Robotic cleaning is the future

With more than 20 years of experience in cleaning, camera inspection, and milling and renovation techniques, Van de Velde pipe inspections & solutions continues to invest in new techniques for its industrial customers. Following the introduction of the "No Men Entry Cleaning Robot" (NME) for aboveground application early this year, all eyes are now on the ROV Cleaning Robot: a cleaning robot for underwater application. It can be used in, for example, water treatment plants.

by Philip Declerq

ROV cleans the water treatment's sludge tanks (Photo: Van de Velde pipe inspections & solutions)

"Our various activities are inextricably linked", according to Mieke Van de Velde of the SCC certified and lab-accredited inspection company from Lier, specialised in cleaning robots. "Automation and safety are key drivers in our niche: robotic cleaning with minimum human effort. The industry requires a 'mind switch' for people to no longer be exposed to unsafe working conditions and hazardous substances. There is still a great deal of ignorance when it comes to ATEX certification. Let me quote Wouter De Geest, BASF CEO: 'Someone crawling into a tank is a thing from the past. Robots should be doing that'."

Not every manhole is the same

Early this year, **Van de Velde** released the hydraulically controlled NME robot, intended to clean and inspect confined spaces where pollution, contamination and explosion pose a potential risk. "Considerable start-up costs were involved in this development. Our mission remains: to be the best at what we do", according to Van de Velde. "On the one hand, the industry had a demand for such a concept; on the other hand, we wanted to stand out from other companies in the market. Furthermore, we have all the camera equipment we need to carry out technical inspections. This equipment can be used in the most hazardous

zones, the most difficult applications in terms of diameters and distances. We fine-tune cameras and install ATEX lighting alongside the cameras. There are no 'standard' applications. That is why the robots are equipped to adapt to manholes ranging from Ø350 to Ø700mm. The NME robot has been used for, among other things, petrochemical companies and in the Dutch industry."

Customised cleaning robot

Two types of cleaning robots can be used, with diameters from 350mm and 500mm. "A ramp or hoist is used to let the robot enter the manhole; the operator keeps a safe distance from the hazardous area. The HP cleaning heads (200 to 2500 bars) ensure optimal suction for the removal of sediment. The robot, equipped with ATEX cameras and measuring equipment, is connected to a HP vacuum cleaning trolley that collects the extracted material. The control unit continuously monitors the atmosphere and allows the operator to oversee the work zone. The robot can be equipped with tools for cleaning, inspection and/or milling. "We sell a service. The robot is operated only by employees who have worked on its development and fine-tuning", according to Van de Velde.

Coating requires different milling tools

The water treatment and beer production branches have also shown interest. Water basins, the water of which is reused for production or sprinkler systems, are usually continuously operational. Shutting down the installation is, at all times, a serious operating expense. This triggered the development of the ROV robot for underwater application. Water treatment plants also deal with the problems of sludge deposits. Nevertheless, cleaning a coated water basin is done differently. To this end, Van de Velde developed milling tools based on a softer material with nylon brushes that don't damage the existing coating. Components from specialised manufacturers, which include sensors, wiring, lighting, materials and camera technology, were used in the development of the ROV. Every (tiny) part of the ROV has been separately ATEX tested. The SME from Lier has an added expertise that lies primarily in their know-how and experience with regard to robotics. Contrary to an NME, a hoist (crane) is used to submerge an ROV.

Last resort

"We focus on quality, safety and efficiency; speed of execution is less important. In many cases, the customer has already tried other solutions and sees us as a last resort", says Van de Velde. "That is why there is no room for mechanical errors. There is always a second robot (redundant) present. We now have a small NME, a large NME and an ROV robot at our disposal. We carry out most repairs to the robot or the equipment ourselves, which is rather unique in the industry."<<

"Someone crawling into a tank is a thing from the past", confirms Mieke Van de Velde from Van de Velde pipe inspections & solutions (Photo: Ph.D)

ROV cleans operational water treatment basin (Photo: Van de Velde pipe inspections & solutions)

Passion for technology

Van de Velde has grown from various forms of expertise that were acquired over the years. Founder Stijn Van de Velde is a selfmade man. He is very practical and development-oriented, with a passion for technology since early childhood. To look beyond the market's existing developments and solutions and, together with his equally motivated employees, focus on finding solutions for the difficult cases. "Passion for technology and involvement in various specialisations are what drives this company. Our research projects are funded through the company's own resources", according to Mieke Van de Velde, Sales & Marketing Manager and Communication Manager.