



The Role of Autonomous Systems in Offshore Wind Construction and Maintenance

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28 MARCH 2018 / MIKE PASSARETTI – ULC ROBOTICS

ULC Robotics partners with industrial and utility companies to develop robotic systems, inspection technology, unmanned systems and sensors that enables remote inspection and remote operations in real-world applications.



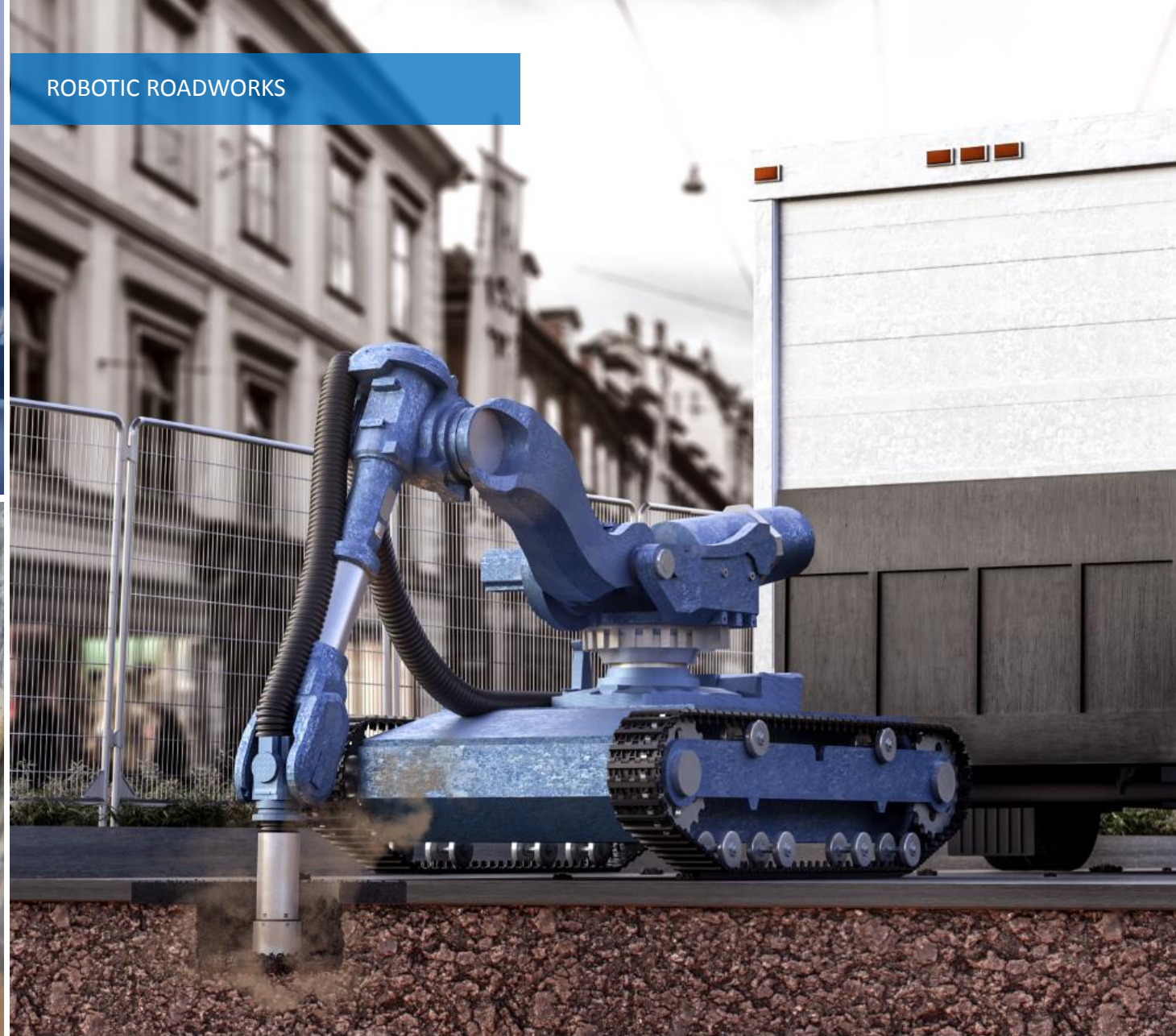
CISBOT ROBOTIC PIPELINE REHABILITATION



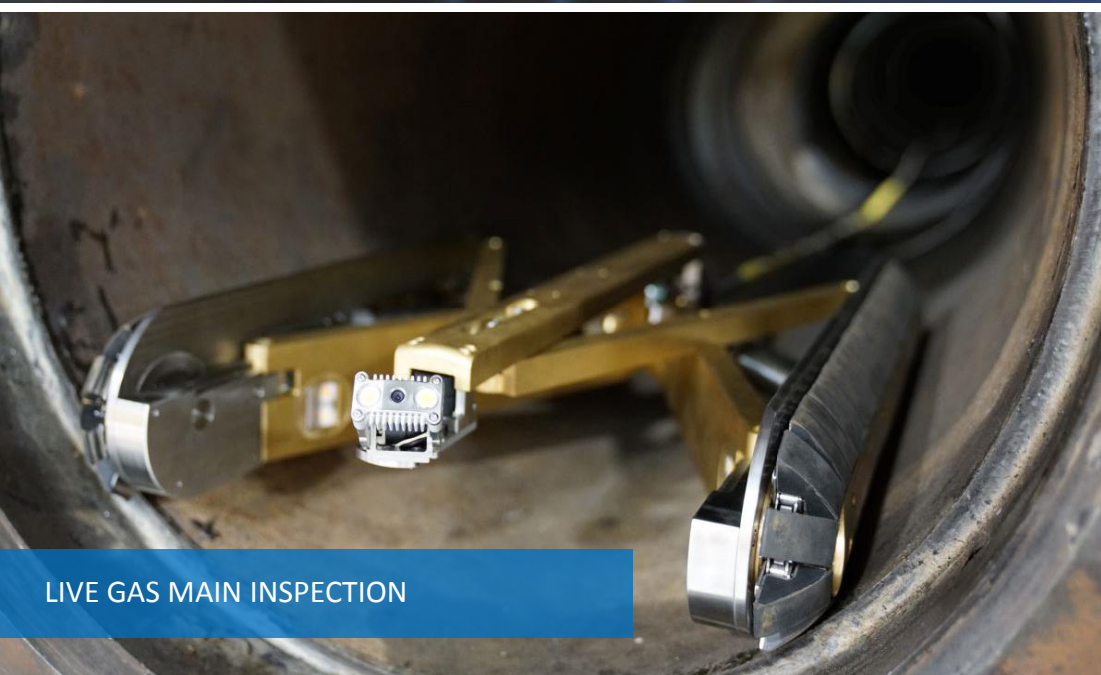
AIR GAP INSPECTOR



ROBOTIC ROADWORKS



LIVE GAS MAIN INSPECTION





UNMANNED AERIAL INSPECTION



Unmanned Vehicles Overview

- Unmanned systems are safer and more economical to operate
- Whether remotely operated or full-blown autonomy, there are many benefits.
- The core goal is to reduce the need to put people in harms way
- Reduce costs, increase availability of high quality data



Submersibles

- **Underwater Operations – Structures**

- Pre-Construction Survey
- Monitor & Support Construction Activities
- Monitor Diver Safety As They Work
- Inspect Foundations

- **Benefits –**

- Highly Maneuverable
- Perform Inspections Faster
- High Quality Data
 - Subject Matter Experts Can View Data from Anywhere



Submersibles

- **Underwater Operations – Cable Inspection**
 - Monitor Cable Position
 - Inspect Seabed for Debris
 - Various robotic arms and tools are available
 - New tools can be developed
- **Benefits –**
 - Highly Maneuverable
 - Perform Inspections Faster
 - High Quality Data



Surface Vessels

- **Surface Operations**

- Support Construction, O&M
- Deploy Sensors For Surveys
- Carry Equipment & Other Cargo from Shore
- Provide Landing Docking or Landing Zone

- **Benefits –**

- Virtually no limit on amount of cargo
- Efficiently Operate for Extended Periods of Time



Unmanned Aircraft

- **Fixed wing, multirotor or hybrid systems:**
 - Pre-construction Surveys
 - Inspection of Structures
 - Turbine blade defects
- **Platform For Advanced Capabilities**
 - NDT Testing of Blades/Structures
 - Installing Sensors
- **Benefits –**
 - Rapid Deployment
 - Safely access very hard to reach areas
 - Opens up pathway for new inspection methods



Unmanned Aircraft

- **Heavy Lift Capable Systems Are Emerging**
 - Cargo Transport
 - Construction Support
- **Unique Payload Systems That Spray Liquids**
 - Cleaning
 - De-icing
- **Benefits –**
 - Similar to Small Unmanned Aircraft
 - Greater lift capacities will open up many new operations



Thank you

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