Deploying remote handling heritage - from fusion to decommissioning projects (and back again)

Simon Delavalle, VNS UK Ltd

Heritage of Veolia Nuclear Solutions UK

Oxford Technologies Ltd was founded by engineers who created the world's first fully **remote handling** campaign inside a Tokamak: 'Boom technology' deployed at UKAEA JET.

2017

2015

2013

2008

2000

VEOLIA
Nuclear Solutions launched

VEOLIA
Kurion joined Veolia

KURION
FOR A CLEANER FUTURE
Joined Kurion

Strategic move into new markets: decommissioning & waste management solutions

Support on future programmes at JET & ITER

oxford technologies
Founded

UKAEA JET: remote handling group

In July 2017 Veolia brought all of its nuclear technologies together into one business and launched Nuclear Solutions.

VEOLIA

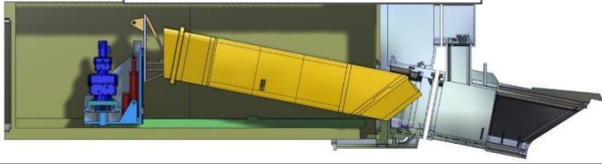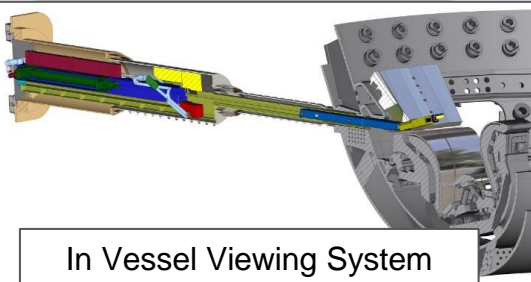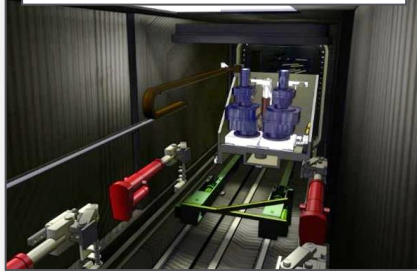# Remote handling for the fusion industry
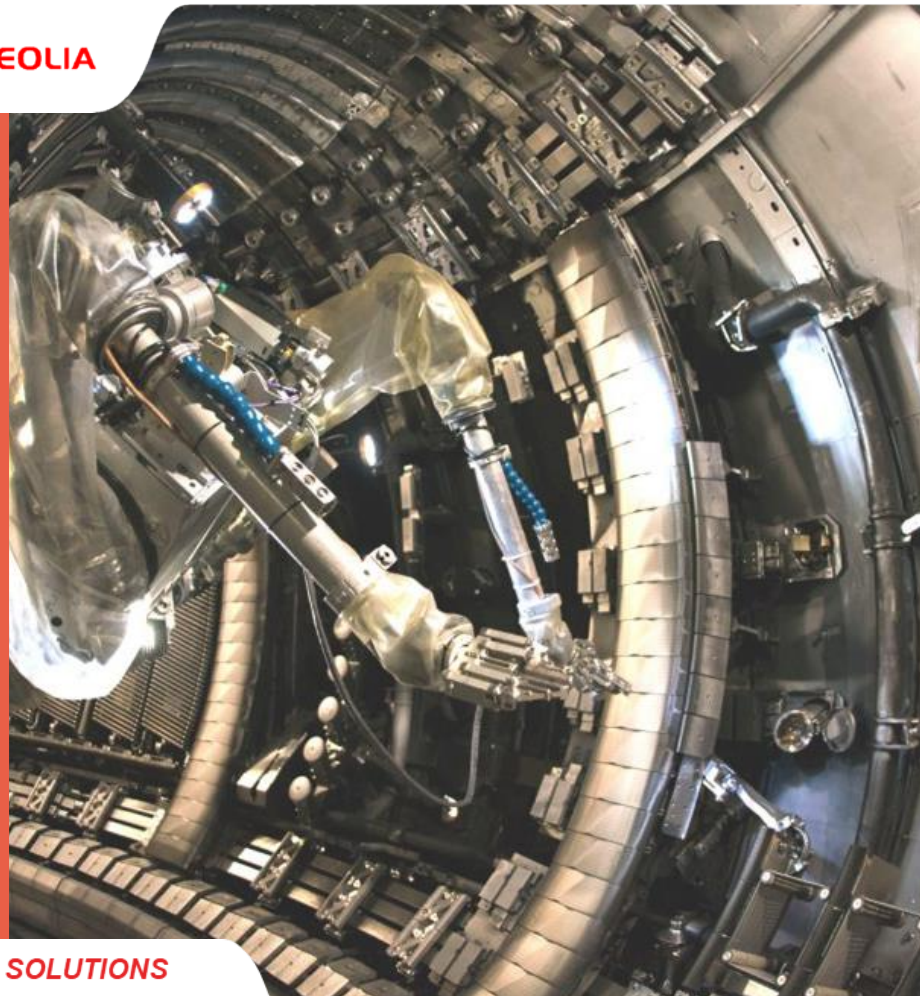
ITER Projects and Experience
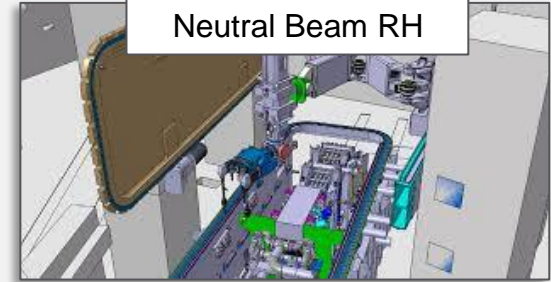
Port Plug Handling

Neutral Beam RH

Cask Transfer System

Multi Purpose Deployer

In Vessel Viewing System
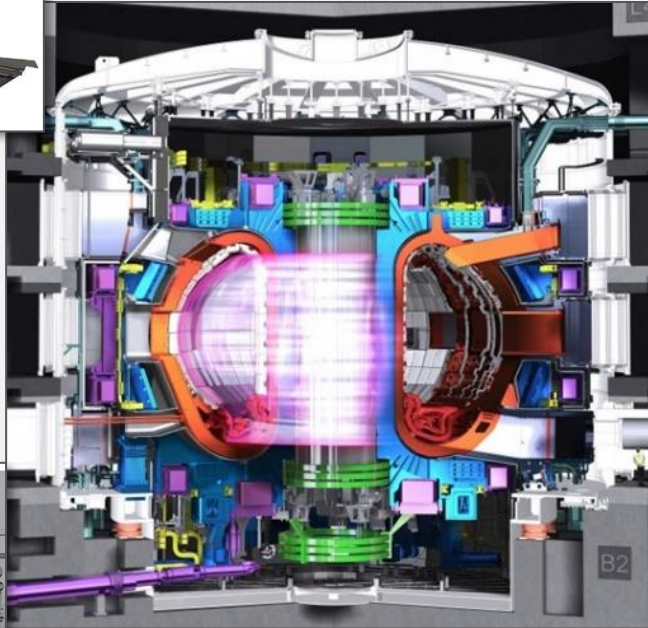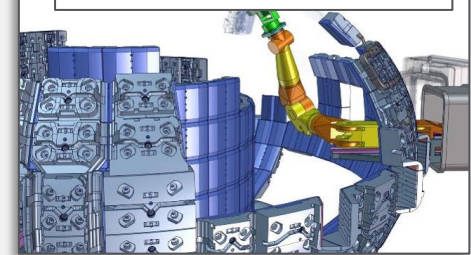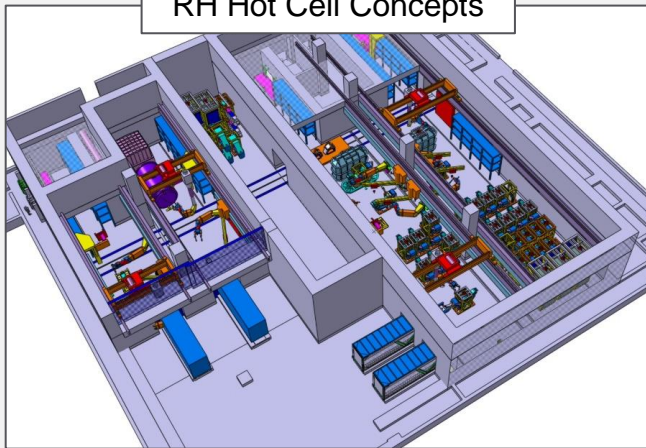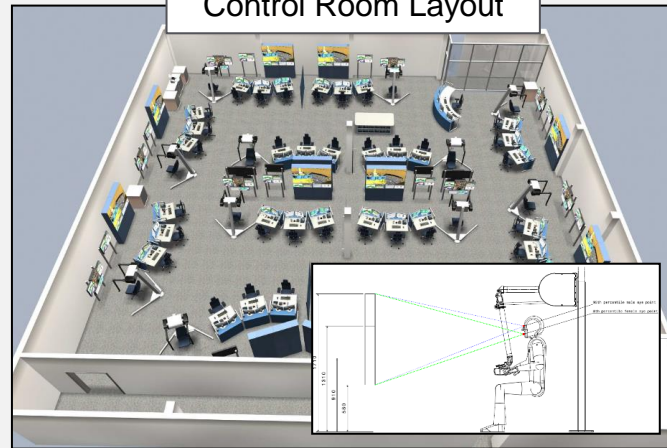
RH Interface Diagnostic
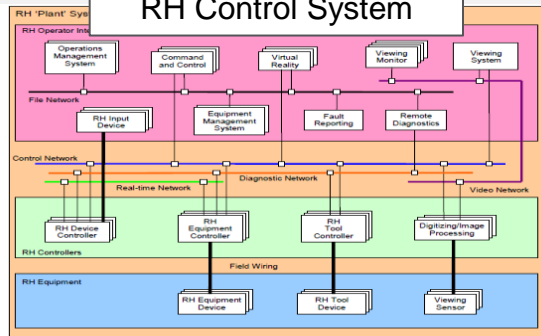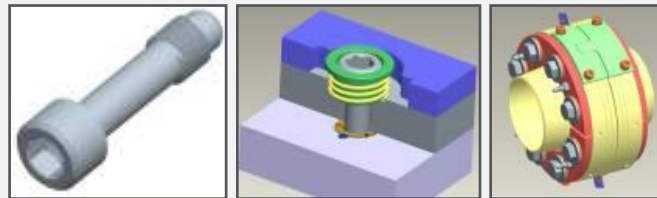
ITER Projects and Experience

RH Hot Cell Concepts

Control Room Layout

RH Control System

RH Code of Practice

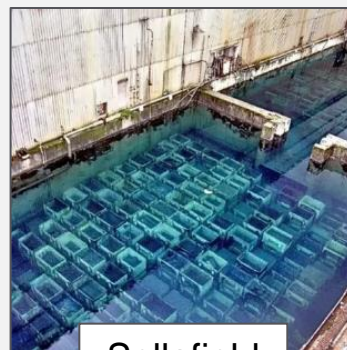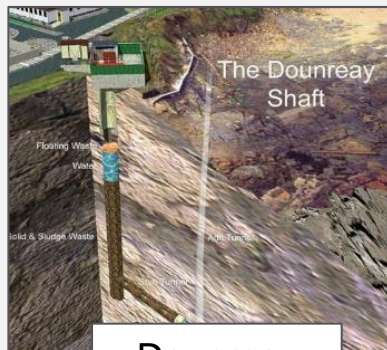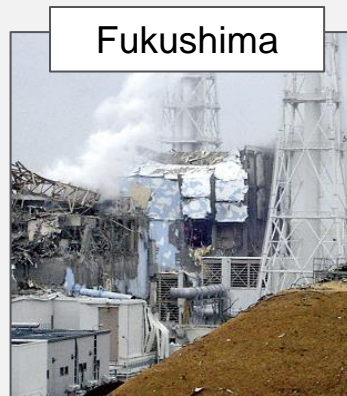# Exporting expertise to the wider industry

VEOLIA

Learning from

JET & ITER

Fukushima

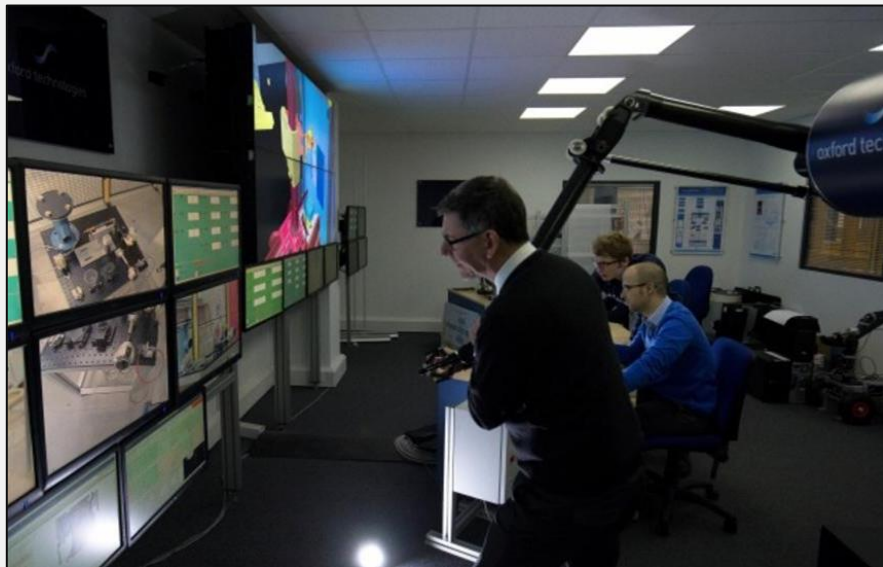Dounreay

Sellafield
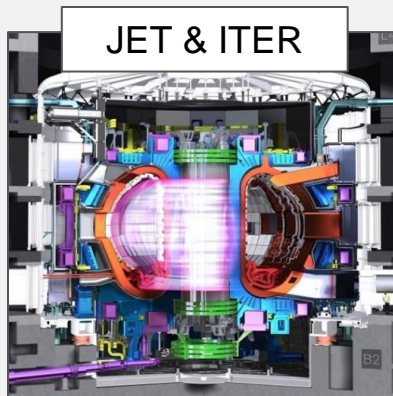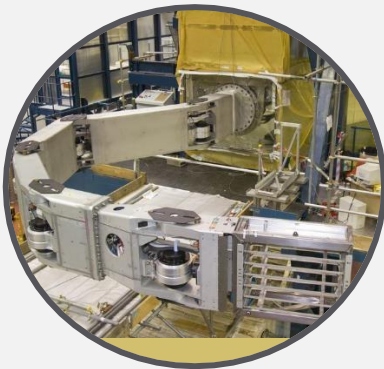
Fusion to Industry

Dexter™ : Force Feedback Remote Manipulator for use in high radiation environments

8 km

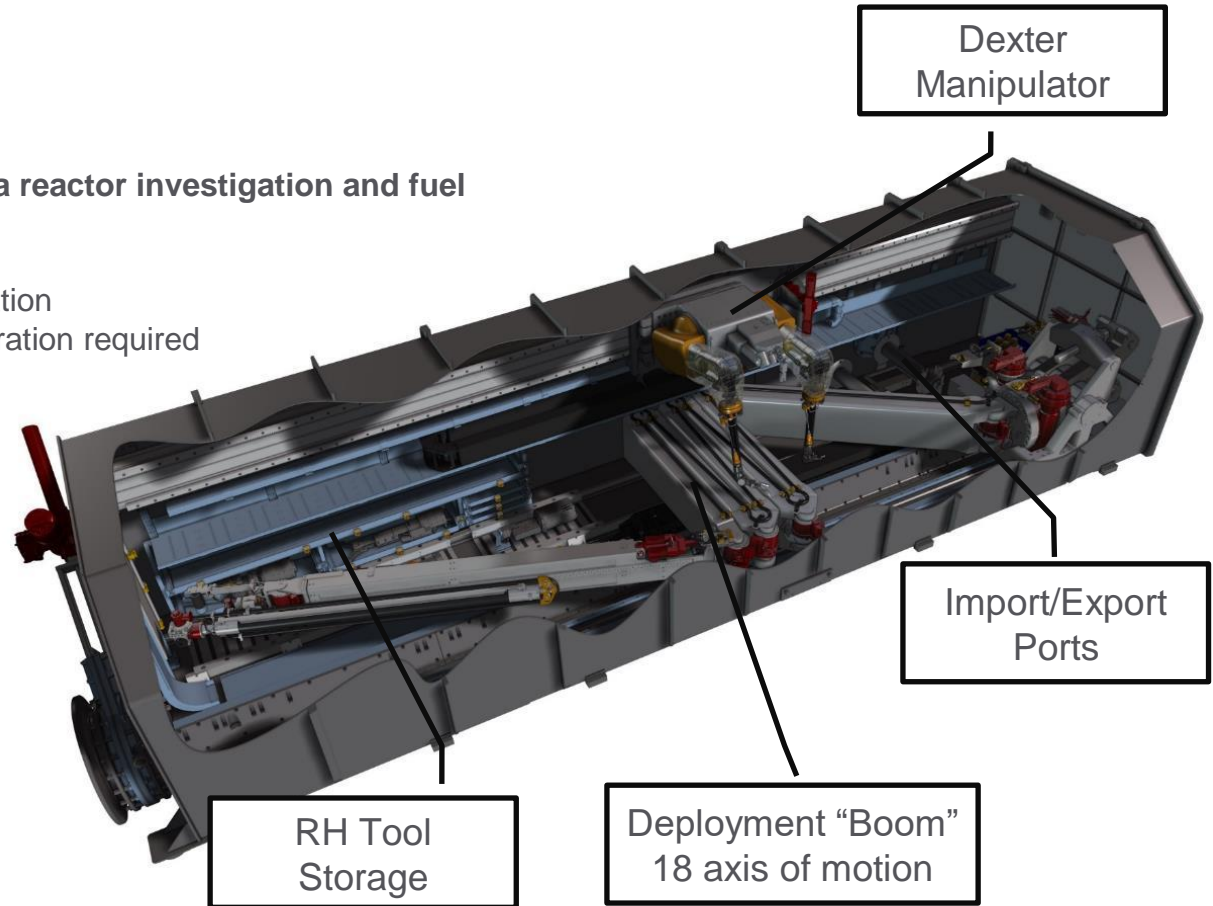# Fusion to Industry

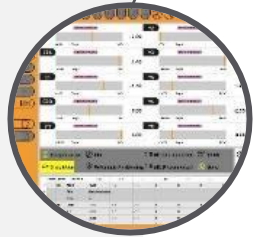**Long reach boom for Fukushima reactor investigation and fuel debris retrieval**
- High radiation environment
- No man access to machine location
- Complex and delicate reconfiguration required

TECHNOLOGY and EXPERTISE transfer from nuclear fusion remote handling experience

Dexter Manipulator

Import/Export Ports

RH Tool Storage

Deployment "Boom" 18 axis of motion

Fusion to Industry

Bespoke actuator
- High torque
- Radiation resistance
- Harsh environment

21m reach
18 axis of motion

Bespoke control system
- Controlling up to 18 robot axis
- Digital twin system for complex operations
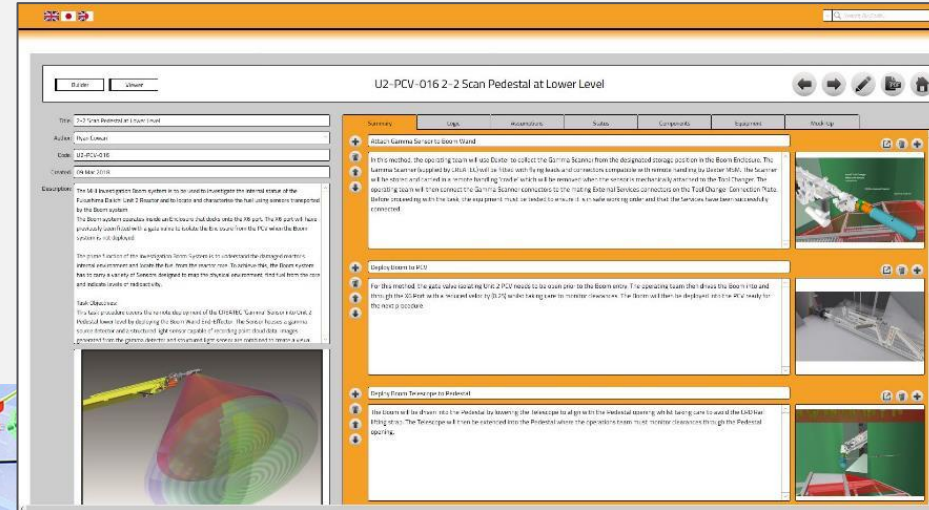
Design for high radiation
- 1MGy gamma radiation

Fusion to Industry…

Digital tools to support RH system design and operation

- Real interfaces driving virtual system
- Task study
- Task optimisation
- Operator training

... and from the industry back to Fusion!

VNS continuously develops its technologies to adapt to the most demanding challenges in the nuclear industry – from high radiation resistance to delicate remote handling operations.

These technologies and know-how can now be redeployed for existing and future fusion enterprises.