



Benefits

- *Delivered ahead of schedule – covering extensive record management for data traceability and provenance*
- *Increased efficiency and cost effectiveness of the operational phase of the characterisation programme*

UK Nuclear Decommissioning Authority (NDA) deliver major new Data Management System Technical Specification with Tessella expertise

When the NDA Radioactive Waste Management Directorate (RWMD) identified the importance of data integrity to their site characterisation programme they selected Tessella to develop a technical specification for a major new data management system. The resulting solution will ensure that the large volume of characterisation data gathered by a wide range of scientific disciplines can be accurately assimilated, compared, manipulated, visualised, traced and preserved for decades to come.

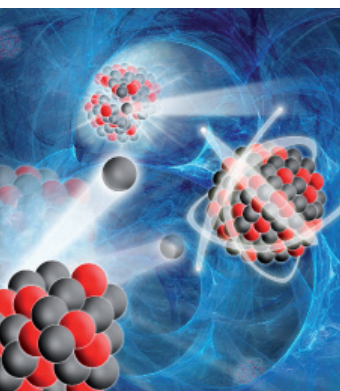
Background and Challenge

The NDA Radioactive Waste Management Directorate (RWMD) is responsible for researching, developing and implementing a long-term environmentally responsible solution for the disposal of the UK's higher activity radioactive waste in a geological facility.

In 2004 the NDA launched the site characterisation programme in prepare for undertaking detailed surface and subsurface investigations into geological, hydrogeological and environmental conditions at one or more sites, for the purpose of the geological disposal of higher activity wastes, as set out in "Managing Radioactive Waste Safely, A

Framework for Implementing Geological Disposal" White Paper published by the UK Government in June 2008.

Analysing and selecting a site that will remain open for 150+ years, and providing effective containment for many thousands of years, requires extensive and very costly geological characterisation, so it is vital that the right data standards, procedures and software infrastructure are in place before collecting data in the operational phase of the programme. The data management solution must protect the investment by securing the highest levels of data integrity whilst offering a simple and intuitive system allowing different scientific disciplines to collaborate, share and interpret the data.



The site characterisation programme aims to build detailed 2D and 3D models of the geological suitability of a site. This involves gathering and combining terrabytes of data from a wide variety of different sources including geological and geophysical surveys, in-situ testing, regional surveys and laboratory analysis.

As well as needing to manipulate and compare very large volumes of data from a lot of different sources the programme has the additional challenge of needing to maintain and preserve the data for hundreds of years. Compared to typical characterisation projects in Oil and Gas for example, this solution must incorporate the need for extensive record management in order to provide full traceability and provenance for the data.

The site characterisation team estimated it would take 2 to 3 years to fully specify, design and implement the required Data Management system which put it on the critical path for the programme. The team went to open tender to find a consulting and technology partner with expertise in developing systems that store and manipulate large volumes of scientific data.

Solution and Benefits

Tessella were selected for the first stage of the project which involved developing an overall data management strategy covering objectives, scope, data governance, architecture, standards and usage. Tessella were also then selected for the second stage which involved working with RWMD to fully specify the system.

Tessella used a Prince 2 project management methodology and iterative requirements elicitation to ensure the system met the needs of the broad community of users and stakeholders - including scientists, academics, government agencies, IT specialists, archivists, regulators, commercial organisations as well as an advisory panel with representation from the NDA and the BGS (British Geological Survey). Specific geoscientific

expertise was also supplied by a number of outside consultancies including Jacobs, ESI and Brooks Gamble.

The overall specification and design for the Data Management system covered a wide remit including data standards, modelling, visualisation, operating procedures, security, continuity, backup, support, digital preservation, archiving, and extensive record management.

Having a comprehensive specification will allow the team to utilise off-the-shelf, industry-standard software components for the implementation phase. This not only ensures the system will be easier to maintain in years to come, but will also provide an accelerated implementation phase, to the extent that the system could be ready for the input of characterisation data a year ahead of schedule.

The NDA/RWMD now has a comprehensive Data Management Technical Specification that provides a solid foundation for systems procurement as well as addressing the high data integrity and availability demands required in the operational phase of the site characterisation programme.

The strong focus on information management will also increase the efficiency and cost effectiveness of the operational phase by reducing ambiguity and misinterpretation, minimising the collection of overlapping data and allowing existing data to be better leveraged.

Incorporating record management and digital preservation into the design and operating procedures provides a secure and accessible knowledge base that can be used to aid understanding and scientific collaboration for many years to come.

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