Use of Digital Engineering in Asset Management

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Use of Digital Engineering in Asset Management

Introduction

- Asset Management is a delivery programme.
- Part of a strategic development of a Digital Engineering Platform.
- Specific digital technology to drive improvements in safety, efficiency, underpinning our technical strategy and driving the green agenda.

Use of Digital Engineering in Asset Management

What can DE can deliver for Magnox?

Consistency

- Data integration – reduces disparate datasets
- Single location for source of truth data
- Improves data quality
- Improves data integrity

Efficiency

- Use of standard software
- Use of standard metadata
- Use by Sites, Functions and Programmes

Stability

- Use of standard software
- Use of standard metadata
- Improves data security
- Provides stable long term structure
- Access permissions / user restrictions can be applied

Reporting

- Interface with NDA MPR

Magnox: A Changing Environment

Magnox's approach to decommissioning is changing significantly:

- Our previous plans focused on Care & Maintenance (C&M) strategies, i.e. reducing hazards on site but maintaining assets under a decay-storage argument until Final Site Clearance (FSC) c. 60-100years in the future and upfront investment to establish passive configuration with minimal ongoing organisation and process demands.
- The new Continuous Reactor Dismantling (CRD) strategy describes a continuous process of hazard reduction to accelerate FSC.
- The new strategy places greater emphasis on the use of digital engineering to improve the efficiencies and make asset management more efficient.

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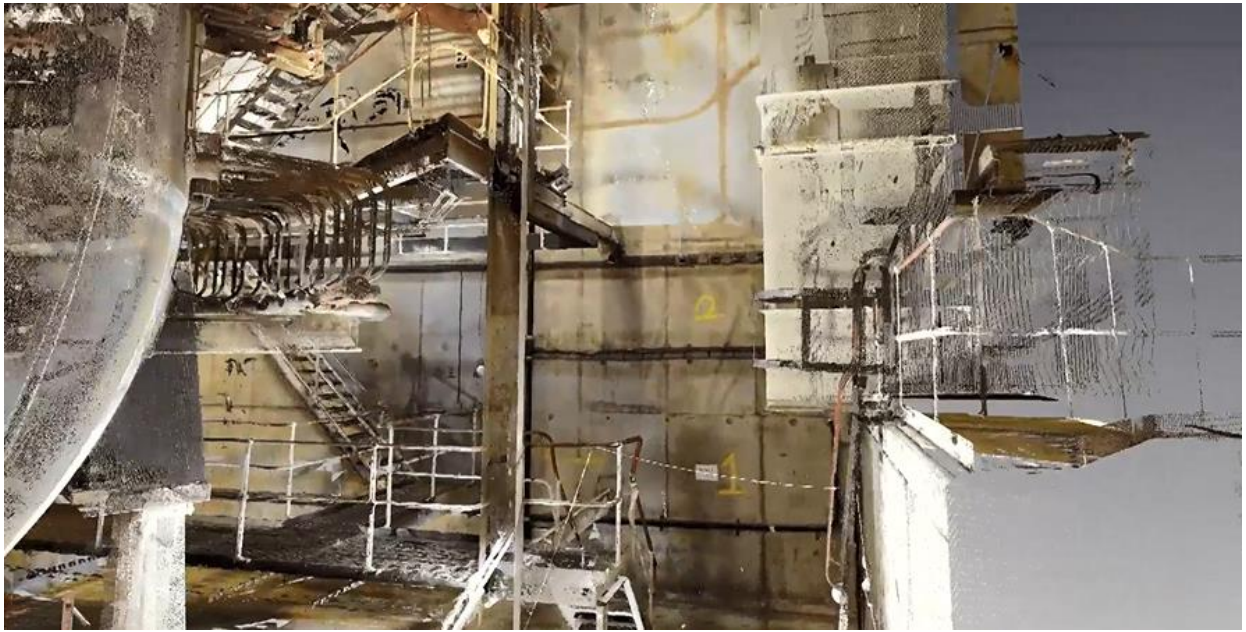
What are we doing currently?



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What are we doing currently?

Magnox is realising the efficiencies of having digital information on its assets on appropriate platforms that will:

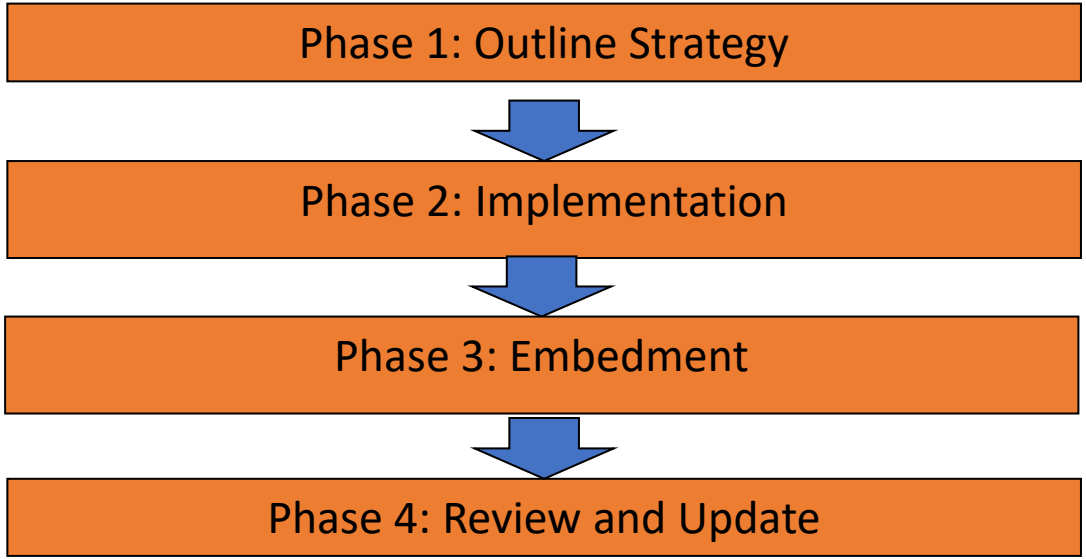
- Facilitate the remote planning and scoping of inspection and maintenance work;
- Facilitate the efficient capturing of inspection and maintenance data;
- Facilitate the efficient use of ROVs for inspections;
- Allow the importation of asset information from newly constructed plants;
- Enhance collaboration with the supply chain on complex waste and decommissioning projects, including:

    1. *Interrogate spatial information for the planning and sequencing of works and the avoidance of logistical clashes;*
    2. *Estimate radioactive & conventional inventory arisings;*

- Provide a tool where stakeholders can quickly and simply visualise the strategy for the site during its lifecycle.

Creation of a DE platform

Magnox have a strategy to implement a DE platform:



Phase 1: Strategy

Estimated delivery within 12 months.

The Digital Engineering Strategy will look at the needs of the business against:

- Asset Management
- Decommissioning
- Waste Programmes
- What wider nuclear and non-nuclear industries are doing
- Critical review of available systems
- How DE can actually improve business performance (metrics) during its lifecycle.

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Phase 1: Strategy

Creation of a Data Wheel:

Phase 2: Project Implementation

Estimated delivery within 2-3 years:

- Review of ESRI arcGIS for suitability for use
- DE Project Implementation through Engineering and AM PGB
- Trialling DE tools
- Acquisition of core digital information for Asset Management (NDA Grand Challenges)
- Incremental improvements will be delivered as soon as they are available.
- Integration of existing data into platform will be prioritised so that the system can be used from day one, e.g. AMD asset conditions, Site drawings, existing digital twin information

Phase 3/4: Embedment, Review & Update

Ongoing deliverables:

- Apply continuous learning of what business benefits DE has for Magnox
- Considers developments in technology
- Horizon Scanning
- Adapts as Continuous Reactor Dismantling Programme strategy evolves

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Case Study:
DNA Boiler Annexes

DNA Boiler Annexes

Dungeness Boiler Annexes:

- Restricted Access due to plant degradation
- Project to demolish structures but minimise impact on the remainder of the structure
- Information use: Demolition sequencing, estimations of mass/volume of materials, checks against drawings, client information, areas of specific hazards

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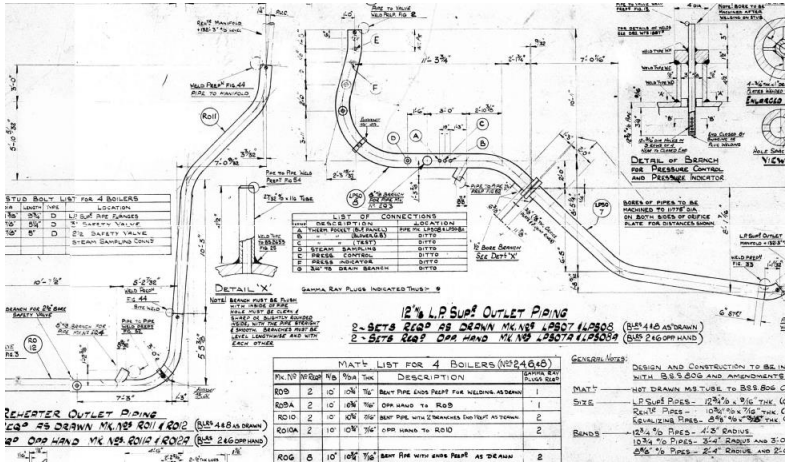
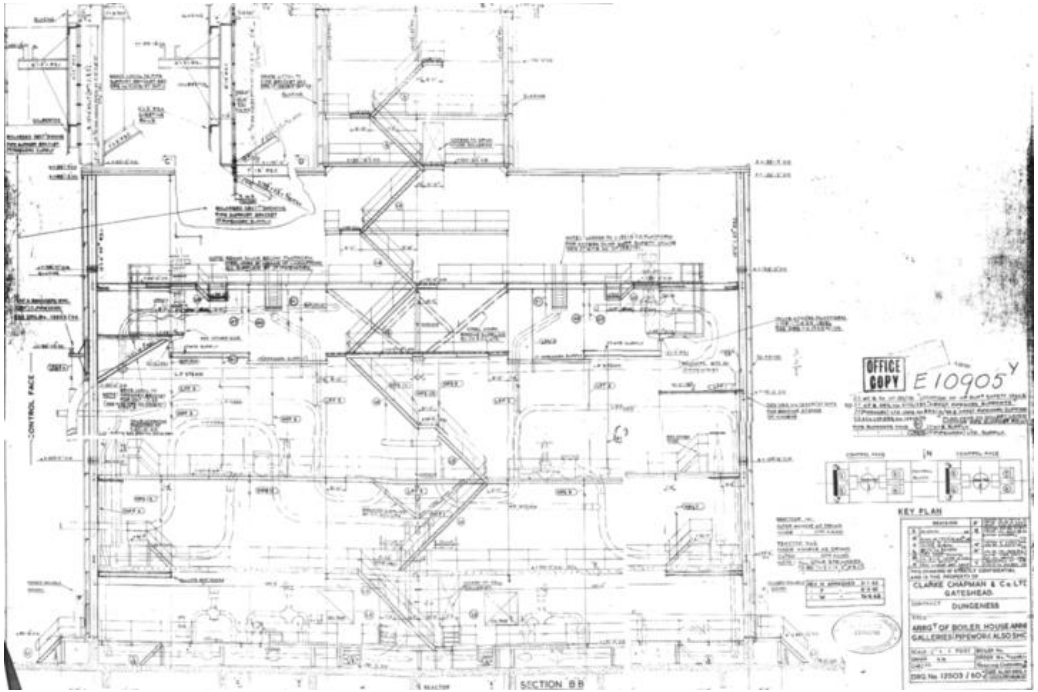
Current Information:





NDA Magnox

the nuclear institute

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Digital Twin

Digital Twin: The benefits

- Resource estimates
- Waste types
- Accurate characterisation
- Cut-plans/verification of configuration
- Stakeholder briefings
- Increased accuracy = reduced risk = underpinned schedule and costs

Any questions?