

MODULAR INSPECTION CRAWLER

Alstom Inspection Robotics



Reliable inspection for corrosion, cracks and other kinds of flaws caused by corrosion is crucial to avoid possible costly incidents.

Alstom Inspection Robotics' modular crawler provides multipurpose capabilities for performing various kinds of inspections or cleaning operations. Thanks to the modular design it is possible to mount various kinds of sensory and camera equipment for NDT and to integrate these into the robotic navigation system.

The modular inspection crawler is a steerable crawler system with integrated navigation that is very efficient and easy for inspection personnel to use.

The design is rugged and suited for operation in harsh indoor and outdoor environments.

Application Areas

The system can be applied on all kinds of ferritic structures such as:

- Tanks (walls, roofs, floors)
- Ship hulls, ship cargo holds
- Penstocks
- Wind tower structures
- Large diameter pipes

System

■ Basic System Architecture

The modular robotic crawler carries the NDT equipment by which a structure can be inspected or cleaned. The NDT equipment can be moved around an axis or be fixed on the robot.

The user controls the robot via the robotic control and navigation.

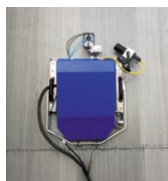
By integrating the NDT payload into the robotic control & navigation, the NDT inspection data can be used to automatically create the inspection reports.

Application

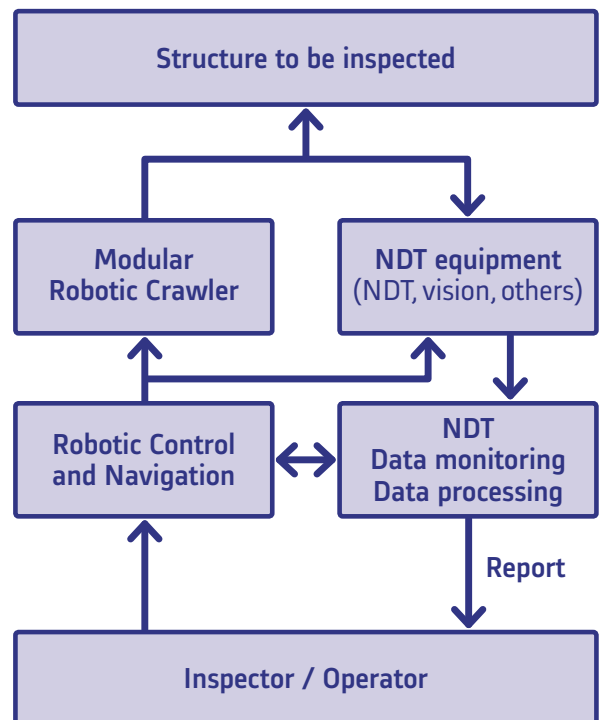


Tanks, Ship Hulls, Wind Towers, others ...

System



Operator



■ Wall Inspection Configuration

The configuration for the inspection of walls is commonly used for the inspection of tank walls, tank roofs or ship hulls and allows a reliable inspection in a short time. The system then automatically generates the required corrosion maps on site.



Crawler (without housing)

Tether cable

Control- / NDT laptop

Controller / power supply

Coupland pump

Water tank

■ System Features

The many features of the modular inspection crawler are:

Rugged Robotic System

- Magnetic attachment (magnetic wheels) allowing vertical and ceiling travel according to payload
- Track drives designed to avoid scratching surfaces
- Ability to negotiate weld seems / steps of up to 12 mm
- High payload (10 kg)
- Easy setup and operation within minutes

Sophisticated Navigation & Control

- Remote control by joy stick
- Navigation support for the operator
- Indication of deviations from the selected driving angle
- Distance sensors to prevent collisions
- Autonomous navigation: following weld seems or contours
- Fully integrated and rugged packaging for reliable onsite application

Versatile Payload Concept

- Integration of various inspection / maintenance applications
- It is possible to adapt different inspection or maintenance payloads
Here some examples:
 - NDT:
 - Up to 4 UT sensors for crack / corrosion inspection
 - Up to 4 ACFM sensors for weld / plate inspection (cracks / corrosion)
 - Motorized axis to hold sensors for x-y scanning
 - Vision: on-board live video camera integrated into the navigation system
 - Water jet cleaning: device for cleaning remote surfaces
- Other payloads are possible and can be implemented as required

Integrated Inspection Data Processing

- Online monitoring of measurement data
- Merging of inspection data (NDT, vision) and navigation information for automatic generation of a flaw map
- Automatic data storage and retrieval
- On-site report generation