

Light-Weight Robot

Non-Destructive Testing of Complex Geometries

Light and transportable robot arm for non-destructive testing (NDT) of complex geometries as in nozzle weld joints or nozzle inner edges

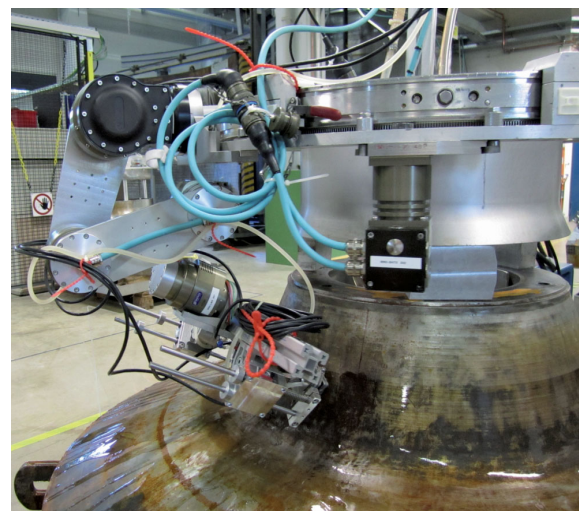
Challenge

Safety regulations and international standards require recurrent inspections for power plants. Inspections on complex geometries are often performed with an automated data acquisition system.

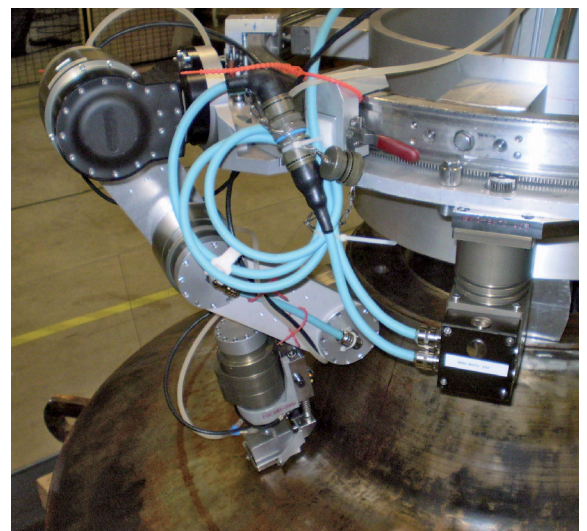
Solution

The Light-Weight Robot (LWR) is the predestinated tool for those applications. With a standard configuration of four axes, the LWR is a perfect match in terms of positioning and movement accuracy. Especially on complex shaped components an optimal coupling and alignment of the transducers is mandatory to achieve the best results. An even higher versatility can be reached with two additional axes and a wide range of connector plates that can be attached to the robot. These options allow an easy modification to existing carrier system or installed rails.

In order to control the robot a 3D point cloud is needed. This cloud determines the scan plan for the tool. The LWR works in a direct link with our 3D-iMaV tool to guarantee an optimal preparation of your inspection task.



LWR with single probe system during a nozzle inspection



LWR with double probe system during a nozzle inspection

Customer benefits

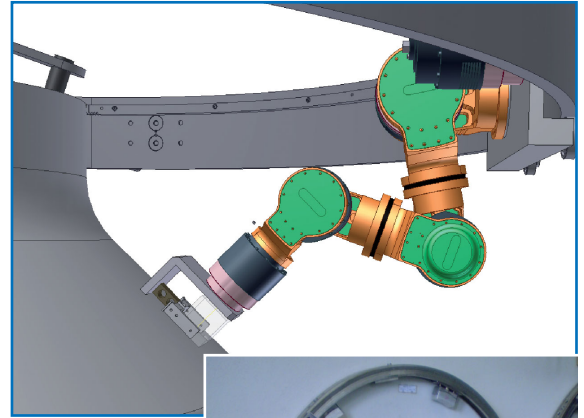
- High precision and flexible testing on complex geometries
- Reduction of inspection manipulators due to versatile application of the LWR to various inspection areas
- Easy performance of inspections on complex geometries by combination of the LWR with the 3D-iMaV tool

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

Technical information

The LWR was developed to work with our 3D-iMaV tool in order to optimize inspection techniques for complex geometries. During the qualification process for the entire primary circuit of the EPR reactor 26 different ENIQ qualifications were necessary. About 10 of these 26 qualification groups belong to the so-called “complex geometries”, like the nozzle-to-shell welds or the nozzle inner radius. The LWR has major advantages in term of reproducibility and positioning accuracy compared to gantry axes systems with spring loaded transducers heads.

Due to its versatility it can be applied on components from various industries.



LWR on feed water nozzle

Features

- Light weight: less than 10 kg (without transducer system)
- Action range can easily be adapted by exchanging connector plates between the joints
- High ultimate load of up to 50% of self-weight
- Inspection of complex geometries as in nozzle weld joints and nozzle inner edges
- Integrated collision control
- Smooth movement due to Schunk modules axes
 - light weight
 - connection via bus system
 - contains motion controllers as well as power electronics and brakes
- Only small amount of cabling work necessary since bus system and power supply are looped through
- 24 V power supply of the drives
- Distance between controller and power box up to 80 m
- Distance between power box and LWR up to 80 m
- 30 m waterproof version available
- Positioning accuracy better than ± 1 mm
- Velocity up to 50 mm/s

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