

Asset Management

Approve Strategy (Gate C)

March 2011



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Executive Summary

Asset Management is the systematic and coordinated activities and practices through which an organisation optimally manages its assets, and their associated performance, risks and expenditures over their lifecycle for the purpose of achieving its organisational strategic plan (PAS-55).

Assets are defined as plant, machinery, property, building, facility, vehicles and other items (excluding nuclear materials), whether operational or not, brought under the ownership of the NDA through the Energy Act. Examples of items classified as assets are presented in Appendix 1.

The objective of the Asset Management Topic Strategy is:

“To secure reliable NDA asset performance in order to enable safe and effective delivery of the Decommissioning and Clean Up mission”

The Energy Act 2004 places a duty on the NDA to secure what it considers to be good industry practice by the persons in control of the designated installations, sites and facilities.

UK Treasury has published expectations for managing public money that place specific expectations on the NDA as an NDPB (Reference 4).

The Site Licence Companies (SLCs) are bound through their site license to operate their facilities to an agreed standard of public and employee safety, security and environmental protection (References 5 & 6).

The reliable performance of its assets is critical to delivery of the NDA's strategies.

The unreliable performance of key NDA assets continues to impact adversely on NDA mission delivery and hence upon stakeholder and Regulator confidence. Two principal causes have been identified for this lack of asset performance:

- Unclear expectations and hence oversight for SLC good practice management of the assets.
- Continued use by the SLCs of inherited asset management regimes which fail to deliver the asset management expectations of the NDA and those of the Regulators.



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To achieve the topic objective, there is a need to address these root causes. This requires the development and communication of clear NDA performance requirements for asset management, agreement on a suitable asset management standard between the principal stakeholders, development and implementation of an effective operating model, and a coherent strategy for delivering these changes.

The strategy selected for NDA asset management improvement is to utilise the internationally recognised asset management standard, Publically Available Specification – 55 (PAS-55).

The NDA is working, and will work, in partnership with SLCs and Regulators to gain a common understanding of the application of PAS-55, to identify and resolve estate-specific issues and to identify the improvements required.

SLC implementation of the strategy requires the NDA to secure an appropriate contractual obligation that can be understood, applied and evaluated. The current contractual obligations will be reviewed and, if required, revised with agreement from the SLCs.

As an interim step the SLCs were incentivised to secure asset performance through benchmarking their asset management arrangements and to identify critical assets using a risk based approach. Plans are in place to improve asset management following benchmarking against PAS-55. Having identified critical assets, further work is required to underpin their management plans, and hence underpin LTPs and supporting funding requirements.

Achieving and sustaining an acceptable level of asset management maturity involves not just systematic but cultural change typically taking a number of years. The NDA aims to continuously improve asset management and to secure reliable asset performance through progressive NDA and SLC objective setting.

Adopting the above strategy and implementation approach will deliver a number of principal benefits to the NDA:

- Improved asset performance
- Reliable asset performance over its lifetime.
- Visibility of asset risk on a consistent basis across the portfolio.
- Justifiable asset investment decisions across the portfolio.
- Improved safety, security and environmental performance.
- Regulators satisfied that an appropriate level of asset management is carried out to ensure that Safety, Security and the Environment are protected.
- Improved governance of the assets.
- Improved efficiency and a potential to reduce asset care and maintenance costs.

1 Background

The Energy Act 2004 places a duty on the NDA to secure what it considers to be good industry practice by the persons in control of the designated installations sites and facilities.

The Site Licence Companies (SLCs) are bound through their site license to operate their facilities to an agreed standard of public and employee safety, security and environmental protection.

UK Treasury has published expectations for managing public money that place specific expectations on the NDA as a NDPB (Reference 4).

The NDA has placed contracts on the SLCs to meet these requirements.

2 Current Situation

Although not formally documented, the intent of the existing strategy is to mandate the application of industry good practice to the management of the NDA's asset portfolio within Clause 7 (Asset Management) and Clause 2 (Industry Good Practice) of the contract with the SLCs, with further guidance provided in EGG02. The NDA carry out financial governance of the assets through audit of LTP financial reconciliation in production of the Annual Report and Accounts and by internal and external financial audit.

However, no performance standard is in place to inform the NDA's review of the SLCs' asset management, therefore industry good practice cannot be assured.

In common with any business the success of the NDA's driving strategies is dependent upon the reliable performance of its assets. An example of the way in which this relationship works is depicted in Appendix 3.

The unreliable performance of key NDA assets continues to impact adversely on NDA mission delivery and hence stakeholder and Regulator confidence.

3 The Case for Change

A history of ineffective investment decisions, unreliable performance of key NDA assets and ineffective management systems continues to impact adversely on NDA mission delivery and hence upon stakeholder and Regulator confidence. This is exemplified by a number of recent asset related incidents (e.g. the CHP stack incident, THORP Feed Clarification Cell incident) and by the level of ongoing work required to remediate historic mismanagement of legacy assets. As well as impacting delivery and incurring significant additional expenditure, the unforeseen nature of these incidents and their consequences indicates a lack of understanding of asset risk. Poor risk management is limiting the NDA's ability to demonstrate

value-for-money management of its assets. The impact of ongoing asset and asset management performance issues is discussed in further detail in Appendix 2.

Two principal causes have been identified for the lack of asset performance:

- Existing NDA approach (discussed in Current Situation, above) in specifying and articulating asset management performance requirements and assuring delivery is not adequate.
- Continued use by the SLCs of inherited asset management regimes which fail to deliver the asset performance expectations of the NDA and those of the Regulators.

To secure reliable NDA asset performance and thereby enable effective delivery of the Decommissioning and Clean Up mission, there is a need to address these root causes. This requires:

- The development and communication of clear NDA asset management performance standard involving principle stakeholders,,
- Development and implementation of an effective operating model based on the standard to deliver reliable performance, and
- A coherent strategy for delivering these changes.

The keystone for progress is therefore the selection of an asset management standard.

4 Key Options

Following initial de-selection of non-credible options, two options for selection of the NDA Asset Management Standard remain. These are:

1. Develop NDA asset management performance standard from scratch.
2. Adopt and adapt a readily available and recognised asset management performance standard.

Option 1 would require significant effort, time and cost to establish a credible standard, which is not currently available within the NDA on short-term timescales. Therefore this option is rejected.

The only readily available asset management standard is published in PAS 55 (Reference 1). The standard has been developed by the Institute of Asset Management and is published by the British Standards Institute. Development has used contributions from



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British and international business and government organisations that have considered what constitutes good industry asset management practice and incorporated the key elements into the standard.

In summary, PAS-55:

- Is a strategic risk based management framework.
- Has credibility with Government, HSE, industry in the UK and abroad, and professional bodies.
- Is flexible to any business situation (fit for purpose and cost effective).
- Is consistent with NDA objectives, Safety and Environmental Regulation and Treasury guidance (Reference 4).
- Provides proven opportunity to validate NDA and SLC asset management in a transparent, demonstrable and consistent way.
- Has previously been successfully implemented within the nuclear industry (by British Energy) and other industries in the UK and abroad.

This option will ensure that credible, sustainable asset management can be assured and implemented on a shorter timeframe within the NDA and SLCs, and is therefore selected as the preferred option for the NDA's asset management standard. This standard will form the basis for benchmarking asset management performance until such time as a better option is developed and available for use by the NDA.

5 Issues

The key risk to asset management strategy is the potential for asset management to be considered as an overhead when funding is heavily constrained and arbitrarily cut as a result. This is typically caused by a lack of visibility of the value delivered by effective management of assets which is one of the key areas that successful delivery will achieve and results in see saw spending increasing significantly the lifetime spend on assets. This may result in non-implementation of the strategy and persistence of unreliable asset performance.

Improvement in performance of the assets requires a shift in culture from the highest level of the organisation down to the bottom tier. This scale of change will take significant time (in the order of years) and hence there may be a number of years before major benefits are realised. This presents a challenge to the NDA in sustaining momentum and support for this period of time from key stakeholders.

6 Recommendations

It is recommended that the NDA implement the proposed asset management strategy, i.e. the adoption of PAS55 as a ready-made asset management standard to benchmark the SLCs against. Adopting this strategy and implementation approach will deliver a number of principal benefits to the NDA:

- Improved asset performance
- Reliable asset performance over its lifetime.
- Visibility of asset risk on a consistent basis across the portfolio.
- Justifiable asset investment decisions across the portfolio.
- Improved safety, security and environmental performance.
- Regulators satisfied that an appropriate level of asset management is carried out to ensure that Safety, Security and the Environment are protected.
- Improved governance of the assets.
- Improved efficiency and a potential to reduce asset care and maintenance costs.

7 References

1. PAS55-1:2008 and PAS55-2:2008. British Standards Institute, Institute of Asset Management.2008.
2. Business Case for the Fellside Boiler Park. Sellafield Limited. RP/0103272/PROJ/00005/B. April 2009.
3. Val Kohler presentation to the Institute of Asset Management Conference 2009.
4. Managing Public Money (UK Treasury, October 2007)
5. Nuclear Installations Act (1965) as amended
6. Environmental Protection Act (????)

Appendix 1 – Definition of Assets

The NDA define assets as plant, machinery, property, building, facility, vehicles and other items (excluding nuclear materials), whether operational or not, brought under the ownership of the NDA through the Energy Act.

This can include items which are non-operational and would more commonly be classified as liabilities, e.g. redundant chemical plant. Including all such items within the NDA's asset management strategy enables consistent management of plant and equipment across the NDA estate, tailored to the NDA's organisational strategic plan.

In the case of waste generated from decommissioning activities, the waste material is not classified as an asset (waste is covered by the Integrated Waste Management Topic Strategy), however the container holding the waste is an asset. Regarding the NDA's IT systems, computer hardware is considered to be an asset whereas the information stored on the hardware is not (note that Information and Knowledge Management is a separate Critical Enabling Strategy).

Critical Assets are assets that are identified as having the greatest potential to impact on the achievement of the organisational strategic plan. The assets can be safety/environmental/security critical and /or performance critical, and can relate to legal, regulatory and /or statutory requirements (PAS-55).

Appendix 2 – The Case for Change

The impact of the current situation regarding asset management upon the NDA's strategic requirements is described below.

Performance of key NDA assets continues to adversely impact on Delivery of the Mission

There are numerous and interdependent contributing factors that result in this situation arising which are described below.

Assets aren't managed with sufficient consideration of the requirements of the NDA mission

To ensure the NDA mission is delivered it is vital that assets are maintained such that performance and reliability are suitable and proportionate to the assets' role within the NDA mission. In addition the value of the work done to maintain or invest in the assets needs to be understood to ensure that safety, security, environmental protection and performance is achieved whilst securing increased efficiency in the business.

The current requirements and oversight regime set out by the NDA and performance by the SLCs do not identify the asset lifetime role, its importance or value to delivering the NDA mission in terms of safety, security and environment, output or efficiency. This is contributed to by the 10 year focus on asset performance as part of live safety case review which is insufficient to ensure consideration of overall lifetime ability to deliver the NDA mission which renders the plant safe under all circumstances but can adversely impact on its required performance if the balance between safety and performance is not properly addressed.

Shortfalls in the management of assets with respect to the Mission are borne out by past asset investment decisions which have been flawed, e.g. BEP, SDP, WTC at Sellafield. The SDP project in particular has incurred major costs to the NDA due to failure of the project design to address the asset's functional requirement. The closure of a number of current investment decisions are also being drawn out due to poor quality and consistency of information as to the purpose and value delivered in comparison with the risk impact presented.

To properly understand to value of investment decisions the full lifecycle of assets needs to be understood against the backdrop of potential scenarios that might emerge e.g. funding constraints. This helps prevent decisions being made that look beneficial in the short term but have some significant implications for business risk in the longer term without first making the risk and costs visible. Currently decisions are being made based on historical information and a limited or non existent approach to optimising the risk and hence cost

Examples of this happening include preparing the B30 infrastructure for retrievals (e.g. the Skip Handler Machine), arising from a historic maintenance regime focused solely on the operational phase of the plant. Evidence suggests that this approach is endemic within the business impacting on a number of critical assets across the NDA portfolio, e.g. the cooling ponds at the Magnox stations.

An issue has emerged recently regarding the limited availability of suitable condition flasks to transport spent fuel to FHP as part of the MOP. The issue has arisen due to poor condition of the flasks, exacerbated by poor condition of the flask maintenance facility. This issue has already incurred delay to the MOP, and poses threat to the future end date, with major potential to the NDA's business. The issue demonstrates a discontinuity between changing strategy at a national level and the asset care work planned and performed by SLCs, and demonstrates the importance of integrating the two via a robust asset management framework.

Management of B29 at Sellafield has recently taken a decision to specify low grade materials for their retrievals encapsulation plant. This decision is consistent with a short design life for the facility, and demonstrates the SLC seeking value for money and a fit-for-purpose design within the context of the plants operating lifetime. Such decision making across the NDA estate is one end goal of the asset management strategy. It is important, however, that the strategic assumptions underpinning such decisions are recorded in a fully traceable manner, and are communicated to those making decisions affecting plant strategy. A robust asset management framework is required to provide information systems adequate for this role, and to ensure that sufficient governance of the systems is in place in a consistent manner across the SLCs.

The magnitude of the negative financial impact on the business of the failure to properly address the strategic performance of assets can be measured in terms of £100Ms.

Lack of visibility of magnitude, location and importance of asset risk

There is currently no comprehensive understanding of the business risk posed to the NDA by the current and future condition and performance of the asset portfolio. Historically, the SLCs' risk processes have tended to be driven by the safety case for operation of each facility, which focuses on a 10 year look ahead at asset condition with respect to designated safety functions. This approach does not always ensure consideration of overall risk to lifetime delivery of the whole NDA mission i.e. safety and output performance. This lack of understanding means that the NDA and SLCs cannot demonstrate sufficient control of that risk. Lack of understanding of the changing condition of critical assets over their required lifetime presents potential for a major unforeseen

nuclear incident to occur such as a catastrophic failure of containment on Legacy storage facilities or structural failure of tall structures, e.g. chimneys with the potential to impact surrounding containment structures. Given the current industry climate, the impact of such an event on the NDA would be beyond that of any national incidents that have occurred to date.

Realisation of asset risks such as critical asset failure could lead to a range of business impacts, from minor impacts such as increased expenditure on maintenance tasks, to major business impacts such as unplanned delays to the reprocessing programmes. It is roughly estimated that the CHP Stack incident cost in the region of £6M due to cessation of Sellafield operations for 2 weeks (Reference 2). The FCC incident at THORP will have incurred a similar weekly rate of commercial impact over a much longer outage period.

The ongoing incidence of major asset related incidents and outages indicate a lack of asset risk management that poses major threat to the NDA and therefore needs to be addressed. For example, the THORP FCC incident indicated a lack of understanding of the impact of a change to operational process to asset condition and hence risk. The CHP stack incident indicated a lack of understanding of ageing mechanisms under defined operating regimes and hence the whole process of identification evaluation and mitigation of risk. Such instances are very public in nature, and severely impact the NDA and SLC's reputation with external stakeholders including regulators, the public, the media, etc. Stakeholder distrust engendered from these events leads to increased intervention from the NDA and regulators, which slows LTP delivery and incurs costs to rebuild reputation. Maturity of SLC risk management systems would enable the NDA to step back into its intended strategic role and allow the SLCs to manage the detail. Reputational damage with the public and media further impacts upon the government, and may influence Government policy regarding the wider nuclear industry, e.g. New Build, funding, acceptability of new strategies, etc. Retrospective review shows that a robust risk based approach should have identified simple low cost solutions to prevent these occurrences and hence significant additional costs.

The context of assessing the impact of risk tends to be limited to the potential impact of nuclear or radiological events resulting in exposure of workers or the public without considering the wider impact. This biases decisions of investments towards high hazard assets without properly assessing the impact of interdependent assets and infrastructure failure on the ability to deliver business objectives and compare investment options on a like for like basis.

It should be noted that effective asset management will not necessarily predict or prevent every asset related incident; however, it should provide a better understanding of the risk profile presented to the NDA by the overall asset portfolio, and identify the assets that play a critical role within the risk profile significantly improving confidence in delivery. This will allow the development of risk mitigation plans, underpin investment strategies, and thereby enable

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available asset expenditure to be focused where it optimally addresses and demonstrates that risks are understood and managed underpinning the investment portfolio.

Therefore, there is a need to develop an understanding of current and future asset risk to enable effective management, to demonstrate control of asset related expenditure, through helping to reduce losses related to unplanned incidents or outages.

Lack of understanding of purpose for asset expenditure

Asset spend should be attributable to a purpose linked to strategy delivery and be proportionate to the risk presented and constraints, e.g. available funding, to meet Energy Act requirements for delivery and value for money. In addition asset spend should include operational, maintenance and care from both a resource and capital perspective.

Currently it is not possible to provide this clarity within and across NDA sites. Asset operation, care and maintenance tends to be spread over a number of cost reporting areas based on historic and safety case requirement, with some tasks being reported as distinct asset care and maintenance costs and some being included within operational or project costs. Therefore, it is not possible to understand the purpose or compare asset operating, care and maintenance spends in a consistent or meaningful manner across the NDA estate and hence demonstrate that the spend is essential and value for money is delivered.

An example of the alignment of investment with risk from British Energy is shown in Figures 1, 2 and 3 below (taken from a presentation given by Dr. Val Kohler of British Energy (BE) to the Institute of Asset Managers Conference, Reference 3).

They represent the development of the company's asset management strategy from an initial approach principally limited to focus on safety case compliance, through to a risk focused approach.

Figure 1 demonstrates BE identifying where expenditure is focused in their business, and identifying a misalignment between this and where risk to the business is being realised (historic losses). Prior to this it was not possible to describe or deal with this position as the information was not available.

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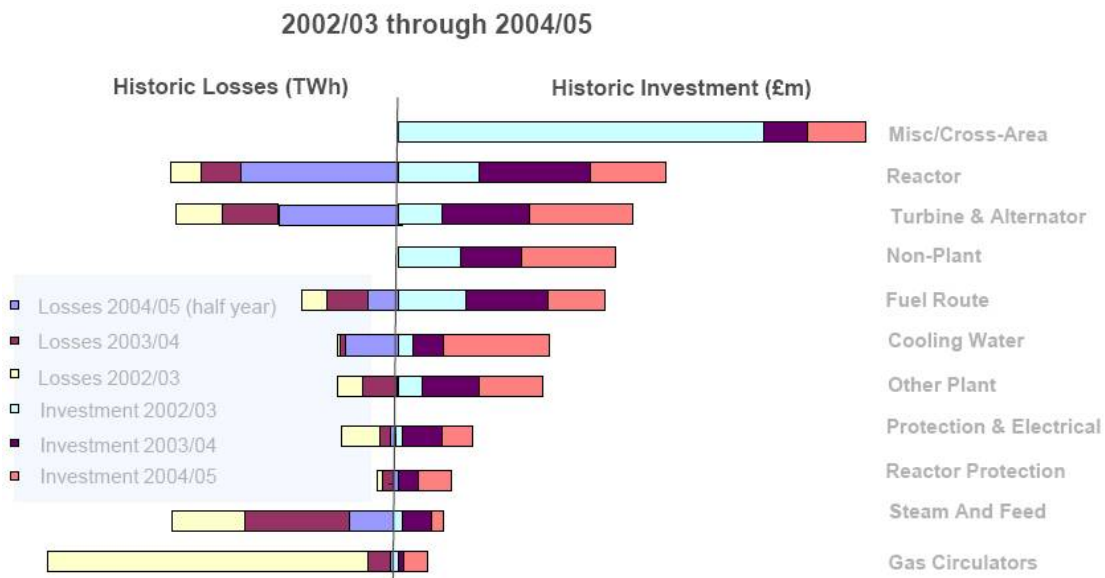


Figure 1

Figure 2 demonstrates expenditure being realigned to the location of historic risk within the business, and Figure 3 demonstrates a move to forward looking investment against future risk to the business derived from understanding the required level of performance and the impact this has on the ability of the assets to deliver.

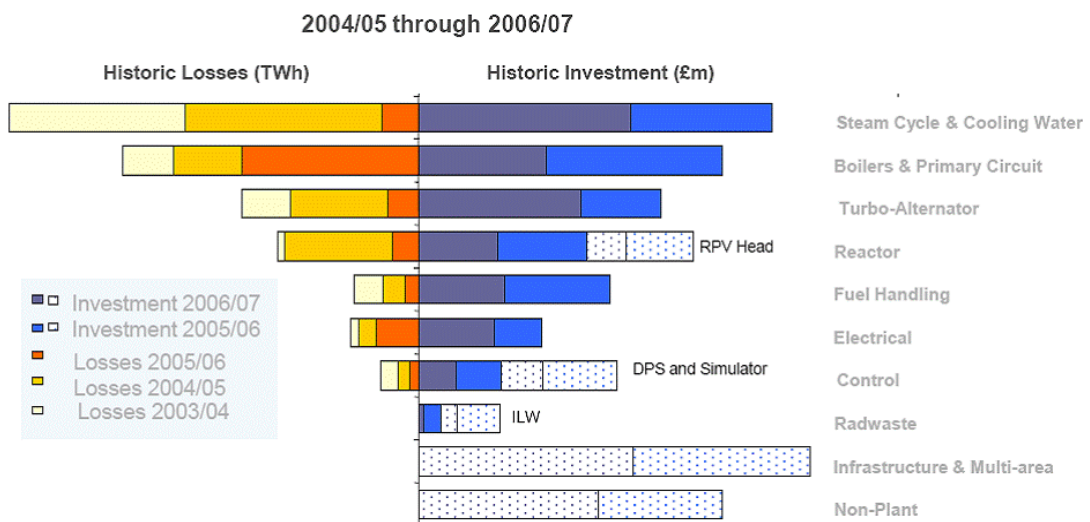


Figure 2

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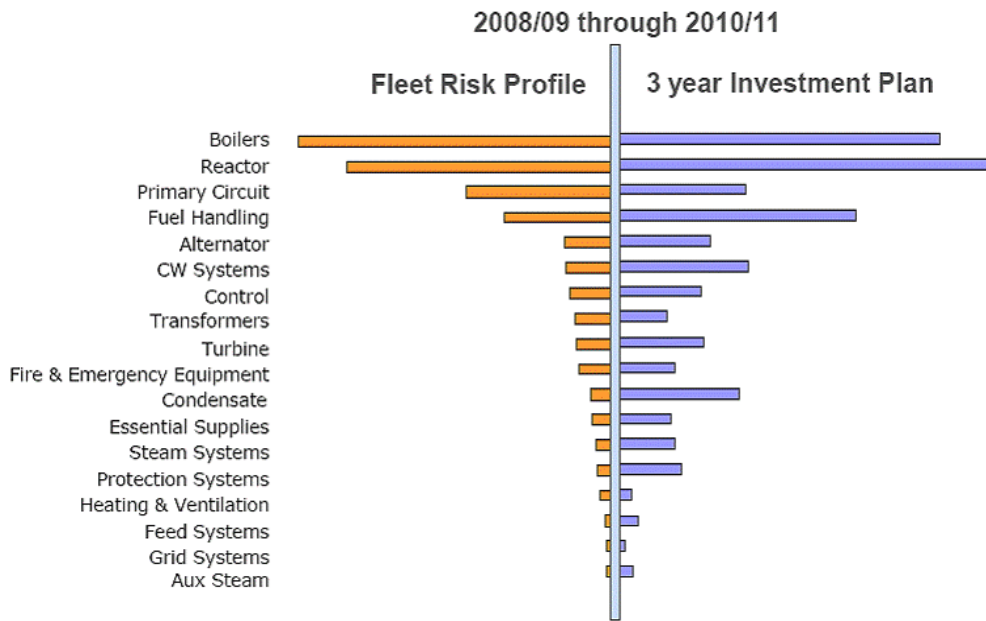


Figure 3

Regulator Concerns over the current asset management arrangements

The Regulators view asset management as the key enabling strategy area for the NDA and SLCs with respect to ensuring the ongoing safe operation of the NDA's nuclear sites.

The Regulators have expressed concern to both the NDA and the SLCs regarding the management and resulting condition of the NDA assets. They have indicated particular concern over how asset management arrangements deal with ageing assets. The Regulators have questioned the ability of the current SLC asset management arrangements to predict the ageing mechanisms associated with the NDA's assets and to develop appropriate intervening strategies.

Other Issues

There are a number of further strategic shortfalls with the existing arrangements:

- Due to the absence of an agreed standard against which to perform NDA's oversight the current arrangements are not effective in ensuring asset management performance to meet the requirements of the NDA Mission. This leaves the NDA open to question from its stakeholders and the Government.
- NAO have expressed asset governance and stewardship concerns for three years running, the NDA and SLCs have been unable to demonstrate sufficient progress to allow these to be withdrawn.
- The lack of knowledge regarding the inherited and estimated future condition and risk of assets at the start of contracts presents the NDA with unacceptable commercial and financial risk whilst operating in steady state and particularly when competing contracts.
- There are differing views of what asset management is and the value of asset management between stakeholders within the NDA, the SLCs and externally. These differences can lead to uncontrolled and diverging approaches that lead to inefficiency and poor performance adversely affecting stakeholder relations.
- There is no systematic representation of asset management within the NDA as a coherent business process. NAO audit findings along with regulatory and NDA concerns about performance within the NDA estate have confirmed this status indicating that a change in strategy is required.

Appendix 3 – Example of asset management working with other Strategies

Asset Management = Reliable Performance
Understand performance required over lifetime. Measurement and monitoring of risk and justification of investment opportunities. Integrated across value chain (retrievals to final disposition) to be affordable and optimise lifetime costs and manage risk (PAS-55)

Infrastructure
Roads, Rail, Transport, Electricity, Steam, Compressed Air, Pipe work, Culverts, Drains, Trenches, Water, Reagent supply facilities, Pipe Bridges, Waste Management, Bridges, Upstream and Downstream interdependent facilities.

