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The Defence Industrial Strategy

An Analysis of Industry Responses

By Michael Codner, Lee Willett and Louise Heywood

Military Sciences Department

Royal United Services Institute for Defence and Security Studies

FOREWORD

The United Kingdom (UK) Ministry of Defence (MoD) has, in its Defence Industrial Strategy (DIS) and its subsequent implementation strategy, Enabling Acquisition Change (EAC), set out for the UK Defence Industrial Base (DIB) a blueprint for delivering affordable defence capability with profound implications for all stakeholders in the defence acquisition community.

In this study, RUSI provides an independent analysis of the defence industry's responses to DIS. The authors have collected and summarized industry's opinions in a non-judgemental way. To these views they have added a brief commentary which draws on the wider debate on DIS in the acquisition community. The study is not designed to present the position of the Institute nor of the sponsors of the work but to stimulate further discussion among MoD, industry, and other stakeholders, both on the challenges in DIS and on taking DIS forward.

Methodology

The research for this report has been based on: the authors' analysis of relevant primary source documents; an overview of

contemporary literature on this subject, including press reports; and an extensive series of interviews with key representatives of a wide range of companies and other organizations within the UK DIB, conducted between early June and late September 2006.[†] The list of interviews was designed to cover companies across the breadth and depth of the supply chain, including Tier 1 prime contractors, Tier 2 suppliers and sub-system integrators, defence-related Small and Medium-sized Enterprises (SMEs), and other companies that otherwise support MoD's acquisition processes. The

Change Team Leader, June 2006 (also known as the McKane Report); House of Commons Defence Committee. *The Defence Industrial Strategy*. Seventh Report of Session 2005-2006. HC 824. 10 May 2006. London: The Stationery Office (TSO) Ltd; House of Commons Defence Committee. *The Defence Industrial Strategy: Government Response to the Committee's Seventh Report of Session 2005-06*. Eighth Special Report of Session 2005-06. HC 1488. 14 July 2006. London: TSO.

[†] RUSI has interviewed representatives of the following companies and organizations (in alphabetical order): Army Base Repair Organisation (ABRO), Atkins, Babcock, BAE SYSTEMS plc, BMT, The Boeing Company, BT plc, Cobham plc, Defence Manufacturers Association (DMA), Devonport Management Ltd, EADS UK, Farnborough Aerospace Consortium, Finmeccanica, Fujitsu, General Dynamics UK Ltd, Honeywell, IBM, J&S Marine Ltd, KBR, Lockheed Martin UK, Logica CMG, Marshall Aerospace, MBDA, Meggitt plc, Northern Defence Industries, Northrop Grumman, QinetiQ plc, Raytheon Systems Ltd, Rolls-Royce plc, Selex Sensors and Airborne Systems, the Society of British Aerospace Companies (SBAC), Thales, Weir Strachan & Henshaw, Hardy Advanced Composites, Ultra Electronics, and VT plc.

^{*} These include: Ministry of Defence (MoD). (2005), *Defence Industrial Strategy: Defence White Paper*, Command 6697, December 2005; MoD, *Enabling Acquisition Change: an Examination of the Ministry of Defence's Ability to Undertake Through Life Capability Management*. A report by the Enabling Acquisition

list includes MoD key suppliers and many of the companies mentioned directly in DIS. The authors also have interviewed several key officials in MoD, including some from the Central Staffs and the Defence Science and Technology Laboratory (dstl) – as well as interviewing representatives of other Government departments – such as the Department of Trade and Industry (DTI).[‡] Interviewees were sent a short brief on the project as an initial basis for discussion in the interview, although discussions always proved to be more wide-ranging. Material from the interviews was then analysed by the authors. From this material, issues considered to be significant and representative of the range of industry opinion were drawn out for presentation and commentary in the report. None of the interview material has been attributed to the originating speaker or organization.

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The report expresses the views of the authors. It does not represent the opinion of the Royal United Services Institute, QinetiQ nor of any of the organizations or individuals who have offered advice and support.

RUSI Assessment of DIS

RUSI assessments of DIS and of its implementation can be found in papers

[§] See: ‘*RUSI Acquisition Focus: The Defence Industrial Strategy - An Objective View*’, in *RUSI Defence Systems*, Summer 2006; and ‘*RUSI Acquisition Focus: Implementation of the Defence Industrial Strategy*’, *RUSI Defence Systems*, Winter 2006.

[‡] The Defence Science and Technology Laboratory.

EXECUTIVE SUMMARY

This study provides a non-judgemental summary of opinions within UK Defence Industry of MoD's Defence Industrial Strategy (DIS), and the follow-up paper entitled *Enabling Acquisition Change* (EAC), with some supporting commentary to encourage discussion in the defence and acquisition communities.

Industry widely sees DIS as a very positive initiative in addressing the realities of a changing defence market for the UK and in identifying realistic courses of action. Industry is impressed that the White Paper was clearly born of a business mindset and that industry was engaged in its development.

While industry is encouraged by MoD's intention to bring about internal changes rapidly, there is a concern that the need for change indicated by DIS is so wide and deep that timescales are unrealistic.

DIS aspires to achieve efficiencies throughout the acquisition process which will offset the problem of rising unit costs. However, there is a clear discrepancy between the capability aspirations of DIS and money that is likely to be available in forthcoming defence budgets.

Although EAC addresses the problem of the separation of the Equipment Plan (EP) and Short Term Plan (STP) by returning responsibility for the budgets of in-service systems to the Equipment Capability (EC) Department for the period beyond four years, there is scepticism in industry that the device is workable.

There are concerns about affordability both generally and in the context of DIS. Major issues are:

- The EP needed to serve the expeditionary strategy is clearly overheated and DIS alone cannot address this without difficult balance of investment choices
- The 2007 Comprehensive Spending Review looms and, if MoD lost influence, it could so distort the EP that DIS became a minor concern
- Through Life Capability Management (TLCM) will require upfront commitment of funds over long timescales with money committed to upgrades the details of which are uncertain – a hostage to unprogrammed demands for cash elsewhere
- Appropriate sovereignty implies a premium to retain industrial capability onshore
- A serious commitment to R&T needs more money
- And finally, there are resource implications in DIS itself. Will it not cost money for MoD to effect its internal changes, and how will MoD pay for this?

Industry needs to see the detail of MoD's EP if it is to structure its businesses appropriately to support the DIS.

MoD's competence or will to effect DIS has been questioned. In particular, there are concerns that:

- Commitment to the implementation of DIS is not reflected at all levels and across all organizations within MoD

- Internal organizational change - in particular the DPA/DLO merger - will be a distraction from DIS implementation
- The culture of committees and matrix management is risk-averse and indecisive - there needs to be clear accountability and strong leadership
- Implementation is dependent on Lord Drayson's personal involvement as Minister for Defence Procurement (Min DP) and could suffer if he left his post
- MoD will not be able to perform effectively as a customer because it does not properly understand workings of its interface with industry and lacks commercial expertise

Industry also needs to change but does not want to do so at a faster pace than the customer, because shareholders need to be convinced that DIS will be implemented.

As for appropriate sovereignty, MoD must be clear about what capabilities and knowledge to preserve onshore. Furthermore, the demand for onshore capability must be balanced against product quality. Concerns of US-owned companies relate principally to fair competition in the light of appropriate sovereignty and, for their UK management, sustainment of head office interest in a shrinking and more insular UK market.

Lower tier companies are concerned that prime contractors will use vertical integration and squeeze out innovation in the supply chain. MoD needs oversight of the supply chain through formal arrangements with primes but not direct control. SMEs are a disparate group whose concerns are for survival and for understanding by MoD and primes of their contributions, in particular to innovation.

Partnering is in part a consequence of the lack of competition within UK at Tier 1. Long-term partnering with MoD should not be exclusive to a few companies. MoD must fully understand the purposes of different partnering and alliancing models which may involve more than two actors. The necessarily elaborate contractual arrangements may not be feasible.

A systems engineering approach should be adopted early in a programme or project. It is a necessary element of establishing an appropriate TLM approach. Systems engineering capability is a prime candidate for appropriate sovereignty in many sectors. It is not restricted to Tier 1.

MoD would benefit from objective advice on both the supplier and customer side. The Lead Systems Integrator approach used in the US should be considered for the UK. Tier 0 contractors (contractors which provide services to MoD on the customer side of the customer-supplier divide) have no vested interest and can provide an independent assessment to MoD of what capabilities are achievable particularly in an Assessment phase.

TLM will become a key means for MoD to respond to changes in the security environment and defence roles. It is not, however, clear how to contract flexibly for TLM for products that are not, as yet, in service. In particular, capability upgrades may be needed at short notice.

For incremental acquisition to be effective, there must be the necessary funding and a guarantee of its availability to relevant suppliers. MoD needs to retain a degree of control in the evolving design of the system, which must employ open architecture.

Primes can stimulate innovation, but this tends to be a feature of thin rather than thick primes. The latter are likely to offer what they already own thus excluding the potential contribution of Tier 2 innovators and SMEs.

For effective TLM there must be coherence between capability planning and the research and technology programme. The Defence Technology Strategy must provide a sustainable technology strategy with clear priorities and must not be limited to a description of areas of research. A realistic alternative to significant investment in research and technology is buying 'off the shelf' capability.

MoD encourages rationalization in the maritime sector and emphasizes the need for a single prime entity, but cannot control evolution of the supplier base. This is a cause of concern for lower tier suppliers. All UK submarine programmes, for example, are regarded as becoming unaffordable.

The C4ISTAR sector differs from other sectors principally because of enduring significant competition. Partnering between companies at Tier 1 is the logical way ahead for major projects. Only MoD can be the design authority for major IT programmes.

INTRODUCTION

The purpose of this study is to provide a summary and independent analysis of a cross-section of representative opinions, of companies supplying to the United Kingdom (UK) Ministry of Defence (MoD), of MoD's Defence Industrial Strategy¹ (DIS), and the follow-up implementation structure paper entitled *Enabling Acquisition Change*² (EAC). Since the publication of these papers and other associated official material, there has been a wealth of commentary and analysis. In particular, individual companies and bodies representing the defence industries have made contributions expressing their viewpoints. In this respect, the essential feature of this study is its objectivity in addressing the views of interested parties in particular in the UK Defence Industrial Base (DIB). The study is intended to further discussion and constructive debate among government, industry, analysts, other stakeholders and, of course, the Armed Forces themselves.

DIS outlines the Government's intentions to establish a sustainable and competitive UK DIB, which can deliver military capability to the UK's Armed Forces, value for money to the taxpayer and a sustainable, realistic and profitable future for industry. DIS establishes a number of themes that will underpin the transformation of the UK's defence infrastructure, including:

- planning, understanding, interaction and collaboration between MoD, industry, and other stakeholders
- through-life capability management
- partnering while preserving competition where appropriate and feasible
- the requirement for MoD and industry to develop together the skills necessary to deliver and manage complex system capabilities and approaches

- incremental development and technology insertion
- system engineering and integration
- the development and improvement of the nature and structure of supply chains
- a viable UK-located DIB, with the retention on-shore of certain critical defence technologies
- the balance and coherence of defence investment and spending across research, development, procurement and support.
- a long term view of future technological needs

The UK Government sees DIS as presenting a number of challenges to industry, not least the need to re-position itself to develop a sustained, long-term future when in the short-term the defence budget will see less money available, there will be fewer programmes and arguably the need for fewer companies. DIS envisages that affordability will be improved by industry working more effectively, both through more efficient partnering and supply chain management, and through evolutionary uptake of innovation. There is a clear challenge to industry to avoid overspends and find ways to offer more affordable whole life solutions.

However, for the purposes of this study a two-sided model of challenge and response is inappropriate.

First, the 'industry' that is challenged is a diverse group with a wide range of opinions, which do not together provide a coherent industry view. Indeed, companies hold views that are opposed to one another in many cases. The reasons for this are clear. Companies have their

own customer-supplier relationships which may be adversarial. Competition feeds differences of opinion, particularly between those who are frequently successful and those that are attempting to enter the market or who believe that they have a new product or process to sell.

There are the established ‘primes’³ and companies that aspire to be primes of first choice. There are companies traditionally seen as British and those that wish to be seen as such. There are companies that meet the criteria of ‘onshore’ and those that do not but who perceive themselves as capable of providing such value for money that ‘sovereignty’ becomes an extravagance. There are lower tier companies in the supply chain who see their contributions to a major system as defining its capabilities, and there are Small and Medium-sized Enterprises (SMEs) which are so disparate in their capabilities, behaviours and interests that their only common feature is their size. Yet the perceived technological value of some of these may be out of all proportion to their small size. Then there are companies which see their contribution as primarily intellectual but essential nonetheless. There are also companies which meet several of these criteria either in themselves or in their subsidiaries in different sectors and programmes.

Because of this range of opinion, this study does not aim to put forward a single view of industry. The opinions that are addressed are those which, in the judgement of the authors, are assessed to be substantial, illustrative of important features of DIS, and representative of companies with particular functions in programmes and projects.

Secondly, DIS presents huge challenges to MoD itself as the scale of the recommendations of EAC indicates. Inevitably, much of this study addresses industry’s views as to MoD’s ability to meet these challenges.

Thirdly, much of DIS is about long-term formal and informal co-operation between MoD and companies, albeit punctuated from time to time by competition and the adjustment of contractual arrangements. There is an implied need in DIS for behavioural and structural change in MoD and industry to be harmonised and synchronised while also being urgent and substantial. This change also must address a future that is uncertain strategically and economically. In a nutshell, this is the challenge that DIS sets.

The following commentary outlines selected views expressed to the authors by interviewees during the conduct of the research and the authors’ analysis of these views. The individual ‘industry view(s)’ summarized in the following sections are not intended to represent any consensus among industry. They do not reflect the opinions of the Institute nor those of the sponsors of the study.

INDUSTRY’S GENERAL VIEWS OF DIS

DIS is a substantial and valuable piece of work

Industry View: Industry widely sees DIS as a very positive initiative in addressing the realities of a changing defence market for the UK and in identifying realistic courses of action. Industry is impressed that the White Paper was clearly born of a business mindset and that industry was engaged in its development. However, participation by industry was very selective. Some large companies mentioned that their input was as a result of their own initiative relatively late in the development of DIS, although they considered themselves to be very significant in their respective industry sectors.

Comment: Individual companies are unlikely to criticize DIS root and branch,

as they will appreciate that their future as suppliers to MoD will be conditional on their compliance with MoD's 'strategy'. Although interviews were non-attributable, views will have been tempered by this consideration. Some of the most enthusiastic of those interviewed commented that DIS was nonetheless highly aspirational, with some of the interviewees questioning whether MoD was institutionally capable of delivery of its share of necessary change.

Some interviewees observed that company membership of the National Defence Industry Council (NDIC) is not truly representative of the UK DIB because a small number of large companies had more than one member. This observation bears examination, although there is recognition that the further work initiated by DIS is engaging a far wider range of stakeholder companies.

MoD needs to move fast to implement DIS, but can it realistically meet its own demands itself?

Industry View: While industry is impressed by MoD's intention to bring about change rapidly, there is a concern that the need for change indicated by DIS is so wide and deep that timescales are unrealistic. In particular, MoD will be undergoing overall business change, including change to management, process, culture and skill-sets, and this degree of change implies the very best in leadership, incentives and ownership by managers at all levels. There are doubts that MoD has the coherence and skill-sets to do this. No company would envisage achieving this degree of change in the timescales outlined by the Minister for Defence Procurement (Min DP). A slower pace of implementation might allow all parties to keep pace, but companies are eager to see early evidence of change and early returns.

Comment: Industry broadly agrees that a fast pace and short timescales are necessary to force changes in behaviour and

structures. Such pace and timescale also signals real commitment by the senior MoD leadership to substantial change. Clearly, not every element of DIS and EAC will be implemented fully and will be in perfect working order within a two year period. However, a longer planning timescale was regarded by some as being a recipe for incremental change and calcification. Implementation could also fall victim to political process and be overtaken by 'fresh' initiatives of new political leadership.

DIS can be read in many different ways

Industry View: Many of those interviewed mentioned that DIS is open to a wide range of interpretations. It is possible for particular interest groups and stakeholders to use the language to support their own cases and for others to interpret it as 'business as usual' in their cases.

Comment: DIS was created in a remarkably short period of time and is acknowledged by those involved in its authorship as having inadequacies and limitations. It was not, however, intended to be a conclusive or definitive document, but one designed to initiate processes of further study and action involving a broader cross section of stakeholders. One would hope that differences in interpretation will be resolved in this process and that the outcomes will be documented. It will be a measure of the effectiveness of the DIS process if broad concepts such as appropriate sovereignty are refined to be specific in the selection of candidate industrial capabilities and if clear prioritization in such areas as research and technology emerges.

CHANGE IN THE MINISTRY OF DEFENCE

The Defence Budget and Affordability

DIS will not alone solve the affordability issue

Industry View: There is a wide view that affordability is a principal driver of DIS. DIS aspires to achieve efficiencies throughout the acquisition process to offset the problem of rising unit costs between successive capability generations. However, there is a clear discrepancy between DIS capability aspirations and actual budgets. Thus, there will be hard balance of investment decisions to be made over the range of capabilities that the UK can afford that DIS will not resolve. Indeed, some argue that the 2007 Comprehensive Spending Review (CSR) could derail DIS.

Comment: DIS states that the primary aim for MoD in re-structuring its acquisition approach is to ensure that industry can meet the requirements of the UK Armed Forces while delivering long-term value for money.⁴ The issue of affordability is implicit in this statement. However, it would be wrong to conclude that affordability was the only motivator of DIS and that the only purpose of DIS is to make the existing Equipment Plan (EP) affordable. Key DIS issues, such as sustaining the UK DIB and appropriate sovereignty, are not likely to come without some financial premium. On the other hand, MoD envisages significant savings across the defence budget as a whole through well-structured Through Life Capability Management (TLCM) arrangements. Regardless of DIS, clearly there are hard choices to be made, whether such choices will be an outcome of the two yearly planning cycle or else imposed through inter-departmental priorities in the CSR. However, a significant measure of the success of DIS would be delivery of a more cost effective acquisition system.

There is also the issue of the costs of infrastructure change in MoD. Officials

have indicated that there will be no new money for this purpose.

The Equipment Plan/Short-Term Plan separation is unworkable

Industry View: There was broad agreement that the current separation between the EP and the Short-Term Plan (STP) would be unworkable in the context of TLCM, incremental acquisition and technology insertion. EAC addresses the inadequacy of MoD's present financial planning construct in this respect through its recommendation to share responsibility for programming of in-service costs between the Front Line Commands for the initial four years of the STP, and the Equipment Capability Customer (ECC) for the remainder of the through life costs (in addition to initial procurement costs). There is scepticism in industry that this device is workable.

Comment: This scepticism seems to stem from a lack of confidence that MoD can integrate decision-making effectively across organizational boundaries. EAC notes the need for a more integrated approach among elements of MoD engaged in acquisition and the Defence Lines of Development (DLod). This requirement implies a stronger role for the ECC organization, which may require a closer engagement with industry.

In reality, there is unlikely to be enough money in the defence budget for capability modification

Industry View: DIS TLCM philosophy addresses the problem perceived by some sectors in industry of 'bow waves' - of acquisition expenditure followed by long lulls - by providing certain companies with support contracts which may include provision for incremental acquisition, upgrades and other forms of technology insertion and modification for change of purpose. However, longer term financial 'headroom' in the defence budget for

these enhancements to capability cannot be specifically predicted and costed. In particular, there is unlikely to be spare capacity in the defence budget for deliberate, front line-driven change. Will the contractual arrangements for TLM actually secure and protect this headroom, for example, if future major platforms and weapons systems programmes adopt a 'minimum' initial requirement of 'fitted for but not with'?

Comment: EAC acknowledges the need for headroom in the EP for adjustments to capability to meet changing strategic and operational circumstances. There is a historic problem, however, that longer term provision for uncertainty falls victim to cost overruns elsewhere in the EP. EAC also highlights the problem of optimism bias both in MoD and industry, which leads to cost and time overruns. Cultural change in this respect, and in countering short-termism in MoD (which is to some extent driven by political considerations), will be important to the success of DIS.

Front line-driven change has typically in the past been funded and executed through the Urgent Operational Requirement (UOR) process. Some respondents sought the adoption of a more formalised approach to short term capability evolution driven by front line needs that, whilst not conducted on the very short timescale required by UORs (generally less than three months), address needs within a window much shorter than conventional acquisition (say six to eighteen months). This should lead to efficiencies and greater opportunity for innovation.

Industry needs to know where, and when, MoD will be spending its money if industry is going to adapt appropriately

Industry View: *Industry needs to see the detail of the EP, if it is to structure its businesses appropriately to support the DIS.*

Comment: In the past, MoD has been constrained by inter-departmental rules from releasing detail of forward spending. However, the EC Department is now working towards providing considerably more information to companies. MoD warns, however, that future spending plans are not programmes and can only give guidance as to intentions at the time they are published. They cannot be used as any guarantee of actual availability of funds. Clearly, industry needs as much and as accurate information as is practicable.

Organizational, Process and Cultural Change

Is MoD really willing to change at every level?

Industry View: *Industry is impressed by MoD's commitment to the implementation of DIS, but is concerned that this is not reflected at all levels and across all organizations within MoD. There is also a danger that internal organizational change, in particular the merger of the Defence Logistics Organisation (DLO) and Defence Procurement Agency (DPA), will be a distraction from wider DIS implementation. There is a risk, as a result, of losing focus on delivery.*

Comment: There is anecdotal evidence to support these concerns, which are reinforced by the pattern of previous reforms. However, to date the process of evolution of DIS and its implementation has been unusual in its speed and forceful direction.

MoD will be incapable of implementing DIS with its present management culture

Industry View: *The culture of committees which are risk averse needs to be broken. Matrix management by Senior Responsible Owners (SROs), Directors of*

Equipment Capability (DECs) and Integrated Project Team Leaders (IPTLs) does not allow for effective outcomes. Points of accountability need to be clear. For effective change, major programme leadership must be incentivised by salaries and bonuses equivalent to those paid to individuals leading major programmes in industry.

Comment: The senior management of MoD is very much aware of this challenge.⁵ It will not be possible simply to impose a basic commercial management model onto a Department of State with its public responsibilities. EAC recommends greater integration among MoD's acquisition organs and an emphasis on MoD as a unitary customer. The DLO/DPA merger will arguably simplify relationships. Strong leadership with good commercial sense will be important to effecting cultural change. In particular, MoD's senior leadership should appreciate that effective decision-making benefits from management models founded on the ideals of simplicity and clear accountability. In the British public service, two factors work against this ideal. One is the practice of incremental change through broad acceptance and compromise. The other is the use of *sui generis* organizational arrangements for particular purposes, such as the proliferation of agencies using a wide range of models, Private Finance Initiatives and other features of the process of partial privatization.

Training clearly has a role in adjusting behaviours, but it must, of course, be the right training. On the one hand, staff must be trained to the specific roles of MoD as customer. On the other, a MoD devised training system could perpetuate inappropriate culture and behaviours if it does not draw on commercial best practice and fit it for purpose.

More exchange of personnel between MoD and industry has been suggested as another means of assisting cultural change.

The DPA/DLO merger sends a positive signal but must not overshadow the core issues of DIS

Industry View: *The DPA/DLO merger is a positive initiative, one which has sent a clear message of MoD's seriousness in reforming. The merger will be an important contributor to TLCM, but is not one of the core issues of DIS. There is a danger that the merger will become the principal focus of MoD activity at the expense of DIS implementation more generally. In particular, personal issues and concerns of civil servants such as relocation and changing responsibilities may cause a hiatus.*

Comment: There was an inevitability in this merger, which was hastened by DIS. However, the signal of firm intent sent out by the merger is important to industry in evaluating the likelihood of real change as a result of DIS. There is an opportunity to learn from the experiences to date of the evolution of the DPA and the DLO to create a new organization that is fit for purpose.

While the merger is a large task, MoD's intention is not to have achieved every aspect of the formation of 'Defence Equipment and Support (DE&S)' by April 2007. By this vesting date, the new Chief of Defence Materiel will be installed with a clear purpose and a new management structure and senior management in place. Changes in location of all staff and activities will clearly take rather longer.

Post-DIS, the Front Line must be able to influence acquisition more directly

Industry View: *The front line needs to be fully involved in acquisition, but how is this to be achieved organizationally and resourced? The front line user and industry innovator should have the opportunity for exchange.*

Comment: Critical to the success of MoD's new approach will be the closer involvement of the Users,⁶ the operational commanders, and feeding back their operational experience and requirements more directly into the acquisition process. Capability maintenance, upgrade and improvement will benefit from continued involvement of the Users in TLCM. There will be increased informal exchange between the front line and industry, through industry's presence in main operating bases and other front line facilities. The commands will need the resources in manpower and expertise for effective formal engagement in the acquisition process, but generating such resources has been a problem in the past.

With the important exception of the Permanent Joint Headquarters and joint commands, the Users represent Single Service interests. Indeed, the User function is shared between the Single Service Commanders-in-Chief and the individual Heads of Service. Although individual Top Level Budget Holders have ownership of each system in service, there may be a lack of coherence in User input where a number of Users share the employment of specific capabilities.

DIS will founder if Lord Drayson moves on

Industry View: *As Min DP Lord Drayson's personal involvement is widely perceived by industry as important for the implementation of DIS, his remaining in office is a significant issue.*

Comment: Clearly there are benefits in having a Min DP with commercial expertise. The creation of the new posts of Defence Commercial Director and Chief of Defence Materiel (as a result of the DLO/DPA merger) will create a caucus with appropriate expertise, alongside the Permanent Secretary, which ought to be able to outlive individual changes of Ministers in office.

However, the hopes of DIS will only be realized in the medium and long-term if it continues to have the highest level of government support and is not associated with a particular immediate political leadership in MoD. Overt cross-government and cross-party support is important, as is that of other influential stakeholders such as City institutions.

Industry could have a positive role in building cross-party support if it is prepared to commend DIS in its meetings with politicians from other parties.

MoD will not have the competence to be a good customer

Industry View: *There is a general concern in industry that MoD will not be able to perform effectively as a customer. MoD does not properly understand the workings of the interface with industry and, in particular, lacks the necessary commercial expertise. It is uncertain whether MoD can develop the necessary skill-sets. Indeed, DIS can be read as outsourcing responsibility in these respects to prime contractors. There may be a growing role for consultants with associated implications for costs and available budgets.*

Comment: Senior MoD management is aware of the need to:

- develop a better understanding of how to fund TLCM, in particular ensuring that investment in TLCM will not compromise up-front investment to the extent that operational capability is lost
- develop a more structured and coherent approach to upgrades and to incremental acquisition
- take a greater proportion of responsibility for design authority
- be clearer in what it wants, understanding its own priorities and cost drivers

- adapt equipment plans to match outputs and resources
- balance resources across the research and development, acquisition, operation and through-life phases
- develop Key Supplier Management relations
- develop greater inter-action in, and oversight of, the supply chain, from customer through primes and tiers down to research innovators (including universities)
- improve the maturity and sophistication of its own commercial functions, and the ability to manage the entire breadth and depth of the supply chain
- develop sufficiently capable and resourced skill-sets, both internally and with and within industry, for better assessment and management of technology planning, risk, cost and through-life challenges
- develop a better understanding of the risks involved in bringing together complex engineering and management projects, and accept that industry realistically cannot be expected to bear all such risks

MoD also accepts that acquisition is a core function of MoD and that core functions cannot simply be outsourced. There may well be a growing need for commercial expertise to be contracted by the customer to meet some of these demands in the short-term, but part of the requirement in outsourcing needs to be information transfer to build up MoD's internal expertise.

Comparisons have been drawn with Integrated Project Teams (IPTs) in non-defence industry sectors, where core acquisition functions are undertaken by small, very highly skilled teams that rely on specialist expertise contracted from leading external organizations.

INDUSTRIAL ISSUES

Change in Industry

Industry needs to transform itself

***Industry View:** Industry recognizes that it must be pragmatic in what is a big task of business change involving management, process and culture. There is a need for industry to transform which is as at least as demanding as that for MoD. Change will involve rationalization of the supplier base and this must be achieved to enhance efficiency and coherence without loss of valuable industrial capabilities and the potential to innovate. Industry must work together to mitigate technological, operating and delivery risks and to reduce overspend. But industry does not want to change at a faster pace than the customer or to a greater extent than the customer requires. Contrary to some perceptions, many companies feel that they are galvanized by DIS to re-consider their strategies and behaviours and are generally and genuinely trying to change. Companies that take action to meet challenges of DIS should be rewarded by award of contracts. In response to Min DP's challenge for industry to change internally to reflect changes in DIS, the broad view is that company boards have a first responsibility to their shareholders so must establish that MoD is serious in its own wish to change. Many companies must also consider the needs of their customers other than MoD.*

***Comment:** MoD will have an increasing reliance on industry to carry more of the training and service provision burden. The emphasis on contractor personnel to maintain high technology systems that will reduce in size and grow in complexity to the point that service personnel will not have the requisite skill-sets to maintain them is something industry will have to address.⁷ MoD needs help from industry in managing lulls in defence spending*

economically without losing capability or industrial skills.

MoD is looking to industry to develop maintainability and upgrade flexibility in system designs. MoD also sees industry as a potential supplier of project management capabilities. In sum, MoD wants industry to demonstrate, in a business sense:

- how it will deliver long-term capability and Value for Money (VFM)
- how it thinks the supply base will operate
- how changing markets affect industry
- how industry expects to thrive
- what business solutions it can develop to make through-life capability management a reality
- and how its shareholders understand DIS and its implications

In response to these demands, industry has the challenge of establishing what ‘demonstrate’ actually means in the short term and to give convincing evidence now of its willingness to change.

Fewer but more complex and longer-lasting platforms and systems will create new challenges for industry, from supporting and upgrading those capabilities through-life, to the level of industrial capacity that the UK can maintain, to the risks that defence consolidation poses for retaining critical design and manufacturing skills. The challenge for industry is to be able to deliver affordable technologies which are adaptable and which will add value across a variety of sectors and scenarios, to assist MoD in offsetting, overcoming and managing capability obsolescence.

Company boards have the problem of convincing their shareholders and the City in particular that there are genuine financial prospects in change driven by DIS. There is a role for the Treasury and Department of Trade and Industry (DTI)⁸ as well as MoD

in educating the City and convincing it of the permanence and relevance of DIS.

Some officials suggested that the companies which can best adapt are likely to reap benefits in the award of contracts.

Sovereignty and Onshore Industrial Capability

DIS highlights the need for the UK to have ‘appropriate sovereignty’ on-shore of certain industrial capabilities:

‘While the industrial base from which we procure is global, sourcing from the UK in certain areas will be essential for our long-term interests. The UK industrial base needs to be sustainable, which means taking a long-term perspective. ... This acknowledges the over-capacity that exists – when viewed against our likely future requirements – in several sectors of the industrial base; and recognises the likelihood that some further rationalisation is inevitable.’⁹

Appropriate sovereignty will cost the Government

Industry View: *There will be a financial premium for Appropriate Sovereignty. It implies that MoD will need to select more expensive options in competitions, to risk monopoly pricing and to invest up front to generate onshore capability. MoD will need to accept this premium if it is serious about sovereignty. Retaining particular capabilities on-shore may still not be affordable, however high they appear in the list of priorities. Furthermore the relevant industrial base needs to be sustainable, and this is not only an affordability issue.*

Comment: Bearing in mind that there are concerns about the affordability of the EP, the ‘sovereignty premium’ is a genuine

issue that is central to the implementation of DIS and one which the research suggests could become very political.

There is also a sustainability issue. Sovereignty that might be affordable today may become unaffordable, in the medium- to long-term, due to rising unit costs. This raises the question of having sovereignty aspirations that cannot be sustained.

However, DIS includes evidence that it is investment in research that drives the quality of future defence capability, and that a research programme that has the potential to deliver capability may give access to advanced technology that might otherwise be denied. For example, there is consistent evidence that the United States (US) only allows the sale of technology to countries that have the know-how to develop that technology themselves. It is, therefore, possible to sustain a wider spectrum of sovereign access through research programmes, even if the eventual technology is derived abroad, or developed by intensive investment should it become crucial to UK interests.

MoD needs to spell out its priorities for sovereignty

Industry View: The real test is whether MoD is clear about what capabilities and intellectual properties to preserve onshore. This is a matter first of having a sound but realistic understanding of what is required for operational sovereignty and autonomy, and second of establishing priorities comprehensively across the sectors.

Comment: Clearly, for a medium power there cannot be absolute criteria for sovereignty as the expression ‘appropriate’ implies. DIS is more specific in some parts than others, and acknowledges that there is much work to be done in identification and prioritization. If, by early 2007, there is a comprehensive priority list, DIS will have been successful in this respect. However, operational independence is always likely to

be conditional to some extent, and hostage to diplomatic fortune. If the UK’s relationship with the US, on the one hand, and the European Union (EU), on the other, should change unfavourably over time, assurances could be revoked. This would place demands on sovereignty which could not be met. This consideration, and that of financial sustainability mentioned earlier, suggest that candidates and priorities for sovereignty must be regularly reviewed, along with changing operational demands. Industry will not therefore be able to rely totally on assurances of sovereignty.

The Front Line needs affordable quality regardless of sovereignty

Industry View: The demand for onshore capability must be balanced against product quality. There is little point in building and sustaining industrial capability that meets the definition of appropriate sovereignty if the product is mediocre.

Comment: There are factors outside the control of the UK government that will limit the application of appropriate sovereignty however high a priority a particular capability may be. However, various studies comparing the standing of the UK in advanced defence technology show that UK is able to produce high quality products, especially at the sub-system level. The challenge for the UK has been the issue of avoiding vertical integration under an overseas prime, which has jeopardized industrial competence even in areas where UK has a global lead.

The sovereignty issue has mixed implications for US companies

Industry View: The operational sovereignty concept was flagged by respondents as important in its implications for US companies. It is a lever for UK offices to argue for more onshore

investment in UK either through the acquisition of companies, by partnering arrangements with major UK companies, or by the development of plant. On the other hand, US-based senior management of US companies see the UK defence market as decreasing and are likely to conclude that there is declining value in onshore investment.

Comment: Although onshore presence of US companies does not in itself guarantee greater access to industrial capability that would qualify for appropriate sovereignty, it will be an important enabler to technology transfer. It also mitigates the sovereignty aspect associated with upgrades and rapid insertion.

Access to US industrial capability is seen as particularly important to many in the Sponsor and User communities in MoD who seek to benefit from leading edge technology, superior capability and value for money.

Supply Chains/Networks

MoD is abrogating its responsibilities to primes

Industry View: *For some of industry, DIS invites MoD to outsource too much responsibility to traditional prime or Tier 1 contractors. Lower tier companies are concerned that primes will use vertical integration and will squeeze out innovation in the supply chain by offering technologies that they own, and thereby preserving their own share of the contract at the expense of innovative sub-contractors.*

Comment: No single company has all the skills to build a complete complex weapon system. However, it is arguably appropriate for certain primes of certain programmes and projects to deliver core technology which defines the capabilities of a major system. In the status quo, the roles of primes differ across sectors and individual programmes and projects. There are ‘thick’

primes and ‘thin’ primes.¹⁰ The industry arrangements differ between very large platform projects and smaller programmes or service delivery models. In some cases a ‘team’ approach, in which a number of companies engage in an alliance or other partnering arrangement at the Tier 1 level, may be appropriate. The role of design authority may clearly belong to a prime in certain programmes and projects, whereas in other complex programmes MoD needs to retain elements of this role. Some large information system programmes are in this category.

There are also models for complex acquisitions based on a risk-taking architecting or systems integration function, which do not necessarily receive the associated individual equipment contracts placed by MoD. The US Lead System Integrator concept (LSI) is an example of this, where the LSI is a prime is specifically forbidden by contract from platform construction and must sub-contract all components of the programme or project to other companies, even if it has these capabilities.

It has been said that ‘prime’ is not a descriptor of a type of company but of the role of a company in a particular programme or project. This observation is important for the addressing the lower tier concerns in the implementation of DIS. The role of a prime must be appropriate to programme or project.

One analysis, the so-called ‘Diamond Diagram’,¹¹ divides major projects into four categories which ‘balance’ platform and system capabilities:

1. System complexity dominates and the platform is not highly sophisticated. Examples quoted are the Watchkeeper, Future Infantry Soldier Technology (FIST) and Maritime Surveillance and Control (MASC) aircraft programmes. Here, it is suggested

that the system integrator should be the prime contractor.

2. Neither platform nor system is particularly complex, or interdependent. An example is the Military Afloat Reach Sustainability (MARS) programme. Here, a 'traditional' platform prime contractor is appropriate with electronics sub-system elements sub-contracted.

3. Platform and systems are both complex but largely independent. Examples are the Future Carrier (CVF), the Future Rapid Effects System (FRES), the Future Lynx helicopter and Medium Versatile Derivative (MVD) surface platform. These programmes themselves to industrial partnering and alliance arrangements.

4. Platform and systems are both complex and highly inter-dependent. Examples are fast jet programmes such as Typhoon and the Joint Strike Fighter (JSF)/Joint Combat Aircraft (JCA) programmes. Here, vertically integrated platform and systems integration will be vertically integrated with electronics sub-system elements sub-contracted.

While this precise analysis and categorization could be challenged, the principle the model represents - that the supplier package must be matched to the nature of the programme or project - is valid. Importantly, MoD needs to develop this type of analysis and be the initiator, rather than receiver, of appropriate solutions at the Tier 1/Tier 2 levels.

MoD needs to oversee supply chains

Industry View: Preserving innovation throughout supply chains is a key concern for non-primers in DIS. Primes are aware of the need for better supply chain management. MoD needs to have oversight/understanding of the supply

chain to ensure that critical technologies are preserved and developed. Codes of conduct between MoD, primes and lower tiers are needed. MoD cannot both delegate responsibility to a prime and direct the supply chain. However, sanctions should be applied to primes who do not encourage innovation in the supply chain. Lower tiers should in some cases provide support directly to platforms and contract for availability, as with aerospace propulsion.

Comment: Supply chain management issues that have emerged from DIS are a particular and urgent challenge for MoD. The degree of intervention of MoD in supply chain matters still needs to be resolved. Some of the issues with which MoD is currently grappling are:

- The required breadth and depth of this understanding, bearing in mind that part of the function of prime contractors in a partnering arrangement is to provide supply chain expertise. MoD will not wish to undermine intended role transfer
- Complexity of and variations among the supply chains between - and indeed within - the DIS industrial sectors¹²
- The right balance between critiquing and encouraging prime contractors in developing their supply chains, and in intervention in the supply chains below Tier 1
- Stimulating information transparency in partnering and alliancing arrangements across and within tiers
- The nature of any interventions in supply chains below Tier 1
- The nature, availability, and extent of any discretionary financial investment by MoD in Tier 2 and below to develop underpinning technologies and encourage innovation

- Suitable contracting structures that will encourage partnering behaviours

Supply chains are very dependent on SMEs which need to be sustained

Industry View: Large companies do not have the breadth of competence and agility they claim, nor are they as innovative as they claim. They are either knowingly or unknowingly very dependent on SMEs and other lower tier companies which have domain knowledge. Current and envisaged supply chain models endorsed by the DIS process could squeeze out SME expertise. MoD needs to sustain SMEs without undue interference in the prime's role. In particular, there is the issue of direct funding. Research and technology funding is allocated unfairly and principally to large companies. On the other hand, MoD and larger companies see SMEs as a source of risk that jeopardizes delivery to cost and time. The challenge is to maximize effectiveness of SMEs in the supply chain. It should be born in mind that SMEs need sustainable income and cannot compensate for programme slippage.

Comment: SMEs have very different functions, from non-defence specific commodity provision to niche technology provision, to research (which is in particular a function of university spawned SMEs). It bears mention that commodity provision is also a function of some very large companies not traditionally associated with the defence sector,¹³ and some large foreign companies who contribute niche technologies have what is essentially an SME profile and supply chain position in the UK.¹⁴

It follows that a generic SME effectiveness strategy is not appropriate. The overriding need is for a comprehensive understanding of supply chains. Indeed, one respondent suggested that the term 'chain' is misleading and that 'network' is a better descriptor, especially as defence innovation often

involves several strands of innovation that cross disciplines as opposed to one chain of supply which implies an up-and-down process. But who should have this understanding? MoD could rightly expect a prime contractor to know the detail of a supply chain, in particular dependencies on unique industrial capabilities in small companies. But MoD needs to have sufficient supply chain knowledge to be aware if primes or lower tier suppliers are not making best use of SMEs, for instance in allowing short term considerations to predominate. In the past, the Research and Technology Organizations (RTOs) have provided this networking function, and have shepherded innovation across the exploitation 'valley of death'. 'Understanding' and 'oversight', rather than 'detailed knowledge' and 'supervision', are appropriate roles for MoD.

In the context of research and technology, the Defence Technology Strategy (DTS) will be very important for research focused SMEs. MoD must ensure that the programme encourages networking across the 'innovation supply chain', and that SMEs have an effective route to market for their inventions, noting that MoD has made it clear it cannot have the resources to deal directly with SMEs on any general basis. A balance of direct investment between large companies and SMEs is appropriate and serves the longer term. In this respect, regional considerations, the commercialization of university skills, and the wider issue of return to taxpayers are relevant. DTI has a leading role here.

There is a view in the analytic community that MoD simply knows too little about SMEs to have any real impact. Nor does MoD see fit to introduce positive discrimination for SMEs in procurement and research, as happens in the US and France. A general ignorance of industry structures and dynamics reflects MoD's unwillingness to commit resources to the area, relying instead on *ad hoc* analysis

and contractor feedback. This may present special problems in tracking novel technology produced by the non-defence specialist small company.

In the US, prime contractors are obliged by contract to invest a proportion of the cost of a project in SMEs. This is an option that MoD should consider although there is likely to be an additional cost to this requirement and there is the counter-argument that the SME base could not meet the demands.

A more practical option might be the banding together of a shifting alliance of SMEs under a larger firm (not a defence prime) to bid for contracts. This is already happening and MoD should consider helping these initiatives where they are likely to give good value-for-money.¹⁵

ACQUISITION POLICY AND PROCESS

Optimism Bias

MoD, as well as industry, must resist 'optimism bias'

Industry View: Cultural over-optimism in both customer and supplier is a fundamental problem. MoD cannot effectively cost all capability aspirations for a programme or project. The capability that the User wants as represented by the EC Department is generally an unaffordable wish list. Yet the research for this study suggests that the process of balancing capability against affordability is not handled well internally in MoD, in particular between DPA and the EC Department.

Comment: Interestingly, cultural and systemic optimism bias is a concern of industry as it is of Min DP.¹⁶ However, whereas Lord Drayson's comments address the whole acquisition system across customer and suppliers, this industry view focuses specifically on optimism bias in MoD.

This optimism has been compounded by the 'big bang' approach to acquisition, where many new features and advanced technologies are introduced simultaneously. This considerably increases risk and is a significant point of difference from most commercial innovation. The 'big bang' approach has been driven in part by the approvals process, where the long decision cycles force inclusion of all conceivable capabilities, rather than simpler, faster acquisition approaches with more scope for subsequent enhancement to avoid the 'innovation squared' outcome.

Internal customer relationships were an issue identified in EAC. Arguably, accurate assessment of project costs and affordability in the earlier stages of the procurement process (for example, in the Concept and Assessment phases) could be improved by greater formal and informal involvement of industry. EAC draws attention to the need for Capability Working Groups to be more consistently effective. Adequate funding of the pre-Main Gate phases of major projects would also allow for a greater involvement of industry in this process.¹⁷

Emphasis on early investment was one of the tenets of Smart Acquisition which never took effect in spite of regular National Audit Office (NAO) comments. Early investment is an easy victim in the competition for resources, and a solution remains elusive even post-DIS. The Investment Approvals Board (IAB) and MoD scrutiny process have responsibilities in this respect.

In the US, two independent cost estimates of a project are required in addition to those provided by the supplier and customer. These have been found to provide more accurate information. For MoD, the additional cost of this option might be outweighed by savings in cost overrun for large programmes and projects.

Competition

The following industry opinions on competition unsurprisingly reflect the individual respondent's status as a UK company or otherwise and position in the supply chain. US companies emphasise the value and existence of competition.

DIS places too little emphasis on the value of competition

Industry View: Open competition presents unwelcome challenges for UK primes. Partnering is a consequence of lack of competition. There are rarely opportunities for competition within the UK at Tier 1 level. Indeed there are near monopoly situations in some sectors. MoD should regularly go abroad to ensure competition among primes. Competition can reward companies to perform.

Comment: DIS presents competition and partnering as alternative models for delivering value for money which are appropriate depending on the availability of realistic competition within any constraints of appropriate sovereignty. There is potentially an element of competition in some forms and situations of partnering where competition takes place between potential partners earlier in the acquisition process and where the subsequent contractual arrangements may remain in place for a longer period.

The challenge is to strike an ideal balance between the efficiencies of supplier consolidation and diversity for preserving competition, where appropriate and realistic, and to stimulate innovation.

There is some resentment in US companies over being used as stalking horses for contract competitions.

Partnering

DIS is in part predicated on the premise that:

'many of the processes and roles currently undertaken by MoD [are] likely to be delivered in future through partnership with industry. This requires the development of acquisition models that engage a range of industrial players including equipment design authorities...technology inserters...integrators of complex systems and/or military capability integrators and innovators'.¹⁸

Actual and potential prime partners are inevitably more sanguine about partnering than other companies.

In addition to MoD/Prime partnering, there are many other useful models

Industry View: MoD must fully understand the purposes of different partnering and alliancing models. Partnering arrangements can involve more than two actors. There can be partnering at Tier 1 with competition at Tier 2. Tier 2 can also be part of partnering arrangements.

Comment: A wide range of partnering models are implied by DIS and proposed by various interest groups within industry. There are, for example, partnering arrangements potentially or actually involving:

- MoD and a single prime
- MoD and an alliance of companies in the prime role. DIS makes reference to 'Team' approaches (e.g. Team JSF)
- companies at Tier 2
- companies at Tier 1 and 2

Part of the purpose of MoD-led, long-term partnering arrangements is to re-orient business models to get best value out of the supply chain, and to incentivize

industry to accept reasonable risks, to drive down costs, and to increase profit through improved performance. MoD would welcome industry involvement at the earliest stage, even though this brings incumbent risks. Industry must make a commercial judgement in this respect.

MoD will need to develop a more flexible, dynamic relationship with industry based on mutual interdependence. It will need better sight and understanding of industry business models, and will need to appreciate supplier expectations. Industry needs to be given the confidence to invest and to adapt to change.

A particular area of interest to MoD here is how industry can take the lead in developing alliancing agreements, both within industry and between industry and MoD, and how effective such alliances can be.

It will be very difficult to set up sufficiently flexible contracts for long-term partnering

***Industry View:** MoD must ensure that partnered suppliers provide value for money. A robust partnering relationship will face hard issues and will not be cosy. Some companies questioned whether the necessarily elaborate contractual arrangements were feasible.*

***Comment:** Long-term partnering arrangements need to have in-built flexibility, to enable MoD and industry to adapt an arrangement to suit changing circumstances. Definition of robust Key Performance Indicators (KPIs) is a means of ensuring value for money in long-term relationships, and MoD has experience of and techniques for benchmarking of costs of projects in a non-competitive environment.*

It is no easy task for MoD to turn through-life concepts into contractual reality in financial terms, and to ensure that through-life partnering arrangements are flexible

enough to adapt to changing circumstances and requirements.

Industry needs longer partnering contracts than MoD will be prepared to offer

***Industry View:** Long-term partnering will help to limit 'bow waves' in investment. Regular investment eradicates short-term thinking in partners but companies need to see a return within five years.*

***Comment:** The duration of partnering contracts for TLCM will vary depending on the programme or project and sector. Clearly, suppliers will look for longer durations, and MoD's commitment to long contracts will be tempered by its judgement as to whether these can be flexible enough to reflect inevitable change in requirements.*

Partnering as presented by DIS favours a few primes

***Industry View:** Opportunities for partnering should be as fair as conventional competition. Long-term partnering with MoD should not be exclusive to a few companies.*

***Comment:** Long-standing partnering arrangements will serve to eliminate the potential for competition in what is a shrinking national market, unless MoD routinely goes abroad and is seen to be fair in awarding partnering contracts. The constraints of appropriate sovereignty may be relevant, and this should be a powerful factor in limiting its reach.*

Systems Integration/Engineering

MoD does not fully understand the scope and importance of systems engineering

***Industry View:** A systems engineering approach should be adopted early in a programme or project. It is a necessary*

element of establishing an appropriate TPCM approach. Systems engineering capability is a prime candidate for appropriate sovereignty in many sectors. It is not restricted to Tier 1. Indeed in some types of programme and project, systems engineering capability is essential at the Tier 2 level where sub-system performance defines the overall capability of the system.

Comment: There was wide agreement in interviews with MoD and industry as to the importance of systems engineering, and its particular significance at both Tier 1 and Tier 2 levels, in a post-DIS acquisition system. A measure of the effectiveness implementation of DIS will be evidence of this endorsement in actions.

The problem of retention and development of onshore expertise is also acknowledged. There is of course a cost to the imposition of a systems engineering approach and, where this is needed early in programmes and projects, there is a requirement for the additional investment pre-Main Gate, something which has been difficult to achieve in the past.

Use of Lead Systems Integrators (LSI) would solve many of the problems of over-dominant primes

Industry View: *Some interviewees suggested that the LSI approach used in the US in some procurement models should be considered for the UK.*

Comment: The 'Diamond' analysis discussed earlier recommends that the system integrator should be the prime contractor for programmes and projects in which system complexity dominates. The LSI concept in the US goes further, in preventing the LSI from competing for sub-platform contracts and therefore enhancing objectivity. The relevance of the LSI concept to the UK has been discussed by MoD and appropriate companies. It is advocated, needless to say, by contenders for the role. There is a concern, however,

that the LSI concept would not lie comfortably in the UK acquisition system, however that evolved.

Of course, the wider politics of procurement might exclude novel concepts such as this for systems integration and prime contracting. In particular, some analysts have observed that the sheer size of BAE SYSTEMS in relation to the UK domestic market and its apparent global agility is likely to influence MoD in making such core procurement decisions.¹⁹

Tier 0²⁰ contractors working for MoD have a burgeoning role

Industry View: *Tier 0 contractors can provide an independent assessment of what capabilities are achievable in an environment where industry over-promises and MoD over-specifies. Tier 0 contractors working for the customer bring flexibility, dynamism and speed of delivery that MoD cannot achieve. Tier 0 has no vested interest, which is important in the Assessment Phase.*

Comment: This issue, which is not restricted to system engineering capability, is closely related to those of MoD competence and indeed the utility or otherwise of the LSI concept for the UK. MoD acknowledges the Tier 0 role for certain programmes and projects. The question is whether it will be an expanding role, given the demands on MoD implied by DIS for oversight of supply processes where traditional customer responsibilities are being outsourced to primes. MoD should build the internal core competences in the post-DIS acquisition process, but will require assistance in the short-term. In this process, there should be a transfer of skills and experience to MoD, and there will inevitably be specific programmes and projects of such complexity that contractor support will be required to the customer side.

Adapting Requirements to a Changing Security Environment

RUSI identified that MoD is aware that it needs to develop a longer-term, through-life approach if it is to succeed in making equipment and, therefore, defence more affordable. MoD will focus on developing platforms with longer service lives and more adaptable capabilities, and will shift capability development emphasis away from upfront technology towards services and support provision and management and procedural change. Particular areas of focus here include systems engineering, capability upgrades, incremental acquisition, and training over the whole life of a programme or platform.

Through Life Capability Management (TLCM) is a very good thing in theory but the uncertainties are vast

Industry View: TLCM will become a key means for MoD to respond to changes in the security environment and defence roles. Threat levels change very quickly and platforms do not. Contracting TLCM for platforms that are already in service is fairly straightforward, because relevant features of the systems have already been tested and are understood. It is not, however, clear how to contract flexibly for TLCM for products that are not as yet in service, bearing in mind that from an industry perspective contract periods should exceed five years but realistically will be shorter than fifteen years.

Comment

Principal industry concerns over TLCM identify the problems of effective flexible contracting for sufficiently long periods, and adequate funding in the medium-term to permit the necessary capability change. TLCM is the norm in, for instance, the commercial aerospace sector, where contracts as long as twenty years in length are typically in place and there is predictable demand. However, there is a radical difference in the defence sector, where a

changing security environment could demand substantial capability changes for a particular system which amount to a change in purpose. The proposed solution - partnering - is untested in the defence sector and involves something of a leap into the dark. In addition to specifying and costing support requirements, a long term contract would need to make provision for the necessary major upgrades.

Presumably, clauses would allow for specific renegotiation for such a change in purpose. A problem for the partnering arrangement arises, however, if the industry partner is not prepared or able to deliver the necessary upgrades within the funding available to MoD.

If MoD is truly committed to TLCM and to adaptable project contractual arrangements into the medium-term, early evidence will be a spate of TLCM contracts, some of which are already in place, which will provide a funding structure into the medium-term at least for prime contractors. Industry will be able to make a judgement as to whether the risk associated with capability change will have been properly addressed and funded.

Significantly, there are associated concerns in industry on the one hand that MoD's through life costing processes are sufficiently mature, and on the other hand that IPTs in particular will not have the proper incentives to support a through-life focus. There is a need for measurement and output targets for IPTs that properly reflect the demands of through-life management.

Incremental acquisition and upgrades need to be properly funded, timely and responsive to needs and offered to the right suppliers

Industry View: DIS emphasises the need for capability upgrade, sometimes at short notice, given the rapidly changing defence context and continuing technological

innovation. One consequence of the gathering pace of change in technology is a growing emphasis on partnering arrangements. For incremental acquisition to be effective, there must be availability of the necessary funding and a guarantee of its availability to relevant suppliers. Clearly this is an important element of partnering, but MoD needs to retain a degree of control in the evolving design of a system, and must be able to insert front line-driven capability change. The system also must employ open architecture if it is not to become a 'cash cow' for prime contractors. Access to architectural knowledge that allows systems to be adapted over their lifetime is strategically important that may constrain offshore acquisition.

Comment: MoD acknowledges that initial acquisition and in-service support should be a package and that acquisition strategy should include technology insertion and upgrade requirements as well as support. There will be a balance to be struck in outsourcing of responsibility for TLCM and retaining sufficient control of capability evolution within the broad provisions made in financial planning. There will be variations in this respect between sectors and programmes and systems. For instance, there is a view in the C4ISTAR sector that MoD needs to retain or resume the role of design authority or give it to an independent third party.

The challenge for MoD and for DIS is to stimulate a prime's interest in innovation where there is no competition

Industry View: Primes can stimulate innovation, but this tends to be a feature of thin rather than thick primes, with thick primes likely to offer what they already own and reluctant to seek new technologies, thereby excluding the potential contribution of Tier 2 innovators and SMEs. There is also a need to draw in innovation from outside the defence sector and to encompass non-defence specific core technology providers.

Comment: The issue of stimulating innovation in the supply chain is addressed earlier in the section on Supply Chains/ Networks.

Research and Technology

Capability planning must be joined up with R&T

Industry View: For effective TLCM, there must be coherence between capability planning and the research and technology programme.

Comment: The current organization of MoD and, in particular, the relationship between the EC Department and the Research, Innovation and Technology (RIT) Staff, reflects the demands of the initial phases of system acquisition. The new TLCM demands require an organization that can address the technology needs and opportunities of requirement change to existing systems through life. TLCM needs to incorporate the technology demands of regular User input as well as proactive industry proposals in an elegant way. In particular, there needs to be more 'push' from the RIT Staff and industry as well as 'pull' from the EC Department.

The Defence Technology Strategy is not likely to meet industry expectations

Industry View: The Defence Technology Strategy must provide a sustainable technology strategy with clear priorities and must not be limited to a description of areas of research.

Comment: There was a recurring message that research and technology is under-funded by MoD and that this situation is unlikely to change substantially in the future. MoD's DTS, commissioned by DIS, is due to be published in early October. There is concern in industry that the DTS essentially will be descriptive of the requirements and will not give the

necessary clear direction as to the allocation of what are limited resources across prioritized technology areas. There is the danger that underpinning and emerging technologies will be overlooked.

The Towers of Excellence and Defence Technology Centre initiatives were designed to focus non-Government research activity and make best use of MoD seedcorn funding. The DTS needs to include a rigorous appraisal of the effectiveness of these initiatives to date, and to ensure that any new or modified initiatives are simplified and coherent both in the context of defence and in a wider cross-government security context.

QinetiQ contains in-house much of the small group innovative power of UK defence research. Analysts²¹ have questioned whether future UK R&T funding will be sufficient to retain these capabilities onshore, and what the implications would be for the UK Defence Technology Industrial Base.

'Off the Shelf' R&T capability is usually available and affordable

Industry View: *The realistic alternative to significant investment in R&T is buying 'off the shelf' capability. The UK must tap into US R&T either directly from the US or through US primes.*

Comment: US companies have contributed this shot of realism, one that receives considerable support in the User and Sponsor communities. It is clearly a balancing argument in establishing the 'appropriateness' of sovereignty. However, without an indigenous R&T footprint, the US may only release 'de-tuned' capabilities. MoD would be left with a flawed strategy once sovereign capability had been relinquished, and new research competences had not been nurtured.

Some officials have remarked that the vast majority of technological innovation is not

defence specific and that arguments for enhancing R&T funding are somewhat old fashioned. The challenge is to be aware of and have access to this commercial technology.

SECTOR ISSUES

Interviewees provided much interesting material on the DIS Sectors. Such material mainly dealt with company plans and intentions. The following observations are directed specifically at DIS.

Fixed/Rotary Wing Sectors

The role and importance of Tier 2 mission systems and avionics needs to be acknowledged

Industry View: *Mission systems and avionics are defining elements of air platform capability and suppliers should have appropriate status in supply chains and partnering arrangements. There is a need for partnering among and between the supplier tiers, and not only between the prime and customer. There is no Pathfinder project for the air systems sectors. The primes are aware of the need to incentivize supply chains, and are not only interested in squeezing out cost.*

Comment: The partnering and supply chain issues are addressed earlier in the report. There are indeed Pathfinder projects in only two of the sectors, and the air sectors have been excluded. It probably is sensible for MoD to focus on a small number of Pathfinder projects that will deliver really useful insights, than to attach one to each sector, in which case they would become part of the overall process of adaptation rather than specific experimental initiatives. There is always the possibility to initiate new Pathfinder projects when initial findings have emerged.

Maritime Sector

Reform of industry in the Maritime Sector has been one of the most controversial aspects of DIS and has drawn particular criticism from Min DP. Events may however be taking a more positive turn. As Min DP has said, the future aircraft carrier (CVF) Main Gate will be a 'key decision point'.²²

Non-primers are at serious risk in the Maritime Sector

Industry View: MoD encourages rationalization in the maritime sector and emphasizes the need for a single prime entity, but cannot control evolution of the supplier base. This is a cause of concern for lower tier suppliers. It will be hard to keep competitive edge among non-primers which may themselves disappear. MoD must contract to ensure their engagement. TLCM is very important for non-primers.

Comment: These issues are discussed earlier under Supply Chains/Networks. However, this sector is unique in the anxiety expressed by industry and the criticism of lack of industry progress in consolidation by Min DP. Arguably, maritime construction has been protected from the full effects of competition to a greater degree than other sectors in the past because of lack of commercial shipbuilding demand in the UK and concomitant political factors relating to employment and return of government investment to taxpayers. There is, therefore, further to go in adapting to the post-DIS environment in which MoD's requirement for onshore capability in the UK is based on design of ships, system engineering and support rather than build.

Submarines will be unaffordable

Industry View: All UK submarine programmes are becoming unaffordable.

Comment: The affordability of UK submarine programmes is a serious concern

overlaid in the medium-term by the likely requirement to replace the *Trident* fleet. It is by no means guaranteed that this expenditure will be wholly met from central government funds, and the current and any future CSRs may indeed take their toll. These concerns are exacerbated by the demands of appropriate sovereignty. Submarine capability does not have a high profile in the context of current operations, but the underwater environment is an unexploited vulnerability of expeditionary forces and new threats could emerge. A likely response to the cost problem is reduction in numbers, although this could result in capability deficiencies in the longer-term.

It is the view of some analysts that there is no need for an extensive UK maritime DIB in the context of most emerging concepts of future warfare.

C4ISTAR Sector

The C4ISTAR Sector has unique features that call for especially complex acquisition processes

Industry View: The C4ISTAR sector differs from other sectors, principally because of both greater likelihood of new MoD investment and enduring significant competition. Partnering between companies at Tier 1 is the logical way ahead for major projects. Only MoD can be the design authority for major IT programmes.

Comment: Partnering with MoD is relevant to the C4ISTAR sector because of the demands of incremental acquisition and the very short timescales for technology insertion that IT demands, rather than for reasons of lack of competition. This difference from some other sectors emphasizes the need for flexible partnering models including the use of alliances at the prime level and a blurring of the distinction between Tier 1 and Tier 2 suppliers in this respect.

MoD has accepted its responsibilities to be design authority in this sector.

CONCLUSION

Industry is widely supportive of DIS and subsequent MoD work such as EAC, because it recognizes the political, economic and military necessity of DIS. There has been surprisingly little overt criticism of the conclusions and demands of DIS, bearing in mind the amount of radical change that it expects of industry.

Industry's principal common concern is MoD's ability to effect DIS, particularly within the timescales of Min DP, and particularly in terms of changing its own culture and developing adequate commercial expertise and understanding. Concerns are reinforced by a perceived lack of medium- and long-term achievement following previous reforms of acquisition processes, and by anecdotally-based perceptions as to a lack of support for DIS in MoD below the senior management level. DIS will need broad acceptance across the acquisition community. It is as important for the longer-term effectiveness of DIS that it receives support generally within government and across political parties. Industry is nervous about initiating its own change processes if these fall out of step with MoD's.

Regardless of the validity of these perceptions, the senior leadership of MoD acknowledges the scale of this challenge and, after eight months, there is no evidence that things are falling behind in the short-term. However, there is a concern that the focus of much of MoD is on its own restructuring, rather than implementation of DIS more broadly. Wide-scale adoption of TLM in programmes and projects will be the clearest evidence that DIS is here to stay. Historically-based concerns apply more to the medium-term and to the acquisition system's ability to evolve.

While attempting to drive change, the senior leadership of MoD also acknowledges that it still has a lot to learn in understanding the complexity of a new generation of acquisition processes and the supply base which will service these processes. This awareness is encouraging but, set alongside the short timelines, does suggest that the demand is for headlong change in a less than precise direction.

DIS is a large and wide ranging document which is not comprehensive. There is a need, which MoD acknowledges and intended, for the detail to be fleshed out and for there to be clear prioritization, particularly in the matters of appropriate sovereignty and research and technology. Clarity in these respects will be an important mark of the effectiveness of DIS. There are rumours in industry that the DTS will not provide the necessary direction nor give evidence of any increased government funding.

Specific concerns relate rather to implications and unintended consequences of DIS. These tend to be specific to classes of company, whether sector, place in the supply chain or 'onshore' status. The established onshore 'primes' and companies that aspire to be primes of first choice look for long term partnering arrangements in DIS and for effective definition and execution of the principles of sovereignty.

For lower tier companies in the supply chain who see their contributions to a major system as defining its capabilities, the dominant concern is MoD's ability to preserve and stimulate the capacity to innovate throughout the supply chain while outsourcing what might be seen as core acquisition competences to prime contractors. SMEs are a disparate group whose concerns are for survival and for understanding of their contributions, in particular to innovation by MoD and primes. The demands are for MoD to have sufficient understanding of SMEs, to

decide on and provide the right degree of governance and contract appropriately.

US-owned companies are aware that many at the User end of the acquisition system respect the leading edge technology and value for money provided by US companies. Their concerns relate principally to sustainment of fair competition in the light of appropriate sovereignty and, for their UK management, sustainment of head office interest in a shrinking UK market in the context of a DIS that could be read as insular.

From a wider shareholder viewpoint, affordability of the EP and, more specifically, confidence in the continuity of funding that TLCM implies is a concern which has major implications for the sustainment and development of the UK DIB.

Finally, all companies are concerned about affordability. Major issues here are:

- The EP needed to serve the expeditionary strategy is clearly overheated, and DIS cannot redress this without hard balance of investment decisions over capabilities
- The 2007 CSR looms and, if MoD lost influence, the CSR could so distort the EP to the extent that DIS became a minor concern
- TLCM will require upfront commitment of funds over long timescales, with money allocated to upgrades the details of which are uncertain – a hostage to unexpected demands for cash elsewhere
- Appropriate sovereignty implies a premium to retain industrial capability onshore
- A serious commitment to R&T needs more money
- Will DIS not cost money for MoD to effect its internal changes, and how will this be paid for?

NOTES

¹ Ministry of Defence (MoD), UK. *Defence Industrial Strategy: Defence White Paper*, Command 6697. Presented to Parliament by the Secretary of State for Defence. December 2005.

² MoD, UK. *Enabling Acquisition Change: an Examination of the Ministry of Defence's Ability to Undertake Through Life Capability Management*. A report by the Enabling Acquisition Change Team Leader, June 2006 (report known also as the McKane Report).

³ The expression 'prime' is often used loosely to describe a design authority or a type of company in terms of scale. It strictly refers to its direct contractual arrangement with MoD.

⁴ MoD, UK. *Defence Industrial Strategy*: p.7.

⁵ The Permanent Secretary and Senior Responsible Owner (SRO) for MoD Acquisition Change has said in a forthcoming article, to be published in *RUSI Defence Systems*, '[i]n my experience, setting the strategy for radical business change is usually the easy part. The harder part is translating it into changed behaviours and improved outcomes, which requires a mixture of consistent vision and hard graft.'

⁶ Terminology recommended by EAC in place of 'Customer 2'.

⁷ Development, Concepts and Doctrine Centre (DCDC), MoD, UK. *UK High-Level Operational Concept (HLOC)*: p.9-5, para.914.

⁸ Ministers from both departments have formally endorsed DIS.

⁹ MoD, UK. *Defence Industrial Strategy*: p.16, paras.A1.11-12.

DIS defines Appropriate Sovereignty as the need for the UK to: 'maintain the appropriate degree of sovereignty over industrial skills, capacities, capabilities and technology to ensure operational independence against a range of operations that we wish to be able to conduct. This is not 'procurement independence', or total reliance on national supply of all elements, and will differ across technologies and projects. ... National security considerations are also relevant where we need to retain sovereignty due to the extreme security of the technology concerned or for legal reasons. ... At the same time, we must be prepared to exploit the opportunities engendered by co-operative arrangements with others, where it makes operational and economic sense to do so' (p.17, paras.A1.21-22. Emphasis in original).

Sir John Chisholm, Chairman of QinetiQ, uses similar terminology: 'In [DIS] a new, important concept is articulated: that of technological sovereignty – the ability to have the know-how to defend ourselves without being beholden to others.' (see Chisholm, 'Britain Has to Invest if it Wants to Keep Ahead in Defence', in *Financial Times*, 8 May 2006, p.17).

¹⁰ A thick prime employs significant vertically-integrated industrial capability in a project. A thin prime employs none.

¹¹ Thales has authored this analysis.

¹² DIS divides these capabilities among the following 'industrial sectors and cross-cutting capabilities': System Engineering; Maritime; Armoured Fighting Vehicles; Fixed Wing; Helicopters; General Munitions; Complex Weapons; C4ISTAR; Chemical, Biological, Radiological, and Nuclear Force Protection; and Counter-terrorism.

¹³ Such as information technology providers like Microsoft.

¹⁴ Honeywell and SAIC come to mind.

¹⁵ This proposal will be published in 'RUSI Acquisition Focus: Implementation of the Defence Industrial Strategy', *RUSI Defence Systems*, Winter 2006.

¹⁶ Min DP address to RUSI, 5 July 2006.

¹⁷ Approaching the aspirations of Smart Acquisition

¹⁸ MoD, UK. *Defence Industrial Strategy*: p.27, para.A3.26.

¹⁹ See, for example: Hartley, K., in House of Commons Defence Committee Report, *The Defence Industrial Strategy*. HC 824. Seventh Report of Session 2005-06. London: The Stationary Office. 10 May 2006, para. 88.

²⁰ A Tier 0 contractor provides a service to MoD on the customer side of the customer-supplier divide.

²¹ In non-attributable discussions with the authors.

²² See forthcoming paper, to be published in RUSI Defence Systems. Min DP affirmed that he was 'encouraged by the way that the Aircraft Carrier Alliance is now working'.

About RUSI

RUSI was founded in 1831, the oldest such institute in the world, at the initiative of the Duke of Wellington. Its original mission was to study naval and military science, what Clausewitz called the 'art of war'.

It still does so: developments in military doctrine, defence management and defence procurement remain central elements in the Institute's work. But in recent years RUSI has broadened its remit to include all issues of defence and security, including terrorism and the ideologies which foster it, and the challenges which we face from other man-made or man-assisted threats and natural disasters.

RUSI is a British institution, but operates with an international perspective. It has amassed over the years an unequalled expertise in its field and an outstanding reputation for quality and objectivity. RUSI's heritage and reputation, its location close to the Ministry of Defence and ministries in Whitehall and its range of contacts with key opinion formers both inside and outside government, gives unique insight and authority.

Royal United Services Institute for Defence and Security Studies, Whitehall, London SW1A 2ET, United Kingdom

Comments pertaining to this report are invited, and should be forwarded to Dr Lee Willett (+44 20 7747 2611: dr.leewillett@rusi.org; or at the above address)

About QinetiQ

QinetiQ is a leading international defence and security technology company that was formed in July 2001 from the UK Government's Defence Evaluation and Research Agency (DERA). QinetiQ has over 11,400 employees, who deliver technology-based services and exploit QinetiQ's strengths in technology research by selling systems solutions, products, managed services and licences to government and commercial customers in a spectrum of defence, security and other commercial markets, and by creating technology based ventures.

In February 2006, QinetiQ Group plc was listed on the London Stock Exchange (main market) and joined the FTSE250 in June 2006. In the year to 31 March 2006, QinetiQ delivered a 37.6 per cent rise in underlying operating profit to £90.7m on turnover which rose by 22.9 per cent to £1,051.7m.

QinetiQ Customer Enquiries, Cody Technology Park, Ively Road, Farnborough, Hants GU14 0LX

Tel: 01252 39 2000 / 3300
Email: customercontact@QinetiQ.com