

The Magnox Clean-Up Programme – Integrating and Making Best Use of the Supply Chain – 16603

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ABSTRACT

In 2010, the UK Nuclear Decommissioning Authority (NDA) secured a funding settlement of £2.5Bn from the Government for the period to 2015 for the Magnox Care & Maintenance programme. This settlement was a reflection of the importance placed on discharging the decommissioning liability associated with the UK's 1st generation Magnox reactors. It also reflected the NDA's confidence in the Magnox Optimised Decommissioning Plan (MODP), which aimed to accelerate entry into Care and Maintenance and reduce the Magnox decommissioning liability by £1.2Bn.

Despite the settlement, huge challenges remained if the MODP was to be delivered within the funding envelope. Essentially, the supply chain had to be able to participate in the delivery of the MODP and make the investment in skills and techniques required to minimise the threats and uncertainties remaining in the Programme.

The Magnox Commercial and Supply Chain Strategy was, therefore, an integral part of the MODP. At the highest level, the Strategy involved:

- Classifying and segregating procurements by risk and value
- Moving the contracting philosophy from risk transfer to risk management
- Focusing on relationships and results rather than activities and processes

By aligning the supply chain to the MODP, Magnox was able to better organise itself to deliver against the MODP, to act on feedback from suppliers and enable a culture of 'Lead and Learn' to take root. Using feedback and learning from other organisations and applying these to contract management approaches improved project outcomes. In particular, learning from previous experience of dealing with Programme "unknowns" increased the company's ability to control and improve on the overall Programme cost and schedule.

The impact of the MODP was to reduce the Magnox baseline by over £1.5Bn and remove 34 reactor-years from the Care and Maintenance preparations period. This huge gain resulted from a range of technical, process and commercial improvements across the organisation. Perhaps the greatest achievement of the MODP and its supply chain strategy was to quantify and stabilise the Magnox Life-cycle scope and cost and enable the successful competition and transfer of the Management and Operating (M&O) contract in 2014 and lay the foundations for further cost-savings to the UK taxpayer.

INTRODUCTION

In the 2010 Governmental Spending Review, the UK Nuclear Decommissioning Authority (NDA) secured a funding settlement of £2.5Bn from the UK Government for the period 2011-15 for the Magnox Care & Maintenance (C&M) programme. This settlement was secured against a backdrop of austerity in the UK and was a reflection of the importance placed on discharging the historic decommissioning liability associated with the UK's 1st generation gas-graphite (Magnox) reactors. The settlement also reflected the NDA's confidence in the Magnox Optimised Decommissioning Plan (MODP), which aimed to accelerate entry into Care and Maintenance and reduce the Magnox decommissioning liability by at least £1.2Bn.

Despite securing the funding, the Magnox MODP objectives meant that there were some huge challenges that had to be addressed to deliver within the funding envelope. Essentially, the supply chain needed to be able to participate in the delivery of the MODP over a wider front and for a longer period in order to justify making the investment in the skills and techniques required to minimise the threats and uncertainties that remained in the Programme. It was also recognised that a secondary benefit of working with critical suppliers in this way would be to help insure Magnox against other UK programmes, including New Build, from "poaching" key suppliers, i.e., help to guarantee quality and security of supply to Magnox.

MAGNOX STRATEGY AND OBJECTIVES

The stated aim of the Magnox strategy was to transform the UK approach to Reactor Decommissioning, by introducing a "Lead and Learn" methodology based on implementing strategic programmes and key initiatives. This strategy was applied across all ten sites and all 22 reactors operated by Magnox with the aim of reducing the life-cycle cost by over £1.2Bn and removing over 30 reactor-years from the programme.

Great care was taken in terms of expressing the strategy in terms of simple objectives that were repeatedly communicated across the company. The objectives listed below cover the full lifecycle of the reactors and were designed to increase the value of the existing assets, remove the biggest hazards on the sites and accelerate the transition of the sites into a Care and Maintenance condition (in line with UK decommissioning policy):

ID	Magnox Objectives
1	Extend the lives of Wylfa and Oldbury (an additional income >£500M to the NDA)
2	Delivering the spent fuel to Sellafield (the biggest hazard at the sites)
3	Getting a site into Care and Maintenance (to show it can be done!)
4	Implement strategic programmes and key waste management initiatives based on global best practice across all sites (to deliver a step-change in performance)
5	To measure performance against the best (benchmarking)
6	To do all of the above safely (look after one another!)

TABLE I. Magnox Objectives

COMMERCIAL STRATEGY

The Magnox Commercial and Supply Chain Strategy was an integral part of the MODP and both were delivered in “locked step”. The strategy set out to both improve performance and protect the company against security of supply issues associated with the UK “New Build” programme and the decommissioning programmes of other Site Licence Companies (SLCs).

The strategy sought to achieve this by becoming a better client, i.e. by sharing requirements and involving suppliers earlier (Early Contactor Involvement – ECI), contracting with selected suppliers for longer (via frameworks) and thereby creating opportunities for supply chain innovation and investment. These “in-contract” approaches were augmented by the adoption of Strategic Relationship Management (SRM) processes, where senior representatives from Magnox would meet periodically with senior managers from key suppliers in order to identify and address longer-term threats and opportunities.

The strategy also drove the company to classify procurements by Risk and Value, with the strategically critical “Lead and Learn” Programmes being procured and managed differently and separately to the more commoditised Business Services and site-based transactions where “Discount for Bulk” principles apply (see Fig.1).

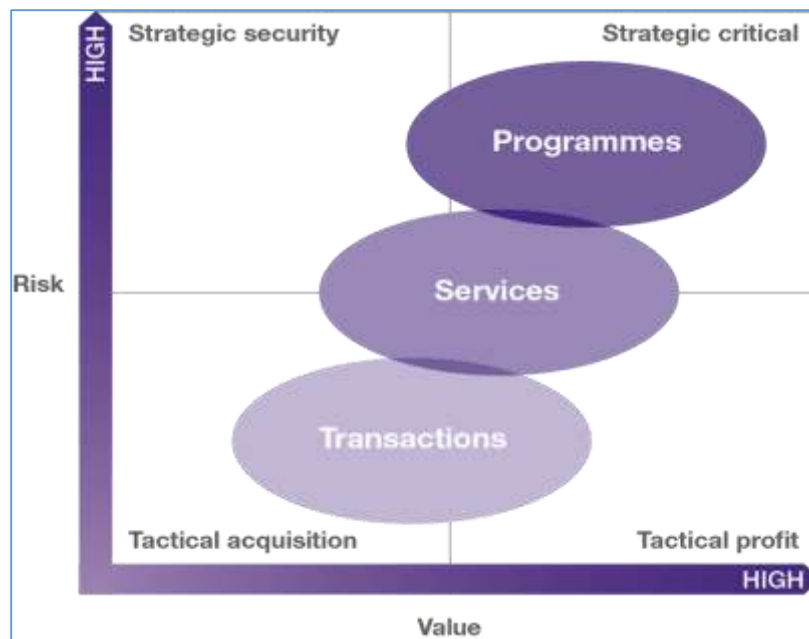


Fig.1. Treatment of Programmes, Services and Transactions

Furthermore, the strategy called for a move to the New Engineering Contract (NEC3®) suite and the adoption of its dynamic Early Warning (EW) and Compensation Event (CE) culture which forces client and contractor to communicate and resolve disputes during the life of the contract, rather than saving these to the end of the contract where no opportunity for correction or learning is possible.

This was accompanied with the introduction of a "paperless", computer based contract management system (**CEMAR**®), specifically designed to log and track the evolution of contracts from contract award to contract close-out, and the introduction of company-wide contract management training for all contract and project managers. These measures were designed to raise the standard of contract management across the company by increasing awareness of best practice and making best practice easier to implement. The contract management tool was also intended to collect data for later analysis, thereby providing a feedback loop for continuous improvement.

Simultaneously, the "default" contract for strategic critical procurements was defined as Target Cost Incentive Fee (TCIF – NEC Option C), with the emphasis of client and contractor managing risks between them, rather than pursuing more traditional risk transfer approaches (see Fig.2)

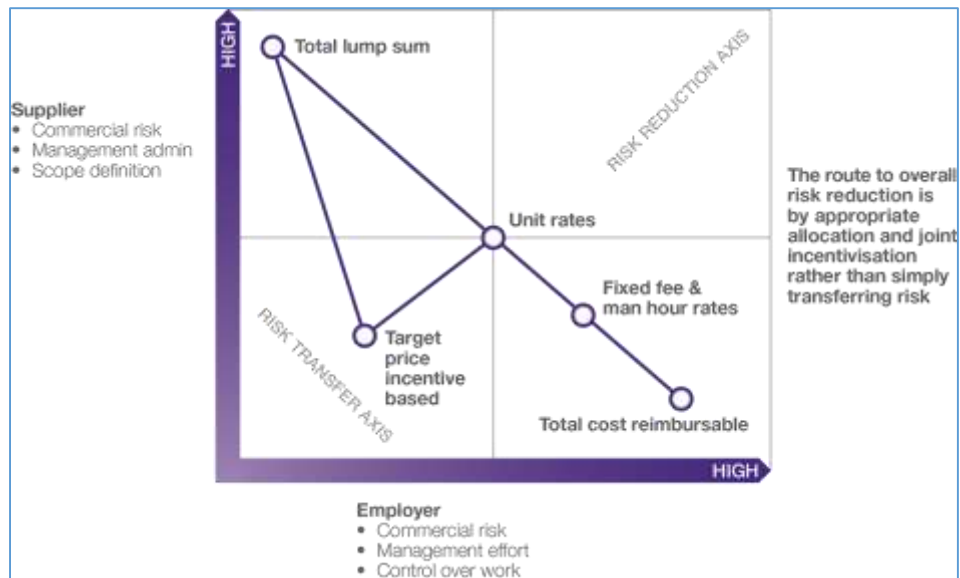


Fig.2.Risk Management vs Risk Transfer

OUTPUTS

One of the first impacts of the commercial strategy was the ability to aggregate work across the company under a smaller number of larger framework contracts. This affected both strategic programmes and business services and allowed the best talent within the commercial team to be allocated to the larger or more challenging projects. This in turn allowed the function to be reorganised against the work (see Fig.3), resulting in a 30% reduction in team size, whilst simultaneously increasing the team's capacity to manage work (procurements rose by over 25% from £370M p.a. to £460M over the period 2010 – 2014), an overall efficiency gain of 60%.



Fig.3.Commercial Organisation (vs Task)

A second impact of the promotion of ECI along with longer, bigger frameworks and increased communication via the SRM and EW/CE process was that the culture of the commercial and project aspects of the business become noticeably more relationship and results focused. At the strategic level, the SRM process allowed a vehicle for long-term opportunities to be realised; in one case delivering an annual saving of £1M simply from the procurement of Agency Supplied Workers. Similarly, at the working level, two points soon became apparent from an analysis of the contract management data that was being collected in the contract management system.

Firstly, over 95% of all the early warnings and compensation events recorded in the system were for £5K or less. The balance of the events were typically much larger and grouped in a band from £0.3M - £1M. Although the second group was much larger and impactful, the delegated authority within the company to approve either size of change was the same. A simple change to the company delegations allowed the bulk of CEs to be approved by the contract manager, thereby freeing up senior management time to address the smaller number of larger events.

Second, prior to a large CE being registered, all EWs on the project would “dry up” from both client and contractor. This is counter-intuitive as it would be expected that, prior this, the reasons behind the CE should bring many EWs to be registered. Indeed, it soon became clear that there was a strong correlation between the EW:CE ratio and project health; with well performing contracts routinely running with a EW:CE ratio >2 and poorly performing contracts with a EW:CE ratio <1 .

Strong parallels exist between this latter observation and historic observations in safety culture. Before the advent of “open reporting” and the active promotion of Human Performance (HuP) and Behavioural Safety observation tools, the prevailing culture at the workplace was to “not tell” on colleagues exhibiting unsafe working practices. As a result, learning opportunities were lost and safety performance remained stubbornly low. However, once the principles underlying the so-called Bird Triangle became generally accepted, and open reporting became the norm, safety performance has improved across industry (see Fig.4).

In contract space, what the **CEMAR**® data revealed to Magnox was that managers in poorly performing projects were “not telling” on their clients/contractors. Managers in well performing contracts were posting Early Warning events at the first signs of loss of contract control, i.e. approvals not given in specified times, security clearances and site access taking too long, design freezes not being enforced, and were gaining the benefit of being able to act on these issues before they became serious. Managers in poorly performing contracts were not encouraging these behaviours and were typified by the culture of “yes, we got off to a poor start, but it will all work out in the end.” Exactly how this was going to occur without feedback or change was hard to see! Indeed, the absence of Early Warnings or an EW:CE <1 soon became a trigger for project performance reviews by senior managers and quickly became respected as a key tool for identifying and addressing issues before they became truly serious.

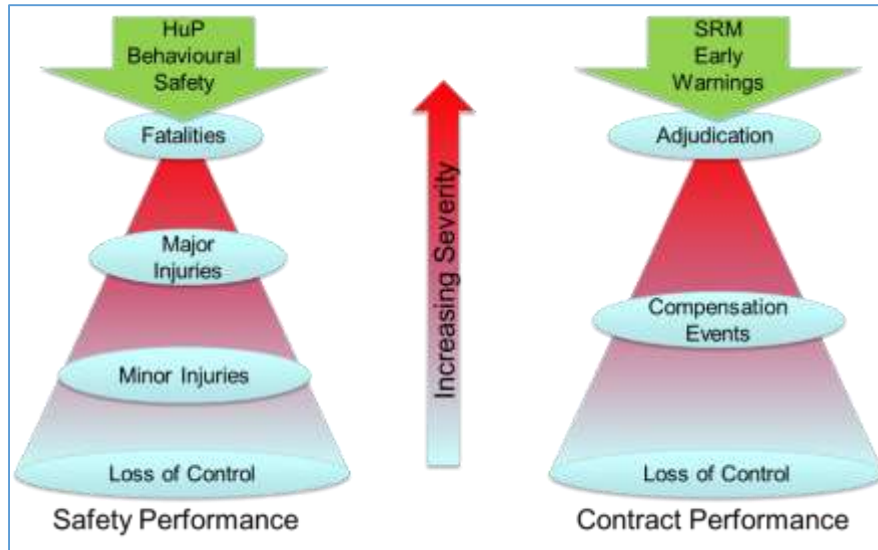


Fig.4. Human Performance (HuP) and Behavioural Safety Concepts applied to Contract Management

CONTINUOUS IMPROVEMENT

By the end of the M&O contract period (2014), the impact of the various aspects of improvement and feedback had been quite profound. Whereas there will always be room for further improvement, Magnox had standardised much of its contract documentation suite and enjoyed improvements in contract lotting, contract formulation and contract management. These in turn led to further measurable benefits in terms of overhead reduction, reduced time for contract awards and improved socio-economic planning.

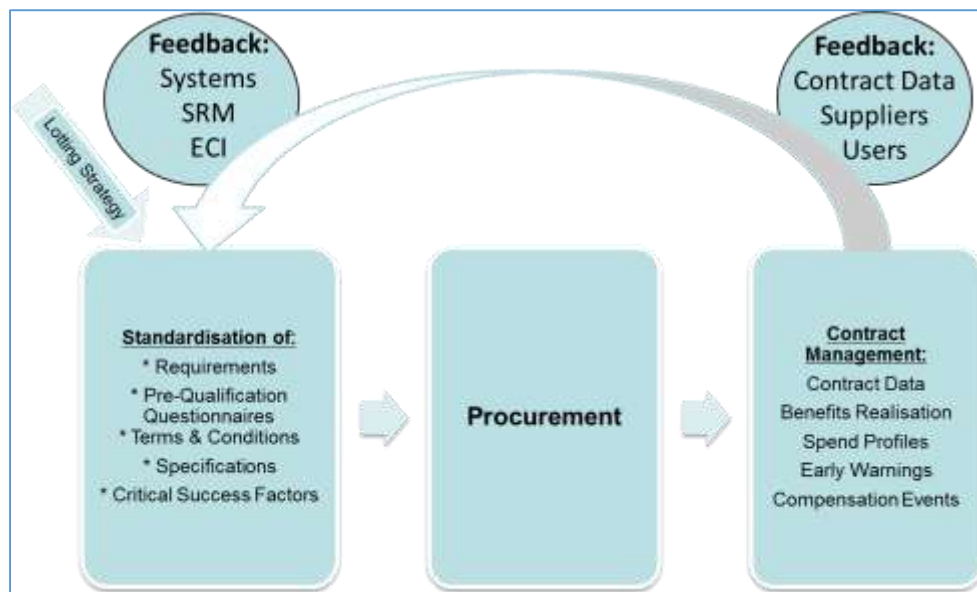


Fig.5. Continuous Improvement Driven Via Feedback Mechanisms

CONCLUSION

By aligning the supply chain to the MODP, Magnox was able to better organise itself to deliver against the MODP and to act on feedback from suppliers and benchmark organisations. This in turn enabled a culture of 'Lead and Learn' to take root, i.e. "develop once, use many times", resulting in wider capability and delivery impacts.

Using feedback tools and learning from other organisations progressively improved approaches and processes, supplier relationships and delivery results and increased the number and scale of positive outcomes across the whole of the programme. Bringing in learning from other areas and applying these to contract management approaches also lowered the frequency and size of negative outcomes. In particular, learning from previous experience of dealing with Programme "unknowns" increased the company's ability to (a) control and (b) improve on the overall Programme cost and schedule.

The overall impact of the MODP was to reduce the Magnox baseline by over £1.5Bn and remove 34 reactor-years from the Care and Maintenance preparations period. This large gain resulted from a range of technical, process and commercial improvements and efficiency gains across the company but the supply chain, empowered by the commercial strategy, played a significant role in achieving this result.

Perhaps the greatest achievement of the MODP and its supply chain strategy was to quantify and stabilise the Magnox Life-cycle scope and cost and thereby enable the successful competition and transfer of the M&O contract in 2014, thereby laying the foundations for further cost-savings to the UK taxpayer.

In the spirit of "Lead and Learn", these experiences and techniques are now being passed on and shared with other Programmes in the UK and around the world.