National Audit Office

REPORT BY THE COMPTROLLER AND AUDITOR GENERAL

HC 489-I
SESSION 2010–2011

15 OCTOBER 2010

Ministry of Defence

The Major Projects Report 2010

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National Audit Office

Ministry of Defence

The Major Projects Report 2010

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Amyas Morse
Comptroller and
Auditor General

National Audit Office

13 October 2010

The Major Projects Report 2010 details the cost, time and performance of 30 military equipment projects from across the Ministry of Defence (the Department) for the year ending 31 March 2010.

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Contents

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This report can be found on the National Audit Office website at www.nao.org.uk/major-projects-2010

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Summary

1 The Major Projects Report 2010 details the cost, time and performance of 30 military equipment projects from across the Ministry of Defence (the Department) for the year ending 31 March 2010[1]. Project Summary Sheets are compiled by the Department, and submitted by them to Parliament[2]. Copies of the Executive Project Summary Sheets are at Appendix Two of this report, and full Project Summary Sheets are available in Volume II[3] of this Report and on our website[4]. This Report focuses on the 15 biggest projects where the main investment decision has been made. Analysis of the key data, including the five projects in-service and ten in the Assessment Phase, are on our website[4].

Context for the Major Projects Report 2010

2 Our report into the **Strategic Financial Management of the Defence Budget**[5] concluded that the Department would find it easier to prioritise and find efficiencies if it had better visibility of its costs. The report noted that the Strategic Defence and Security Review will provide an opportunity for the Department to rebalance its future spending plans in the short term. Over the longer term however, the challenge for the Department will be to ensure that these plans remain in balance. Perpetuating the cycle of over-committed plans, short-term cuts and re-profiling of expenditure would mean the continuation of poor value for money for the taxpayer on the projects affected and a reduction in the funds available to support front-line activities. Also, **The Major Projects Report 2009**[6] drew attention to the gap (estimated as between £6 billion and £36 billion) between estimated funding and the cost of the Defence budget over the next ten years, and that the Department was taking decisions which were poor value for money. The report also indicated signs of improved project control.

3 This Report builds on the findings from these two reports – identifying areas where the overcommitted Defence budget is driving uneconomic central Departmental decisions, but also highlighting improvements in project-level performance.

1 Our methodology is described in Appendix One.
2 The National Audit Office validates the information contained within the Project Summary Sheets to ensure it is consistent with the project performance and accounting records of the Department. The information is not subject to a full audit however.
3 *The Major Projects Report 2010*, HC 489-II, Parliamentary Session 2010-2011.
4 www.nao.org.uk/major-projects-2010.
5 Strategic Financial Management of the Defence Budget, HC 290 Parliamentary Session 2010-11.
6 The Major Projects Report 2009, HC 85-I,II Parliamentary Session 2009-2010.

In-year performance

4 **Figure 1** summarises the key data from the 2010 report. **The most significant development has been an in-year cost increase of £3.3 billion**. This has arisen as a result of central Departmental decisions taken as a consequence of the mismatch between planned expenditure and the forecast Defence budget, referred to above. Specifically, the Department has committed an additional £2.7 billion to the Typhoon procurement programme including purchasing a further 16 Typhoon combat aircraft (paragraphs 11 and 2.2-2.4); and £650 million of the in-year cost increase on the Queen Elizabeth Class aircraft carrier that has resulted from the 2008 decision to delay the introduction into service of these vessels (paragraphs 12 and 2.6-2.8).

5 **Cost performance on the remaining 13 projects has been largely stable in-year.** The **rate of timescale slippage has also reduced significantly** since last year – falling to an average of fewer than two months additional delay per project – with eight projects reporting no additional slippage and A400M reporting schedule recovery. The Department also expects to meet 98 per cent of its Key Performance Measures – up from 96 per cent last year. This is an encouraging performance from the Department's project teams.

Figure 1
Headline figures for cost, time and performance for the largest 15 projects

	Major Projects Report 2010	Major Projects Report 2009
Total forecast cost	£67.1 billion	£60.2 billion
Number of projects	15 projects	15 projects
In-year cost increase	£3.3 billion	£1.2 billion
In-year slippage	27 months (average: two months)	93 months (average: seven months)
Key Performance Measures 'To be met'	189 of 193 across 15 projects are 'To be met', of which 27 across nine projects are 'At risk'	185 of 192 across 15 projects are 'To be met', of which 21 across six projects are 'At risk'
Defence Lines of Development 'To be met'	118, across 15 projects are 'To be met', of which 31 across 11 projects are 'At risk'. Three Lines of Development on one project were not assessed	124, across 15 projects are 'To be met', of which 34 across 13 projects are 'At risk'. Six Lines of Development on three projects were not assessed

NOTES

1 Joint Combat Aircraft has been excluded from the analysis of average in-year slippage as it has no In-Service Date defined.

2 These figures are not directly comparable due to differences in the project population. Thirteen of the fifteen post-main investment decision projects reported in the Major Projects Report 2009 continue to be reported in 2010. The Terrier and Support Vehicles' projects reported in the Major Projects Report 2009 have been replaced in the Major Projects Report 2010 post-main investment decision population by the Nimrod MRA4 and Tornado Capability Development projects. The Support Vehicles' project is now part of the Support Projects' population.

Source: National Audit Office analysis of Departmental data

6 The improved performance reflects, in part, a number of initiatives to better understand drivers to project performance. Notably, Defence Equipment and Support, the part of the Department charged with buying and supporting defence equipment, has recently started using a project monitoring system called Sentinel. This system uses a number of metrics to quantitatively assess the overall 'health' of selected projects. By providing early warning of emerging issues Sentinel is a potentially important step forward for the Department as it seeks to sustain the emerging trend of improving project performance.

7 On the **Nimrod MRA4** reconnaissance aircraft the Department took an informed decision to consider the balance of costs, risks and the operational impact of delaying service entry in order to focus resources on capabilities more relevant to current operations. Consequently, the Department decided to delay the Nimrod MRA4 by 22 months (which represents almost all of the total slippage reported this year across the 15 projects) and intends to undertake mitigating action to address some of the capability risks it presents.

Central Departmental decisions taken to try to balance the defence budget

8 The in-year cost increase of £3.3 billion is largely as a result of central Departmental decisions taken as a consequence of the mismatch between planned expenditure and the forecast Defence budget. This Report highlights three types of decision, outlined below, which the Department has taken to manage its budget. They have all had the effect of reducing cash flow requirements in the short term, making it easier for the Department to manage its budget in-year, but the effect has been to reduce long-term value for money overall across the Defence budget.

9 Not including realistic budgetary provision to reflect likely project outcomes. On the **Typhoon combat aircraft** project, the Department signed a Memorandum of Understanding with the Partner Nations to procure 232 aircraft in three tranches, subject to reaching an agreed financial ceiling[7]. The Department made budgetary provision to spend up to this ceiling. The costs of the first two tranches of aircraft were higher than expected, based on the estimate approved when the main investment decision was taken. The remaining budget was therefore insufficient to procure all 88 Tranche 3 aircraft.

10 In addition to the likely shortfall in the budget, the Department did not have a requirement for all 88 aircraft in the Tranche 3 buy. Under the Memorandum of Understanding, any Partner which unilaterally announced its intention to reduce the number of aircraft procured from Tranche 3 could be liable to make good the additional costs to other Partners up to the agreed financial ceiling. These costs were likely to be significant and would include related industrial implications. A further complication was speculation about the intentions of the other Partners, and the Department believed that some did not wish to take their full number of aircraft or to proceed with Tranche 3 at all. It was also the case that significant export orders, if achieved, could potentially alter these discussions. The Department was therefore faced with a difficult set of choices.

7 This agreement, signed by the four Partner Nations – Italy, Germany, Spain and the United Kingdom – in 1998, was also reflected in a joint contract placed with industry.

Despite the likelihood that it would incur significant costs whatever course of action it chose to pursue, in 2004 the Department decided not to provide budgetary provision for Tranche 3 and removed the remaining funding of £978 million.

11 Following intensive negotiations, the Department subsequently decided that best value for money in the circumstances would be to buy an additional 16 aircraft to take it up to the financial ceiling whilst meeting operational requirements. In July 2009 the Department approved an additional £2.7 billion for the Typhoon programme including the purchase of these aircraft, which it believes meets its outstanding financial obligations. This represented a new financial commitment for the Department, and was a significant contributor to the gap between estimated funding and the cost of the Defence budget over the next ten years which we reported in the Major Projects Report 2009 as between £6 billion and £36 billion.

12 **Slowing down of projects** whereby money is taken out of earlier years, often resulting in an overall increase in costs and a delay in delivering new defence capability. For example, in December 2008, the Department decided to slow down the production of the two **Queen Elizabeth Class aircraft carriers**. The Major Projects Report 2009 recorded that the Department expected the total net cost increase resulting from this decision to be £908 million, including cost of capital. However, the Department took the decision on the basis of initial estimates from industry. The Department now estimates that, partly as a result of this deferral, it will incur a further £650 million of additional expenditure, bringing the total project cost increase to £1.56 billion.

13 A further way the Department seeks to manage its budget is to **reduce the number of items to be procured**. Such decisions may mitigate cost increases on a specific project or compensate for wider cost increases elsewhere in the Defence budget. A reduction in numbers may also be a sensible response to changes in the security environment. This was the case on the **Support Vehicles** project where the number of units to be procured reduced by 1,303 vehicles because of changed operational requirements. Whatever the reason, defence projects tend to include significant development costs and the effect of reducing numbers is to share these non-recurring costs across a smaller number of production units. Reductions in numbers therefore tend to increase unit costs and be economically inefficient, especially if made after the main investment decision has been taken. The balance between development and production costs is an important factor when the Department decides whether a project offers sufficient value for it to invest in. By changing this ratio, reducing the number of items to be procured can adversely affect the perceived value of the project.

14 On the **Nimrod MRA4** reconnaissance aircraft the number of aircraft being procured has progressively reduced from 21 to nine and the unit cost is now three times the figure expected when the investment decision was made. In some cases, such as the **Lynx Wildcat** helicopter project, the Department has been able to mitigate the increase in unit costs by working with its industry partners to improve the efficiency of production. However, even in this case the scale of development costs meant that a decision to reduce helicopter numbers by 23 per cent[8] saved only 12 per cent of the project's costs.

8 *The Major Projects Report 2009*, HC 85-I,II Parliamentary Session 2009-2010, p4.

15 The Strategic Defence and Security Review should provide an opportunity for the Department to re-balance its policy intent and the available funding to provide a solid baseline against which to make future equipment acquisition decisions. The Department recently committed to report annually to Parliament on the affordability of the ten-year Equipment Plan[9]. We will provide a statement of assurance and associated commentary on the report. The Department is still finalising the form of its report but, provided the scope is sufficient, the improved transparency should provide a stimulus to more prudent financial management. In particular, both the Strategic Defence and Security Review and the reporting on affordability of the Equipment Plan should help deter practices which slow down projects, not recognise potential costs or reduce equipment numbers and have adverse value for money implications.

Conclusion on value for money

16 For the second successive year the cost performance on the majority of projects has been broadly stable. The rate of timescale slippage has reduced significantly since last year falling to an average of two months delay per project – with eight projects reporting no additional slippage and A400M accelerating its forecast In-Service Date by nine months. There are also examples where the Department has begun to take pragmatic decisions to re-prioritise resources to meet pressing operational needs and better monitor the drivers underlying good project performance.

17 The in-year cost increase of £3.3 billion is a result of central Departmental decisions taken as a consequence of the mismatch between planned expenditure and the forecast Defence budget. The reasons for the cost increase illustrate both the causes and effects of the Department's inability to manage its budget effectively and represent poor value for money for the taxpayer. On the Typhoon combat aircraft project the Department did not include realistic provision in its budgets to reflect likely project outcomes. The Department's additional £2.7 billion commitment to the Typhoon programme including the purchase of 16 Tranche 3A Typhoon aircraft has therefore had to be accommodated by making savings elsewhere in the Defence budget.

18 Savings may come from reducing the numbers of equipments being procured typically increasing the unit cost of the remaining equipments as development costs are spread over smaller numbers, or slowing projects down. Such decisions can result in an overall increase in costs and a delay in delivering new defence capability. This was the case with the Queen Elizabeth Class aircraft carrier, where the Department made the decision to delay the project in 2008 based on an initial estimate of the cost implications, resulting in a further reported cost increase this year of £650 million, bringing the total long-term cost increase attributed to the 2008 decision to £1.56 billion.

9 House of Commons Defence Committee, Defence Equipment 2010, HC 99, Parliamentary Session 2009-2010.

Part One

In-year performance of projects

1.1 In this Part of the Report we examine data trends for the 15 largest equipment projects. We also highlight the similarity in trends between these projects and performance across a broader population of Departmental projects which have traditionally fallen outside the reporting boundaries of the Major Projects Report.

Performance on most projects is stable

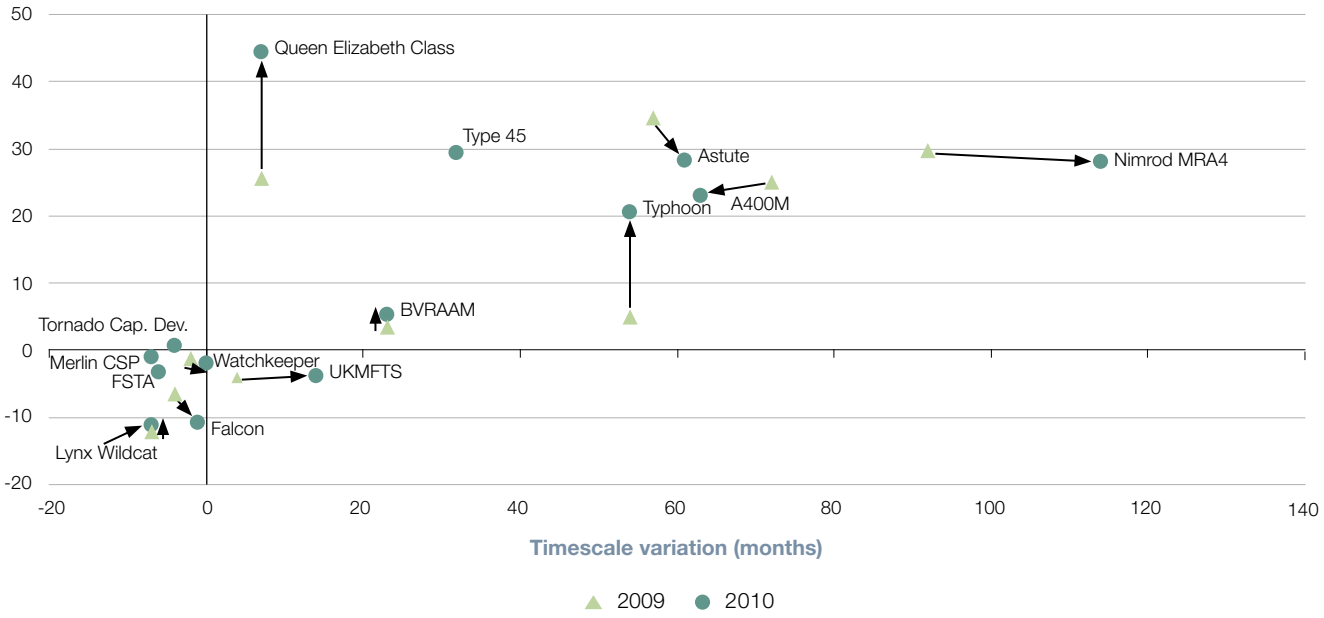
1.2 As Figure 1 indicates, excluding the £3.3 billion of cost increases on the Typhoon combat aircraft and Queen Elizabeth Class aircraft carrier projects which reflect central Departmental decisions taken to try to balance the defence budget[10], in-year performance on the remaining 13 projects has been encouraging. The remaining projects' costs were broadly stable. Total in-year slippage was 27 months, of which 22 months was due to the decision to delay Nimrod MRA4 (see paragraphs 2.9-2.11). Eight projects reported no slippage and the A400M transport aircraft accelerated its In-Service Date by nine months. **Figure 2** overleaf summarises the key data by individual projects. **Figure 3** and **Figure 4** overleaf provide a more detailed analysis of the key messages on in-year cost, time and performance[11].

1.3 The stable performance on the majority of projects reflects the efforts which the Department has put in to improving project control and introducing innovative practices at the level of the individual projects. For example, the Department's Defence Equipment and Support leadership team has begun to use a project monitoring system called Sentinel. The aim of Sentinel is to assist senior management in quantitatively assessing the overall 'health' of selected projects based on metrics for project cost, time, performance, resources and level of assurance.

10 Further details on developments on these projects are given in paragraphs 2.2-2.8.
11 Full copies of all the Project Summary Sheets and additional graphical analyses are available in Volume II of this Report and on our website.

Figure 2

Cost and timescale performance for the largest 15 projects



BVRAAM = Beyond Visual Range Air-to-Air Missile
FSTA = Future Strategic Tanker Aircraft
Merlin CSP = Merlin Capability Sustainment Programme
Tornado Cap. Dev. = Tornado Capability Upgrade Strategy (Pilot)
UKMFTS = United Kingdom Military Flying Training System

NOTES

1 Joint Combat Aircraft is excluded from the analysis as it does not yet have an approved In-Service Date.

2 The variation shown is the difference between the expected cost of and timescale for each project at the main investment decision and the actual/current forecast.

3 Movements from 2009 to 2010 are shown for those projects included as post-main investment decision projects in the Major Projects Report 2009.

Source: National Audit Office analysis of Departmental data

Figure 3

The 15 largest equipment projects where the Department has taken the main decision to invest

Project	Description	Expected cost to completion at approval (£m)	Current forecast cost to completion (£m)	Total cost variation (£m)	In-year change on costs to completion (£m)	Expected In-Service Date at approval	Current forecast In-Service Date	Total time variation (months)	In year change to In-service date (months)	Defence lines of development				Key performance measures				Number to be procured	
										To be met	To be met, at risk	Not to be met	Not assessed	To be met	To be met, at risk	Not to be met	In year change – not to be met	Approved	Current plan
A400M	Large transport aircraft	2,628	3,231	+603	-54	Feb-09	Mar-15	+73	-9	5	3	0	0	9	0	0	No change	25	22
Astute	Attack submarine	5,204	6,677	+1,473	-51	Jun-05	Jul-10	+61	+4	7	1	0	0	16	3	0	No change	4	6[1]
Beyond Visual Range Air-to-Air Missile (Meteor)	Air-to-air missile: Original In-Service Date	1,240	1,305	+65	+23	Sep-11	Aug-13	+23	–	8	0	0	0	7	0	0	No change	* * *	* * *
	Air-to-air missile: In-Service Date 1					Aug-12	Aug-12	0	0										
	Air-to-air missile: In-Service Date 2					Jul-15	Jul-15	0	0										
Falcon	Deployable communication system	354	316	-38	-15	Jun-10	Dec-10	+6	+2[2]	5	4	0	0	8	1	0	No change	–	–
Joint Combat Aircraft	Fighter/attack aircraft	2,672	2,448	-224	-3	No date specified	No date specified	No data	No data	6	2	0	0	5	2	0	No change	–	up to 150[3]
Future Strategic Tanker Aircraft	Air-to-air refuelling and passenger aircraft	12,326	11,917	-409	-46	May-14	May-14	0	0	7	1	0	0	9	0	0	No change	14	14
Lynx Wildcat	Light Helicopter: battlefield and naval variants	1,901	1,689	-212	+20	Jan-14	Jan-14	0	0	5	3	0	0	15	3	0	No change	80	62
Merlin Capability Sustainment Programme	Update of helicopter avionics	837	829	-8	-1	Feb-14	Feb-14	0	0	8	0	0	0	10	0	0	No change	30	30
Nimrod MRA4	Reconnaissance aircraft	2,813	3,602	+789	-45	Apr-03	Oct-12	+114	+22	5	3	0	0	4	3	2	+1	21	9
Queen Elizabeth Class	Aircraft carrier	4,085	5,900	+1,815	+767	Jul-15	May-16	+10	0	7	1	0	0	9	0	0	No change	2	2
Tornado Capability Development	Upgrade network communications and Precision Guided Bomb	301	303	+2	+2	Feb-13	Nov-12	-4	0	5	0	0	3	17	5	0	No change	96	96
Type 45	Anti-air warfare destroyer	5,000	6,464	+1,464	0	May-07	Jul-10	+38	0	4	4	0	0	8	1	0	No change	6	6
Typhoon	Fighter aircraft and Future Capability Programme	17,115	20,627	+3,512	+2,665	Dec-98	Jun-03	+54	0	5	3	0	0	15	1	1	No change	232	160[4]
United Kingdom Military Flying Training System	Flying training capability	952	916	-36	0	May-09[5]	Feb-10	+9[5]	+6	8	0	0	0	20[5]	8[5]	0[5]	-2	28	28[5]
Watchkeeper	Surveillance, target acquisition and reconnaissance unmanned aerial vehicle	907	889	-18	-6	Jun-10	Feb-11	+8	+2	2	6	0	0	10	0	1	No change	54	54
Total		**58,335**	**67,113**	**8,778**	**3,256**			**392**	**+27**	**87**	**31**	**0**	**3**	**162**	**27**	**4**	**-1**		

NOTES

1 Costs include long lead items for Astute Boats 5 and 6.

2 Falcon has two increments; A and C. The In-Service Dates disclosed above represent those for Falcon Increment A. The In-Year Change to In-Service Dates represents the total delay to the Falcon programme. Falcon Increment A has slipped only 1 month in-year.

3 The precise number of Joint Combat Aircraft has yet to be determined.

4 UK contracted offtake is 184 aircraft, of which 24 have been diverted to the Royal Saudi Air Force.

5 The dates specified for the United Kingdom Military Flying Training System relate to the Advanced Jet Trainer increment. The In-Year Change to In-Service Dates represents the total variation to the UKMFTS programme. The Key Performance Measure figures shown are those for the full United Kingdom Military Flying Training system. These will only be fully satisfied through delivery of the user requirements for each of the individual increments. The platform numbers specified for the United Kingdom Military Flying Training System relate to the Advanced Jet Trainer increment.

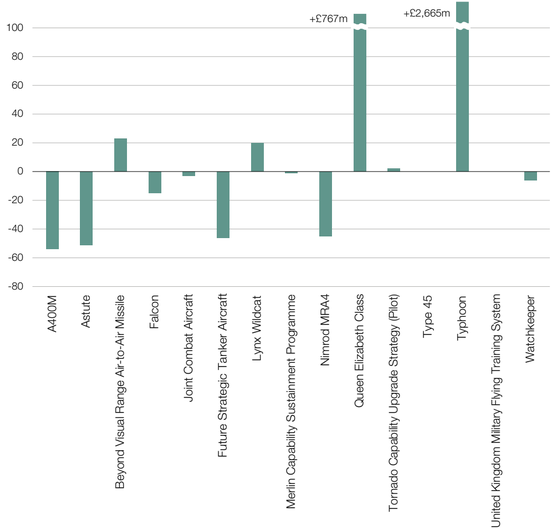
Source: National Audit Office analysis of Departmental data

Figure 4
Analysis of key data

Cost

In-year cost variation for the largest 15 projects

In-year cost variation (£m)



NOTES

1 The overall forecast cost of the 15 largest projects has increased by £3.3 billion (£1.2 billion in 2009).

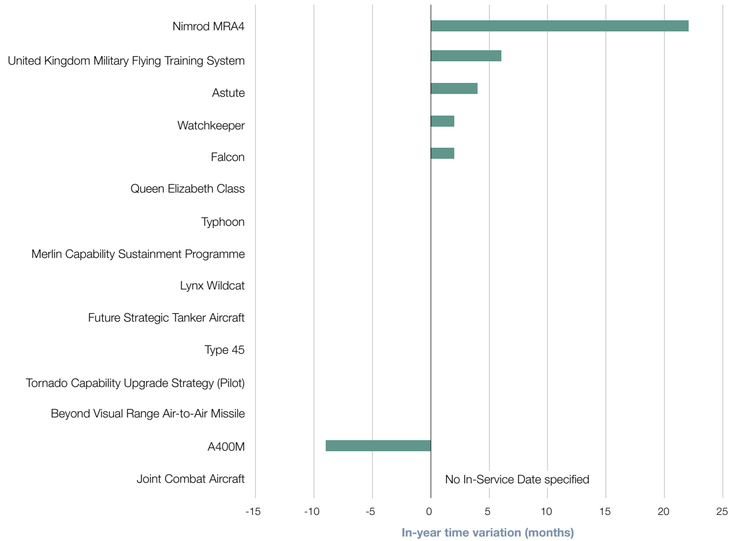
2 The increase is largely a result of additional costs from the 2008 decision to defer the Queen Elizabeth Class aircraft carriers (£650 million) and a cost increase on the Typhoon combat aircraft programme as a result of the Tranche 3A decision (£2.7 billion).

3 Excluding the impact of central Departmental decisions, the projects show a net cost reduction of £59 million with project variations in-year ranging from -£54 million to +£117 million. This indicates that the costs on the rest of the population have remained relatively stable over the last year.

4 Excluding the Queen Elizabeth Class and Typhoon the primary reason for project costs increasing was movements in foreign exchange rates (£210 million).

Time

In-year time variation against approved In-Service/Initial Operating Capability Date for the largest 15 projects



NOTES

1 The 14 projects for which overall time performance can be reported[5] are forecasting to achieve their In-Service Dates, on average, two months later than expected last year (seven months in 2009).

2 Total in-year slippage was 27 months (93 months in 2009). Eight projects reported no overall change to their forecast In-Service Date in-year and a further four projects reported slippage of six months or fewer. The forecast In-Service Date for the A400M project has advanced by nine months (slipped by 48 months in 2009).

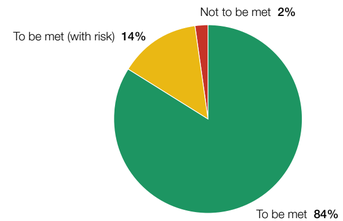
3 Almost all (22 months) of the net slippage was on the Nimrod MRA4 aircraft as result of a pragmatic decision to re-prioritise limited resources towards supporting more urgently-required capabilities.

4 The delays on Astute, Falcon and Watchkeeper are a result of technical difficulties. The variation on the United Kingdom Military Flying Training System is due to realignment to a revised contractual milestone structure.

5 The Joint Combat Aircraft does not yet have an In-Service Date specified.

Key Performance Measures

Summary of status of Key Performance Measures for the largest 15 projects



NOTES

1 When the Department makes the main investment decision on a project, it approves a number of Key Performance Measures which define the required capability of the equipment to be procured.

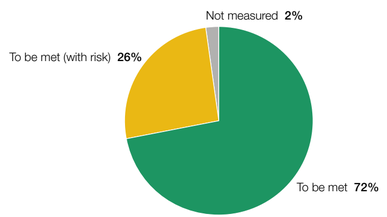
2 189 Key Performance Measures across 15 projects are reported as 'To be met' by the specified In-Service Date.

3 Of these, 27 across nine projects are 'At risk'. However, the Department remains confident that these will be met by the In-Service Date, as action is in place to mitigate the risks.

4 Four Key Performance Measures across three post-main investment decision projects are forecast 'Not to be met'.

Defence Lines of Development

Summary of status of Defence Lines of Development for the largest 15 projects



NOTES

1 The Department manages the coordinated delivery of associated components of military capability based on eight Defence Lines of Development. This approach aims to ensure that all elements of a capability, such as Equipment, Training and Infrastructure, are introduced and managed coherently to meet current operational needs.

2 118 out of 121 Defence Lines of Development across the 15 projects are reported as 'To be met'.

3 Of these, 31 across 11 projects are reported as 'At risk'. The Department remains confident that these will be met, as action is in place to mitigate the risk.

4 The Watchkeeper unmanned aerial vehicle has the most lines of development assessed as 'At risk' (six, with only Doctrine and Organisation assessed as 'To be met') while seven projects had no lines of development 'At risk'.

5 Only three Lines of Development across one project were reported as 'Not assessed' in-year compared to eleven across six projects in 2009.

Source: National Audit Office analysis of Departmental data

How the performance of the top 15 projects compares to that of the wider population

1.4 This year, for the first time, the Department has provided summary data on the performance of an additional set of 30 projects, which do not form part of the Major Projects Report population, in order to give a wider view of project performance[12]. Further detail is provided in Appendix Five in Volume II of this Report[13]. The forecast costs of these projects/increments range in value from £9 million to £339 million and cover a diverse range of capabilities from enhanced computer network defence to next generation anti-armour weapons. **Figure 5** summarises the in-year performance on these projects. Overall, performance is broadly stable and mirrors that of the biggest projects reported in detail in the Major Projects Report, excluding the Queen Elizabeth Class aircraft carriers and Typhoon combat aircraft.

Figure 5

Headline figures for cost, time and performance for the wider population of projects that have passed their main investment decision and are not included in the Major Projects Report

	Wider Population of Projects
Total forecast cost	£3.3 billion
Number of projects	29 projects/project increments[1]
Total In-year cost decrease	£9 million
Total In-year reduction in slippage	10 months (average: zero months/project)
Key Performance Measures 'To be met'	178/180 across 24 projects, of which 11 across 3 projects are 'At risk'

NOTE

1 The Automatic Test Equipment Initiative project has been excluded from the analysis as it was cancelled in-year.

Source: National Audit Office analysis of unvalidated Departmental data

12 This data has not, however, been verified by the National Audit Office as it falls outside of the scope of the Major Projects Report.

13 *The Major Projects Report 2010*, HC 489-II, Parliamentary Session 2010-2011.

Part Two

Central Departmental decisions taken to try to balance the defence budget

2.1 This Part of the Report provides details of three types of decision which the Department has used to manage its budget:

- **Not making realistic budgetary provision**, for example, on the Typhoon combat aircraft.
- **Slowing down of projects**, for example, on the Queen Elizabeth Class aircraft carriers and the Nimrod MRA4 reconnaissance aircraft.
- **Reducing the number of items to be procured**, for example, on the Nimrod MRA4 reconnaissance aircraft and Lynx Wildcat helicopter.

Not making realistic budgetary provision

2.2 **Typhoon**[14] is a combat aircraft being developed, produced and supported in a collaborative project with Italy, Germany and Spain. In 1998 the Department signed a Memorandum of Understanding with these Partner Nations to procure 620 aircraft, including 232 for the United Kingdom, in three tranches, subject to reaching an agreed financial ceiling[15]. The Department made budgetary provision to spend up to this ceiling. The costs of the first two tranches of aircraft were higher than expected, based on the estimate approved when the main investment decision was taken. The remaining budget was therefore insufficient to procure all 88 Tranche 3 aircraft.

2.3 In addition to the likely shortfall in the budget, the Department did not have a requirement for all 88 aircraft in the Tranche 3 buy. Under the Memorandum of Understanding any Partner which unilaterally announced its intention to reduce the number of aircraft procured from Tranche 3 could be liable to make good the additional costs to other Partners up to the agreed financial ceiling. These costs were likely to be significant and would include related industrial implications. A further complication was speculation about the intentions of the other Partners, and the Department believed that some did not wish to take their full number of aircraft or to proceed with Tranche 3 at all. It was also the case that significant export orders, if achieved, could potentially alter

14 We are currently undertaking a detailed value for money study into the capability delivered by the Typhoon combat aircraft.
15 This agreement, signed by the four Partner Nations – Italy, Germany, Spain and the United Kingdom – in 1998, was also reflected in a joint contract placed with industry.

these discussions. The Department was therefore faced with a difficult set of choices.[16] Despite the likelihood that it would incur significant costs whatever course of action it chose to pursue, in 2004 decided not to provide budgetary provision for Tranche 3 and removed the remaining funding of £978 million.

2.4 Following intensive negotiations, the Department subsequently decided that best value for money in the circumstances would be to buy an additional 16 aircraft to take it up to the financial ceiling whilst meeting operational requirements. In July 2009 the Department approved an additional £2.7 billion for the Typhoon programme including the purchase of these aircraft, which it believes meets its outstanding financial obligations. This represented a new financial commitment for the Department, and was a significant contributor to the gap between estimated funding and the cost of the Defence budget over the next ten years which we reported in the Major Projects Report 2009 as between £6 billion and £36 billion.

Slowing down of projects

2.5 The Department can choose to slow down the delivery of a project in order to save costs in the short term. In terms of the Queen Elizabeth Class aircraft carrier the decision to slow down the project has led to a significant cost increase. In contrast, on the Nimrod reconnaissance aircraft, the decision to delay the project was a pragmatic one made following a full analysis of the options in order to reprioritise resources to more urgent operational requirements.

Queen Elizabeth Class aircraft carrier

2.6 In December 2008, the Department decided to constrain expenditure on the **Queen Elizabeth Class aircraft carrier** project during the four years commencing 2009-10 by slowing the rate of production. The motivation for this decision was to help balance the Defence budget, in the following few years. When the decision was taken, the Department expected the slowdown to yield a reduction in spending of £450 million in the years to 2013-14. After this time costs were forecast to increase by £1,124 million, giving a net increase of £908 million. This decision was poor value for money and we examined it in detail in the Major Projects Report 2009[17].

2.7 In addition to the cost growth reported in 2009, the Major Projects Report 2010 includes a further cost increase of £650 million related to the decision, bringing the total cost increase to £1.56 billion. The Department expects to have a definitive cost figure for the Queen Elizabeth Class by the end of 2010 when it agrees a Final Target Cost with industry.

16 On the basis of a confidential memorandum from the National Audit Office, the Committee of Public Accounts took evidence from the Department on its position regarding Tranche 3 in January 2005.
17 HC85-I the Major Projects Report 2009, Parliamentary Session 2009-2010, paras 2.5 – 2.6.

2.8 The reasons for the cost increase in MPR10 can be categorised as follows:

- £190 million increase in the forecast direct cost of the 2008 decision to slow the project, for example, by extending the design and engineering team by two years. This is in addition to the £300 million recorded in the Major Projects Report 2009.
- £35 million of additional inflation due to the extended timescales. The first Carrier will be delivered one year later than planned in 2015 and the second will be delayed by two years. This cost increase is in addition to the £374 million recorded in the Major Projects Report 2009.
- When the contract for the Carriers was signed in July 2008, it included a commitment and incentives for industry to take concerted management action in the early years of the project to reduce costs by £337 million. The need to re-plan the project following the Department's decision to delay delivery contributed to these cost reduction opportunities being lost.
- Unrelated to the 2008 decision there has also been some £117 million of cost growth on the project due to increased build costs. When the Department committed to the project it recognised that some uncertainty remained and that it would need to work with industry to fully understand the costs before agreeing a Final Target Cost. This work has identified £117 million of additional costs including increases in the expected cost of materials and changes to the build strategy.
- £88 million of additional cost of capital as a net result of all the above cost increases.

Nimrod MRA4 reconnaissance aircraft

2.9 The Nimrod Maritime Reconnaissance and Attack Mk4 aircraft will be able to detect, identify and track all types of submarines and surface vessels. It will also be able to conduct maritime Search & Rescue operations, including the detection, identification and tracking of life rafts and persons in the water, and the coordination of activities of other rescue aircraft.

2.10 The aircraft was due to enter service in December 2010. However, in December 2009, the Department decided to delay the project as one of a range of measures aimed at reprioritising Defence expenditure to focus on current operations. Consequently, the In-Service Date will now be achieved some 22 months later than planned, in October 2012, accounting for most of the in-year slippage of 27 months recorded in the Major Projects Report 2010.

2.11 The decision to delay the project was a pragmatic one taken by the Department in difficult circumstances and was made following an analysis of the options. The decision has freed up £110 million to be used for other, higher priority tasks and equipment projects, but it is not without risk to maintaining the integrity of the United Kingdom through detection of hostile surface and sub-surface vessels. Although the Department has re-tasked other fixed and rotary-wing aircraft to cover some of the Nimrod's missions this has resulted in an overall reduction in anti-submarine and long range search-and-rescue capabilities. The Department regards these to be relatively lower

priorities and a capability risk has been taken. The Department is also actively planning to maintain continuity in the build-up of support services prior to the aircraft beginning flying training with the Royal Air Force and to support the minimum level of activity to sustain key skills until the aircraft enter service.

Reducing the number of items to be procured

2.12 Robust cost data underpins good decision-making, planning, performance management and the evaluation of longer-term investments. One of the most straightforward ways of analysing cost data is to consider the unit cost of, for example, a vehicle, aircraft or ship, as this illustrates the impact of both variations in overall costs and of changing the number of items being procured. Defence projects tend to include significant development costs and the effect of reducing numbers is to share these non-recurring costs across a smaller number of production units. Reductions in numbers therefore tend to be economically inefficient if made after the main investment decision has been taken. The balance between development and production costs is an important factor when the Department decides whether a project offers sufficient value for it to invest in. By changing this ratio, reducing the number of items to be procured can adversely affect the perceived value of the project.

2.13 The Major Projects Report does not measure unit costs on a consistent basis. We have therefore performed our own analysis by dividing the total forecast costs for each project by the total number of units being procured. The unit cost is therefore a total of the unit production cost (the cost of physically manufacturing an item) and an apportionment of the development costs to that unit. The results are shown in **Figure 6** overleaf. The key messages are:

- Changes in unit costs can be significant and typically result from attempts to balance the overall Defence budget or to keep projects with cost overruns within affordable limits by reducing numbers ordered. Most notably, required numbers of the **Nimrod MRA4** reconnaissance aircraft have progressively been reduced from 21 to nine as a means of controlling cost overruns. As a consequence the unit cost is now three times the figure when the main investment decision was taken.

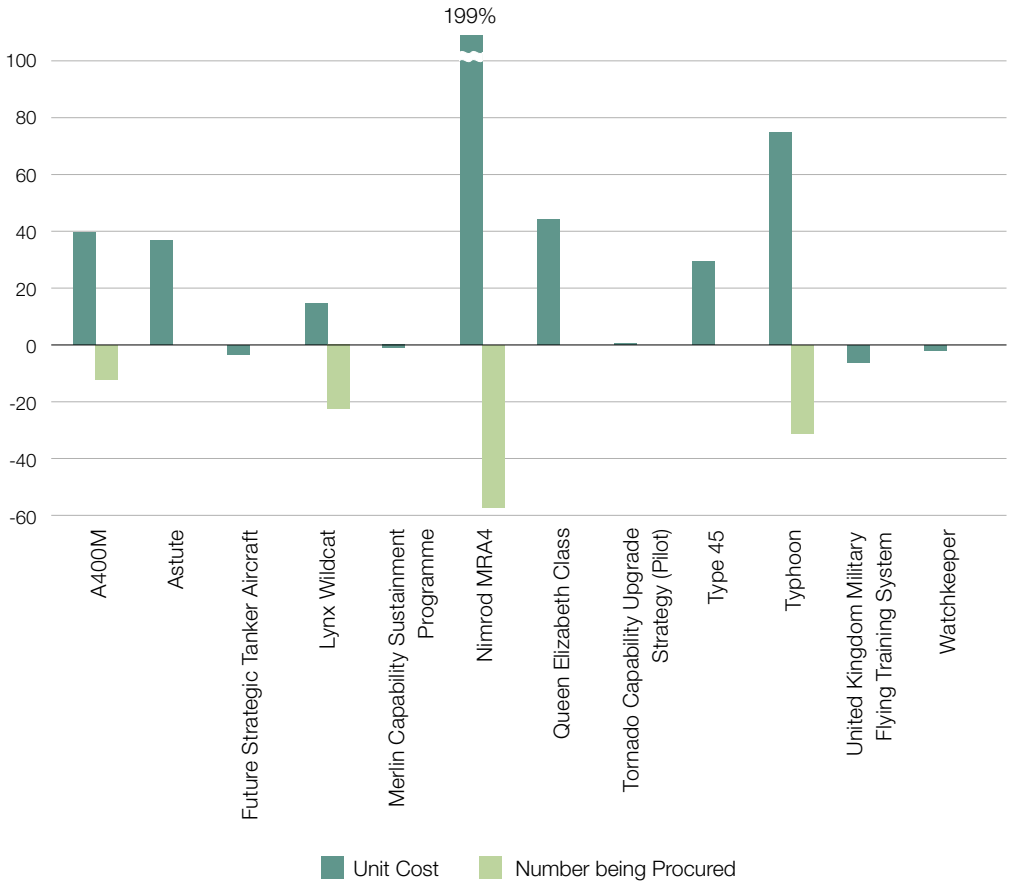
- Reducing order quantities increases unit costs, even when the Department has managed to reduce production costs. On the **Lynx Wildcat** helicopter project, the decision in 2008 to reduce the number of helicopters being procured by 23 per cent only reduced procurement costs by 12 per cent. This was despite the Department working closely with the manufacturer, Agusta Westland to increase commonality between the two variants of the helicopter being procured and therefore reduce production costs.

- Unit cost data can bring in to sharp relief the effect of failures to commit to projects on a sound technical and commercial basis and against unrealistic cost estimates. For example, the unit cost of the **Astute** submarine project has risen by 37 per cent. This unit cost should fall as the Department commits to buy further submarines for which it has currently ordered long-lead items for Boats 5 & 6.

2.14 Decisions to reduce the number of units being procured can reflect changing operational requirements for the equipment. In such cases, not buying unnecessary units should reduce total production costs but also result in savings in support costs. For example, on Support Vehicle the Department reduced its requirement by 1,303 cargo vehicles as a result of changes to operational requirements and better vehicle availability and load carrying capacity over the vehicles they were to replace.

Figure 6

Percentage variation in unit cost and number of items being procured for the largest 15 projects



NOTES

1 The percentage change in unit cost has been calculated as the total forecast cost at 31 March 2010 divided by the number of items being procured at that date versus the budgeted cost divided by approved number of platforms to be procured at the point of the main-investment decision.

2 The calculation for Astute is for boats one to four as current costs for boats five and six relate to long lead items only.

3 Three projects have been excluded from this analysis. The Joint Combat Aircraft because aircraft numbers were not specified at the project's main investment decision, Falcon project because the procurement is of a range of platforms and infrastructure equipments and thus a single unit cost figure cannot reliably be calculated, and Beyond Visual Range Air-to-Air Missile because the number of missiles being procured is classified.

Source: National Audit Office analysis of Departmental data

Appendix One

Methodology

The Major Projects Report 2010 is the twenty-seventh to be produced by the Department. The Committee of Public Accounts originally requested the Report after their 9th Report, Session 1981-82, which noted the absence of any requirement for the Department to inform Parliament about the costs of its major military projects.

The Major Projects Report is not a statutory account, and we do not offer a formal audit opinion on the accuracy of the data contained within it.

Selected Method	Purpose
1 Evaluation of individual projects	
We examined 30 projects (15 of which have passed the main investment decision, 10 of which have not, and five of which are in-service) to assess cost, time and performance. The resulting Project Summary Sheets are compiled according to agreed guidelines.	To confirm that the Project Summary Sheets conform to the guidance and that it has been accurately and consistently applied. We do not question forecasts or assumptions of the Department's long-term costings unless better information becomes available.
2 Review of key documents	
Our review included key Departmental planning documents, contracts, project plans, contractor reports, and assessments of performance by the Director of Capability and front line commands.	To validate the information provided by the project teams in the Project Summary Sheets.
3 Analysis of cost, time and performance	
Using the qualitative and quantitative data collected above, we considered whether the Department is forecasting to deliver to the budget, time and performance expected when the main investment decision was made.	To identify the greatest cost and time variances and the factors that cause them, with particular attention to trends in the Department's overall performance.

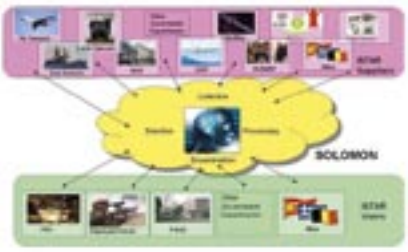
Appendix Two

Executive Project Summary Sheets

Dabinett

The Capability

The Dabinett Programme will significantly improve the efficiency, effectiveness, quality and timeliness of intelligence delivered to a commander, primarily by making better use of legacy systems but also through the introduction of new capability across all the Defence Lines of Development. It consists of a number of projects delivering capability across three overlapping phases.



Overview of Cost, Time and Performance

	Approved	Forecast/Actual	Variation	IY Variation
Continuous Assessment Phase	£8m	£7m	-£1m	-£1m
Phase 1 Assessment Phase	£4m	£3m	-£1m	-£1m

Dabinett is currently planned to deliver over three phases.

Phase 1: The Intelligence, Surveillance, Target Acquisition and Reconnaissance Information Integration & Management project is the only project in Phase 1 of the Programme. It passed Initial Gate in April 2009. In February 2010 two competitive Assessment Phase contracts were placed, with preferred bidder selection expected in late 2010.

Phase 2: Phase 2 will provide common Intelligence, Surveillance, Target Acquisition and Reconnaissance enabling services, and implement improvements to Intelligence, Surveillance, Target Acquisition and Reconnaissance information integration, Intelligence, Surveillance, Target Acquisition and Reconnaissance management, and intelligence processing.

In February 2010 a decision was taken by the Direct Process and Disseminate Programme Board to divert planned resources from this phase to an Urgent Operational Requirement and other higher priority tasks. This led to a Capability management measure to defer funding for Phase 2 by two years. This has provided an opportunity to re-plan Phases 2 and 3. This re-planning is expected to complete by December 2010.

Phase 3: The Deep and Persistent element of Dabinett, previously planned for Phase 3, has been split out from the Direct Process and Disseminate element and will form part of the Air Intelligence Surveillance Target Acquisition and Reconnaissance programme. Phase 3 of Dabinett will therefore only consist of the technology refresh activities.

The Assessment Phase

Date	Milestone
March 2008	Programme Initial Gate Approval
April 2009	1st Project Initial Gate Approval

The Programme is in a continuous Assessment Phase that will initiate a number of projects, with their own lifecycles, over a series of phases to deliver the full capability identified for Dabinett.

Future Integrated Soldier Technology

The Capability

The Future Integrated Soldier Technology programme aims to integrate both current and emerging key technologies that British dismounted soldiers require for them to maintain their position at the forefront of capability. The programme will ensure the future soldier has equipment that optimises effectiveness, reduces physical and psychological load, and minimises the effects of combat stress and the risks of human error.

Historically, soldiers have been equipped in a piecemeal manner. The programme will consider the dismounted soldier as a system, and the eight-man section as a virtual platform. This 'system of systems' approach, demonstrated successfully during the Concept Phase, should fundamentally improve the capabilities of troops engaged in dismounted close combat. It will deliver an integrated suite of equipment encompassing the NATO domains of Command, Control, Communications, Computers and Information, Lethality, Mobility, Survivability and Sustainability.

Overview of Cost, Time and Performance

	Approved	Forecast/Actual	Variation	IY Variation
Cost of Assessment Phase	£26m[1]	£151m[2]	+£125m	+£9m

NOTES

1 Approval for Assessment Phase 1 only. Due to the incremental nature of this programme, this approval does not include further Assessment Phases.

2 Represents total forecast cost for Assessment Phases 1-3.

The Assessment Phase

Date	Milestone
August 2001	Initial Gate Approval
March 2003	Award of prime contract
July 2009	Main Gate Approval – Increment 1A
July 2010	IAB submission – Increment 1B

Main Gate approval for Increment 1A was achieved in July 2009. A contract for the Demonstration and Manufacture phase of Increment 1A (Surveillance and Target Acquisition) was placed with Thales Optronics Ltd on 27 July 2009. Work under this contract is due to be completed by September 2015.

A request for Main Gate approval of Increment 1B was refused by the MOD's Investment Approvals Board in December 2009 due to a lack of allocation of the necessary radio frequency spectrum. As this issue has proved impossible to resolve, and there is no further funding to pursue work in this area, a further submission will be made in July 2010 recommending termination of Increment 1B.

Work on the Assessment Phase of a second increment is expected to commence during 2010, subject to approval.

Future Rapid Effect System

The Capability

Future Rapid Effect System will be part of a balanced force consisting of Heavy, Medium and Light brigades.

The Future Rapid Effect System will replace the Army's Saxon, FV 430 and Combat Vehicle Reconnaissance (Tracked) vehicles. The new vehicles will provide higher levels of deployability and survivability over these existing vehicles.

The Future Rapid Effect System fleet is expected to be comprised of five families of vehicles: Utility, Reconnaissance, Medium Armour, Manoeuvre Support, and Basic Capability Utility.

Summary of Project Progress

	Approved	Forecast/Actual	Variation	IY Variation
Cost of Assessment Phase	£222m	£238m	+£16m	N/A

The Assessment Phase

Date	Milestone
May 2004	Initial Gate Approval (Utility Vehicle)
June 2007	Utility Vehicle Acquisition Strategy approved
January 2008	System of Systems Integrator contract award
May 2008	Provisional preferred bidder for Utility Vehicle Design announced
June 2008	Initial Gate Approval (Specialist Vehicle)
July 2009	Specialist Vehicle Acquisition Strategy approved
22 March 2010	General Dynamics UK announced as the preferred bidder

The Utility Vehicle programme is currently on hold following the Equipment Examination in December 2008 and an option taken as part of the Department's 2009 financial planning round that has deferred all funding for the Utility Vehicle until April 2012.

The Specialist Vehicle element of the Future Rapid Effect System programme continues to make good progress and secured Investment Approvals Board and Ministerial approval in June 2008 for funding to conduct an Assessment Phase.

The Specialist Vehicle Acquisition Strategy was approved in July 2009. The approved approach is to appoint through competition, a prime contractor to deliver the Demonstration, Manufacture and initial In-Service phases of the requirement.

Following the assessment of a Pre Qualification Questionnaire, BAE Systems Global Combat System and General Dynamics UK were issued an Invitation to Tender.

At the conclusion of the tender and approvals process, General Dynamics UK were announced as the preferred bidder on 22 March 2010. At the time of this report, the MOD is in negotiation with General Dynamics UK with the intention of placing a Demonstration Phase contract for Reconnaissance Block 1 and the Common Base Platform.

The Future Rapid Effect System has been recast from a single programme into three constituent programmes; Specialist Vehicle, Utility Vehicle and Manoeuvre Support. The Future Rapid Effect System funding lines have now been split across the three programmes and in future will be reported separately in the MPR.

Helix

The Capability

Project Helix will provide a rapidly deployable airborne electronic surveillance capability, against an evolving and increasingly complex target set up to 2025. The capability will support operations where it will collect, analyse, fuse and disseminate a coherent and readily interpretable electronic surveillance picture in support of national, joint and coalition operations. This information will support targeting and combat identification.

Overview of Cost, Time and Performance

	Approved	Forecast/Actual	Variation	IY Variation
Cost of Assessment Phase	£44m	£38m	-£6m	-£3m

The original concept of the Project was for the procurement of a modern mission system to fit into existing Nimrod R1 aircraft, together with ground analysis facilities, training facilities and a support solution to the planned Out of Service Date of 2025. The procurement strategy to realise this concept was selection of a preferred bidder by a competitive and phased-down selection process. Following a submission to the Defence Board by Nimrod IPTL and the Director of Equipment Capability (ISTAR), the Investment Approvals Board directed in 2008 that an additional option focused on the US Rivet Joint system should be considered. This was included in the Main Gate business case.

The Assessment Phase

Date	Milestone
August 2003	Initial Gate Approval
April 2004	Award of contracts for Assessment Phase
April 2005	First down-select
April 2007	Final down-select
May 2008	Assessment Phase Strategy Re-Examination
December 2009	Main Gate Submission to Investment Approvals Board. Approval given to proceed to Minister for Defence Equipment and Support and to HM Treasury
January 2010	Project placed on hold whilst MOD undertakes an examination of its planning assumptions for equipment over the next 10 years
March 2010	Ministerial and Treasury approval secured for Main Gate approval and Letter of Offer signed

Indirect Fire Precision Attack

The Capability

Indirect Fire Precision Attack will provide, by incremental acquisition, a suite of munitions for indirect precision attack of static, mobile, and manoeuvring targets, extending to ranges in excess of 150 kilometres. The capability required under Indirect Fire Precision Attack will be delivered through a structured programme of Assessment, Demonstration and Manufacture phases. The Assessment Phase is indicating that the Indirect Fire Precision Attack capability is likely to be achieved by a mixture of guided rockets, enhanced artillery shells and Loitering Munitions. They will carry a variety of payloads. Indirect Fire Precision Attack munitions will make use of a number of in-service platforms such as the Multiple Launch Rocket System and the AS90 self-propelled howitzer. The mix of munitions procured under the programme will have a range of In-Service Dates: this multi-solution approach is being managed through an incremental procurement strategy.

Summary of Project Progress

	Approved	Forecast/Actual	Variation	IY Variation
Cost of Assessment Phase	£170m	£152m	-£12m	–

The Assessment Phase

Date	Milestone
May 2001	Initial Gate Approval
May 2002	Assessment Phase Contract Award
June 2008	Increment 2 – Loitering Munitions Approval
September 2007	Increment 1 – Ballistic Sensor Fuzed Munition – Contract placement for Demonstration & manufacture achieved in September 2007 following international competition
March 2010	Increment 2 – Loitering Munition – D&M phase approved
February 2010	Increment 1 – Ballistic Sensor Fuzed Munition – cancellation approved December 2009; contract terminated February 2010

Approval for the cancellation of Ballistic Sensor Fuzed Munition was granted by the Investment Approvals Board on 21 December 2009, and the contract was terminated in February 2010. The Demonstration & Manufacture phase for the Loitering Munition was approved by the Investment Approvals Board in March 2010 as part of the Complex Weapons Interim Main Gate 1 submission. The Guided Multiple Launch Rocket System has a proposed first delivery date of June 2018. Guided Shell has an anticipated in service date of 2018 and the Large Long Range Rocket has an assumed in service date of 2020. These dates have changed since Major Project Report 2009 due to budgetary factors arising in the 2009-10 planning round.

Joint Military Air Traffic Services

The Capability

The Joint Military Air Traffic Services project seeks to sustain the provision of Air Traffic Management at MOD Airfields and Air Weapons Ranges through the provision of Mode S Secondary Surveillance Radar data, addressing equipment obsolescence in the air traffic inventory and through the more efficient delivery of support services. The project will provide air traffic services to military and civilian aircraft arriving at, departing from, and operating within the immediate vicinity or confines of, MOD aerodromes (United Kingdom, overseas permanent and deployed) and at air weapons ranges.

Overview of Cost, Time and Performance

	Approved	Forecast/Actual	Variation	IY Variation
Cost of Assessment Phase	£9m	£8m	-£1m	-£1m

The Assessment Phase

Date	Milestone
January 2008	Initial Gate Approval
February 2010	Review Note Approval

Part 2 of the Assessment Phase enables formal industry engagement. The intention is to use the competitive dialogue process to determine the preferred bidder and delivery solution for the Joint Military Air Traffic Services within the delivery framework developed during Assessment Phase Part 1.

A Review Note Industry Engagement was issued in December 2009 seeking approval to initiate formal industry engagement and release of an additional £6 million to provide specialist technical support and external assistance to the competitive dialogue process. Approval for Part 2 of the Assessment Phase was given on 22 February 2010.

Military Afloat Reach and Sustainability

The Capability

The Military Afloat Reach and Sustainability programme will provide afloat logistic support to UK and allied maritime task groups at sea and their amphibious components operating ashore. Although not strictly a one-for-one replacement programme, new vessels will incrementally replace much of the existing Royal Fleet Auxiliary flotilla, as ships enter and leave service, respectively.

Overview of Cost, Time and Performance

	Approved	Forecast/Actual	Variation	IY Variation
Cost of Assessment Phase	£44m	***	***	–

The Assessment Phase

Date	Milestone
May 2008	Four bidders selected for Fleet Tanker competition: Navantia of Spain, Fincantieri of Italy, a BVT lead consortium with BMT and DSME (of Korea), and HHI of Korea
December 2008	Department's Equipment Examination announcement states that there is scope for considering alternative approaches to procurement of the Fleet Tanker. Competition put on hold pending review
March 2009	Competition for Fleet Tanker formally closed
October 2009	Advert placed in Official Journal of the European Union for up to six Tankers

Following Ministerial approval a new competition was launched in October 2009. Following assessment of Pre Qualification Questionnaires, six companies have been invited to proceed to the next stage of the competition. The companies are: A&P Group Limited (UK), Daewoo Shipbuilding and Marine Engineering (Republic of Korea), Fincantieri (Itay), Flensburger Schiffbau-Gesellschaft (Germany), Hyundai Heavy Industries (Republic of Korea), and Knutsen OAS (UK) Limited.

Operational Utility Vehicle System

The Capability

The requirement for the Operational Utility Vehicle System was reviewed in 2007 by the Army, as lead user, when the need for vehicles with enhanced protection, capacity and mobility was identified. The Single Statement of User Need stated that 'Operational Utility Vehicle System would provide a robust, easily supported system, comprising operational utility vehicles that are able to carry light cargo (up to 6T) or small groups of personnel, integrate as many special-to-role systems as possible and which can operate in diverse climatic and topographical conditions worldwide, in order to support and contribute to land (including land air) and littoral manoeuvre operations'. This capability would be a key supporting enabler for offensive combat operations providing the following roles: unit level logistic cargo vehicle, systems carrier, commanders mobility platform, liaison and personnel mobility platform.

Overview of Cost, Time and Performance

	Approved	Forecast/Actual	Variation	IY Variation
Cost of Assessment Phase	£13m	£10m	-£3m	–

The Operational Utility Vehicle System programme was deferred for two years as part of the Departments 2010 financial planning round. On current assumptions, the competition will re-start in 2012.

Search and Rescue Helicopter

The Capability

Search and Rescue – Helicopter is a joint MOD/Maritime and Coastguard Agency programme which will replace the current Search and Rescue capability, provided by the Royal Navy and the Royal Air Force Sea Kings and under the Maritime and Coastguard Agency service contract. In the coming decade, as the Sea Kings come to the end of their planned lives and the Maritime & Coastguard Agency contract expires, the capability will be progressively replaced with a harmonised, Private Finance Initiative, Search and Rescue service. A competition for the new service was launched in May 2006, and following several rounds of bidding and detailed evaluation of competing potential solutions, the Soteria consortium was appointed as preferred bidder in February 2010. Contract placement is planned for later in 2010.

Overview of Cost, Time and Performance

	Approved	Forecast/Actual	Variation	IY Variation
Cost of Assessment Phase	£11.2m	£7.2m	-£4.0m	–

The Assessment Phase

Date	Milestone
Assesment Phase 1	
May 2003	Initial Gate Approval
Assesment Phase 2	
August 2005	Second Initial Gate Approval
May 2006	PFI Competition launched
November 2006	Four consortia down-selected
February 2007	Competitive Dialogue Starts
January 2008	1st Round Costed Bids
September 2008	Withdrawal of UK Air Rescue consortia leaving two remaining bidders
November 2008	2nd Round Costed Bids
January 2010	Assessment Phase concluded
February 2010	Preferred Bidder (Soteria consortium) announced

Since MPR 09 the Assessment phase has concluded with the achievement of Main Gate and the selection of Soteria as preferred bidder for the Search and Rescue – Helicopter PFI contract. An Information note or Review note will be submitted to Department for Transport and MOD approving authorities immediately prior to contract signature, setting the final performance, time and cost parameters of the project. Contract placement is planned for later in 2010.

Eagle/Sustain Sentry

The Capability

Sentry provides airborne surveillance, airborne command and control, a limited maritime surveillance capability and can operate as a communications coordination and relay platform.

Overview of Cost, Time and Performance

	Approved	Forecast/Actual	Variation	IY Variation
Cost of Assessment Phase	£17m	£4m	-£13m	–

The Assessment Phase

Date	Milestone
January 2005	Six Prime Contractors invited to submit proposals
August 2005	IAB approve re-scoping of Eagle
May 2006	IAB noted decision to downselect to two potential Prime Contractors
July 2006	Award of contracts for technical demonstration phase cancelled
October 2006	Competition-based procurement strategy cancelled and Boeing considered for acquisition of Eagle capability
March 2007	IAB approval given to a single source approach to a “de-scope Eagle” option
April 2008	Recommendation to defer project by two years approved
2008	Option taken to provide Sentry aircraft with a Mode S Identification Friend or Foe Interrogation capability
2009	Project Eagle descoped
2010	Main Gate – Mode S
January 2010	ISAB informed of change of change of strategy from Project Eagle to Sustain Sentry

An Information Note informing the Investment Approvals Board of the change of strategy from Project Eagle to Sustain Sentry was submitted in January 2010. Following the response from the Investment Approvals Board in February 2010, a Business Case Working Group was convened with the Investment Appraisal Board Scrutiny community, and it was decided to submit an Initial Gate Business Case rather than a Review Note. This effectively placed the project in Concept Phase, with an Initial Gate submission anticipated in September 2010.

The Sentry Project Team is working with its industrial partner Northrop Grumman to develop the Sustain Sentry Programme plan in terms of capability, time and cost.

Work is continuing with Northrop Grumman to agree the contractual terms and conditions for the delivery of the Mode S capability. It is expected that terms and conditions of the Mode S Contract will be agreed in July 2010.

A400M

The Capability

The A400M is planned to provide tactical and strategic mobility to all three Services. The required capabilities include: operations from airfields and semi-prepared rough landing areas in extreme climates and all weather conditions by day and night; carrying a variety of equipment and troops over extended ranges; air dropping paratroops and equipment; and being unloaded with the minimum of ground handling equipment. The Future Large Aircraft "Initial Gate" approval was received in July 1997. Intensive discussions about the future of the A400M programme (at both Ministerial and official level) between Partner Nations and Airbus Military have taken place over the past year, and have culminated in agreement in principle to amend the previously agreed contract. This amended contract is expected to be concluded later this year with the first UK aircraft to be delivered in 2014.

Overview of Cost, Time and Performance

	Approved	Forecast/Actual	Variation	IY Variation
Cost of Assessment Phase	£2m	£1m	-£1m	£0m
Cost of Demonstration & Manufacture Phase	£2,744m	£3,231m	+£487m	-£54m
In-Service Date	December 2009	March 2015	+63 months	-9 months

In-year Cost and Time Variation Detail

****

The very significant programme milestone of the first flight of the prototype A400M took place on 11 December 2009 in Seville. Flight trials continue and, on 9 March 2010, the A400M prototype (MSN001) flew from Seville to Toulouse for the next stages of flight trials. Also of note is the conclusion of the Flying Test Bed trials programme in September 2009.

In March 2009 the UK and its Partner Nations agreed to enter a "standstill" agreement with Airbus Military, the purpose of which was to enable possible options and outcomes for the A400M programme to be discussed without prejudicing the rights of either party under the existing contract. Initially to run for three months from April until the end of June 2009, the "standstill" period was extended to include July. In July 2009 the UK agreed to join Partner Nations in a negotiation phase with Airbus Military to determine the way ahead for the A400M programme.

A further "standstill" phase covering the renegotiation period was agreed; initially valid until 31 December 2009, it was subsequently extended to 31 January 2010. During the renegotiation period, extensive discussions at official and ministerial level took place between Nations and with Airbus Military and its parent organisations Airbus and EADS. As the renegotiation phase progressed, it became clear that the A400M programme would only remain viable with further investment from Partner Nations. The UK expects to manage this additional funding through a reduction in the number of aircraft (from 25 to not less than 22) it receives. Analysis undertaken during the renegotiation phase has resulted in a clearer production and delivery schedule enabling a more accurate forecast of the In-Service Date.

Risk Assessment against Defence Lines of Development

- Equipment
- Training
- Logistics
- Infrastructure
- Personnel
- Doctrine
- Organisation
- Information

Astute Class Submarines

The Capability

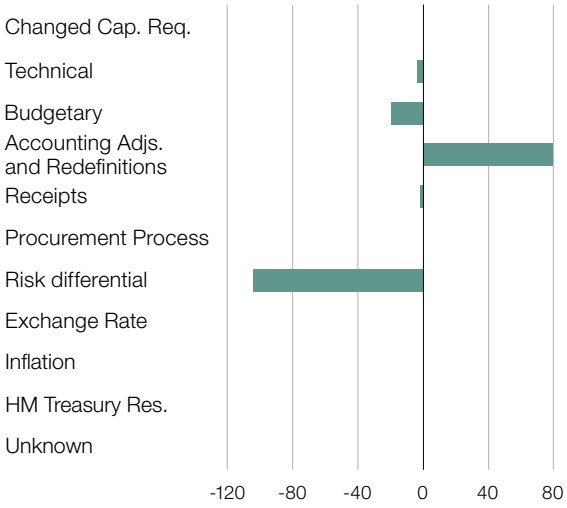
The military requirement is for up to eight Astute Class Submersible Ship Nuclear to replace the existing Swiftsure and Trafalgar Classes of nuclear powered attack submarine. Astute Class submarines are required to perform a range of military tasks; these unique requirements are combined within the Astute design to provide global reach, endurance, covertness, sustained high speed and the ability to conduct unsupported operations in hostile environments.

Overview of Cost, Time and Performance

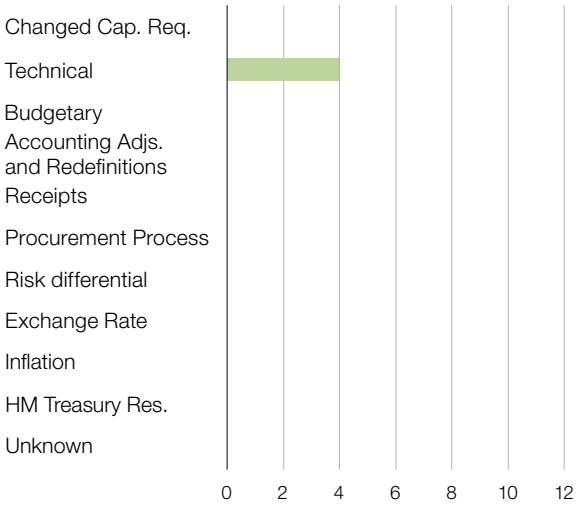
	Approved	Forecast/Actual	Variation	IY Variation
Cost of Assessment Phase	£33m	£29m	-£4m	£0m
Cost of Demonstration & Manufacturing Phase Boats 1-3	£2,578m	£4,041m	+£1,463m	+£108m
Cost of Demonstration & Manufacturing Phase Boat 4	£1,610m	£1,567m	-£43m	-£22m
Cost of Demonstration & Manufacturing Phase Boat 5	£855m	£735m	-£120m	-£120
Cost of Demonstration & Manufacturing Phase Boat 6	£351m	£334m	-£17m	-£17m
Cost of Support Phase	£331m	£273m	-£58m	-£25m
Cost of Support Phase Acts Bts 1-3	£182m	£588m	+£406m	-£3m
Cost of support Phase Acts B4	£260m	£267m	+£7m	+£7m
In-Service Date	June 2005	July 2010	+61 months	+4
Support Contract Go-Live – Initial Support Solution	August 2007	May 2007	-3 months	0 months
Support Contract Go-Live – Astute Class Training Service Boats 1-3	February 2004	March2008	+49 months	0 months
Support Contract Go-Live – Astute Class Training Service Boat 4	December 2013	July 2012	-18 months	0 months
Support Contract End – Initial Support Solution	December 2012	December 2012	0 months	0 months
Support Contract End – Astute Class Training Service Boats 1-3	September 2026	September 2037	+132 months	0 months
Support Contract End – Astute Class Training Service Boat 4	September 2039	September 2039	0 months	0 months

In-year Cost and Time Variation Detail

In Year Costs (£m)



In Year Time (months)



Boat 1, First of Class, sailed from Barrow-in-Furness on 15 November 2009 and into her home port of HM Naval Base Clyde on 20 November 2009. Boat 1 is now conducting an extensive period of First of Class sea trials prior to formally handing over to the Royal Navy. Early sea trials exposed technical problems that have required modifications before recommencing sea-trials in February 2010. Boat 2 started early stages of reactor systems commissioning during 2009. As resource for this work is common, Boat 2 has experienced significant delays in year. Progress on Boat 3 and initial build of Boat 4 has been less affected.

Risk Assessment against Defence Lines of Development

- Equipment
- Training
- Logistics
- Infrastructure
- Personnel
- Doctrine
- Organisation
- Information

Beyond Visual Range Air-to-Air Missile

The Capability

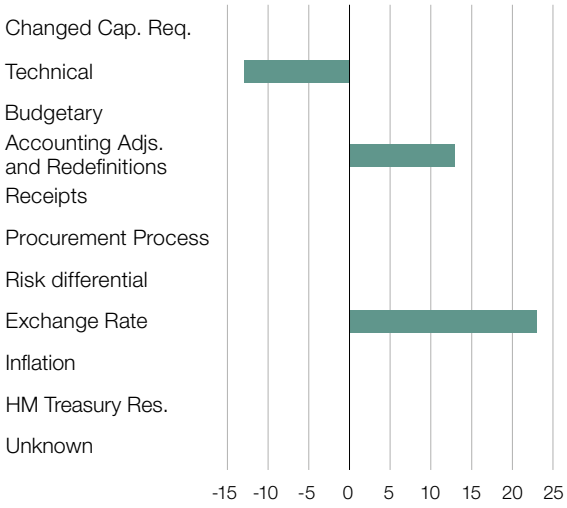
The Beyond Visual Range Air-to-Air Missile (BVRAAM) programme is intended to develop and produce a replacement for the interim fit of AMRAAM as the long-range air-to-air weapon on Typhoon in UK service. It is a collaborative project with France, Germany, Italy Spain and Sweden. Main Gate approval was obtained in May 2000, with a contract for Development, Manufacture and Support let with MBDA (UK) in December 2002.

Overview of Cost, Time and Performance

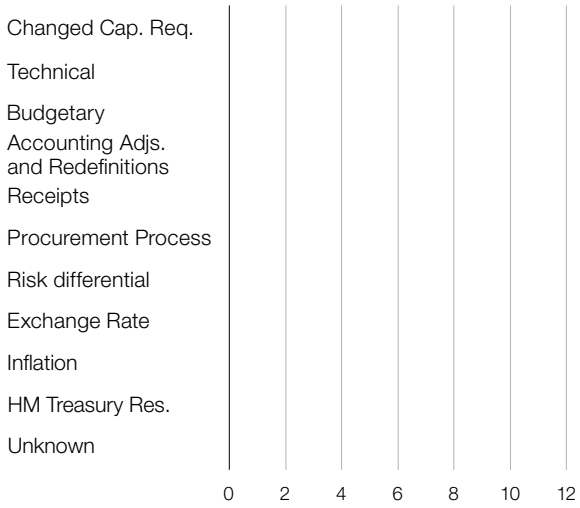
	Approved	Forecast/Actual	Variation	IY Variation
Cost of Assessment Phase	£14m	£20m	+£6m	–
Cost of Demonstration & Manufacture Phase	£1,362m	£1,305m	-£57m	+£23m
Cost of Support Phase	–	–	–	–
Duration of Assessment Phase Inc 1	55 months	55 months	–	–
In-Service Date 1	August 2012	August 2012	–	–
In-Service Date 2	July 2015	July 2015	–	–

In-year Cost and Time Variation Detail

In Year Costs (£m)



In Year Time (months)



The Meteor Development programme has progressed to a point where a near-production standard of missile has been produced, which is the subject of a comprehensive proving programme consisting of modelling, ground trials, air carriage trials and guided firings, the first of which was completed during June 2009. These activities will generate the evidence against which approval will be given to its Certificate of Design prior to the commencement of Production, leading to In-Service Date 1 in 2012.

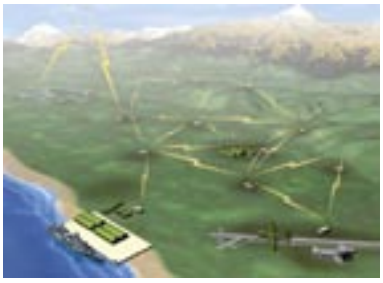
Eurofighter GmbH were given authorisation in July 2009 to begin preliminary Typhoon missile carriage and release work, the first step towards full integration. The full integration as part of a wider enhancement package is being developed in support of achieving In-Service Date 2 in 2015, with a priced proposal received and being evaluated.

Risk Assessment against Defence Lines of Development

- Equipment
- Training
- Logistics
- Infrastructure
- Personnel
- Doctrine
- Organisation
- Information

Falcon

The Capability



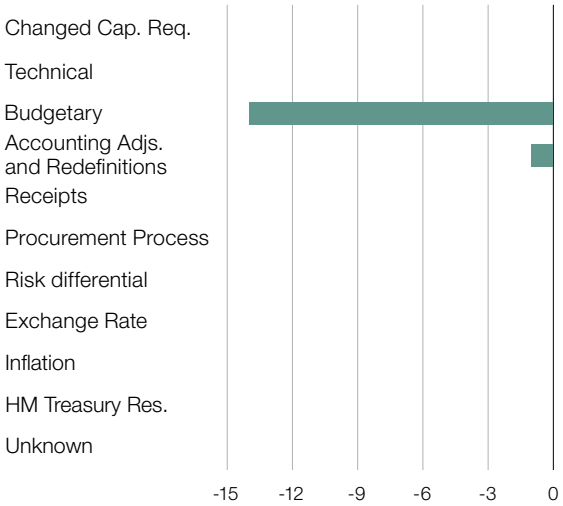
Falcon will provide the comprehensive deployable communication systems that are needed at all levels of command and will operate in conjunction with systems such as Bowman, Cormorant, Skynet 5 and with allies' communication and information systems. It will not duplicate the capability of existing systems, but will be the high capacity system that binds together tactical communications in a theatre of operations as an integral part of the plans for Networked Enabled Capability. Falcon will replace, incrementally, a number of current systems, in particular Ptarmigan and RAF Transportable Telecommunications System/Deployable Local Area Network.

Overview of Cost, Time and Performance

	Approved	Forecast/Actual	Variation	IY Variation
Cost of Assessment Phase	£30m	£31m	+£1m	–
Cost of D&M Phase – Increment A	£324m	£270m	-£54m	-£15m
Cost of D&M Phase – Increment C	£50m	£46m	-£4m	£0m
Cost of Support Phase – Increment A	£82m	£70m	-£12m	–
Cost of Support Phase – Increment C	£18m	£18m	0	–
In-Service Date – Increment A	February 2011	December 2010	-2 months	+1 months
In-Service Date – Increment C	March 2011	April 2011	+1 months	+2 months
Support Contract Go-Live				
Support Contract End – Increment A	December 2018	December 2018	0 months	0 months
Support Contract End – Increment C	December 2018	December 2018	0 months	0 months

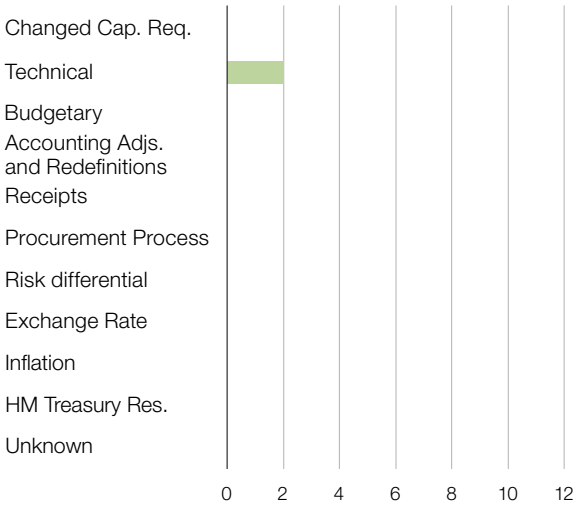
In-year Cost and Time Variation Detail

In Year Costs (£m)



Following Main Gate approval for Increment A in March 2006, the Demonstration and Manufacture contract was awarded to BAE Systems Insyte. The majority of the system has been developed to a high degree of maturity and the system validation and verification process has started. However, there have been delays to the voice telephony and cryptographic sub-systems, which have had a consequential delay to the whole contract.

In Year Time (months)



The Equipment Acceptance Trial, a key milestone in the system's development, was completed successfully and reported as a pass with caveats in November 2009. Falcon Phase 2, which is in the early concept stage and is thus not covered by the MPR, is subject to a financial planning round 2010 Option, this option being a re-profile and would result in a delay to Phase 2 In Service Date by one year.

Risk Assessment against Defence Lines of Development

- Equipment
- Training
- Logistics
- Infrastructure
- Personnel
- Doctrine
- Organisation
- Information
- Interoperability

Future Strategic Tanker Aircraft

The Capability

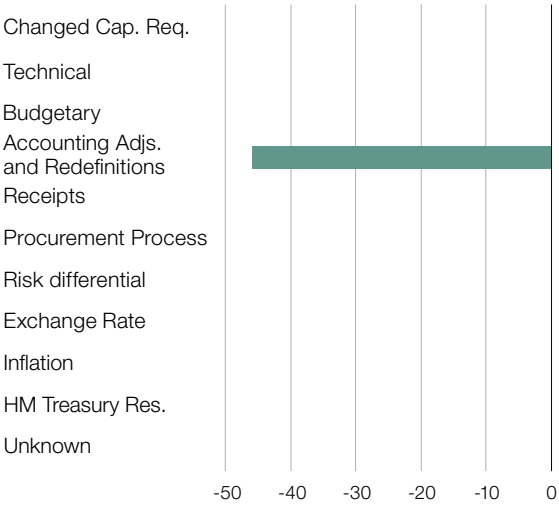
The Future Strategic Tanker Aircraft Service is planned to replace the Air-to-Air Refuelling and the passenger Air Transport capability currently provided by the Royal Air Force's fleet of VC10 and TriStar aircraft. Air-to-Air Refuelling is a key military capability that significantly increases the operational range and endurance of frontline aircraft across a range of defence roles and military tasks. Many of the UK's frontline Fast Jet fleets require Air Refuelling to an operational theatre in order to meet deployment timelines.

Overview of Cost, Time and Performance

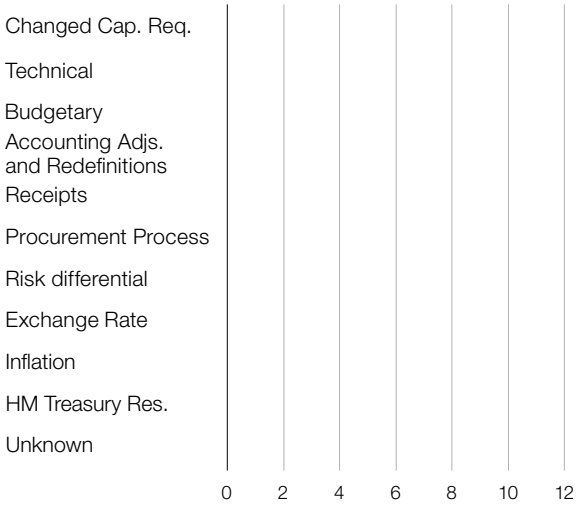
	Approved	Forecast/Actual	Variation	IY Variation
Cost of Assessment Phase	£13m	£38m	+£25m	–
PFI Costs	£12,536m	£11,917m	-£619m	-£46m
Duration of Assessment Phase	May 2007	December 2000	77 months	–
In-Service Date (Air-to-Air Refuelling)	November 2014	May 2014	-6 months	–
Support Service PFI Contract Go-Live	March 2008	March 2008	–	–
Support Service PFI Contract End	March 2035	March 2035	–	–

In-year Cost and Time Variation Detail

In Year Costs (£m)



In Year Time (months)



The first set of wings was rolled out on time in February 2009 at Broughton. The first A330-200 aircraft successfully completed its maiden flight in June 2009 and was delivered to the Airbus Military facility at Getafe, Spain in July 2009; the second aircraft joined it in September 2009. Work is progressing to plan, and test flying commenced in September 2010 when the first FSTA aircraft was converted from an A330-200 aircraft. A second aircraft is currently being converted for their FSTA role.

The delivery of the first aircraft into service is expected in October 2011.

The Main Operating Base will be located at RAF Brize Norton and the site preparation has been completed on time. This work had to be completed before construction of the new infrastructure could commence and was a key milestone for AirTanker Ltd's progress. The infrastructure work is on track.

Risk Assessment against Defence Lines of Development

- Equipment
- Training
- Logistics
- Infrastructure
- Personnel
- Doctrine
- Organisation
- Information

Joint Combat Aircraft

The Capability

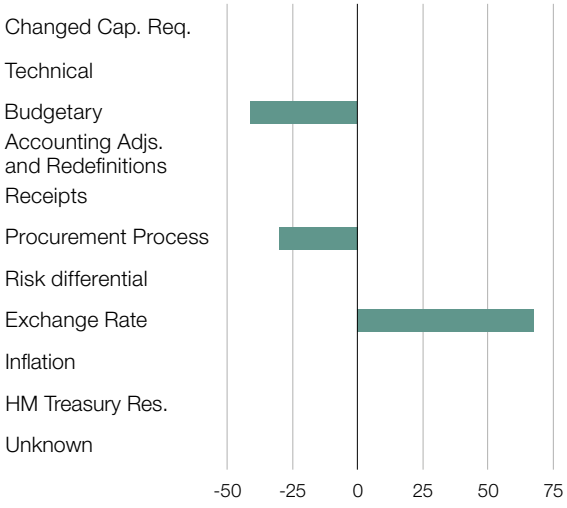
The Joint Strike fighter was selected to meet the UK's Joint Combat Aircraft requirement for a survivable multi-role expeditionary air capability, able to operate from land and sea. Joint Strike Fighter is a 5th Generation aircraft programme comprising nine partner nations led by the US. The UK's Level 1 partner status, alongside with the United States Navy, Marine Corps and Marine Corps, has enabled significant influence throughout the System Design and Demonstration phase of the programme. The UK has an incremental Main Gate strategy and is planning to officially release an in-service date after the purchase of training aircraft, currently planned for early 2011.

Overview of Cost, Time and Performance

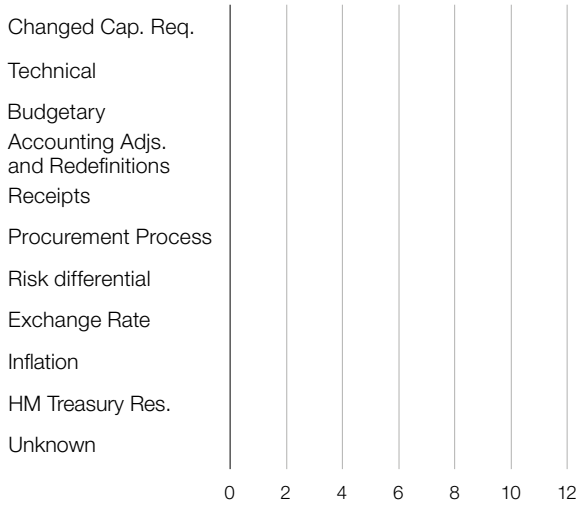
	Approved	Forecast/Actual	Variation	IY Variation
Cost of Assessment Phase	£150m	£144m	-£6m	£0m
Cost of Demonstration & Manufacture Phase	£2,874m	£2,448m	-£426m	-£3m
Cost of Support Phase	–	–	–	–
Duration of Assessment Phase	–	–	–	–
In-Service Date	–	–	–	–
Initial Operating Capability	–	–	–	–
Support Contract Go-Live	–	–	–	–
Support Contract End	–	–	–	–

In-year Cost and Time Variation Detail

In Year Costs (£m)



In Year Time (months)



On 18 March 2009, the UK Secretary of State for Defence announced the approval to purchase three Short Take Off and Vertical Landing variants of Joint Strike Fighters for Operational Test and Evaluation. The UK placed requirements on the US Department of Defense for the procurement of these aircraft with associated support and training equipment, and the first two aircraft are already on the production line at Lockheed's factory in Fort Worth, Texas. On the 26 January 2010, Sqn Ldr Steve Long became the first UK military pilot to fly the aircraft when he conducted a test flight at Patuxant River in Maryland, USA. On 18 March 2010 the Short Take Off and Vertical Landing variant demonstrated significant progress in fully meeting capability by successfully completing its first vertical landing at US Naval Air Field Patuxant River.

Risk Assessment against Defence Lines of Development

- Equipment
- Training
- Logistics
- Infrastructure
- Personnel
- Doctrine
- Organisation
- Information

Lynx Wildcat

The Capability

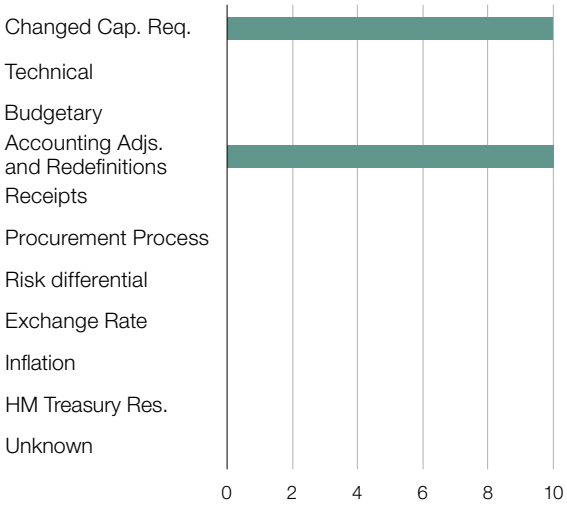
The Lynx Wildcat capability was developed to meet the requirements for a dedicated small helicopter for use in both the land (Battlefield Reconnaissance Helicopter Requirement) and maritime (Surface Combatant Maritime Rotorcraft Requirement) environments to replace the current Lynx fleet which is reaching its life end. Lynx Wildcat is a single-source, combined helicopter procurement programme with Westland Helicopters Ltd, which follows More Effective Contracting principles. Project approval is for 80 aircraft, with funding for 62 held by the Integrated Project Team.

Overview of Cost, Time and Performance

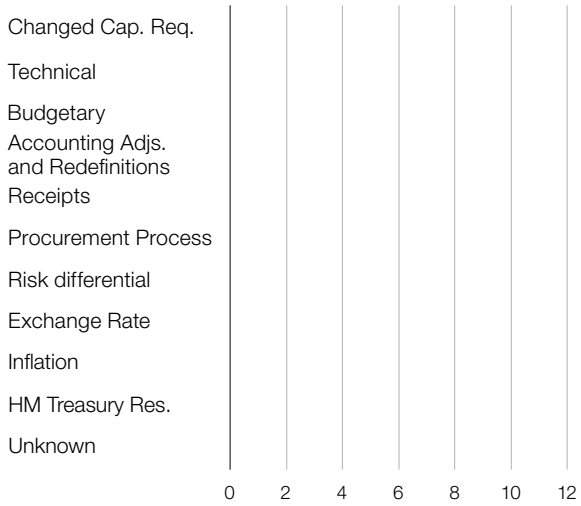
	Approved	Forecast/Actual	Variation	IY Variation
Cost of Assessment Phase	£59m	£57m	-£2m	£0m
Cost of Demonstration & Manufacture Phase	£1,966m	£1,689m	-£277m	£20m
Cost of Support Phase	£0m	£0m	£0m	£0m
Duration of Assessment Phase – Battlefield Reconnaissance Helicopter		54 months		
Duration of Assessment Phase – Surface Combatant Maritime Rotorcraft		45 months		
In-Service Date – Battlefield Reconnaissance Helicopter	August 2014	January 2014	-7 months	0 months
In-Service Date – Surface Combatant Maritime Rotorcraft	August 2015	January 2015	-7 months	0 months
Support Contract Go-Live	–	–	–	–
Support Contract End	–	–	–	–

In-year Cost and Time Variation Detail

In Year Costs (£m)



In Year Time (months)



The first airframe was delivered to the Westland build line in November 2008 and a successful 'First Flight' was achieved in November 2009 in accordance with the schedule contracted in June 2006. A Planning Round 10 Option was run to address the legislative and safety requirement to fit all combat aircraft including helicopters with fuel system survivability measures.

A Review Note was submitted to the Investment Approvals Board in December 2008 and approved in January 2009, detailing a new strategy to explore a single source, integrated Support Solution and Training Delivery Service through the aircraft manufacturer, AgustaWestland. Work continues towards approvals and contract let.

Risk Assessment against Defence Lines of Development

- Equipment
- Training
- Logistics
- Infrastructure
- Personnel
- Doctrine
- Organisation
- Information

Merlin Capability Sustainment Programme

The Capability

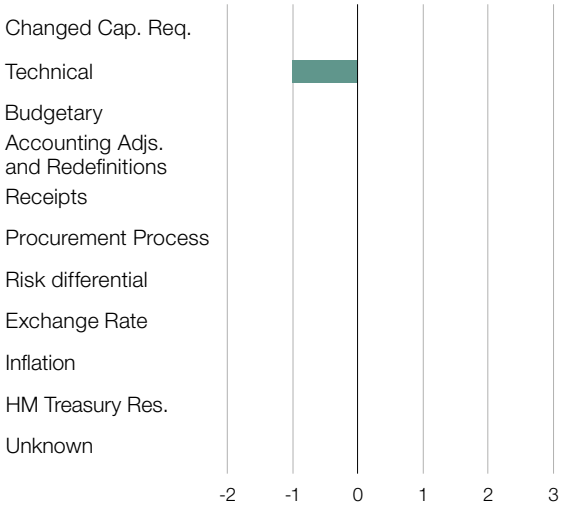
The Merlin Capability Sustainment Programme will update 30 Merlin Mk1 aircraft to overcome existing and forecast obsolescence within the Weapon System Avionics to ensure sustainment of the required capability until the planned out-of-service date (2029). The approach taken is one of system level technology refresh of the key mission and air vehicle avionic systems. A core feature of the programme is the implementation of a flexible open architecture that will deliver lower cost of ownership, enable cost-effective future capability insertion and compliance with the latest safety legislation. The Demonstration & Manufacture contract has been placed with Lockheed Martin Aero Systems Integration Corporation.

Overview of Cost, Time and Performance

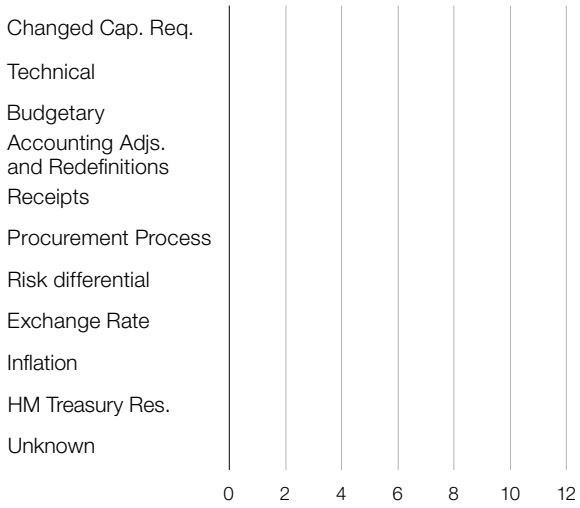
	Approved	Forecast/Actual	Variation	IY Variation
Cost of Assessment Phase	£29m	£27m	-£2m	£0m
Cost of D&M Phase	£840m	£829m	-£11m	-£1m
Cost of Support Phase	£0m	£0m	£0m	£0m
Duration of Assessment Phase	34 months	34 months	0 months	0 months
In-Service Date	September 2014	February 2014	-7 months	0 months
Initial Operating Capability	September 2014	February 2014	-7 months	0 months
Support Contract Go-Live	N/A	N/A	N/A	N/A
Support Contract End	N/A	N/A	N/A	N/A

In-year Cost and Time Variation Detail

In Year Costs (£m)



In Year Time (months)



The programme remains on track, following successful completion of the Training System Design Reviews (April and September 2009). The production of the trials aircraft has commenced and is on track for first flight in September 2010.

Risk Assessment against Defence Lines of Development

- Equipment
- Training
- Logistics
- Infrastructure
- Personnel
- Doctrine
- Organisation
- Information

Queen Elizabeth Class Aircraft Carriers

The Capability

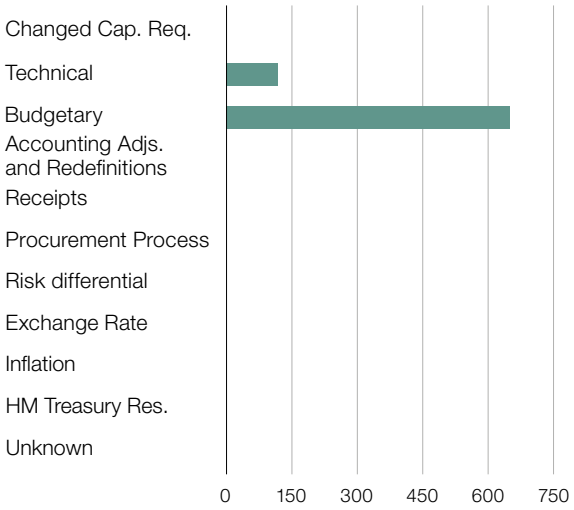
The platform element of the Carrier Strike capability will be provided by the Queen Elizabeth Class Aircraft Carriers. A staged approval to Main Gate in 2007 led to the formation of the Aircraft Carrier Alliance (comprising MOD and Industry) and contract award in 2008 to deliver the programme with In Services Dates originally planned for 2014 and 2016. The continuing need for the Carrier Strike capability was confirmed in the 2008 Equipment Examination by the Defence Management Board.

Overview of Cost, Time and Performance

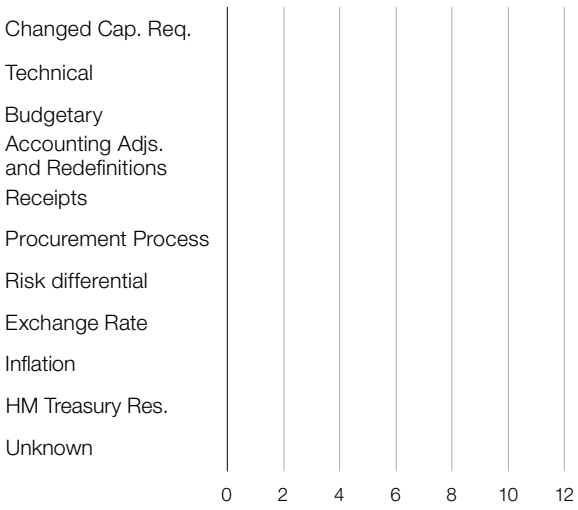
	Approved	Forecast/Actual	Variation	IY Variation
Cost of Assessment Phase	£118m	£331m	+£213m	£33m
Cost of D&M Phase	£4,359m	£5,900m	+£1,541m	+£767m
Cost of Support Phase	–	–	–	–
Duration of Assessment Phase Inc 1	55 months	84 months		
In-Service Date	October 2015	May 2016	+7 months	0 months
Support Contract Go-Live	–	–	–	–
Support Contract End	–	–	–	–

In-year Cost and Time Variation Detail

In Year Costs (£m)



In Year Time (months)



Following Main Gate approval the project moved into the Engineering Transition Phase, an extension of the Demonstration Phase to encompass the period prior to contract signature. On 3 July 2008 a contract was signed with BVT Surface Fleet for the manufacture of the two carriers together with signature of an Alliance Agreement with all members of the Alliance.

The first cut of steel took place in July 2009 at the Govan shipyard in Glasgow, and manufacture is under way in five UK shipyards: Babcock Rosyth and Appledore, BAE Systems Govan, Portsmouth, and A&P Tyne. This work will expand to the final shipyard in 2010. Current In Service Date estimates are May 2016 for HMS Queen Elizabeth and December 2018 for HMS Prince of Wales.

During 2009 a number of significant milestones were achieved: completion of No.1 dock at Rosyth; delivery of an upper deck section from Appledore to Rosyth; delivery of the Highly Mechanised Weapon Handling System and the delivery of Emergency Diesel Generators.

In addition, the preparations and equipment procurement have proceeded with equipment sub-contracts placed to date in excess of £1,000 million, and at the close of the Financial Year 2010, the bow of the Queen Elizabeth departed from Appledore for Rosyth.

Risk Assessment against Defence Lines of Development

- Equipment
- Training
- Logistics
- Infrastructure
- Personnel
- Doctrine
- Organisation
- Information

Nimrod Maritime Reconnaissance and Attack MK4

The Capability

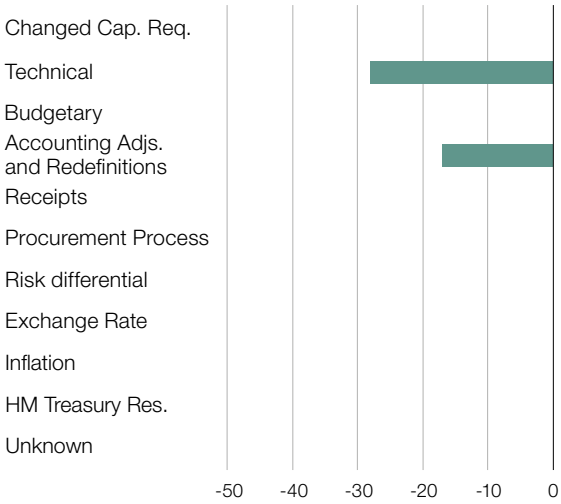
The Nimrod Maritime Reconnaissance and Attack Mk4 will replace the current Nimrod Maritime Reconnaissance Mk2 as the new maritime patrol aircraft. Nimrod Maritime Reconnaissance and Attack Mk4 will provide significantly enhanced Anti-Submarine and Anti-Surface Warfare capability through improved aircraft and sensor performance, a greater degree of system integration, better Human Machine Interface design, and a substantial improvement in availability and supportability.

Overview of Cost, Time and Performance

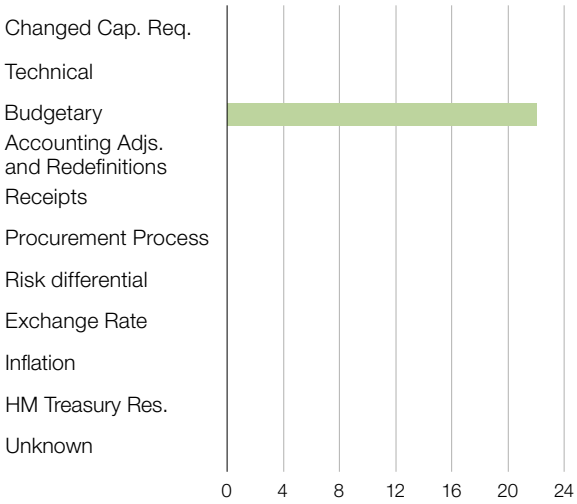
	Approved	Forecast/Actual	Variation	IY Variation
Cost of Assessment Phase	£4m	£5m	+£1m	£0m
Cost of D&M Phase	£2,813m	£3,602m	+£789m	-£45m
Cost of Support Phase	N/A	N/A	N/A	N/A
ISD	April 2003	October 2012	+114 months	+22 months

In-year Cost and Time Variation Detail

In Year Costs (£m)



In Year Time (months)



The Nimrod Maritime Reconnaissance and Attack Mk4 contract for the design, development and production of 21 aircraft was placed with BAE Systems in 1996, following an international competition. Initial problems with the project resulted in the contract being re-negotiated in mid 1999, early 2002 and 2003. Pending definition of a satisfactory design standard, series production activities were limited to those activities vital to the preservation of essential skill sets within BAE Systems and its supply chain. In parallel with this, the Department reduced its requirement from 21 to 12 as it was determined that this would meet the maritime reconnaissance requirement. A business case seeking authorisation of commitment to full production was approved in May 2006, and the contract was amended to re-introduce the production requirements in July 2006. As part of the approval process the project's original Key Requirements were redefined and endorsed as Key Performance Measures by the Investment Approval Board and a revised definition of the In Service Date was approved. Affordability issues identified in Spring 2008 resulted in a further reduction in the number of aircraft from 12 to 9. In December 2009, the Secretary of State for Defence announced that the introduction of the Nimrod Maritime Reconnaissance and Attack Mk4 would be delayed as one of a range of measures aimed at reprioritising Defence Expenditure to focus on current operations. Consequently the In Service Date has been delayed by 22 months to October 2012.

Risk Assessment against Defence Lines of Development

- Equipment
- Training
- Logistics
- Infrastructure
- Personnel
- Doctrine
- Organisation
- Information

Tornado Capability Upgrade Strategy (Pilot)

The Capability

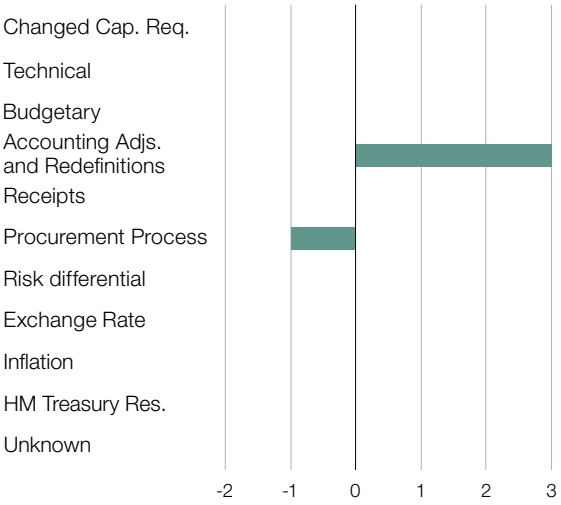
Tornado Capability Upgrade Strategy (Pilot) provides a single integrated Demonstration, Manufacturing and In-service phase for three capabilities that will be delivered in two work packages. Secure Communications on Tornado and integration of Precision Guided Bomb will be delivered as Capability A. Tactical Information Exchange Capability will be delivered as Capability B.

Overview of Cost, Time and Performance

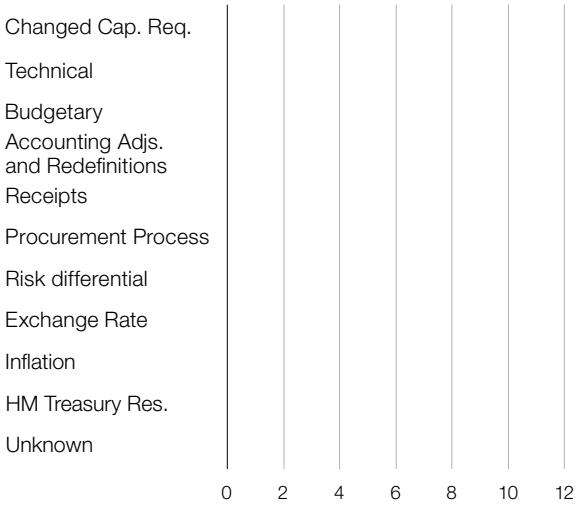
	Approved	Forecast/Actual	Variation	IY Variation
Cost of Assessment Phase	£1m	£12m	+£11m	£0m
Cost of Demonstration & Manufacture Phase	£301m	£303m	+£2m	£2m
Cost of Support Phase	£85m	£74m	-£11m	£0m
Duration of Assessment Phase		19 months		
In-Service Date	March 2013	November 2012	-4 months	0 months

In-year Cost and Time Variation Detail

In Year Costs (£m)



In Year Time (months)



Capability A has passed both the Preliminary and Customer Design Reviews, and the first Trial Installation aircraft was completed in February 2010. The second Trial Installation aircraft is due to complete in May 2010 with the first two aircraft to have Capability A embodied being accepted into the Combined Maintenance Unit at Marham in October 2010.

Capability B passed the Preliminary Design Review and completed Customer Design Review in August 2010. The first Trial Installation aircraft is due to complete in November 2011.

Risk Assessment against Defence Lines of Development

- Equipment
- Training
- Logistics
- Infrastructure
- Personnel
- Doctrine
- Organisation
- Information

Type 45 Destroyer

The Capability

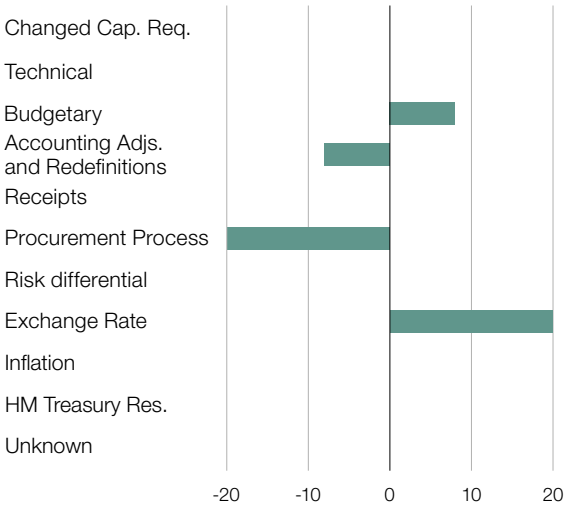
The Type 45 is a new class of six Anti-Air Warfare Destroyers, to replace the capability provided by the Royal Navy's existing Type 42s. The warship is being procured nationally. The Type 45 will carry the Principal Anti-Air Missile System, which is capable of protecting the vessels and ships in their company against aircraft and missiles, satisfying the Fleet's need for area air defence capability into the 2030s. The Principal Anti-Air Missile System is being procured collaboratively with France and Italy. The Destroyers Team is responsible for providing the Principal Anti-Air Missile System to the warship Prime Contractor.

Overview of Cost, Time and Performance

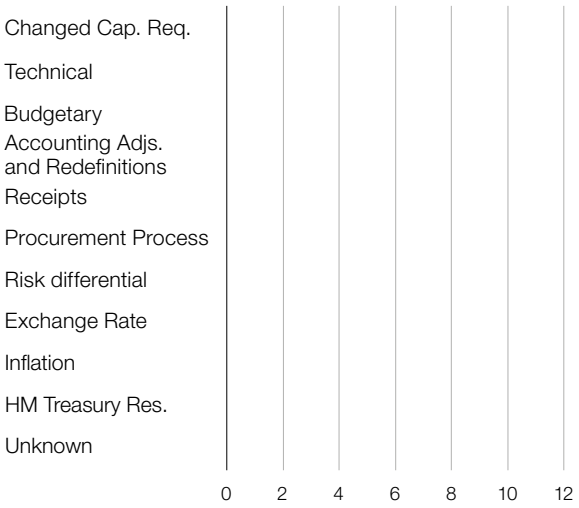
	Approved	Forecast/Actual	Variation	IY Variation
Cost of Assessment Phase	£213m	£232m	+£19m	£0m
Cost of Demonstration & Manufacture Phase	£5,475m	£6,464m	+£989m	£0m
Cost of Support				
– Initial Spares	£14m	£14m	£0m	£0m
– Full Support	£968m	£958m	-£10m	-£10m
Duration of Assessment Phase	–	108 months	–	–
In-Service Date	November 2007	July 2010	+32 months	0 months
Support				
– Initial Spares Contract Go-Live	June 2008	June 2008	0 months	0 months
– Full Support Contract Go-Live	April 2009	Sept 2009	+5 months	+5 months
– Initial Spares Contract End	–	–	–	–
– Full Support Contract End	November 2017	November 2017	–	–

In-year Cost and Time Variation Detail

In Year Costs (£m)



In Year Time (months)



The past year has seen significant progress in the manufacture of the six ships. All ships are now in production. The first ship, HMS Daring was commissioned into the Royal Navy in July 2009. A contract for up to seven years of Support for Type 45 was awarded to BAE Systems Surface Ships Ltd in September 2009. The fifth Type 45, Defender, was launched in October 2009. The second ship (Dauntless) was Accepted off Contract from the Prime Contractor in December 2009. Test firings of the Principal Anti-Air Missile System took place in May and November 2009.

These test firings did not meet all of their planned trials' objectives. During the Department's 2010 Planning Round a decision was taken to amend the production programme of Aster Missiles. This decision deferred production of some missiles, reducing the costs in early years, but adding £46 million to the overall cost of the Principal Anti-Air Missile System programme. However, the effect of other Planning Round decisions and the benefits accrued through the good progress of the Ship programme, mean that the result is no overall cost growth of the T45 programme.

Risk Assessment against Defence Lines of Development

- Equipment
- Training
- Logistics
- Infrastructure
- Personnel
- Doctrine
- Organisation
- Information

Typhoon

The Capability

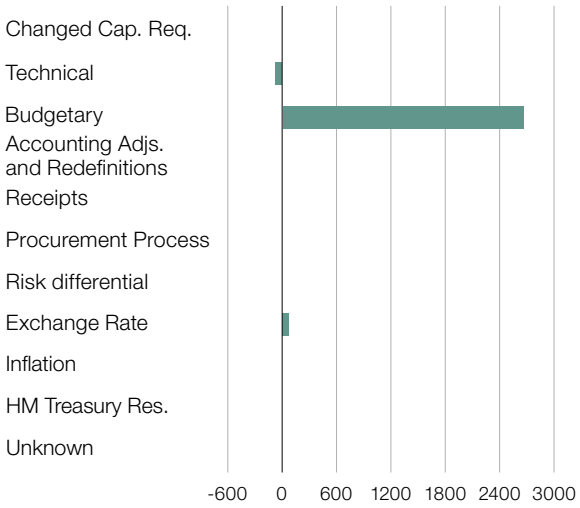
Typhoon is an agile, multi-role combat aircraft, which is being developed, produced and supported in a collaborative project with Germany, Italy and Spain. Typhoon entered service with the RAF in 2003 and commenced operational duties in June 2007 when it assumed Quick Reaction Alert responsibility for defence of UK airspace. The air-to-air missile capability on the first tranche of aircraft has been complemented by the integration of an initial precision air-to-surface capability, which was declared combat ready by the RAF in July 2008. The Typhoon Future Capability Programme will provide more comprehensive air-to-surface capability on the 2nd tranche of aircraft from 2012.

Overview of Cost, Time and Performance

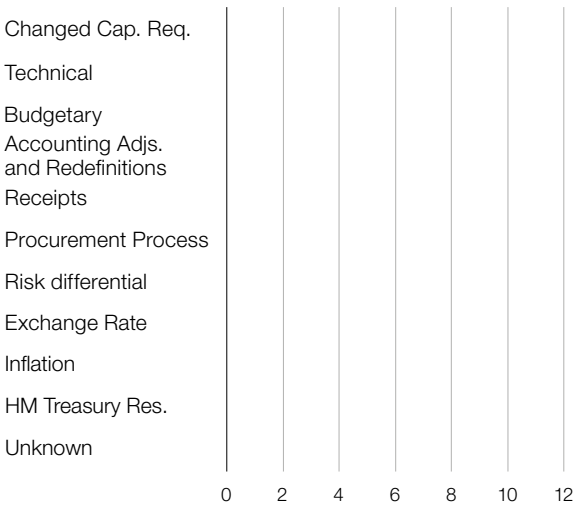
	Approved	Forecast/Actual	Variation	IY Variation
Cost of Assessment Phase	£131m	£122m	-£9m	£0m
Cost of Demonstration & Manufacture Phase	£17,129m	£20,627m	+£3,498m	+£2,665m
Cost of Support Phase	£13,100m	£13,100m	+£0m	+£0m
In-Service Date – Typhoon	December 1998	June 2003	+54 months	0 months
In-Service Date Typhoon Future Capability Programme	June 2012	June 2012	0 months	0 months
Support Contract Go-Live	–	–	–	–
Support Contract End	–	–	–	–

In-year Cost and Time Variation Detail

In Year Costs (£m)



In Year Time (months)



Deliveries of Tranche 2 aircraft commenced in October 2008. The original Typhoon fleet numbers required (232 aircraft) were established in the 1990s. Current fleet planning and assumptions to meet defence requirements have determined the aircraft numbers and capabilities now required. The contract for the third Tranche, signed in July 2009, represents the best solution for the UK in balancing current military requirements and international obligations against affordability. The UK has retained the option to order further aircraft. Deliveries of Tranche 3 aircraft are scheduled to start in 2013.

The approvals process for Typhoon Future Capability Programme has been accelerated to combine Initial and Main Gates, to maximise efficiency across the Partner Nations. Phase 2 of the programme is planned as part of the MOD's Future Defence Programme announced in December 2009.

Risk Assessment against Defence Lines of Development

- Equipment
- Training
- Logistics
- Infrastructure
- Personnel
- Doctrine
- Organisation
- Information

United Kingdom Military Flying Training System

The Capability

The UK Military Flying Training System will deliver a coherent, flexible and integrated flying training capability catering for the needs of the Royal Navy, the royal Air Force and the Army Air Corps. The flying training system takes aircrew from initial training through elementary, basic and advanced flying training phases to their arrival at their designated operational aircraft. The focus for UK Military Flying Training System is to achieve a holistic system based on capability and service delivery; it is not solely about the provision of aircraft platforms. It also offers an opportunity to modernise the flying training processes for all three Services, realise efficiencies and, since training is currently spread across several organisations, take advantage of potential economies of scale.

Overview of Cost, Time and Performance

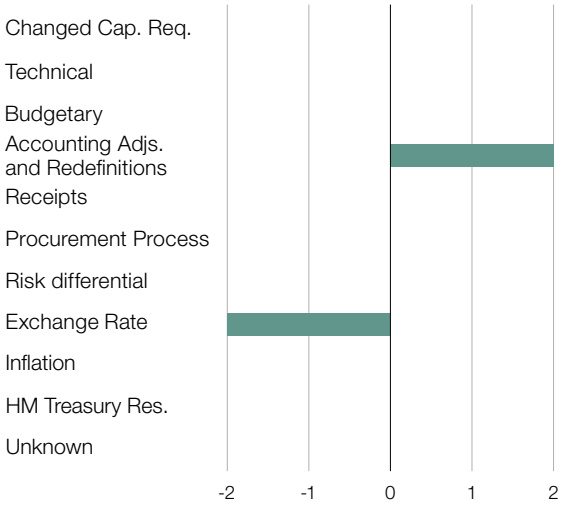
	Approved	Forecast/Actual	Variation	IY Variation
Cost of Assessment Phase	£116m	£108m	-£8m	£0m
Cost of Demonstration and Manufacture Phase	£959m	£916m	-£43m	£0m
Cost of Support Phase	£480m	£470m	-£10m	-£3m
In-Service Date – Advanced Jet Trainer	February 2010	February 2010	–	-5 months
In-Service Date – Advanced Jet Trainer Ground based training Environment	July 2010[1] September 2010	January 2011 March 2011	+6 months +6 months	+9 months +4 months
In-Service Date – Rear Crew Stage 1	September 2011	November 2011	+2 months	+2 months
Support Contract Go-Live – Advanced Jet Trainer		July 2008	–	–
Support Contract Go-Live – Training System Partner and Headquarters	March 2008	November 2008	+8 months	–
Support Contract End Advanced Jet Trainer	–	–	–	–
Support Contract End – Training System Partner and Headquarters	March 2013	November 2013	+8 months	–

NOTE

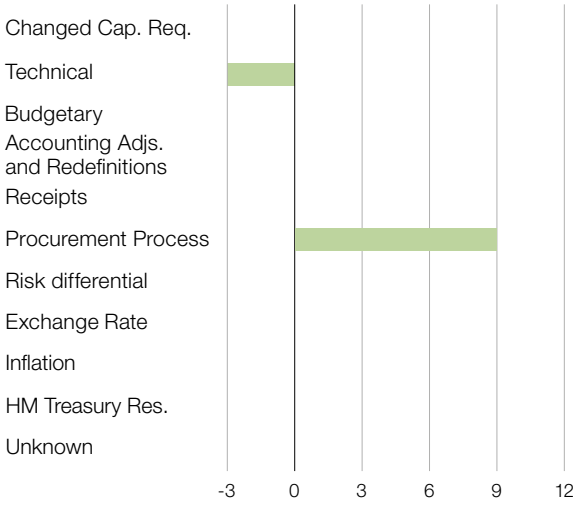
1 Forecast dates realigned to match the definitions approved at Main Investment Decision rather than those reported against in MPR09. There are two simulators hence the reason for two dates.

In-year Cost and Time Variation Detail

In Year Costs (£m)



In Year Time (months)



United Kingdom Military Flying Training System

Following the award of the Training System Partner Contract, the next phase of the programme was the provision of a training capability for the Royal Navy Observers – Rear Crew Training Stage 1. A Review Note was submiited in November 2007 seeking approval to issue the Invitation to Negotiate, and this was approved in December 2007. In May 2009 the Main Gate Business Case was submitted and approved subject to caveats in relaton to In Year Affordability and Safety and Environmental assurances. An Information Note was submitted in July 2009 confirming resolution of the caveats and the contract was subsequently awarded in July 2009.

Advanced Jet Trainer

Operational Capability 0 was completed by BAE Systems in August 2008 and Release to Service was achieved in April 2009. Iinitial Spares have been delivered to RAF Valley, maintainers and conversion training for pilots completed and BAE Systems delivered the first production aircraft in February 2009. The Operational Capability 2 development programme is progressing to plan. Minister approved the In Service Support Review Note in January 2010 with HM Treasury and Commitment approval received in March 2010.

Risk Assessment against Defence Lines of Development

- Equipment
- Training
- Logistics
- Infrastructure
- Personnel
- Doctrine
- Organisation
- Information

Watchkeeper

The Capability

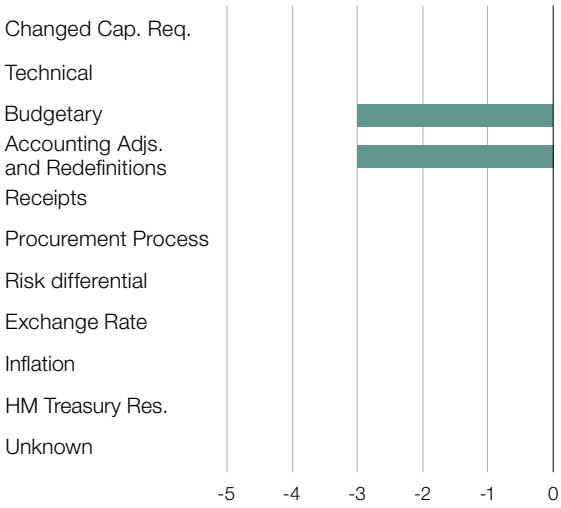
Watchkeeper will provide the operational commander with a 24-hour, all weather, intelligence, surveillance, target acquisition and reconnaissance capability supplying accurate, timely and high quality imagery to support decision making. The system will consist of unmanned air vehicles, sensors, data links and ground control stations. Watchkeeper is planned to be delivered through an incremental programme to allow the system to benefit from both existing and developing sensors and air vehicle technology.

Overview of Cost, Time and Performance

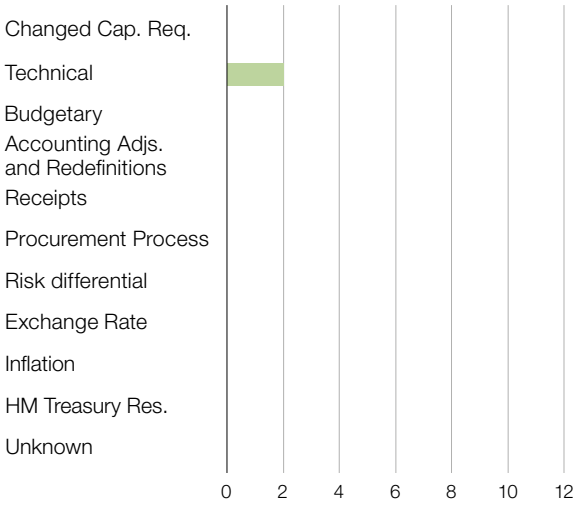
	Approved	Forecast/Actual	Variation	IY Variation
Cost of Assessment Phase	£52m	£65m	+£13m	£0m
Cost of Demonstration & Manufacture Phase	£920m	£889m	-£31m	-£6m
Cost of Support Phase	£5m	£5m	£0m	£0m
Duration of Assessment Phase		68 months		
In-Service Date	February 2011	February 2011	0 months	+2 months
Initial Operating Capability	February 2011	February 2011		
Support Contract Go-Live	January 2010	January 2010	0 months	0 months
Support Contract End	May 2013	May 2013	0 months	0 months

In-year Cost and Time Variation Detail

In Year Costs (£m)



In Year Time (months)



Watchkeeper's maiden flight took place on 16 April 2008 in Israel, and was followed by the successful achievement of the Automatic Take Off & Landing System demonstration in July 2008. Stage 2 flight trials concluded in Israel in March 2009. The Watchkeeper Training facility at 32 Regiment, Larkhill was commissioned in September 2009. Automatic Take Off & Landing System maturity flights were concluded during Stage 3 flight trials during November 2009. Watchkeeper achieved it's Maiden UK flight on 14 April 2010 at Parc Aberporth in South Wales. However, the programme has experienced some technical issues concerning system software development and integration, which have impacted the programme timescales. Watchkeeper Initial Contractor Logistic Support contract was signed in January 2010.

Risk Assessment against Defence Lines of Development

- Equipment
- Training
- Logistics
- Infrastructure
- Personnel
- Doctrine
- Organisation
- Information

Airborne STand Off Radar (Astor)

The Capability

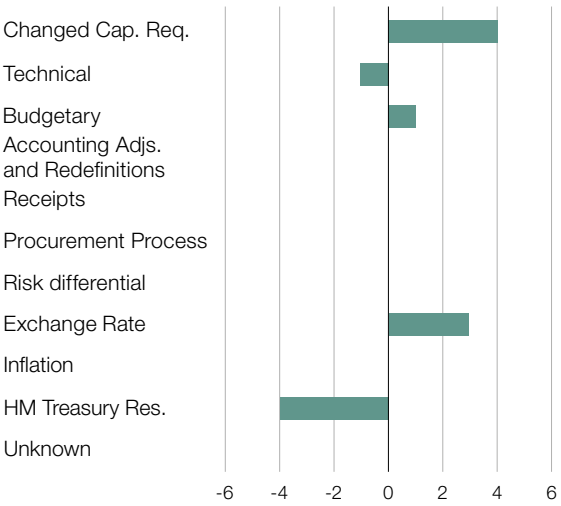
Airborne STand Off Radar provides a long-range all-weather theatre surveillance and target acquisition system, capable of detecting moving, fixed and static targets. It is designed to meet a joint Army and RAF requirements. The system comprises a fleet of five air platforms, each with a radar sensor, and eight ground stations.

Overview of Cost, Time and Performance

	Approved	Forecast/Actual	Variation	IY Variation
Cost of Assessment Phase	£12m	£13m	+£1m	£0m
Cost of Demonstration & Manufacture Phase	£914m	£1,019m	+£105m	+£3m
Cost of Support Phase	£265m	£260m	-£5m	+£3m
Duration of Assessment Phase Inc 1	June 1999	September 1993	+69 months	–
In-Service Date	September 2005	November 2008	+38 months	0 months
Support Contract Go-Live	June 2006	June 2006	–	–
Support Contract End	September 2016	September 2016	–	–

In-year Cost and Time Variation Detail

In Year Costs (£m)



The Prime Contract was awarded to Raytheon Systems Limited in December 1999 for the full demonstration and manufacture of the system. The contract also covers the provision of ten years contractor logistic support. All five air platforms and eight ground stations have been delivered to the user and the In Service Date was achieved in November 2008. Airborne STand Off Radar is currently in Afghanistan supporting Operation Herrick.

Risk Assessment against Defence Lines of Development

- Equipment
- Training
- Logistics
- Infrastructure
- Personnel
- Doctrine
- Organisation
- Information

Bowman

The Capability

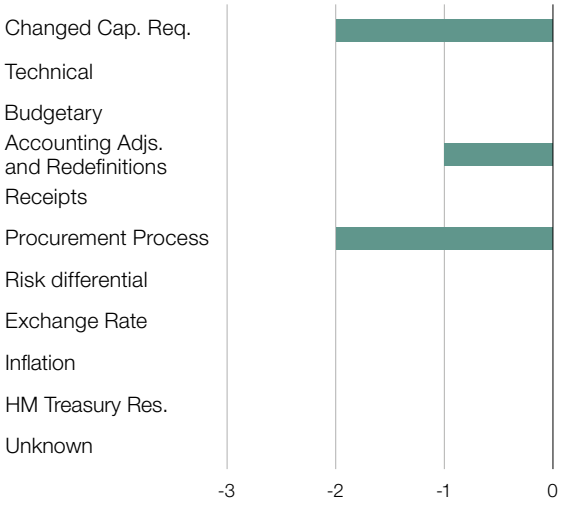
Bowman provides a secure tactical voice and data communication system for all three Services in support of land, littoral and air manoeuvre operations. Bowman achieved its In Service Date in March 2004. In 2005, the first converted brigade deployed to Iraq on Operation Telic, with a core Bowman capability alongside Clansman capability.

Overview of Cost, Time and Performance

	Approved	Forecast/Actual	Variation	IY Variation
Cost of Assessment Phase	£130m	£397m	+£267m	£0m
Cost of D&M Phase	£2,041m	£2,082m	+£41m	+£42m
Cost of Support Phase	£127m	£122m	-£5m	-£5m
In-Service Date	December 2004	March 2004	-9 months	–
Initial Operating Capability	–	–	–	–
Support Contract Go-Live	April 2009	April 2009	–	–
Support Contract End	March 2011	March 2011	–	–

In-year Cost and Time Variation Detail

In Year Costs (£m)



On the basis of Brigade scale operational field trials, Bowman achieved its In Service Date on 26 March 2004. In 2005, the first converted brigade deployed to Iraq on Operation Telic, with a core Bowman capability alongside its residual Clansman capability. During 2005/06 both Operation Telic and Operation Herrick converted fully from Clansman to Bowman. During 2005, a review of the programme provided the opportunity to better ensure that it would deliver a capability consistent with MOD's vision of achieving Network Enabled Capability. Upgrade "4F" which began in 2005, provided secure voice and limited data capability with conversion of over 13,000 vehicle platforms completed by November 2009. Upgrade "5" with improved data capability, has delivered capability which, following extensive user trialling, achieved Full Systems Acceptance in April 2009 and is currently being fielded across Defence. Continued operational experience indicates that Bowman is delivering critical operational capability. The original Bowman contract only provided for limited support; until funding allowed a longer term support solution and to prevent loss of capability, a number of contracts were approved in 2006 to meet and sustain levels of support required for Operations. These contracts bridged the period up to April 2009, when the Approval for Stage 1 of a separate Longer Term Support solution came into effect.

Risk Assessment against Defence Lines of Development

- Equipment
- Training
- Logistics
- Infrastructure
- Personnel
- Doctrine
- Organisation
- Information

C Vehicle PFI

The Capability

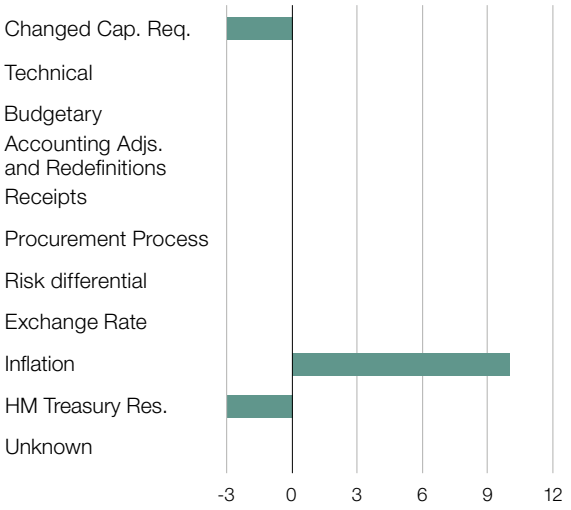
At present the C Vehicle fleet comprises over 2,111 items of 150 types such as rough terrain earthmoving equipment, specialist engineer construction plant as well as field material handling equipment. These are held at varying degrees of military readiness and are capable of undertaking a wide range of combat support, logistic and construction tasks. The majority of the fleet is Commercial Off The Shelf, which has been modified to meet military requirements.

Overview of Cost, Time and Performance

	Approved	Forecast/Actual	Variation	IY Variation
Cost of Assessment Phase	£4m	£3m	-£1m	-£1m
Cost of Demonstration & Manufacture Phase	n/a			
Cost of Support Phase	£714m	£697m	-£17m	–
Duration of Assessment Phase Inc 1	November 2000	December 2003	+37 months	0 months
In-Service Date	April 2006	March 2006	-1 month	0 months
Support Contract Go-Live	April 2006	March 2006	-1 month	0 months
Support Contract End	June 2021	June 2021	0 months	0 months

In-year Cost and Time Variation Detail

In Year Costs (£m)



Through fleet management the C Vehicle Fleet today comprises 2,111 items of 150 types. C Vehicles are currently deployed to Afghanistan, and were also used in Operation Telic in Iraq. A total of 225 assets are currently on Operations. C Vehicle equipment was also used to provide a temporary bridge over the River Derwent at Workington in Cumbria following the floods in November 2009. This year over 60 new cranes and 33 truck mounted loaders have been introduced under the Equipment Refurbishment and Replacement Programme. Outside of the PFI, the MoD has purchased protected vehicles as part of an Urgent Operational Requirement for use on operations. The in service support for these vehicles is being provided by the PFI contractor, ALC.

Risk Assessment against Defence Lines of Development

- Equipment
- Training
- Logistics
- Infrastructure
- Personnel
- Doctrine
- Organisation
- Information

Support Vehicles

The Capability

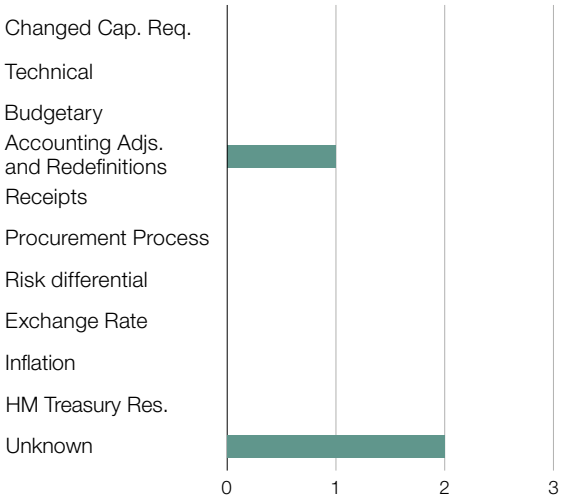
The Support Vehicle programme is procuring the future tri-service cargo and recovery vehicles that will increase the military material lift/distribution and recovery capabilities. The programme is procuring a fleet of vehicles consisting of 42 variants but effectively based around the Light, Medium and Heavy Cargo Vehicles (6, 9 and 15 tonne respectively), the 7,000 litre Unit Support Tanker, the Recovery Vehicle and the Recovery Trailer. These vehicles will replace the in-service 4, 8 and 14 tonne cargo vehicles and the three in-service recovery vehicle types.

Overview of Cost, Time and Performance

	Approved	Forecast/Actual	Variation	IY Variation
Cost of Assessment Phase	–	–	–	–
Cost of Demonstration & Manufacture Phase	£1,641m	£1,282m	-£359m	+£10m
Cost of Support Phase	£1,180m	£326m	-£854m	+£3m
Duration of Assessment Phase	–	–	–	–
In-Service Date	April 2006	February 2008	+22 months	0 months
Support Contract Go-Live	January 2008	January 2008	0 months	0 months
Support Contract End	March 2034	March 2034	0 months	0 months

In-year Cost and Time Variation Detail

In Year Costs (£m)



The total Support Vehicle Programme provides 6,928 Cargo Vehicles, 288 Recovery Vehicles and 69 Recovery trailers, replacing a fleet of just under 15,000 in-service vehicles. The first 6, 9 and 15 Tonne prototype (quantity 14) vehicles were produced and underwent formal Military trials, on schedule, in 30 October 2006.

A total of 3,707 vehicles are in-service (end of March 2010), a number of which have been delivered to theatre to support current operations. Under the Urgent Operational Requirements process, £25.4 milion has been spent to produce an Enhanced Palletised Load System (a modified variant of the 15T SV) to provide a protected vehicle with a palletised load and container handling facility to meet a capability gap. A further £16.7 million has been used to up-rate the protection systems employed by the vehicles to counter the escalating threat levels.

Risk Assessment against Defence Lines of Development

- Equipment
- Training
- Logistics
- Infrastructure
- Personnel
- Doctrine
- Organisation
- Information

TROJAN and TITAN (Trojan & Titan)

The Capability

The project delivered new vehicles to provide an armoured engineer capability to meet the Army's requirements, namely: Titan which is an armoured bridge-layer, and Trojan which is an armoured obstacle breaching vehicle. They have replaced the Chieftain vehicles which were over 30 years old, and are the first purpose-built engineer vehicles to be procured since the Second World War. They are based on the Challenger 2 hull and are as well protected, mobile and reliable. They have a variety of specialist equipments to provide effective engineer support for armoured and armoured-infantry units.

Overview of Cost, Time and Performance

	Approved	Forecast/Actual	Variation	IY Variation
Cost of Assessment Phase	£3m	£8m	+£5m	–
Cost of Demonstration & Manufacture Phase	£398m	£347m	-£51m	+£5m
Cost of Support Phase	[1]	£771m	–	–
Duration of Assessment Phase		56 months	+25 months	–
In-Service Date	December 2006	October 2006	-2 months	–
Support Contract Go-Live	–	–	–	–
Support Contract End	–	–	–	–

NOTE

1 Support costs were not included in the MG approval note.

In-year Cost and Time Variation Detail

No variation is measured as support costs were not included in the main investment decision approval.

The Demonstration & Manufacture contract was let in March 2001 with the first production vehicle (of 66) delivered in October 2005. In Service Date was achieved on Batch 1 vehicles in October 2006. Acceptance of Batches 2-4, via Reliability Trials, has been achieved and the Batch Test 5 trials are ongoing (due to complete in June 2010). Initial Operating Capability for Trojan was declared in August 2007, but Initial Operating Capability for Titan has been delayed due to technical problems with the bridge launching mechanism and the Nuclear Biological and Chemical/Environmental Control System. This is now scheduled for June 2010. On successful conclusion of Batch Test 5 the Final Acceptance Build Standard will be agreed with BAE Systems, and all 66 platforms will then be upgraded to Final Acceptance Build Standard by BAE Systems. This is a significant package of work which will be carried out at BAE Systems's factory in Newcastle; the current completion date for this is February 2012. Full Operating Capability will be declared when the all vehicles have been upgraded to Final Acceptance Build Standard.

Three Trojans (at Batch 5 standard) were deployed to Afghanistan in January 2010 in support of Operation Moshtarak.

Risk Assessment against Defence Lines of Development

- Equipment
- Training
- Logistics
- Infrastructure
- Personnel
- Doctrine
- Organisation
- Information

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