



National Audit Office

MINISTRY OF DEFENCE

Major Projects Report 2006

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Major Projects Report 2006

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SUMMARY

1 The Major Projects Report 2006 covers cost, time and performance data for projects in the year ended 31 March 2006. We examined¹ 20 of the largest projects (**detailed in Figure 1**), where the main investment decision to proceed has been taken by the Ministry of Defence (the Department); and ten projects still in the Assessment Phase (detailed in Appendix 2). Five projects

are new to this year's Report.² One project, the Private Finance Initiative (PFI) deal for Skynet 5 communications satellites, is dealt with separately in Appendix 3 so that account can be taken of its restructuring to build extra satellites as physical assurance to replace the previous insurance provision.

¹ Our methodology is described in Appendix 1.

² Brimstone (Advanced Air-launched Anti-Armour Weapon), Panther (armoured personnel vehicle) and Trojan and Titan (armoured bridge-laying and obstacle breaching vehicles) in the post-Main Gate population and Future Rapid Effect Systems (medium weight armoured vehicles) and Military Afloat and Reach Sustainability (auxiliary ships) of the Assessment Phase projects.

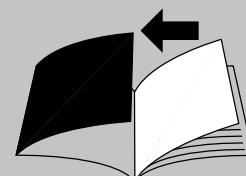






















Figure 1 overleaf

1 Major Projects Report summary of Post Main Gate Project

Project	Description	In-year change on costs to completion (£ millions)	In-year change on in-service date (months)	In-year change in key user requirements	Current forecast cost to completion (£ millions)	Budgeted cost to completion at Approval (£ millions)	Current forecast in-service date	Expected in-service date at Approval
 A400M	Heavy transport aircraft	-28	0	No change	2,616	2,628	March 2011	February 2009
 Astute Class Submarine	Attack submarine	+164	-1	No change	3,656	2,578	December 2008	June 2005
 Bowman	Data and voice communication radios	+10	0	No change	2,017	1,898	March 2004	March 2004
 Brimstone	Anti-armour weapon	-44	0	No change	900	814	March 2005	September 2001
 Beyond Visual Range Air-to-Air Missile	Air-to-air missile	0	+12	No change	1,204	1,240	August 2013	September 2011
 Combat, DBL Infrastructure and Platform BISA	Bowman-related software, hardware and integration systems and tools	0	0	No change	338	343	December 2005	March 2004
 C Vehicle Capability	Vehicle fleet	-7	0	No change	703	674	March 2006	October 2005
 Future Joint Combat Aircraft	Fighter/attack aircraft	+2	In-service date not yet approved	No change	1,916	2,034	In-service date not yet approved	In-service date not yet approved
 Guided Multiple Launch Rocket System	Global positioning system guided rockets	0	0	No change	263	319	April 2007	March 2007
 Light Forces Anti-Tank Guided Weapon	Anti-armour firepower system	-5	-4	No change	305	315	July 2005	November 2005
 Next Generation Light Anti-Armour Weapon	Short range anti-armour weapon	-42	+8	No change	314	377	July 2007	November 2006
 Nimrod Maritime Reconnaissance and Attack MK4	Reconnaissance and attack patrol aircraft	-292	0	No change	3,516	2,813	September 2010	April 2003
 Panther	Armoured vehicle	0	+6	No change	201	229	September 2007	November 2006
 Precision Guided Bomb	All weather 24 hours general purpose precision bomb	-11	0	No change	341	339	September 2007	June 2007
 Sting Ray Life Extension and Capability Upgrade	Life extension and capability enhancement for Sting Ray Lightweight Torpedo	-5	0	1 Key User Requirement forecasted not to be met	594	727	May 2006	December 2002
 Support Vehicle	Cargo and recovery vehicles, and trailers	-24	0	No change ¹	1,338	1,367	February 2008	September 2005
 Terrier	Armoured earth moving vehicle	-3	0	No change	296	295	September 2008	September 2008
 Trojan and Titan	Armoured engineering vehicles	+6	+5	No change	336	348	October 2006	October 2005
 Type 45 Destroyer	Anti-air warfare destroyer	+157	+7	No change	6,110	5,000	December 2009	May 2007
 Typhoon	Fighter aircraft	Commercially sensitive	0	No change	Commercially sensitive	16,671	June 2003	December 1998

Source: National Audit Office

NOTE

1 Support Vehicle is expected not to meet three of its Key User Requirements. This is a correction of an error in the Major Projects Report 2005, which stated that 24 Key User Requirements would be met rather than 23.

2 The Department still expects to meet 98 per cent of Key User Requirements, although performance is marginally worse than recorded in the Major Projects Report 2005. **Figure 2 overleaf** summarises project time and cost performance. Over their lives thus far, projects have been delayed by a total of 433 months.³ Thirty-three months of the total delay occurred within the year 2005-06, a lower contribution to the total than in any Major Projects Report since 2002.

3 The current total forecast cost for the population is £27 billion, an increase of eleven per cent compared with the total budgeted costs approved at Main Gate. During 2005-06, the Department undertook a review of the post-Main Gate projects to control costs better. This Review has reduced the costs of these 20 projects as recorded by the Major Projects Report by £781 million,⁴ some three per cent overall and equivalent to a 21 per cent reduction in the overall cost increases on projects since Main Gate.

4 During its Review the Department paid particular attention to the past recommendations of the Committee of Public Accounts⁵ which have stressed the need for the Department to live within its means. £242 million, that is 31 per cent of the £781 million reduction is from:

- the better management of commercial and contractual arrangements, for example on the Nimrod MRA4 project the Department is negotiating a one per cent cost reduction in the fee it pays to its contractor;
- more cost effective means of delivery, for example on the Astute submarine project the Department made £7 million savings by devising more efficient ways to deliver safety requirements;
- re-assessing quantities required, for example, on the Guided Multiple Launch Rocket System project the Department reduced the numbers of rockets being procured to save £114 million; and
- more appropriate accounting treatments, for example, on the Terrier project the Department is now accruing for future milestone payments resulting in a saving of £3 million on cost of capital charges.



5 A further £448 million, that is 57 per cent, was achieved by either re-classifying expenditure from procurement to support or transferring expenditure to other budgets for procurement or for corporate management where they can be best managed. These re-allocations do not represent a saving to the Department as a whole. By transferring the costs elsewhere the Department potentially may have to forgo other activities, which previously could have been provided, or make corresponding efficiency gains to accommodate the expenditure.

6 While the principles underpinning the review are sensible, due to the basis upon which Major Projects Report is compiled, it would be inappropriate to look at in-year cost changes and trends for 2006. Our cost analyses this year have focused on how the Department has addressed the potential in-year cost increases to live within its financial means.⁶ We report in detail on the in-year performance of five projects which have experienced substantial cost movement or are representative of the Department's management of cost growth in 2005-06.

The future of the Major Projects Report

7 The Department has reported annually to Parliament on its progress in procuring major pieces of defence equipment since 1984. The Major Projects Report is a key accountability document and provides much important information that underpins a number of the Department's Public Service Agreement targets and three of the Defence Procurement Agency's Key Targets.

3 Appendix 4 shows time variation since Main Gate Approval per project.

4 This includes a cost reduction of £91 million due to a rebate and exemption from HM Revenue & Customs.

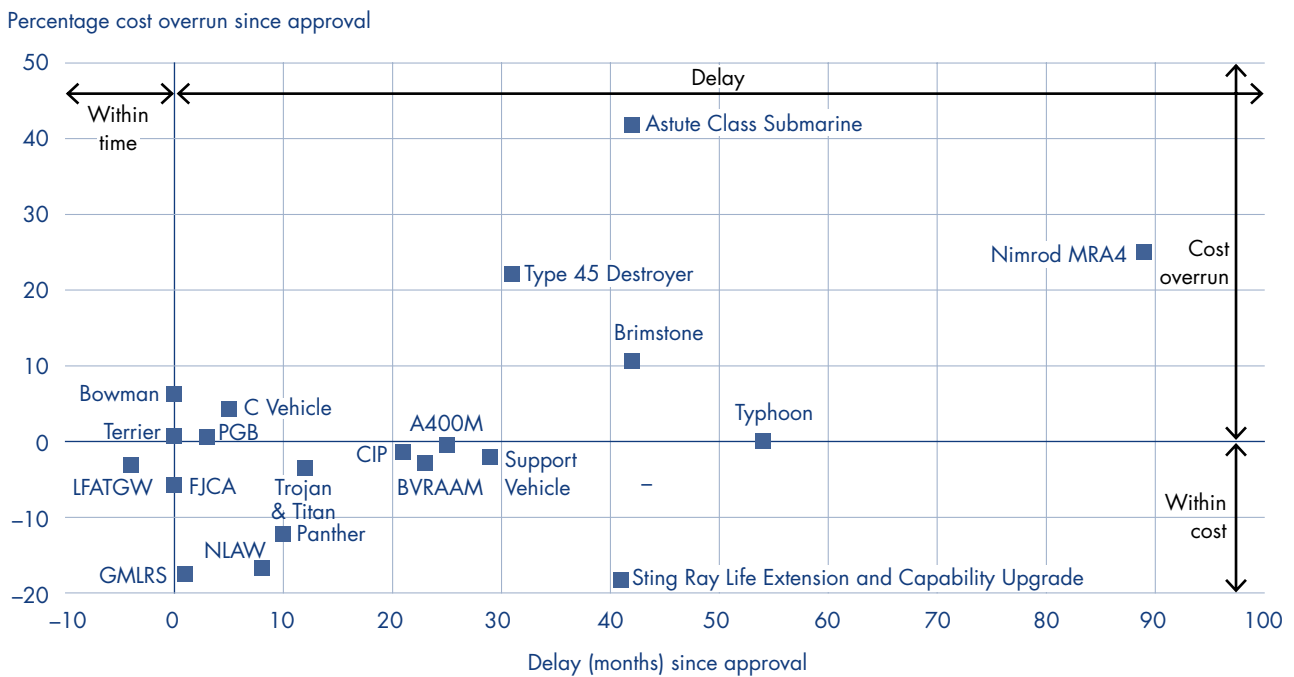
5 C&AG's Report – Ministry of Defence: Major Projects Report 2005 (HC 595, November 2005) and House of Commons' Committee of Public Accounts Report – Ministry of Defence: Major Projects Report 2004 (HC 410, July 2005).

6 For the sake of completeness, we have produced figures which show the cost variation in-year and the consumption of the cost risk differential which are available in Appendix 5. For the reasons stated above, these figures must be interpreted with care.

8 While aspects of the Report have evolved, the methodology for selecting the projects to be included and the basis for reporting cost, time and performance have remained largely unchanged. Over the same period the challenges of defence acquisition and the Department's approach to delivering and sustaining defence capability have changed significantly. Examples of these developments are the use of the PFI; the emphasis on delivery of Through Life Capability Management⁷; more regular use of cost, time and performance trade-offs to enable the Department to live within its budgetary means; the use of incremental acquisition and the planned merger of the Defence Procurement Agency and the Defence Logistics Organisation. The key changes are explored in more detail in Appendix 6.

9 The Report in its current form, focusing on initial procurement activities, does not give a complete account of the Department's performance across the spectrum of acquisition activity as the difficulties this year in providing a balanced assessment of cost performance illustrate. Over the coming months we and the Department will develop proposals for a major overhaul of the Major Projects Report to be submitted to the Committee of Public Accounts in Spring 2007, with the intention of introducing a revised Report from 2008. The review will seek to build on the strengths of the existing format and will be conducted in parallel with a wider review of performance reporting being undertaken by the Department. The result will be to provide better public information to Parliament.

2 Forecast time and cost positions in Main Gate projects as of 31 March 2006



- Key**
- BVRAAM = Beyond Visual Range Air-to-Air Missile
 - FJCA = Future Joint Combat Aircraft
 - NLAW = Next Generation Light Anti-Armour Weapon
 - PGB = Precision Guided Bomb
 - CIP = ComBAT, DBL Infrastructure and Platform BISA
 - LFATGW = Light Forces Anti-Tank Guided Weapon
 - GMLRS = Guided Multiple Launch Rocket System

Source: National Audit Office

NOTES

- 1 No over/underspend is reported on Typhoon as the information is commercially sensitive.
- 2 No time advance/delay is reported on Future Joint Combat Aircraft as the in-service date has not been approved.

7 See Appendix 6 for details in Through Life Capability Management.



The Department has been proactive in addressing potential in-year cost increases to live within its financial means

1.1 In the first part of this Report we examine the progress of 20 of the Department's largest post-Main Gate procurement projects against original budgeted cost. The current total forecast cost of the population is £27 billion, an increase of 11 per cent compared to the total budgeted costs approved at Main Gate. Traditionally, our analysis has focused on the trends and reasons for cost movements in-year. This year we focus on the Department's efforts to live within its means mainly by re-allocating costs to other budgets, re-assessing quantities required; more appropriate accounting treatment and by re-defining some elements of the projects.

1.2 During 2005-06, the Department undertook a review of the 20 post-Main Gate projects to control costs better. We recognise the rationale underpinning the resulting measures is sensible. A consequence is, however, that because of the basis upon which the Major Projects Report is compiled, some of these measures appear as a cost reduction to the individual project, but these costs will now be incurred elsewhere in the Department.

1.3 Forecast in-service dates, as at 31 March 2006, are comparable to the previous year. The delivery timeframe of the population as a whole has slipped 33 months in-year, an average of 1.7 months per project. Seventeen projects are expected to meet all their Key User Requirements (their required capability), one less than last year. Additionally seven projects have one or more of their Key User Requirements 'at risk'.⁸

The Department has improved its understanding of major equipment project costs

"Challenge" teams worked with project teams to achieve cost reductions

1.4 In Autumn 2005, recognising that the forecast costs of the Major Projects Report population were rising, the Department created four "challenge" teams, headed by senior members of the Defence Procurement Agency's Corporate Finance and Performance Group, to help Integrated Project Teams understand the drivers behind predicted increases in expenditure and to identify opportunities to reduce costs. Each team in this Departmental Review included an external independent assessor. The Defence Management Board⁹ agreed to any proposed changes to the capability or quantity of equipments being procured.

The challenge process is to become part of the Department's normal business

1.5 As part of their regular in-year management processes, Integrated Project Teams had already identified potential cost reductions of £341 million by trading capability, removing unnecessary risks and re-evaluating the costs of trials and other support costs. The Departmental Review process consolidated these savings and identified a further £781 million. As a result of the Departmental Review process, the Department has strengthened its internal financial reviews on all projects in the Defence Procurement Agency's Key Target population (equipments valued at £20 million or more).

⁸ This refers to projects where there is a possibility that the Key User Requirements will not be met but there is mitigation action in place to address this risk.

⁹ The Defence Management Board is responsible to Ministers for the full range of Defence Business, other than the conduct of operations. It is the executive board of the Defence Council and as such is responsible for directing a number of key processes, including the annual re-costing of the Defence programme and the Departmental planning process.

1.6 The Department's proactive approach has enabled it to offset the potential cost increases on most of the projects, although it was not able to eliminate cost growth in all. Type 45 destroyer and the Astute submarine both experienced considerable net cost growth in-year. Both projects are explored in more detail in Part 2.

The actions taken to improve the management of project costs fall into several categories

1.7 Figure 3 summarises the 44 main measures identified by the Departmental Review process, under four main headings. The following section examines each of these categories in more detail.

Some costs have been re-allocated to enable them to be more appropriately managed

1.8 The Departmental Review process identified 18 occasions in seven projects, where activities included in the Equipment Plan allocations and worth £448 million, should be moved to other budgets within the Department where they can be more effectively managed. The re-allocations took three main forms:

- in eight cases, costs have been re-categorised as expenditure to be incurred while equipment is in-service rather than costs relating to procurement. In these instances, the forecast costs have been moved to the equipment's in-service support budget managed by the Defence Logistics Organisation;
- in seven cases, costs were transferred to existing or newly created procurement projects; and
- in three cases, expenditure will be managed separately in the Equipment Plan at a corporate level, rather than on a project by project basis (such as the Astute submarine case example). This amounts to £17 million.

3 Categories of measures identified in the Departmental Review

	Number of instances	Total cost reduction (£m)	Percentage of total cost reduction
Re-allocated to enable more appropriate management	18	448	57
■ Suppliers' corporate costs	3	17	2
■ Re-allocated to other parts of the Department	15	431	55
Re-assessments of quantities required	3	139	18
More appropriate accounting treatment	5	32	4
Re-definition of some elements of the projects	18	162	21
■ Re-assessment of requirements	2	6	1
■ Commercial and contract management	8	138 ¹	18
■ More cost effective methods of delivery	8	18	2
	44²	781	100

Source: National Audit Office

NOTES

1 This includes a cost reduction of £91 million due to a rebate and exemption from HM Revenue & Customs.

2 The Project Summary Sheet for Astute records one Departmental Review measure for decreasing costs regarding nuclear safety cases. For the purposes of analysis, this has been broken into six separate measures.

1.9 Although justified, these re-allocations do not represent a saving to the Department as a whole. By transferring the costs elsewhere the Department potentially may have to forgo other activities, which could previously have been provided, or make corresponding efficiency gains to accommodate the expenditure.

There were some forecast cost reductions as a result of the application of more appropriate accounting treatments

1.10 One area on which the Departmental Review focused was Integrated Project Teams' application of accounting principles, particularly accruals. The resulting changes in accounting treatment did not contribute greatly to the overall saving – only a £32 million reduction in forecast costs.

1.11 However, there is still inconsistency between projects in relation to the level of evidence project teams believe is required to estimate the accrual with reasonable certainty. For the Major Projects Report 2005, the Sting Ray Life Extension and Capability Upgrade project contained an accrual for future increased overheads to the value of £12 million. This year the Integrated Project Team concluded that as it was not under any legal obligation to pay the additional costs and the required provision could not be estimated accurately, the accrual should be removed. There were no accrued future milestone payments in the Terrier vehicle project recorded in Major Projects Report 2005. This year, the Integrated Project Team conducted an in-depth review of the project's work schedule which has given the team sufficient certainty to include accruals for the period to March 2011. This has resulted in a cost of capital reduction of £3 million this year.

Some savings were achieved reducing quantities of equipments

1.12 Three projects: Guided Multiple Launch Rocket System; Brimstone anti-armour weapon and Support Vehicle have reduced the quantity of equipment being procured as a result of the Departmental Review. This is the second largest category of cost decreases at £139 million.

1.13 Trading quantities to remain within cost is often a difficult decision to take. The Department assessed that there was a risk that the quantity changes on projects like Guided Multiple Launch Rocket System could have unwelcome consequences and prevent the Department meeting its assessed requirement in these areas for Large Scale Operations. But, as we have commented previously this is something the Department must be willing to do to live within its means. In 2005, the Committee of Public Accounts recommended that: "The Department needs to be willing to sacrifice specific elements of capability on particular programmes to meet time and cost constraints, if it is to deliver timely and cost effective capability from the defence budget as a whole."¹⁰

1.14 That such trades can be potentially detrimental to military capability re-emphasises the importance to the Department of planning realistically and only committing to projects it is confident it can deliver to time and budgeted cost.

Some requirements were re-assessed to deliver savings

1.15 In a small number of cases the Department chose to re-assess requirements to determine if capability could be revised, saving £6 million. For example, the ability of the A400M transport aircraft to be loaded with civil pallets, which are wider than military pallets, was deemed surplus to requirements, reducing costs by £5 million.

Commercial and contract management arrangements were tightened and more cost effective methods of delivery were found

1.16 On four projects the Departmental Review identified revisions to the existing contractual and commercial arrangements which would save £138 million. For example, agreeing amendments to incentive payments to be made to a contractor; re-assessing the levels of contingency funds required and pursuing tax rebates. It also identified seven measures on the Astute submarine and Nimrod MRA4 aircraft projects where a change to the planned method of delivery could deliver £17 million in cost decreases.

¹⁰ C&AG's Report – *Ministry of Defence: Major Projects Report 2005* (HC 595, November 2005) and House of Commons Committee of Public Accounts Report – *Ministry of Defence: Major Projects Report 2004* (HC 410, July 2005).

The majority of projects did not experience any delays in-year, but challenges remain

Fourteen projects either experienced no delays or were advanced

1.17 The 19 post-Main Gate projects are now expected to be delivered in aggregate 433 months later than expected when they were approved, although delays are dominated by a small number of legacy projects. This represents a 34 per cent increase in timescales overall.¹¹ One of the projects, Nimrod MRA4 aircraft is currently forecast to take more than double the time predicted at Main Gate. Appendix 4 provides further details on total time variations against approved in-service dates and consumption of risk differential.

1.18 Against this historic performance it is encouraging that 12 of the 19 projects experienced no delays and two projects have brought forward their delivery dates in the last year. The Light Forces Anti-Tank Guided Weapon entered service in 2005, some four months earlier than estimated for the Major Projects Report 2005.

1.19 In the last year projects have slipped by 33 months, an average of 1.7 months per project, in contrast to the previous year's figure of 2.4 months per project. Five projects have been delayed. **Figure 4** shows the in-year timescale performance for post-Main Gate projects.

Many of the in-year delays are attributable to technical factors

1.20 In the past, technical factors have been the most significant reason for delays.¹² As **Figures 5** shows, they remain the single most significant cause of delays in the last year. We expect that these factors will not have such an adverse effect on project delivery in future, given the Department's emphasis on the Assessment Phase.

Delays may lead to capability gaps and increased costs

1.21 The in-year delays on three projects – Next Generation Light Anti-Armour Weapon, Beyond Visual Range Air-to-Air Missile and Type 45 destroyer – mean there may be a gap in the available capability or a delay in enhanced capability if other equipment reaches its out of service date before these replacements are ready.

Performance on Key User Requirements has slipped slightly

1.22 Seventeen of the 20 post-Main Gate projects are expected to meet all of their Key User Requirements, compared to 18 projects in the 2005 Report. Sting Ray Lightweight Torpedo Life Extension and Capability Upgrade project is now expected to miss one of its ten Key User Requirements relating to the Warhead and Firing Chain. Of the other two projects, the Typhoon aircraft will miss one and the Support Vehicle is expected not to meet three of its Key User Requirements.¹³

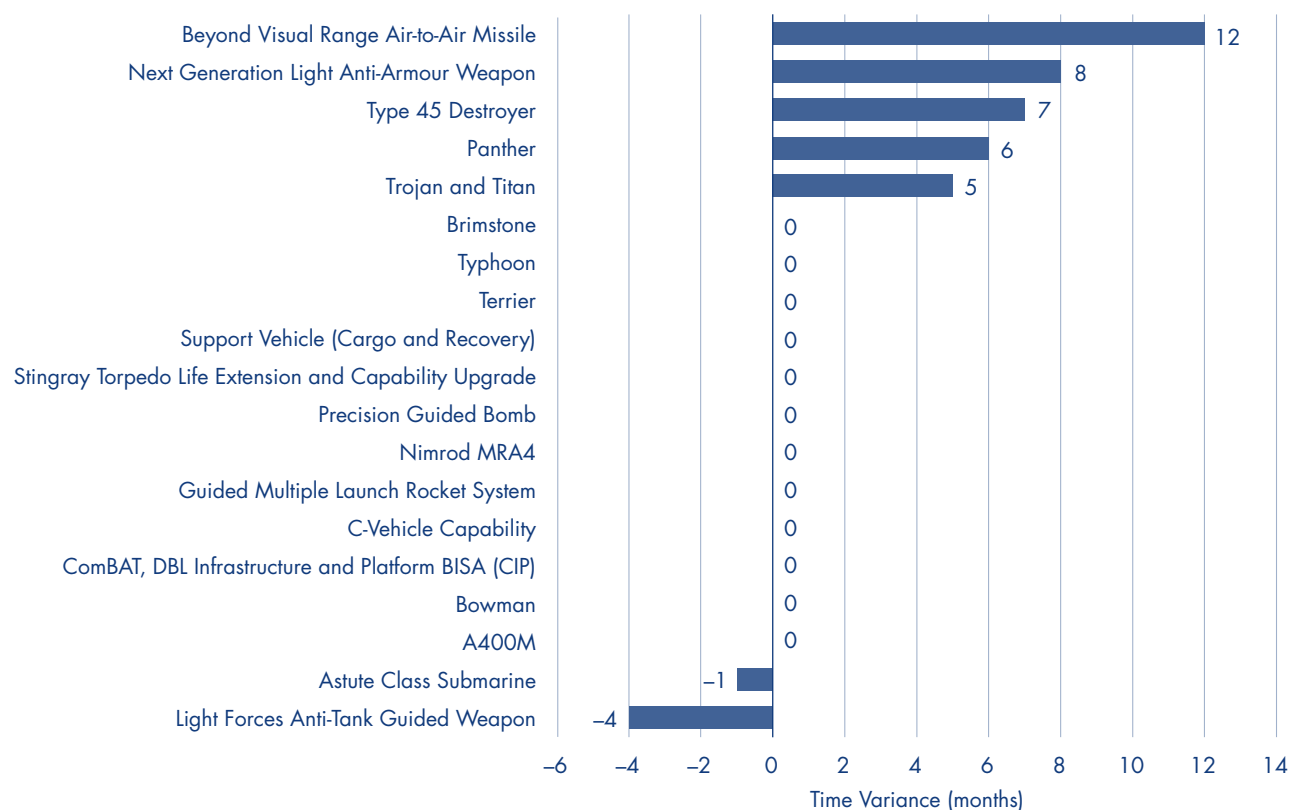
1.23 Thirteen Key User Requirements on seven projects are considered to be 'at risk'. This represents six per cent of the total. The Bowman communication system, Terrier vehicle and Future Joint Combat Aircraft Integrated Project Teams have the same concerns as reported in the Major Projects Report 2005. The Nimrod MRA4 aircraft now has an extra Key User Requirement 'at risk' and the Panther vehicle, Typhoon aircraft and Type 45 destroyer have identified new risks to Key User Requirements. Technical factors remain the largest cause of the increased risks to the projects. One of the ways the Department may deal with this is to make trade-offs in capability to keep within its budget and in-service date parameters.

¹¹ Future Joint Combat Aircraft is part of the United States Joint Strike Fighter programme and is aligned with its acquisition lifecycle. The current approval is for the cost of System Demonstration and Development only and further approval will be sought for the cost and in-service date of the main procurement phases.

¹² For a more detailed analysis of these trends see C&AG's Report – Ministry of Defence: Major Projects Report 2005, paragraphs 1.8, 2.8 to 2.13.

¹³ This is a correction of an error in the Major Projects Report 2005 which stated that 24 Key User Requirements would be met rather than 23.

4 Time variation in year by project



Source: National Audit Office

NOTE

1 Future Joint Combat Aircraft is excluded as its in-service date has not yet been approved.

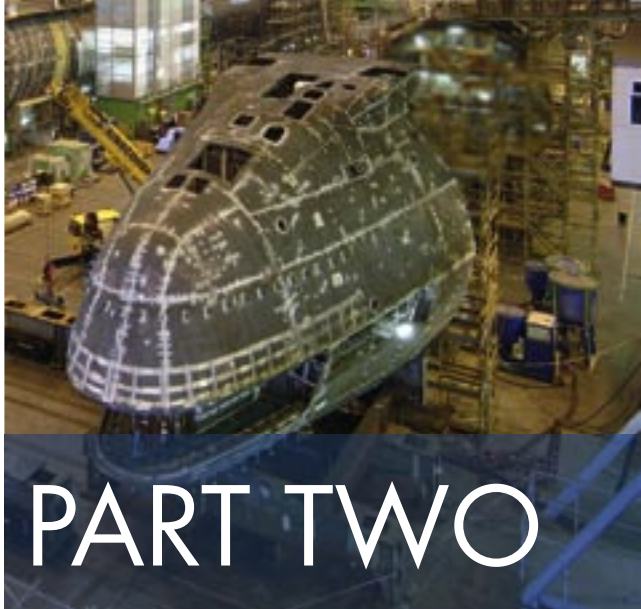
5 Projects that are forecast to be delayed

Project	Net delay (months)	Cause	Cost	Operational Impact
Beyond Visual Range Air-to-Air Missile	+12	Change in associated project	Nil	Capability delay
Next Generation Light Anti-Armour Weapon	+8	Technical factors	Nil	Potential capability gap
Type 45 Destroyer	+7	Technical factors	+£1m	Delays capability
Panther	+6	Technical factors	Nil	Nil
Trojan and Titan	+5	Contracting Processes	+£4m	Nil

Source: National Audit Office

NOTE

An associated project is a separate project which forms part of the overall capability.



Case examples

2.1 In the light of the Departmental Review, the second part of our Report focuses on five projects, presented in **Figure 6**, which demonstrate the variety of approaches taken by the Department to meet requirements and live within its financial means.

6 Summary of post-Main Gate case examples

Project	Example actions taken to reduce cost overruns	Changes in forecast In-Service Date	Key User Requirements 'At Risk'
Astute Class Submarine	More effective delivery of nuclear safety (£7m); Waived incentive payments (£1.3m); Corporate responsibility for pension costs (£5m) and legacy decontamination and decommissioning costs (£1m)	Advancement of one month due to reduced construction time	Nil
Guided Multiple Launch Rocket System	Forecast cost increase (£114m) was fully offset by measure to reduce rocket quantities	Nil	Nil
Precision Guided Bomb	Removal of immature minor technological requirement (£1m); Foreign Exchange policy (£1m) and Use of Integrated Test and Evaluation Programme (£3m)	Nil	Nil
Trojan and Titan	Reclassification of element of spares costs to consumables (£4m) and deletion of requirement to convert prototype vehicles (£1m)	Delay of five months, but still to be delivered two months ahead of approved date	Nil
Type 45 Destroyer	Transfer of acquisition and management of training solution to another project (£36m)	Delay of eight months due to integration problems and difficulties followed by advancement of one month	Three

Source: National Audit Office

Astute Class Submarine

The Astute Class of Attack Submarines is the replacement for the existing Swiftsure and Trafalgar Classes of nuclear attack submarine.

Forecast costs increased by £164 million in-year

2.2 Technical factors contributed to a potential cost escalation. Although many measures were taken to reduce the growth, the most significant of which are described below, there has been a £164 million cost increase in-year.

Savings of £20 million on Nuclear Safety Demonstration were made

2.3 In response to a predicted increase in costs of £17 million the Departmental Review asked the Integrated Project Team to identify sensible savings to offset this level of cost growth. A total of £7 million of cost reductions resulted from the introduction of four measures identified with BAES Submarines, which provide more effective means of delivery:

- Rationalisation of the nuclear safety infrastructure. Previously, the plan was for the existing dock-side cranes and supporting infrastructure to be upgraded to fully withstand seismic activity. The alternative approach of mooring the submarine off the jetty using pontoons and hiring a lighter mobile crane provides a net saving of £3 million.
- Internal publication of the Nuclear Safety Case Manual. £1 million of the money set aside for the production of the manual externally has been saved by delivering internal guidance in the form of a Department-wide publication.
- Removal of High Integrity Alarms. The Department decided that it was more efficient to fit both digital and analogue alarms, rather than develop and implement the originally planned and more expensive High Integrity Alarms. This saved £1 million.
- Retaining existing pump designs and altering the approach to training. By not seeking to develop alternatives and changing the method for pump running during the build and commissioning processes, costs of £2 million are avoided.

The Department has confirmed that these measures will not impact on the safety or capability of the programme.

Contractor waived Incentive Payments of £13 million

2.4 The Department and BAE Systems have worked in partnership to identify ongoing cost reduction opportunities, particularly in the commercial and financial areas. Originally incentives were separately identified and valued in the contract but as the programme has progressed both parties agreed that they had become less meaningful and that incentives should be treated in a different way. Therefore, BAE Systems have waived an incentive payment of £13 million on Boat 1.

Reallocation of pension cost increases saved the project £5 million

2.5 BAE Systems faced significant future shortfalls in its various pensions schemes which the Trustees required to be addressed. To manage this BAE Systems effected a number of actions, including injecting cash, property and assets as well as asking staff to agree changes to their own contributions and benefits.

2.6 In addition to its internal actions, the company, through the contracting arrangements, sought a contribution from the Department. The Pricing and Forecasting Group of the Department agreed to allow a five per cent increase in wage rates for the local pension scheme at Barrow. The Department is taking a corporate view of its liability to these costs. Hence the costs are no longer included in the forecast for the Astute project and are reported as a decrease of £5 million. Meanwhile, they are being managed and paid separately.

£1 million was saved on decommissioning and decontamination costs of legacy items

2.7 The Astute contract includes a clause whereby the Department accepts a specific liability for costs of decontamination and decommissioning of assets at the contractor's Barrow shipyard. Currently Astute is the Department's only programme using the Barrow facilities and BAE Systems requested that the Department takes responsibility for decontamination and decommissioning costs of other assets, which relate to historic Departmental programmes. The Department agreed to pay £1.1 million for work on two specific assets in order that the current Astute programme could continue.

2.8 There is no provision within the Astute project Approval for decommissioning or decontamination costs for legacy programmes. The Department has therefore decided to fund these corporately. This meant that the costs appear as a saving to the project of £1 million in the Major Projects Report. However, the Department will still meet this cost.

Delays on the project have been reduced by one month in-year

2.9 In the Major Projects Report 2005, the forecast in-service date for Astute was January 2009. Re-assessment of construction time means that Astute will enter service in December 2008; 42 months – or three and a half years – later than forecast at Main Gate, a one month improvement on the Major Projects Report 2005.

2.10 The opportunity to accelerate the schedule for Boat 1 has been identified following efforts by BAE Systems and the Department and there have been both performance efficiency and progressive build strategy improvements.

Guided Multiple Launch Rocket System

GMLRS is a guided rocket which has an extended range at more than 60 kilometres to replace the unguided Multiple Launch Rocket System (range 30 kilometres). It has a Global Positioning System to enhance accuracy.



The project had no net cost growth in-year

2.11 The number of rockets to be procured for the Guided Multiple Launch Rocket System programme has fluctuated throughout the acquisition process. A higher than expected unit cost quotation from the contractor, in 2005-06, meant the cost of the project would have increased by £114 million.

2.12 An analysis of operational requirements identified that the system was significantly more precise than originally anticipated. Therefore, the Department reduced the number of rockets required from 6,204 to 4,780. However, this reduced requirement was insufficient to fully offset the potential cost increase.

2.13 Following the Departmental Review, the Defence Management Board considered that it was tolerable to reduce further the number of rockets purchased under the Guided Multiple Launch Rocket System project by a quantity that ensured there was a nil cost increase. Only 4,080 rockets will be ordered. This has created a shortfall in capability which the Defence Management Board considers to be acceptable and the Indirect Fire Precision Attack project will consider whether more rockets should be bought at a later date.

Precision Guided Bomb

A general-purpose bomb, which can operate in all-weather and at any time of day or night. Its Global Positioning System aided inertial navigation and laser guidance modes offer increased accuracy to attack moving as well as fixed targets.

£11 million of savings have been achieved in-year

2.14 Through a mixture of good financial management, re-assessment of technology requirements and opportunities identified during the Departmental Review, the Integrated Project Team were able to reduce forecast costs throughout 2005-06, three of which are described below.

Removal of a minor technological requirement reduced costs by £1 million

2.15 Initial plans for the development of the Precision Guided Bomb were designed to include data loggers (technology to monitor the environment (temperature and vibration) that the weapon is exposed to during storage, ground transportation, and captive carriage on the aircraft). In re-assessing the requirement, as a result of the Departmental Review, it was decided that data logging technology was not sufficiently advanced to be used at this juncture. Therefore, the Integrated Project Team removed the provision of £1 million for procurement of these items over 2006-07 and 2007-08.

2.16 The Defence Logistics Organisation will need to fund the cost of inserting the technology when it is available. As such there will be little benefit in whole life cost terms, although it is recognised as a saving for the purposes of the Major Projects Report.

Foreign Exchange Rate Risk mitigation will deliver savings of £1 million

2.17 A forward contract is an agreement between two parties to exchange a specified amount of one currency for another currency, at a specified exchange rate, on a future date. The Department decided corporately, from 1st April 2006, to reduce its exposure to exchange rate fluctuations in this way. The Precision Guided Bomb Integrated Project Team will use this policy in managing its project to save £1 million.

Prudent management of the Integrated Test Evaluation and Acceptance Programme saved the project £3 million

2.18 Before the equipment is accepted into service there has to be confirmation that it thoroughly satisfies the identified needs. An Integrated Test Evaluation and Acceptance programme provides the impartial assurance and independent auditing needed for final acceptance. Closer co-ordination of test, evaluation and acceptance activities with other projects and the Air Warfare Centre, has reduced duplication and saved £3 million.

Trojan and Titan

The project provides an armoured engineer capability that will replace the Chieftain vehicles. Titan is an armoured bridge-layer and Trojan is an armoured obstacle breaching vehicle.



The project experienced a net in-year cost increase of £6 million

2.19 The increase in forecast costs in-year was mainly due to programme delays which caused a total increase of £14 million, of which only £8 million could be offset. The most significant cost reductions are described below.

Reclassification of spares to consumables: re-allocated expenditure of £4 million to another part of the Department

2.20 A capital spare is a part that is capable of repair and will generally be procured alongside the main equipment, such as a vehicle or aircraft. If the spare can only be used once, then it will be counted as consumable stock and will be procured using the in-service support budget. An Approval for a major equipment project includes the purchase of capital items and capital spares.

2.21 As part of the Departmental Review some £4 million worth of spares were re-classified as stock. Whilst this is a saving in terms of the Major Projects Report, the Department will still bear the cost through the Defence Logistics Organisation equipment support budget.

Deletion of the requirement to convert prototype vehicles resulted in a cost saving of £1 million

2.22 The original Approval for Trojan and Titan recognised the need for a training solution but did not include a specific requirement for Driver Training Vehicles. The contract did include a requirement for the contractor to convert four prototype vehicles into Driver Training Vehicles to aid the preparation of Engineers' Units for tasks in the field.

2.23 During the Departmental Review, the conversion of the prototypes to Driver Training Vehicles was deemed beyond the scope of the original requirement and the conversion was stopped, which will save £1 million. Two options were considered to fill the gap in the training solution:

- use production vehicles for training purposes; or
- seek new funds in the Equipment Plan for the conversion work.

2.24 The Department has proposed to exercise the first option, although it has acknowledged that this is likely to increase pressure on the management of the fleet. In deleting the requirement to convert the prototypes to training vehicles there is a risk that insufficient vehicles will be available to train the Royal Engineers. Should this risk occur, the impact would be mitigated through a redistribution of the vehicles to support the training activity. However, the impact will not be fully known until the Trojan and Titan conversion training has been underway for twelve months, in mid-2007.

Delays to the Bowman communications project have adversely affected the forecast In-Service Date

2.25 In 2003, the Department decided to fit the vehicles with the Bowman system during build, rather than install the older Clansman communications systems and convert the in-service vehicles from 2007. Problems with the Bowman project¹⁴ have delayed the Trojan and Titan project by five months.

2.26 While there is no foreseeable operational impact arising from the delay to the in-service date, there will be additional financial costs:

- £1 million to extend support function for in-service vehicles;
- £4 million payable to BAE Systems because of late supply of Bowman hardware by the Department; and
- £2 million to fund remaining Installation, Design and Conversion activities.

Type 45 Destroyer

The Type 45 is a new class of Anti-Air Warfare Destroyers that replace the capability provided by the Royal Navy's Type 42 Destroyers.



Type 45 project suffered a net cost increase of £157 million

2.27 An increase in build costs for Ships 4 to 6 has caused forecast expenditure to rise in-year by £184 million. The Department achieved a reduction of £36 million by transferring the responsibility for shore training to support the operational deployment of the ships to another project team which has resources and experience in this area and would be better placed to manage the costs. Whilst the cost of the Type 45 project has reduced, it does not result in a saving to the Department as a whole.

The project has experienced a net in-year delay of seven months

2.28 A re-assessment of the risks to achieving the in-service date for Type 45 identified an eight month delay in the production timetable and the likelihood that the Multi-Functional Radar, which forms a key part of the Principal Anti-Air Missile System, would not meet its development schedule. This delay will be reduced by one month by undertaking more parallel working, so that the second ship can be used to demonstrate elements of capability that should have otherwise been certified in the First of Class.

2.29 There will be both operational and cost implications. Operationally there will be a delay in the Royal Navy being able to have the capability to defeat concurrent attacks by more than two sea-skimming missiles. An existing Type 42 destroyer will need to continue in service for an additional seven months at a cost of £1 million to mitigate this risk.

Three Key User Requirements were 'At Risk'

2.30 Nine Key User Requirements were agreed at Approval for the Type 45 project. At 31 March 2006, three were considered at risk. Two are linked to delivery of the Sampson radar, with the other one related to the ship's ability to operate both Merlin and Lynx helicopters. The Department is now confident that there are sufficient mitigating actions in place to ensure all Key User Requirements will be achieved at in-service date.

¹⁴ For a more detailed analysis refer to C&AG's Report – Ministry of Defence: *Delivering digital tactical communications through the Bowman CIP programme* (HC 1050, July 2006).

APPENDIX ONE

Methodology

Project population

Projects qualify for inclusion in the Major Projects Report if their forecast of future expenditure is among the 20 highest, for those that have achieved approval at the main investment decision and the ten highest for those projects still in the Assessment Phase. They are replaced when, as they progress through the procurement process, estimated forecast costs reduce below the level of the top projects, although their total costs may nonetheless be very high.

Scope of validation

The Major Projects Report is not a statutory account and we do not offer a formal audit opinion on the accuracy of data contained within it. The Department compiles the Project Summary Sheets according to the guidelines, to which we have agreed, and the figures are calculated on a different basis to the Department's Resource Account. The draft summary sheets are also made available to the industrial prime contractors for comment and amendments are incorporated as appropriate.

Our validations confirm that the Project Summary Sheets conform to the guidance and we check that it has been accurately and consistently applied. Each year Integrated Project Teams (IPTs) build up detailed forecasts for the equipments on costs and time to completion, which are subject to Departmental scrutiny for inclusion in its Equipment Plan. Traditionally, we agree the data against the approved Equipment Plan, but this year the Department has moved to biennial planning for equipment procurement. Therefore the Equipment Plan for 2006 was not produced, and so each IPT had to provide detailed audit trails to substantiate every change in their forecasts. We do not question the forecasts or assumptions of the Department's long-term costings unless better information subsequently becomes available.

Other test checks on the data confirm in-service dates to project plans and the likely achievement of their Key User Requirements with the Equipment Capability Customers.

Outcome of validation

All the draft Project Summary Sheets were amended following validation. However, for the majority the adjustments were minor to improve clarity. The incidence of significant errors has declined, reflecting the level of priority attached to the Report by the Defence Procurement Agency and the efforts of the Integrated Project Teams. In particular, the Future Integrated Soldier Technology; Bowman communications; ComBAT, DBL Infrastructure and Platform BISA systems and tools and Panther vehicles¹⁵ projects provided credible draft summary sheets.

Analysis

We considered whether the Ministry of Defence is currently forecasting to procure major equipments within time, to budget and to meet Key User Requirements. Our examination of time and forecast cost is based on the most likely estimates. The analysis involved using both quantitative and qualitative sources of information. In particular we focused on those projects showing the greatest cost or time variances and the factors that caused them to change. Case examples of a few key projects illustrate our findings.

15 Panther is new to the population.

APPENDIX TWO

Assessment phase projects as of 31 March 2006

The Department has changed the format of the Pre-Main Gate Project Summary Sheets to bring them into line with its policy on the release of information on equipment projects. Costs for the Demonstration and Manufacture phase and in-service dates are not set until the main investment decision is made at Main Gate Approval. Forecasts prior to this Approval are for internal planning purposes only and publicly declaring these limit the Department's ability to make trade-offs and to conclude satisfactorily commercial arrangements.

To maintain transparency and public accountability, the Department will continue to provide a range for the cost of the Demonstration and Manufacture phase and in-service date for the Committee of Public Accounts. In the Project Summary Sheets that accompany this Report, the envelopes for cost and time are classified for commercial reasons.

7 Current forecast costs of Assessment phase projects

Project	Description	Forecast cost of Assessment phase (£m)
Advanced Jet Trainer	Training system	73
Falcon	Communication System	31
Future Aircraft Carrier	Aircraft Carrier	302
Future Integrated Soldier Technology	Fighting system for dismounted close combat	33
Future Rapid Effect System ¹	Medium weight armoured vehicle	649 ²
Future Strategic Tanker Aircraft	Tanker aircraft providing air-to-air refuelling capacity	30
Indirect Fire Precision Attack	Munitions	20
Military Afloat Reach and Sustainability ¹	Auxiliary vessels	*** ³
UK Military Flying Training System	Training system	29
Watchkeeper	Unmanned air vehicles, sensors and ground stations	65

Source: National Audit Office

NOTES

- 1 These projects are new to the population.
- 2 Includes the cost of the Assessment Phase roles for the Initial Operating Capability of the Utility vehicle and also the Assessment Phases of later variants.
- 3 The forecast cost of the Assessment Phase for the Military Afloat Reach and Sustainability project has been classified as the information is commercially sensitive.

APPENDIX THREE

Skynet 5 restructuring

1 There have been a number of developments on the Skynet 5 project which has been removed from the post-Main Gate population of the Major Projects Report 2006. This appendix provides a high level analysis of the restructuring of the deal and the costs and benefits that it brings.

2 The Skynet 5 PFI programme provides the next generation of satellite communications services for military use and will replace the Skynet 4 satellite constellation at the end of its predicted life. The deal was signed in October 2003, with the contractor Paradigm (wholly owned by EADS) at a forecast cost of £2,775 million. It comprised:

- the operation of Skynet 4 satellites until their end of life;¹⁶
- the upgrade and support of ground based infrastructure in the United Kingdom;
- the design, build, launch and operation of two satellites, until their out-of-service date of 2018;
- the provision to the Department of capacity equivalent to 1.1 Skynet 5 satellites; and
- the supply of new remote terminals.

3 Insurance provision was a key part of the deal. One of the insurances required was to mitigate risks to the satellites during the launch phase and while the satellites were in orbit (collectively known as space insurance). This provision was the responsibility of the contractor. Insufficient capacity in the market for space insurance led the Department to sign a restructured deal in December 2005. The deal provides a third satellite acting as physical assurance, replacing the requirement for space insurance. The duration of the project has also been extended to 2020, with a possible further

15 months thereafter. As a result of this extension in duration the forecast cost is £3,660 million, an increase of £885 million. This restructured deal provides benefits to both the Department and the contractor.

Insurance played an important role in the original deal

4 Under the original deal Paradigm would have taken out insurance against damage during the launch and in orbit stages of the satellites' lives. This aimed to mitigate several risks outlined in **Figure 8 overleaf**. The insurance cover also protected Paradigm from any loss of revenue from the Department that resulted from a loss of satellite capacity.

5 Also the Department was to act as insurer of last resort. That is, it would take responsibility for losses if insurance was not available in the market place or there was insufficient capacity to insure the satellites to their full value, or if the cost of insurance exceeded a cap agreed with Paradigm.

There were risks in using insurance

6 The Space Insurance Market is regarded generally as volatile and reacts strongly to payouts. Capacity in the market is not guaranteed and premia can be high. The capacity in the space market had in fact been in decline since its peak in 1999, as **Figure 9 overleaf** demonstrates. The Department was aware of this volatility during the procurement process. It sought advice from insurance experts Willis InSpace. In 2001, Willis reported to the Department that the market was expected to contract dramatically owing to a number of recent losses. It also noted an increase in premium rates.

16 Predicted to be 2008.

8 Risks to the satellite

Launch

The launch phase is the period of time during which the Skynet 5 satellites are launched from the ground into Geostationary Transfer Orbit and transfer into Geostationary Orbit (GEO) followed by a period of testing in GEO before the satellite is deemed 'in orbit'. Skynet 5A, the first of the Skynet 5 satellites, is currently intended to be launched at the end of 2006. Launch is a time of great risk to the satellite with each launch phase having an approximate chance of failure of 20 per cent.¹ Risks include:

- catastrophic failure of the launch vehicle which would irrecoverably damage the satellites; and
- damage to the satellite's sensitive electronic equipment from the physical stresses of ascent resulting in either partial or total failure of the satellite.

In orbit

Risks in the in orbit phase tend to affect the capability rather than the totality of the satellite. The chance of partial and total failure has been estimated as 20 per cent.² Risks include:

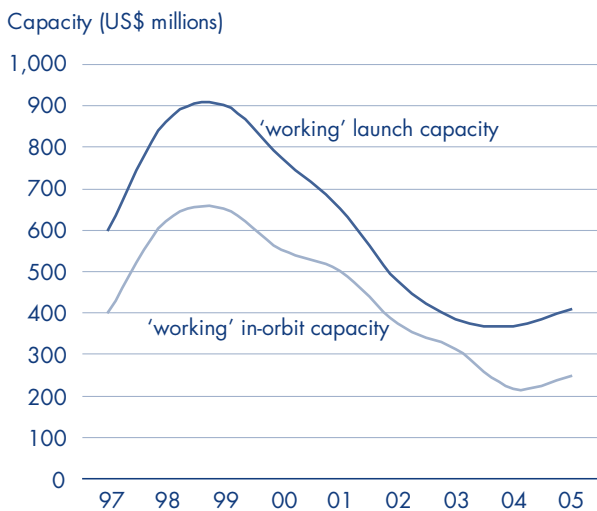
- solar radiation damaging the electronics and reducing the number of radio channels available; and
- depletion of fuel reserves while maintaining the satellite's orbit. It is possible to reduce the number of manoeuvres needed to maintain the orbit near the end of the satellite's life, although this may degrade the coverage of the signal.

Source: National Audit Office

NOTES

- 1 Source: QinetiQ analysis of the reliability of Ariane 5 as a launch vehicle using data from June 1996 to February 2005.
- 2 Source: Frost and Sullivan, Commercial Communications Satellite Bus Reliability Analysis, August 2004 – study of 266 successful deployments of commercial satellites and insurance claims.

9 The trend in capacity in the space insurance market



Source: Willis InSpace 2005

7 In 2002, as it selected its preferred bidder for the deal, the Department calculated that there was a 20 per cent possibility of insufficient capacity in the market, thus exposing it to the risk of acting as insurer of last resort. Should this risk materialise the Department could expect to be liable to pay up to £350 million. The space insurance market did not improve during the preferred bidder negotiations. In early 2003, the Department and preferred bidder did discuss the possibility of mitigating this risk by building a third satellite to be held as a spare, and launched if one of the two satellites failed. The procurement arrangements for Skynet 5 had been evolving for several years and a revision at this late stage would have created the risk of the deal collapsing. The Department did not lose sight of the risk of insufficient capacity in the insurance market and continued to monitor the situation. It did not develop formally any contingencies against the risk that it may have to act as insurer of last resort or alter its responsibility as insurer of last resort before the deal was signed. When it became clear that the insurance risk had matured around the time that the deal was signed, the Department took forward a mitigation strategy jointly with the company.

8 The space insurance market was also sensitive to rising premia rates. To protect itself against this, during the preferred bidder stage, Paradigm set a cap on the premia for launch and in orbit insurance of approximately £250 million. This was to be paid through the unitary charge. If insurance capacity was not available then the Department would be able to reclaim part of this amount, which had not been used for insurance premia, from the contractor.

The deal was signed even though the space insurance market continued to decline

9 The space insurance market continued to contract as the original deal was signed. A report commissioned by Paradigm's lenders in October 2003, released two weeks before the deal was signed, stated clearly that there was inadequate capacity in the insurance market to insure the Skynet 5 risks in full. The report concluded that the Department's contractual responsibility as insurer of last resort offered sufficient comfort to Paradigm's lenders.

There were drivers to sign the original contract despite the risks

10 The Department faced a difficult decision whether to sign the deal and accept responsibility as insurer of last resort, or delay signing until it had developed a strategy, such as a physical assurance provision, to deal with the lack of capacity in the space insurance market. It signed the deal in October 2003, because:

- delaying contract signature would have probably delayed the provision of the satellite service, creating a capability gap from when the aging Skynet 4 went out of service until Skynet 5 went on line;
- there were potential cost implications, as the other bidders may have challenged the Department's procurement process as it could be changing the nature of the deal during the preferred bidder stage; and
- insurance did not have to be placed until six months before launch and there was a possibility that the markets could improve.

The deal has been restructured, reflecting the worsening space insurance market

Paradigm proposed a restructuring option soon after the original deal was signed

11 Within six months of signing the deal Paradigm proposed a restructuring, which also aimed to overcome the worsening insurance position. The restructuring would improve the financing of the deal thus contributing to funding extra satellites creating physical assurance. A third satellite would be launched and act as an in orbit spare. A fourth would be partially built and launched if one of the first three satellites failed. This new structure aimed to mitigate the risk of satellite failure and provided Paradigm with a greater source of third party revenue. The Department's responsibility as insurer of last resort would cease under this proposal. The restructured deal is compared to the original in **Figure 10 overleaf**.

The Department sought legal, insurance and financial advice to develop the option

12 During 2004, the Department and its advisers developed Paradigm's suggestions into a detailed proposal. Throughout the period the space insurance market continued to decline, putting further pressure on the Department to develop a solution.

13 In May 2005, the Department concluded that the worsening space insurance market would only provide £170 million cover per satellite. As the Department estimated it would cost £350 million to build and launch a replacement satellite in the event of one satellite failure, there would be a shortfall in cover of £180 million.

The Department assessed that the proposed restructuring offered better value for money than other options considered

14 The Department explored the restructured option alongside four others, concluding that the restructured option (number 3) was the best value for money. The options were:

- 1 Do nothing (the current position with the Department partially insuring)
- 2 Self insure
- 3 Restructuring with a third satellite launched and a part build of a fourth
- 4 Restructuring with a third satellite launched and a provision created to build a fourth
- 5 Refinancing only

15 According to Treasury guidance on appraising and evaluating projects, the relevant costs and benefits to Government and society of all options should be calculated. However, the Department did not conduct a full Net Present Value analysis on options 2, 4 and 5 because it considered they were fundamentally similar to other options or that they were unlikely to succeed for reasons other than value for money.

16 The Department did conduct a thorough and more exacting appraisal of the current situation (option 1) compared with the favoured restructuring option 3. This followed Treasury guidance in the main and assessed the costs and benefits of both options. Key was the calculation of the Net Present Value based on a number of scenarios of satellite launch losses. However, this appraisal has some limits because:

- the model contains the most likely satellite loss scenarios. This approach was agreed by the Chief Economic Adviser and the Department’s scrutineers. However, it does not include the possible cumulative effect of several partial losses of capability while the satellites are in orbit. With the omission of situations deemed insignificant, their aggregate effect is omitted, which could have altered the outcome of the exercise;
- some of the costs used in the analysis were broad estimates only; and
- inconsistency in the rationale for including some costs, such as the procurement of a replacement for Skynet 5, yet omitting third party revenue sharing gains that could be generated for the Department under the Skynet 5 deal.

17 The Net Present Value calculation showed that the restructured option was only £40 million cheaper than the Department’s current position. Given this small difference in Net Present Value and the limits in the analysis, it would have been difficult to conclude that the restructured option offered substantially better value for money on this basis alone. However, the Department’s analysis

outside the Net Present Value calculation demonstrated other benefits such as removing both the Department’s exposure to future shortfalls in the space insurance market and the potential for capability gaps should one satellite fail; and these tilted the balance clearly in favour of the restructured option.

The restructuring was not a cost-free exercise

18 The restructured deal was signed in December 2005, at the maximum cost of £3,660 million which allows for the fourth satellite to be launched. Should this not be required the cost of the deal falls to £3,273 million. The original forecast cost approval of Skynet 5 was based on the assumption that there would be no launch phase loss of a satellite. The re-approval for the restructured deal in October 2005, changed this to the more prudent assumption that one of the three satellites would fail during the launch phase and that the part-built fourth satellite would need to be completed and launched.

19 The cost of the project has increased by £885 million, mostly because of the additional service period payments, which total £822 million. These give the Department an additional two years of satellite capacity, with a further extension of 15 months if the fourth satellite is launched. While the Department will gain from the extra life of the deal, the original requirement did not specify an operational need for the additional years’ service. The extra two years service is driven by the contractor’s affordability considerations.

10 Comparison of key features of restructured deal with original deal

Feature	Original deal	Restructured deal
Cost	Forecast cost £2,775 million (as reported in Major Projects Report 2005).	Forecast cost in 2006, £3,660 million (should the fourth satellite be launched).
Number of satellites	Two satellites in orbit, a third satellite to be built and launched, using insurance pay out, if one is lost.	Three satellites in orbit, part build of fourth, to be completed and launched if one satellite is lost.
Insurance	Covers launch loss, loss of revenue and in orbit loss. Department insurer of last resort.	None, except £60 million premia for loss of revenue to protect Paradigm. ¹ Department not insurer of last resort.
Duration	Deal to last until 2018.	Deal extended to 2020 and possibly 2022 if fourth satellite launched.

Source: National Audit Office

NOTE

¹ This insurance was not required under the contract. It will be paid for as part of the Unitary Payment.

20 The £250 million set aside for insurance under the original deal remains as part of the Unitary charge and has gone to fund the build of the third satellite and part-built fourth. Under the original deal the Department could have claimed back either part or all of this money if there was insufficient capacity in the space insurance market.

21 The contractor has contributed to the costs of building the third satellite from funds yielded by the financial restructuring. These gains were not sufficient to trigger the gain-sharing mechanism¹⁷ in the contract and therefore the Department would not have been entitled to a share of the financial benefits. The contractor was unable to quantify these gains when we asked for a figure.

The restructured deal provides benefits to both parties

22 The restructured deal provided benefits to both the Department and Paradigm. Above all, it mitigates the loss of one satellite and ensures a much greater probability that Paradigm will be able to meet Department's required capacity of 1.1 Skynet 5 satellites. Other benefits include:

- no change to the Department's Equipment Plan budget for the next ten years, provided the trigger for work on the fourth satellite is not activated. The additional two years' service charge at the end of the deal is outside the current Plan. Therefore, the restructuring will have no impact to the Department in terms of the affordability of its portfolio of projects during the service period extension;
- rescheduling the requirement for the follow-on Skynet 6 project, potentially releases funds for other projects in those years of the Equipment Plan budget where it was planned to spend this money; and
- availability of additional communications capacity should the Department's requirements change, although it will pay the contractor for any additional usage.

23 The third satellite provides Paradigm with greater capacity to sell to other parties, therefore increasing its potential for third party revenue. The contract enables the Department to receive a share of third party revenues. Importantly, the contractor is also able to maintain its lines of production and supply for an extended period.



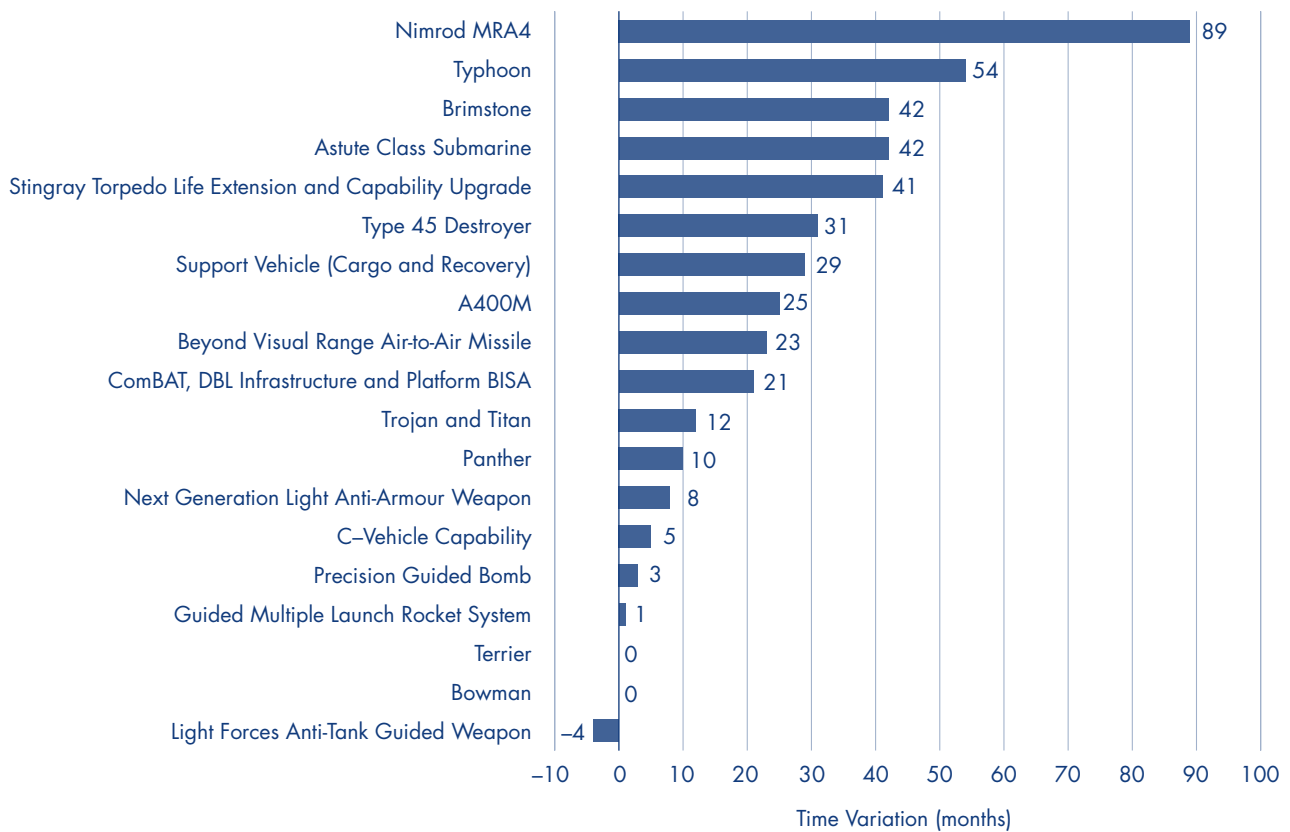
¹⁷ The Department is entitled to a 50 per cent share of any refinancing gains which exceed a threshold equity Internal Rate of Return of 16.5% – that is the rate of return to the investors in the project.

APPENDIX FOUR

Time performance since Main Gate approval

11 Variation in time performance since Main Gate Approval

Compared to their expected in-service dates at Approval, 16 projects are forecasting delays.



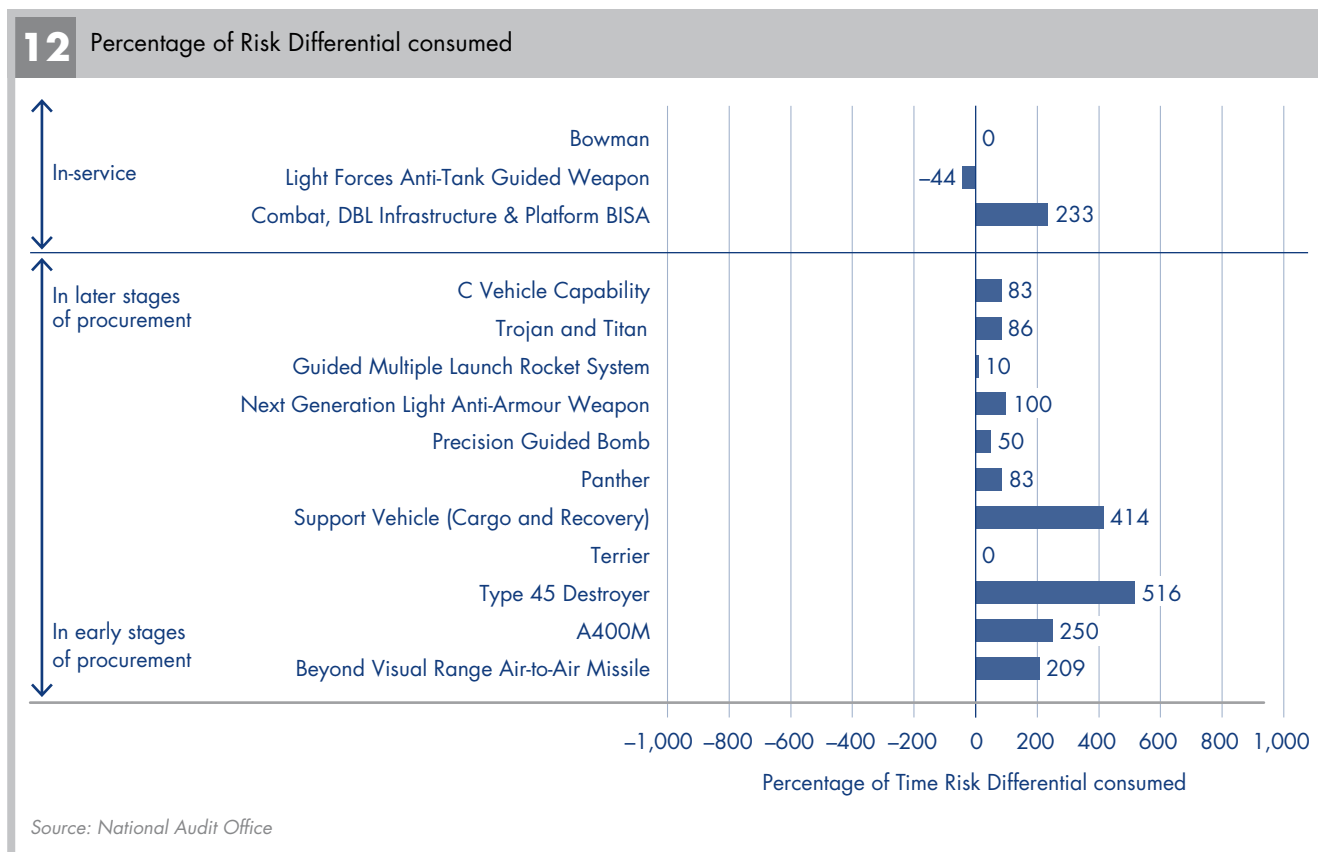
Source: National Audit Office

NOTE

Future Joint Combat Aircraft is excluded as its in-service date has not yet been approved.

Percentage of risk differential consumed

Risk differential represents the difference between the budgeted (that is 'most likely') and the not to exceed time estimates approved at Main Gate. **Figure 12** is showing that five projects are forecasting to exceed their time estimates. This year, the forecast for the Next Generation Light Anti-Armour Weapon project has reached the highest acceptable time estimate made at Main Gate Approval.



NOTES

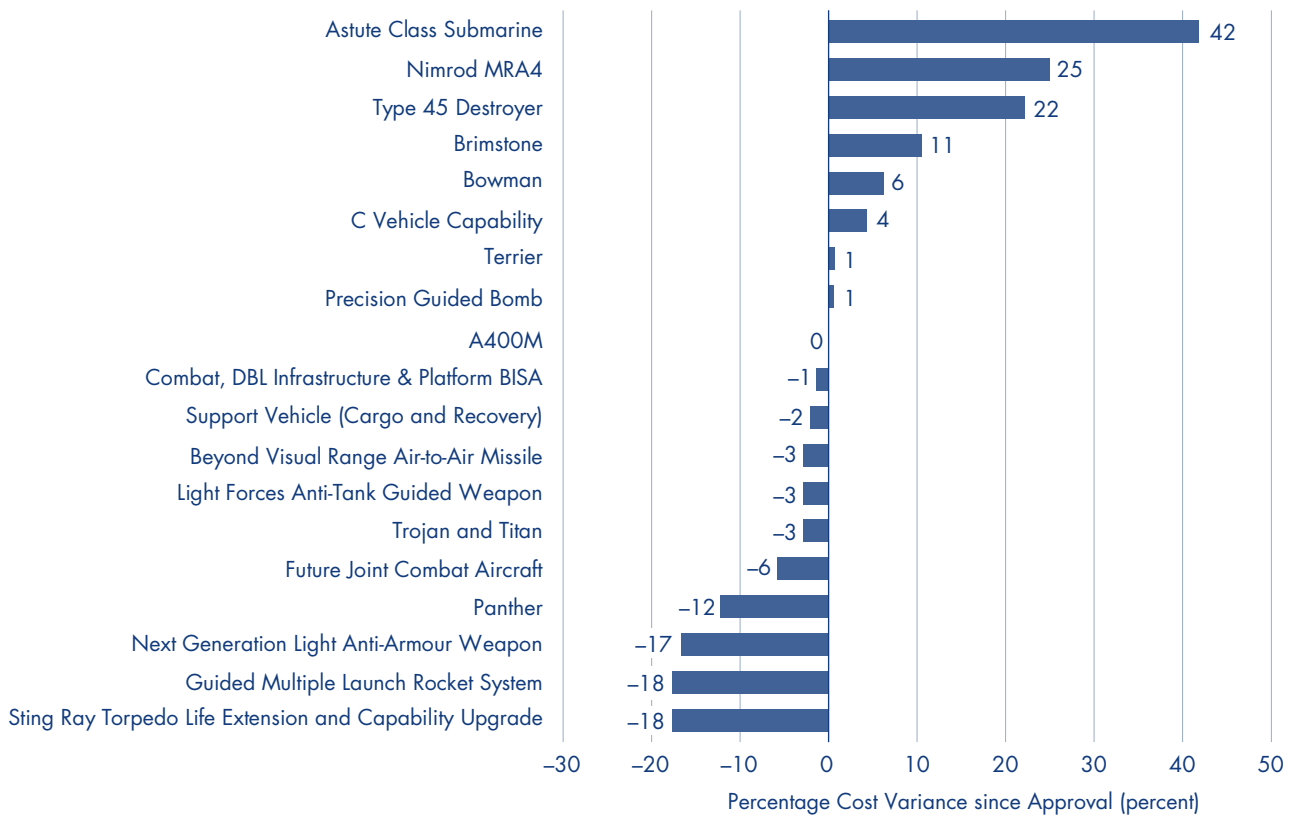
- 1 Future Joint Combat Aircraft is excluded from this analysis as its in-service date has not yet been approved.
- 2 Astute Class Submarine, Brimstone, Nimrod MRA4, Sting Ray Life Extension and Capability Upgrade and Typhoon are excluded because they are legacy projects and as such do not have time risk differential in their Approvals.

APPENDIX FIVE

Cost performance in-year

13 Cost variation since Approval

Eight projects are predicting overruns against their forecast of 'most likely' costs at approval.



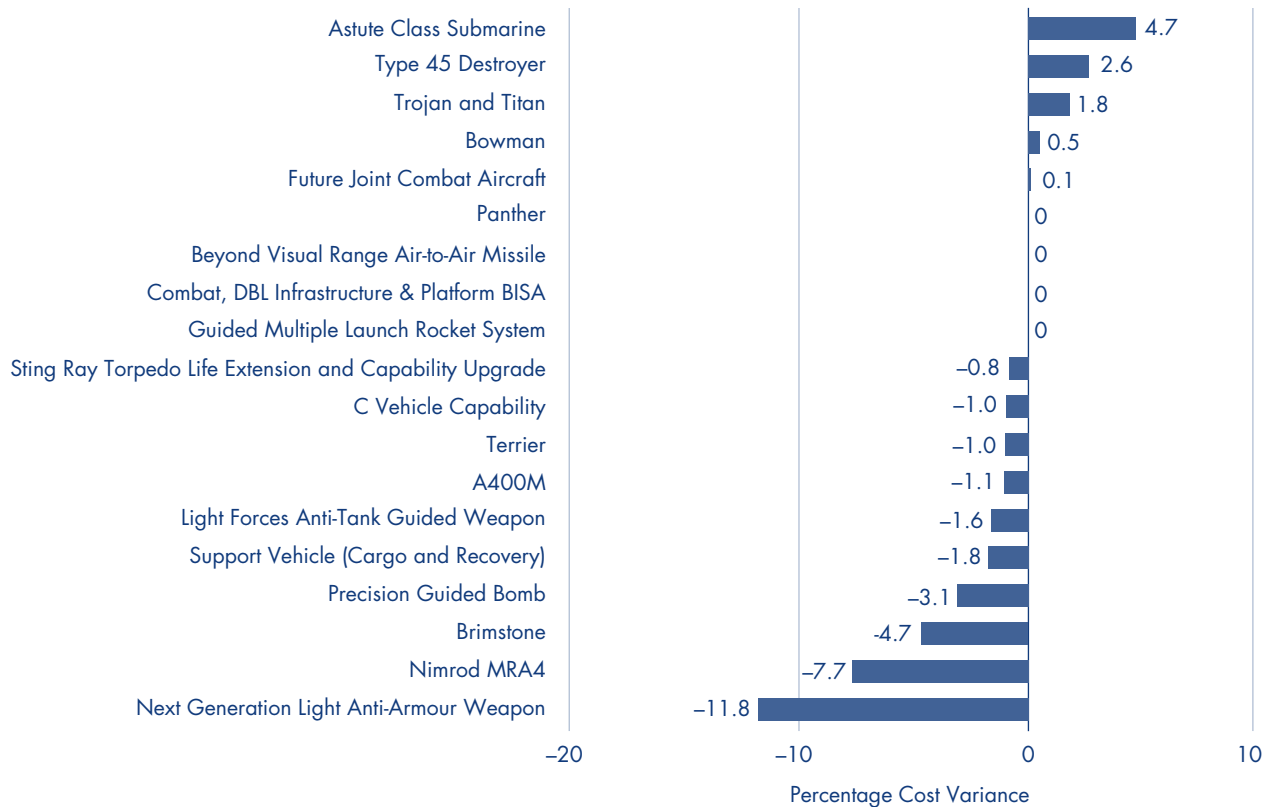
Source: National Audit Office

NOTE

Typhoon is excluded from this analysis as the information is commercially sensitive.

14 Cost variation in-year by project

Type 45 and Astute submarine showed the greatest in-year cost increase. These are legacy projects, approved before the introduction of Smart Acquisition.



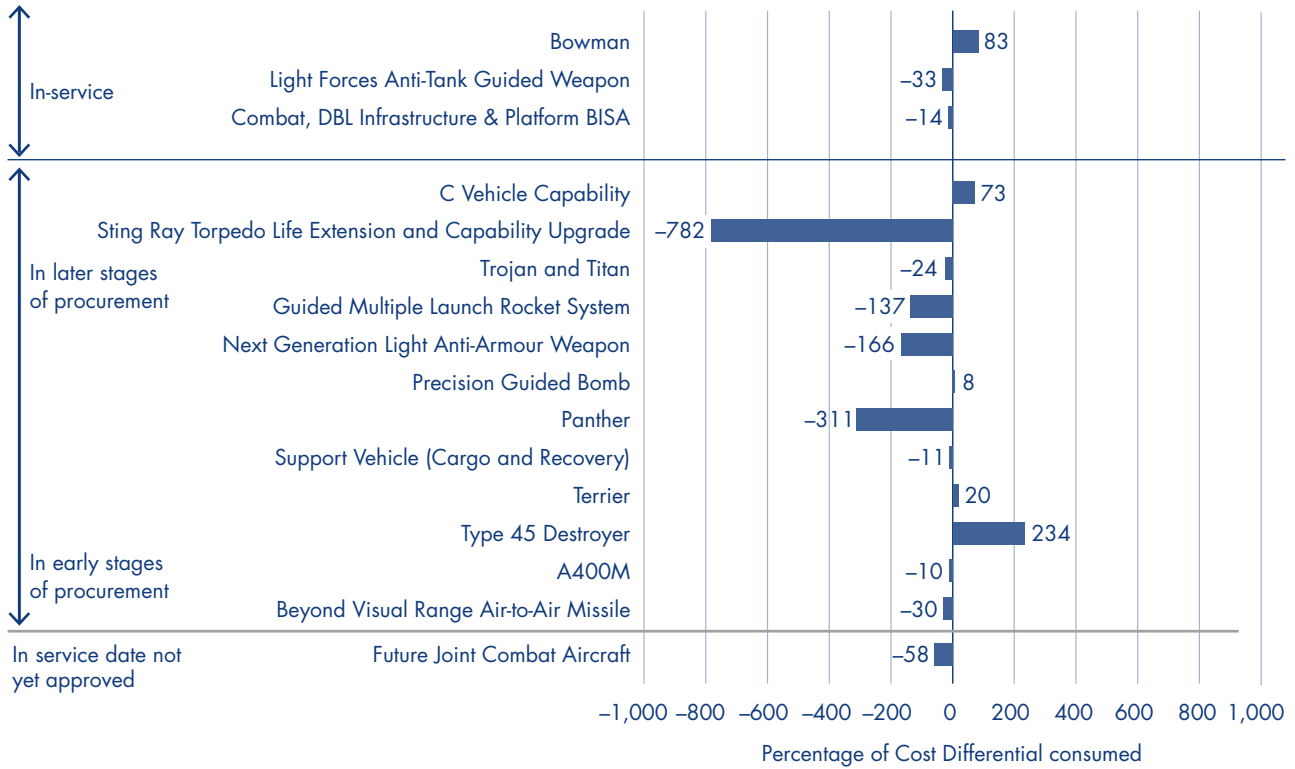
Source: National Audit Office

NOTE

Typhoon is excluded from this analysis as the information is commercially sensitive.

15 Percentage of Cost Risk Differential consumed

Eleven projects are within their budgeted cost estimates (have not consumed any risk differential). This is an improvement from the Major Projects Report 2005 where only eight projects were within their budget.



Source: National Audit Office

NOTES

- 1 Astute Class Submarine, Brimstone and Nimrod MRA4 are excluded because they are legacy projects and as such do not have risk differentials in their Approvals.
- 2 Typhoon is excluded from this analysis as the information is commercially sensitive.

APPENDIX SIX

Through Life Capability Management

1 The Department has expressed its commitment to a new approach to procuring and delivering capability using a process known as “Through Life Capability Management”. This aims to build on Smart Acquisition and improve the Department’s assessment of the affordability of Defence Programmes and provide better delivery of integrated military capability as opposed to individual lines of equipment.

2 Smart Acquisition, introduced in 1998, advocated a through life systems approach, more investment in the early project phase, effective trade-offs and new procurement approaches. While previous Major Project Reports have noted that the main principles of Smart Acquisition are sound, there had been inconsistent application across the Defence Procurement Agency which weakened the effectiveness of the initiative.

3 More recently the Department commissioned a team to examine what changes needed to be made to facilitate good through life capability management, with a focus on structure, processes and organisation. The Enabling Acquisition Change report was published in June 2006 and its recommendations provide a major driver towards establishing Through Life Capability Management (see figure 16).

4 The organisation for achieving Through Life Capability Management will be created through the merger of the Defence Procurement Agency and the Defence Logistics Organisation. It will be an integrated acquisition and support organisation responsible for procurement, maintenance and containment of military capability from April 2007.

5 The Department has also set out the way relations with industry will help facilitate Through Life Capability Management in the Defence Industrial Strategy. To plan more effectively in the future the Department will work jointly with industry for the long-term, to meet military requirements cost effectively.

16 Summary of Recommendations of *Enabling Acquisition Change*

- Re-introduction of a ten year view of defence spending across the board.
- Increased emphasis on realism in planning of defence capability.
- Programme equipment support costs over ten years.
- Equipment Capability Customer should be responsible for programming support costs of new equipment over the first ten years and of in-service equipment beyond four years.
- New clarity given to the customer role.
- Merger of the Defence Procurement Agency and the Defence Logistics Organisation to create “an integrated procurement and support organisation”.
- Changes to governance of procurement and investment approvals process to encourage collective ownership of acquisition issues at top of the Department.
- Adoption of through life targets and adjustments to planning of research.

Source: *Enabling Acquisition Change*, Ministry of Defence, June 2006

APPENDIX SEVEN

Glossary

Approval

The formal decision by the Investment Approvals Board (and, dependent on the size of the project, HM Treasury) on the investment of funds in a project. Approval sets 'Not to Exceed' parameters for the project's cost and In-Service Date, which reflect the worst case scenario should all foreseen risks arise. The project cannot exceed these parameters without returning to the Investment Approvals Board for further approval. The Main Gate process also sets target 'Most Likely Estimate' figures for cost and In-Service Date. The difference between these targets and the approved not to exceed figures is known as a project's Risk Differential.

Assessment Phase

The second phase in the acquisition cycle after the Concept Phase and beginning with Initial Gate. The aim of the Assessment Phase is to develop an understanding of options for meeting the requirement that is sufficiently mature to enable selection of a preferred solution and identification, quantification and mitigation of the risks associated with that solution. At the end of the Assessment Phase a Business Case is submitted to the Investment Approvals Board for Main Gate Approval.

Business Case

The documentation submitted to the Investment Approvals Board at Initial Gate or Main Gate, making the case for proposed expenditure on the next phases of the project.

Cost of Capital

The opportunity cost to the Government of employing money in capital expenditure instead of on alternative investment opportunities. For the public sector, Cost of Capital is charged at 3.5 per cent of the average capital employed during each year. Prior to 1 April 2003 the rate was six per cent.

Demonstration and Manufacture Phases

The third and fourth phases in the acquisition cycle, which begin after Main Gate approval, and continue until the equipment enters service. During the Demonstration and Manufacture Phases, development risk is progressively eliminated, the ability to produce integrated capability is demonstrated and the solution to the military requirement is delivered.

Equipment Capability Customer	Has responsibility for identifying the capability needed to meet the United Kingdom's objectives, for translating these needs into an approved programme and for ensuring the effective delivery of that new capability into service.
Equipment Plan	The Department's budgeting plan for expenditure on procurement of defence equipment, which runs across a ten year planning cycle.
Incremental Acquisition	A procurement strategy which aims to reduce risk and spread costs by building up a required capability over time. Each increment offers additional capability.
Initial Gate	The approval point preceding the Assessment Phase. At Initial Gate, a Business Case is put to the Investment Approvals Board to confirm that there is a well-constructed plan for the Assessment Phase that gives reasonable confidence that there are flexible solutions within the time, cost and performance envelope the Equipment Capability Customer has proposed.
In-Service Date	The definition varies between projects. For example Typhoon's In-Service Date is defined as the date of delivery of the first aircraft to the Royal Air Force. Light Forces Anti-Tank Guided Weapon's In-Service Date is defined as the date when one Brigade is trained and equipped. It does not necessarily mean the capability is fully delivered or available for operational use.
Investment Approvals Board	The Departmental body responsible for the approval of investment in projects at Initial Gate and Main Gate. The Investment Approvals Board comprises the Vice Chief of Defence Staff, the second Permanent Under Secretary, the Chief of Defence Procurement and the Chief of Defence Logistics and is chaired by the Chief Scientific Advisor. For projects with a value of less than £100 million, delegated representatives of Investment Approvals Board members may authorise approval.
Key User Requirements	These outline the user requirements which are considered to be key to the achievement of the mission and are used to measure project performance.
Main Gate	The point at the end of the Assessment Phase when the decision to give Approval is made. At Main Gate the Business Case presented to the Investment Approvals Board recommends a single technical and procurement option. By Main Gate, risk should have been reduced to the extent that the Customer and Integrated Project Team can, with a high degree of confidence, undertake to deliver the project to narrowly defined time, cost (procurement and whole-life) and performance parameters.