



CREATING THE FUTURE OF ON-SITE ROBOTICS

Effee: On- stream and remote repairs

- 
- An aerial photograph of an offshore oil rig and a supply ship at sea. The rig is a complex structure with multiple levels and cranes, situated in the water. The supply ship is a long, narrow vessel with various equipment and containers on its deck. The background shows the dark blue ocean and a white, textured shoreline on the left.
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- How it started
 - On-stream repairs
 - Remote repair operations

On-site repair – how it started



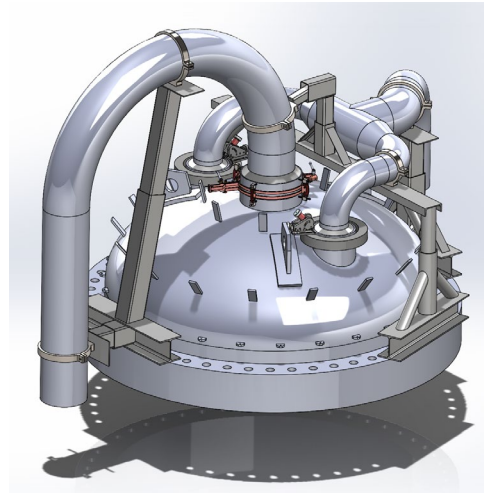
On - site repair at a glance



Corrosion/crack/hot tap
repairs On-stream



Corrosion/crack
repairs in TA



Special repairs



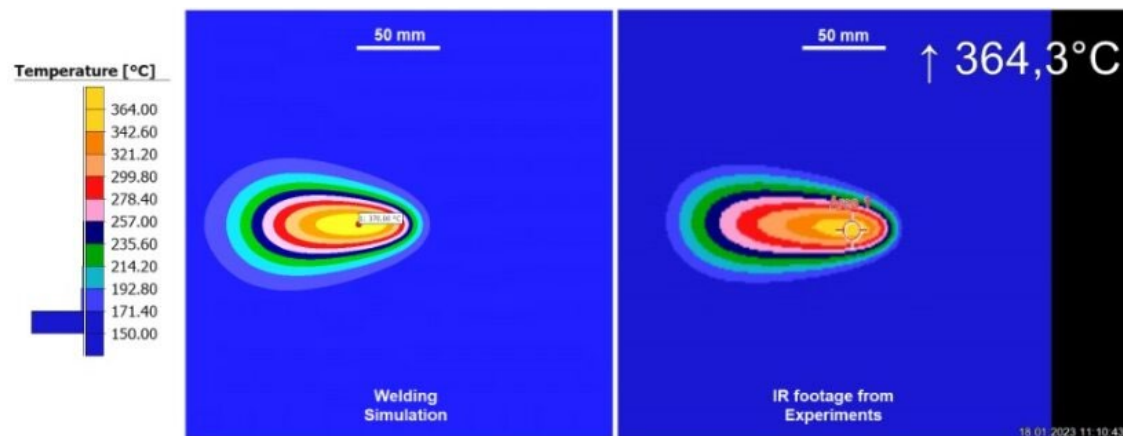
Remote repairs



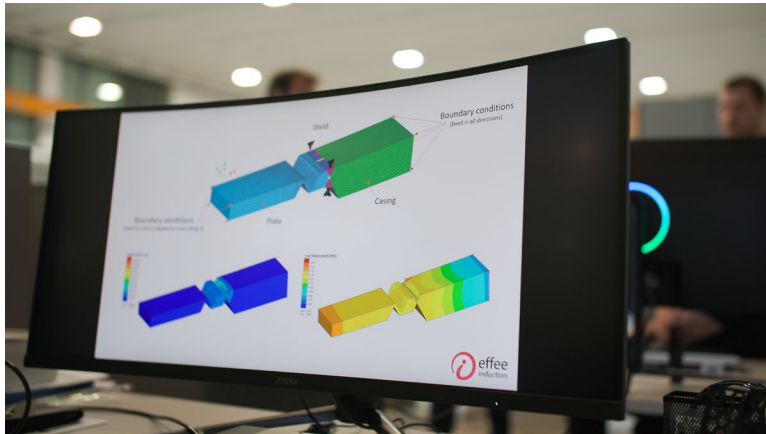
Tie-ins and
FLX-modifications

On - Stream repairs

Robotic welding / AM repair of
on - stream equipment



Robot is the missing link



Welding simulation



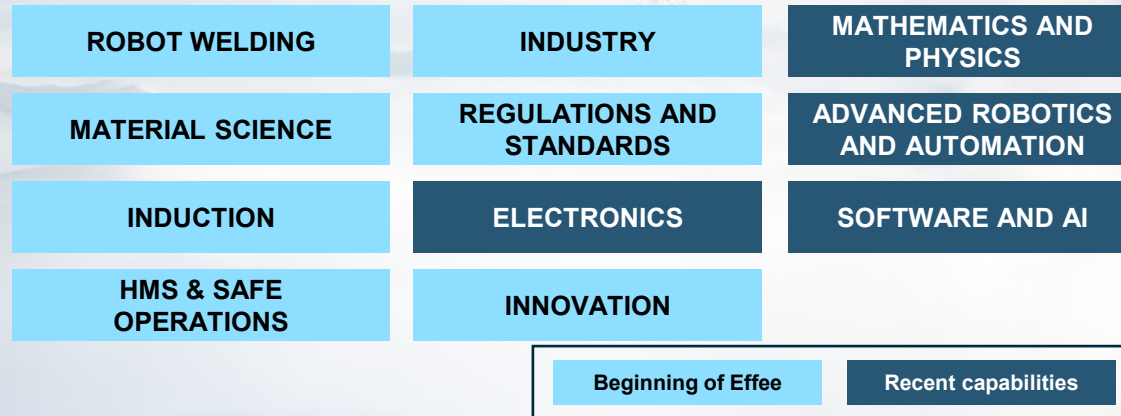
Insufficient control over welding parameters



Result NOT as simulated

Effee - a rare combination of competencies and problem solvers

Effee key competency



Other examples of inhouse competency

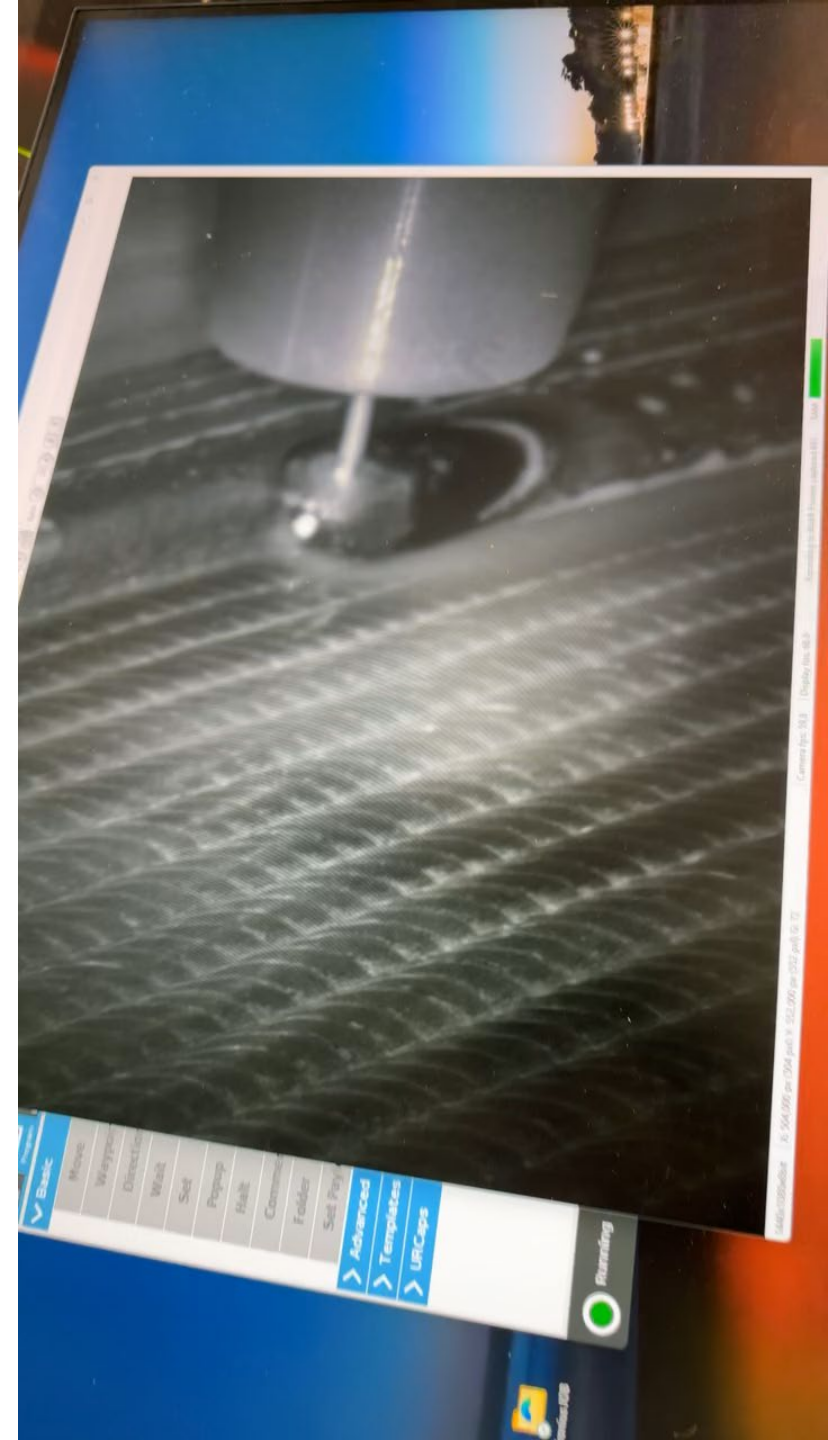
- 3D Printing / Additive manufacturing (Laser, wirearc and polymer)
- Reverse engineering
- 3D Scanning
- Laser ablation
- Remote operations
- Mechanized welding
- Multiphysics FEA
- Piping engineering
- Mechanical engineering



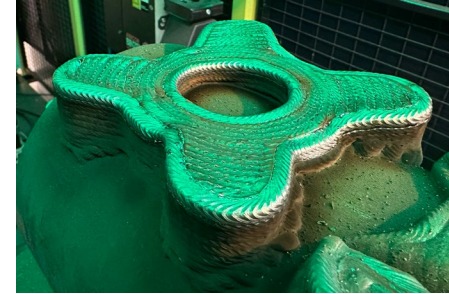
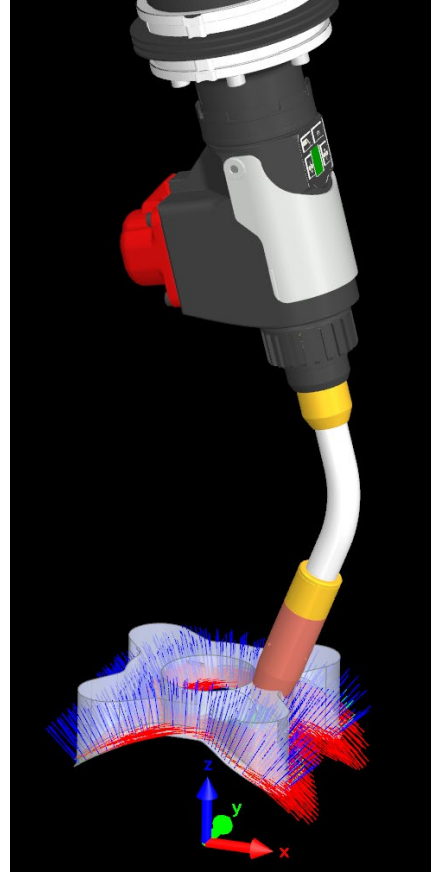
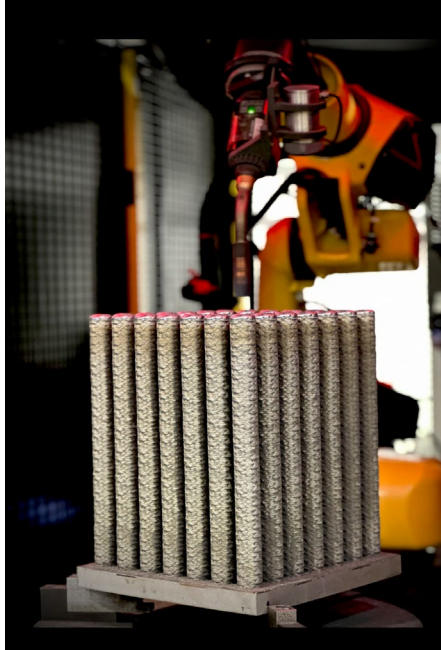
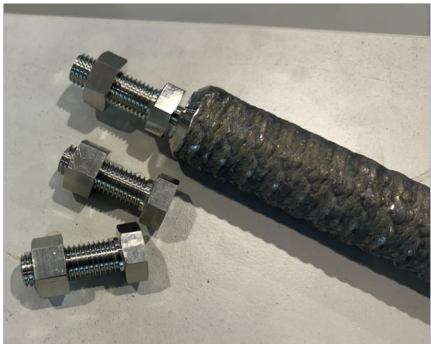
DIGI_HUD_03.mov



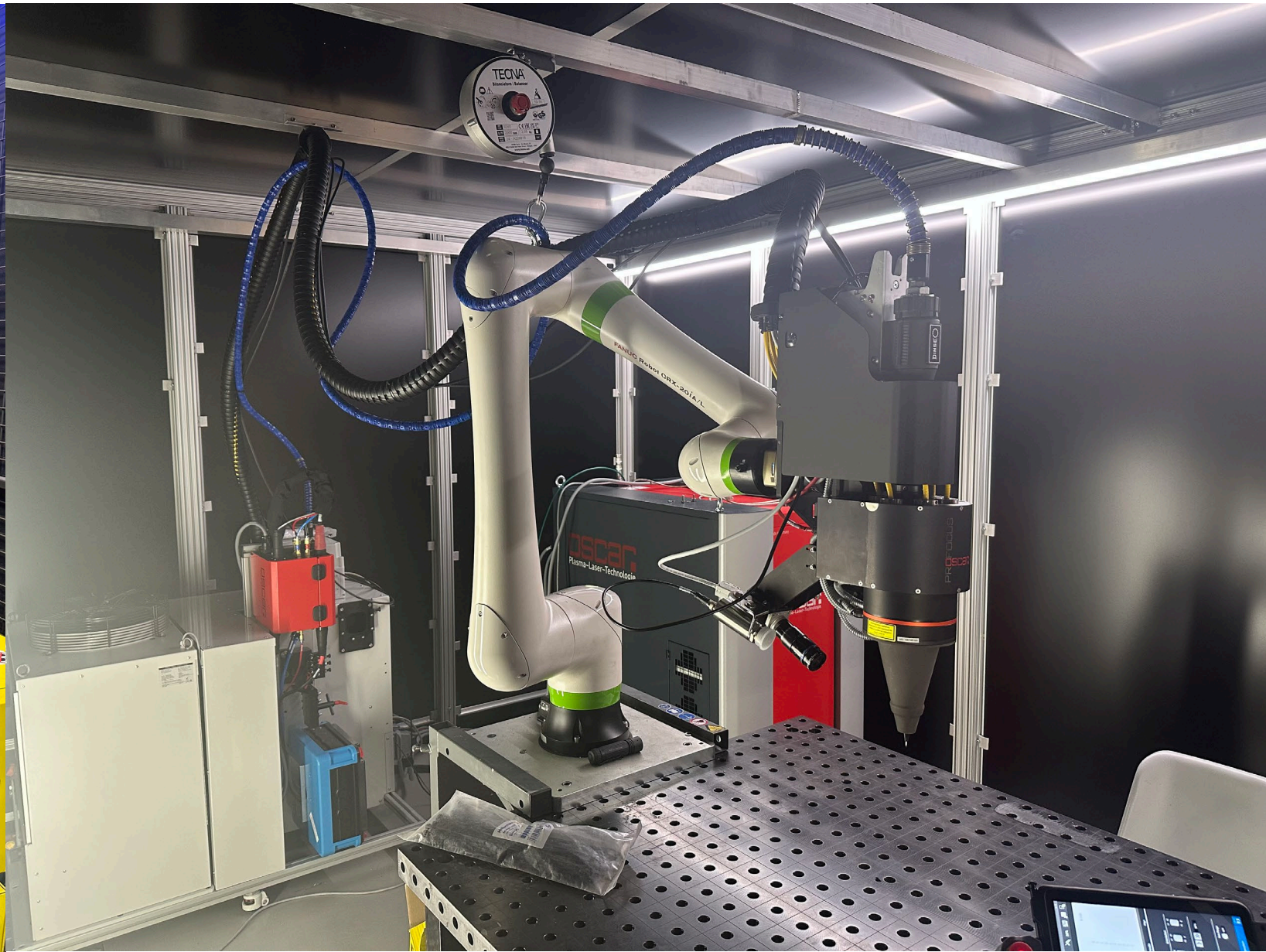
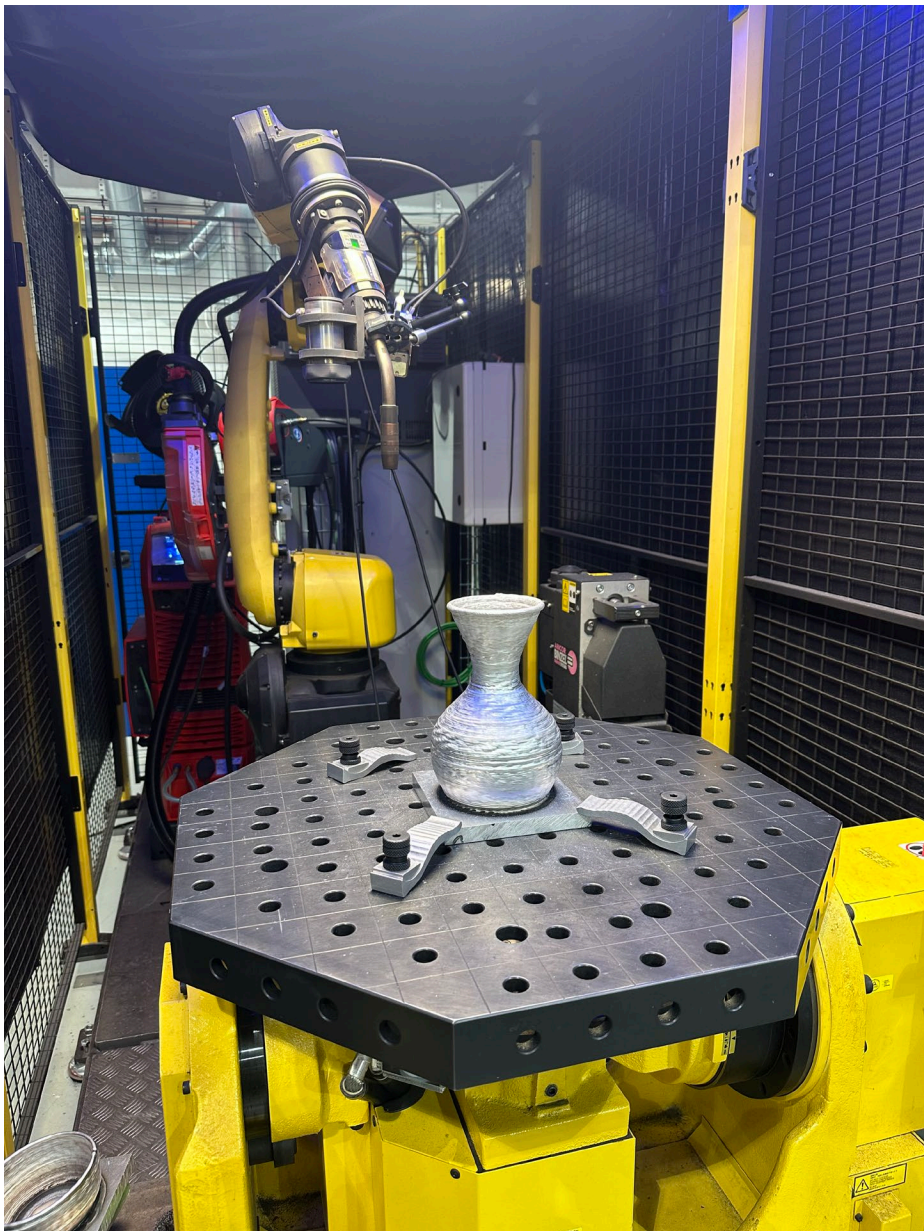
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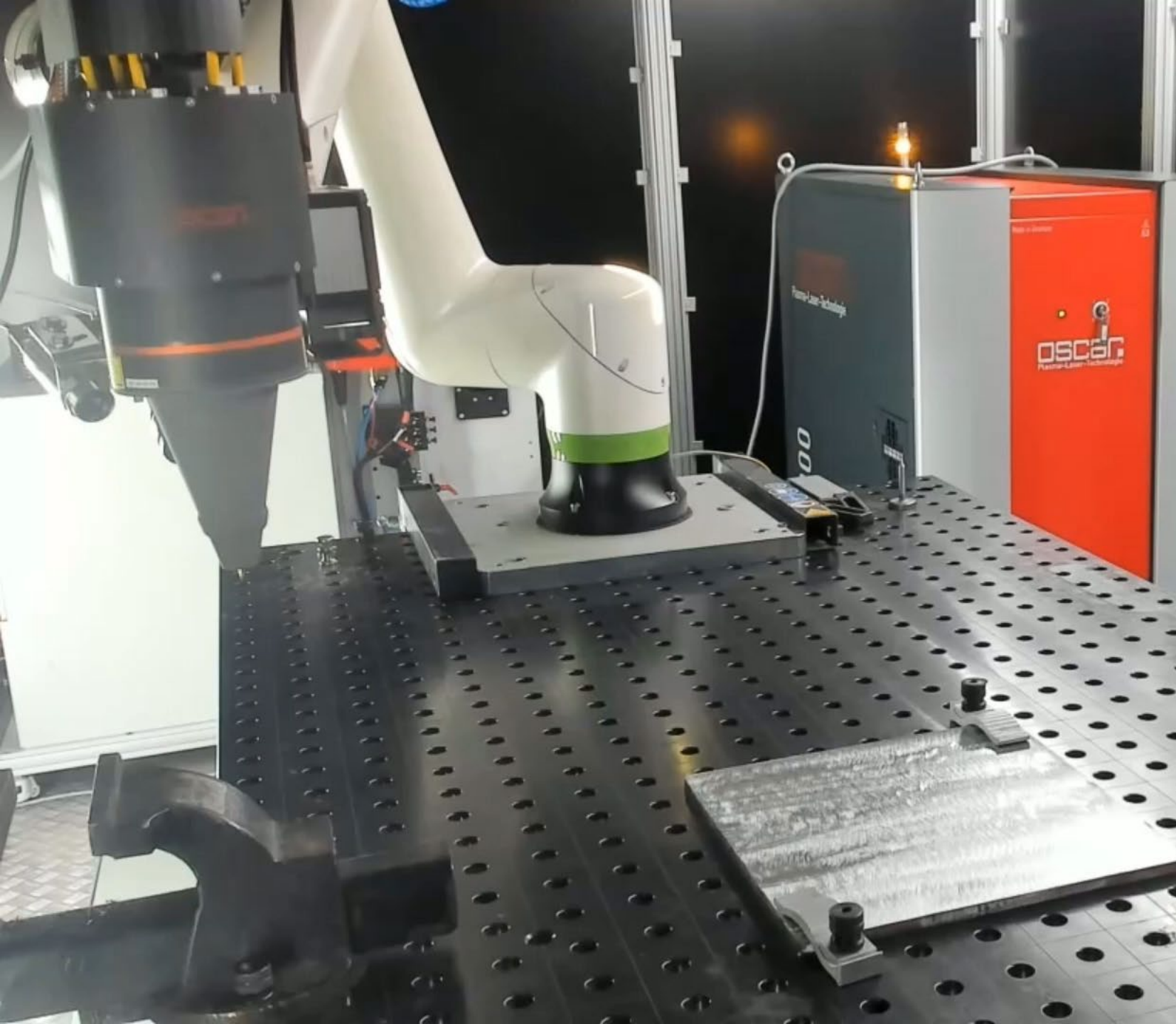


Additive manufacturing and hot taps



Additive manufacturing and hot taps

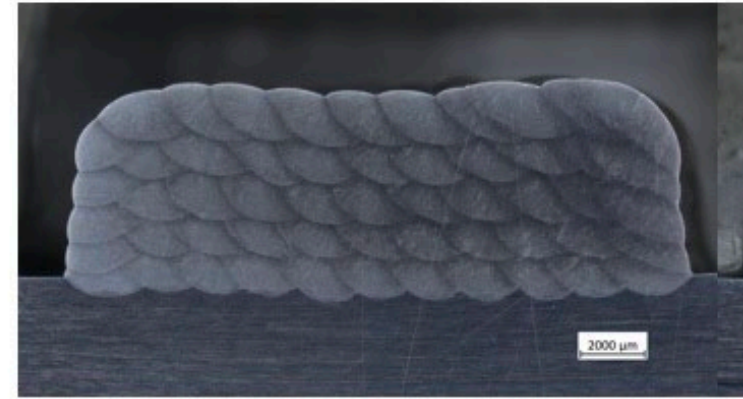




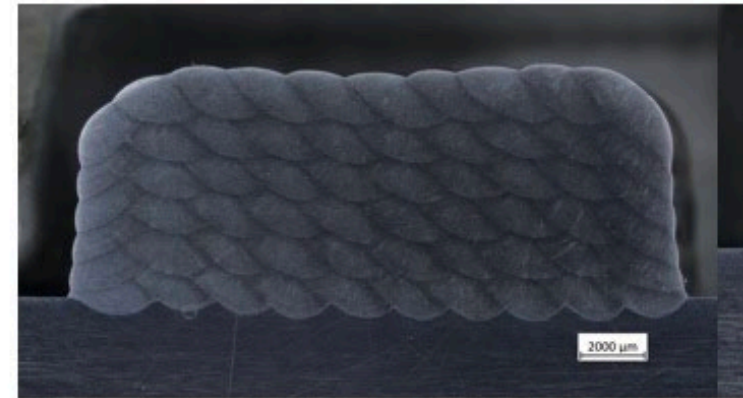
Hatch spacing 60%

P/feed

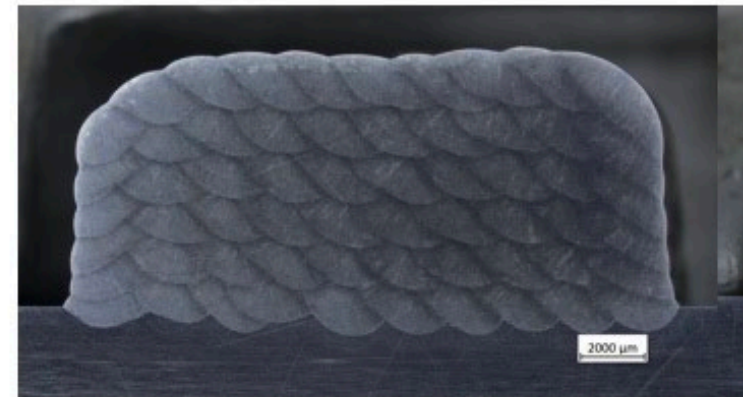
Low



Mid



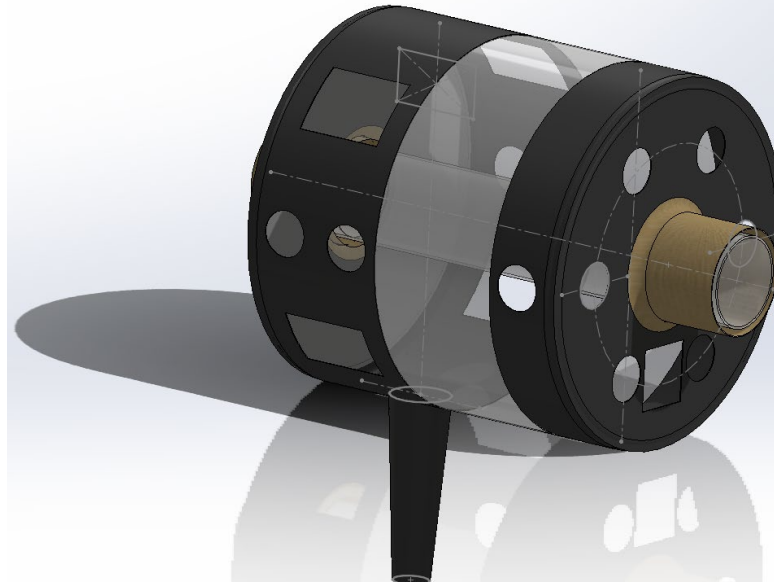
High

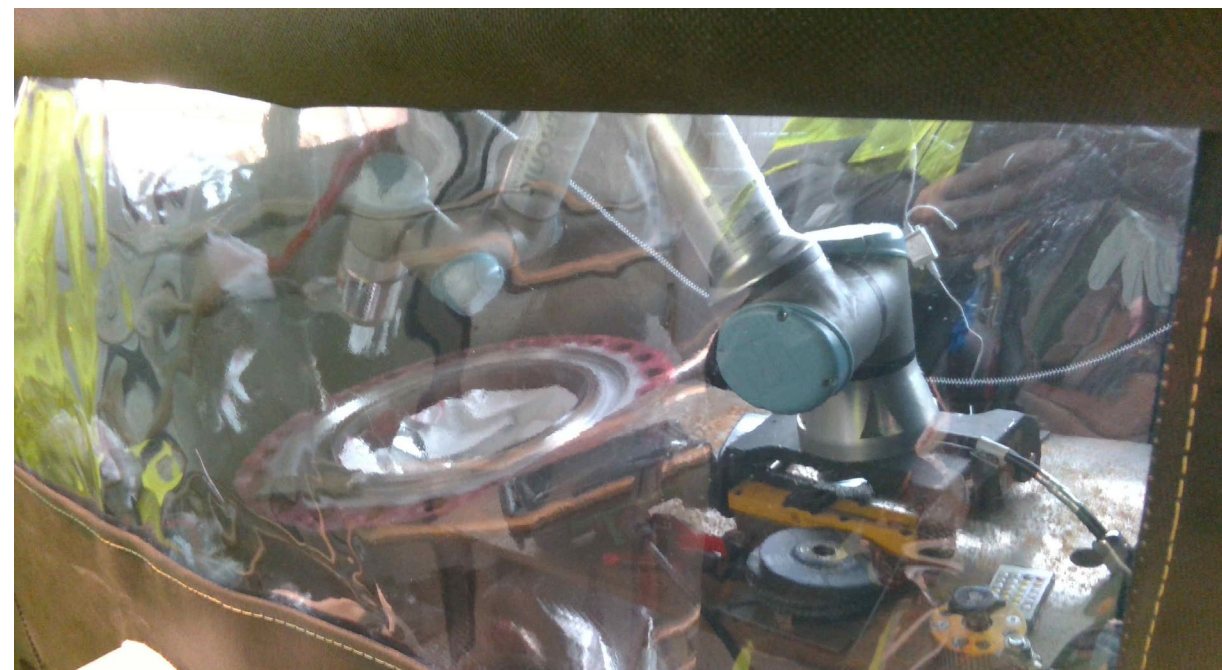


Robot habitat for remote robotic welding

- Less hassle
- Significant less time for setup and welding
- Less POB
- Added safety with Inert-gas

Only possible with
Robotic or mechanized welding.
Field proven





BUSINESS | 27 JAN 2025

Safety a priority as Goodwyn A prepares for production boost

To minimise safety risks, Woodside is exploring robotic and orbital welding for a project that will boost production from the Goodwyn A platform off Western Australia's Pilbara coast.



"The demonstration from Effee exemplified that we can do these activities such as welding in a safer manner than once imagined by combining the knowledge of experienced welders with new technology," Huiwen says.

Mike Brameld first identified the potential of the Effee robotic welding technology some years ago through a long-standing knowledge-sharing agreement between Woodside and Equinor, the Norwegian state-owned energy company.

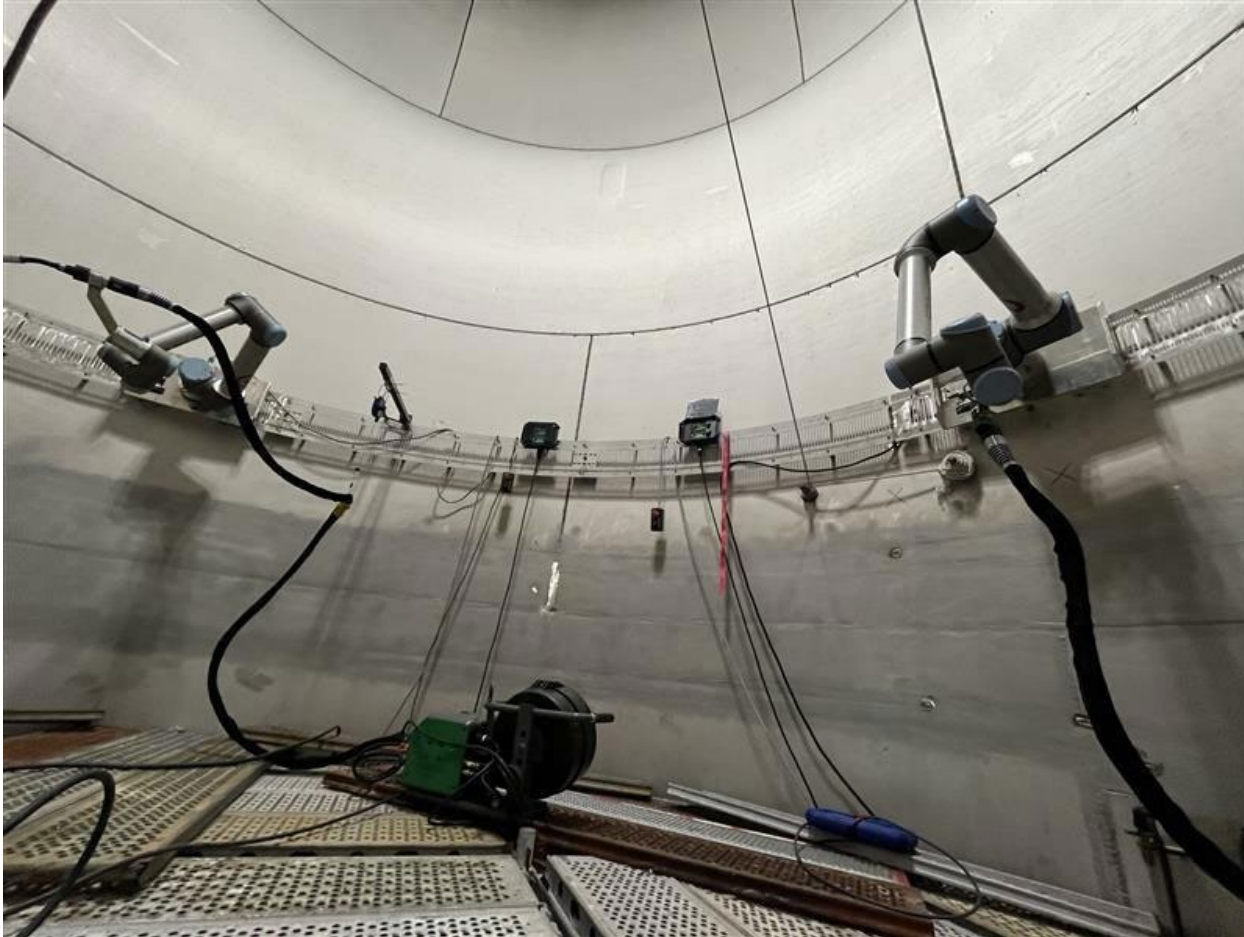


The logo for 'effee' features a stylized red 'i' inside a circle, followed by the word 'effee' in a bold, black, sans-serif font.



Vessel repair on biorefinery

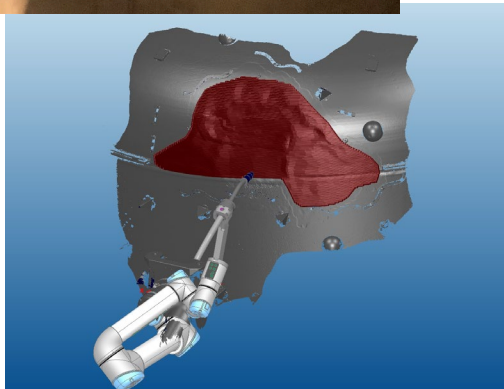
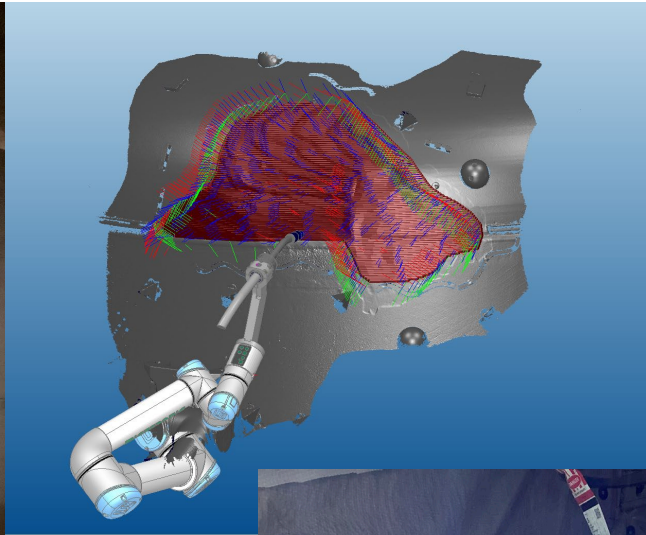
Inconel 625 on 316





Remote repair operations

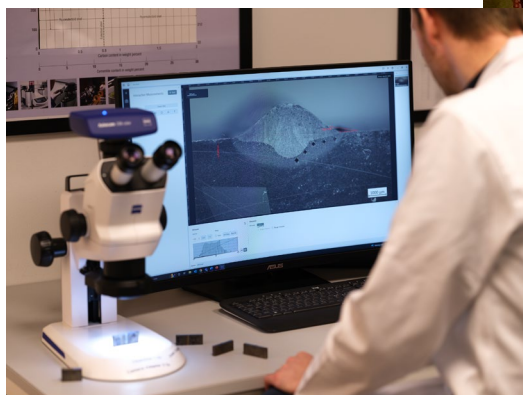
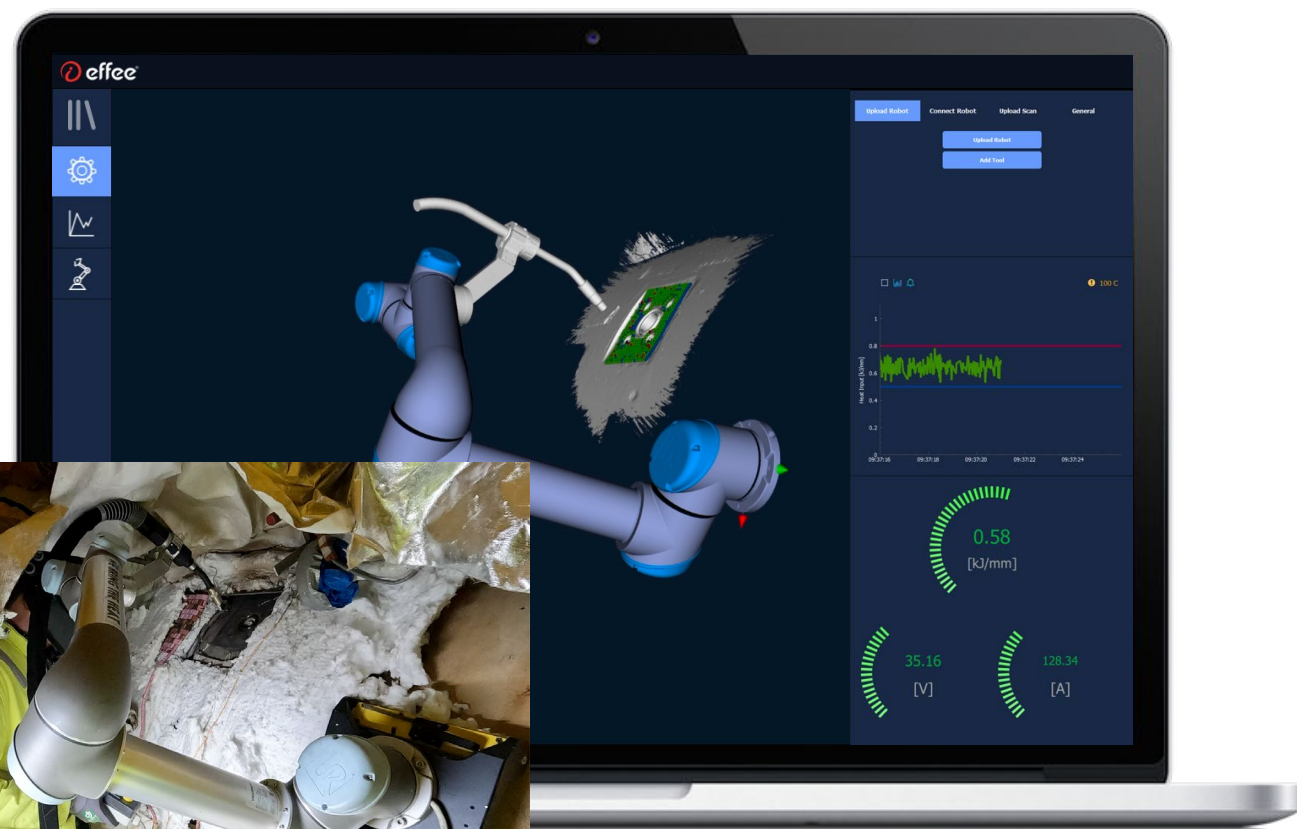
Blow off tank 3D print



3D- print on compressor casing



3D-scan sent from Offshore site
Planning & simulation - onshore
Rigging and preparations offshore
Send file offshore and load
Small adjustments
Play weld!

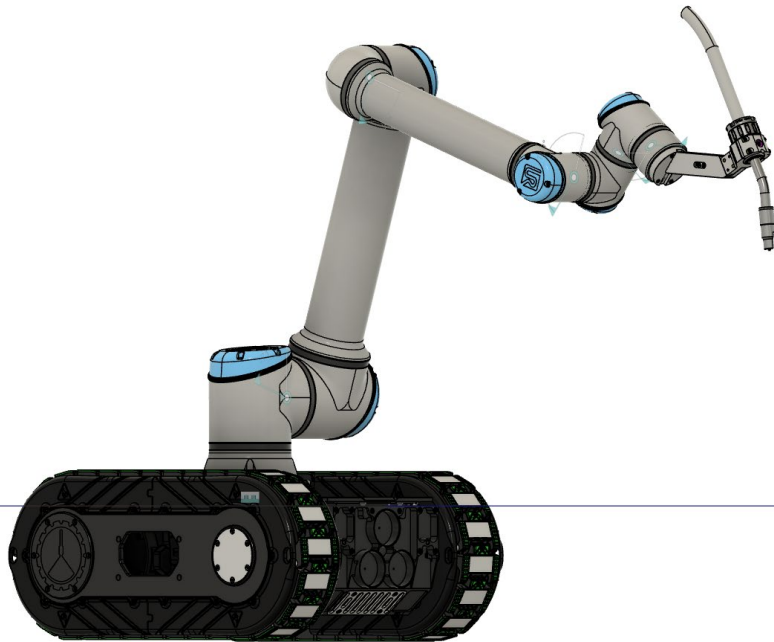


Compressor repair executed offshore

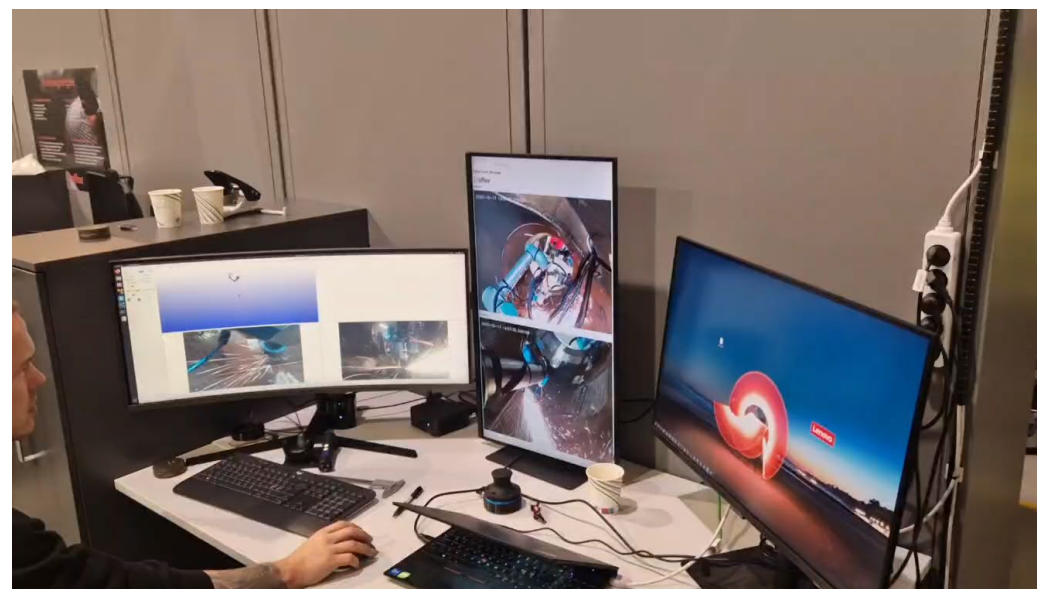
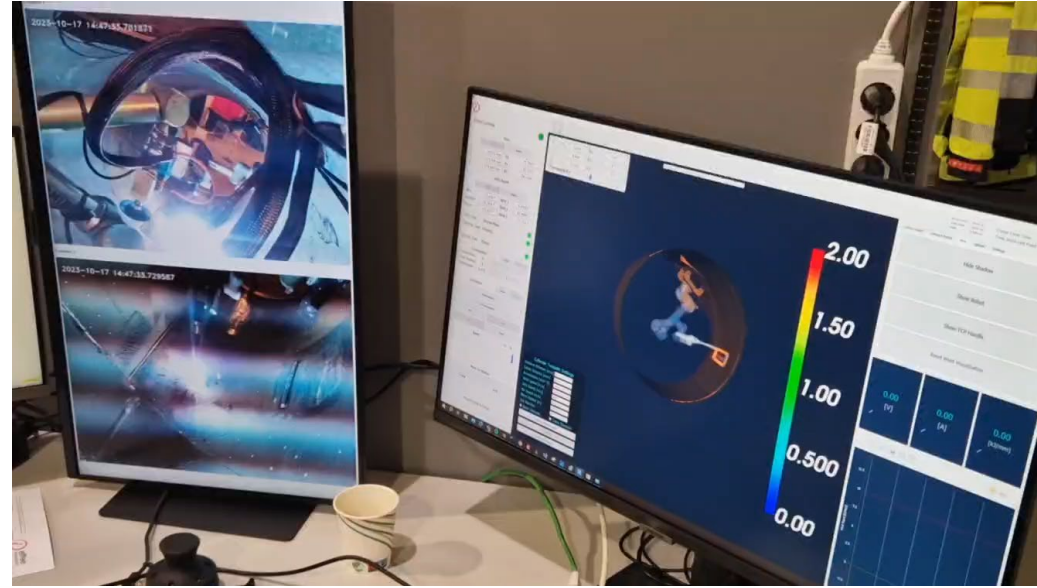
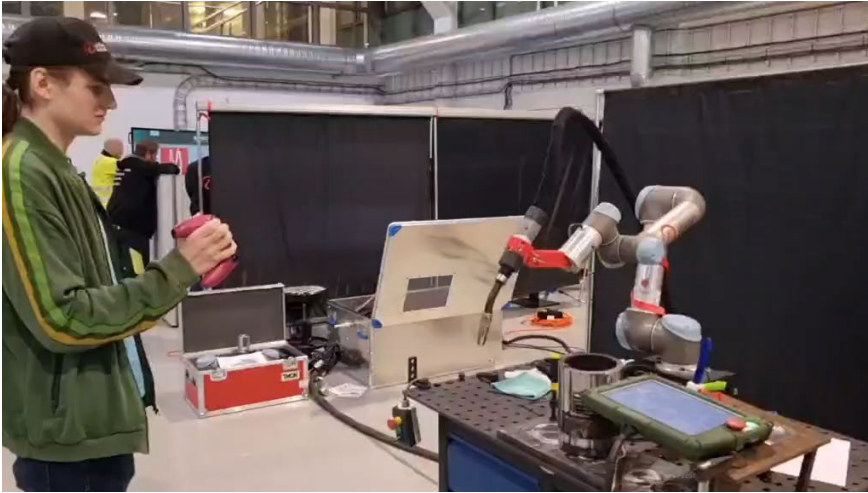


(Fully) remote repairs

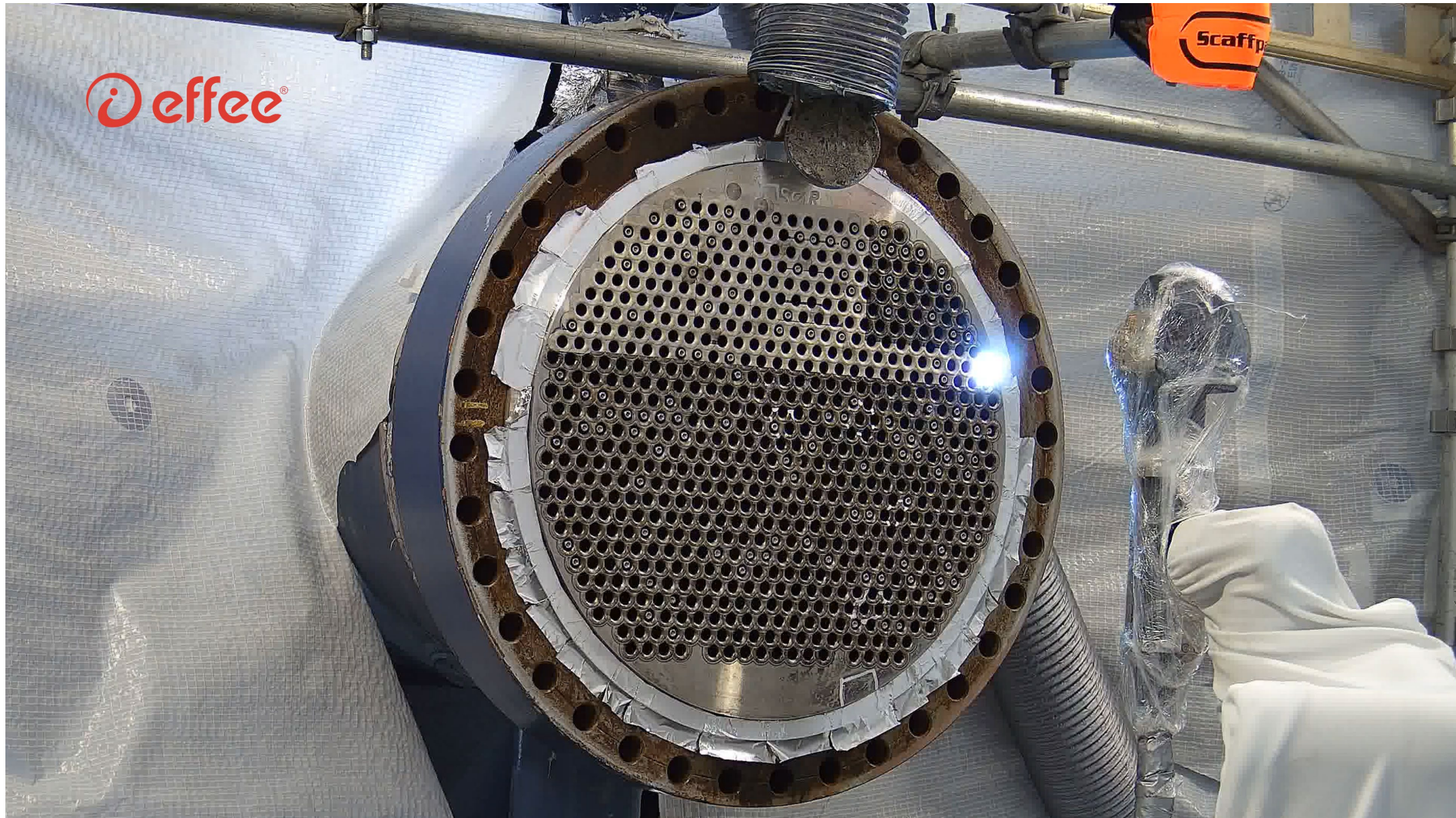
Next generation repair technologies



A new toolbox for remote repairs



Remote laser cleaning

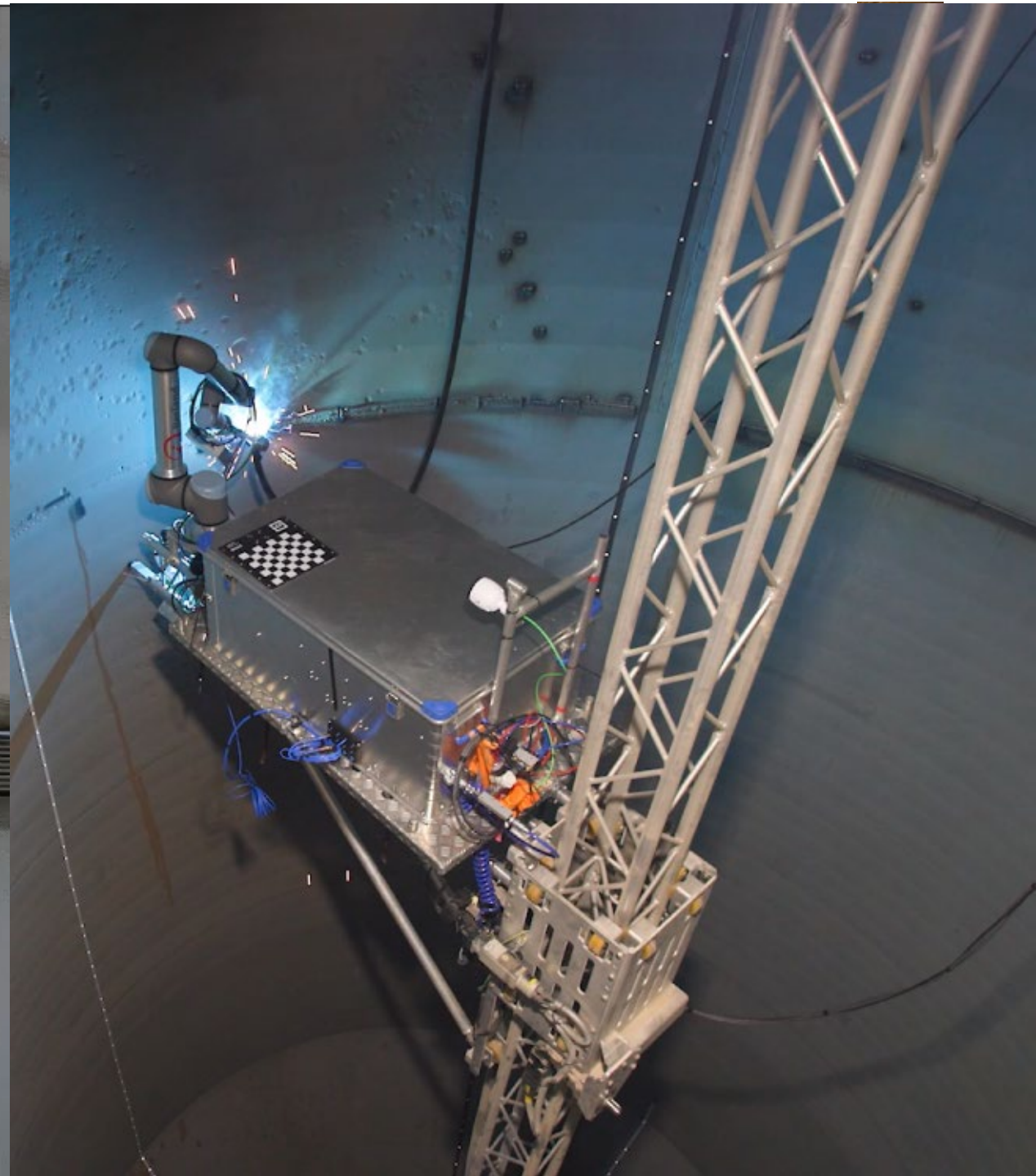


No human entry turn around development

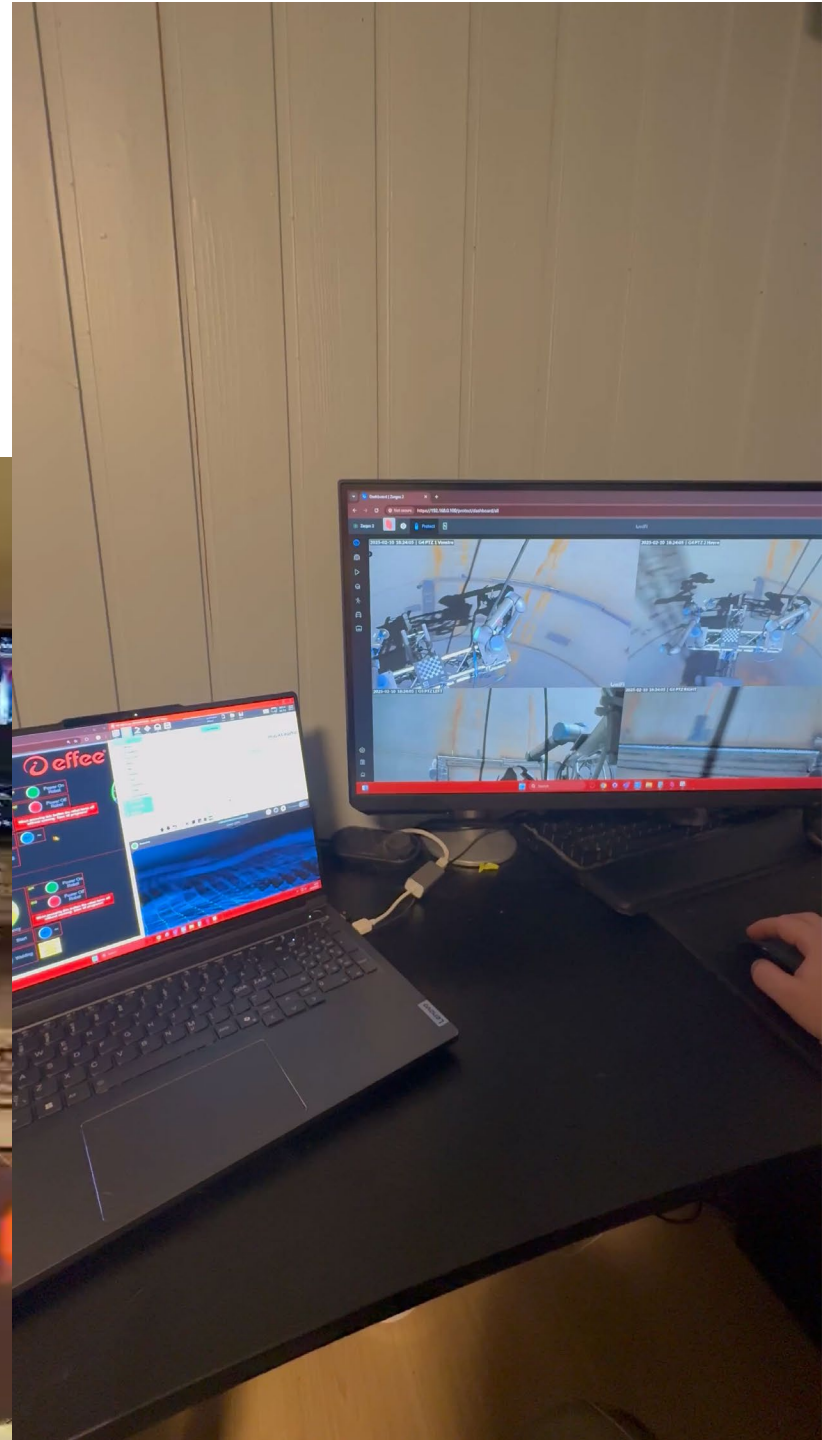
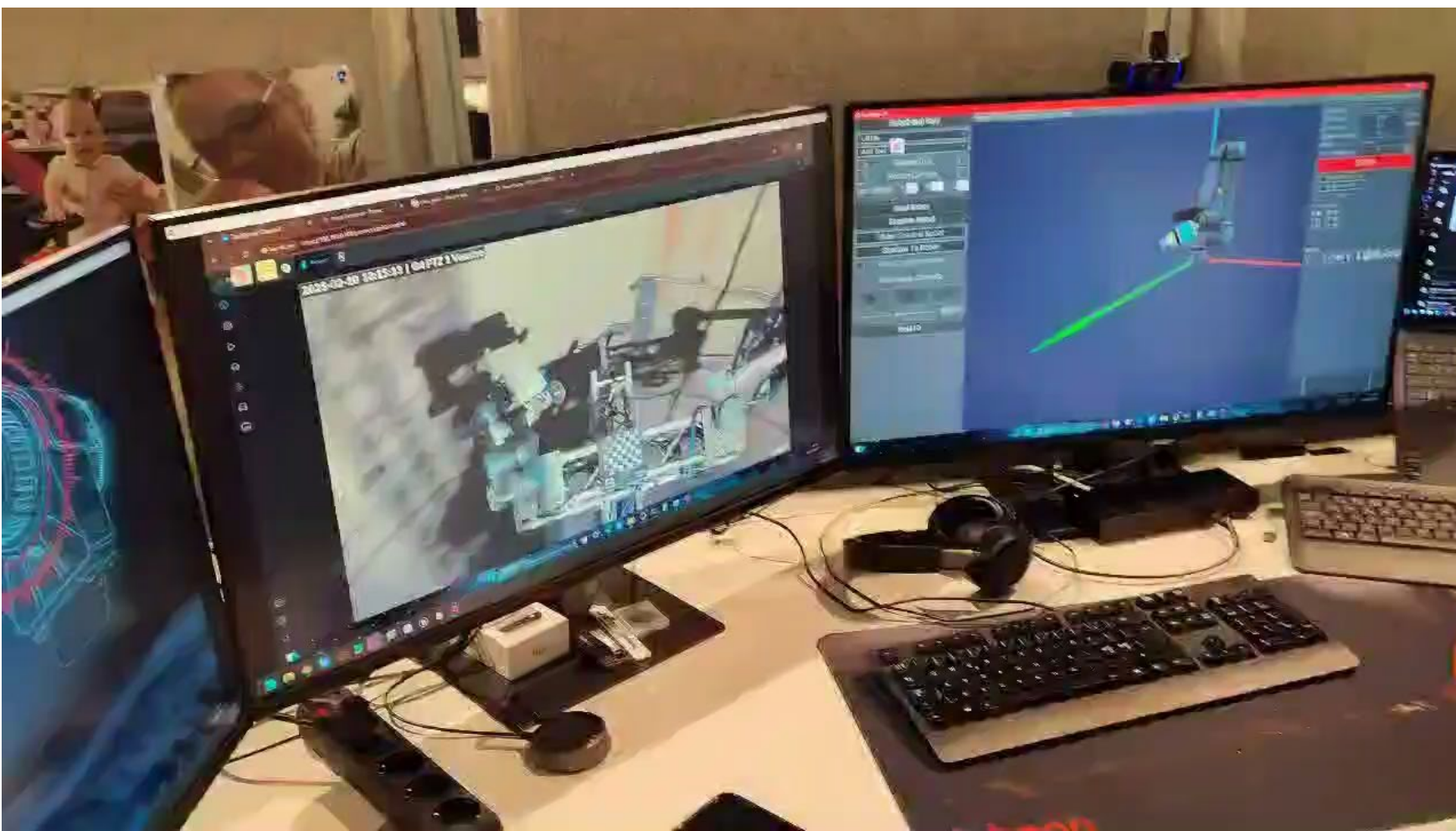


» GASSCO





Hybrid welding work allowing new operational models



Future potential operative models

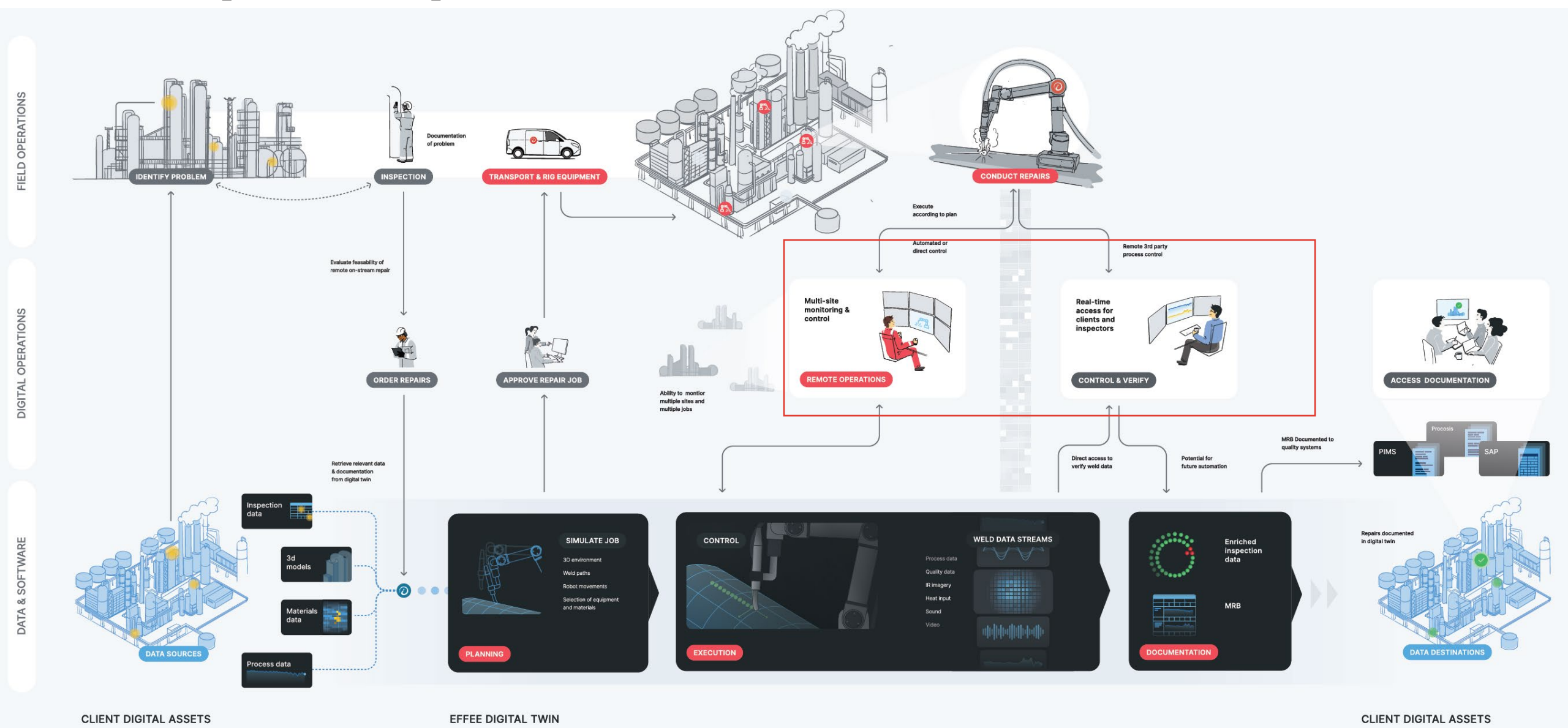


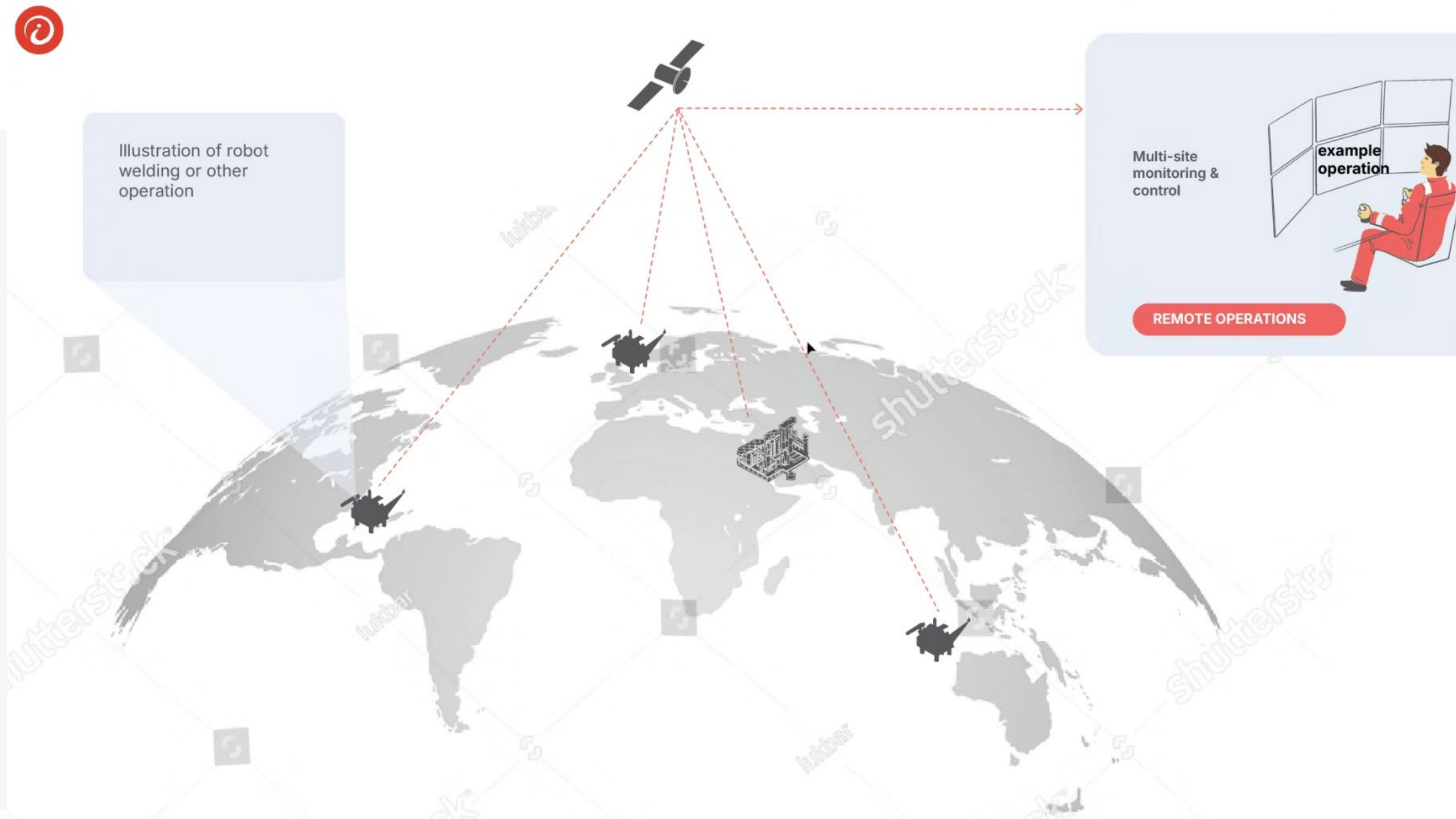


Illustration of robot welding or other operation

Multi-site monitoring & control

example operation

REMOTE OPERATIONS







HJH@EFFEE-OSR.COM

Thank you! ☺