players across the sector in order to build the energy system of the future.

### International focus

In addition to its activities as a transmission system operator, Elia Group provides consulting services to international customers through its subsidiary Elia Grid International. In recent years, the Group has launched new non-regulated activities such as re.alto - the first European marketplace for the exchange of energy data via standardised energy APIs - and WindGrid, a subsidiary which will continue to expand the Group's overseas activities, contributing to the development of offshore electricity grids in Europe and beyond.

The legal entity Elia Group is a listed company whose core shareholder is the municipal holding company Publi-T.

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