IDEAS FOR FUTURE UK DEFENCE PROCUREMENT

A report for the Shadow Defence Team

September 2011

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Shadow Secretary of State for Defence

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A strong UK defence industry is essential to support our national security needs and can be a major contributor to the UK's economic recovery. We want our Armed Forces to have the equipment they need when they need it. The Labour Shadow Defence Team knows that efficient procurement must underpin a credible defence policy which provides for the frontline whilst protecting the bottom line. We therefore established an independent Review Team of experts to study ideas for the future of acquisition reform.

The recommendations in this report will be submitted to the Labour Party for consideration as part of the review, led by Liam Byrne and reporting to Ed Miliband in 2012. The views are those of the Review Team and reflective of the views of the industry figures and stakeholders consulted. These are important proposals which should inform the thinking of all policy makers interested in this crucial issue. We plan to examine them in detail as we develop our future policy platform.

The review process has been open and as consultative as possible, making a virtue of hearing from those with direct experience and expertise in defence procurement systems. Academia, industry, former and current senior military personnel from our allies overseas, international business figures, politicians and the general public have all been engaged during this ten month study. This approach is not just reflective of how we believe defence policy-making and politics more widely must be conducted, but also reflective of our knowledge that after 13 years in government Labour lost some of its momentum on reform. The review process was therefore both an exercise in learning from those most in command of this policy area, as well as reconnecting with people vital to our economy and our security.

We are extremely grateful that so many senior industry figures have talked openly with the Review Team about the challenges they face. The recommendations in the review are a product of the work carried out by Bill Thomas (review Chairman), former Senior Vice President and General Manager (Europe, Middle East and Africa) for Hewlett-Packard Company, and Tony Roulstone, former Managing Director of Rolls-Royce Nuclear. Their invaluable experience with the defence sector provided important insight and their hard work ensured all areas of the defence industry have been consulted. They were helped enormously by Admiral Lord Alan West, former Chief of the Naval Staff and First Sea Lord, to whom we also owe our thanks.

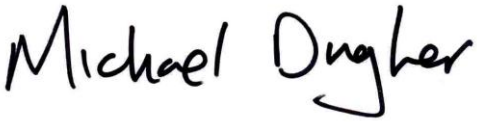
Labour's record on defence is strong and we are proud that we increased the Defence budget by 10% in real terms during our time in office. The equipment programme was upgraded and modernised, military operations were conducted with success and welfare for the forces community was greatly enhanced. However, despite all the investment and improvements, including the breakthrough Defence Industrial Strategy in 2005, some of the problems in acquisition, which have plagued all governments, regrettably continued. In beginning to develop future policy we have to be honest about the past, which is why the Labour Government commissioned the Gray Report, published in 2009. This study analyses further some of the shortcomings in equipment programme planning, management and delivery systems.

One of our priorities in the study has been to identify ways to balance the defence equipment and support budget. It looks at how the financial planning horizon can be extended – in line with Bernard Gray's recommendation and the policy of the previous Government[1] – how procurement systems can provide value for money within financial constraints, moving away from 'exquisite systems' at any cost, and how we can use export sales as an objective test of both effectiveness and value for money. Another crucial area for attention has been how to design a strategic 'Make-Buy' policy, balancing sovereign capabilities, operational independence and support for UK industries with purchasing from overseas within budgets. The report looks at defining the capabilities which should be UK-based over the long-term, which would allow for Research and Technology (R&T) and industry investment to be targeted, and it looks at how active industrial policy can support UK defence imperatives. Delivering to time and to budget is considered in depth, with insights on how to both better control project and programme management and establish a closer Ministry of Defence-industry working relationship. The Review Team have also sought to demonstrate how to deliver efficiencies in the system.

The study is bold in its proposals on structural reform, including recommending that the Defence Equipment and Support (DE&S) becomes a non-departmental public body in order to enhance accountability, effectiveness and professionalism. It is bold too in its proposals for cultural change, suggesting that there is far greater investment and examination at the beginning of projects, with greater willingness to cancel them if there are over-runs, and providing better career paths within defence procurement to strengthen a culture of professionalism.

[1] http://www.mod.uk/NR/rdonlyres/3EED5271-DCC6-4F83-A959-A0AB3CC5F9A3/0/ReviewAcqReportWMS.pdf

The UK defence and security landscape is evolving rapidly. The changing nature of conflict, greater need for co-operation between nations, fiscal realities and public reticence, as well as new and emerging threats which demand new and expensive equipment, all collide to make this a transformative era for defence policy. While our forces will be drawing down from Afghanistan, Libya once again proves that we are likely to have responsibilities beyond our borders on which we may at times be compelled to act upon. To do so Britain must retain a strong, committed, proactive defence policy. That is Labour's starting point and this report is a key contribution to the debate on how that can best be achieved.



Rt. Hon Jim Murphy MP
Shadow Secretary of State for Defence

Michael Dugher MP
Shadow Minister for Defence
Equipment, Support and Technology

Introduction

Admiral Lord West

Our Armed Forces' equipment is fundamental to their ability to fight and win and yet for many years, despite repeated attempts by successive administrations, it seems the kit has been over-priced and often not as good or plentiful as required.

In 1906 HMS DREADNOUGHT, the battleship that revolutionised naval power, was launched a year and a day after being ordered. In 2006, HMS DARING the replacement for type 42 destroyers, was launched six years after being ordered and some 21 years after the feasibility studies for the replacement type 42 was begun. It seems as though we have moved backwards.

The pressure on the defence budget reinforces the need to do something about procurement and I am pleased to have been able to assist the authors of this study.

Successive governments have stated quite clearly that the defence and security of the Nation are their highest priority. One can argue whether or not the allocation of resources has reflected that aim but there is no doubt that the poor performance of our procurement system has had a damaging impact.

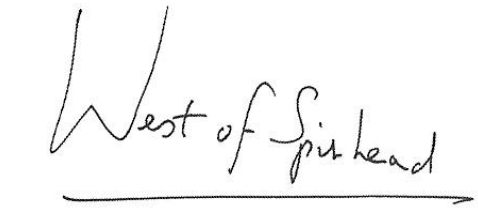
The UK needs to operate across the full spectrum of defence activity with an expeditionary capability and readiness for large-scale operations. The requirement to keep abreast of rapid technological change, inter-operate with a myriad of partners and to be fleet-footed enough to operate at the appropriate scale in even minor operations puts a huge pressure on equipment provision.

I am particularly pleased that this report gives considerable support and a boost to our defence industries. I welcome the proposals to capitalise on the wisdom of those in the defence procurement arena. Similarly, the decision to push for DE&S to become an NDPB is, I believe, sound.

Many years ago the Long-Term Costings (LTC) was a ten year planning tool but the move to the four-year CSR has blighted defence planning. I am a firm believer in a more unified cross-party approach to

defence. The longer time scales and, ideally, party political cooperation will give a greater certainty to industry and I hope this government grasps the nettle.

There are real risks of a chaotic and highly dangerous world developing over the next decades, not least within the context of ever-increasing competition for resources of all kinds amongst a rapidly expanding world population. In the final analysis our national survival will depend, as it always has, on our armed forces. A key part of their capability rests on timely provision of the right equipment at a sensible cost. The proposals in this review will address that issue.



Admiral Lord West

Study Process

Following the Strategic Defence & Security Review of 2010[2] and the subsequent Green Paper[3], a review of defence procurement was set up by the Shadow Secretary of State for Defence, the Rt Hon Jim Murphy MP. An independent Review Team was established and this final study, the conclusion of a ten month consultation, will be submitted to the Labour Party to inform the work of the Shadow Defence Team as they produce a comprehensive review of defence policy as part of the Labour Party's official policy review process, led by Rt Hon Liam Byrne MP, which is reporting to Rt Hon Ed Miliband MP, Leader of the Labour Party, in 2012.

The findings are intended to be recommendations for all policy-makers and should form the basis of a new defence procurement strategy for the UK. The authors hope that, as well as guiding the Labour Party's policy-development process, the evidence and recommendations in this paper will be considered by the Government as they develop their own defence industrial strategy. These are ideas for the future intended for further examination and debate.

In light of the strategic context in which defence procurement policy sits, the aim of this review was to outline proposed reforms to UK defence procurement policy which would:

- Ensure that Services get the right equipment and support to match their needs, in a timely manner and with best value;
- Make the financial and programme planning of defence procurement effective over the medium and long-term;
- Align defence procurement and UK industrial, science and technology policies;
- Ensure that the defence procurement organisation has the capability to succeed in delivering equipment on time and budget, and supporting its in-service use.

The review was conducted by:

- Bill Thomas (Review Chairman): Chair of the International Advisory Board at the Cranfield School of Management; Board Member of the Advisory Board at Leeds University Business School; former Senior Vice President and General Manager (EMEA) for Hewlett-Packard Company; former Programme Manager for SD-Scicon and Systems Engineer for Marconi Space and Defence.

[2] Source: Securing Britain in an age of uncertainty: The Strategic Defence & Security Review, 2010
[3] Source: Equipment, Support, and Technology for UK Defence and Security: A consultation Paper, 2010

- Tony Roulstone: Course Director at the University of Cambridge, Department of Engineering; and former Managing Director of Rolls-Royce Nuclear.

- Admiral Lord Alan West, former Chief of the Naval Staff and First Sea Lord.

The process has involved:

- Taking evidence from those involved in UK defence procurement, including former senior defence procurement officials, senior defence industry representatives, former defence ministers, representatives of the relevant trade unions and the wider general public.

- Looking for lessons that can be learned from commercial organisations outside the defence industry faced with similar challenges in the design and procurement of large complex, one-off systems.

- Considering the lessons that can be learned from the experience of other countries, including meetings at both ministerial and official level in Israel, France and the United States of America.

Executive Summary

The context in which defence procurement sits and the problems faced by both the MoD and the defence industry are also prevalent in other countries' Ministries and industries. While the details may vary between different projects or programmes the essential lessons of successfully managing such programmes are common. As well as consulting widely with UK industry to learn from their experiences and insights, the Review Team sought to identify best practice from elsewhere to set defence procurement practices in the UK on a path to being more efficient, effective, affordable and streamlined.

The defence industry plays a key role in the UK economy, in particular through exports. As part of a comprehensive strategy for growth, therefore, it is important the industry is supported and sustainable. It is important too because the challenges for defence are growing and the requirements high. Through effective procurement practices these can be met while also providing certainty for industry.

The problematic issues of defence procurement are systemic and widespread and have become so over decades. The motivation of the various actors in the acquisition process, planning and budgeting, project management, industry-MoD interactions and industrial strategy are all issues that must be confronted. There have been numerous attempts to tackle this, notably by the last Government who implemented the Defence Industrial Strategy, SMART procurement and commissioned the Bernard Gray report into defence acquisitions. Despite this, necessary lasting change was not realised and serious issues continue and require action.

We have broken these problems down into five key areas:

- **Balancing the Defence Equipment and Support Budget**;
- **Strategic 'Make – Buy'** – reviewing the strategic choice of developing a unique military requirement or buying equipment which is largely, or completely, off-the-self;
- Implementing **Firmer and Fairer Contracts with Industry;**
- **Procurement Process and Efficiency;**
- Developing and maintaining the skills and capacity to deliver on time and to budget with **Professional Procurement and Programme Organisation.**

Balancing the Defence Equipment & Support Budgets

The changes proposed by Lord Levene and Bernard Gray to both MoD decision-making and financial planning are sound and need to be built on and implemented within a framework that provides a clear financial horizon for the MoD. We have proposed that the MoD moves to ten-year rolling budgets rather than the current four to five year spending review plans. This would limit the expectation that projects beyond the spending review horizon can be accommodated into future spending periods and enable MoD planners to consider the affordability of new projects. It would also give the defence industry more information against which it can plan its investment and developments.

In his report on Defence Acquisition in 2009, Bernard Gray agreed with this analysis and recommended that the MoD move to a ten-year rolling budget. The Defence Secretary at the time, the Rt Hon Bob Ainsworth MP, accepted this recommendation and subsequently committed the Government to the proposal in a written ministerial statement to Parliament in October 2009[4]. In our view, this was the right approach and by failing to take the plan forward, the current Government may have missed an opportunity to correct one of the primary barriers to running better defence procurement projects in the years ahead.

The budgeting system also needs to alter the motivations of the main actors in defence procurement to move from seeking to buy 'exquisite systems' at any cost to systems which provide value within financial constraints and a ten-year planning horizon. Too often, scope creep has led to the MoD seeking systems which exceed the current identified need in the desire to meet future but undefined threats and ensure we make use of all available technology. In this case the exquisite can be the enemy of excellence and resultant delays to delivery due to timetable slippage can leave our troops without on the frontline.

To achieve and sustain different behaviours, the main actors in defence procurement need to see the advantage of their restraint and the danger of maximising spend. A new paradigm of 'Design to Cost' needs to be embraced at all levels.

The key recommendations for consideration in Part 2 are:

- *The MoD should move to a 10-year financial planning horizon for equipment spending.*

- *The capability that is defined should be able to enable the ambition, not exceed it. Equipment programmes should meet 100% of need and be delivered on time and within existing budgets. The idea that the 'best is the enemy of the good' should become ingrained within the MoD's procurement structures.*

[4] http://www.mod.uk/NR/rdonlyres/3EED5271-DCC6-4F83-A959-A0AB3CC5F9A3/0/ReviewAcqReportWMS.pdf

- *The budgeting system needs to address the motivations of the key players in defence procurement, making it a rational decision for the main players to 'Design to Cost'.*

Strategic 'Make-Buy'

The MoD's defence procurement strategy should be expressed in a concrete 'Make-Buy' policy, consistent with competition, sovereign capability and research priorities.

The idea of categorising programmes in terms of 'Make' (equipment developed by the MoD) and 'Buy' (equipment that is purchased) relates to the different choices that the MoD and the defence industry have in a market where decisions are constrained and have long-term consequences. In the context of a reducing number of defence suppliers within the defence industry, combined with the aim to ensure value for money, decisions between whether to 'Make' or 'Buy' equipment have become increasingly important.

A 'Make-Buy' strategy must ultimately be the result of a series of decisions about what type of military capability will be required and what type of future procurement should be employed. Therefore, we have proposed that it should be linked to periodic strategic defence reviews and a clearly stated position of what type of systems will be required over a ten-year period. A clear 'Make-Buy' strategy can provide coherence and stability to industry investment planning and R&T spend.

It is important that any 'Make-Buy' strategy supports sovereign capabilities and makes explicit the difference between 'absolute' sovereign capabilities, which are the small number entirely constructed and maintained in the UK, and 'deployment' sovereign capabilities, which are upgraded in the UK. It is proposed that there should be very few occasions where the UK does not develop and maintain the capacity to upgrade and modify its key military equipment and systems. Therefore, all 'off-the-shelf' purchases should be subject to a 'UK control' test that states that there must be UK-based upgrade capability in the UK capable of performing UORs on equipment.

Furthermore, in order to support exportability within the industry, an export business plan should be developed as part of the Main Gate approval.

The key recommendations for consideration in Part 3 are:

- *Align strategic 'Make-Buy' policy and R&T spending with a defined proportion assigned to supporting SMEs.*

- *Develop a coherent, strategic 'Make-Buy' policy to sit alongside every defence spending review, matching strategic ambition, defence and military capabilities.*

- *Define 'absolute' and 'deployment' sovereign capabilities in each defence spending review. In order to guide industry, it is essential to distinguish between 'absolute' sovereign capabilities (equipment that is vital to national security and that we must be able to design, construct, produce and support in the UK) and 'deployment' sovereign capabilities (equipment designed and developed off-shore, but that we must be able to modify, upgrade, provide support capability and deploy for UK needs).*

- *Due to the implications for UK freedom of action, there should be very few occasions where the UK does not develop and maintain the capacity to upgrade and modify its key military equipment and systems. To ensure UK-based engineering, upgrade capability and UORs can be provided and maintained for systems purchased offshore or 'off-the-shelf', a new criteria for purchase, a 'UK control', should be established.*

- *It is preferable for defence companies to have less than 50% of their relevant business with the MoD to become a sustainable sovereign capability supplier. If the MoD chooses suppliers with less than 50%, this should be coupled with the understanding that the company's future capability to provide is based on its continued support.*

- *An export business plan should be developed as part of the Main Gate approval, and the decision to invest in 'Make' systems should be subject to scope for export.*

- *A clear five-tier strategic 'Make-Buy' strategy should be established. The five tiers would be: 'Commodity', using a single purchasing agency; 'Specialised Buy', subject to competition where there are at least three credible suppliers; 'Strategic Buy' of equipment or systems important in defence terms; 'Strategic Make' of critical capabilities; 'Defence Significant' capabilities where the UK decides to compete in both the technology and international export market.*

Firmer and Fairer contracts with industry

When an effective market exists (at least three credible suppliers), competition is of course the best procurement policy. However, the reality is that there is seldom a viable market for major and complex defence projects. In this report, we have sought to face up to this reality and incorporate it into the development of the strategic 'Make-Buy' policy.

It is clear that commercial conditions for contracts between the MoD and industry should always be firm and ensure value for money. Where there is no effective competition, the contracting policy should aim to set tough cost benchmarks, make actual costs visible and provide significant incentives and penalties to ensure performance. The key to achieving these aims is for the MoD to: challenge suppliers and construct 'should-cost' models; use 'fixed-price' contracts as the norm; and employ 'open book' contracts for additional requirements once a programme has started.

In our view, the way contracts are managed can be greatly improved if defence companies are given more responsibility and incentivised to improve. In this context, defence companies should accept higher levels of risk in exchange for the opportunity to generate more profit.

The key recommendations for consideration in Part 4 are:

- *Competition should be used where there are alternative equipment or systems to be purchased and there is an effective market with at least three competent suppliers.*

- *'Fixed price' contracts used as the norm for either whole projects or piecemeal across the contract, with pressure added by a '90% cost rule' where prices cannot be agreed.*

- *De facto and actual monopoly suppliers should operate with 'open book' contracting once a contract is let.*

- *'Should cost' estimates for projects should be used and include productivity improvements that have been achieved from previous programmes.*

- *Greater incentive rewards capable of being earned by contractors for taking on risk within projects.*

- *Industry provides higher warranties for performance and should be able to earn greater profits on the successful delivery of big contracts.*

- *Alliancing and Partnering principles to be considered for development contracts where there is no effective competition, as well as for support contracts.*

Procurement Process & Efficiency

The procurement of large, complex, often bespoke systems over many years has been subject to significant delay, cost increases and expansion of scope. The long programme timescales make the problem of financial planning much worse. Five long programmes are much less likely to meet an aggregate plan than ten programmes of half the length. Shorter less complex projects and stronger project management discipline are central to controlling these issues.

Defence procurement projects have clearly become too long and should be designed with shorter durations and incremental capability upgrades. Commercial projects have benefited from the widespread adoption of 'Lean Project Delivery' and such process change is essential to achieving the more rapid project delivery needed in defence procurement. If properly organised, timescale and overall cost could be significantly collapsed.

UORs have shown that effective equipment can be acquired much more quickly than business as usual. The equipment that is currently procured through UORs is often used and then discarded as the process does not take the equipment's lifecycle into account. The UOR model should be expanded so that the process can be employed more widely and become a path to a more complete solution. A new 'UOR plus' process is required. This new process would still procure urgently needed equipment to the front-line, but it would also take into account support and logistics planning and the equipment's long-term integration into the Armed Forces.

The main recommendation is to ensure stronger project management discipline within the MoD, giving project and programme managers the ability to control change and are held accountable. Equally, however, it is important that the responsibility industry hold is translated into obligations and it is proposed that provision is introduced to restrain or cancel projects that exceed either their schedule or budget by a defined amount.

The key recommendations for consideration in Part 5 are:

- *Much shorter projects of three to five years with realisable objectives and successive phases for incremental capability improvement.*

- *Streamline all processes and decision-making, initially targeting at least 50% cuts in process duration using the 'Lean' approach. Cutting time results in cutting cost. In order to achieve these efficiency goals, a systematic and comparative study is required to look at best practice of military and commercial development project stages; concept studies, development, production, and introduction to service.*

- *A new 'UOR+' process is required. This process would still procure equipment that was urgently required, but would also take into account its support and logistics planning, the*

required support and training and its integration into the wider Armed Forces equipment programme.

- *A procurement cycle with proper (closed) gates and contingency plans.*

- *Recognise that a single acquisition cycle will never fit the huge range of items procured by the MoD and introduce a more graded approach with at least three different types of lifecycle: 'UOR+', buying 'off-the-shelf' and new developments / 'Make'.*

- *Alliance or partnering approaches used successfully for support contracts should be used where possible for equipment development. This would remove interface/overheads and drive innovation.*

- *Project managers in IPTs should have the authority, accountability and responsibility for project execution. The confusion as to whether SROs or IPT leaders are managing projects needs to be resolved.*

- *Major decisions, such as those at Main Gate, or which involve numerous people to sign off, should be targeted to take less than one month.*

- *A single independent and senior project technical and financial risk assurance team should be established, reporting to the CDM, who is able to halt a project to address a build up of risk and, where necessary, close it down.*

- *Shut down or return a project to Main Gate approval when forecast cost, or timescale, exceeds 120% of that approved (similar to the US Nunn-McCurdy Law).*

- *Project management activities should be moved out to industry with the MoD to set schedule requirements and contractors providing information to project managers.*

- *Move design authority to industry where it is still in the MoD. The MoD should define military standards while industry sets and justifies technical standards.*

Professional Procurement & Programme Organisation

The key to better performance is greater professional project and programme management, faster decision-making, fuller accountability for outcomes with the single-minded pursuit of the agreed objectives and longer-term integration of military expertise. These required improvements can be taken forward and institutionalised by reforming the structure and culture of DE&S.

It is recommended that DE&S should become an executive NDPB. Because of the need for DE&S to demonstrate accountability to Parliament for the expenditure of large amounts of Government money this model is preferred to a PPP or GoCo, as considered in the Bernard Gray report.

It is important also to tackle the long timescale of military procurement in comparison to the normal short period of duty for military personnel in DE&S roles, the ability of military personnel to gain adequate and appropriate training, the potential for divided loyalties, and retaining civilian staff for complex programme management roles.

We propose a number of changes, including the establishment of a new Weapon Engineering Service in which military staff would be encouraged to transfer into mid career and after they have served in their own Service. Furthermore, the reporting structure of DE&S needs to be altered to provide IPTs with greater authority, procurement managers must be better trained, more capable and more professional, and there needs to be better development and retention of costing skills.

The key recommendations for consideration in Part 6 are:

- *Give the authority, accountability and responsibility for project and programme outcome to IPT leaders.*

- *Enhance the role of cost estimators as part of each IPT and have an independent project review team reporting to the CDM to maintain the quality of estimation work and the integrity of forward budgetary estimates.*

- *Military staff to act solely as subject experts rather than as project managers.*

- *Create a new Weapons Engineering Service to manage the training, development, career and pay of defence procurement staff, recognising equipment procurement as a professional competence. This would be a mixed civilian and military organisation and provide the opportunity for officers to enter as a permanent career move. Career, posting, promotion and pay would be managed by the CDM.*

- *Design a new model for PPM professional training, career planning and performance standards, learning from commercial practise and focusing on enhancing the skills of project managers. This would include five-year improvement objectives for project managers with performance improvement being a key part of DE&S strategy and would be graded with year-by-year measures and targets.*

- *Enhance the focus on outcomes rather than process in the management of projects, encouraging a 'culture of consequences' for individuals, including pay for performance, rather than for service.*

- *Re-structure DE&S into an executive NDPB with an element of in-sourced management and an external Board.*

Part 1: Strategic Context

Defence procurement

Overview

1.1 The MoD spends about £16bn[5] every year on equipment and support including the internal costs of civilian manpower to support this activity. This is split between equipment procurement, valued at £10bn including research and development, and the balance for support and spares. The total of committed equipment spend is in excess of £60bn[6], with the largest 15 projects accounting for over 90% of this total. It is these largest projects that attract the attention of the National Audit Office (NAO) who have been reporting annually on major projects' slippage and overspend every year for more than ten years[7].

1.2 Slippage and overspend in major projects is not a new issue nor is it specific to one particular government or Minister. In 1997, projects such as the Euro-fighter, the EH101 Merlin and the Tornado MLU, to name but a few, were all delayed and over cost.

1.3 Equipment expenditure includes £400m per year for Research and Technology (R&T) and a further £2.2bn[8] of development. On an annual basis, the UK spends 4% of its equipment budget on R&T and a further 20% on equipment development. This level of research and development is high considering that UK defence procurement policy for many years has been open competition with the aim of buying established equipment.

The economy and the UK defence industry

1.4 The technology inherent in military systems and the large annual spend on defence equipment make the defence industry an important contributor to the UK economy. A study published in 2009[9] showed that a £100m investment in the defence industry will generate an increase in gross output of £227 million and increases in Exchequer revenues by £11.5m, reflecting the strong UK-based supply chain and relatively high wage earning employees within the defence industry. This also means that the tax contributions to the Exchequer are above average for the wider economy. In addition, the report stated that for each job in the defence industry 1.6 jobs are created additionally in the economy. Hence a £100 million investment would result in 1,885 jobs created of which 726 would be in the defence industry.

[5] Source: Figure derived from MOD Directorate of Defence Resources, UK Defence Statistics 2010
[6] Source: Figure derived from Defence Equipment & Support, UK Defence Statistics 2010
[7] Source: NAO Major Project Reports, 1998 - 2010
[8] Source: Figure derived from MOD Departmental Resource Accounts, UK Defence Statistics 2010
[9] Source: "The economic case for investing in the UK defence industry", Oxford Economics, 2009

1.5 Military exports are a significant proportion of UK manufacturing exports, totalling over £7bn in 2010, of which, as an example, the Defence aerospace exports were nearly 25% of the total aerospace exports for the UK[10]. In most areas of defence, unless equipment can win defence exports it will be very difficult to maintain an UK-only defence technological capability.

Current Prices (£ million)

	2003	2004	2005	2006	2007	2008	2009
Identified Export Orders for Defence Equipment and Services	**4 882**	**4 546**	**3 989**	**5 527**	**9 651**	**4 357**	**7 251**
Split by Equipment Type:							
Air Sector	3 526	3 199	2 491	4 133	7 525	2 940	5 263
Land Sector	303	475	584	670	762	447	940
Sea Sector	252	209	369	280	1 017	355	520
Not Specified	801	663	546	444	347	615	528
Total UK Exports			211 756	243 821	218 919	247 349	224 316
Defence exports as % of total			**1.88%**	**2.27%**	**4.41%**	**1.76%**	**3.23%**

Source: UKTI Defence and Security Organisation, UK regional trade statistics, ONS

TABLE 1

UK industrial landscape

1.6 In 2005, the Defence Industrial Strategy (DIS)[11] and subsequently the Defence Technology Strategy (DTS)[12] made important reforms in order to allow industry to plan their investments. The DIS made the following changes:

- Gave a strategic view of defence capability requirements going forward. Part of the strategic view is specifying, in order to meet, the industrial capabilities we would wish to see retained in the UK for defence reasons;
- Gave further detail on the principles and processes that underpin procurement and industrial decisions;
- Would support what was required to sustain desired industrial capabilities onshore, and would investigate how the MoD might address gaps between the level of MoD activity and industry's own plans.

"The Strategy sets these out, and explains clearly for the first time which industrial capabilities we require to be sustained... In doing so... assists industry in planning for the future commits the Government to greater transparency of our forward plans"[13]

[10] Source: UKTI Defence and Security Organisation
[11] Source: Defence Industrial Strategy, 2005
[12] Source: Defence Technology Strategy for the demands of the 21st century

1.7 The DTS supported the implementation of the DIS by laying-out:

- The priority of science and technology areas for R&D investment;
- The critical areas where we are dependent upon the viability of UK science and technology for operational sovereignty and security;
- Supporting opportunities and initiatives.

1.8 These strategies were well received but suffered from incomplete implementation and funding pressures.

1.9 The Government published their Green Paper, *Equipment, Support and Technology for UK Defence*, last year[14]. It sets out two main points:

- The primacy of competition for defence procurement, recognising that there would be a 'handful' of critical areas where the UK has or needs the operational advantage and freedom of action for a particular capability, where the UK might take action to sustain the underpinning technologies or skills in order to protect our national security. It may also require acceptance of greater mutual dependence on some of our key allies; and
- Establishes that spending on defence and security must be for the sole purpose of protecting our national security.

1.10 The Government appears to want the benefits of a strong defence industry, but in the Green Paper it goes on to say its *"default position is to use open competition in the global market, to buy off-the-shelf where we can".*[15] It also appears to have set its face against industrial activism, with no evident discernable industrial policy.

MoD and R&T funding

1.11 MoD R&T funding is being constrained by declining defence spending in real terms. As a result, MoD R&T by itself is not able to cover the full range of technologies. In fact, much of the MoD R&T annual budget is consumed by maintaining the internal Defence Science and Technology Laboratory (DSTL), funding QinetiQ and supporting university structures to act as advisers to the MoD. Little is employed on basic research and radical new developments.

1.12 In the past, military R&T was seen as at the cutting edge of many new developments in science and technology. This is now much less the case. As newer technologies are

[13] Source: Defence Industrial Strategy, 2005, page 2
[14] Source: Equipment, Support, and Technology for UK Defence and Security: A consultation Paper, 2010
[15] Source: Equipment, Support, and Technology for UK Defence and Security: A consultation Paper, 2010, pages 6 & 7

understood, and often commercialised, they become available more widely around the world. A prime example is GPS, now ubiquitous, but only 20 years ago it was considered to be the 'crown jewels' of military technology.

1.13 The volume of commercial R&T has grown and become separate from military R&T. The MoD risks being left behind in the rapidly developing areas of IT, communications and software technology unless it finds a way of accessing and using these technological developments within its new projects.

1.14 Following the DTS, there was a drive to encourage more R&T spending by industry and to stimulate development by universities and SMEs. The Centre for Defence Enterprise was established with a small budget and a remit to widen access to technology developed outside the defence estate.

Defence exports

1.15 The UK has a strong record of defence exports, as can be seen in figure 1, with foreign purchases being valued at £7bn[16] in 2009, with the total defence volumes being of the order of £20bn. Air systems (most noticeably the Typhoon) dominate, representing over 70% of total exports in the period 2003-09, with small contributions from Naval, Land and other systems. As well as these large defence exports, aerospace exports of over £20bn a year have a close relationship to defence R&T and industrial capabilities.

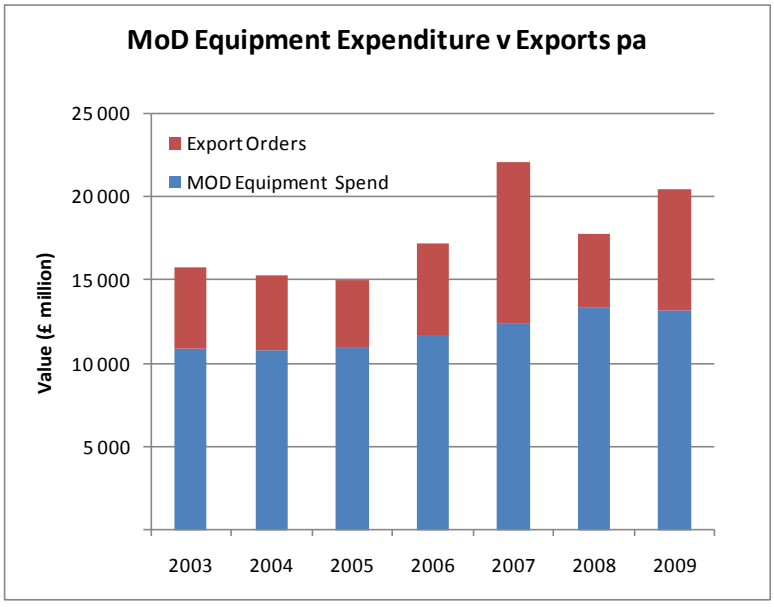


Figure 1 – MoD equipment Expenditure versus export value by year
Source: MOD Departmental Resource Accounts

[16] Source: UKTI Defence and Security Organisation

Trends in defence policy

1.16 As in the UK, defence funding is set to fall across many countries as national governments seek to cut their deficits accumulated as a consequence of the global financial crisis. The US has plans to save $400bn[17] over 10 years from their defence budget and continuing deficit pressures are likely to force the need for higher savings. As a result, major reductions to equipment and support expenditure are being sought now by many and this trend of a real terms decline in defence spend will continue for many years.

1.17 This fall in defence and hence equipment spend occurs against a long term trend of increasing costs of military systems which are increasingly both more technologically advanced and more interoperable with other systems, making them complex. In both the US and UK, the cost of complex systems such as combat aircraft and ships has been rising for more than 20 years at compound real rates in excess of 5% pa. Defence planners have in many instances sought technical superiority at almost any cost. Where budget constraints have been reached, there has been more willingness to cut the number of items of equipment bought than to compromise on the capability of the system. Therefore, the number of aircraft, armoured vehicles and ships has been falling as new and more expensive types of equipment are deployed. One such example of this can be seen with the Type 45 destroyer which is one of the most capable surface ships in the world, but in order to have this exquisite system only six of the original 12 envisaged will enter service.

1.18 There is a view strongly held in some quarters that the 2010 SDSR and Defence budget cuts have not been balanced and therefore the future programme will again be unaffordable. Within the next ten years, major expenditure is planned on items including the Typhoon, JSF, the Queen Elizabeth Class aircraft carriers, seven Astute submarines and the replacement of the Trident programme (missiles and submarines). It is still unclear as to whether this can be accommodated within the Government's current defence budget.

1.19 Other trends are leading to a strategic re-think in defence planning. Firstly, the nature of conflict is shifting. In future, conflict is more likely to be against relatively unsophisticated and perhaps irregular forces in urban settings. It is imperative to retain the ability to conduct large scale interventions, but with the 'new model' of intervention seen in Libya, whereby specialist units on the ground work with local forces to gather intelligence, backed by air power and naval supremacy to shape the balance of power on the ground, will be

[17] Source: President Obama, April 13th 2011, as part of the President's Framework for Shared Prosperity and Shared Fiscal Responsibility

increasingly reliant on advanced ISTAR and communications technologies in which nations must now increase investment. Secondly, the continuing escalation of high technology equipment is out-stripping the ability of nations to pay for such developments and so while development programmes for fast jets, submarines and missiles will continue, they will be more subject to budgetary compromises and involve greater collaboration in order to meet their large development costs.

1.20 Each of these trends place additional burdens on defence policy-makers and practitioners who must adapt strategy and posture. Procurement policy, it has been shown, did not adequately meet the challenges of the past and must be reformed to both correct the current shortcomings as well as sufficiently equip our forces for the new, emerging security landscape.

SMART procurement

1.21 Over the last ten years, there have been two major attempts to modernise Defence Acquisition. The first was SMART procurement, following the 1998 Strategic Defence Review (SDR). Subsequently, the Defence Procurement Agency (DPA) was merged with Defence Logistics Organisation (DLO) to create the current organisation, DE&S.

1.22 SMART procurement aimed to enhance defence capabilities by acquiring and supporting equipment more efficiently in terms of time, cost and performance. SMART contained seven key themes:

1. A through life approach, where initial spend and effort was to be increased at the initial concept and assessment stages, to fully cost the procurement, the future capability and in-service support requirement;
2. Incremental acquisition, where achievable capability should initially be sought but upgrades downstream should be enabled;
3. A partnering approach between industry and the MoD, where industry could have a greater involvement in shaping the future capability, but also provide in-service support, backed by new multi disciplinary Integrated Project Teams (IPTs), set up to bridge the gap between industry staff and procurement staff, as well as using systems engineering techniques more effectively;
4. Clearer accountability and responsibility for projects, backed by the new IPTs;
5. Less inflationary procurement contracts;
6. Streamlined acquisition stages and processes for different types of equipment; and
7. Converting the procurement executive to an agency (now overtaken by the DE&S).

1.23 The SMART procurement initiative brought about major changes in process and organisation, but since its introduction criticism has continued to be levelled at the MoD for delays, shortages and cost overruns. It is clear, therefore, that despite the benefits and improvements it brought, SMART acquisition is not working fully as initially intended.

1.24 The merger of equipment procurement and support was driven by the desire to manage through life costs with an integrated organisation. Through life equipment management is common place in modern manufacturing where "cradle to grave" costs are evaluated for any new product in order to provide financial transparency - no doubt what SMART acquisition was attempting to emulate. However, through life costs are difficult to estimate, especially due to the complex nature of defence products. Attempting to cost a product which has no comparable product in the marketplace and where the culture prevents transparent bidding processes is challenging at best.

Success with SMART Acquisition

SMART acquisition has enjoyed success, such as with the ATTAC project (Availability Transformation: Tornado Aircraft Contract) where BAE Systems took over depot-level support and maintenance for the RAF's Tornado fleet, dramatically improving the speed and efficiency of support. SMART acquisition, however, has not completely worked as intended and issues concerning delays, shortages and cost overruns remain.

1.25 Incremental acquisition is a logical step to counter the increasing duration and size of defence contracts. However, rather than allow for future upgrades, incremental acquisition has allowed scope creep and for projects to get out of financial or timescale control. The use of Private Finance Initiative (PFI) contracts has been introduced to try and tackle these problems, but, while that brought many benefits, the problem of timescale control has still affected some cases. It is clear that there has been a failure to fully analyse alternative options during the contract bidding process.

1.26 Successful partnering, such as with Augusta Westland, Rolls-Royce, BAE Systems and MBDA, has been developed in recent years from the start of many projects. However, there is still a noticeable divide between senior partner managers and the MoD. Many contractors have not felt a significant change of attitude and have complained they are not given the freedom they require. Though IPTs are a significant step-change towards more effective partnership, they do not have the appropriate level of authority, which puts them at odds with senior figures in the MoD. Until the IPTs have responsibility, authority and accountability they will not be able to function as originally intended.

1.27 In essence, SMART acquisition has not been as successful as expected. It made changes to the procurement process, introducing the Concept, Assessment, Demonstration, Manufacture, In-service and Disposal (CADMID) cycle, new contracting procedures and the notion of being "an intelligent customer". It did not, however, address the cultural change which was required in order to make these processes effective in improving project performance.

The importance of major projects

1.28 Defence procurement is a large, complex and challenging activity. It involves the specification, related R&T acquisition, contracting, development and acceptance of equipment and systems and their subsequent support in operations for 30 or more years. It involves large and complex systems such as fighter aircraft or submarines, or much simpler items such as clothing or military rations.

1.29 It is recognised that the initial purchase of defence equipment is only part of the cost. There are large manning, training and operational learning costs as well as support costs. When considered over the lifetime of the equipment, these costs may exceed the equipment expenditure itself many times over.

1.30 The optimisation of these types of cost is the practice of Total Lifetime Cost Management (TLCM). It has been suggested that the sole focus of equipment and support management should be on TLCM. However, TLCM is an imprecise science and involves different types of costs owned by different parts of the MoD. Performance of equipment procurement has been poor for many years. Any strategy must make acquisition more effective and affordable. Until procurement programmes for new major projects are much more stable, efforts in TLCM are likely to be ineffective.

Major projects procurement performance

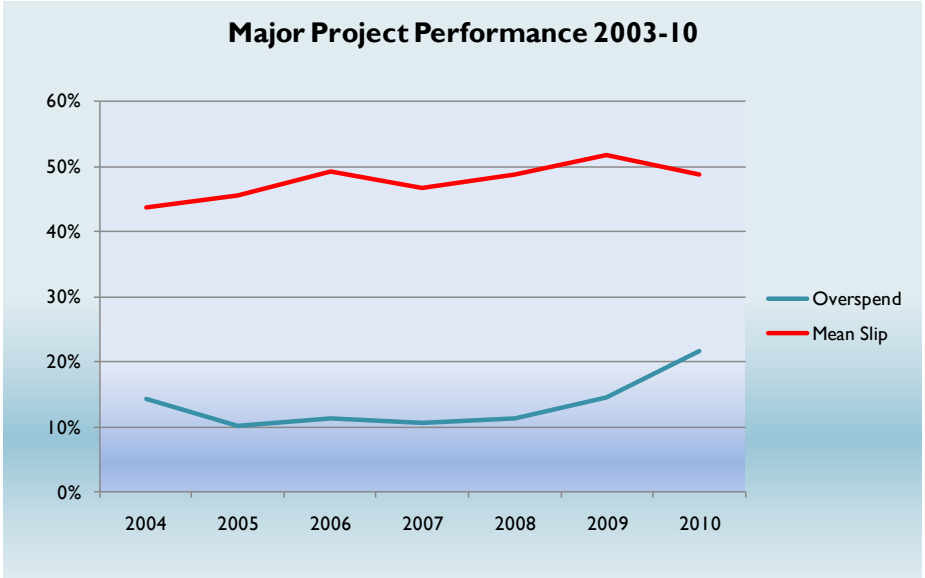
1.31 Regular NAO reports on defence procurement have catalogued the poor record of delay and cost increases of large defence projects over many years. Successive reports analysed the top 15-20 major projects (£67bn[18] of forecast spend) which cover in excess of 90% of the approved equipment spend.

1.32 In addition, in the NAO major projects report 2010, there was also some discussion of the next 29 projects which account for £3.3bn of spend, which only makes up another 5% of spend. Therefore a very small number of major projects represent the vast majority of MoD's project performance problem.

[18] Source: NAO Major Projects Report 2010

1.33 Over the period for which there is consistent data (2003-2010), major projects costing in excess of £200m, and were planned to take 4-5 years between the Main Gate decision and Entry into Service (Demonstration & Manufacture phase), exceeded their most likely out-turn estimate of cost by more than 10% on average (with extremes of up to 40%). They also slipped by 40-50% (with some as much as 250%) of their expected schedule. This can be seen in Figure 2.

1.34 The Government's current claim of a £38 billion unfunded liability over the next ten years has been impossible for us to verify. The Government has withheld information from the Defence Select Committee[19] as to how this figure was calculated and we have not had access to the necessary data, which would have allowed us to make our own calculations. We hope that the Government will respond soon to the request form the Defence Select Committee in order to provide clarity for industry, our forces and all policy makers.



Source: NAO Major Project Reports

Major projects' average performance for projects within 2 years of their planned EIS versus Main Gate approvals **Figure 2**

[19] Source: The Strategic Defence and Security Review and the National Security Strategy Sixth Report of Session 2010–12 HC 761 August 2011

1.35 Bernard Gray had, for his 2009 report[20], access to more cost data and examined a wider group of projects across both their Assessment, Demonstration and Manufacture phases. He determined that overall cost outturns for the two phases together were as much as 40% (adjusted for equipment volume) above those planned and that slippage was of the order of 80%. The mean changes in cost and timescale spilt between phases were as follows:

In phase Increase	Assessment	Demo & Manufacture	Total
Cost Growth	26%	12%	42%
Slippage	54%	18%	80%

Source: Gray - Section 3.2

1.36 The MoD has managed costs in two main ways, both of which have impacted the benefits expected when the project was approved. Production volumes have been reduced (e.g. Typhoon from 232 to 160 aircraft, Nimrod from 22 to 9 aircraft, fewer Astute class submarines) and programmes were delayed to spread the costs over more years, or to later years where the defence budget is less constrained (e.g. Terrier from EIS in 2008 to 2013). In this way, annual budgetary pressures were managed and the costs of some programmes were brought under control. Just recently, we have seen the current Government: postpone the Main Gate decision for Trident post 2016; plan to equip just one of the two aircraft carriers they are constructing; cut the number of Chinooks purchased from 22 to 14; and announce plans to cut the size of the Joint Strike Fighter fleet.

[20] Source: Review of Acquisition for the Secretary of State for Defence, 2009

Euro-fighter Typhoon - Complex international collaboration leading to delay and large cost increases

In 1985, after an earlier failed attempt to develop a Europe-wide fighter project, the UK, West Germany and Italy agreed to start the Euro-fighter. They were later joined by Spain. When the programme started, the cost was to be equally shared by both Government and industry, but this changed to being fully funded by governments with complicated funding and work-share arrangements. This increased costs and slowed down decision-making.

In 1990, the selection of the aircraft's radar proved a further complication, with two options being argued over. This resulted in the UK having to make concessions to achieve a solution. This was an example of the convoluted and slow decision-making process between the four parties, each with their own political pressures, military requirements and industrial policy objectives.

The programme cost to the UK rose from £7bn in 1996 to £20bn (estimated by NAO) in 2003, the date of the first delivered aircraft. The programme was 54 months late. The development costs on a comparable basis have doubled to £6.7bn. Recently, the number of aircraft to be bought by the UK has been cut from 232 to 160. Hence, the aggregate cost of development plus production, for each aircraft has risen by over 75% to £125m per aircraft.

1.37 Pushing expenditure into later years has been a long-established practice at the MoD. More recently, it was partly responsible for the progressive build-up of the bow-wave of projects and the mis-match between planned spend and funding in the period between 2010 and 2020. The Government claims that this forecast overspend was addressed by the departmental expenditure reductions announced in the 2010 SDSR, but this is true only to an extent. With defence spending increases of 1% pa from 2015-2020, it is estimated that the gap between demand and defence funding in the period exceeds £10bn, especially when you consider the ring-fenced commitment to Afghanistan (in which expenditure is assumed to reduce) and the looming completion of several projects in the middle of the decade[21].

1.38 In this context, where the Government faces a new affordability problem going forward, real reforms are urgently required.

[21] Source: Malcolm Chalmers in "Unbalancing the Force?" – RUSI 2010

2010 Major Project Report - Projects within 2 years of planned EIS (all costs in £ million)

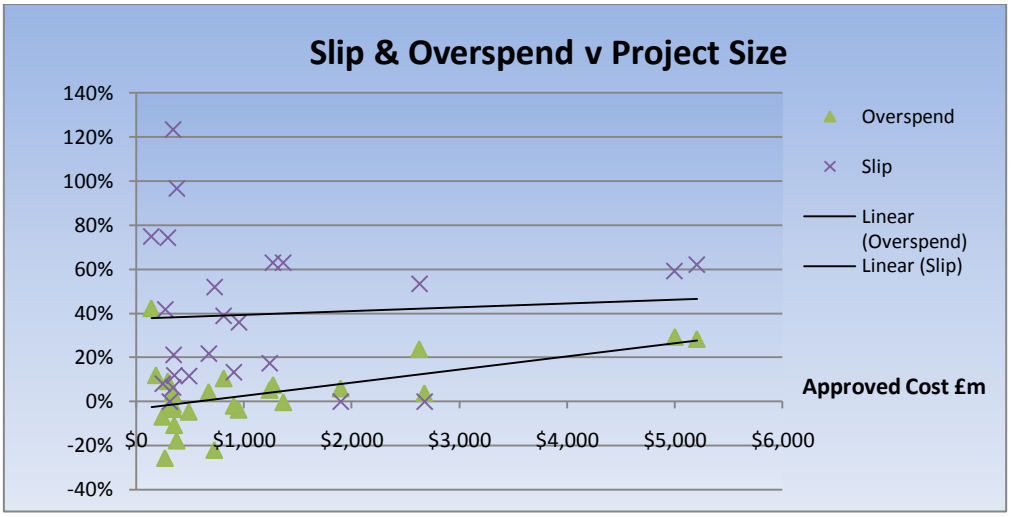
Project:	Planned	Forecast	Overspend	Cost +%	Baseline	Slip %
A400M	£2,628	£3,251	£623	24%	137.00	53%
Astute	£5,204	£6,677	£1,473	28%	98.00	62%
BVRAM	£1,240	£1,305	£65	5%	132.00	17%
Falcon	£354	£316	-£38	-11%	51.00	12%
Nimrod	£2,813	£3,602	£789	28%	45.00	253%
T45	£5,000	£6,464	£1,464	29%	66.00	59%
Typhoon	£17,115	£20,627	£3,512	21%	133.00	41%
UKMFTS	£952	£916	-£36	-4%	25.00	36%
Watchkeeper	£907	£889	-£18	-2%	60.00	13%
Total	**£36,213**	**£44,047**	**£7,834**	**22%**	**747.00**	**52%**

Major Project Performance – NAO 2010 **Table 2**

1.39 The range of major project performance variance in 2010 is wide, with several projects exceeding their planned spend by more than 20%: Type 45 destroyer (29%), Astute submarines (28%), A400M transport aircraft (24%) and Typhoon (21%). The spread of project slippage is wider with six projects exceeding 33% slippage: Nimrod MR4 (250%), Astute (62%), Type 45 destroyer (59%), A400M (53%), Typhoon (41%) and Military Training Flying System (36%).

1.40 In the UK, programmes are rarely, if ever, cut in their entirety (Nimrod MRA4 being a recent and notable exception) when their costs increase substantially. It is more usual for projects to be slipped once and then slipped again. This approach not only risks early obsolescence but it often ensures further cost increases as the design team needs to be retained during the longer project period. Although it is well known that delay costs large sums of money, it is a strange fact that MoD tries to 'save' money by a strategy of project delay.

1.41 Considering MoD's major projects over the period of 2003-2010 (see Figure 3, which excludes Typhoon and Nimrod because they distort the sample), there is little evidence that size (as represented by the costs approved at Main Gate) is more than a very weak factor in project slippage, with mean slippage being between 40 and 50%.



Source: NAO Major Project Reports

Major projects - Slippage and Overspend trends **Figure 3**

1.42 The two main reasons for project slippage seem to be failure to identify and enforce controls on budget and timeline at an early point in the programme cycle and a policy decision to delay projects to accommodate short-term budget pressures.

1.43 Defence procurement is not without its problems in other countries. Similar major project data for the US DoD shows projects are on average late by 40% and overspend was on average greater than the 10-20% experienced by the UK MoD[22].

1.44 The Gray Report[23] analysed similar data in more detail and made recommendations for change in the budgeting and planning of the MoD. We expect the majority of these recommendations (see Table 3) to be implemented now that he has been appointed as Chief of Defence Material (CDM), responsible for all equipment procurement and support. The subsequent report by Lord Levene into the Structure and Management of the MoD, Defence Reform, 'An Independent Report into the Structure and Management of the Ministry of Defence'[24], clarified the responsibilities for equipment planning and budgeting, elevating the position and responsibility of the CDM. These are sensible reforms which will provide a good basis for addressing the planning and budgeting problems of the MoD.

[22] Source: "A Closer Look at Acquisition Performance" - RUSI

[23] Source: Review of Acquisition for the Secretary of State for Defence, 2009

[24] Source: An Independent Report into the Structure and Management of the Ministry of Defence, 2011

Problem effect	Prime Cause	Gray Recommendations
Unaffordable Procurement Budget & Plan	Too many programs	Strategic Defence Review to be held in the first session of a new Parliament
		A rolling 10 year budget should be agreed for the MoD
	Specification creep	An Executive Committee of the Defence Board should be formed to be accountable for an affordable Equipment Programme
		Clarify roles and create a real customer-supplier relationship between the capability sponsor and project delivery
	Cost over runs ~40%	Revise aspects of the Approval process to improve decision-making
		Further cost reductions within in-service support should be pursued vigorously and the aspirations of TLCM should be reappraised
	Program delays ~ 80%	Improve the ability of DE&S to deliver efficiently on new equipment and support
		Change the status of DE&S

Summary of Gray's Analysis and Recommendations **Table 3**

Labour's business policy review

1.45 The Defence Procurement Review takes place within the wider context of Labour's Business and Enterprise Review, led by John Denham. The global recession revealed an economy that is too vulnerable to global shocks. Growth in the UK economy has become too dependent on a few key sectors, and a small number of regions. It is unfair in the way that it shares the rewards of growth and how it allocates economic risks. It faces growing competitive threats from the global economy and the pace of technological change.

1.46 In the coming years, we must address these significant challenges:

- As global competition intensifies, how will we pay our way in the world?
- How can we build a more resilient economy, which underpins - not undermines - our national and local communities?

- How can we ensure that future economic growth is generated more inclusively, and the fruits of this growth more fairly shared?

1.47 We must build an economy that is competitive abroad and fair at home, more balanced and inclusive in how and where it generates growth, and in who benefits from it. The growth we need must be private sector growth: private companies succeeding in fair competition in fair markets; an entrepreneurial culture with more people setting up businesses, running businesses and growing businesses.

1.48 Future success won't come from governments retreating or doing as little as possible. It will come from following three principles, which we plan to explore further:

- **Active, intelligent government**:

  Government setting clear direction, understanding with business where our future success lies and how it can be realised. The Labour Government ensured that there are areas of real strength to build on: the creative industries; defence, aerospace and other advanced manufacturing; pharmaceuticals; business services; and higher education among others. These are generally high-paying sectors generating good jobs and producing goods and services that are competitive in global markets for which demand is likely to grow. The challenge is to make much more of our economic activity 'leading-edge' – globally competitive abroad across a broad range of goods and services, and offering good, well paying jobs.

  Government should use every tool at its disposal to create the conditions for private investment and strong private sector growth, particularly in key sectors of the economy.

- **Reforming the machinery of government:**

  Ensuring Government is better equipped to understand what business needs and to deliver the coherent, consistent, stable and predictable policy environment needed to make long term investment decisions. There are certain factors which deter investment or make it more expensive: uncertainty about public policy; confusion about what Britain's economy will look like in the future; fear that policy will change arbitrarily and unpredictably.

- **Supporting the growth of more 'good companies':**

  Our economy should comprise companies of all shapes and sizes that are innovative, investing for the long-term, and committed to the country and the community. Governments cannot tell individual businesses which strategy or business model they

should pursue. But governments can shape the environment in which these choices are made, increasing the rewards to a business of pursuing high value, fair and socially responsible strategies. With businesses investing more in their workforce, the need for more risky government solutions becomes less. With work more rewarding, the need for government to compensate for the failures of the labour market becomes less.

Going forward

1.a.1 The crucial role the defence industry plays in the UK economy is clear, generating inward investment and employment. This underlines the need for a clear strategy of support.

1.a.2 Attempts to design such a strategy have to date faltered. The *Defence Industrial Strategy* and the *Defence Technology Strategy* applied the right principles and were the correct direction of travel for policy development. In particular, identifying the capabilities that are strategically important to the UK by focusing on improving procurement systems and linking R&D with procurement and defence priorities were breakthrough approaches which must continue. Procurement reform in the form of SMART acquisition was also important and the themes will echo in any future reforms. Each of these attempts at reform, however, did not implement the lasting change that was necessary. The current Government has cited inadequate funding for the perceived limited success of the DIS and the DTS, but it is clear that the required cultural and systemic change necessary was not implemented.

1.a.3 Under the current administration it seems efforts have stalled. The focus of the Green Paper is solely on competition without clarity on how industry or an export market will be stimulated. It is essential that the principles and efforts which characterised previous attempts at reform are taken forward to achieve lasting results.

1.a.4 Delivery delays and cost-over-runs have become systemic, particularly among major projects, where the impact is greatest. The procurement system is not as effective as it should be and greater efficiency can be found by process, structural, and cultural change. The current funding restraints and those going forward reinforce the need for this.

Part 2: Balancing the Defence Equipment & Support Budgets

Balancing the budget

Financial planning horizon

2.1 Severe pressures on defence budgets over the last 30 years, combined with poor programme performance, has led to budget over-runs becoming endemic. These failings have been reported and analysed by the National Audit Office (NAO) in its annual reports[25] and in Bernard Gray's 2009 report into defence acquisition[26].

2.2 The MoD is unique in government departments in having such a large and important element of its spending in major long-term projects and many of the problems stem from the stretched nature of forward equipment budgets. Most major defence projects last for more than four or five years from approval (Main Gate) to Entry Into Service (EIS). The period before Main Gate, in which technical studies and procurement options are developed, may also take several years. The total project timescale is normally eight years and can extend beyond a decade.

2.3 As projects usually exceed government spending review timescales of four to five years, failure to control current programmes can have a knock-on effect on future defence budgets. One way the MoD has managed programme budgets that threaten to overspend has been to slip individual projects so that some of their spend falls into future spending periods[27]. And the projects that are planned in the period beyond the spending review horizon, or projects that slip into this period, do not seem to get the same level of financial scrutiny as current projects. This lack of control can lead to the build up of unaffordable projects.

2.4 It is clear that the financial framework in which the MoD plans procurement requires attention. In our view, the best approach would be for the MoD to move to ten-year financial planning horizons and a ten-year committed envelope for major procurements. This would limit the expectation that projects beyond the spending review horizon can be accommodated into future spending periods because they have been approved at either Initial or Main Gate. It would also enable MoD planners to consider the affordability of new projects and give the defence industry more information against which it can plan its investment and developments.

[25] Source: NAO Major Project Reports, 1998-2010
[26] Source: Review of Acquisition for the Secretary of State for Defence, 2009
[27] An example of this kind of delay can be seen in the Terrier project, which was 55 months late against a plan of 74 months – a delay of 74%.

2.5 In his report into defence acquisition, Bernard Gray agreed with this analysis and recommended that the MoD should move to a ten-year rolling budget as soon as possible. The previous Government accepted his recommendation and in a Written Ministerial Statement[28] to Parliament on 15 October 2009, the Defence Secretary at the time, the Rt Hon Bob Ainsworth MP, committed the Government to planning "equipment expenditure to a longer time frame, with a 10-year indicative planning horizon for equipment spending agreed with the Treasury". In our view, this was the right approach the current Government has missed an opportunity by not taking the proposal forward.

Matching ambition to resources

2.6 With programmes that extend over years and even decades, the MoD has tended to shift or extend scope in the face of changing threats or evolving technology. The question is whether a system should be delivered to budget with a baseline capability and enhanced later, or delayed so that more complex capabilities can be added to make it the most capable system possible.

2.7 In recent years, the MoD has repeatedly gone down the route of buying the best possible equipment or system with major impacts on cost and time. Given the choice between technological excellence or larger numbers of less technically capable equipment, the decision has invariably been for the more capable and costly approach.

2.8 The small quantities of equipment that the UK needs to procure can also promote this tendency for the MoD to seek the most technologically advanced military capability. This is reinforced when delays in procurement programmes result in reduced equipment volumes to meet budget targets.

2.9 The main task in relation to equipment and support is to match requirements with the best possible options for delivery. In our view, the MoD should avoid the practice of buying 'exquisite systems' at any cost and move to acquiring systems that provide value within the current financial constraints. The essential starting point for this decision should always be that 'fit for purpose', rather than over-engineered equipment, must be bought to meet, in total, the military requirement.

2.10 Delivery of equipment programmes that meet the need within existing budgets is the priority. Too often, scope creep has led to the MoD seeking systems which exceed the

[28] Written Ministerial Statement, Defence Acquisition (Independent Review), The Secretary of State for Defence, Mr Bob Ainsworth, 15 October 2009 - http://www.publications.parliament.uk/pa/cm200809/cmhansrd/cm091015/wmstext/91015m0001.htm#09101539000068

current identified need in the desire to meet future but undefined threats and ensure we make use of all available technology. While, in essence, admirable, this scope creep leads to time delays and the result is that our Armed Forces on the frontline receive their kit much later. The 'exquisite system' projects often seek to deliver equipment which cannot be afforded and may never by delivered, meaning that troops use for longer the equipment of yesterday rather than tomorrow.

2.11 The MoD has to ensure the value-based solution is adhered to rigorously. To do this, capability managers setting out the military requirements need to recognise that they have a fixed amount of money over a certain period and that the current level of funding has to cover their whole range of capabilities. We recognise that this change will be difficult to achieve[29], but only when equipment capability teams start to recognise the constraint of cost, will more progress be made.

Type 45 destroyer – an example of failed collaboration which was followed by the pursuit of new requirements irrespective of cost

After the failure of the earlier NATO Frigate Replacement (NFR90), France, Italy and the UK issued a joint requirement in 1992, combining the "Horizon" frigate and a new Principle Anti Air Missile System (PAAMS) into the common new-generation frigate (CNGF) programme. Differing requirements caused issues: France and Italy wanted limited range air defence systems to protect carriers, but the UK wanted a large defensive footprint to protect multiple ships. Changing requirements and technological issues caused further delays between 1995 and 1997 and a disagreement over the Vertical Launch System (VLS) for the Aster missiles led to more compromise.

In 1999, the UK withdrew from the CNGF project due to the differing requirements and started its own project, the Type 45 destroyer, which would bring the investment of the PAAMS system with it. The type 45 destroyer, a much larger and more costly ship, entered service two years late in 2009 and £1.5 billion over its original budget (of £5 billion). As an air defence warship, HMS Daring (the first in the class) first entered service without the PAAMS air defence system, which was further delayed by failed sea trials.

Because of the increased unit costs and budgetary constraints, only six, rather than the intended twelve, Daring class destroyers are to be built, leaving the Navy with fewer warships to cover the required range of roles.

The conspiracy of optimism

2.12 The MoD's record of weak defence procurement projects is made worse by the insertion of new requirements with calculations of their costs underestimated. This is due to unrealistic assumptions or narrow definitions of the scope or requirement. Once studies for a new programme have started and commitment is gained, the requirement is widened and

[29] See DIS the next year – Political, Organisational and financial Issues – Sir J Blackham City Forum January 2007

more realistic costs become evident. A new requirement starts with thin wedges of cost studies in the hope that funding will be found for full development when the requirements and the options have been considered. This 'conspiracy of optimism' effectively sets programmes up for delay and can seriously effect financial planning.

The structure of the MoD – ensuring clarity of roles and accountability in financial planning and budgeting

2.13 The equipment requirements of the Armed Forces are connected to their military capacity and ability. It is right, therefore, that the task of defining what is required to meet possible future threats, as well as threats indentified in defence reviews, are undertaken by military personnel. The key question is how the MoD should be structured and staffed to ensure clarity of roles and accountability in financial planning and budgeting. This needs to include how to select and train military personnel, and, given the long timescales between making decisions and the delivery of equipment, how to ensure they feel responsible for the requirements and value for money.

2.14 The first step towards solving these problems is to re-structure the MoD in order to reinforce the roles and responsibilities of those within each department. In his recent report, Lord Levene[30] highlighted this lack of clarity within the MoD and proposed that defence procurement decision-making be separated along the lines of: a directing Head Office, the individual services and Acquisition:

- Head Office, setting strategic direction on capability, making policy and strategy.

- The individual services, generating and developing their services, balancing spend between different capability areas, including between manpower equipment and training.

- CDM/DE&S, acquiring and supporting equipment, systems and commodities under a firm commitment/acceptance programme agreed with the services.

2.15 We support these recommendations. However, Lord Levene's report sought to tackle the problem from the 'top down', dealing with the motivation of the top players in defence acquisition from the Defence Board down to the Service Chiefs. Though this is a valid starting point it is important that these changes are rigorously implemented throughout the MoD, not just at the top, in order to deal with the motivations of the entire procurement staff.

[30] Source: An Independent Report into the Structure and Management of the Ministry of Defence, 2011, page 13

2.16 These issues are discussed in more detail in Parts 5 and 6.

Changing behaviour

2.17 Breaking the cycle of over-spends and slippage will not be easy. Everyone in the defence planning chain has an interest in the current high-technology, high-cost approach. Only by changing the planning and budgeting conditions in a way that affects the motivations of the decision-makers will better balance be brought to defence procurement plans.

2.18 Overambitious assumptions, which lead to an overstretched budget, are the result of decisions made by several different groups: military requirement teams, financial planners and procurement teams and industry. Each of these groups has an interest in maximising the use of the defence budget and to achieve and sustain different behaviours, they all need to see the advantages of restraint and the danger of maximising spend. This will require changes to the budgeting rules for major projects to make it rational behaviour for staff to manage cost and drive value for money. A new paradigm of 'Design to Cost' needs to be embraced at all levels.

- **Military requirement teams** usually select the equipment option with the most capability. The ground rules for requirement teams should become one of managing a long-term budgetary line, which is fixed in size, and trade-off one type of capability against another within a capability sector. For military requirement teams, a fixed expenditure envelope should be the pre-requisite for 'Design to Cost' at the highest level.

- **Financial planners and procurement teams** tend to consume the entire available budget. Financial planning in the MoD operates in 'stovepipes', with little ability for Integrated Project Team (IPT) leaders to transfer budgets from one project to another. This blunts any drive to make savings. In our view, a change in budgeting above the level of projects (i.e. programmes) is required to make saving a rational activity for IPT leaders.

- **Industry** tends to seek to maximise the size of any contract. Many years of experience has demonstrated to defence companies that delivered capability is more important to the MoD than cost. Changing this ingrained behaviour will require strong measures. Industry responds to the environment in which it is placed and a realisation that problem projects could be cut in their entirety would drive a better balance of value and technical performance by industry.

Changes required to alter the motivations of the key players in defence procurement

From: 'Exquisite systems' at any cost	**To: Design for value for money, in near the term**
Affecting:	
• Military requirements teams	A fixed amount of money – requirement meets need
• Financial planning & procurement	Savings on one project allows others to be funded
• Industry	Projects cut in their entirety if not affordable

Summary of review team recommendations for consideration in Part 2:

- The MoD should move to a 10-year financial planning horizon for equipment spending. This would limit the expectation that projects beyond the spending review horizon can be accommodated into future spending periods because they have been approved at either Initial or Main Gate. It would also enable MoD planners to consider the affordability of new projects and gives the defence industry more information against which it can plan its investment and developments.

- The capability that is defined should be able to enable the ambition, not exceed it. Equipment programmes should meet 100% of need and be delivered on time and within existing budgets. The idea that the 'best is the enemy of the good' should become ingrained within the MoD's procurement structures.

- The budgeting system needs to address the motivations of the key players in defence procurement, making it a rational decision for the main players to 'Design to Cost'. 'Design to Cost' trade-off with industry is a mandatory part of requirements setting and concept studies.

Part 3: Strategic 'Make-Buy'

'Make-Buy'

Overview

3.1 'Make-Buy' is the strategic choice whether to develop a unique or customised solution for a military requirement or to buy equipment or a system that is largely, or completely, 'off-the shelf'. 'Make-Buy' in the defence procurement context separates customised development ('Make') from buying systems or equipment already developed ('Buy'). With 'Make', the MoD can specify what it wants and with 'Buy', the MoD has to purchase and use what is available, accepting its limitations and constraints.

3.2 Hence, there are two types of equipment procurement:

- 'Make' – equipment that is developed by the MoD either alone or in collaboration with other countries.

- 'Buy' – equipment that is purchased largely 'off-the-shelf' from major US or EU system providers once they are defined or complete.

The choice between 'Make' and 'Buy'

3.3 The idea of categorising programmes in terms of 'Make' and 'Buy' relates to the different choices that customers and suppliers have in a market where decisions are constrained and their effects are long-term. 'Make-Buy' decisions operate in the context of a high level staged and gated process, which includes these main elements:

- Concept definition and options trade-off;
- Project definition and approval, including the programme/project 'Make-Buy' policy;
- Either:
  - For 'Buy': procurement selection by competitive assessment and/or commercial competitive tender;
  - For 'Make': vendor selection based on concept and capability or competition, followed by a staged development programme leading to the acceptance of the design;
- Manufacture and delivery;
- In-service support to operation, with spare parts provided, local support and periodic major refits.

The costs associated with 'Make' and 'Buy'

3.4 The development costs of the 'Make' option are in general high with long development programmes whereas the 'Buy' option is more immediate with lower costs at the point of purchase. However, support costs for the 'Buy' option over the whole life of the equipment may well be higher.

3.5 Because of the desire to achieve the best possible goods and services for the front-line, there can be a tendency to demand total compliance to an exact specification defined to meet UK-specific requirements, rather than trade-off some of the requirements to achieve a better designed product overall, delivered in a timely manner.

3.6 This may well result in equipment to be bought 'off-the-shelf'. 'Make' aimed at addressing an exact specification plans can be un-realistic because they are produced assuming the shortest possible timescales and lowest price points to help justify the selection of a bespoke solution.

3.7 During the procurement of bespoke, complex equipment, events seldom run smoothly and delays, scope creep and overspend can occur. With the benefit of hindsight, many project managers would prefer to have delivered something truly valuable more quickly, rather than having tried to deliver the perfect system only to see it suffer massive delays and cost over runs.

3.8 In the context of a reducing the number of defence suppliers within the defence industry, combined with a desire to employ competition to ensure value for money, decisions between 'Make' and 'Buy' are increasingly important.

'Make-Buy': the context and challenges

3.9 The UK market in defence equipment has been reduced over recent decades. Competition to achieve value for money has led to consolidation. In many cases, new equipment is ordered after a gap of many years and failure to win a new competition can put companies under stress. Unless there are substantial export opportunities or closely related commercial activities, some suppliers may be forced to consider selling or closing their military business as a result of the high costs of retention and the prospect of future orders from the MoD being too remote.

3.10 The MoD has encouraged consolidation in the past with the selection of prime contractors to lead and integrate weapon systems and complex equipment. This means that

choice is now reduced. In many cases, the UK only has a single supplier of a particular type of system or equipment. And for more costly and complex equipment and systems, the need for large investment in technology and the desire for economies of scale has led to either the MoD purchasing from abroad (often from the US) or collaborating with other countries in which UK companies share the development, production and support work. This was the case with the Euro-fighter, where simultaneous requirements from several European countries for replacement fast jets led to a collaborative programme to satisfy the requirement while spreading costs.

3.11 Within this context, there are a range of forms that 'Make' and 'Buy' procurement strategies can take. With 'Make' procurement for specialist and protected sovereign capabilities, the MoD can design new systems from scratch, such as the Astute class submarine. Alternatively, it can choose to adapt a system which has been produced before. An example of this would be the Phantom fighter-bomber, which was bought from the US, but with UK engines and British-made avionics.

3.12 'Buy' can simply be ordering military equipment or systems produced by another country with adaptation for the minimum set of essential UK requirements[31], or a case of the equipment or system being modified or 'anglicised' to suit a UK operating and support model.

3.13 The 'Make-Buy' process takes into account both the range of suppliers that are available and the importance of the technology or capability in developing or producing each type of equipment or system (see Figure 4). Different commercial policies and 'Make-Buy' approaches can be followed according to these factors. (Strategic 'Make-Buy' and commercial policy is discussed further in Part 4.)

[31] For example, the C-17 transport, where almost every aspect of its operation and support was accepted as the US model.

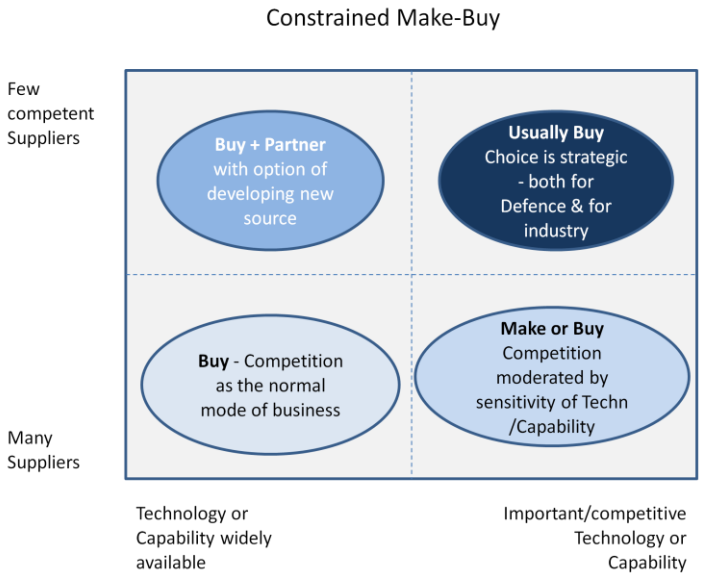


Figure 4

3.14 The main exemption from this approach is the integration of weapons into a platform. This is recognised as a generic capability, important to defence. It allows the UK to purchase sub-systems and equipment from abroad but employ them in a UK-specific ship or aircraft systems, such as the Passive Infra-Red Airborne Track Equipment (PIRATE) system[32]. This approach allows the system created to be optimised and aligned with the UK's military modes of operation. The policy can be attractive to the military, though it is often expensive and very time consuming.

3.15 For such systems it is the customary, though not exclusive[33], approach for the platform provider to be the same company as the system integrator. This is entirely reasonable for an aircraft, where every part of it is optimised for the mission, but less relevant for ships and some military systems where the platform is of less significance and could be purchased with the sub-systems integrated to produce a system in line with the requirements.

'Make-Buy' and competition policy

3.16 The MoD has had a policy of procurement by competitive tender for over 25 years. Despite this, only around 30% (by value) of major project spend is achieved by competition. There is greater competitive tendering in the supply chain below the prime contractor. For smaller contracts, and for more standard equipment, the proportion is higher, but for complex weapons systems, there is often no effective market and technology choices drive buyers towards a particular system.

[32] The PIRATE system is an infrared search and track system (IRST) on the Euro-fighter produced by a European consortium.

33 For example, the Merlin ASW helicopter.

3.17 We support the use of competition for defence procurement where the equipment can be clearly specified and there is an effective market. Where there is no effective competition, this should be recognised and the 'Make-Buy' strategy should establish the basis for future developments and future procurements. (Aligning strategic 'Make-Buy' policy with competition policy is explored in more depth in Part 4).

'Make-Buy' as a baseline for planning

3.18 The importance of 'Make-Buy' policy is in providing coherence and stability to defence procurement. This coherence and stability is required both in planning the MoD's R&T strategy and in providing the basis for industry to decide whether and where it should put its research and business investment. The provision of clear plans for future procurement is a necessary condition for industry to plan their investment and take ownership of their sales strategy.

Aligning Research and Technology with strategic 'Make-Buy'

3.19 Alignment between R&T plans and a strategic 'Make-Buy' policy is crucial. Unless there is a realistic prospect and a commitment to 'Buy', R&T development will be wasted. The MoD's R&T funding is being constrained by declining defence spending in real terms (see table 4). R&T spending has been declining since 2007 and is unlikely to increase in the near future, especially due to the emphasis the current Government has placed on buying 'off-the-shelf' by the current Government. As a result, MoD R&T, by itself, is not able to cover a full range of technologies.

Inclusive of non-recoverable VAT at Current Prices (£ million)

	2003/04	2004/05	2005/06	2006/07	2007/08	2008/09	2009/10
Estimated MOD Equipment Expenditure	**10 886**	**10 754**	**10 974**	**11 672**	**12 380**	**13 386**	**13 174**
Capital Expenditure on Equipment	4 404	4 555	4 913	5 146	5 401	6 669	6 469
Equipment Support	3 804	3 623	3 542	3 793	4 272	4 292	4 212
Research & Development	2 677	2 576	2 519	2 732	2 707	2 426	2 493

Source: MOD Departmental Resource Accounts

Table 4

3.20 The MoD risks being left behind in the rapidly developing areas of IT, communications and software technology unless it finds a way of accessing and using technological

developments within new projects. Following the DTS[34], there was a drive to encourage more R&T spending by industry and to stimulate development by universities and small and medium enterprises (SMEs). The Centre for Defence Enterprise was established with a small budget and a remit to widen access to technology developed outside the defence estate. This example of good practice should be built upon to enable the MoD to access the large and rapidly developing commercial R&T sector with defined proportion of R&T spending is set aside to support SMEs.

3.21 Smaller companies often develop new technologies (e.g. active noise cancellation) and are important in leading innovation. An important aspect of an R&T strategy should be to identify and support such ventures with a clear eye on the potential for involvement in future 'Make' decisions.

The role of the Centre for Defence Enterprise (CDE)

The MoD is determined that front-line forces have the best battle-winning technologies for the future.

The CDE:

- Is the first point of contact;
- Accesses proof of concept funding;
- Makes rapid decisions;
- Supports and mentors SMEs.

Strategic 'Make-Buy' and defence spending reviews

3.22 A 'Make-Buy' strategy must ultimately be the result of a series of decisions about what type of military capability will be required and what type of procurement strategy should be employed. The strategy must, therefore, be linked to the regular defence spending reviews, which should state what future technology and what type of systems will be required in the next ten years. This should be viewed as the first stage of value for money thinking, in which the understandable desire to purchase the best possible systems is rationalised as a strategic plan that is both affordable and deliverable.

3.23 At times of constrained budgets, decisions about what is to be bought and developed is even more important. Because the number of systems developed will be small, these decisions cannot be one-off or isolated from the wider strategic defence imperatives as these decisions may destroy capabilities important to the UK. If the Government of the day makes a deliberate choice to exit an area of work because it has become less important or too expensive, that would be understandable, but it would be regrettable if a capability was lost due to happenstance.

[34] Source: Defence Technology Strategy for the demands of the 21st century

Sovereign Capabilities

3.a.1 The concept of 'Sovereign Capability' is, in our view, very important. It is crucial that the UK retains operational independence and autonomy for key capabilities, which are deemed vital to the defence of the country and our interests. Therefore, the construction and maintenance of these capabilities should take place within the UK.

3.a.2 The term 'Sovereign Capability' is often used loosely and with ambiguous meaning, which can be construed as a preference only to purchase only from UK companies. Such a policy of restricting defence procurement to UK companies would be damaging for defence procurement. The UK benefits from having the most open market for defence equipment in the world and this should continue. The UK also needs to work collaboratively with other countries with whom we share budgets, strategic support, complex and sensitive equipment and intelligence. In the same way that we benefit from an open market, we also benefit from open relationships.

'Absolute' and 'Deployment' sovereign capabilities

3.a.3 There are two forms of 'Sovereign Capability':

- **Absolute** sovereign capabilities are the small number of systems that are so sensitive or significant to national security that we must maintain the capability to design, construct, produce and support in the UK.

- **Deployment** sovereign capabilities are the systems that the UK can modify, upgrade, provide support and deploy even though the design and development of the equipment was initially conducted off-shore.

3.a.4 ***Absolute:*** Absolute sovereign capabilities are often very expensive because of the need to maintain leading technological skills and their production can be intermittent and low volume, unless export orders are won. It is likely, therefore, that the range of equipment and systems that are classified as 'absolute' will be relatively small. The UK only has the ability to independently develop capabilities where the:

- Requirement and the system is defined in a defence spending review to be strategic;
- The UK has developed leading technology which the Government is committed to maintaining through an industrial strategy;
- The requirement is not unique to the UK, and hence has export potential.

3.a.5 ***Deployment:*** The 'Make-Buy' decision is often more complex than just whether or not to buy from abroad. It is possible, as in the case of complex weapons systems, to buy from overseas but maintain the equipment in the UK. A 'buy and adapt' approach is one where the system originates from another country but support and logistics, where the development drivers are not dissimilar, are UK-sourced. This approach can be effective if there is a competent UK partner, but it depends on:

- An engineering and design capability which has been developed for related systems;
- The equipment supplier providing a trusted onshore capability;
- A large volume of spares and support equipment.

Sovereign capabilities and defence spending reviews

3.a.6 It is important that what is intended to be a sovereign capability is clearly defined in regular defence spending reviews. This will ensure that the strategic 'Make-Buy' policy is closely linked to defence ambition and threat assessments. This will also enable R&T to be targeted and allow industry to understand which areas they should invest in. Making the distinction between 'absolute' and 'deployment' sovereign capabilities is essential in order to guide industry.

Expanding Sovereign Capabilities for deployment

3.a.7 In recent conflicts that the UK has been involved, there has been a need to modify and upgrade equipment, either to meet conditions in theatre (e.g. modify tank and helicopters for desert operations), or to counter an emergent threat (defensive aids in Iraq and Afghanistan). The UK has had the capacity to respond rapidly to these needs through Urgent Operational Requirements (UOR), which have been used with great effect in Afghanistan and elsewhere.

3.a.8 It can be argued that better and more equipment should be able to accommodate this kind of flexibility and it is the role of the Equipment Capability teams to anticipate military developments and introduce features that make equipment, in some sense, 'future-proof'. However, there are limits to what can be foreseen. Even if a new threat is identified, the cost of making equipment fully capable of countering all possible conditions may lead to it becoming too complex and too expensive.

3.a.9 The capacity to upgrade and support military systems is an inherent part of UK defence. Where equipment is designed and developed in the UK, this capacity can be retained by other related work, either for the MoD or related commercial export. Otherwise, the MoD can retain dedicated teams and facilities for this purpose. Where the equipment is designed and developed abroad, the MoD can depend on skills and facilities in the country of origin or,

through a support contract, arrange for the essential knowledge and facilities to be established in the UK. In some cases, foreign countries may regard the technology as too sensitive, or too expensive to move abroad. UK dependence on a foreign country for crucial elements of its capacity to modify, upgrade and deploy its equipment is, however, problematic. When the UK wishes to deploy its forces, should the Government have to gain the agreement of other countries because of previous supply contracts? And if there is a clash of priorities between the UK and another country's requirements, should the UK have to take second place?

3.a.10 Because of these implications for UK freedom of action, we consider that there should be very few occasions where the UK does not develop and maintain the capacity to upgrade and modify its key military equipment and systems. Therefore, all off-shore/'off-the-shelf' purchases should be subject to a 'UK control' test that states that there must be UK-based engineering and upgrade capability in the UK capable of performing UORs on the equipment. Where a purchase is made, there should be engineering and design capability which has been developed for related systems and the equipment supplier should provide a trusted onshore capability and not be hindered by the priorities of other countries. The capacity to upgrade and support military systems is an inherent part of UK defence and must not be hindered by a lack of skills or capability to provide support.

Buying 'off the shelf'

3.a.11 A defence procurement strategy that emphasises competitive tendering above all else can be in conflict with the UK's need to export and develop a high added value manufacturing industry. Buying equipment off-the-shelf developed by others may well deliver lower purchase prices because of both the avoidance of R&D costs and the lower costs of larger production runs. However, while 'off-the-shelf' purchases should be a part of defence procurement, there are three major arguments to set against such potential savings:

- Defence systems are complex and can almost never be bought 'off-the-shelf' and used without costs associated with integration into UK systems (including command and control systems) and support capabilities, including engineering modification for operational need, safety clearance and release to service;

- The defence industry requires a critical level of capability to support the operation and enhancement of equipment and systems purchased from abroad. Without this level of capability, the UK will become a passive purchaser and user of foreign military equipment to the detriment of military flexibility;

- The defence industry is vital to the UK economy and a policy disproportionately reliant on buying 'off-the-shelf' could limit capacity and in turn put at risk the direct and indirect employment which depends on the defence manufacturing base;

- Defence exports are a major part of UK manufacturing exports (£7bn in 2010). Foreign defence forces will not buy equipment from the UK that is not used by our forces.

Supporting sovereign capability providers

3.a.12 While protecting flexibility within our equipment programme by increasing sovereign capabilities, it is also important too that industry suppliers are protected. Where the UK needs a 'Sovereign Capability', there is the possibility that companies become so focused on MoD business that it becomes in effect captive to the supplier. A steady flow of contracts and developments are then required in order to keep in operation what is considered as a national asset. This is in no-one's interest. The MoD does not have a duty to provide business to a specific company, and companies can quickly become uncompetitive and overly dependent on MoD contracts. It is the stimulus of exports, or related commercial business that can ensure defence contractors continue to improve and innovate.

3.a.13 To avoid such a situation, sovereign capability providers should ideally be companies which have at least 50% of their relevant business with customers other than the MoD, either in the export market or in closely related commercial markets. This would help to ensure that they would be a sustainable sovereign capability supplier and not reliant on winning every contract available from the MoD. Industry should recognise the importance of this fact and work with the MoD. Of course, the MoD would have the option of accepting a company with less than 50% as long as it is aware that the company could become captive, reliant on the MoD for business.

Exportability and 'Make-Buy'

3.a.14 Success in export markets should be a touchstone issue for defence procurement. The decision to invest large amounts of tax-payers' money in developing a new system, rather than buying 'off-the-shelf', should include the scope for export.

3.a.15 Exports not only bring money back into the economy – as can be seen with the success of exports in the air sector (more than 73% in 2009 and 72% averaged over the period 2003-2009[35]) – but exportability is also a good way of gauging if a proposed project will be effective and good value for money.

[35] Source: UKTI Defence and Security Organisation

3.a.16 Key elements to this approach would include having equipment that will be attractive to other countries and a good understanding of the competitive landscape. Because of the scope for conflict between the MoD and industry project managers about the design for export, both should have business cases that depend on export. Industry will not make its commercial targets without export sales and the MoD will have an unaffordable project unless exports are achieved. The tension of satisfying both UK and export requirements will drive decisions toward both effectiveness and value.

3.a.17 An export business plan should be developed as part of the Main Gate approval and one of the tests of a successful project manager should be the achievement of export targets. Of course, there will be a small number of systems that are too sensitive to consider exporting, but exportability should be a component of the initial assessment as part of the strategic 'Make-Buy' policy.

Industrial activism

3.a.18 After the global financial crisis of 2007/8, attention has turned towards the need for the UK to support a sustainable industrial base, rebalancing the economy towards science and technology and the associated industrial capacity, and exploiting high technology and high added value manufacturing. The previous Government's Industrial Strategy, New Industry New Jobs 2009[36] (see box – Labour Industrial Policy 2009 – *New Industry New Jobs*) reflected these new realities.

3.a.19 It remains clear that the UK economy needs to be based more on advanced value added manufacturing. Defence provides an important element that can contribute to achieving a new vision for industry. However, defence cannot stand apart from wider industrial strategy. Almost all the technology that is important to defence - aerospace, materials, electronics, computers systems and engineering – has wider applications and a much larger base in the commercial market. It is these wider markets that make certain technology attractive and that can make defence development affordable. Therefore, any defence industrial strategy needs to be considered within the structure of a broader UK industrial policy.

3.a.20 We believe the approach and principles that led to *New Industry New Jobs* is an ideal starting point for policy development. Equally, it is clear that a strong defence industry must play a part and a 'Make-Buy' strategy for the UK is essential to supporting the industry.

[36] Source: New Industry New Jobs, 2009

Labour Industrial Policy 2009 - New Industry New Jobs

The fastest-growing global product and services markets are, in many cases, areas where the productivity and trade performance of British businesses has been strong. However, as other economies respond to the same opportunities, or try to replicate the UK's strengths, the competitive pressure our businesses face will intensify

Our response in Britain to this pressure has to be to continue to raise our productivity, improve our resource efficiency and concentrate on developing comparative advantages at the top of global value chains. Two key elements will be critical:

First, a continued focus on ensuring that our economy is driven by **high levels of skills and creativity**. Britain is, and will continue to be, an economy driven by the creation and exploitation of knowledge. Over the last fifteen years the contribution of high-technology manufacturing and knowledge-intensive services to UK gross value added has increased steadily to over 40%. For this reason, any constraint on the ability of UK-based businesses to exercise comparative advantage on the basis of high levels of skills or knowledge must be regarded as a serious impediment to the UK's economic success.

Second, it will also be necessary to pay particular attention to **technological change** where this is reshaping industries and demanding high levels of innovation, skills and investment from those businesses who will ultimately lead in these markets. These include the shift to digital communications in vital network industries, a range of low carbon technologies and new processes in the chemical, automotive, aerospace and other industries. Businesses attempting to innovate in these areas will in many cases face particular challenges of finance, and the need to sustain development programmes over the long timeframes required to commercialise new technologies.

There are four immediate priority areas for action and reform in Britain: **innovation, skills, finance** and **infrastructure**. We must also continue to ensure that British businesses are able to **access growing global markets**.

Source: New Industry New Jobs, 2009, pages 10, 11 & 12

A Make-Buy strategy for the UK

3.b.1 Integrating the ideas outlined in the above sections, the UK should have a 'Make-Buy' policy with five tiers:

Commodity A **Single purchasing agency** in the form of the DE&S as a NDPB (i.e. not one each for the Services) which operates by competition to maximise the buying potential of common items used by each service. (This proposal is discussed in more depth in Part 6).

Specialised Buy Competition to buy **off-the-shelf** equipment and when there are at least three credible suppliers (this proposal is discussed in more depth in Part 4), purchasing from home or abroad narrowly on the basis of price. LThre will be little customisation or modification of the equipment for UK use, with the minimum but necessary training and support packages.

Strategic Buy Strategic 'Buy' is the purchase, normally through competitive tender, of equipment or **systems important in defence terms** because of their need for freedom of use, support or upgrade, for which on-shore or other special arrangements are required to ensure that Services can use and depend upon the equipment.

Strategic Make A relatively short list of **critical capabilities** (in defence terms alone), confirmed or updated at the time of the regular defence spending reviews, for which the UK will:

- fund the R&T;
- not compete contracts;
- have a plan to maintain the capability.

Because of the level of cost commitment, this list will be short and will need to be decided in future defence spending reviews alongside strong affordability criteria. This would then become the outline budget for the following defence spending period.

Defence Significant This would be a list of systems/capabilities in addition to the above where the **UK decides to compete** in technology and its export. Because of the need for a strong defence industry to support the above, and/or the opportunity for the UK to export defence equipment and/or leverage capability for commercial sales, the list would be confirmed or updated in defence spending reviews with no commitment to purchase specific systems or commit to a defined level of spend. For such capabilities it is recognised that UK-based capability is more important than UK ownership, but where owners are foreign, or based abroad, the relationship should be

managed actively by the MoD.

3.b.2 Correctly done, the strategic 'Make-Buy' strategy would ensure that the MoD is candid about matching strategic ambition, defence capability and military capability. It would also:

- Recognise that a lot of 'off-the shelf' equipment would need to be integrated into UK systems, the operational policy, training practices and procedures, safety systems and support and logistics programmes;

- Both supplement and complement the standard policy of open and international competition;

- Provide a baseline for procurement, for R&T spending and investment by industry;

- Identify and ensure sovereign capabilities are maintained, either in the form of a small number of critical systems or in the form of UK-based capability to upgrade for UORs and deploy.

Summary of review team recommendations for consideration in Part 3:

- Align strategic ‘Make-Buy’ policy and R&T spending with a defined proportion assigned to supporting SMEs.

- Develop a coherent, strategic ‘Make-Buy’ policy to sit alongside every defence spending review, matching strategic ambition, defence and military capabilities.

- Define ‘absolute’ and ‘deployment’ sovereign capabilities in each defence spending review.

- Ensure UK-based engineering, upgrade capability and UORs are provided and maintained for systems purchased offshore or ‘off-the-shelf’. This new criteria for purchase would be known as ‘UK control’.

- It is preferable for defence companies to have less than 50% of their relevant business with the MoD to become a sustainable sovereign capability supplier. If the MoD chooses suppliers with less than 50%, this should be coupled with the understanding that the company’s future capability to provide is based on its continued support.

- An export business plan should be developed as part of the Main Gate approval, and the decision to invest in ‘Make’ systems should be subject to scope for export.

- Establish a five-tier ‘Make-Buy’ strategy which comprises a single purchasing agency.

Part 4: Firmer and Fairer contracts with industry

Competition, commercial policy and defence procurement

4.1 It has been UK policy for more than 25 years for competition to be the usual means of letting defence contracts[37]. This position was re-iterated in the Government's recent Green Paper[38]. But despite this, our analysis of the MoD's major project data, reported in annual NAO reports, shows that only 30% of current major projects nearing their service date (by value) were let by competition. If so-called 'synthetic' competitions are included, this figure falls to less than 20%[39].

4.2 Where a sufficient market exists, open competition is the best procurement policy. This applies to smaller projects and routine services and is mandated for prime contractors when letting parts of a larger project to a sub-contractor. However, when procuring large, complex contracts, which dominate MoD expenditure, genuine competition is not always feasible. There is seldom an effective market, with very few defence companies having the technological and economic capacity to undertake the most complex projects. This reality has to be taken into account when developing the 'Make-Buy' policy. In our view, if there are less than three competent suppliers, the MoD should accept that there is no market for the equipment and adopt an alternative commercial approach. The creation of competitive situations by encouraging companies that do not have the resources or the record of competence in the area to bid should cease.

4.3 Even where competition is effective in establishing a major defence project, once the contract is let, the MoD is, to some extent, captive to requirement changes. Therefore, a firm commercial position is required, both for competitive and non-competitive contracts. The main challenge is to ensure that value for money is sustained throughout long acquisition and support programmes once the competitive pressure of an open market is no longer present. There are also challenges associated with maintaining the terms and conditions that achieve good value for money when dealing with companies that effectively

[37] This adheres to EU procurement law which requires competition to be the norm except when a national security case can be made. This policy is currently under review.

[38] Source: Equipment, Support, and Technology for UK Defence and Security: A consultation Paper, 2010

[39] Examples of 'synthetic' competition include the Astute submarine and later for the new Queen Elizabeth class carriers. In each case, the competition was somewhat synthetic and though a price was tendered the outcome was subsequently modified by negotiation with major changes to the contracting parties and the contract structure. These difficulties were caused because the original competitive tender exercises were based on a false assumption that there was an effective market in capital ships.

become monopoly suppliers, either because there is no credible alternative or it is dictated by national security reasons.

Astute class submarine – an example of a synthetic competitive tender exacerbated by a lack of skills due to a long gap in submarine procurement

In 1991, the Royal Navy approved studies to define the batch 2 Trafalgar class submarines. The subsequent studies and bidding process detailed an equivalent boat with enhanced capabilities. In 1997, the MoD ordered three Astute class submarines to replace the current attack submarines after a long and somewhat contrived, competitive tender exercise. This order for £2 billion was awarded to GEC-Marconi Ltd (later bought by BAE Systems). Due to difficulties (listed by the NAO as "exceptional") arising from the introduction of a computer aided design system, the unavailability of trained staff and poor project management, the programme was delayed and its costs rose.

Two linked issues were key:

- BAE Systems acquired the contract when they purchased GEC-Marconi, who had recently bought VSEL, the submarine builder. The industrial leadership of the programme changed frequently with several different managing directors of the shipyard within the space of a few years. This resulted in confused management and a lack of communication with the workforce.
- The loss of engineering capabilities and specialised skills at the Barrow site due to the long gap in ordering after the Vanguard class submarines.

In 2003, BAE Systems and the MoD funded an increase of £680m to the development costs. Further cost increases were agreed in 2007 due to changes in the design, requiring more materials and inflationary costs.

The Astute class, defined as Batch 2 of the Trafalgar class, is over 10 meters longer, has an increased displacement of 2,600 tonnes and a weapons carrying capacity 50% larger than HMS Trafalgar - a dramatic change to the requirement, much of which occurred after the contracts had been signed.
In total, the programme was £1.35 billion (53% in real terms) over budget and 57 months late in 2009, with a forecast total cost of £3.9 billion for the first three submarines.

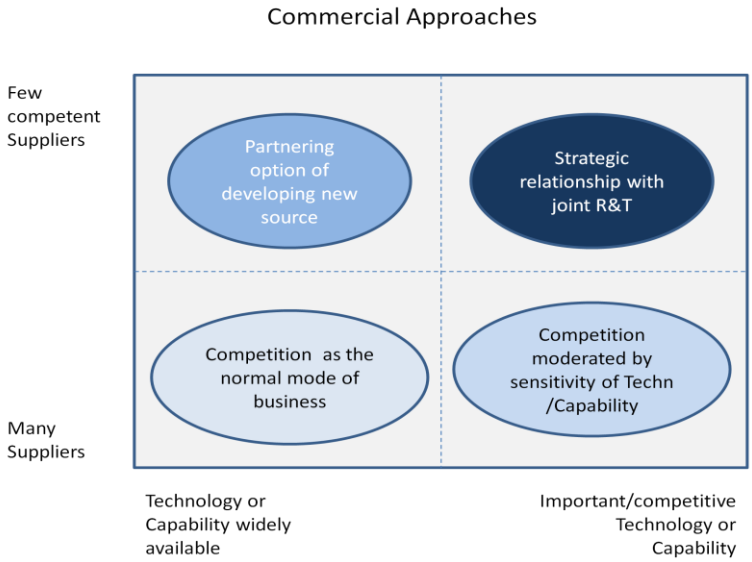


Figure 5

4.4 There are two broad ideas for meeting these challenges: **tougher commercial conditions** and **partnering agreements with industry**.

Managing contracts - tougher commercial conditions

4.5 Setting tougher commercial conditions for defence acquisitions requires setting tough cost benchmarks, making actual costs visible and the wider use of incentives to encourage companies to innovate and perform.

4.6 Open **competitive tendering** should be used wherever the requirement can be defined so that the acquisition can be priced with low risk. This should apply to the majority of purchases. However, when there are not enough competent suppliers, or the required capability is strategically important to UK national security, **'fixed-price' contracts**[40] should be the norm[41]. 'Fixed-price' contracts aim to incentivise the supplier to reduce costs and manage the project in a timely manner. In addition, this type of contract can discourage the MoD from repeatedly modifying the specification.

[40] 'Fixed-price' contracts - when the amount of payment does not depend on the amount of resources or time expended.

[41] Target-cost contracts exist, but have not been widely used by the MoD because of a concern that they are a disguised form of reimbursable contract without the sufficient incentives for the contractor to improve and perform. Unless the limits for success and failure are set further apart, and the contracts managed better, they will continue not to live up to their potential.

4.7 When the requirements of a programme do have to be changed, an **'Open Book' arrangement** with the allowable profit should be used with the supplier to ensure complete cost transparency. This is the case for both competitively tendered projects and projects awarded without competition. Using an 'Open Book' arrangement for requirement changes is a good way of helping to maintain commercial incentives. Contractors are fully compensated and the MoD is not exploited by unjustifiable price increases.

Best Practices in non-competitive contracting:

- Recognise when there no effective market;
- Better definition of requirements, and more professional supplier management than competitive situations;
- Build own 'should-cost' models – challenge suppliers estimates;
- Fixed price contracts with open book for change;
- Be pragmatic about agreeing prices but always have a walk-away position;
- Understand the leverage of the long game – there is always another contract.

4.8 A **cost plus contract** should be used instead of a 'fixed-cost' contract for a very small number of advanced technology projects and open-ended development contracts. And because there is little incentive for contractors to agree prices for what they might see as risky work at an early stage, a payment limit (e.g. 90% of a target price) should be set, which will be all the MoD pays if a price is not agreed. This type of incentive has been used with success in Israel.

4.9 For contracts that are loosely defined in scope or requirement, a Target Cost Incentive Fee (TCIF) should be applied until the full requirements can be tied down. Providing that the TCIF is set at a challenging yet achievable level, this will provide an incentive to the contractor to reduce costs and final prices.

4.10 Finally, setting tough cost benchmarks to challenge suppliers involves using **'should-cost' estimates**. 'Should-cost' estimates deal with the calculation of the cost of un-priced or additional work, taking historical data and analogies between current and previous projects into account.

4.11 This overall approach that we have outlined aims to provide significant incentives and penalties to ensure that contractors perform. By accepting more responsibility[42], defence companies would be able to take more risk in exchange for the opportunity to generate higher levels of profit than the Government Profit Formula[43].

[42] This transfer of more technical control to industry can be balanced by performance warranties.

[43] The Government Profit Formula (GPF) incorporating the 1968 Memorandum of Agreement between the Government and the CBI and subsequent revisions and changes since that time, as agreed between the representatives of Government and the CBI.

A suggested mapping between 'Make-Buy' and forms of contract is given in Table 5.

Purchase type	Competitive tender	Single tender fixed price	Target cost incentive fee	Cost plus fee
Commodity	√	-	-	-
Specialised Buy	√	Follow-on contracts	-	-
Strategic Buy	√	Follow-on contracts		
Strategic Make	-	√	Refining the scope	Technology & open ended development
Defence Significant	-	√	Refining the scope	Technology & open ended development

Commercial Options linked to Make-Buy Strategy **Table 5**

Managing contracts - Partnership agreements

4.12 Partnering with industry is an approach adopted between MoD and its suppliers in order to cut timescales and reduce overlap and overheads. This approach emphasises collaborative working with contracts that provide incentives for higher levels of performance and is characterised by the agreement of objectives, joint decision-making, a commitment to continuous improvement and, most importantly, shared risk and reward.

4.13 Partnering agreements were seen as the way ahead under SMART procurement as it can enable value for money trade-off between requirements and budgets. Partnering agreements have been used with success for support contracts, however the case for partnering can be complex and it is often considered second best to 'fixed-price' by open competition. This is, perhaps, the incorrect approach for a sector with a limited choice of sources.

Effective Partnering

Successful partnering can prove to be extremely effective at cutting costs, speeding up delivery and simplifying contracts:

- Partnering contracts with MBDA UK have provided in-service support for missiles with great success under the REVISE project (Revolutionary In-service Support Environment).
- Partnering with Augusta Westland for the Sea King helicopter integrated an operational support contract which replaced 60 individual contracts with over 30 suppliers, saving over £5 million a year.
- Similar partnering ideas in support have cut the response times and costs for Tornado support ATTAC and similar work is being developed with Babcock, BAE Systems and Rolls-Royce for submarines.

Benefits of partnering include: reducing administration and bureaucracy; more rapid turnaround; the ability to adapt as the circumstances change; a reduction in the contingency set aside by each participant; and an overall reduction in cost.

There are, however, some difficulties too, such as: implementing a trusted performance measurement system; having a sufficiently mature design at the start to prevent complications; and, most importantly, how to measure the performance and benefits of the project.

4.14 Alliances between defence contractors (and occasionally with the MoD) for a project that has complex interfaces and technological uncertainty, should also be to be considered for support and development contracts where there is no effective competition. This approach shares the risk and reward and allows interfacing problems to be addressed.

Summary of review team recommendations for consideration in Part 4:

- Competition should be used where there are alternative equipment or systems to be purchased and there is an effective market with at least three competent suppliers.

- 'Fixed price' contracts used as the norm for either whole projects or piecemeal across the contract, with pressure added by a '90% cost rule' where prices cannot be agreed.

- De facto and actual monopoly suppliers should operate with 'open book' contracting once a contract is let.

- 'Should cost' estimates for projects should be used and include productivity improvements that have been achieved from previous programmes.

- Greater incentive rewards capable of being earned by the contractor for taking on risk within projects.

- Industry provides higher warranties for performance and should be able to earn greater profits on the successful delivery of big contracts.

- Alliancing and Partnering principles to be considered for development contracts where there is no effective competition, as well as for support contracts.

Part 5: Procurement Process & Efficiency

Time and cost

5.1 The procurement of large, complex, often bespoke systems over many years can be subject to significant delay, cost escalation and expansion of scope[44]. The challenge is how to minimise or eliminate these delays and shifts in scope which by definition increase costs and deny up-to-date capability to the Services.

Future Strategic Tanker Aircraft (FSTA) procurement – an example of the MoD embarking on a large PFI procurement programme which led to scope creep and delays

In March 2008, the MoD agreed a contract with AirTanker for an air-to-air refuelling and passenger air transport service to replace its 24 Tristar and VCIO aircraft with 14 converted A330 commercial jets. This programme is called the Future Strategic Tanker Aircraft (FSTA) and is being procured through a 27 year, £10.5 billion, Private Finance Initiative (PFI) contract, under which AirTanker will own the aircraft and provide a service to the MoD.

The MoD budgeted for the FSTA in 1997, selecting to use a PFI to allow it to fund a project that would otherwise be unaffordable. However, no evidence could be found by the NAO of the MoD having evaluated alternative procurement routes, favouring the budgetary benefits of PFI. The high long-term programme cost of the PFI, together with the cost of scope changes, has meant the aircraft will not initially have ground attack protective measures as the MoD did not decide this was necessary until later.

The contract took over nine years to sign (15 years from start to Entry Into Service) with FSTA in-service dates slipping by five and a half years. This delay was caused by the unforeseen scale and complexity of the deal. Delays included four years of non-competitive negotiation, increases in specification late in the procurement process, poor project resourcing, and governance and poor access to cost data (the MoD never gained visibility of detailed sub-contractor costs/margins).

In contrast to FSTA, the Boeing 777 project (a similar scale of commercial aircraft) was offered into the market in 1989 and had its first order in 1990, under a long-term lease with terms not unlike the PFI. The first aircraft was delivered 4 years later.

[44] Part 2 also includes a number of proposals to tackle some of the overarching problems that cause scope creep and delay.

The link between time and cost

5.2 In commercial programmes, time is recognised as a valuable commodity to be husbanded and used sparingly. The view is that once a long-term plan of action is decided, or a programme started, its cost is linked to its duration and the value of the project will decline with the passage of time. During our review process, we have found that the perception of the UK defence industry is that the MoD has a very different view of time and, hence, project cost:

- Firstly, additional MoD internal costs which occur as a result of delay do not affect the project viability. Project budgets are of external spend rather than a complete account of external and internal costs (with their realistic overheads).

- Secondly, any costs already spent are judged to have little or no value. The annual nature of government budgets leads to a view that past or spent cost is of little consequence, whereas future cost is paramount. This tends to weaken the concept of value, the importance of overall cost and managing a project to meet its original business case.

5.3 Some project managers consider shorter project duration as being associated with higher levels of risk, but the provision of extensive additional time in the schedule is a poor substitute for properly identifying and mitigating programme risks. It is only when the pressure of speeding up events becomes too great that inefficiency might lead to poor cost effectiveness. The optimal approach is to plan a project to be done as rapidly as previous practice has shown to be feasible.

5.4 It is the task of a project manager to ensure the plan recognises risks and that each part of it is delivered meeting intermediate milestones. Any time contingency for risk should be held at the highest level and normally included at the end of the schedule. This approach is not only the speediest but also usually the best way to proceed at lowest cost.

5.5 Concentrating on time also provides a unifying focus for a project team. Team members know that if problems are understood and solved in a timely manner, their project will succeed and the discipline of the plan and boundaries of the approved timescale drives the project forward.

Technology shelf-life

5.6 Technology has a military effectiveness shelf life. If the process of applying technological advances to new weapons systems is slow, much of its competitive value is lost. Therefore military programmes should seek to bring new technology to equipment and systems as fast as possible with the emphasis on a practical, rather than an optimal, solution. If technology can be inserted quickly with faster development programmes, the ability to maintain competitive systems in the field is much enhanced.

Managing very long and complex programmes

5.7 Defence equipment development programmes are long by any standard. It is normal for complex systems to take 20 years from Concept Studies to Entry Into service and the trend is for timescales to become longer. It used to be accepted that these timescales were as good as could be achieved due to the nature of high technology and the complexity of weapons systems. But recently, commercial systems with similar complexity and scale have been completed in less than half the time as defence programmes, with time savings at every major stage: concept studies, development, production and introduction to service.

5.8 Further, the costs of delay adversely affect the external spend for a development project. If one element of a project is delayed, other parts tend to fall in line with the revised timeframe. The costs of the large body of staff in industry and overheads are then claimed from the project budget. And because the external spend is usually the largest element of development projects, major increases in project cost can flow from relatively small and local delays and affect the overall project timescale.

5.9 Such delays on poorly controlled plans also have a separate and corrosive influence on project discipline. If there is an expectation of delay, local project managers may well conceal risk or delay until the overall project slippage is declared elsewhere. This can result in 'Gaming' behaviour, where the aim is not to meet the requirement of the project but wait until the overall schedule slips. At this stage, project managers can re-align their work packages and projects to the new schedule and make use of the additional time to recover their work.

5.10 In this situation, project management information is adversely affected and a realistic judgement of out-turn dates becomes confused with what is 'politically' acceptable to reveal. Rather than being in control of project completion, project managers become administrators of a project process, measuring and analysing the effects of failure after the time for corrective action has passed.

5.11 It is clear that long programme timescales make the problem of financial planning much worse. Five long programmes are much less likely to meet an aggregate plan than ten programmes of half the length. This is a well understood effect in queuing theory ('whip effect') and relates to the accumulation of statistical variability in systems which have a greater effect in more complex systems.

5.12 In our view, there are two strategies to control the project 'whip effect':

- **Shorter less complex projects;**
- **Stronger discipline of project management.**

Shorter less complex projects

5.13 Defence projects have become too long. This is either because they are overloaded with requirements or the process has become too complex. Projects should be much shorter, lasting three to five years. Commercial projects have benefited from the widespread adoption of 'Lean' ideas and if properly organised, both cost and the timescale of activities can be collapsed. In our view, at least 50% cuts in process duration should be the initial target and in order to achieve this, a systematic and comparative study is required to look at best practice of military and commercial development project stages; concept studies, development, production, and introduction to service.

Examples of successes in acquisition of complex systems by other government departments

There is no single Government-wide acquisition model or template, and departments are free to develop their own processes, checks and balances under the same overall remit. Other departments have procured complex systems in less time than the MoD. Examples include:

- The Met Police replacing its helicopters in a £20m programme, including the design and development of a mission system, plus its integration into, and customisation of, three EC145 helicopters. It took 25 months from inception to delivery (ITT April 2005, final delivery May 2007);

- The Thames Valley Police's mini-tender - this £40m programme was for the supply of six EC135 helicopters to six police forces who pooled the acquisition under the leadership of the Thames Valley Police. It took less than two years to deliver. (ITT September 2007, first delivery June 2009).

5.14 Projects must focus on a realisable requirement for which the technology is demonstrated. Trade-off of cost and timescale must be considered during the assessment phase of the project and industry's view of what can be accomplished should be taken into account. Where additional capability is required, this should be planned for a later phase or upgrade. It is better to have an improvised system now with the route to

improvement, than waiting many years for a system that may not accomplish all that is desired and may well be unaffordable.

Flexibility in 'Make-Buy': UOR+

5.15 The Urgent Operational Requirement (UOR) process has shown that effective equipment can be acquired much more quickly than business as usual. Rapid trade-offs of requirement and cost have been made, with equipment being selected, modified and produced for use in a fraction of the time than the normal processes would demand. The need for so many UORs in Iraq and Afghanistan has shown the need for reform as well as a route to reform. But to be employed more widely, the UOR process will need to be expanded to consider the path to a more complete solution.

5.16 Currently, a UOR provides a capability that is required to combat an immediate need. It can, and has, delivered urgent requirements into conflict areas rapidly and made a dramatic difference to the combat environment for our Armed Forces. However, the equipment that is procured through the UOR process is often used and then discarded as the process does not take the equipment's lifecycle into account.

Urgent Operational Requirements (UORs)

- Urgent: meet clearly articulated and unforeseen current or imminent threat;
- Bespoke: cannot be met through redeployment of current assets;
- Rapid: delivered rapidly – usually within 12-18 months;
- Specific: unique to an approved theatre;
- Quantity: sufficient for operations.

5.17 In our view, a new 'UOR+' process is required. This process would still procure urgently required equipment, but it would also take into account support, logistics planning, training and integration into the wider Armed Forces equipment programme. In this way, equipment acquired through the 'UOR+' process would not need to be discarded and could be integrated into the long-term capability of our Armed Forces. It would also enable the UOR process to be used in a far greater range of procurement projects in addition to the standard Concept, Assessment, Demonstration, Manufacture, In-service and Disposal (CADMID) cycle.

Hermes UOR – an example of success

An Urgent Operational Requirement (UOR) contract was let in 2007 to lease ten Hermes 450 UAVs, which have an optical surveillance capability. These went into service in Iraq a year later and now support operations in Afghanistan 24 hours a day, all year round. This capability, though less than that of Watchkeeper, has proved invaluable to operations in Afghanistan – at a much lower cost and delivered to time.

Flexibility and the CADMID Cycle

5.18 The CADMID lifecycle is at the heart of defence procurement. It defines the activities and processes for every stage of procurement and provides the backbone for all DE&S. The CADMID cycle has streamlined the process of project approval by limiting the sign off points to two gates: The Initial Gate and Main Gate. By eliminating the delays associated with further gates, as in the previous 'Downey Cycle', it has reduced, in theory, the time taken for projects to be completed.

5.19 In the operation of this type of gated life cycle, the gates are both points of approval and the opportunity to identify and reduce project risk. Where the risks are too high for the stage of the project, the gate should remain closed until the risk is addressed or mitigated by the identification of a contingency plan. The progressive slippage of MoD projects is typical of a situation where risk is not reduced and the project is allowed to continue. Such behaviour fatally weakens the discipline that gates contribute to the project management process.

5.20 Though it is often said that the reason gates are passed with major risks intact is to maintain progress towards completion, experience shows this to be false. When a risk occurs, remedial plans are developed, but the wider project hits the slippery slope of progressive delay. The best practice in project management should be the reduction of risks at the point of gated reviews. This would force project managers to confront problems and deal with them early, rather than allow risks to accumulate.

5.21 The two key issues with the current CADMID cycle are that it is not applicable for UORs and its structure is rigid, applying equally to all types of project. It should be recognised that a single acquisition cycle will never fit the huge range of items that is required to be procured within the MoD. In our view, a more graded approach should be implemented with at least three different types: 'UOR+', buying 'off-the-shelf' and new developments or 'Make'.

5.22 Project and procurement managers need the professionalism and authority to be able to select the life-cycle along with the commercial approach most appropriate to a particular project.

Partnering with industry

5.23 Further reduction of the high overheads involved in complex defence projects can be achieved by using Alliancing or Partnering approaches. Alliancing involves a group of several companies to share risk and reward on a project, in some cases, with the MoD as a risk partner. Partnering involves joining the MoD and contractor teams together to speed execution and cut the costs associated with interfaces. Both of these seek to get the client and contractor teams focused on project outcome and completion.

Stronger project management discipline

Authority and responsibility

5.a.1 The means of project success in defence procurement does not currently lie with the project manager. The role involves providing advice but it is up to others to make the decisions. This breaks a key principle of effective project management – making sure that managers have both the authority and responsibility for effective action to deliver the project.

5.a.2 In order to install stronger discipline within MoD project management, it is key that project and programme managers have the ability to control change and are held accountable. The confusion as to whether Senior Responsible Officers or IPT leaders are managing projects needs to be resolved.

5.a.3 We propose to reinforce the position of project managers as well as the introduction of a better defined, rigid Gate system. This would enable project managers to have clearly defined objectives for any project at any stage in its lifecycle. Contingency plans around these gates would need to be built in order to enable and encourage change and each project manager would understand his or her project and its requirements.

5.a.4 The time taken to make decisions is also a key parameter in effective project teams. If decisions are held at too high a level or there are too many tiers of management, projects can become bogged down in oversight and briefing activity. During our review process, we were made aware that the norm in the MoD for the time it takes to make a major decision is much longer than can be justified, with some project managers currently making planning assumptions of 140 days to leave time for all the required reviews, scrutiny and briefing process.

5.a.5 Such lengthy, time-consuming processes run counter to good practice, blunts the impetus of a project and inevitably leads to very long project timescales. In our view, targets for major decisions should be less than 30 days, rather than several months.

5.a.6 The key to breaking this cycle of indecision and review is to install the value of time and stimulate the taking of rational risks. The best commercial project managers accept responsibility for their project, and have the authority to take the actions necessary for success.

Scrutiny and review

5.a.7 It is a view widely held that too much of the Equipment Capability and DE&S project management resources are involved with the man-to-man marking of each other and industry. To prevent this, structured project design with clearer schedule information should replace the detailed scrutiny of project progress and achievement.

5.a.8 In place of the many and separate scrutiny and review processes, a single independent and senior project technical and financial risk assurance team, reporting to the CDM, should be able to understand and challenge the level of risk being taken by a project team and, where necessary, be able to close a project down.

5.a.9 The US has a procurement provision for defence procurement, called the Nunn-McCurdy Amendment[45], which looks to cancel any project that exceeds its original estimate by more than 25%. In our view, this type of provision should act as a back-stop in the UK, restraining or cancelling projects that exceed either their schedule or budget by a defined amount, for example, exceeding the base line by 20% for both time and cost.

Requirement management

5.a.10 Requirement management is also important as the release of new requirements leads to increases in cost and disrupts the work of the team and the schedule. Best practice should involve either the deferral of new requirements to a later phase of development or to group the requirements into packages to be released infrequently and under strict control.

45 The Nunn-McCurdy Amendment - http://www.cdi.org/missile-defense/s815-conf-rpt.cfm

Improving internal efficiency

5.b.1 Reductions in defence expenditure over the next four years will require a major reduction in MoD manpower. This has been announced as a cut across MoD civilian staff of over 25,000 positions, which will inevitably mean a cut to DE&S staff.

5.b.2 DE&S was formed by the amalgamation of the DPA and the DLO. The lines of responsibility were redrawn with both new equipment and support becoming the responsibility of Integrated Programme Teams (IPTs). These teams have the task of managing Through Life Costs (TLCM) and balancing additional development expenditure against later spares and support expenditure.

Streamlined processes

5.b.3 When the DPA and the DLO were merged, there was a reduction in manpower, however processes were not streamlined and therefore the intended lasting change was not realised. In our view, the reduction in the budget is necessary and must be coupled with the need to streamline processes. This should be planned and executed as a programme in its own right because of its importance to both efficiency and the future performance of the organisation.

5.b.4 If too many people are involved in approving a project, the impetus can be lost. In recent years, DE&S has attempted to streamline the numbers of approvers at Initial Gate and Main Gate, cutting the number from 68 to 53. This is a large number and demonstrates that the project team has very little delegate authority.

5.b.5 It is apparent that the major re-organisation of defence procurement against a background of spending restrictions and regular external criticism of project performance, has made the MoD's programme control process complex, onerous and overly focused on process at the expense of outcome. Project management techniques should be used to achieve an end, they are not an end in themselves.

5.b.6 The MoD should look to commercial practice and 'Lean' design principles to streamline and simplify processes that have become too complex and are employed in a mechanistic manner. In our view, process change is essential to achieving the more rapid delivery of projects and the efficiency improvements that are required by the reduction in defence manpower.

Transferring project management activities outside the MoD

5.b.7 Some current DE&S activities should be considered for transfer to prime contractors and industry. These include the provision of project support and monitoring activities. Where this may lead to concerns about un-recognised project slippage, this can be controlled through incentive-based contracts. Where technical control of design or design standards has been retained by the MoD, these should be delegated to industry.

5.b.8 The MoD should focus on military and security standards and when novel technical approaches are proposed by industry, the MoD should act more like a regulator, considering the case and the evidence of the new approach or standard. Where there is concern about the effect on operations in use, this can be better addressed through warranties than time-consuming independent studies and second guessing.

Summary of review team recommendations for consideration in Part 5:

- Much shorter projects of three to five years with realisable objectives and successive phases for incremental capability improvement.

- Streamline all processes and decision-making, initially targeting at least 50% cuts in process duration using the 'Lean' approach. Cutting time results in a cutting cost. In order to achieve these efficiently goals, a systematic and comparative study is required to look at best practice of military and commercial development project stages; concept studies, development, production, and introduction to service.

- A new 'UOR+' process is required. This process would still procure equipment that was urgently required, but would also take into account its support and logistics planning, the required support and training and its integration into the wider Armed Forces equipment programme.

- A procurement cycle with proper (closed) gates and contingency plans.

- Recognise that a single acquisition cycle will never fit the huge range of items procured by the MoD and introduce a more graded approach with at least three different types lifecycle: 'UOR+', buying 'off-the-shelf' and new developments / 'Make'.

- Alliance or Partnering approaches for equipment development should be utilised where possible for all support contracts. This would remove interface/overheads and drive innovation.

- Project managers in IPTs should have the authority, accountability and responsibility for project execution. The confusion as to whether SROs or IPT leaders are managing projects needs to be resolved.

- Major decisions, such as those at Main Gate, or which involve numerous people to sign off, should be targeted to take less than one month.

- A single independent and senior project technical and financial risk assurance team should be established, reporting to the CDM, who is able to halt a project to address a build up of risk and, where necessary, close it down.

- Shut down or return a project to Main Gate approval when forecast cost, or timescale, exceeds 120% of that approved (similar to the US Nunn-McCurdy Law).

- Project management activities should be moved out to industry with the MoD trying to set schedule requirements and contractors providing information to project managers.

- Move design authority to industry where it is still in the MoD. The MoD should define military standards while industry sets and justifies technical standards.

Part 6: Professional Procurement & Programme Organisation

Having the skills and capability to deliver on time and to budget

6.1 This report has covered the shortcomings in the MoD procurement process. Cost, for example, has often been compensated for by reducing the number of units of equipment purchased. This has led to a large mismatch between the actual unit cost compared with the original business case, even if the project cost appears to have been controlled.

6.2 It is widely recognised that the management of developing state of the art weapon systems is challenging. It is much more difficult, for example, than managing a civil engineering project of similar value. Developing and applying new technology, in a novel configuration, is a high risk activity. However, these types of risk are known at the outset of the project or programme and are a factor in the very long times-scales which are normal for the development of military systems. Risk is ultimately inherent to procurement and is not, therefore, an adequate excuse for the consistent lack of achievement of approved schedules and budgets.

6.3 Piecemeal and organic efforts to improve project and programme management by the MoD, including SMART procurement, have had some success, but none of these efforts have transformed the two key performance indicators: on-time and to budget.

Future Rapid Effect System (FRES) – an example of combining requirements to make a system overly complex

In 1999, Germany and the UK started development of the Boxer Multi Role Armoured Vehicle, a multi use vehicle with switchable modules. Boxer was devised to replace the Army's Saxon wheeled APC, the tracked FV432 as well as some of the CVR(T) vehicle family. The UK withdrew from the project in 2003, largely due to the inability of the Boxer to be deployed rapidly using the C-130 transport aircraft.

The FRES project was established in 2004 to cover a range of armoured vehicle requirements. It was recognised as complex and the MoD decided to appoint a "System of Systems Integrator" (SOSI). The SOSI was to: programme manage; deliver system of systems engineering and integration; develop and manage alliances; develop the MoD's own SOSI competence; and use through life capability management and through life technology management. However, the SOSI role was scrapped after the MoD announced a failure to progress.

In 2008, the IPT, selected the Piranha V design from General Dynamics. However, General Dynamics withdrew the same year when no production order was made. Once again, the project was rescheduled to restart in 2010 after the SDSR.

The contract for a new armoured vehicle was finally awarded in 2010 to General Dynamics for the ASCOD AFV, with an estimated first delivery date of 2015. The new vehicle, when delivered, will not be capable of being airlifted by a C-130 aircraft, one of the main reasons for withdrawing from the Boxer project in the first place. If the UK had stayed with the Boxer project, it would now be in service.

6.4 The key to better performance is greater professional project and programme management, faster decision-making, fuller accountability for outcomes with the single-minded pursuit of the agreed objectives and longer-term integration of military expertise. These required improvements can be taken forward and institutionalised by reforming the structure and culture of DE&S.

DE&S: challenges and the need for reform

6.5 There are some important, unavoidable issues which must be addressed in order to make defence procurement more professional in its approach, capability and, therefore, performance. These include:

- The long timescale of military procurement in comparison to the normal short period of duty for military personnel in DE&S roles;
- The ability of military personnel to gain adequate experience and training in programme management and procurement during their military career;
- The potential for divided loyalties between military staff in procurement roles who are paid and ultimately managed by a parent Service;

- How to attract, retain and motivate civilian staff for complex and multi-million pound procurement and programme management roles.

6.6 There are some very good project management and procurement staff in the MoD, however the performance and standard is uneven and the prime focus of many is compliance with process, rather than achieving defined objectives and outcomes. Reform of project and programme management is perhaps the most sensitive and most difficult element under consideration in this review. People make a difference and people matter in an organisation like DE&S. They have a very difficult task managing very complex and large development projects. But it seems that the environment for project management in the MoD is risk averse and one in which showing that every issue and topic has been considered is more important than making timely decisions.

6.7 The frequent changes in military project managers, driven by their career norm (two or three years in a post), has also lead to changes of strategy and emphasis during projects. There are doubts about the professional ability of senior project managers, who may join IPTs to lead a project with just a single previous posting and up to one week's training in the contemporary practices of project management.

6.8 To reform the MoD so that it can install a culture that fosters the right attitude and behaviour for the successful management of complex projects and programmes, a number of issues need to be addressed. These include:

- Establishing a firm internal contract between the MoD and DE&S, with the separation and freedom to deliver;
- Professionalising project and programme management staff by providing professional training, career paths and incentives;
- Making managers accountable, responsible and enabling them to control change;
- Promoting timely decision-making and stopping a culture of multiple reviews;
- Recognising procurement risk as a reasonable part of normal business, and define 'reasonable risk' – providing freedom from interference is the essence of partnering agreements once let;
- Implementing best practice from across DE&S as well as external and commercial project managers.

6.9 DE&S has gone through much change over the years and has undergone several reforms to internal programmes and organisational structure. It is not a stranger to change and new initiatives. In the last 15 years, we have had: SMART Procurement and SMART Acquisition; the merger of DPA and DLO; the Defence Acquisition Change Programme (with its subsidiary TLCM, PACE, DLTP, Fit for Business, Capability Delivery and Transformation Staircase projects). While these changes have brought incremental

progress, the lack of significant improvement in the performance of major programmes indicates the problems are deep-seated and that more radical methods should be considered. In principle, there are several means of making such a fundamental change. We propose that a reform programme:

- Makes DE&S a largely civilian programme management organisation which operates as an agency, with military staff employed as technical advisers or permanently transferring in;
- Use Outsourcing to supplement the procurement and programme management functions of DE&S, either in whole or in pieces, to a commercial programme management company;
- Re-focuses DE&S on directing programmes, with the management of functions and activities let to industry on term contracts, with performance and efficiency targets.

6.10 The success of the above strategies will be the ability to attract, motivate and retain top level managers who are both technically competent but also able to deliver projects and defence equipment programmes in a much more cost effective and timely manner.

More effective project teams and leaders

6.11 The key to change involve authority, accountability and responsibility. The reporting structure of DE&S needs to be altered to provide IPTs with greater authority. Further, the current situation of Senior Responsible Owners and IPTs sharing responsibilities needs to change.

6.12 At present each major project has an SRO while the IPT manage the project within DE&S. While this dual accountability was introduced to enable project to move through the complex committee structure of MoD, it has blunted accountability. In our view, SRO should create the context for success but project managers in DE&S should be solely responsible for managing and delivering the project.

6.13 Procurement managers must be better trained, more capable and more professional. Procurement and project management must be seen as an attractive and exciting career. A new cadre of better qualified and more innovative civilian project managers needs to be built.

6.14 In our view, those leading major projects need to be both technically very competent and have a good understanding of business and commerce. They should always be supported by specialists in contracts, finance and technology, but the development of project leaders who are recognised for their ability to tackle and resolve

the complexities of procurement, as well as making sound and timely decisions, is a crucial element of the required reform.

Costing skills

6.15 The ability to estimate costs of new programmes and the work being done by industry is crucial to successful project management. These skills are rare and take time to develop and it is unfortunate that some key costing skills, applicable specifically to defence systems, were lost during the repeated re-organisations of the MoD in the late 1990s and the early part of 2000s. This could be due to the view that that in-house costing was no longer required following the widespread use of competitive tendering.

6.16 However, in many areas of defence equipment there is not an effective market. The degree to which requirements change also means that even when a 'fixed price' is established, each change needs to be estimated and assessed. This topic is receiving attention on both sides of the Atlantic as both the MoD and the DoD seek to re-build their capability to estimate cost.

6.17 The MoD has two main ways of estimating cost: 'will cost' and 'should cost'. The 'will cost' is a top-down data used for planning when detailed estimates are not available. Historical data is used as well as analogies between current and previous projects. The 'should cost' is the calculation of the cost of additional or un-priced work. It is also used to consider competitive tenders with a view to excluding those that under-price a job and hence would have difficulty completing a project. Each of these methods of cost estimation must be properly understood and deployed.

6.18 Cost estimation is a key skill for DE&S. Estimators should be part of each IPT, but also independent project review teams that report to the CDM in order to maintain the quality of estimation work and the integrity of forward budgetary estimates.

Military input

6.19 Today, military input to defence projects occurs in two main ways: Equipment Capability teams are staffed by serving officers and many IPTs in DE&S are led and staffed by members of military personnel on a tour of duty in between line or staff posts. Lord Levene[46] and Bernard Gray[47] both commented, in their respective reports, on the short duration of the tours of military staff in procurement and made recommendations about extending tours the most senior staff with the aim of providing more stability and

[46] Source: An Independent Report into the Structure and Management of the Ministry of Defence, 2011
[47] Source: Review of Acquisition for the Secretary of State for Defence, 2009

accountability. We support these proposals and believe that they could both promote stability of requirement and ensure that managers can remain with a project long enough to see the results of their decisions.

6.20 We also believe that there should be a greater separation between the role of the customer (Equipment Capability in MoD), a role that should be mainly reserved for military staff, and that of the purchaser (project and procurement professionals in DE&S), a role that should have greater responsibility for the delivery of projects within existing budgets. While DE&S should retain some military staff in the form of subject experts, project and procurement professionals require training, experience and professionalism that cannot easily be delivered by serving officers who only have occasional tours in DE&S.

6.21 In this review, we propose the establishment of a new Weapon Engineering Service (discussed in detail below) in which military staff would be encouraged to transfer into mid career and after they have served in their own Service. They would join a largely civilian staff in pursuing a full career in defence procurement, bringing with them the understanding of military need. These changes would both promote stability of requirement and ensure that managers can remain with a project long enough to see the fruits of their decisions.

Professional personnel – Weapons Engineering Service

6.22 Many of those that we consulted consider that DE&S should strengthen its technical and managerial competence. This is broadly supported by the Haddon-Cave report[48].

6.23 We propose the creation of a new Weapons Engineering Service, constituted from the current Defence Engineering Service. The training, development, career and pay of this mixed civilian and military Weapons Engineering Service would be managed by the CDM. The CDM would be able to ensure that staff are both trained and developed and could decide how long project managers remain in their roles. Success and failure would have consequences for project staff. Good performance would lead to bonuses and promotion and repeated failure would lead to restricted career prospects and, in some cases, removal from their post. This would build a performance organisation run by performing people.

[48] The Nimrod Review Haddon-Cave Report HC 1025 - October 2009.

6.24 The proposed Weapons Engineering Service would employ stringent standards when recruiting and demand professionally qualified engineers for key management roles. Their career approach would ensure that managers gain sufficient business and acquisition training so that they are equipped to perform and become regarded amongst the best of their generation in the engineering profession.

6.25 The demands of the role and the need to develop competence through progressive experience mean it is expected that the majority of senior roles in the Weapons Engineering Service would be filled by civilian staff. Military staff would continue to provide their perspective of operations by working in the teams for individual tours as subject experts. This valuable understanding of the military requirements is important to defence procurement, but is not a sufficient to qualify for project leadership. Military officers who wish to pursue a career in the Weapons Engineering would have the opportunity to compete for posts on the same basis as civilian staff. This would involve a mid career transition, possibly between the ages of 35 and 40, after they have had command experience. Once selected, officers would transfer into the new Weapons Engineering Service.

Structures that enable culture change

6.26 Structural and organisational changes does not in itself lead to behavioural change. However, in the case of defence procurement, we are persuaded that the scale of reform is such that the adequate change cannot be accomplished within the current structure of DE&S.

6.27 The key issue is for DE&S to have the freedom to create and sustain a more appropriate and different culture. DE&S has tried to change within the MoD structures before but it has been frustrated. A dramatic change of culture is now required.

6.28 Instead of secrecy about future plans, the MoD should, within national security requirements, like other countries, be open about their future plans. Rather than decisions being made by committee, the structured and controlled delegation of authority to project managers should enable them to consult interested parties but make the decision that facilitate progress of the project. Project managers would then be accountable for their decisions and should expect their own performance to be judged on the basis of the success of the project.

6.29 It is easy to underestimate the difference between DE&S and a professional and efficient commercial project company. Several well known companies do nothing else other than project management. They recognise that that alone is a difficult enough task to succeed at. One of the keys to their success is the ability to develop an understanding

of a 'culture of consequences' for project staff in which they understand how to take charge of a project and ensure that the difficult decisions which all projects contain and which drive the project to conclusion are taken effectively.

6.30 If a project manager is successful, they can expect to be rewarded. If they fail in a repeated manner, the job will be at risk. His or her pay, bonuses and career will be determined by the performance rather than the time in the job. This breeds a positive 'culture of consequences' in project staff which encourages them to perform and hence their projects to succeed.

Cultural change

From	To
• Secrecy of future requirements	Presumption of openness about plans
• No delegation of authority	Disciplined delegation with accountability
• Decisions made by committees	Leaders consult but make decisions
• Procurement part of military career	Military staff commit to career professional
• Lack of consequence for PMs	Career and remuneration reflecting success

6.31 Several alternative structures have been considered in other studies. SMART procurement considered establishing a separate Agency structure. The Gray report considered the full range of options[49] from the status quo of remaining in the MoD, through to Agency, Non Departmental Public Body (NDPB), Government Owned Company Operated GOCO, Public Private Partnership PPP and full privatisation.

6.32 Gray recommended setting up a trading fund, and if that did not yield the level of change required within 12 months, for DE&S to become a GOCO. It is unclear whether the reforms contained within the Gray report will be implemented and the level of structural change beyond that, announced in the Levene report, is uncertain.

6.33 The fundamental need for a new capability originates within the Services. The Equipment Capability customer in MoD refines and expresses those needs as requirements. It is the role of DE&S to acquire that capability in a timely and efficient

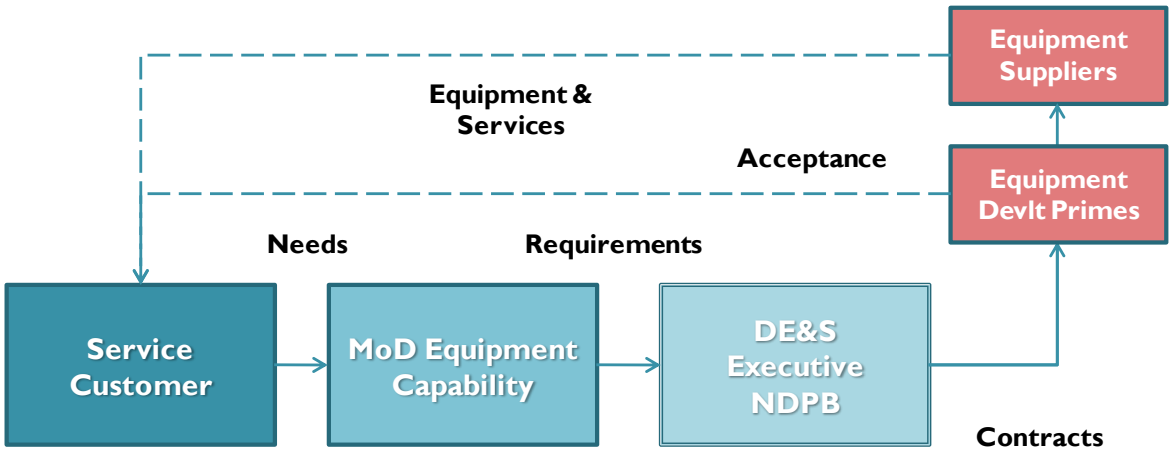
[49] Review of Acquisition for the Secretary of State for Defence - An independent report by Bernard Gray October 2009, p.97.

manner. Because of the need for DE&S to demonstrate accountability to Parliament for the expenditure of large amounts of Government money, we have ruled out PPP and full privatisation.

6.34 A GoCo would bring the skills of commercial management to aid problem solving, yet would have the potential for an essential element of defence to be subject to a contract. Also, commercial managers would have divided loyalty between maximising shareholder value and acting solely in the interest of defence. We propose, therefore, that DE&S becomes and executive NDPB, similar to the Nuclear Decommissioning Authority NDA and led by CDM as its accounting officer. It should have the remit of equipping and supporting the defence forces.

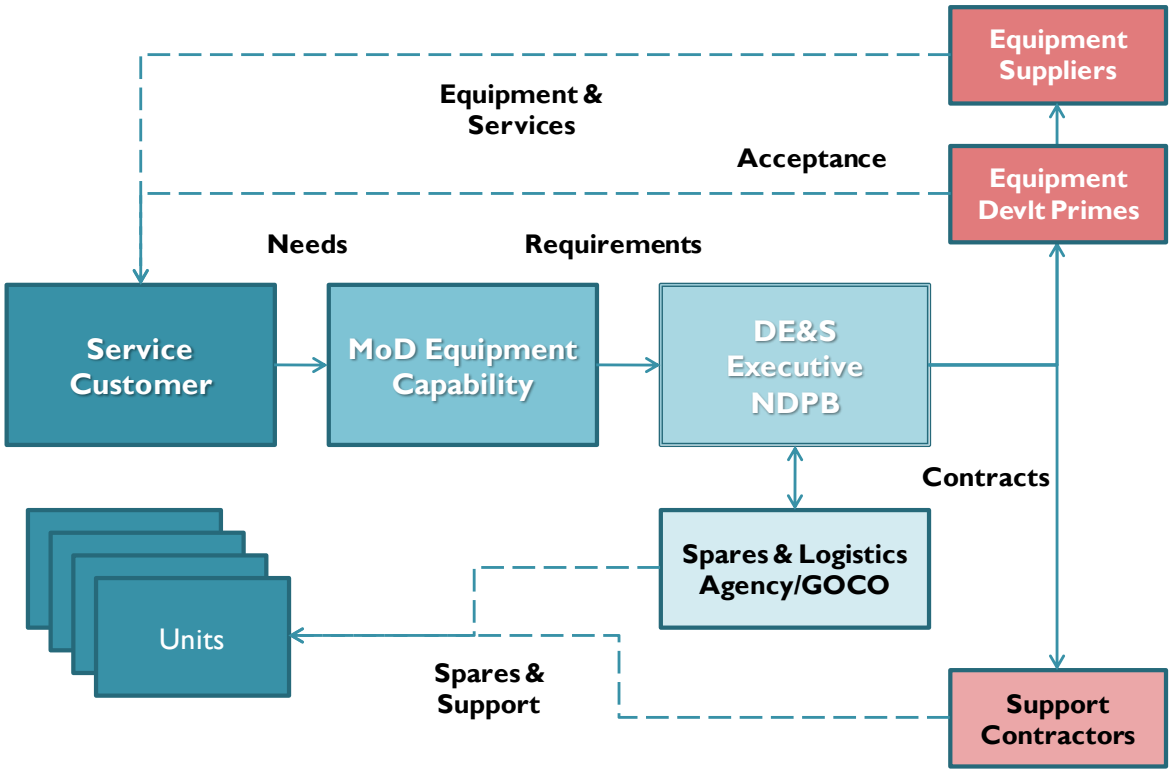
6.35 The benefits of commercial practices and management can be gained by in-sourcing some managers and by adopting commercial practices and tools in a more whole-hearted manner. We propose that the new DE&S should have a non-Executive Board with members who have substantial and senior commercial experience.

DE&S as an Executive NDPB **Figure 5**



Equipment or System Acquisition **Figure 6**

6.36 DE&S contracts with industry to either buy a system 'off-the-shelf' from a specialist supplier or through a prime contractor to develop new equipment or system. DE&S has the role of equipment acceptance, ensuring the equipment is fit for service by using either contract staff, or a MoD test organisation such as DSTL.



Acquisition & Support Figure 7

6.37 This review has not considered in any detail the role and structure of the MoD spares and logistics organisation. Other reviews have posed the question whether spares and logistics might be run better as an Agency or perhaps fully outsourced where it could gain the full benefits of major investments and development in logistics across the commercial sector. With our proposed model, the spares and logistic organisation would be separated from DE&S and become a supplier operating under its own direction. DE&S would have a range of in-house and contractor organisations as its suppliers to deliver support to its customers within Service units.

Making the changes

6.38 The reforms proposed should be seen as a whole and need to be implemented over a number of years in a consistent and progressive manner. The process, staffing,

structural and strategy changes proposed would probably take five years to implement fully. This programme must been seen as a single and integrated activity which would need high level ownership. Such an important programme would be a key part of the of the CDM role. The CDM would need to establish a dedicated team with a step-wise programme of activities to cover the full range of reform. The momentum of the programme would be maintained by setting some key intermediate measures against which progress and success could be demonstrated.

Six point plan for DE&S

1. DE&S procurement and programmes to become an Executive NDPB with some in-sourced commercial management and a Board with commercial experience.
2. Consideration should be given to separating logistics and spares organisation to become a dependent Agency or GoCo contracted to DE&S.
3. Simplify and make the procurement process more flexible so it is better tailored to the nature of the project.
4. Delegate authority to IPT leaders and make them accountable – clear objectives and lines of responsibilities.
5. Redesign structure from top to bottom for accountability, without committees for decision making.
6. Professionalise structures through a new Weapons Engineering Service, led and managed by CDM, which military personnel would commit to mid career. This would introduce higher standards of recruitment with better training and education.

This is a complex task and difficulties include implementing a trusted performance measurement system, having a sufficiently mature design at the start to prevent complications and, most importantly, how to measure the performance and benefits of the project.

Summary of review team recommendations for consideration in Part 6:

- Give the authority, accountability and responsibility for project and programme outcome to IPT leaders.

- Enhance the role of cost estimators as part of each IPT and have an independent project review team reporting to the CDM to maintain the quality of estimation work and the integrity of forward budgetary estimates.

- Military staff to act solely as subject experts rather than as project managers.

- Create a new Weapons Engineering Service to manage the training, development, career and pay of defence procurement staff, recognising equipment procurement as a professional competence. This would be a mixed civilian and military organisation and provide the opportunity for officers to enter as a permanent career move. Career, posting, promotion and pay would be managed by the CDM.

- Design a new model for PPM professional training, career planning and performance standards, learning from commercial practise and focusing on enhancing the skills of project managers. This would include five-year improvement objectives for project managers with performance improvement being a key part of DE&S strategy and would be graded with year-by-year measures and targets.

- Enhance the focus on outcomes rather than process in the management of projects, encouraging a 'culture of consequences' for individuals, including pay for performance, rather than for service.

- Re-structure DE&S into an executive NDPB with an element of in-sourced management and an external Board.

Conclusion

There are implications for defence procurement for UK national security since it concerns when equipment is delivered and to what cost and timeframe, as well as implications to the UK economy, since the defence industry plays key role in our export market and is an important national employer. The longstanding issues which are covered in this report, therefore, must be dealt with at a time when budgetary constraint is necessary and the UK remains an important global player whose role in the world requires it to retain strong Armed Forces with expeditionary capabilities.

This report makes important recommendations which the authors hope will be taken into account by all policy-makers, both the Government as they formulate their own industrial strategy and the Labour Party's Shadow Defence Team as they conduct their review process.

It is important that future UK defence procurement professionalises MoD staff, empowers industry but also ensures it is held to account, supports both sovereign capabilities as well as exportability, embeds partnership working both within the industry and between companies and the MoD, outlines an industrial strategy for defence and designs a commercial policy which will deliver requirements to time and budget.

The changing defence landscape is both a threat and an opportunity for the UK. Reform of defence procurement as outlined in this review can ensure UK Armed Forces are prepared and able to serve the national interest.

Appendix A: Organisations that gave evidence to the Review Team

ADS

Agusta Westland	Pentagon Acquisition Officials
Babcock International	CSIS
Elbit Systems	CH2MHill
Israel - DOPP	Bechtel
MBDA	KBR
Northrop Grumman	Shell
Qinetiq	BP
Rafael Systems	HP
Rolls-Royce	Gore
Thales	Eurocopter
BAE Systems	SELEX Galileo
EADS	University of Cranfield
Defence Industry Unions	RUSI
Team Animation	Former MoD Minsters
CellCrypt	Former Senior MoD Officials

Glossary of Terms

CADMID	-	Concept, Assessment, Demonstration, Manufacture, In-service and Disposal
CDM	-	Chief of Defence Material
CSR	-	Comprehensive Spending Review
DACP	-	Defence Acquisition Change Programme
DE&S	-	Defence Equipment & Support
DLO	-	Defence Logistics Organisation (now part of DE&S)
DoD	-	Department of Defense
DP	-	Defence Procurement
DPA	-	Defence Procurement Agency (now part of DE&S)
DSTL	-	Defence Science and Technology Laboratory
EAC	-	Enabling Acquisition Change
EIS	-	Entry Into Service
EU	-	European Union
GoCo	-	Government Owned, Company Operated
GPS	-	Global Positioning System
IPT	-	Integrated Project Team
ISTAR	-	Intelligence, Surveillance, Target Acquisition, and Reconnaissance
MoD	-	Ministry of Defence
NAO	-	National Audit Office
NATO	-	North Atlantic Treaty Organisation
NDA	-	Nuclear Decommissioning Authority
NDPB	-	Non-Departmental Public Body
PFI	-	Private Finance Initiative
PMO	-	Programme Management Office
PPM	-	Professional Project Management
PPP	-	Public Private Partnership
R&T	-	Research & Technology
SDR	-	Strategic Defence Review
SDSR	-	Strategic Defence and Security Review
Service Chiefs	-	The heads of the Royal Navy, Army and Royal Air Force
SMART	-	Smart Acquisition is a long-term MOD initiative to improve defence acquisition
SME	-	Small to Medium size Enterprise
SRO	-	Senior Responsible Owner
TLCM	-	Total Lifetime Cost Management
UAV	-	Unmanned Ariel Vehicle
UOR	-	Urgent Operational Requirement

September 2011