



The NDA group
Digital Vision and Strategy 2022-25

Foreword

I'm delighted to introduce you to the NDA group's first digital strategy, setting out our ambitions to embrace and exploit digital technology to help and enhance the way we all work.

This strategy flows directly from our mission to clean-up and decommission the UK's legacy nuclear sites and capitalises on the recent transformation of our operating model. By coming together as a group of organisations, we now have the opportunity to pursue shared goals to boost our digital capacity and capability.

There's great work happening across our group in this area and by no means are we starting from scratch. While our organisations may be at different stages of digital improvement, modernising, simplifying, and joining up approaches to data and technology are priorities for us all.

We are amongst the most experienced and skilled organisations in the world, across decommissioning, waste management and nuclear transport. Our digital strategy aims to provide our people with the best available tools and techniques to do their jobs, collaborate and share learning. It also underpins the NDA group Information Security and Cyber Resilience Strategy. As our digital journey continues, we'll build a clearer picture of our roadmap and the techniques we'll adopt.

A more digitally enabled NDA group with the right technology, tools, systems, and data will help to unlock our full potential. There's no doubt that revolutionising our digital capacity and capability will help us to fulfil our collective vision, which is to deliver our critically important mission, create great places to work for everyone and be trusted to do more.

David Peattie
Chief Executive Officer, NDA group





“ Improvements in our technology, tools, systems, and data will result in accelerating the delivery of our mission. ”

David Peattie, Chief Executive Officer, NDA group

Introduction

The digital strategy will provide clarity on how we define digital and the benefits we are trying to achieve, while building awareness across the group through clear definition of terms, language, and principles.

The document references and aligns to government strategy, but is bespoke to us, the journey we are on and our ultimate mission. It isn't intended to be standalone, nor will it be delivered in isolation and shouldn't be confused with, or aim to replace, existing IT and digital strategies. It supports, reinforces, and aligns to our other strategies, including Information governance, information security and asset management, as well as our overarching enterprise strategy, Strategy 4.



This strategy is for everybody across the NDA group – it's written for us, by us, but it also has important implications for our supply chain and our stakeholders. We are living in an increasingly digital world and integrating digital initiatives into how we operate as a group is bigger than just us; we need to draw on the expertise and experience of our supply chain and at the same time ensure they are helping us achieve our objectives through a structured flow down of requirements and performance targets.

There will be several digital initiatives which are common across group organisations. We must promote collaboration instead of working in silos, to remove duplication, drive efficiencies and promote consistency. This will have secondary benefits such as a more flexible workforce where knowledge and skills are more easily transferable, access to better quality information and data to enhance decision making and sharing of risk and responsibility so there is more space to innovate, experiment and capitalise on new opportunities.

This strategy gives us all a foundation upon which to build. It provides advice, guidance, best practice examples, ideas and inspiration to exploit shared opportunities, but at the same time seeks to preserve each organisation's autonomy to make their own choices. It will be in place for three years and continuously reviewed during this period. We will establish clear accountability through a digital leadership governance group, and coordinate, track activities and monitor progress using defined metrics and Key Performance Indicators. Regular digital maturity benchmarking will allow us to measure the outcomes of our strategy and give us a point of reference to compare ourselves against the best in industry.

Ultimately, success of this strategy will hinge upon how much it is used in practice; do people understand it, do they care about it, do they feel equipped to deliver it and, most importantly, does it help make the NDA group a great place to work.

This is the latest step in our digital journey. To take it, we need to move forward together as a group and can only do this with your on-going support, commitment, and enthusiasm.

A group approach



Frank Rainford
Group Chief of Staff
and Security Officer



Gordon Frisby
Finance Director at
Magnox Limited



Neil Cook
Finance Director
at Dounreay



Ben Whittard
Security and Resilience
Director at Nuclear
Transport Solutions



Michael Buttery
Chief Financial Officer
at Nuclear Waste
Services



Martin Chown
Chief Executive Officer
at Sellafield



What is our digital strategy and who is it for?

The Nuclear Decommissioning Authority is a non-departmental public body of the Department for Business, Energy, and Industrial Strategy, formed by the Energy Act 2004. Its purpose is to deliver the decommissioning and clean-up of the UK's civil nuclear legacy in a safe and cost-effective manner, and where possible to accelerate programmes of work that reduce hazard.

This strategy sets out how the NDA group will work collaboratively to transform operations and services, using common digital principles and approaches, to enhance the delivery of the NDA mission.

To ensure the creation of a document that any member of the NDA group can read and understand a set of guiding development considerations were established. The strategy and supporting documents were produced and tested against these principles.

The NDA group digital strategy builds on the existing "one NDA" initiative, which articulated a new way of working across the group. Our digital aspirations are firmly based on maximising the opportunities that come from working more effectively and efficiently together as a group of organisations. To achieve this, it is crucial the strategy encompasses individual business-led requirements and is sympathetic to the information technology transformations and operating plans that are already in place and underway in each of the group companies, as well as any other in-flight initiatives.

"Digital means freeing up our people and information from technology redundancy, to have the ability to make data-led decisions at the point of work, wherever that should be"

AIMS

This strategy has three key aims:

1

Giving all NDA group staff clarity of what digital means, how it can be applied to make everyone's working life better, and an understanding of what their role is in our digital journey.

2

Aligning NDA group companies' approaches and ambitions for digital, moving us towards a common set of policies, language, and principles, in time finalising the group digital operating model.

3

To enable the NDA group strategy, individual business strategies and operating plans.

Why do we need a digital strategy?

Technology is changing at an exponential rate, far quicker than many organisations can keep up with, and we are no different. To try to bridge this gap, we must become more agile in how we identify, assess and act upon digital opportunities and challenges. This means building in greater tolerance for change by creating more 'flex' within our organisational processes, and promoting a culture where change is celebrated and promoted rather than being perceived as a threat. One way in which we can do this is by developing and embedding a more efficient operating model for digital.

Currently the NDA group spends around £3.1 billion per annum, a significant proportion of which is on overheads and small works.

Modest reductions in the administration and operations costs brought about by the adoption of digital approaches could result in efficiency savings facilitating the redirection of funding to delivery of mission critical risk reduction activities.

In parallel, the profile and importance of digital transformation has been steadily rising across both the public and private sectors. Individual NDA group companies have identified opportunities and benefits of digitally driven approaches for their businesses, and some have implemented their own digital strategies to deliver efficiencies and improvements.

Timescales

This strategy covers the 3-year period from April 2022 to March 2025.

Strategy ownership

The Strategy is sponsored by the NDA group Chief of Staff and Security Officer and owned by the digital leaders in each operating company. However, everyone across the group has a role in delivering it.

It has been developed collaboratively with input from individuals across the NDA group. It has been formally accepted by the Enterprise Digital Steering Group (EDSG), comprised of digital leaders representing all group entities, and the leadership teams at group and subsidiary levels.

Target outcomes

The NDA group digital strategy provides a framework for us to interpret and meet the Government Digital Strategy, and guidance to help group companies adopt a joined-up and converging approach to digital. The aim is to generate the widest possible benefits, encouraging co-creation, collaboration, and co-operation to deliver:

- Improved governance and assurance for digital initiatives
- Increased value for money for the taxpayer
- Enhanced performance and outcomes
- Reduced operational risks
- Improved stakeholder confidence and trust
- Improved ways of working, culture, and experience for our people

Digital can mean different things to different people. It is not just concerned with IT projects and technology.

It encompasses all elements associated with managing information and data including our leadership and group culture, the skills and talent we need, how we structure our business and the supporting architecture of our systems, how we capture and manage our data, and, most importantly, how these impact day-to-day operations, planning and strategy development.

Digital transformation across these areas, enabled by appropriate IT infrastructure and capabilities, is what will allow us to embed new ways of working, culture, and processes to accelerate our nuclear decommissioning mission.

DEFINITION OF DIGITAL

For the purposes of the NDA group, we define digital as:

Re-imagining, transforming and repeatedly improving our ways of working; developing people and processes, and exploiting information, data, and technology, in the best ways possible to achieve the NDA mission.



Alignment with UK government digital strategies

The UK government has set out a Digital Strategy which has seven key pillars. Three of these pillars are particularly relevant to us:

- Everyone should have access to the digital skills they need
- Cyberspace should be safe and secure
- The power of data should be unlocked, improving public confidence in its use

In addition, the Department for Business, Energy, and Industrial Strategy (BEIS) 3-year Digital Data and Technology Strategy states that digital should:

- Be embraced, understood, and valued by everyone
- Enable collaboration and partnerships
- Provide access to business intelligence
- Allow for continuous improvement

This group digital strategy supports the strategic objectives of the group, our overarching mission and is aligned and consistent with the digital strategies of the UK Government and BEIS.



Where are we trying to get to?

In many organisations and industries where digital transformation programmes have been successful, this has led to improvements in technology, tools, systems, and data and a more engaged and agile workforce. We only have to look at the experience of the last two years in how some of the workforce have transitioned to home working, to see the value in technologies that enable collaboration, and give us access to information and data anywhere.

Building on the progress we have made to date, we are now ready to embark on the next stage of our digital journey, which means coming together as a group to jointly pursue digital opportunities, aligning behind common principles, purpose, and language, and achieving efficiency and risk reduction benefits from closer collaboration, knowledge and capability sharing.

This strategy has been developed to inform, guide, and support this digital convergence across the NDA group, but is not intended to replace group companies' own digital and IT strategies. Maintaining autonomy and speed to deliver digital initiatives at the operating company level is vital. Nor would it be appropriate for a central entity to dictate, when each company has its own priorities, constraints and culture that need to be considered.

Achieving digital convergence requires us to align behind common aspirations and objectives, and work towards a shared view of the future. To support this, we have collectively agreed a digital vision and mission statement, along with a set of strategic objectives for digital which will guide us through the next three years.

Digital mission statement

A mission statement provides a more detailed view of how the vision will be achieved, focusing primarily on the delivery mechanism.

Our NDA group digital mission statement is to:

“Fundamentally change the way that we deliver the NDA mission by enabling the transformation of our business culture, practices, and optimisation of our processes, by adopting and deploying innovative, technology.

As a result, this will support a digitally upskilled workforce, will offer improved value for money and enable the group to be more resilient and agile in its ability to face existing and new challenges.”

DIGITAL VISION STATEMENT

A vision statement clearly articulates what it is we are trying to achieve through digital. It typically has two key elements: an aspiration and a delivery mechanism.

Our group digital vision is for us to become an informed, safer, more responsive and digitised NDA group, accessing information and data when, where and how it is needed.

- **INFORMED:** leveraging insights to improve operations using data analytics and predictive decision making
- **SAFER:** we have more insights into operational risks and can manage them in a more cyber-secure and effective way using new and innovative methods
- **MORE RESPONSIVE:** we have the organisational agility to pursue new opportunities which meet our business needs
- **DIGITISED:** we have moved away from paper and manual processes through re-imagining operations and the way we work
- **ACCESSING INFORMATION AND DATA:** our people have the skills, tools, and assets they need to make decisions.

Digital strategic objectives

Beyond individual outcomes that benefit each group operating company, we expect the group Digital Strategy to deliver substantial reinforcing and multiplying outcomes for the NDA group and its stakeholders. These desired outcomes are captured in the following strategic objectives, which have been validated and agreed by representatives from across the group operating companies.

Our collective strategic objectives for digital are:

GOVERNANCE

- Strong alignment between strategy and digital, with greater understanding of investment priorities, requirements, and anticipated benefits from digital initiatives
- Fast and effective decision making that targets synergies and efficiencies across all parts of the NDA group

PEOPLE AND CULTURE

- Mobilised and upskilled people, with the fluidity to grow and share digital knowledge, skills and competencies across organisations, roles, and functional areas
- New ways of working that make life easier for our colleagues and improve their day-to-day experience, aligned to the One NDA culture

PROCESS

- Automation of key processes, moving away from manual tasks and paper towards digitised information, records, and data capture
- Standardised approaches to process re-engineering, using common methods and tools to enhance business outcomes

TECHNOLOGY

- Jointly pursuing simplified and modernised technology and common systems to achieve economies of scale and reduce risk
- Greater agility to adopt emerging technologies by reducing barriers to innovation and embracing modern security protocols and governance approaches

INFORMATION AND DATA

- Easy access to high quality and relevant real time data and information, to enhance decision making, planning, performance, and innovation
- Focus on maintaining valuable data and maximising its value by improving data and information management, structure, and the ability to integrate

Digital design principles

At the core of our digital strategy, and how we will achieve our vision, mission, and strategic objectives, are our nine digital design principles which are set out here. These principles should be considered when undertaking any new digital project or initiative anywhere across the group. Applying these principles will help to ensure that all projects or initiatives with a digital element across the group are aligned, with areas of commonality and wider benefit identified and realised. A checklist to support the application of these digital design principles can be found in Appendix 1.



1. ACTIVE ESTATE-WIDE VALUE GENERATION

As NDA group, we always look and try to find the widest possible benefit for the group. Focused upon our shared mission and culture. We will ensure active and ongoing leadership, sponsorship and ownership of digital initiatives, which will be business led.



2. COLLABORATIVE

We look both within the group and externally to learn from leading-edge change to support our adoption of digital. We share best practices and benefits realisation, achieved for each operating company. Digital is part of our horizon scanning approach.



3. GET AHEAD

We will get ahead of the obsolescence curve. Our new approaches will be actively managed and deployed driving increased value for the organisation. Obsolescence will not be the driving force for change.



4. DATA AND INTELLIGENCE DRIVEN

We adopt Open Data Standards and share data models as a group. We value data and treat it as a strategic asset. Data will be accessible and provided to those who require it, enabling more effective insight and decision making.



5. OPPORTUNITY AND OUTCOME BASED

We will become opportunity and outcomes-based, to help change the way colleagues work together to co-design services. We will set short term goals to achieve quick wins whilst working toward larger objectives shifting from a risk based, to an opportunity-based approach.



6. KEEP IT SIMPLE

We strive to develop innovative solutions but value simplicity over complexity. Most systems work best if they are kept simple rather than made complicated; therefore, simplicity should be a key goal in design, and unnecessary complexity should be avoided.



7. EDUCATE

We will invest in ongoing skills and talent development at all levels to enable establishment of the required digital capabilities to achieve our strategic ambitions. We will share our knowledge and experience with colleagues, supporting greater benefits for all.



8. REMOVE SILOS

We will remove silos and organisational barriers in order to deliver our transformation. All functional and value-stream areas have a role to play in our digital transformation; this is not just NDA's transformation it is for everyone across the group.



9. TRUST

We will trust our workforce and provide them with processes, systems, tools and skills in order to deliver their roles effectively. We will deploy platforms utilising an agile approach where users can test and learn by doing, whilst embracing failure as an opportunity for learning. We will always follow the 'Secure by design' principle outlined in the NDA group Information Security and Cyber Resilience Strategy.

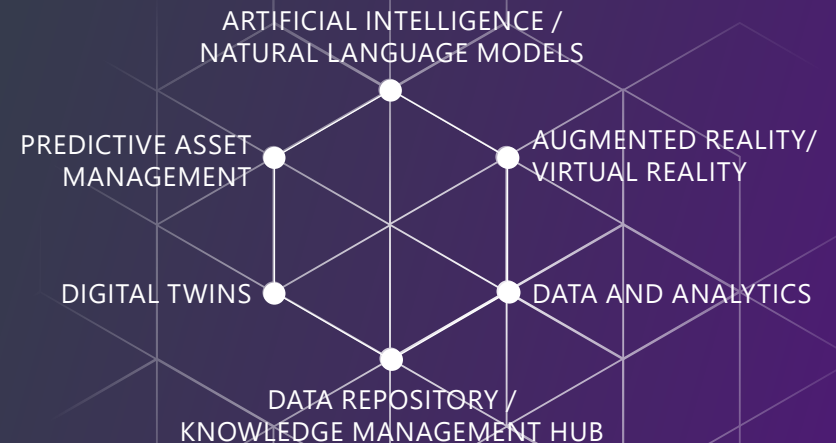
What digital opportunities could we benefit from?

The application of digital technologies and new ways of working will touch every individual across the estate in different ways and to differing degrees.

Here we provide some illustrations of the opportunities and benefits digital could have for us as a group:

- Data access can become seamless and collaborative between group organisations and individuals, with ways of working to support access and data sharing to the point where it is required, wherever that might be. Platforms like Office 365 and Teams have started that journey. However, these are just the beginning to saving time, working more efficiently and being more effective by reducing transaction and travel costs.
- Creation of specific automated applications, for example engineers and pre-operations teams can work in an agile way to build digital twins of facilities to model cost-reducing construction, operations, maintenance, and dismantling techniques, which alone could deliver significant savings.
- A site operative being able to remotely access their information and tools from a secure mobile device without having to use fixed IT infrastructure removing exposure to hazardous environments e.g., heights and radiation, and increasing the efficiency of plant operations through avoiding unnecessary shutdowns.

These benefits for the NDA group can be achieved through a variety of digital uses, in areas such as:



These are just some examples of potential digital opportunities and benefits. Detailed reviews of these six digital themes can be found in Appendix 2: "Digital opportunities", where we identify and explore them in more detail supported by case studies from across industry.

What digital enablers do we need?

Collective experience and insights from other organisations and sectors tell us that to achieve our digital vision, mission, and objectives, we need the following enablers to be in place.

AMBITION (STRATEGY, VISION AND ROADMAP)

OPERATING MODEL

DATA GOVERNANCE

LEADERSHIP AND CULTURE

SKILLS AND TALENT



Digital operating model

What is this enabler?

A digital operating model describes how we are organised to achieve our strategic objectives. It is about the configuration of digital capabilities we possess which enables us to achieve our digital vision and continue to deliver our mission.

A capability is something that we, as an organisation, can do to achieve a specific outcome.

Why is it important?

Developing a digital operating model for the NDA group involves infusing the existing group operating model with new digital capabilities and enhancing existing capabilities to realise the benefits of digital. It seeks to address gaps in capability and strengthen the structures and processes in place to support digital, while also providing greater clarity in terms of responsibilities and accountability for digital initiatives.

What do we know about current challenges / opportunities?

- Unclear or missing roles and responsibilities for digital
- Confusion on the role of digital versus IT
- No consistency in governance and decision-making for digital initiatives
- No single process for prioritising investment in digital and ensuring benefits are realised
- Legacy technologies and tools are in place which restrict our ability to innovate

What are we doing to improve?

We have defined, and are in the process of assessing, our digital capabilities across four areas:

- **Strategy:** Capabilities that cover setting the strategic direction of the enterprise and specific functions for digital
- **Planning and Oversight:** Capabilities that link those which set the strategic direction and those which make it a reality
- **Delivery:** Capabilities that are required to execute our strategy and progress us in our digital journey
- **Enablers:** Capabilities which provide the support and backing to ensure activities can be carried out more safely, quicker, and cheaper

We will use this assessment to identify challenges, opportunities, and gaps across the group, including areas where certain operating companies have a high level of maturity in specific capabilities that could be shared or leveraged with other operating companies.

Along with the digital capability assessment, we are undertaking considerable stakeholder engagement with individuals across the group which will inform the design of the future operating model. The future digital operating model will be designed around the following six dimensions:

1. Organisation and governance – how are decisions on digital made; by whom, how, and at which forums?
2. Process – how is digital innovation managed, how are initiatives selected, how is funding unlocked and how are benefits communicated, managed, and realised?
3. Technology and tools – what are the technologies and tools available that can support us in achieving our vision and mission?
4. Information and data – how do we improve the flow of information across the group, and improve the quality confidentiality, integrity and availability of data to enhance decision making?
5. Culture and ways of working – how do we adopt a “one NDA” way of working, value, and behaviours, to embed new ways of working that leverage digital opportunities and improve life for our people?
6. Sourcing – how do we get value out of our supply chain and ensure we have the right people with the right skills and capabilities in place for the job?

The target operating model draft will be ready for review and validation in Q2 of 2022.

Digital leadership and culture

What is this enabler?

Changing culture is an ongoing process which needs close monitoring, and the dynamic, complex nature of the system means any number of expected or unexpected factors can divert culture off course. Leadership preferences and styles play a significant part in creating culture. External factors also impact culture, but these are often outside the influence of the organisation.

Shifting a culture is not just about the 'big moves' but the 'little nudges'. Certainly, dramatic changes can create a high level of forward momentum, but having a sustained impact requires the more subtle adjustment of attitudes, conversations and behaviours driven by leaders – all elements under their control.

Why is it important?

According to a recent study, an average of 84% of digital transformation strategies fail, primarily due to lack of leadership and clear perception on purpose. This is typically characterised by digital transformation projects which are incubated and centrally driven by a small, highly motivated project board, without the full buy-in at executive board level.

We can't simply invest in new technology and expect it to be successful without spending time understanding the impacts on our people, their roles, and the processes they follow. Strong and inclusive digital leadership can help address this by making sure technology implementation is supported by a clear case for change and importantly, people must feel informed, equipped, and able to deal with that change.

What do we know about current challenges / opportunities?

- The last few years have seen significant structural and legal changes in how we operate as a group
- We have a new group leadership team which has different backgrounds and experiences when it comes to digital
- Many people across the group still confuse digital with IT and question the need for digital strategies over and above existing IT strategies and operating plans
- Resistance to change exists in many places, with long established norms and practices dominating
- An agile and experimental approach to digital innovation has yet to take hold
- Digital could be an important vehicle for embedding the new "one NDA" culture, as well as facilitating more widespread innovation

What are we doing to improve?

We are conducting interviews and engaging with insight groups to understand more about the group culture across all the operating companies. This will help us identify potential 'big moves' and the various 'nudges' that need to take place for the 'shift to digital'. The output from these interviews and insight groups provides a comprehensive picture into how employees experience and articulate their current culture, as well as shining a light on what is currently occurring at the very deepest cultural level, exploring the unquestioned assumptions, beliefs and values which may be uniting or dividing everyone across the organisation and their attitudes to digital transformation.

Using this output, we will create an engagement plan which targets leaders across the entire NDA group. This is about engaging everyone so that they understand the NDA group digital vision and feel empowered and accountable for its delivery. Only then is it possible to equip leaders with the right skills – the complex mix of technical and professional capabilities – to accept and implement change across the different operating companies.

Skills and talent

What is this enabler?

Without sufficiently enabling and empowering our workforce, the extent to which we can benefit from digital transformation will be limited. Often it isn't the rate of technology change which causes a problem, but the much slower rate of organisational and individual change that typically accompanies it. A primary cause of stakeholder resistance to change is due to having limited awareness, knowledge and confidence in what digital is and why it should be seen as important; important enough to warrant making a change to how an individual goes about performing their day-to-day role.

Why is it important?

Without understanding the digital skills we require, we run the risk of not being able to capitalise on new and emerging technologies and not being able to take people on the journey, so they feel engaged and equipped to deliver the digital strategy and vision. We need to build this clear picture to address digital skills gaps through recruitment and training and be able measure the success of training initiatives and investment in capability building.

What do we know about current challenges / opportunities?

- The criticality of security and safety can make risk taking and new ways of working hard to implement, especially when new digital skills are needed
- There is generally a significantly low level of digital skills maturity across the group with a need to focus on foundational digital skills
- Existing digital capability assessments tend to focus on IT departments, not the digital skills needed for all staff
- As a group, we have a responsibility for socio-economic prosperity and digital inclusion for local communities, so need to target transferable skills that support other jobs as well as home life
- Technical skills are needed but behaviours, soft skills and leadership are equally important
- To-date, incentivisation to up-skill the workforce has largely focused on regulatory obligation and mandatory training, which isn't always the most appropriate approach and can prevent social and exploratory learning.

What are we doing to improve?

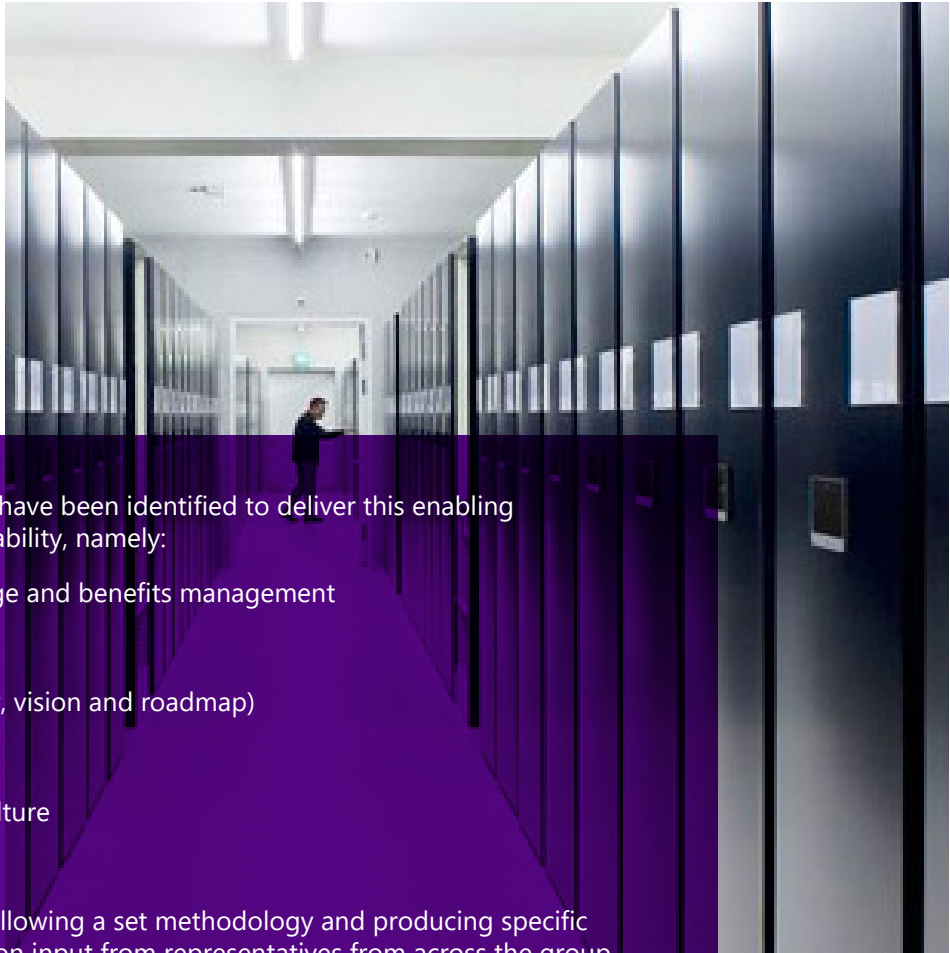
We are creating an NDA group digital skills and competency framework to help implement the NDA group digital vision by confirming the skills, capability, and knowledge for digital needed across different groups of people and at different levels of the organisation. Such a framework can in turn be used to generate targeted role-based training plans to up skill the wider workforce in key digital skills and give them the confidence they need to be more accepting of digital change. As well as producing the framework, we are undertaking a base-lining activity of assessing digital skills across the group to identify gaps and areas where we need to collectively focus our capability development efforts.

How will we deliver the strategy?

To deliver this strategy and its objectives will require consistent group-wide business change and evolution, during the remainder of the strategy period (until 2025) and for the following 5+ years (until 2030).

To enable and govern this change will require project, programme, and portfolio management capability, in addition to specific technical digital capability.

The purpose will be to manage the business change, ensure benefits are identified and delivered; and enable the cross-group prioritisation and alignment of change initiatives.



A set of workstreams have been identified to deliver this enabling organisation and capability, namely:

- Programme, change and benefits management
- Data governance
- Ambition (strategy, vision and roadmap)
- Operating model
- Leadership and culture
- Skills and talent

Each workstream is following a set methodology and producing specific deliverables drawing on input from representatives from across the group operating companies.

Our approach to every workstream will align to our overall methodology, while being guided by best practice in Project (Association of Project Management (APM)) and Programme Management (government-approved MSP approach), allowing us to monitor not only cost and budget, scheduling, risk, stakeholder engagement and quality management, but also benefits realisation, outcomes, and continuous improvement.

A man with short dark hair and glasses is looking down at a laptop screen. He is wearing a dark shirt. The background is a window with light coming through. A purple rectangular box is overlaid on the right side of the image, containing the title text.

Group digital roadmap March 2022 – March 2025

The group digital roadmap will accompany this strategy. It is currently being co-created by the group and will be approved by the Group Leadership Team once finalised. It will capture strategic digital initiatives, along with key delivery milestones.

Strategic digital initiatives are categorised within different themes, as follows:

- Digitally enabled workforce – making work-life easier; from field-work automation through new tools and data, to hybrid / flexible working models. Deploying new digital office tools like Office 365, and enterprise resource planning systems, all facilitated by rich data and underpinned with digital skills
- Operations, processes and asset lifecycle – re-imagining and modernising operations and management of assets through digital asset management, data sharing, and use of new and emerging technologies
- Engaging stakeholders – using data and technology to enhance communications with regulators, suppliers, customers, and the public

Group digital roadmap

In developing our digital roadmap, the sequencing will be phased using the steps below:

1. **SPARK AND EXCITE:** start with quick-wins that demonstrate our ability to transform and showcase value
2. **SET THE FOUNDATIONS:** set the fundamental enabling capabilities, processes, and standards from which to build upon
3. **SCALE:** implement a larger set of initiatives that will be truly transformational
4. **EVOLVE:** optimise and move with the latest technology to identify the next set of digital initiatives

These phases aim to build momentum, whilst recognising that the foundational activities required will take time and effort to implement. Only when the fundamentals are in place, can transformation occur at scale.

Scaled transformation will move the group to being an organisation where digital ways of working are business as usual. As digital progression never ceases, the need to keep evolving to harness new and improved technology will remain.

The sequencing will also seek to address the enablers in parallel. Keeping the enablers aligned and sequenced correctly avoids delivering technology without considering people focused activities, or conversely motivating and developing the skills of the organisation but leaving them without appropriate data, tools, and processes.

The ideal situation is to synchronise new technology and capability development, so that as new technologies become available and are implemented, our workforce has the right behaviours, knowledge, skills, and support to utilise them.



DIGITAL ROADMAP CONSIDERATIONS

As well as seeking to progress enablers in parallel, there are several other considerations which will inform development of our group digital roadmap which:

- Must be aligned to wider business objectives and our mission
- Must be supported across the group
- Must capture and reflect group-wide requirements and aspirations, not biased to any one operating company
- Needs to cover more than just technology
- Is different to a technology / application / IT roadmap
- Needs to be accompanied by an appropriate change management approach, to manage the impact on people.

Metrics and outcomes

FOR THIS STRATEGY

Performance against the NDA group key Target for the development and delivery of this Strategy is reported monthly to the Group Leadership Team (GLT), NDA Board and HMG in the NDA group performance report and is subject to independent audit by the Government Internal Audit Agency (GIAA) at the end of Q3 and the end of Q4 to ensure the performance being reported can be sufficiently evidenced.

FOR PROJECTS ARISING WHICH SUPPORT THIS STRATEGY

The digital vision and strategic objectives set out in this strategy identify desired outcomes from our digital transformation programme, but do not include or mandate any specific metrics. This is to ensure operating companies retain autonomy to identify, target and manage benefits in their own way and in recognition of their respective operating contexts.

Over time as we mature, we will introduce more consistency in how we measure and track benefits so that different digital initiatives can be compared, and outcomes aggregated at a group level.

Stakeholder mapping and engagement

Engagement with stakeholders from across the NDA, operating companies, and potentially other key stakeholders such as the Office of Nuclear Regulation, will be vital to the success of this programme. It will be critical to engage with the right people across the group at the right time if the group Digital Strategy is to land and be adopted.

Extensive stakeholder mapping has been undertaken to determine which parties need to be actively engaged, consulted, or kept informed. This also includes external stakeholders, including but not limited to the Office of Nuclear Regulation (ONR), the UK Government Department for Business Energy and Industrial Strategy (BEIS), Cabinet Office, UK Government Investments, Natural Resources Wales, the Environment Agency / Scottish Environment Protection Agency, and any other key stakeholders required.

One of the important aims of our ongoing stakeholder engagement is to improve inclusivity of digital benefits and outcomes, while building awareness of and confidence in digital. When interviewing stakeholders, a common theme in feedback is an apparent disparity between office and site workers in terms of who receives the benefits of digital transformation. Approaching stakeholder engagement with this in mind, we will produce content and communications in a variety of formats and styles, aimed to improve inclusivity and reach a wider audience across the NDA group.

Communications

Clear and compelling communication of this group digital strategy to the NDA group, NDA Group Leadership Team, operating companies, and other key stakeholders, is key to successful adoption and delivery of the strategy in the coming years. To include all parties and avoid only reaching well-informed stakeholders, the messaging will be pitched accurately and communicated via different channels.

We will develop a robust approach to communications, to determine the best way to communicate to the various stakeholders and plan the timings of such communications to keep them well informed.

Glossary

Advanced Analytics	The autonomous or semi-autonomous examination of data or content using sophisticated techniques and tools beyond those of traditional Business Intelligence
Agile	<ol style="list-style-type: none">1. Able to move quickly or easily;2. relating to or denoting a method of project management, used especially for software development, that is characterised by the division of tasks into short phases of work and frequent reassessment and adaptation of plans.
Association of Project Management (APM)	A registered charity delivering project management education and developing qualifications, conducting research, and providing resources.
Augmented Reality	An artificial environment which combines both physical elements of the real world with the projection of virtual elements.
NDA Beacon Projects	NDA group projects, chosen from the Group Key Targets which are the primary focus of the organisation for the coming or current period. There are usually 3-4 Beacon Projects set up each year, and they may or may not span more than one year. They run from April each financial year.
BEIS	The UK Government Department for Business Energy and Industrial Strategy. BEIS are responsible for setting the funding for the NDA Group.
BI, Microsoft Power BI	<ol style="list-style-type: none">1. Business Intelligence2. A branded software reporting tool used to provide this (Power BI)
BIM	Building Information Model(ing) - a process supported by various tools to generate and manage digital representations of physical artifacts, usually complex and 3D/4D models. We should apply the ISO 19650 standard which is an international standard for managing information over the whole life cycle of a built asset using building information modelling (BIM).
Benefits Realisation	The process of identifying, delivering, and measuring benefits, often as the result of instigating a change.
Best Practice	Commercial or professional procedures that are accepted or prescribed as being correct or most effective. (Compare to good practice)
The Cloud	A storage space online for applications and documents
Cloud Based	Something which is situated or exists in the cloud.

Common Data Environment	A central repository where project information is held, often used in conjunction with BIM
Company Devices	These are laptops and other devices such as mobiles / pagers provided by the NDA group
COTS	Commercial Off the Shelf Software - applications available to buy ready to use "out of the box" from the market.
Cyberspace	An operating environment consisting of the interdependent network of digital technology infrastructures and the data therein spanning the physical, virtual and cognitive domains. Data repository. A large database infrastructure that contains multiple datasets, which can be mined for analysis and data reporting.
Digital	<p>1: The representation of physical items or activities through binary code</p> <p>2: When used as an adjective, it describes the dominant use of the latest digital technologies to improve organisational processes, improve interactions between people, organisations, and things, or make new business models possible</p> <p>3. NDA group definition: re-imagining, transforming and repeatedly improving our ways of working; developing people and processes, and exploiting information, data, and technology, in the best ways possible to achieve the NDA mission</p>
Digital Asset	Anything that exists in a digital format and comes with the right to use. Examples include digital documents, photographs, spreadsheets, and include their contents and associated metadata.
Digital Business Optimisation	The process of using digital technology to improve existing operating processes and business models.
Digital Business Transformation	The process of exploiting digital technologies and supporting capabilities to create a robust new digital business model, often requiring new capabilities, a different value proposition for (new or existing) customers, and a new financial architecture.
Digitisation	The process of changing from analogue to digital form, also known as digital enablement. It takes an analogue process and changes it to a digital form which can enable new value producing opportunities.
Digital Ambition	Clarification of the direction for digital business; ascertaining how digital will impact the organisation, its people, culture, technology, and competitive advantage.
Digital Maturity	A measure of the organisations ability to create value through responding and being able to take advantage of technological developments.
Digital Operating Model	A visual and written representation which describes how entities are organised to achieve their digital strategic objectives.
Digital Roadmap	A high-level document which outlines what goals a business wants to achieve and identifies the initiatives to enable it to get there
Digital Twin	A virtual representation of an object or system designed to accurately reflect the physical object, often across its

	lifecycle. It frequently uses real-time or periodic data and simulation, machine learning and reasoning to inform decision-making.
Digital Workplace	Enables new, more effective ways of working; raises employee engagement and agility; and exploits consumer-oriented styles and technologies.
EDSG	NDA's Enterprise Digital Steering Group the governance body responsible for overseeing and reporting on the GKT to deliver the Group Digital strategy and its subsequent adoption.
Enterprise Asset Management	A combination of software, systems and services used to maintain and control operational assets and equipment with the aim of maximising the quality and utilisation of assets throughout their lifecycle, increase productive uptime and reduce operational costs.
Fail-Fast	A philosophy that values extensive testing and incremental development to determine whether an idea has value
GDPR/ UK GDPR	General Data Protection Regulation is a regulation in EU law on data protection and privacy in the EU and European Economic Area (EEA) It also addresses the transfer of personal data outside of these areas. Its primary aim is to enhance individuals' control and rights over their personal data and to simplify the regulatory environment for international business. This has now been replaced in the UK with UK GDPR which is enshrined in UK law not by the EU but by the Brexit transition legislation.
Gemini Principles	A common set of standards to guide the development and use of the built environment information management framework and the National Digital Twin.
GLT	NDA Group Leadership Team, the primary executive governance body for the NDA
GKT	Group Key Target - a project or activity which is given priority annually and against which staff pay performance bonuses are applied. In 2021/22 there were 28 GKTs across the group.
Good Practice	An approach which has been proven to work well and produce good results and is therefore recommended as a model for adoption. (Compare with Best Practice).
Handrail	Linear features which can be used as a means of navigating, especially useful in times of poor visibility
IoT	The Internet of Things - Physical objects embedded with sensors, processing ability, software, and other technologies and that connect and exchange data with other devices and systems over the internet or other communications network
IoT Platform	A software suite that facilitates operations involving enterprise resources and endpoints (sensors, devices, multi-device systems and systems-of-systems)
Information Security	The means of keeping confidential information of our company and that of our customers protected.
Innovation	The practical implementation of ideas that result in the introduction of new or improved offering in good or

	services.ISO56000:2020 defines innovation as "a new or changed entity realising or redistributing value"
MSP	Managing Successful Programmes (MSP®) is a framework that comprises a set of principles and processes for use when managing a programme. A programme is made up of a specific set of projects identified by an organisation that together will deliver some defined objective, or set of objectives, for the organisation.
Natural Language Processing	A branch of Artificial Intelligence that allows computers to analyse and synthesise speech and natural language.
NDA Group (core)	The core NDA group companies involved in creating the digital strategy which comprise: <ul style="list-style-type: none"> • Sellafield Limited • Magnox Limited • Dounreay Site Restoration Limited • Nuclear Decommissioning Authority • Nuclear Transport Solutions Limited (NTS) • Nuclear Waste Services Limited (comprising Low Level Waste Repository Limited (LLWR) and Radioactive Waste Management (RWM) Limited)
NDA Group Digital Strategy	An umbrella document which acts as a high-level handrail to guide the NDA companies toward better digital processes and alignment
NDA Re-Imagine Project	A 2021/22 Group Key Target (GKT) which seeks to retain and develop some of the benefits of digital and remote working and other associated outcomes which were the result of the remote working forced by the Covid 19 pandemic.
Network	A group or system of interconnected people or things
Network Topology	Schematic description of the arrangement of the physical and logical elements of a network
Obsolescence Curve	The state of being which describes the trajectory which can be plotted when an object, service or practice is no longer maintained, required, or is degraded, although it may be in full working order. Usually applied to software in an NDA context.
Office 365 (Microsoft)	A Microsoft product, a cloud-based gateway that allows individuals to create, share and edit documents from any location. Using a web browser, one can access documentation that has been saved to the cloud.
One NDA	A way of working more effectively and efficiently to maximise the opportunities within the group of operating companies.
Open Data Standards	Documented reusable agreements that can help people and organisations to publish, access, share and use

	better quality data. Open data standards may pertain to common models or a common language allowing information to be shared consistently and it make combining information simpler and easier.
PaaS	Platform as a Service- a category of cloud computing services that allows customers to provision, run, and manage a modular bundle comprising a computing platform and applications without the complexity and cost of building and maintaining the infrastructure usually associated with developing and launching applications.
Predictive Asset Management	The process of using data to accurately judge when faults or issues with an asset may arise, to prevent or mitigate the risk before it becomes a more serious problem.
SATAWAD	Secure, Any Time, Any Where, Any Device. - used in reference to goals for mobile workforces, usually uses the cloud to achieve this.
SaaS	Software as a Service - a method of software delivery and licensing whereby software is accessed online via a subscription rather than bought and installed on individual computers. The supplier manages access to the system including security, availability, and performance.
Value stream	1. a set of actions that take place to add value to an end user from initial request to realisation. In NDA this is often used to refer to the strategic themes: Spent Fuels, Nuclear Materials, Integrated Waste Management, Site Decommissioning and Remediation, and Critical Enablers
"Vanilla" Software	2. meaning plain or unadulterated, often used to denote it is "out of the box" or unmodified. Unmodified software is simpler and cheaper to upgrade and version. Also known as "White Label"
Virtual Reality	An artificial environment which fully immerses the user into the digital environment, creating a simulation which is like the real world.
Web Access	Ability to link to company documents and services via the internet.
Wireless Sensor Network	Groups of devices which can be redeployed quickly without any change in network topology and enable remote reporting and management

APPENDIX 1 | Checklist to support application of digital design principles

We are aware that for local and operational reasons it may not be possible to comply with all the suggested items contained in the checklist all the time. We ask that these items are considered and where there is a good reason for non-compliance that this is documented.

The intent is that future digital projects or initiatives are assessed in accordance with the digital Strategy and design principles. This will help to ensure we are moving towards digital convergence in how we approach digital, the systems and technologies we use and the experience of our workforce.

Rule/ Items/ questions for consideration:	Digital principles reference:
Is the activity aligned to the NDA's strategic objectives?	1,5,6,8
Is there an easily understood rationale for the activity/ project?	6,8
Does it simplify; and is it business led?	6,9
Do we have the skills and capabilities to deliver and operate it?	7,9
Have we reviewed feedback and metrics from the business; does it meet needs?	9
Does it enhance cross-entity working?	2
Does it deliver defined, time-bound, and measurable benefits?	6
Are KPI performance metrics built into contracts?	2,3
Is compliant with all relevant procurement rules?	2,3
Does it adopt a scalable procurement model?	1,8
Is it information security compliant?	1,9
Is it General Data Protection Regulation (GDPR) compliant?	1,9
Is sanctioning compliant (including sub-processes such as carbon/ ethics etc.)?	1,9
Will a known/ accepted data model standard be adopted?	4,8
Has software as a service (SaaS) & a flexible contract model been considered?	2,3,8
Has adopting outsourced or cloud-based services/ elements been considered?	2,3
Does the solution support an open information architecture model?	4,8
Can I buy it commercially off the shelf? (COTS) – we should buy not make	2,3,6
Is software as standard as is possible? It should be - "out of the box"	2,3,6

The digital opportunities that have been identified are:

- **Digital Twins**
- **Augmented Reality/Virtual Reality**
- **Artificial Intelligence/ Natural Language models**
- **Data and analytics**
- **Predictive asset management**
- **Data repository / knowledge management hub**

For each of these we illustrate where it has been used, what the outcomes were and how this could potentially benefit the NDA.

Some of these technologies are already being used across the NDA group, for example, Magnox have used Virtual Reality in training for Dragon reactor decommissioning.

Digital Twins

A digital twin is a virtual representation of a physical asset or process. Digital twins are designed to provide insight based on real-time data and allow for testing and examination of the process or asset in a virtual environment.

WHERE HAS IT BEEN USED?

An example of a successful creation and use of a digital twin comes from the pharmaceuticals industry. A major pharmaceuticals company was experiencing difficulties in identifying variabilities in the vaccine manufacturing process. This process was also slow, expensive, and unsustainable, and with the industry pressures around regulatory processes and time to market that the company was experiencing, there was a need for a digital solution.

To address these issues, the company developed a digital twin for vaccine manufacturing, which acts as a complete and real-time simulation of the entire manufacturing process.

WHAT WERE THE OUTCOMES?

This allowed the company to monitor the manufacturing process closely and anticipate failures, due to the accurate and real-time data that the digital twin provided. They were able to experiment in the virtual environment of the digital twin rather than experimenting in the real world, which in turn made the process quicker, more cost-effective, and more sustainable. Consequently, as development is accelerated, there is a reduced risk in manufacturing, and quality of understanding is increased.

WHAT VALUE COULD IT ADD TO NDA GROUP?

Digital twins could provide the NDA group with the virtual environment in which to trial and experiment with new processes of waste treatment and storage, asset maintenance, dismantling and decommissioning techniques without the costs and risks associated with experimenting in the real-world. This could accelerate programme delivery whilst also providing significant cost savings to the taxpayer.

Augmented Reality/Virtual Reality

Augmented Reality (AR) is an artificial environment which combines both physical elements of the real world with the projection of virtual elements. AR partially immerses the user into the environment, whereas Virtual Reality (VR) fully immerses the user into the digital environment, creating a simulation like the real world.

WHERE HAS IT BEEN USED?

At a nuclear plant in Finland, where training is required for all possible scenarios from minor disturbances to critical accidents. Previous training methods tended to be slow, inefficient, and costly.

To address these issues, the plant became the first to successfully implement and use VR simulations; using VR technology based on the requirements of the nuclear operation centre, to allow training to be done safely and cost effectively in the virtual environment.

WHAT WERE THE OUTCOMES?

There were three main outcomes to the introduction of VR in the nuclear plant. Firstly, VR training resulted in a 90% cost reduction when compared to the costs associated with a physical simulator. Secondly it provided an increase in safety and efficiency as realistic VR training prepared employees for unexpected real-life scenarios. Finally, it improved the design process of training, as pre-validations and evaluations could be done months in advance in the virtual environment.

WHAT VALUE COULD IT ADD TO NDA GROUP?

As with the Finnish plant, VR could provide the NDA group operating companies with a safe and cost-effective solution to training in areas such as emergency evacuation, fuel handling, leaks and fires, and other decommissioning and operative functions.

Artificial Intelligence / Natural Language Models

Natural Language Processing (NLP) is a branch of Artificial Intelligence that allows computers to analyse and synthesise speech and natural language. NLP helps to bridge the gap between the computer's understanding and human communication.

WHERE HAS IT BEEN USED?

Natural Language Processing has been used at an Australian oil and gas company, where engineers' work relies heavily on historical and procedural information. There is consequently an important need to capture the knowledge from all employees that are retiring or leaving the company. Alongside this, this company also operated on a model of spending 80% of time on finding relevant information, and 20% on solving problems, which was an unsustainable and ineffective model.

As a response, a Natural Language Processing solution was given 600,000 pages of documentation to learn from. The AI learned to suggest approaches to solve problems that the company employees would face daily. Currently over 70% of employees are using it to assist with their daily tasks.

WHAT WERE THE OUTCOMES?

Implementing a Natural Language Processing tool meant that time spent on research reduced by 75% due to the improved access to learnings. Consequently, as less time was needed for research, employees were able to work more flexibly to solve new problems and challenges quicker. Using the NLP solution also increased knowledge retention in employees, as it became easier and quicker to learn from past challenges and successes.

WHAT VALUE COULD IT ADD TO NDA GROUP?

There are two areas where Natural Language Processing could be particularly beneficial for the NDA group and operating companies. Firstly, knowledge can be stored, shared, and accessed more efficiently. As the technology can learn from historical events, experiences, and technical documentation, this can ensure the knowledge is passed from one generation to the next. This information can be accessed by asking the tool questions, either typing or talking. Secondly, some aspects of regulatory and compliance report writing could be automated by using NLP technology, as the tool can pull in relevant information from past reports and other documents.

Data and Analytics

Analytic solutions can computationally analyse data and statistics of any type, providing information and insights to enable better decision making.

WHERE HAS IT BEEN USED?

An example of data and analytics being used effectively is a pharmaceuticals company in Switzerland. Siloed working amplifies inefficiencies in the drug development process, and besides being locked in siloes, data throughout this company's operations was owned by different functions and was difficult to access. As well as this, the reliance on legacy systems and hardcopy data inhibited the use of live data which could be analysed to make real-time decisions.

To address this siloed data, the company introduced a data analytics platform that ingests, cleanses, aggregates and manipulates data from a variety of sources. This platform contains eight modules, one of which is a 'control tower' for clinical studies. This 'control tower' monitors the portfolio of over 500 global clinical studies, providing real-time and fully automated data updated.

WHAT WERE THE OUTCOMES?

Using a central data analytics platform meant that the company could combine decades worth of operational data and apply machine learning to generate actionable insights. As the platform is used to plan, predict, and compare activities across the company, decisions can be made that are backed by data, which in turn optimises costs and maximises quality.

The 'control tower' enables better oversight, as well as preventative course correction and greater efficiencies. It also drives action to prevent problems before they may happen by identifying risks to timelines or costs

WHAT VALUE COULD IT ADD TO NDA GROUP?

Effective use of data and analytics could enable better decision making across the NDA group. For example, an analytic solution could assist us in assessing the strategic health of plans, projects, and assets across the group, combining multiple datasets to provide improved oversight and help us identify and manage risks.

Predictive Asset Management

Predictive asset management is the process of using data to accurately judge when faults or issues with an asset may arise, to prevent or mitigate the risk before it becomes a more serious problem.

WHERE HAS IT BEEN USED?

The Royal Navy experienced inconsistency and information silos with data standards due to different suppliers being involved in different systems, which meant they struggled to benefit from the efficiencies that digital offers.

So, to accelerate the use of data analytics and AI, the Royal Navy introduced an innovation programme called NELSON with BAE Systems Applied Intelligence. NELSON uses predictive AI to assist fleet-wide asset management, as well as making all data available in one common environment. NELSON is also able to identify unusual shipping behaviour and strengthen logistics planning through the construction of 'Navy Mind', a big data platform.

WHAT WERE THE OUTCOMES?

NELSON predictive asset management technology reduced costs of integration, enabled new upgrades to be seamlessly introduced, and delivered better insights and analytics for the Royal Navy. The predictive AI means that faults can be predicted before they happen, and preventative measures can be taken. Time is also saved as issues can be resolved before they become more serious, and the lifetime of assets is prolonged due to the data-based recommendations on asset health and asset management.

WHAT VALUE COULD IT ADD TO NDA GROUP?

Predictive asset management could provide valuable insight for the NDA when applied to nuclear sites. By using the available data to create predictions around when physical assets may require maintenance or management, the NDA group will be able to reduce costs, risks and make more informed decommissioning and waste management decisions.

Data repository / knowledge management hub

A data repository is a large database infrastructure that contains multiple datasets, which can be mined for analysis and data reporting.

WHERE HAS IT BEEN USED?

One example of best practice digitalisation from the oil and gas sector is the establishment of the first UK National Data Repository (NDR), a digital platform for offshore petroleum related information and samples currently being used in 191 countries. The NDR stores a total of 4.6 TB of data and has an Application Programming Interface (API) which allows users to search for and download information from their own internal organisational information systems.

WHAT WERE THE OUTCOMES?

The platform facilitates reporting obligations for offshore petroleum licensees and owners / operators of offshore infrastructure to the Oil and Gas Authority (OGA), and the OGA can use the NDR to disclose reported information to any registered user, subject to statutory confidentiality periods. Anyone with an interest in petroleum-related information may register to search, view, and download disclosed information.

According to the OGA, the repository to addresses the following industry and regulatory requirements:

- Ensuring global access to unique and irreplaceable petroleum-related information
- Enabling retention and reporting obligations to be discharged
- Enabling the disclosure of petroleum-related information by the OGA
- Facilitating collaborative data interchange between relevant persons, the broader oil and gas industry, academia, and the regulator to encourage economic activity
- Ensuring that maximum value is derived from petroleum-related information by ensuring the widest possible transparent access
- Ensuring the curation of petroleum-related information and samples

WHAT VALUE COULD IT ADD TO NDA GROUP?

Having a centralised data repository or knowledge management hub would enable better decision making across the NDA group, as all current and archived data would be accessible as and when it is needed. It would improve information transparency and would standardise the ways in which information and data is collected and stored, improving efficiencies between group operating companies and the NDA.



Sellafield Ltd



Magnox



Dounreay



Nuclear Waste Services



NTS
Nuclear Transport Solutions