

**Challenge:**  
**Asset Inspection Through**  
**19mm Inspection Ports**



- Welcome and introduction to Game Changers
- The challenge in detail  
(Stephen Israel and David Hargreaves)
- How to apply for funding

# About Game Changers

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**FINDING  
SOLUTIONS**



**TESTING  
FEASIBILITY**



**PROVING  
CONCEPTS**

# Where we support



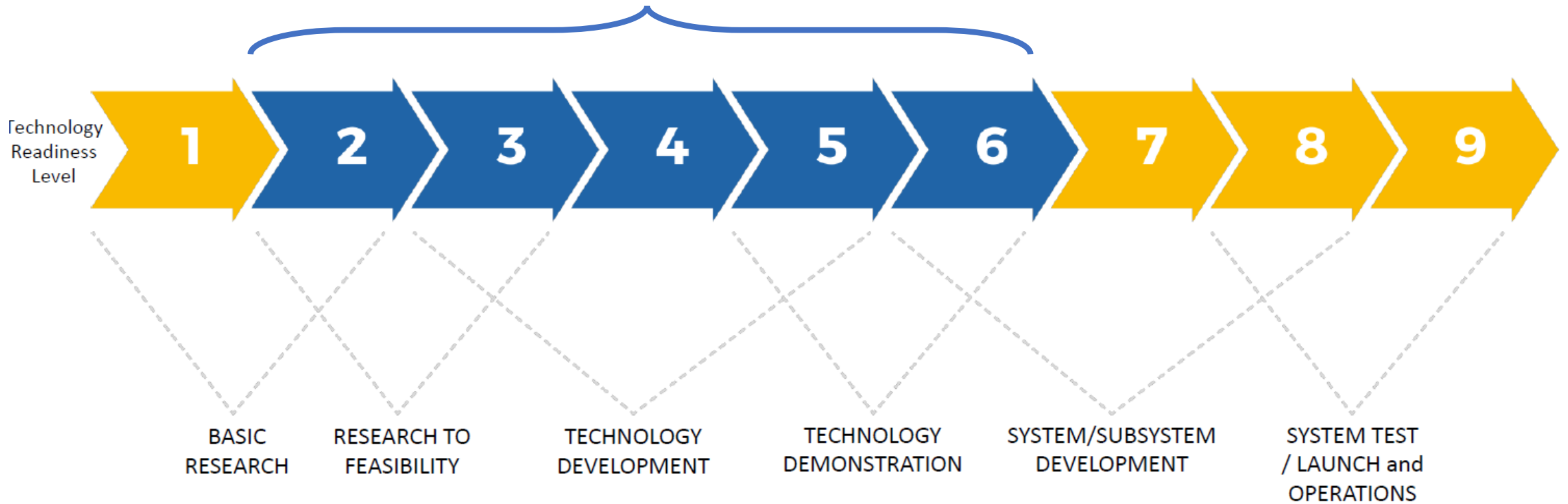
**FINDING SOLUTIONS**



**TESTING FEASIBILITY**

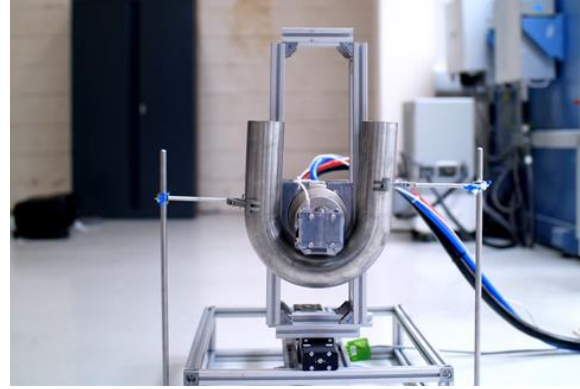


**PROVING CONCEPTS**



# Game Changers works

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- **50+** challenges
- **500+** applications
- **140+** feasibility projects
- **45+** proof of concept projects
- Multiple projects progressing to active trials, in discussion with Tier 2s, secured £m+ beyond Game Changers





## **MER Active Duct Camera**

**Dr David Hargreaves**  
**Stephen Israel**

**23 March 2023**

# Contents

- MER overview
- Active Duct & Tank Rooms
- Historical inspections
- Challenges & requirements

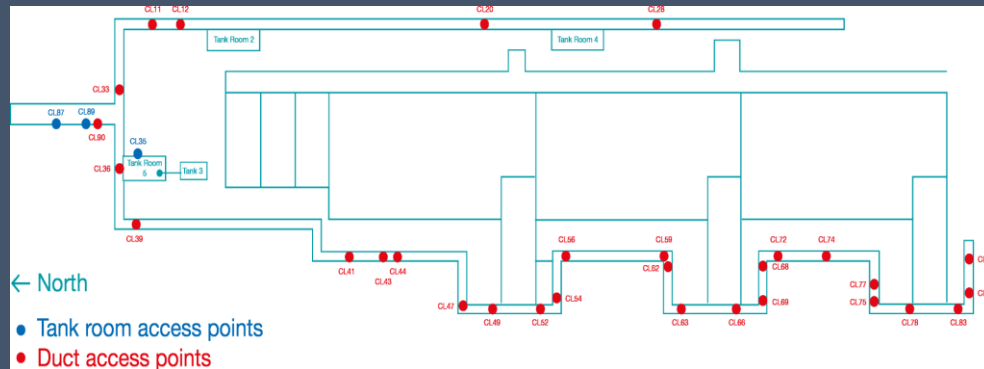


# MER

- Magnox East River refers to a number of facilities on Sellafield site.
- 2 facilities of particular interest
- Fuel Handling Plant 1985 (FHP)
  - Receives, repackages, exports & stores spent nuclear fuel
- Site Ion eXchange Effluent Plant 1986 (SIXEP)
  - Treats effluents, providing abatement of radioactive species prior to discharging to sea.

# Active Duct & Tank Rooms

- Active duct provides a route for various active lines along the East & West sides of FHP and across to SIXEP as well as linking the 6 effluent tank rooms

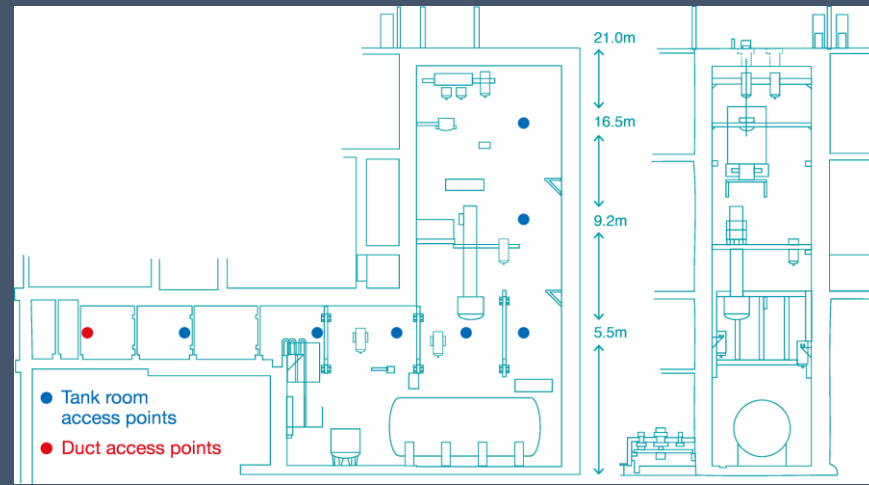


## Tank Rooms

- Dimensions are variable
- Largest with a height of ~21m

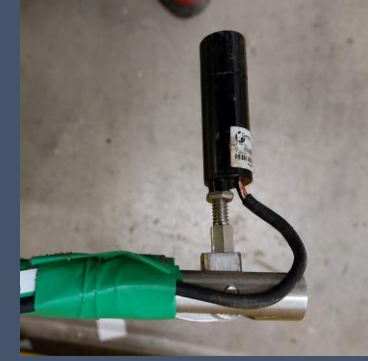
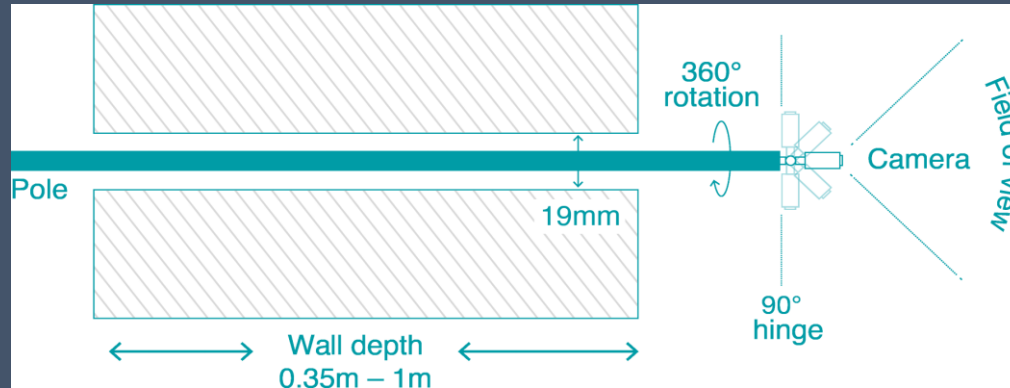
## Duct

- Effectively a sealed corridor
- Length: ~270m
- Width: 3m
- Height: 3m



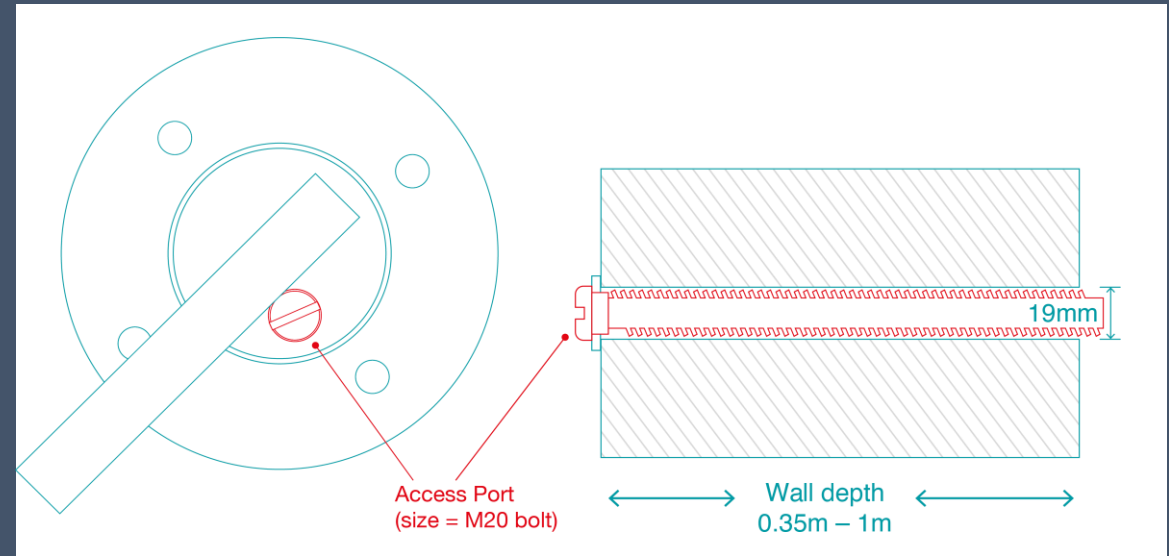
# Inspection History

- Started 2001
- Inspection due every 5 years
- Equipment:
  - Bullet camera on 1.5m pole
  - Non-integrated lighting
  - Articulates 90 degrees (manually)
  - Manual rotation required to achieve full coverage
  - No radiological shielding required



# Inspection Ports

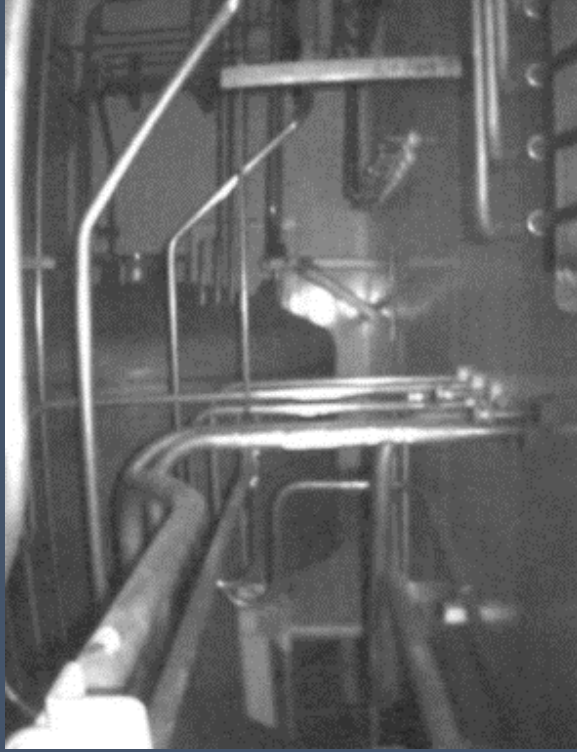
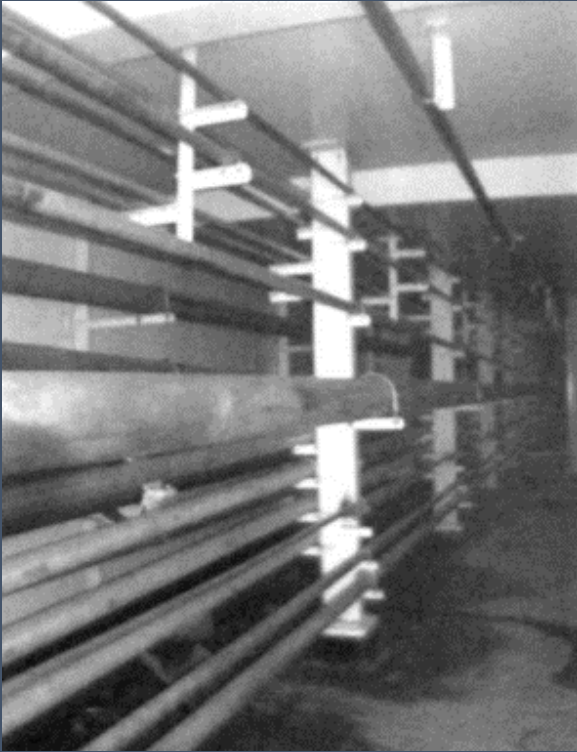
- 105 access ports
- 19mm bore
- 0.35m – 1m of concrete
- 4m – 6m between ports
  - At times greater due to several being inaccessible
- Mostly horizontal access
- Some vertical access



# Challenges

- Size
  - Must be deployable through 19mm bore port, 0.35m – 1m concrete
- Image quality
  - Full HD 1080p
- Lighting
  - Sufficient to light 3m x 3m cross sectional area, with maximum depth possible
- Coverage
  - 4m – 6m between ports, could be greater if ports inaccessible
- Retrievable
  - Current scope of inspection to use 49/105 ports
  - Won't generate any orphan wastes

# Challenges





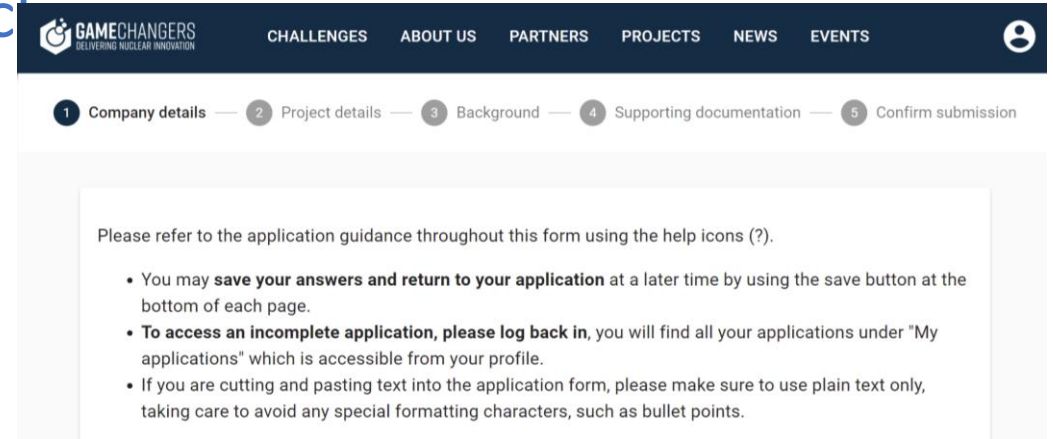
# Summary

- Primary goal: Improved images from active duct system
- Secondary goal: Repeatability
- Additional: Take advantage of smaller ports across site
  - Pipebridges
  - Service trenches
  - Pipework
  - Legacy facilities

**Thanks for listening**

# Apply via our online form

- £10k per project for feasibility projects which may provide a solution to the challenge
- Poster + application form
- Individual or collaborative applications welcome
- **Online webinar:** 9 am Tuesday 4<sup>th</sup> April
- **Closing date:** 12 noon Thursday 4<sup>th</sup> May



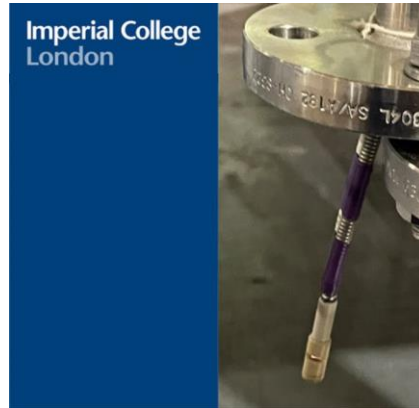
The screenshot shows the top navigation bar of the Gamechangers website with links for CHALLENGES, ABOUT US, PARTNERS, PROJECTS, NEWS, and EVENTS. Below the navigation is a progress indicator with five steps: 1 Company details, 2 Project details, 3 Background, 4 Supporting documentation, and 5 Confirm submission. The main content area contains a message: "Please refer to the application guidance throughout this form using the help icons (?)." followed by three bullet points: "You may save your answers and return to your application at a later time by using the save button at the bottom of each page.", "To access an incomplete application, please log back in, you will find all your applications under 'My applications' which is accessible from your profile.", and "If you are cutting and pasting text into the application form, please make sure to use plain text only, taking care to avoid any special formatting characters, such as bullet points."

**Primary contact**

karim.bahou@fis360.com

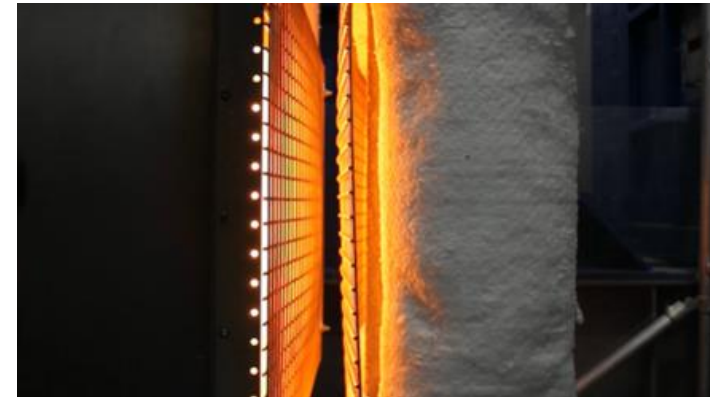
[gamechangers.technology](https://gamechangers.technology)

## Lunchtime technology talks: Thursday 30<sup>th</sup> March 2023



### Imperial College London

Use of near-infrared photo spectrometry to identify and quantify organic compounds



### University of Sheffield

Contaminated concrete removal using controlled heat-induced spalling

[Lunchtime Technology Talk webinar  
\(gamechangers.technology\)](https://gamechangers.technology)