National Audit Office

REPORT BY THE
COMPTROLLER AND
AUDITOR GENERAL

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Ministry of Defence

The Major Projects Report 2012

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National Audit Office

Ministry of Defence

The Major Projects Report 2012

Report by the Comptroller and Auditor General

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Amyas Morse
Comptroller and Auditor General
National Audit Office

17 December 2012

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This report examines the Ministry of Defence's progress in delivering its largest defence equipment projects to agreed cost, time and performance measures.

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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-2012

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Key facts

Cost: £468m

increase in 2011-12 forecast costs to complete all projects, including £336 million of future fuel costs on the Future Strategic Tanker Aircraft, over which the Department has limited financial control

Time: 139 months

increase in 2011-12 forecast delay to complete all projects

Quality: 99%

of technical specifications forecast to be achieved, at the point the equipment enters service

£56.5 billion	total cost to complete the 16 projects when they were approved
159 years	total time to complete the 16 projects when they were approved
237	total number of technical specifications that the 16 projects are measured against
£63.1 billion	current forecast cost to complete the 16 projects
195 years	current estimated time to complete the 16 projects
£6.6 billion	cost increase on the 16 projects since approval
468 months	total delays to the 16 projects since approval
11.7 per cent	overall percentage cost increase since approval
29 per cent	overall percentage time slippage against original planned project length
£132 million	in-year cost increase over which the Department has more financial control

Summary

1 Each year the Ministry of Defence (the Department) presents to Parliament a *major projects report* which gives data on the cost, time and performance of the largest defence projects where the Department has taken the main decision to invest, known as post-main gate projects. It also contains less detailed information on the largest acquisition projects where the main investment decision has not yet been taken (known as pre-main gate projects). We validate the data and this report sets out the conclusions from our analysis and draws out key themes emerging.

2 In 2012, the Department submitted to Parliament the first in what will be an annual series of statements on the affordability of its equipment plan. The Equipment Plan sets out the Department's forecast expenditure plans to provide and support the equipment the armed forces require to meet the objectives set out in the National Security Strategy over the next ten years. We have reviewed the Department's statement and intend to publish our conclusions in a separate report. The Plan covers forecast expenditure of £159 billion, including £73 billion on buying new equipment. The 16 post-main gate projects in this year's *Major Projects Report* account for £19.5 billion of this forecast procurement spend, which represents the remaining amount to be spent on these projects. Taken together with the *Major Projects Report*, the new statement on the affordability of the Equipment Plan provides a more informed basis for Parliament to understand whether the Department is balancing prudent financial management with meeting the equipment capability needs of the armed forces.

Key findings

3 Limits to Departmental control over the causes of cost and time variation. Delivering what is often highly sophisticated defence equipment to agreed timescales and costs is a complex challenge. The slippage of 139 months in the last year reflects issues on two-thirds of projects. However, the cost performance is more varied (**Figure 1** overleaf). Forecast costs have increased by £468 million in the past year, which reflects a net increase of £637 million on three projects, including £336 million of forecast fuel inflation on the Future Strategic Tanker Aircraft, and a net decrease of £169 million on the remaining projects.

Figure 1

Main variations on project costs, 2011-12

Three projects contributed the majority of the £468 million increase in forecast costs reported in-year

		Cost increases		Cost decreases	
Project	**Net in-year project variation (£m)**	**In-year cost increase (£m)**	**Reason**	**In-year cost decrease (£m)**	**Reason**
Future Strategic Tanker Aircraft	+257	+336	Future fuel costs	-98	Refinancing PFI deal
		+31	Increases in inflation	-20	Manpower operating costs
				-10	Reclassified training costs
		+24	French participation in programme no longer planned		
		+2	Implementing new safety requirements	-5	Programme delays resulted in reduction in PFI charge
				-3	Savings in office support costs
Queen Elizabeth Class aircraft carrier	+217	+217	Aircraft Carrier Alliance now have a greater understanding of costs relating to the build schedule, and were not able to fully deliver agreed cost reduction opportunities		
A400M aircraft	+163	+175	UK contribution to Export Levy Facility	-5	Reduced risk contingency
		+7	Training facility costs	-8	Reduction due to re-pricing
		+3	Integration of technology onto A400M	-10	Reuse of existing equipment on A400M
		+1	Increased fee to OCCAR (Organisation Conjointe de Coopération en Matière d'Armement)		
Costs of remaining 13 projects	-169				
Total in-year forecast variation	**+468**				

Source: National Audit Office analysis of departmental data

4 In some cases, such as forecast fuel price inflation on the Future Strategic Tanker Aircraft, the Department has only very limited control over the causes of cost variation. The Department has greater control over other causes: not accounting for the impact of the fuel inflation for the past five years has meant that the cost increase reported this year has been greater than if more regular updates were made. On the Queen Elizabeth aircraft carriers project, the variation is due to Department and industry now having a greater understanding of the costs relating to the build schedule and not being able to fully deliver agreed cost reduction opportunities. Project delays primarily reflect a range of technical problems, such as software development, on which we have reported regularly.

5 **The importance of stability.** It would be unrealistic to expect the Department and its industry partners to identify every risk at the start of very technically challenging projects. However, the continuing problems indicate that the Department has more to learn from historic performance and, in particular, needs to set realistic timescales. If defence equipment projects do not meet approved cost and time boundaries this creates turbulence and uncertainty for the Equipment Plan, reducing the Department's ability to plan and manage the defence budget effectively.

6 Reducing cost and time variations on projects should enable the Department to plan and deliver new capabilities to the armed forces with more certainty. However, as this year's *Major Projects Report* demonstrates, there continue to be cost variation and time slippage, with variations on 14 out of 16 projects. In recent years we have reported several times that the Department has had to slip projects or cut equipment numbers to bridge the gap between estimated funding and the forecast cost of the defence budget. These decisions were not value for money and meant that new capabilities were not available on time. There are no such instances recorded this year, though difficult decisions may still be necessary as part of the Department's drive to keep the Equipment Plan in balance.

7 **Historically the Department has tended to prioritise performance requirements.** With a limited budget, there is a balance to be struck between four elements: the performance requirement, the cost, the delivery time and the number of ships, aircraft or vehicles to be procured. Historically the Department has focused on achieving the full performance requirement, even if this means suffering delays, cost increases, or having to cut equipment numbers. The Department currently expects to achieve 99 per cent of its equipment capability specifications. However, average project costs have risen by nearly 12 per cent and projects have been delayed by nearly 30 per cent since the main investment decision. So it is clear that meeting the specified performance requirement has had priority.

8 More recently, the Department has started to take a more balanced approach. It has challenged the affordability of the proposed performance specifications of the Type 26 Global Combat Ship before the main investment decision. This is with the aim of defining an affordable requirement from the outset. We hope to see this approach to requirement setting adopted more widely across the Department. The Department believes that it is taking a more realistic approach to forecasting slippage that occurs on projects after the main investment decision has been taken, resulting in some of the increases reported this year. For example, Chinook New Buy helicopter project has added six months as a result of lessons learned during flight trials for the related Julius project.

9 The Department is bearing the capability risk and some costs of project delays. For example, a version of the Falcon communications system which was being developed for use in Afghanistan, at a cost of £32 million, will not now be deployed to theatre. This is partly due to development delays and it means that there will need to be reliance on legacy systems for a longer period.

10 The Department is taking steps to address potential short-term gaps in capability in Afghanistan. The Department has approved an additional £946 million upgrading helicopters for operations, and particularly on enhancing the ability to operate in the conditions experienced in Afghanistan. For example, 22 Lynx helicopters have been upgraded with new engines to allow them to operate year-round for the first time in Afghanistan. The Department has also increased the number of helicopters available by reducing maintenance times. On air transport and air-to-air refuelling, to support current operations, address known capability gaps, and reduce the impact of previously reported delays in introducing the A400M, the Department has spent £787 million. This has included extending the life of existing aircraft and purchasing two extra C-17s for strategic air transport, and two BAe 146 aircraft for transport and communications.

11 Delays to new equipment and budgetary constraints require the Department to make difficult judgements on longer-term capability gaps. At various points to 2017, there will be critical gaps in air transport and air-to-air refuelling capability. From 2022, there will be approximately a one-third shortfall in tactical transport aircraft against the stated requirement. On the ability to move passengers and cargo by helicopter, the Department has accepted that while there will be a shortfall against the full requirement, it believes that current plans will deliver a sufficient capability, and the risk will be reduced by using other defence capabilities.

Conclusion on value for money

12 The Department faces a difficult task balancing the tension between delivering the capabilities for which it has a stated requirement and those it can afford. Early signs show that it has begun to make realistic trade-offs between cost, time, technical requirements and the number of, for example, ships, aircraft or vehicles to be procured. However, the variances to cost and time reported this year indicate it needs to do consistently better. In these circumstances it is not yet possible to conclude the Department is consistently delivering value for money from managing its major projects.

13 There will always be some causes of project instability over which the Department will have limited control. To achieve value for money in future on individual projects and to underpin an affordable Equipment Plan, the Department must continue to address long-standing issues on project performance to best use the money available.

Part One

Project cost, time and performance

1.1 In this part we examine in-year changes to the forecast cost,[1] time and performance metrics for the 16 largest projects, where the main investment decision (known as the main gate decision) has been taken.[2] **Figure 2** summarises those projects where there has been variation to time and/or cost this year, as well as how they have changed from 2011 if the project was also included in *The Major Projects Report 2011*. Figures 3 to 5 provide more detail on the changes to this year's 16 post-main gate projects. Appendix Three shows the detailed figures for each of the projects.

Forecast costs have risen by nearly £0.5 billion

1.2 The total forecast cost of the 16 projects in this *Major Projects Report* population is £63.1 billion, an increase of £6.6 billion (11.7 per cent) since the main investment decision was taken. Forecasts have increased by £468 million in the last year. See **Figure 3** on page 12 for a breakdown of this across projects.

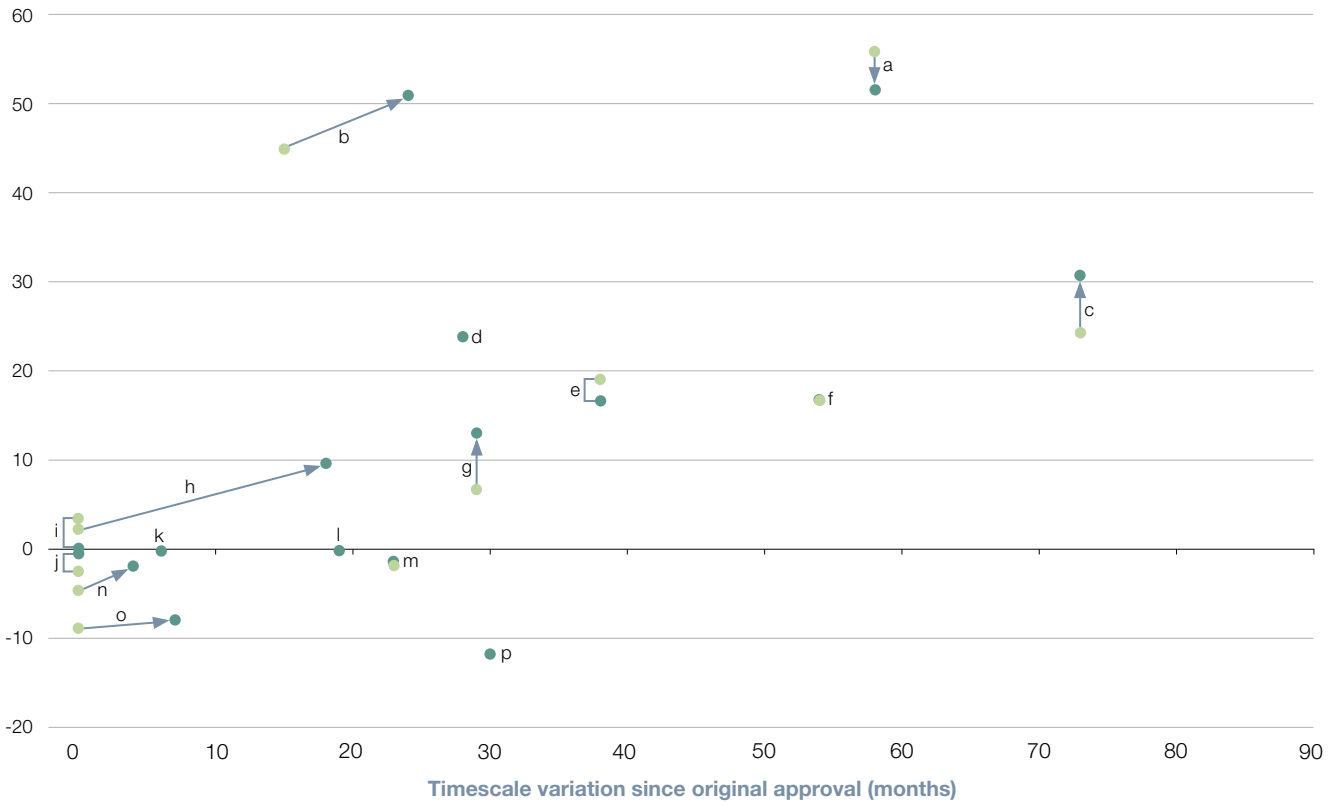
1 All approved and forecast costs are measured on an outturn basis so therefore include the Department's assessment of inflation. See Appendix Five for further information on how inflation is treated.

2 The 25 project summary sheets the Department submits to Parliament are contained in Volume II of this report. This consists of the 16 post-main gate projects, plus a further nine projects where the main investment decision has yet to be taken, known as pre-main gate projects. Copies of the executive project summary sheets are contained within Appendix Four of this report.

Figure 2

Comparison between 2011 and 2012 forecast costs and time to complete the largest equipment projects

There are variations to 14 out of 16 projects in the last year



a	Astute Boats 1-3	e	Type 45	k	Chinook New Buy
b	Queen Elizabeth Class	f	Typhoon	l	Chinook Julius
c	A400M	g	Astute Boat 4	m	Beyond Visual Range Air-to-Air Missile
d	Complex Weapons Selected Precision Effects at Range Capability Block 2	h	Typhoon Future Capacity Programme	n	Merlin CSP
		i	Airseeker	o	Lynx Wildcat
		j	Future Strategic Tanker Aircraft	p	Falcon

● 2012 ● 2011

NOTES

1 The variation shown is the difference between the originally approved cost of, and delivery date for, each post-main gate project, and the actual or forecast cost and delivery date as reported in *Major Projects Report 2012*.

2 Movements from 2011 to 2012 are shown for those projects included as post-main gate projects in *Major Projects Report 2011*.

3 The time variation shown for Complex Weapons Interim Main Gate 1 is the delay to Selected Precision Effects at Range Capability 2 Block 1. For more detail, see the Complex Weapons Project Summary Sheet in Volume II.

4 Astute boats six and seven have been excluded as they have not yet passed their main investment decision. Astute boat five has also been excluded as there is only a +0.8 per cent variation in cost and no time variation.

5 Complex Weapons Interim Main Gate 2 and Warrior Capability Sustainment programme have both been excluded as neither have any variation to time or cost.

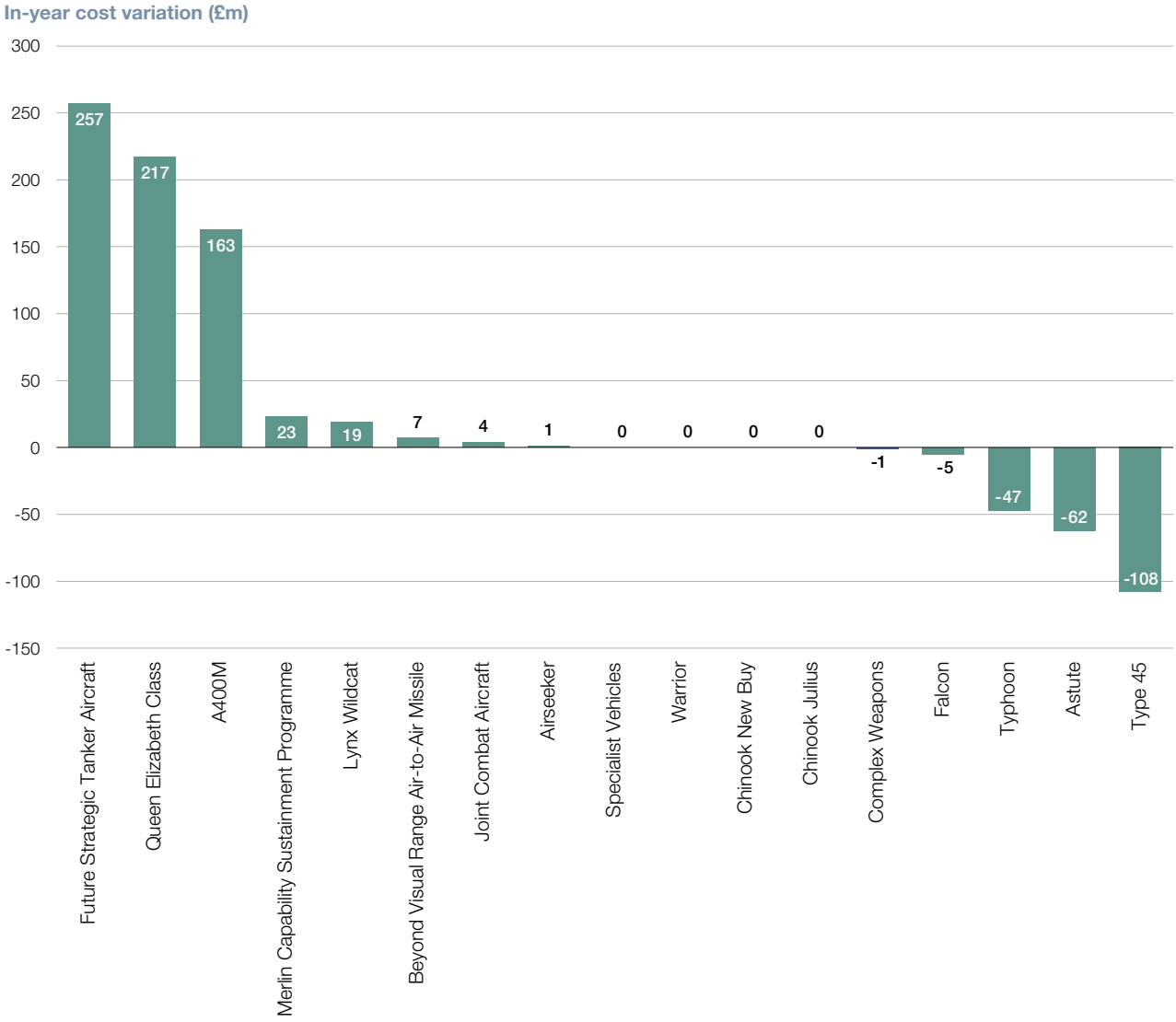
6 Joint Combat Aircraft and Specialist Vehicles are excluded as they do not yet have approved in-service dates.

Source: National Audit Office analysis of departmental data

Figure 3

In-year forecast of cost performance on projects

Significant cost growth has occurred on three projects, partly offset by large reductions on three others



Source: National Audit Office analysis of departmental data

1.3 The in-year increase in forecast costs of £468 million has arisen through net cost growth of £637 million on three projects, partly offset by a net forecast cost reduction of £169 million across the remaining 13 projects:

- On **Queen Elizabeth Class aircraft carriers** forecast costs have increased by £217 million since the agreement of the Final Target Cost in 2011. This reflects industry's greater understanding of the risks relating to the build schedule and the test and commissioning phase, and that the Aircraft Carrier Alliance has not been able to fully deliver cost opportunity savings that were identified at that time. This has taken place during a period of uncertainty caused by the Department's 2010 decision to change the design of the carriers to operate a different variant of the Joint Strike Fighter, and the 2012 decision to revert back to the original variant. We will report on the Department's decision to revert to buy the original variant of the Joint Strike Fighter in spring 2013.
- A net £257 million increase to the forecast whole-life cost of the **Future Strategic Tanker Aircraft**. The reasons for in-year cost variation on the project are summarised in Figure 1, but include a £336 million increase due to higher than expected fuel price inflation.[3] The project is unique among the *major projects report* population as it is being funded by a private finance initiative deal, and the costs we report reflect the whole-life costs of the 27-year project. The contract specifies that fuel costs will remain the Department's responsibility as they are difficult to predict accurately. The scale of the increase is due to a combination of the recent forecast movement in fuel price to 2035 and the fact that the Department had not updated its assumptions on the future cost of fuel since the main investment decision was taken in 2007. Also included within the £257 million variation was a forecast reduction of £98 million in the financing costs of the Private Finance Initiative contract.
- On **A400M transport aircraft** there has been a net £163 million increase, which includes an increase of £175 million due to the Export Levy Facility. In July 2011, the A400M partner nations agreed a €1.5 billion Export Levy Facility with the contractor, EADS. The UK contribution to this is £175 million. The Export Levy Facility may be repaid on future export sales of the A400M. The Department has formally treated the Export Levy Facility as a £175 million increase in the cost of the A400M programme.

3 See Appendix Five for an explanation of inflation in the *major projects report*.

- The forecast cost of the remaining 13 projects has reduced by a total of £169 million in 2011-12. Most of the decreases relate to three projects – **Typhoon combat aircraft, Type 45 destroyer** and **Astute boats 1-3 submarines** that have already achieved their in-service date.[4] These all held contingency funds against risks during their build programmes which they have now given back to the centre of the Department. This was a prudent approach for these three projects, but from this year onwards the Department intends to hold a central contingency fund, currently valued at around £4.8 billion. The Department believes it now has a process in place to manage risk contingency on all projects, to ensure there are the right incentives to encourage realistic cost estimating. This process will include assessing the balance between project risk contingency funding and central risk contingency funding, to ensure most efficient use of resources.

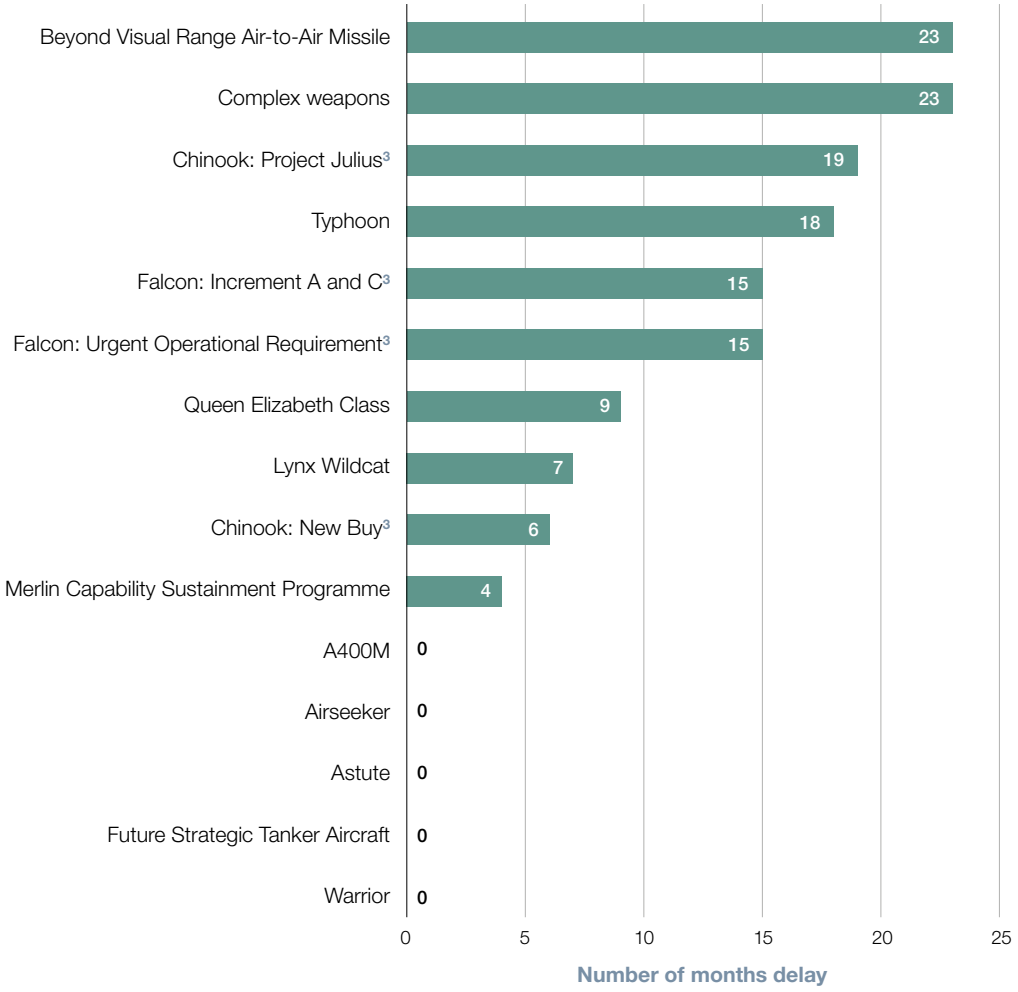
Projects have been delayed by 139 months in-year

1.4 For the 13 projects for which time performance can be measured,[5] the total forecast in-year time slippage was 139 months (**Figure 4**). The total forecast delay to the in-service dates of projects since the main investment decision was taken is now 468 months. This equates to a 29 per cent increase in the average forecast time to complete projects, compared to the estimate made when the Department approved the projects. The in-year slippage has primarily been caused by technical challenges faced by industry in developing the equipment (see paragraph 1.5). The causes of the delays, such as software development, are reoccurring problems on which we have reported regularly. The continuing incidence of such problems indicates the Department has more to do to set realistic timescales. The Department believes that it is taking a more realistic approach to forecasting slippage that occurs on projects after the main investment decision has been taken, resulting in some of the increases reported this year. For example, Chinook New Buy has added six months as a result of lessons learned during flight trials for the related Julius project.

4 For Astute Boats 1-3 we measure the in-service date of Boat 1.
5 Of the 16 projects in the population, we report time on 13 of them. For Joint Combat Aircraft and Specialist Vehicles, no in-service date has yet been approved so we cannot measure them. Type 45's in-service date has already been met, so we no longer measure it.

Figure 4
In-year forecast variation of time performance on projects

Slippage has occurred on eight projects totalling 139 months



NOTES

1 HMS Astute (first of Astute class) has achieved its in-service date. The performance shown is for Astute Boat 4 and Boat 5.

2 The main Typhoon project has also achieved its in-service date. The variation shown is against the Typhoon Future Capability Programme.

3 Chinook New Buy and Chinook Project Julius count as a single project; as do Falcon Increment A and C and Falcon Urgent Operational Requirement.

Source: National Audit Office analysis of departmental data

The Department is bearing capability risks and some wider costs resulting from delays

1.5 The Department is bearing the capability risk associated with retaining older equipment in service to cover the delay to new equipment. In some cases there are additional costs of updating existing equipment to extend its service life. The five most significant delays in-year are outlined below:

Falcon communications project (+15 months), Falcon Urgent Operational Requirement (+15 months)

- The planned in-service date for the Falcon equipment was June 2010 for the Army variant (Increment A) and September 2010 for the RAF variant (Increment C). Falcon was also being modified specifically for use in Afghanistan under the urgent operational requirements increment. The whole project has had delays relating to technical issues with the cryptographic technology, which protects the security of the information during transmission. These issues caused a delay to Increments A and C in-year of 15 months. Another consequence of the delay was that the version of the equipment being acquired for use in Afghanistan, at a cost of £32 million,[6] has also been delayed, which means the armed forces will continue to use an existing, less efficient communications system there. This *Major Projects Report* currently records the forecast in-service date for all Falcon variants as December 2012. Subsequent to the end of the *Major Projects Report* reporting period (31 March 2012), the in-service date for both Increment A and Increment C was achieved in October 2012.

Chinook helicopter New Buy (+6 months) and Julius cockpit upgrade project (+19 months)

- In July 2011, the Department committed to buy 14 new Chinook helicopters. Twelve were to supplement the existing fleet of 46 helicopters and two were to replace helicopters destroyed in Afghanistan. The Department is also fitting a new cockpit on all its Chinooks (known as Project Julius) to improve the helicopter's capability and secure training and support savings, by increasing commonality across all 60 helicopters in the future fleet. There have been problems with developing the new software which have delayed the Julius digital cockpit upgrade. To mitigate the risk of insufficient numbers of Chinook helicopters being available to meet operational needs, the Department rescheduled the Julius conversion timetable leading to a 19 month slippage. Based on the experience from Project Julius an additional six months has been added to the duration on the Chinook New Buy project to reflect the risk that flight trials could identify the need for

6 The cost reported in the project summary sheet in volume II was £51 million. This was the forecast cost as at the reporting date of 31st March 2012. Subsequent to year end the cost has been finalised at £32 million.

additional software updates. Subsequent to the end of our reporting period (31 March 2012) the Department has resolved the software problems more quickly than expected and the delay to Project Julius has reduced to nine months, with the first upgraded helicopters entering service in June 2012. This will be reported in full in next year's *Major Projects Report*.

Complex Weapons family of missiles (+23 months)

- The Department is procuring a suite of missiles through the Complex Weapons programme. This aims to meet the Department's overall Complex Weapons requirement at a lower cost than would be achieved through separate acquisition projects. Additionally, the Department believes this programme supports the industrial capacity needed to maintain the UK's sovereign capability to produce these weapons. One element of this programme, the Selected Precision Effects at Range Capability 2 Block 1, was delayed in-year by 23 months due to problems with rocket motor and warhead development. Also the Loitering Munition element has completed some successful test firings, but the Department decided not to conduct a capability demonstration in Afghanistan by March 2012, in part due to system maturity. The Department is deciding on the future of this project, which it has spent £207 million to date developing. Finally, the main investment decision point for Future Anti-Surface Guided Weapon (Heavy) was delayed in-year. This was due to the need to secure approval from France. Discussions are still ongoing, but are dependent on the outcome of the French Government's spending review that is currently being undertaken. There will now be at least a 19-month gap between the existing capability leaving service and the new missile being available. The Department may extend the life of the existing missile to mitigate the gap.

Typhoon Future Capability Programme (+18 months)

- This project will enable Typhoon aircraft to drop precision guided bombs. The delays are due to problems with developing the software (15 months) and the consequent impact caused by the need to reschedule subsequent activities such as testing (three months). The problems have also increased the forecast cost of the project by £22 million.[7]

Beyond Visual Range Air-to-Air Missile project (+23 months)

- Delays in developing the software to support later elements of the Typhoon Future Capability Programme have also caused slippage to the Beyond Visual Range Air-to-Air Missile project because the integration programme has had to be rescheduled. To compensate for the slippage the Department is extending the life of the existing AMRAAM missile at a cost of approximately £50 million.

7 See the Typhoon project summary sheet in Volume II for more detail.

The Department expects to achieve the capabilities it requires from defence equipment

1.6 The Department's historic focus has been on delivering equipment which fully meets the often highly challenging and technologically ambitious performance requirements of the armed forces. It has been successful in doing this but projects have taken longer and cost more than anticipated, and equipment numbers have often been reduced. When the Department takes the main investment decision it approves a number of key performance measures for each project which provide an indicator of whether the equipment is providing the desired military capability.

1.7 For the 16 projects in *Major Projects Report 2012*, the Department has set 237 key performance measures. Of these 234 (99 per cent) are expected to be achieved, although the Department has identified risks to achieving 35 (15 per cent) of these measures (**Figure 5**).[8] On the newer Type 26 ship, the Department is displaying a greater willingness to challenge the affordability of the proposed ship and take a more balanced approach to setting cost, time and performance requirements before the main investment decision.

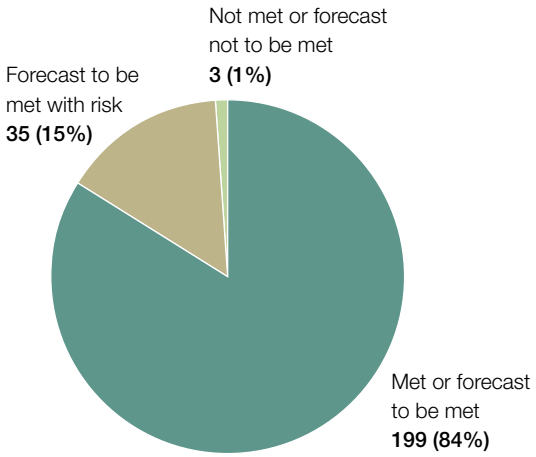
1.8 Each project also reports against eight defence lines of development.[9] These look at the other elements of capability such as trained personnel and logistical support, which the Department needs to deliver at the right time, to ensure that it can best use new equipment. The Department expects to deliver 98 per cent of the defence lines of development on time, with risks identified to achieving 27 per cent of the lines. Four lines of development are not expected to be delivered on time. The organisation line of development on the Astute class submarines is forecast not to be met, due to the delays in prior years to delivering the boats. This was reported previously, but the three shortcomings with the equipment, training and logistics lines of development on the Typhoon project are new this year. They are due to the in-year delay to the Typhoon Future Capability Programme (see fourth bullet, paragraph 1.5).

8 The three key performance measures not expected to be met are on the Astute Class submarine, Queen Elizabeth Class aircraft carrier and the Typhoon combat aircraft projects. All have been reported in previous years.

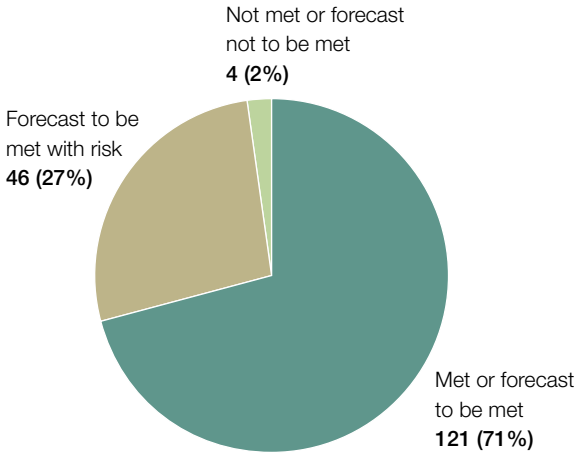
9 The eight defence lines of development are: equipment, training, logistics, infrastructure, personnel, doctrine, organisation and information. Collectively, they form the constituent parts that come together to generate military capability.

Figure 5
In-year forecast of technical performance on projects

The majority of projects are meeting or expecting to meet their key performance measures



The majority of projects are meeting or expecting to meet their defence lines of development



Source: National Audit Office analysis of departmental data

Part Two

Departmental actions to manage procurement delays and budgetary constraints

2.1 In this part of the report we look in detail at two capability areas – helicopters, and air transport and air-to-air refuelling. Both capabilities are critical in supporting current operations in Afghanistan and future force structures. The Department plans to spend some £13.8 billion on air transport and refuelling aircraft and £12.7 billion on helicopters over the next ten years. Both fleets are also in a period of transition, with helicopters and aircraft that have been in-service for decades being replaced by fewer, more capable, systems.[10]

2.2 The two case studies show how, within budgetary constraints, the Department is working hard to reduce the short-term impact of delays in procuring new equipment on current operations. However, extending the life of existing equipment, and buying additional equipment it originally did not plan to buy, has cost the Department over three-quarters of a billion pounds of additional funding for air transport and refuelling aircraft. It has also spent nearly a billion pounds on helicopters, and upgrades to support them, specifically for operations. In the longer term the Department is satisfied that its plan delivers sufficient helicopter lift and has accepted risk against the full requirement. There are also some critical gaps until 2017 in air-to-air refuelling and tactical air transport, as well as a one-third gap from 2022 in tactical air transport.

Air transport and air-to-air refuelling

2.3 The air transport fleet undertakes strategic tasks (predominantly transporting personnel and equipment over long distances) and tactical tasks (mainly conducted within an operational theatre, such as Afghanistan). As **Figure 6** shows, the air transport and refuelling fleets are in a period of transition with aircraft that have been in service for up to 40 years being retired and replaced by a smaller fleet of new, more capable aircraft.

10 A number of these feature in this year's *Major Projects Report*: A400M transport aircraft; Chinook New Buy and Julius cockpit; Future Strategic Tanker Aircraft; Lynx Wildcat helicopter, and Merlin helicopter.

Figure 6
Air transport and air-to-air refuelling fleets

The air transport and refuelling fleets are in a period of transition to a smaller number of more capable aircraft

	Current Fleet		Future Fleet (Force 2020) in 2022	
	Aircraft	**Quantity**	**Aircraft**	**Quantity**
Air-to-Air Refuelling	VC10	8	Future Strategic Tanker Aircraft	14
	Tristar	8		
Strategic Air Transport	C-17	7	C-17	8
	Future Strategic Tanker Aircraft	1		
Tactical Air Transport	Hercules C-130J	24	A400M	22
	Hercules C-130K	8		
Communications Fleet	BAe 125	6		
	BAe 146	2		

NOTES

1 Some Tristar aircraft are capable of providing both air-to-air refuelling and passenger transport.

2 One Future Strategic Tanker Aircraft is currently available for passenger tasks but not yet able to perform a refuelling role.

Source: National Audit Office analysis of departmental data

2.4 The *Strategic Defence and Security Review*[11] outlined a future fleet of seven C-17 strategic transport aircraft,[12] 14 Future Strategic Tanker Aircraft (which can undertake both strategic air transport and air-to-air refuelling tasks) and 22 A400M transport aircraft (both tactical and strategic tasks). As these aircraft were introduced, older aircraft would progressively be retired. The Hercules C130K tactical transport aircraft would be withdrawn from service in December 2012, the Tristar and VC10 aircraft by 2013 and the Hercules C130J tactical transport aircraft by 2022. The Department has revisited these plans to mitigate potential and actual delays to two of the new aircraft projects. The first Future Strategic Tanker Aircraft has entered service in its strategic transport role, but the refuelling capability has not yet been demonstrated, as flight trials have revealed problems such as fuel leaks and refuelling basket instability. Therefore, the Department took action to mitigate the potential risk to introducing this capability by extending the other aircraft lives, although Future Strategic Tanker Aircraft currently remains on track to meet its May 2014 in-service date. As previously reported, the A400M project has been delayed by 73 months and the aircraft are not now expected to enter service until March 2015.

11 *Securing Britain in an Age of Uncertainty: The Strategic Defence and Security Review*, October 2010. Available at: www.cabinetoffice.gov.uk/resource-library/strategic-defence-and-security-review-securing-britain-age-uncertainty

12 The planned number for the future fleet of C-17 is now eight, as an extra one was purchased in 2012.

2.5 As **Figure 7** shows, the delays in introducing the new aircraft and budgetary constraints have caused critical shortfalls in some capability areas. This is particularly apparent up to the end of UK combat operations in Afghanistan in 2014, when both air transport and refuelling aircraft will be extremely busy, but also from 2022 for air transport, when the Hercules C130J aircraft goes out of service early, leaving the Department approximately one-third short of its stated tactical transport aircraft requirement.

2.6 Budgetary constraints have also cancelled or delayed some equipment projects. For example, a measure taken by the 2010 *Strategic Defence and Security Review* to save £87 million on the C130J Hercules aircraft will create a gap in capability after the planned retirement of the C130K and until A400M is suitably equipped to undertake this role from 2022. The Department is considering enhancing the capability of the C130J to close this gap.

2.7 The Department has taken action to mitigate the effects of previously reported delays to the A400M and potential delays to the Future Strategic Tanker Aircraft, address potential gaps in capability for current operations and meet new operational requirements. The Department has extended the life and upgraded the capability of its existing aircraft fleets and bought additional aircraft it originally did not plan to buy. This has cost an additional £787 million:[13]

- The VC10 aircraft was due to go out of service in March 2013 but the Department is currently exploring an extension of a few months to that date to provide additional refuelling capability. The length of time the Department can continue to operate the aircraft is constrained by the closure of the maintenance facility for the aircraft at St Athan.
- Once the VC10 aircraft are retired, and until the Future Strategic Tanker Aircraft can fulfil the role, the Department will rely solely on the Tristar aircraft fleet to meet its air-to-air refuelling needs. The service life of the Tristar has therefore been extended from July 2013 to March 2014 at a cost of £7 million, although the Department is unsure if further technical issues may arise as it operates an ageing Tristar fleet. The Department will also need to use its C-17 and charter aircraft to transport passengers, which the Tristars currently do, although the Future Strategic Tanker Aircraft has also now entered service in this role.
- A small number of Hercules C130K aircraft have also had their service lives extended by ten months to October 2013 at a cost of £16 million.

13 See Appendix Six for a breakdown by year and type of this expenditure.

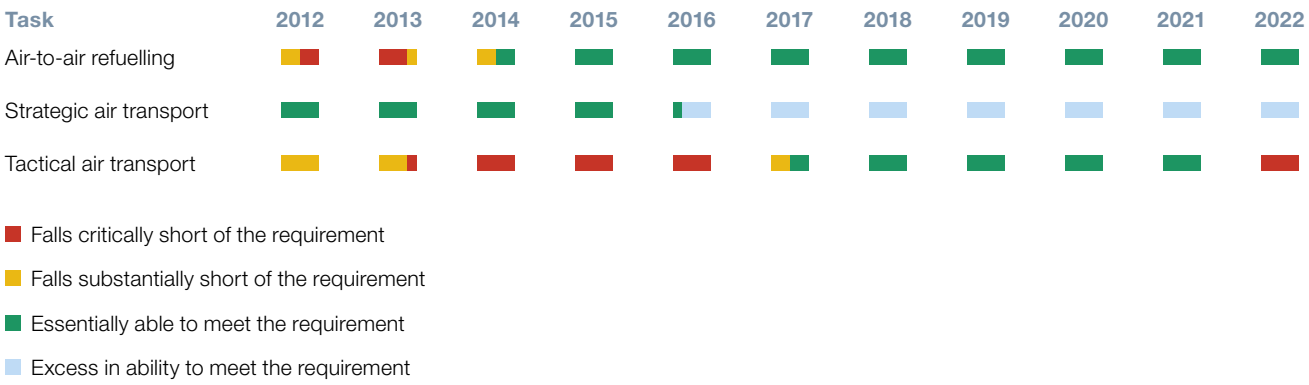
- The Department has purchased an eighth C-17 aircraft at a cost of £215 million and two BAe146 aircraft at a cost of £47 million to relieve the pressure on the air transport fleet until the A400M enters service. These aircraft are in addition to the C-17 aircraft which had already been purchased in 2009 at a cost of £176 million, and they reduce the risks caused by the A400M delay, as well as increase capability for the extraction from Afghanistan around 2014.
- Additionally, the Department has spent £326 million on various adaptions or upgrades of equipment specifically for operations (See Appendix Six).

Helicopters

2.8 Our 2004 report on Battlefield helicopters[14] highlighted a 38 per cent shortfall against the Department's stated requirement to move sufficient numbers of personnel by helicopter (known as the helicopter lift requirement). At that time the Department expected to fully meet the requirement by 2017. **Figure 8** overleaf shows how this situation has now changed. Budgetary constraints prior to the *Strategic Defence and Security Review*, and the change of policy arising from it, have reduced the requirement and available budget. Since then the Department has made a significant investment in new aircraft and upgrading existing aircraft to address the shortfall identified in our 2004 report (**Figure 9** on page 25). The Department believes that the current plan delivers sufficient helicopter lift and while there will remain a shortfall against the full requirement they accept the risk taken across the totality of defence capabilities.

Figure 7
The Department's requirement for air transport and refuelling aircraft

There will be critical shortfalls in capability until 2015 and from 2022



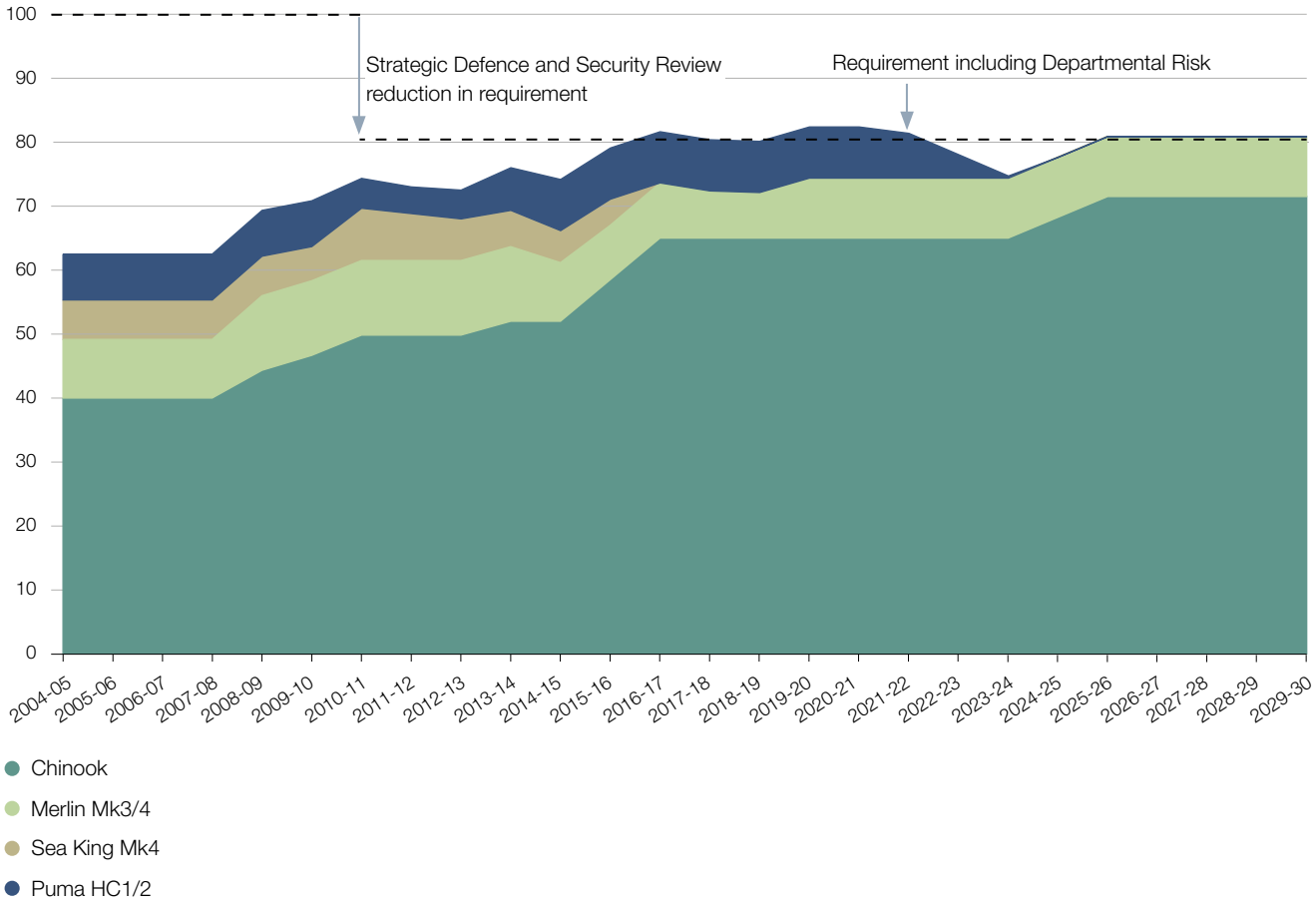
Source: National Audit Office analysis of departmental data

14 Comptroller and Auditor General, *Ministry of Defence: Battlefield Helicopters, Session 2003-04,* HC 486, National Audit Office, April 2004. Available at: www.nao.org.uk/publications/0304/battlefield_helicopters.aspx

Figure 8
The Department's requirement for helicopter lift

The Department is accepting risk against the full helicopter lift requirement over the next two decades

Percentage of the helicopter lift requirement



NOTES

1 The requirement is based on the combined capability from all the types of helicopter at any one time.

2 The existing Lynx and future Lynx-Wildcat fleets are excluded from the analysis as their contribution to helicopter lift is relatively limited.

Source: National Audit Office analysis of departmental data

Figure 9
The Department's funded helicopter upgrade projects

Changes to three current helicopter projects are due to budget constraints

Helicopter type	Original Procurement Plan	Latest Plan (31 March 2012)
Chinook Mk 6		
Cost of demonstration and manufacture	£1,330 million	£726 million
Number of aircraft	22	12
Cost per aircraft	£60.4 million	£60.5 million
In-service date	None set	November 2014
Lynx Wildcat		
Cost of demonstration and manufacture	£1,850 million	£1,660 million
Number of aircraft	80	62
Cost per aircraft	£23.1 million	£26.8 million
In-service date	Planned as 102 months after contract award	Battlefield Reconnaissance Helicopter: August 2014 Surface Combatant Maritime Rotorcraft: January 2015
Puma Life Extension Programme		
Cost of demonstration and manufacture	£339 million	£339 million
Number of aircraft	28	24
Cost per aircraft	£12.1 million	£14.1 million
In-service date	November 2013	March 2015

NOTES

1 The 'Original Plan' information is the earliest stated information for each project.

2 The Cost per aircraft is the total demonstration and manufacture cost divided by the number of aircraft being purchased.

3 The latest planned cost of the Chinook fleet is lower than the project summary sheet figure, because £115 million has been deducted to make it comparable with the original figure. This amount is to be reimbursed by HM Treasury because it is funding for two helicopters to replace those destroyed on operations in Afghanistan. These are in addition to the 12.

4 Although an in-service date was not set for Chinook until the main investment decision was made, Bob Ainsworth, the then Secretary of State, announced to Parliament in December 2009, that the first ten Chinooks would be delivered in 2012-13.

5 The original planned cost for Puma is taken from the main gate business case. There was no cost estimate earlier in the planning process.

6 Battlefield Reconnaissance Helicopter is now known as Army Helicopter. Surface Combatant Maritime Rotocraft is now known as Helicopter Maritime Attack.

Source: National Audit Office analysis of departmental data

2.9 New safety standards will also impact on the pattern of expenditure on helicopter capability, and this is an element of spend that the Department is obliged to undertake. The Department is currently undertaking activities costing £64 million to assess the future safety upgrades required, and future costs are estimated to be in the hundreds of millions. An example of planned activity is fitting sensors to allow helicopters to land in dust clouds and other conditions of near-zero visibility.

2.10 The Department has taken a number of steps to maximise the value it gets from its current helicopter assets. It is reducing the number of types of helicopter and variants of the same helicopter type it operates, upgrading some helicopters and improving the efficiency of its maintenance arrangements:

Reducing the number of types of helicopter operated

- The Department is focusing on four core helicopter fleets: Chinook, Apache, Lynx Wildcat and Merlin, with the Puma upgrade covering an additional capability gap over the next decade. The ageing Sea King helicopter fleet will be retired from service by 2016,[15] allowing the transfer of £170 million into the wider helicopter budget. Once the Sea King leaves service there will be some consequent capability gaps until upgraded Merlin helicopters can take on the tasks of providing helicopter lift from naval vessels to the shore (a two-year gap until April 2018) and providing airborne surveillance and control capabilities for the future aircraft carriers (a potential four-year gap until 2020). The Department is examining alternative means of closing these capability gaps.

Reducing the number of variants of the same type of helicopter

- The Chinook fleet has provided the Department's primary means of delivering helicopter lift in Afghanistan. The Department currently operates 46 Chinook helicopters in three variants. The lack of commonality increases support costs. Project Julius is a £280 million project to upgrade the cockpit and avionics of the current fleet.[16] This will provide commonality between the new and all the existing aircraft, along with the 14 New Buy Chinook being bought at a cost of £841 million,[17] and is expected to deliver training and support efficiencies. This change to the overall fleet negates the previous plan for a dedicated fleet for specific tasks and roles will be carried out from across the fleet with some minor role modifications, avoiding additional costs. In addition, the Chinook fleet was upgraded so that the whole fleet has the same engines, in a £128 million project that completed in 2012.

15 On 20 December 2012, the Department announced a £258 million contract with industry to support the Sea Kings up to their retirement in 2016.
16 See the Chinook Project Summary Sheet in Volume II of this report.
17 This includes £115 million to be reimbursed by HM Treasury to fund two Chinooks to replace those destroyed on operations in Afghanistan.

Upgrading existing helicopters

- The Department has approved an additional £946 million since 2002 upgrading helicopters for operations in Iraq and Afghanistan, focusing particularly on enhancing the ability to operate in hot and high conditions. For example, in 2008, the Department signed a contract with AgustaWestland to upgrade 12 Lynx Mk9a helicopters with more powerful engines at an approved cost of £74 million. The first four upgraded helicopters were available for deployment to Afghanistan by May 2010, with the remaining helicopters delivered three months ahead of schedule. A further £66 million was approved in 2010 to upgrade the remaining fleet of ten aircraft in the fleet. The upgrade enables the helicopters to be used all year round for the first time in Afghanistan.

Improving helicopter availability and the efficiency of support arrangements

- Compared to ground vehicles, helicopters are expensive to operate, with half of the British Army's maintenance budget spent supporting around 300 operational helicopters. The Department has reduced maintenance costs and improved availability by agreeing long-term availability based contracts with industry. For example, support of the Chinook fleet is contracted through Boeing under a 34-year partnering agreement. The contract includes an element to incentivise industry performance, with five-year repricing clauses, and no contractual obligation beyond the current pricing period. The current five-year pricing period from 2011 to 2016 has an approved cost of £391 million.

  Between 2005 and 2011, there has been a 50 per cent reduction in Chinook major depth repair times, a 30 per cent increase in flying hours achieved per helicopter and a 15 per cent increase in available aircraft to over 30 aircraft available at any one time. This means that fleet flying hours have increased from 12,500 to the current average of 18,000 hours per year. The Department believes that the culture of continuous improvement the support arrangement has engendered has been the key factor in delivering these performance improvements.

Appendix One

Our audit approach

1 This study, now in its 29th year, is our annual report to Parliament that examines the in-year changes to the cost, time and technical performance of the Department's 16 largest military equipment projects.

2 We publish the Department's data for the 16 projects which covers cost, time and performance against what was originally planned at the main investment decision. We validate but do not audit this data. We do not question the Department's forecasts or assumptions for long-term costings unless better information becomes available.[18] We perform analysis to report on overall trends and in-year performance. We also validate and publish more limited data on the nine largest projects where the main investment decision is yet to be taken.

3 This year we also undertook reviews into two capability areas: helicopters, and air transport and air-to-air refuelling. For these we looked at the spend in each capability area; the challenges faced; and what the Department is doing to overcome them and maintain the required capability.

4 Our audit approach is summarised in **Figure 10**. Our evidence base is described in Appendix Two.

18 However, our separate work on the equipment plan looks at whether the underlying assumptions are reasonable, consistent and honest.

Figure 10
Our audit approach

The objective of government

In 2011-12, the Department had an equipment budget for the next ten years of £159 billion. The Department's objective is to deliver well-resourced and equipped armed forces and achieve a balanced and affordable Equipment Plan.

How this will be achieved

The Department states that it has established an affordable core Equipment Plan. It aims to maintain this going forward through good project management to ensure projects keep to planned budget, time and performance.

Our review

We reviewed the Department's time, cost and performance data for the 16 largest equipment projects to assess whether it is achieving value for money through the performance of these projects. We also looked at two capability areas to assess how the Department has managed to maintain delivery of capability in the face of budget reductions.

Our evaluative criteria

Project cost, time and performance – we measure the largest projects' forecasts against original approvals.

Helicopter and air transport and air-to-air refuelling – effectiveness of Department's approach to managing these capabilities.

Our evidence

(see Appendix Two for details)

We assessed performance through:

- Validating the data provided by the Department.
- Reviewing key project documents such as planning documents, contracts, project plans, contractor reports, and assessments of performance by the Director of Capability and front-line commands.
- Data analysis to consider whether the Department is forecasting to deliver to the budget, time and performance expected when the main investment decision was made.

We considered the Department's management of capability areas by:

- Interviewing staff in the Department.
- Reviewing key documents.

Our conclusions

Early signs show that it has begun to make realistic trade-offs between cost, time, technical requirements and the number of ships, aircraft or vehicles procured. However, the variances to cost and time reported this year indicates it needs to do consistently better.

To achieve value for money in future on individual projects and to underpin an affordable Equipment Plan, the Department must continue to address long-standing issues on project performance to best use the money available.

Appendix Two

Our evidence base

1 We reached our conclusions on the overall value for money from the top 16 equipment projects based on the data collected during fieldwork in June and July 2012. The interviews for the case studies were carried out between June and September 2012.

2 We measured the largest projects' forecasts against original approvals:

- The project teams in Defence Equipment and Support put together the project summary sheets which are published in Volume II of this report. We validated the data back to supporting evidence such as planning documents, contracts, project plans, contractor reports, and assessments of performance by the Director of Capability and front-line commands.
- 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.

3 We looked at the Department's management of capability in two specific areas – helicopters and air transport and air-to-air refuelling:

- Our case studies on the Department's helicopter and air transport capabilities were informed by a series of semi-structured interviews with senior military and civilian personnel. Key themes identified in the studies were further researched and evidenced through document review.

Appendix Three

Summary data on the Department's largest equipment projects

Figure 11

The 16 largest equipment projects where the Department has taken the main decision to invest

The Department's net forecast to complete the largest 16 equipment projects has risen £468 million and slipped 139 months in-year

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, with risks	Not to be met	In-year change, not to be met	To be met	To be met, with risks	Not to be met	In year change, not to be met	Approved	Current plan
A400M	Large transport aircraft	2,498	3,268	+770	+163	Feb 09	Mar 15	+73	0	5	3	0	No change	9	0	0	No change	25	22
Airseeker	Airborne electronic surveillance	633	634	+1	+1	Oct 14	Oct 14	0	0	6	2	0	No change	9	0	0	No change	3	3
Astute	Attack submarine: boats one to three	2,233	3,386	+1,153	-94	Jun 05	Apr 10	+58	0					7	1	1	No change	1	1
	Attack submarine: boat four	1,279	1,448	+169	+44	Aug 15	Jan 18	+29	0	6	1	1	No change	7	3	0	No change	1	1
	Attack submarine: boat five	1,464	1,453	-11	+26	Aug 20	Aug 20	0	0					7	3	0	No change	1	1
	Attack submarine: boat six	632	617	-15	-13	May 22	May 22	0	0									1	1
	Attack submarine: boat seven	325	300	-25	-25	Mar 24	Mar 24	0	0									1	1
Beyond Visual Range Air-to-Air Missile (Meteor)	Air-to-air missile: original in-service date					Sep 11	Aug 13	+23	0										
	Air-to-air missile: in-service date one	1,136	1,122	-14	+7	Aug 12	Nov 12	+3	0	8	0	0	No change	7	0	0	No change	***	***
	Air-to-air missile: in-service date two					Jul 15	Jul 17	+23	+23										
Chinook	Heavy Lift Helicopter: New Buy	841	841	0	0	May 14	Nov 14	+6	+6	6	2	0	No change	5	2	0	No change	14	14
	Heavy Lift Helicopter: Julius Cockpit	280	280	0	0	Sep 11	Apr 13	+19	+19					5	2	0			
Complex Weapons	Pipeline Weapons funding: Interim Main gate 1 – Loitering Munition					Mar 12	Mar 12	0	0	8	0	0	No change	22	2	0	No change	N/A	N/A
	Pipeline Weapons funding: Interim Main gate 1 – Selected Precision Effects at Range Capability 2 Block 1	246	243	-3	0	Oct 12	Feb 15	+28	+23	7	1	0	No change	8	1	0	No change	N/A	N/A
	Pipeline Weapons funding: Interim Main gate 2	541	540	-1	-1	Nov 16	Nov 16	0	0	8	0	0	No change	10	0	0	No change	N/A	N/A
Falcon	Deployable Communication System: Increment A	297	254	-43	-5	Jun 10	Dec 12			5	4	0	No change	6	3	0	No change	N/A	N/A
	Deployable Communication System: Increment C	45	44	-1	0	Sep 10	Dec 12	+42	+15	5	4	0	No change	6	3	0	No change	N/A	N/A
	Deployable Communication System: Urgent Operational Requirement	53	51	-2	0	May 11	Dec 12	+19	+15	4	5	0	No change	5	4	0	No change	N/A	N/A
Future Strategic Tanker Aircraft	Air-to-air refuelling and passenger aircraft	12,307	12,266	-41	+257	May 14	May 14	0	0	6	2	0	No change	9	0	0	No change	14	14
Joint Combat Aircraft	Fighter/attack aircraft	2,566	2,200	-366	+4	No date specified	No date specified	No data	No data	4	4	0	No change	4	3	0	No change	Not yet determined	Not yet determined
Lynx Wildcat	Light Helicopter: Battlefield Reconnaissance variant	1,803	1,663	-140	+19	Jan 14	Aug 14	+7	+7	3	5	0	No change	6	2	0	No change	80	62
	Light Helicopter: Surface Combatant Maritime Rotorcraft variant					Jan 15	Jan 15	0	0	6	2	0	No change	6	4	0	No change		
Merlin CSP	Update of helicopter avionics	805	791	-14	+23	Feb 14	Jun 14	+4	+4	8	0	0	No change	10	0	0	No change	30	30
Queen Elizabeth Class	Aircraft carrier	3,541	5,348	+1,807	+217	Jul 15	Jul 17	+24	+9	4	4	0	No change	8	0	1	No change	2	2
Specialist Vehicles	Armoured Fighting Vehicle	1,394	1,394	0	0	No date specified	No date specified	No data	No data	8	0	0	No change	11	0	0	No change	Not yet determined	Not yet determined
Type 45	Anti-air warfare destroyer	4,757	5,556	+799	-108	May 07	Jul 10	+38	0	4	4	0	No change	8	1	0	No change	6	6
Typhoon	Fighter aircraft	15,173	17,671	+2,498	-69	Dec 98	Jun 03	+54	0	2	3	3	+3	8	1	1	No change	232	160
	Aircraft software upgrade: Future Capability programme	402	441	+39	+22	Jun 12	Dec 13	+18	+18					7	0	0	No change		
Warrior	Warrior Capability Sustainment Programme	1,319	1,319	0	0	Nov 18	Nov 18	0	0	8	0	0	No change	9	0	0	No change	445	445
Total		**56,570**	**63,130**	**+6,560**	**+468**			**+468**	**+139**	**121**	**46**	**4**	**+3**	**199**	**35**	**3**	**0**		

NOTES

1 Astute Boats 1-3 in-service date refers to the in-service date of Boat 1, HMS Astute.

2 Astute Boats 6 and 7 approvals are for initial items for the build only.

3 Falcon increments A and C were originally approved and measured separately, but are now aligned so the in-year variation is now counted as one variation.

4 Joint Combat Aircraft and Specialist Vehicles are yet to have the number of platforms to be procured, or the in-service dates, approved.

5 All approved and forecast costs are on an outturn basis. See Appendix Five for further details of outturn costing.

Source: National Audit Office analysis of departmental data

Appendix Four

Executive project summary sheets

A400M

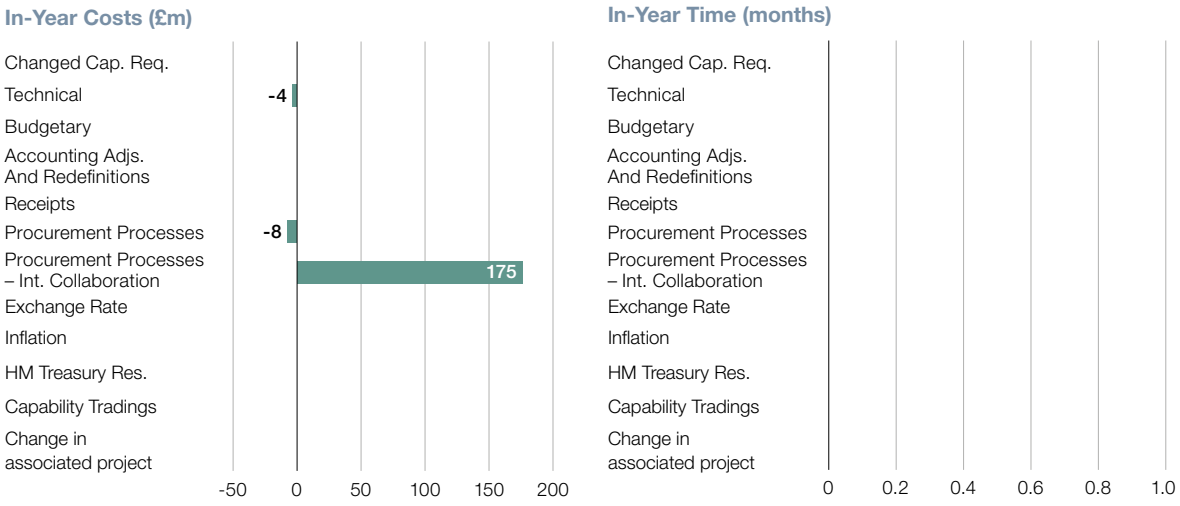
The Capability

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 including vehicles and troops over extended ranges; air dropping paratroops and equipment; and being unloaded with the minimum of ground handling equipment. The 1998 Strategic Defence Review confirmed a requirement for an airlift capability to move large single items such as attack helicopters and some Royal Engineers' equipment and concluded that this would be met, in the latter part of the first decade of the 21st Century, by Future Transport Aircraft. The A400M was selected to meet this requirement. It will replace the remaining Hercules C-130K fleet.

Overview of Cost, Time and Performance

	Approved	Forecast/Actual	Variation	IY Variation
Cost of Assessment Phase	£2m	£1m	-£1m	
Cost of Demonstration & Manufacture Phase	£2,498m	£3,268m	+£770m	+£163m
Duration of Assessment Phase		34 months		
In-Service Date	February 2009	March 2015	+73 months	0 months

In-year Cost and Time Variation Detail



On 18 May 2000, the Investment Approvals Board approved the acquisition of 25 A400M aircraft with an In-Service Date of December 2009. Following the submission of a Review Note, on 8 May 2003, the Investment Approvals Board revised the In-Service Date to December 2011 and defined it as being the delivery of the seventh UK A400M aircraft. This change was necessary due to delays in the German Parliamentary approvals process which had prevented signature of the multinational contract; approval was finally granted on 21 May and, on 27 May 2003, the A400M Design and Production Phase contract (including the UK order for 25 aircraft) was signed by OCCAR on behalf of the six partner nations.

On 29 March 2010, in a Written Ministerial Statement, the Secretary of State informed Parliament that agreement had been reached between A400M partner nations and Airbus Military on the future of the programme. Heads of Terms had been agreed that would form the basis for the negotiation of an amended contract (including the decision to amend the UK order from 25 to 22 aircraft). On 31 March 2010, the Heads of Terms were signed on behalf of partner nations by OCCAR with Airbus Military.

Following the signature of the amended Design and Production Phase contract on 7 April 2011, the revised aircraft production and delivery schedules remain on track. Programme and Project Review Meetings (held on a quarterly basis) at which Airbus Military present details of the current programme status and forthcoming activities to partner nations and OCCAR, indicate that steady progress continues to be made.

Investigation work into the causes of engine problems encountered in June 2011 during flight trials have concluded and solutions have been developed. Although this caused some disruption to the flight trials programme, this is not expected to have a significant impact on the aircraft production schedule.

Although the A400M is a military transport aircraft, its design will be predominantly civil certified, with additional military certification as necessary. With the exception of long distance endurance flying, all flight trials associated with the initial Type Certificate clearance were completed by the end of March 2012. The evidence produced by these trials has been evaluated by the European Aviation Safety Agency and a Restricted Type Certificate was granted in late April 2012.

The first flight of MSN006 (the fifth and final prototype aircraft) took place on 20 December 2011. Together the trials fleet had amassed 2944 flying hours and 1002 test flights by 25 March 2012.

Risk Assessment against Defence Lines of Development

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

Airseeker

The Capability

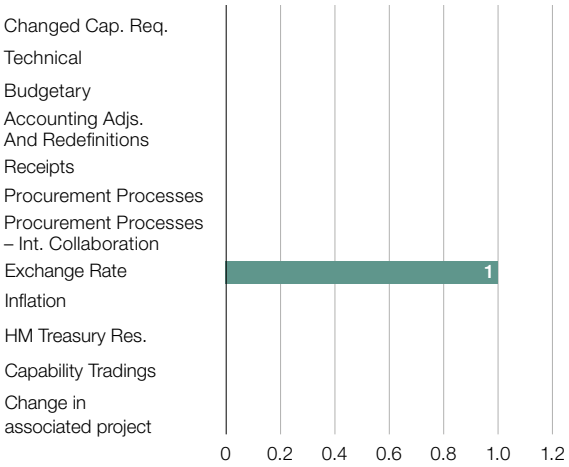
Project Airseeker (formerly known as Helix) seeks to sustain the UK's airborne electronic surveillance capability provided by the Nimrod R1 aircraft and associated ground elements, against an evolving and increasingly complex target set up to 2025. It will provide a rapidly deployable capability to support operations where it will be able to 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 identifications.

Overview of Cost, Time and Performance

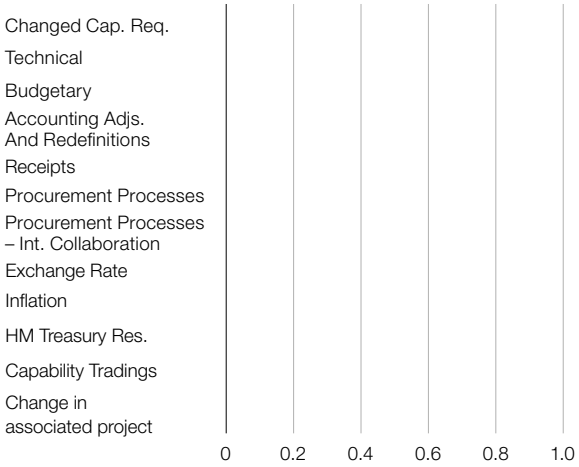
	Approved	Forecast/Actual	Variation	IY Variation
Cost of Assessment Phase	£44m	£38m	-£6m	
Cost of Demonstration & Manufacture Phase	£633m	£634m	+£1m	+£1m
Cost of Support Phase	£633m	£637m	+£4m	+£4m
Duration of Assessment Phase		79 months		
In-Service Date	October 2014	October 2014	0 months	0 months

In-year Cost and Time Variation Detail

In-Year Costs (£m)



In-Year Time (months)



On 23 June 2011, the Chief of Defence Materiel signed on behalf of the Secretary of State for Defence a Memorandum of Understanding for Sustainment and Follow-on Development that had been signed by the USA Under-Secretary of Defense (Acquisition, Technology and Logistics) earlier that month, covering a Cooperative Agreement to provide support and capability updates for the USA and UK fleets of Rivet Joint aircraft and ground systems. This agreement runs to 31 March 2025.

The refurbishment and conversion of the KC-135 tanker aircraft that forms the basis of the first UK Rivet Joint aircraft is progressing ahead of schedule in Greenville Texas.

Progress on the Co-manning Memorandum of Understanding, whereby the USA Air Force trains and provides operational experience for UK aircrew is also on schedule.

Design of the UK facilities to house ground exploitation equipment at the Joint Services Signals Unit (RAF Digby) has been agreed with the Defence Infrastructure Organisation.

Risk Assessment against Defence Lines of Development

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

Astute Class Submarines

The Capability

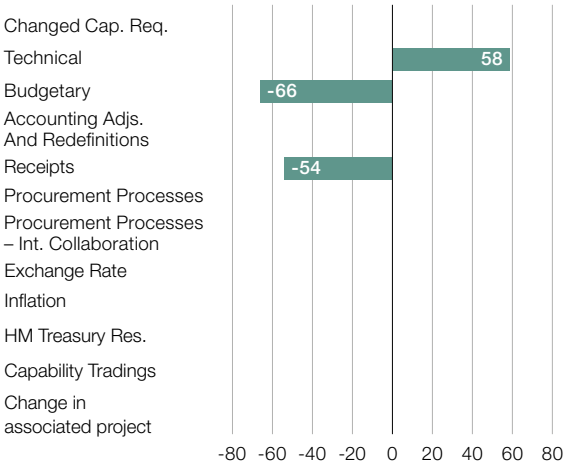
The military requirement is for up to 8 Astute Class Submersible Ship Nuclear to replace the existing Swiftsure and Trafalgar Classes of nuclear powered attack submarine. Astute Class submarines are required to perform a range of military tasks; these unique requirements are combined within the Astute 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

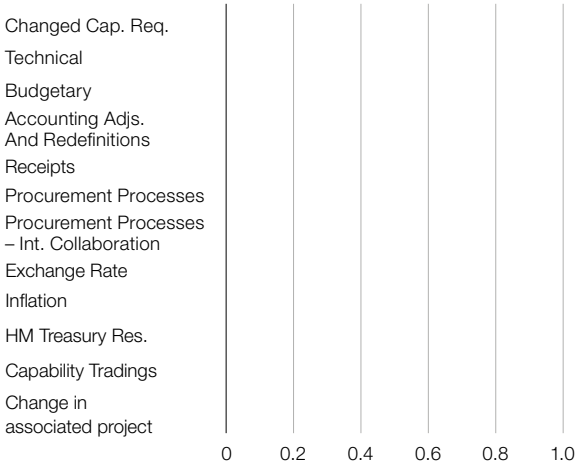
	Approved	Forecast/Actual	Variation	IY Variation
Cost of Assessment Phase	£33m	£29m	-£4m	
Cost of Demonstration & Manufacture Phase Boats 1–3	£2,233m	£3,386m	+£1,153m	-£94m
Cost of Demonstration & Manufacture Phase Boat 4	£1,279m	£1,448m	+£169m	+£44m
Cost of Demonstration & Manufacture Phase Boat 5	£1,464m	£1,453m	-£11m	+£26m
Cost of Demonstration & Manufacture Phase Boat 6	£632m	£617m	-£15m	-£13m
Cost of Demonstration & Manufacture Phase Boat 7	£325m	£300m	-£25m	-£25m
Cost of Support Phase – Initial Support Solution	£315m	£269m	-£46m	-£3m
Cost of Support Phase Astute Class Training Service Boats 1–3	£151m	£660m	+£509m	+£12m
Cost of support Phase Astute Class Training Service Boat 4	£260m	£201m	-£59m	-£117m
Duration of Assessment Phase		69 months		
In-Service Date Boats 1–3	June 2005	April 2010	+58 months	0 months
In-Service Date Boat 4	August 2015	January 2018	+29 months	0 months
In-Service Date Boat 5	August 2020	August 2020	0 months	0 months
Support Contract Go-Live – Initial Support Solution	May 2007	May 2007	0 months	0 months
Support Contract Go-Live – Astute Class Training Service Boats 1–3	January 2004	March 2008	+50 months	0 months
Support Contract Go-Live – Astute Class Training Service Boat 4	December 2013	May 2015	+17 months	+35 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)



On 20th July 2011, Her Majesty's Treasury approved revised time and costs for Boats 1 to 4 and approved Main Build for Boat 5, Initial Build for Boat 6 and Long Lead Items for Boat 7. At this time the Investment Approvals Committee also approved In-Service Dates for Boats 5, 6 and 7.

In June 2011, HMS ASTUTE successfully completed the UK phase of Contractor Sea Trials. While on a comprehensive sea trials programme in US waters the submarine successfully completed the first of class British Tomahawk Land Attack Missiles Firing Trials, and final Spearfish deep discharge trials.

Boat 2 AMBUSH was launched and lowered into the basin outside of the Devonshire Dock Hall on 6 January 2011. Fitting out of the submarine has been completed and the vessel is now undergoing a rigorous period of trials and testing prior to exiting the shipyard. The submarine successfully completed her first test dive in the shipyard's basin in early October 2011. This is a critical milestone ahead of the boat's planned exit from Barrow.

Boat 3 ARTFUL continues construction in the Devonshire Dock Hall at Barrow and is making good progress with Diesel Generator Trials successfully completed in August 2011.

Boat 4 AUDACIOUS; all hull and casing units have been moved to the Devonshire Dock Hall.

Boat 5 ANSON had her 'keel laid' on 13th October 2011, at a traditional keel laying ceremony where the Minister for International Security Strategy, Gerald Howarth unveiled a section of her hull.

The Astute Class Training Service (ACTS) has provided training for the ships companies of both HMS ASTUTE and AMBUSH throughout the last twelve months. This year saw the first delivery of the Submariner Qualification course for the Royal Navy.

Risk Assessment against Defence Lines of Development

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

Beyond Visual Range Air-to-Air Missile

The Capability

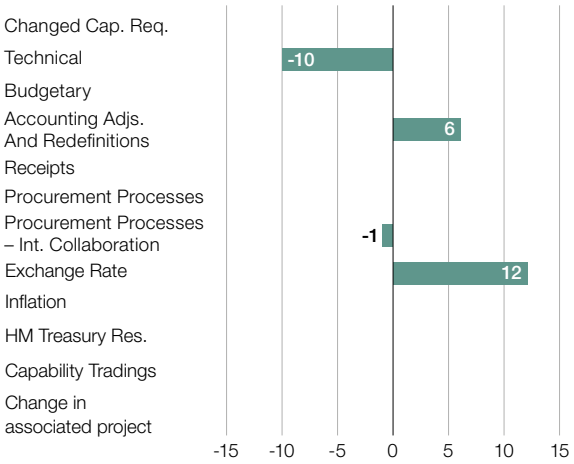
The Beyond Visual Range Air-to-Air Missile system will provide Typhoon with the capability to combat projected air-to-air threats and sustain air superiority throughout the life of the aircraft. The integration of Meteor on to Typhoon forms part of the project, with a current Initial Operating Capability of 2015. Key features of the Beyond Visual Range Air-to-Air Missile requirement include stealthy launch, enhanced kinematics (giving increased stand-off and disengagement ranges, a better ability to engage and destroy highly agile manoeuvring targets), a large no-escape zone and robust performance against countermeasures. This is a collaborative programme with: Germany, Spain, Italy, Sweden and France.

Overview of Cost, Time and Performance

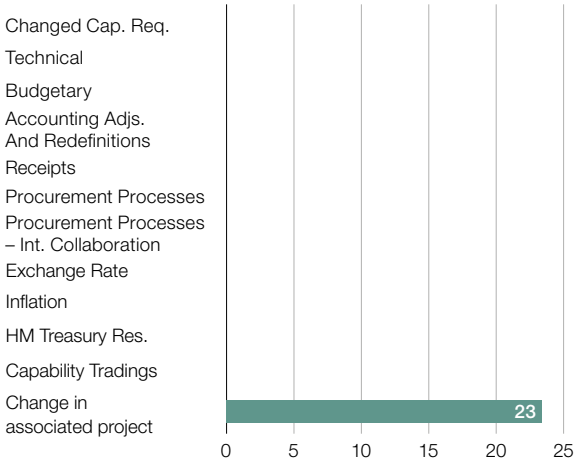
	Approved	Forecast/Actual	Variation	IY Variation
Cost of Assessment Phase	£14m	£20m	+£6m	
Cost of Demonstration & Manufacture Phase	£1,136m	£1,122m	-£14m	+£7m
Cost of Support Phase	–	–	–	–
Duration of Assessment Phase		55 months		
Original In-Service Date	September 2011	August 2013	+23 months	0 months
In-Service Date 1	August 2012	November 2012	+3 months	0 months
In-Service Date 2	July 2015	June 2017	+23 months	+23 months

In-year Cost and Time Variation Detail

In-Year Costs (£m)



In-Year Time (months)



The Meteor programme is now progressing towards the end of the Demonstration phase, marked by the six-nation signature of the Certificate of Design scheduled for the latter part of 2012.

The CP270 early integration work continues to progress on schedule, and will end with an aerial firing of the missile from a Typhoon in the latter part of 2012.

However, the delivery of the full integration programme outturn is dependent on the completion of the Typhoon Future Capability Programme 1, and this has been delayed until late 2013 causing a 23-month delay to In-Service Date 2.

Risk Assessment against Defence Lines of Development

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

Chinook New Buy and Julius

The Capability

New Buy: The UK currently has a fleet of 46 Chinook, delivered between 1981 and 2001. This project is to procure 14 new aircraft (12+2 attrition aircraft to replace those lost in Afghanistan in 2009).

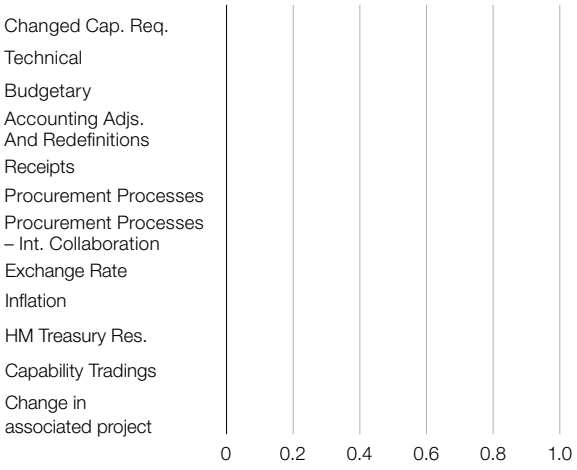
Project Julius: The Julius project modifies the existing fleet. The main changes to the aircraft are to be the incorporation of an integrated glass cockpit, moving map tablet and a crewman's workstation. This means the aircraft can more easily 'swing role' between Special Forces and Support Helicopter tasks.

Overview of Cost, Time and Performance

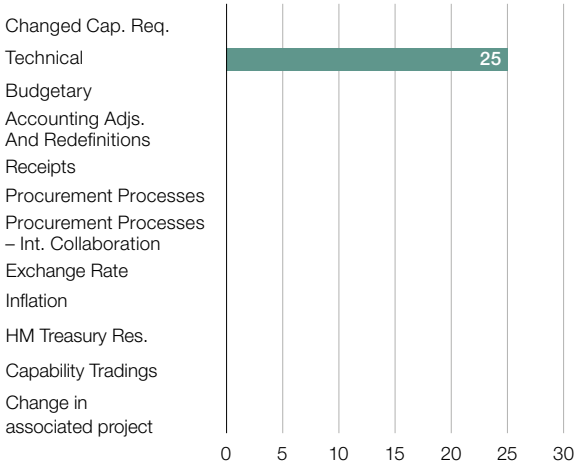
	Approved	Forecast/Actual	Variation	IY Variation
Cost of Assessment Phase	£11m	£10m	-£1m	–
Cost of Demonstration & Manufacture Phase – New Buy	£841m	£841m	0	0
Cost of Demonstration & Manufacture Phase – Julius	£280m	£280m	0	0
Cost of Support Phase – Through Life Chinook support	£391m	£386m	-£4m	-£4m
Cost of Support Phase – New Buy Support	£84m	£84m	0	0
Duration of Assessment Phase		16 months		
Original In-Service Date – New Buy	May 2014	November 2014	+6 months	+6 months
Original In-Service Date – Julius	September 2011	April 2013	+19 months	+19 months
Support Contract Go-Live – Through Life Chinook support	May 2011	May 2011	0 months	0 months
Support Contract End – Through Life Chinook support	March 2016	March 2016	0 months	0 months

In-year Cost and Time Variation Detail

In-Year Costs (£m)



In-Year Time (months)



Project New Buy: Key scheduled activities have been completed, including: delivery of software releases from Thales; Government Furnished Assets Working Group held; Test and Evaluation Working Groups held in preparation for the Test Readiness Review. Aircraft continue to be built on the production line. As of the end of May 2012, Aircraft 4 was at the Cabin Cockpit Splice stage and Aircraft 3 Cabin had been painted.

Project Julius: The Mk 4 Release to Service was signed by Assistant Chief of the Air Staff on the 11th May 2012, enabling aircrew to begin training on the aircraft. Aircrew training is under way to support operations and Initial Operating Capability was achieved on 15th June 2012, against the initial approval of September 2011. As of the end of May 2012, MoD had accepted 5 aircraft in total. The overarching project remains on schedule to meet its Full Operating Capability in October 2015.

Risk Assessment against Defence Lines of Development

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

Complex Weapons Pipeline

The Capability

The Team Complex Weapons initiative is based on meeting the UK's enduring requirement to have battle winning military capability through the use of Complex Weapons; to be assured that the weapons will perform as expected; and to retain the ability to develop leading edge Complex Weapons technologies.

Within this context, the initiative aims to deliver:

a) Improved, adaptable and flexible Complex Weapons that can be shaped to meet current and future military capability needs;

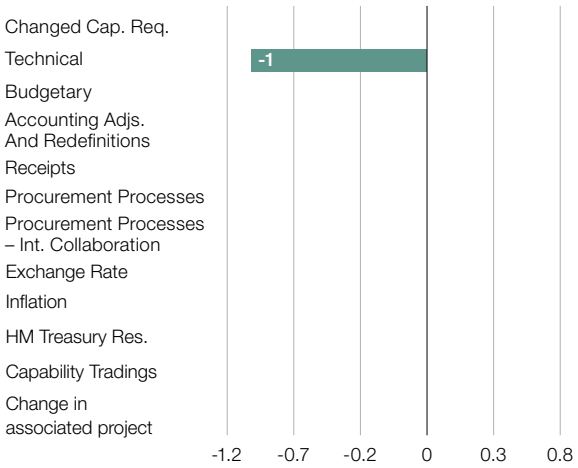
b) Freedom of Action and Operational Advantage in our Complex Weapons through a sustained indigenous industrial construct.

Overview of Cost, Time and Performance

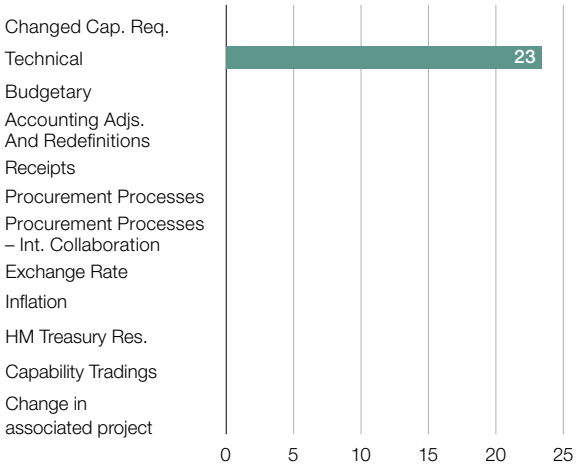
	Approved	Forecast/Actual	Variation	IY Variation
Cost of Assessment Phase – Complex Weapons	£239m	£236m	-£3m	–
Cost of Assessment Phase – Interim Main Gate 1 Assessment Phase elements	£145m	£143m	-£2m	–
Cost of Demonstration & Manufacture Phase: Interim Main Gate 1 Demonstration and Manufacture phase elements	£246m	£243m	-£3m	–
Cost of Demonstration & Manufacture Phase: Interim Main Gate 2 Future Local Area Air Defence System	£541m	£540m	-£1m	-£1m
Duration of Assessment Phase		22 months		
In-Service Date Loitering Munition	March 2012	In-service date was not met	–	–
Spear Capability 2 Block 1	October 2012	February 2015	+28 months	+23 months
Interim Main Gate 2- Future Local Area Air Defence System	November 2016	November 2016	0 months	0 months

In-year Cost and Time Variation Detail

In-Year Costs (£m)



In-Year Time (months)



Interim Main Gate 1

Loitering Munition – The Demonstration and Manufacture Phase of Fireshadow was approved by the Investment Approvals Board in April 2010 as part of the Complex Weapons Interim Main Gate 1 submission. It is intended that this will be demonstrated in 2012.

Spear Capability 2 Block 1 (Brimstone 2)

- Rocket Motor April 2011 – an issue identified. June – High level issues resolved. February 2012 Rocket motor failed qualification. Detailed investigations into failure begins
- Tandem firing performance trials undertaken July/August 2011; outcome unsatisfactory. Discussions with company ongoing
- Warhead gained Critical Design Review in December 2011
- Telemetry firings in January/February 2012 (using legacy rocket motor). Analysis ongoing but indications that firings were successful.

Spear Capability 2 Block 2

Planning Round 2011 Option to delete and decision to continue with Spear Capability 2 Spiral Development.

Spear Capability 3

- Request for Quotations (RFQ) for seekers released – February 2011
- Initial discussions about demonstration and manufacture/ integration issues with Typhoon – May 2011
- Assessment Phase subsystem downselect, Concept Design Review and Phase 2 Gate Review completed – July 2011
- MBDA commenced launcher study because BRU-61 launcher found to be incompatible with chilled airframe design – August 2011
- Warhead supplier recommendation endorsed by Portfolio Management Board; Systems Design Review Complete; BAE Systems under contract for Phase 1 of Airframe and Propulsion Flight Demonstration. Draft System Requirement Document issued – December 2011
- Contract let with Hamilton Sunstrand for Turbojet Technical Assistance Agreement – January 2012.

Interim Main Gate 2

Following Investment Approvals Board approval in April 2011, Future Local Area Air Defence System (Maritime) (now officially known as Sea Ceptor) Type 23 Demonstration Phase Contract was placed in December 2011. MBDA is the prime contractor with supporting non-prime elements provided by BAE Maritime Services, Qinetiq and Defence Science and Technology Laboratory (DSTL).

The Preliminary Design Review was held in February/March 2012 and its successful conclusion marks a major milestone.

Interim Main Gate 3 was the third of the submissions and concerned approval for the Future Anti-Surface Guided Weapon (Heavy) Demonstration and Manufacture Phase. The Business Case was presented to Equipment Capability Secretariat on 9 January 2012 and was considered by the Investment Approvals Committee on 18 January. On 31 January, Director General Finance approved the case, with a caveat that negotiations should be concluded with France before 31 March 2012. Bi-laterals continued, but by 28 March when Chief Secretary to the Treasury (CST) wrote to the MoD, discussions had not been concluded and as such Chief Secretary to the Treasury approved the case, subject to receiving French national approval. Reflecting this caveated approvals position and the absence of a final negotiated position on the Future Anti-Surface Guided Weapon (Heavy) Demonstration and Manufacture Phase, standard Major Projects report practice has been followed meaning that this project is not included in later sections of this report.

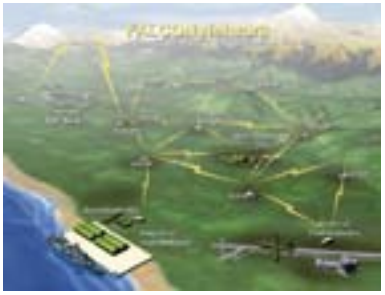
Risk Assessment against Defence Lines of Development – Loitering Munition

Equipment	Training	Logistics	Infrastructure
Personnel	Doctrine	Organisation	Information

Risk Assessment against Defence Lines of Development – Spear Capability 2 Block 1

Equipment	Training	Logistics	Infrastructure
Personnel	Doctrine	Organisation	Information

Falcon



The Capability

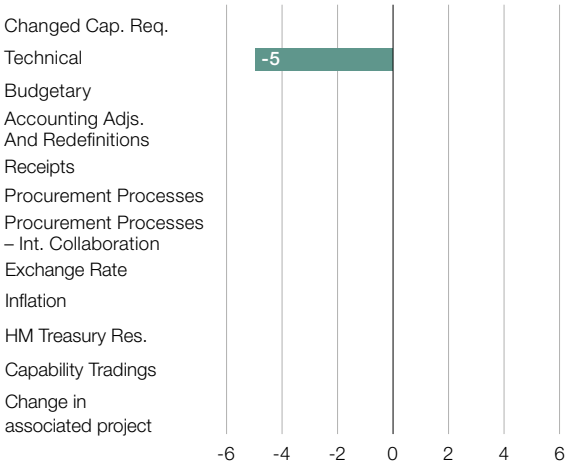
Falcon will provide the comprehensive deployable communication systems that are needed at all levels of command and will operate in conjunction with systems such as Bowman, Cormorant, Skynet 5 and with allies' communication and information systems. It will not duplicate the capability of existing systems, 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

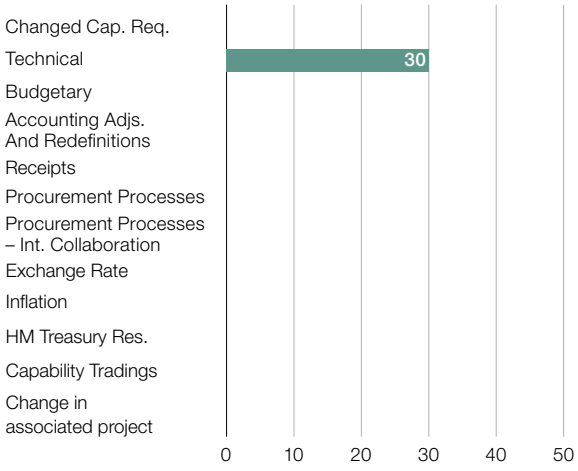
	Approved	Forecast/Actual	Variation	IY Variation
Cost of Assessment Phase	£30m	£31m	+£1m	
Cost of Demonstration & Manufacture Phase Increment A	£297m	£254m	-£43m	-£5m
Cost of Demonstration & Manufacture Phase Increment C	£45m	£44m	+£1m	£0m
Cost of Demonstration & Manufacture Phase UOR	£53m	£51m	-£2m	£0m
Cost of Support Phase – Increment A	£82m	£70m	-£12m	£0m
Cost of Support Phase – Increment C	£18m	£18m	£0m	£0m
Cost of support Phase – UOR	£12m	£12m	£0m	£0m
Duration of Assessment Phase		44 months		
In-Service Date – Increment A	June 2010	December 2012	+30 months	+15 months
In-Service Date – Increment C	September 2010	December 2012	+27 months	–
In-Service Date – UOR	May 2011	December 2012	+19 months	+15 months
Support Contract Go-Live – Increment A	February 2011	January 2012	+11 months	+10 months
Support Contract Go-Live – Increment C	March 2011	January 2012	+10 months	+8 months
Support Contract Go-Live – UOR	December 2012	December 2012	0 months	0 months
Support Contract End – Increment A	December 2018	January 2021	+25 months	+15 months
Support Contract End – Increment C	December 2018	January 2021	+25 months	+15 months
Support Contract End – UOR	January 2013	January 2013	0 months	0 months

In-year Cost and Time Variation Detail

In-Year Costs (£m)



In-Year Time (months)



Falcon had been experiencing difficulties since Quarter 3 2010 when it was identified that technical issues with the cryptographic subsystem meant that the project was subject to a series of senior management reviews. The development issue with the crypto was the sole contributory factor to the delay of the Falcon programme.

In addition due to the delay to the programme, Falcon was invited to attend the inaugural Major Projects Review Board conducted by Chief Defence Materiel and Secretary of State for Defence in June 2011. Following the review, Chief Defence Materiel communicated with industry that continued lack of performance could result in contract cancellation. The programme re-presented at the next Major Project Review Board in September 2011 reporting that the cryptographic problems had been resolved and the programme was now back on track. An action was placed indicating Falcon would again be reviewed at the next Major Projects Review Board in December 2011.

A Review Note was raised for timescale only in November 2011 to reset the In-Service Date for Increments A and C plus the UOR. The programme slippage was a total of 19 months from previous approval. The revised dates were reset to December 2012 (at 50%) for Increments A and C, and UOR Equipment Delivery Date of March 2013 (at 90%). These dates were approved in December 2011.

Risk Assessment against Defence Lines of Development – Increment A

Equipment Training Logistics Infrastructure
Personnel Doctrine Organisation Information Interoperability

Risk Assessment against Defence Lines of Development – Increment C

Equipment Training Logistics Infrastructure
Personnel Doctrine Organisation Information Interoperability

Risk Assessment against Defence Lines of Development – UOR

Equipment Training Logistics Infrastructure
Personnel Doctrine Organisation Information Interoperability

Future Strategic Tanker Aircraft

The Capability

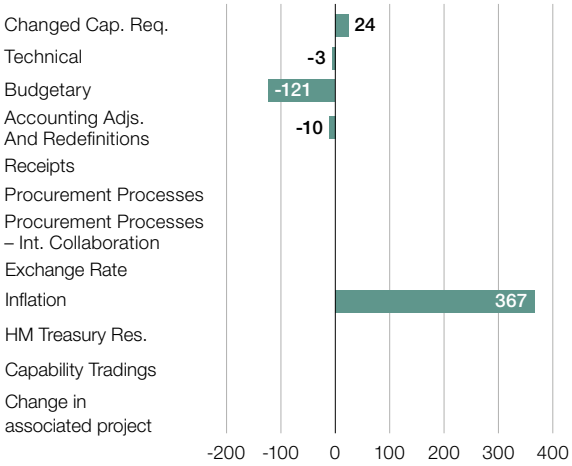
The Future Strategic Tanker Aircraft Service will replace the Air-to-Air Refuelling and the passenger Air Transport capability currently provided by the Royal Air Force's fleet of VC10 and TriStar aircraft. Air-to-Air Refuelling is a key military capability that significantly increases the operational range and endurance of front-line aircraft across a range of defence roles and military tasks.

Overview of Cost, Time and Performance

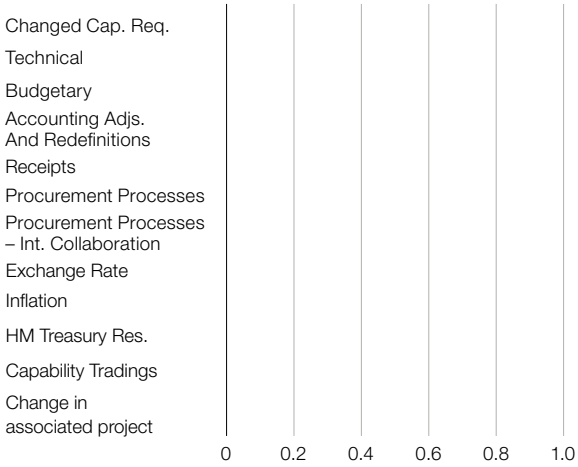
	Approved	Forecast/Actual	Variation	IY Variation
Cost of Assessment Phase	£13m	£38m	+£25m	
PFI Costs	£12,307m	£12,266m	-£41m	+£257m
Duration of Assessment Phase		77 months		
In-Service Date (Air-to-air refuelling)	May 2014	May 2014	–	–
PFI Contract Go-Live	March 2008	March 2008	–	–
PFI Contract End	March 2035	March 2035	–	–

In-year Cost and Time Variation Detail

In-Year Costs (£m)



In-Year Time (months)



TEMPEST and Defensive Aids Subsystem testing began at Boscombe Down on 18 April 2011, and Ground testing for Air-to-Air Refuelling with receivers began in May 2011.

On 10 October 2011, the Civil Aviation Authority issued the Part 145 & M Certificate to Air Tanker Services. This completed the set of Air Tanker Services deliverables for Introduction to Service. Because of problems in the trials programme and delay in delivery of documentation from Air Tanker, the Introduction To Service date slipped to February 2012.

The first Voyager aircraft arrived at Royal Air Force Brize Norton on 21 December 2011. On arrival, Air Tanker registered the aircraft and obtained the Civil Aviation Authority Certificate of Airworthiness.

The originally planned flight trials to clear wing pod Air-to-Air Refuelling for Tornado and Typhoon finished in December 2011. These trials identified problems associated with fuel leakage at various parts of the Air-to-Air Refuelling clearance flight envelope. Rectification plans for these issues were finally agreed with Air Tanker and the Independent Technical Adviser on 31 January 2012.

The Director Air Support signed the Voyager Release To Service Recommendation for Air Transport and Aeromed 3 only, on 21 March 2012, and the Release To Service was signed by the Assistant Chief of the Air Staff on 4 April 2012. The Aircraft was placed on the Military Aircraft Register on 5 April 2012.

Risk Assessment against Defence Lines of Development

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

Joint Combat Aircraft

The Capability

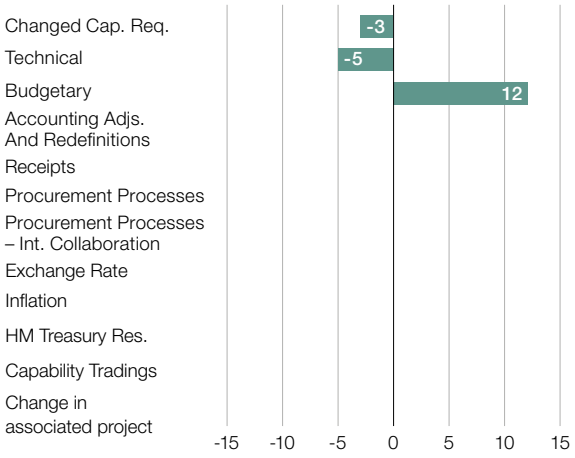
Joint Strike fighter was selected to meet the UK's Joint Combat Aircraft requirement for a survivable multi-role expeditionary air capability, able to operate from land and sea. Joint Strike Fighter is a 5th Generation aircraft programme. Using secure links it will operate as a Combat Intelligence, Surveillance, Target Acquisition & Reconnaissance platform providing intelligence to troops on the ground, and when required will be able to employ a range of sophisticated weaponry, even through adverse weather.

Overview of Cost, Time and Performance

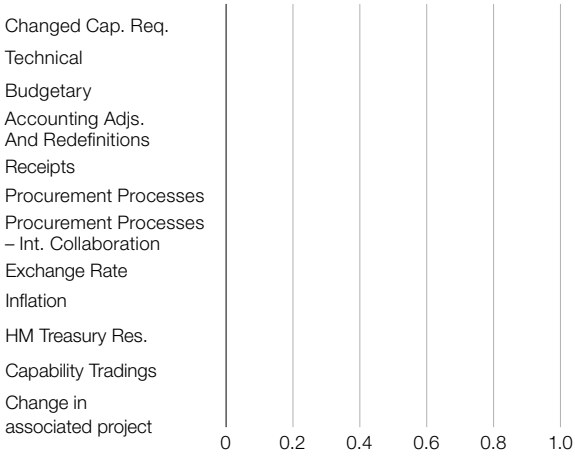
	Approved	Forecast/Actual	Variation	IY Variation
Cost of Assessment Phase	£150m	£144m	-£6m	
Cost of Demonstration & Manufacture Phase	£2,566m	£2,200m	-£366m	+£4m
Cost of Support Phase	–	–	–	–
Duration of Assessment Phase	–	–	–	–
In-Service Date	–	–	–	–
Support Contract Go-Live	–	–	–	–
Support Contract End	–	–	–	–

In-year Cost and Time Variation Detail

In-Year Costs (£m)



In-Year Time (months)



During financial year 2011-12, the MoD continued to pursue a Carrier Variant aircraft based programme in line with the variant change decision taken under Strategic Defence and Security Review 2010. In-year progress during financial year 2011-12 focused on the following:

- Continuing production of three UK Joint Strike Fighter aircraft. The first two of these jets have entered the final production stages and are in pre-flight testing at the Lockheed Martin Fort Worth Texas production line.
- The Joint Strike Fighter programme System Development and Demonstration phase continues at pace with a total of 2,689 flight test hours achieved through to 24th March 2012, which exceeded test point and flight targets for all variants.
- The Joint Combat Aircraft project team received approval to accommodate further years of shared programme costs and long lead funding for a fourth Joint Strike Fighter to be procured under Low Rate Initial Purchase (LRIP) contract 7.
- A United States Department Of Defense Report announced a slip to the Joint Strike Fighter programme milestone C, which represents the conclusion of System Design and Development, to April 2019. One of the most significant cost impacts reflected in the report was the US restructuring its production profile, reducing the aircraft quantity inside the US Financial Year 2013–17 time frame by 179 aircraft. The costs of future aircraft will be affected and this impact will be considered in future approvals.

Risk Assessment against Defence Lines of Development

Equipment Training Logistics Infrastructure

Personnel Doctrine Organisation Information

Lynx Wildcat

The Capability

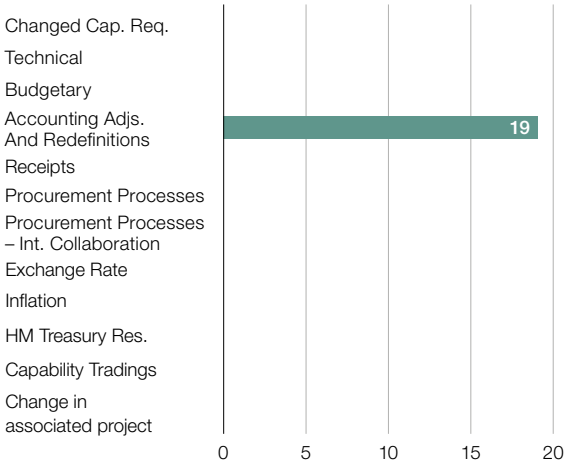
The Lynx Wildcat capability was developed to meet the requirements for a dedicated small helicopter for use in both the Land (Battlefield Reconnaissance Helicopter Requirement) and Maritime (Surface Combatant Maritime Rotorcraft Requirement) environments to replace the current Lynx fleet which is reaching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

Overview of Cost, Time and Performance

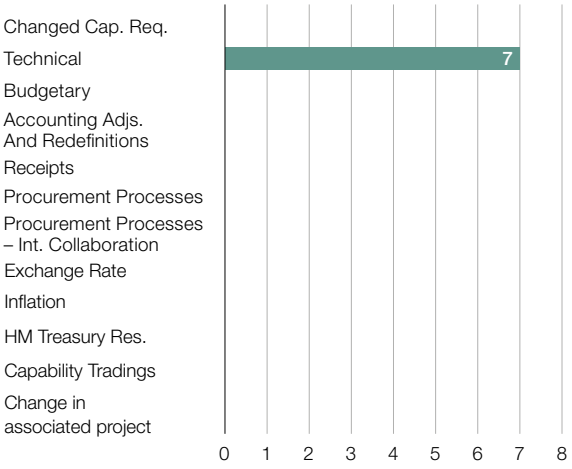
	Approved	Forecast/Actual	Variation	IY Variation
Cost of Assessment Phase	£59m	£57m	-£2m	0
Cost of Demonstration & Manufacture Phase	£1,803m	£1,663m	-£140m	+£19m
Cost of Support Phase – Wildcat Integrated support and training	£314m	£303m	-£11m	-£11m
Duration of Assessment Phase – Battlefield Reconnaissance helicopter		54 months		
Duration of Assessment Phase – Surface Combatant Maritime Rotorcraft		45 months		
In-Service Date – Battlefield Reconnaissance helicopter	January 2014	August 2014	+7 months	+7 months
In-Service Date – Surface Combatant Maritime Rotorcraft	January 2015	January 2015	0 months	0 months
Support Contract Go-Live – Wildcat Integrated support and training	April 2012	April 2012	0 months	0 months
Support Contract End date – Wildcat Integrated support and training	March 2017	March 2017	0 months	0 months

In-year Cost and Time Variation Detail

In-Year Costs (£m)



In-Year Time (months)



Production aircraft build continues to schedule with six Army Helicopter having achieved flight milestones with a further four Army Helicopter and two Helicopter Maritime Attack aircraft in production.

Significant unanticipated activity has been undertaken to satisfy the emerging Regulatory Instructions issued by the recently formed Military Aviation Authority (MAA). Following the issue of the Aircraft Release Recommendations by the Independent Technical Evaluator (Aircraft Test and Evaluation Centre (ATEC)) the Aircraft Release to Service Recommendations will be endorsed by Director Helicopters and forwarded to the MAA and the Army Release to Service Authority for approval in April 2012, to enable flight by Service personnel.

Following approval in December 2011, AgustaWestland were awarded the Wildcat Integrated Support and Training (WIST) contract on 26 January 2012 for Pricing Period 1 (to 31 March 2017) within the framework of a through-life, single source contracting arrangement with integral five-yearly re-pricing and exit strategies. The contract provides the full range of Technical and Materiel Support Services, a Support Management Organisation and a Training Service. Following the establishment phase, it will 'go live' to support the first aircraft delivery from April 2012.

The Support and Training Key Performance Indicators will be reported on in MPR 13.

Risk Assessment against Defence Lines of Development – Battlefield Reconnaissance Helicopter

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

Risk Assessment against Defence Lines of Development – Surface Combatant Maritime Rotorcraft

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

Merlin Capability Sustainment Programme

The Capability

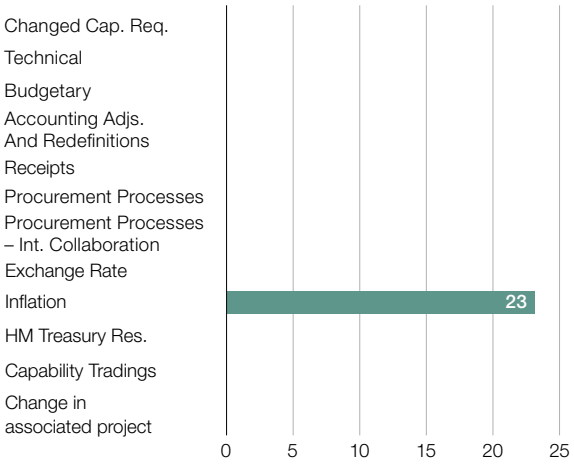
The Merlin Capability Sustainment Programme will update 30 Merlin Mk1 aircraft to overcome existing and forecast obsolescence within the Weapon System Avionics to ensure sustainment of the required capability until the planned Out of Service Date (2029). The converted aircraft will be known as Merlin Mk2.

Overview of Cost, Time and Performance

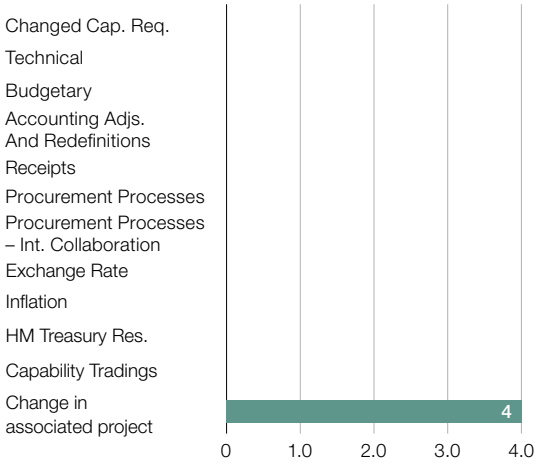
	Approved	Forecast/Actual	Variation	IY Variation
Cost of Assessment Phase	£29m	£27m	-£2m	
Cost of Demonstration & Manufacture Phase	£805m	£791m	-£14m	+£23m
Cost of Support – Integrated Merlin Operational support (whole fleet)	£629m	£624m	-£5m	-£5m
Duration of Assessment Phase		34 months		
In-Service Date	February 2014	June 2014	+4 months	+4 months
Support Contract Go-Live – Integrated Merlin Operational support (whole fleet)	April 2011	April 2011	0 months	0 months
Support Contract End date – Integrated Merlin Operational support (whole fleet)	March 2016	March 2016	0 months	0 months

In-year Cost and Time Variation Detail

In-Year Costs (£m)



In-Year Time (months)



The key milestone for 2011-12 was the clearance of the Merlin System Configuration (MSC) software standard at Issue 3.0 which supported the 'Ready for trials' milestone. This enabled formal flight trials to commence and occurred on schedule in July 2011. The programme uses a 'fly-fix-fly' philosophy that has delivered further increments of maturing software builds (3.0.1, 3.0.2, 3.1, 3.1.1 and 3.2). All activity fully supported through a thorough safety and airworthiness process. Factory training was delivered for the Combined Test Team to facilitate the trials programme. Formal acceptance of the contracted System Requirements Document commenced – primarily related to legacy Mk1 read across. The engineering training devices have commenced production following a successful Technical Design Review that froze the design baseline. The third and final Production Readiness Review was held on schedule (28 July 2011) and signalled the readiness for full rate production which commenced in January 2012.

In November 2011, an issue with data on expiry dates of aircraft components within the Merlin forward fleet led to a temporary cessation of flying for the entire Merlin non-operational fleet. This included all Mk2 trials aircraft. This prevented Merlin Capability Sustainment Programme development flying (2-3 months) at a critical stage in the programme and effectively missed one 'fly-fix-fly' cycle. In addition, programme pressures including new certification regulation with the establishment of the Military Aviation Authority has increased the overall schedule risk and is reflected in the 50% confidence date moving to June 2014 (+4 months).

Risk Assessment against Defence Lines of Development

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

Queen Elizabeth Class Aircraft Carriers

The Capability

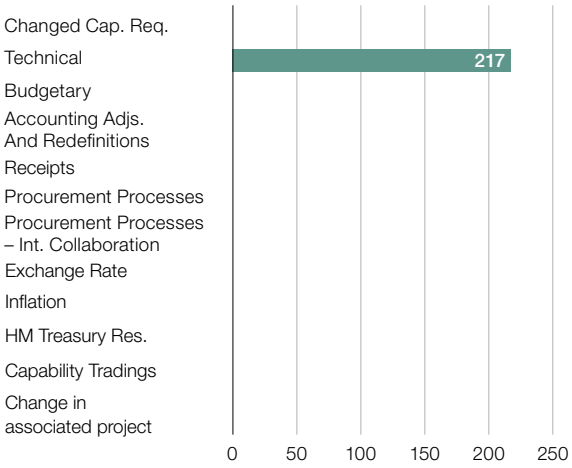
The platform element of the Carrier Strike capability will be provided by the Queen Elizabeth Class Aircraft Carriers. A staged approval to Main Gate in 2007 led to the formation of the Aircraft Carrier Alliance (comprising MoD and Industry) and contract award in 2008 to deliver the programme with In-Services Dates originally planned for 2014 and 2016. The continuing need for the Carrier Strike capability was confirmed in The Strategic Defence and Security Review 2010.

Overview of Cost, Time and Performance

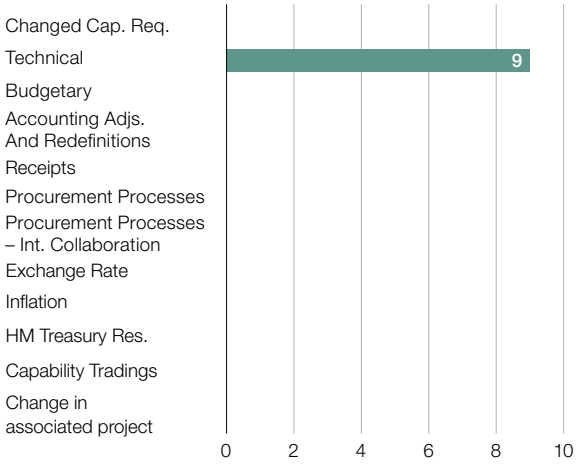
	Approved	Forecast/Actual	Variation	IY Variation
Cost of Assessment Phase (including Conversion)	£176m	£332m	+£156m	–
Cost of Demonstration & Manufacture Phase	£3,541m	£5,348m	+£1,807m	+£217m
Duration of Assessment Phase (including Conversion)		106 months		
In-Service Date	July 2015	July 2017	+24 months	+9 months

In-year Cost and Time Variation Detail

In-Year Costs (£m)



In-Year Time (months)



In October 2010, the government announced the conclusions of the Strategic Defence and Security Review. As part of this announcement, only one QE Class carrier would be operated, while the other would enter Extended Readiness. Furthermore, the operational carrier would be fitted with catapults and arrestor gear to allow it to operate the more capable Carrier Variant Joint Strike Fighter aircraft. In order to facilitate this change, the Capital Ships project is undertaking an 18-month conversion development phase to develop an optimum conversion solution. This work is expected to conclude in late 2012, with decisions taken in early 2013. However, a formal announcement is expected to be made in mid-May 2012, on the close out of the Department's Planning Round 2012. As a result of this decision there will be a requirement to fully review the overall programme to develop revised cost and time estimates.

The Goliath Crane was delivered to Rosyth in March 2011 and was commissioned (ready for use) in June 2011. Steelwork began on HMS PRINCE OF WALES's Lower Block 03 at Govan, with a formal steel cut ceremony held on 26 May 2011.

Work has continued across all six shipyards involved in the project, with Lower Blocks 02 (Portsmouth) and 04 (Govan) expected to be delivered to Rosyth in the coming months.

After the end of our reporting year, in May 2012, the Secretary of State announced the Department's decision to cancel Conversion, and to revert to the pre Strategic Defence and Security Review position of operating the Queen Elizabeth Class as a Short Take-Off and Vertical Landing platform. The decision to revert will result in a write-off of costs accrued up to 10 May 2012. As of the end of April 2012, up to £44m had been committed and the Department will be liable for associated rundown costs. The full impact of reverting to Short Take-Off and Vertical Landing is currently being considered and will form part of the final write-off business case.

The schedule and cost impact of this decision will need to be assessed and will be part of the project's re-approval submission toward the end of 2012.

Risk Assessment against Defence Lines of Development

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

Specialist Vehicles

The Capability

Specialist Vehicles will be more fightable, survivable, lethal, and have a greater find capability than the increasingly obsolescent legacy Combat Vehicle Reconnaissance (Tracked) fleet. Specialist Vehicles will provide a mobile, protected ground platform for reconnaissance to fill a capability gap and will contribute to a combined arms capability of modern, medium-weight, strategically deployable, tracked vehicles.

Overview of Cost, Time and Performance

	Approved	Forecast/Actual	Variation	IY Variation
Cost of Assessment Phase	£109m	£129m	+£20m	
Cost of Demonstration & Manufacture Phase	£1,394m	£1,394m	–	–
Duration of Assessment Phase	–	Continuous	–	–
In-Service Date	–	–	–	–
Support Contract Go-Live	–	–	–	–
Support Contract End	–	–	–	–

In-year Cost and Time Variation Detail

Recce Block 1 and Common Base Platform Demonstration:

Building on the initial progress started in 2011, the programme has successfully completed its stage payment milestones for:

- Integrated Baseline Review and System Design Review of the Turret
- System Design Review
- Preliminary Design Review of the Platform
- Entry Review into the Preliminary Design Review Anchor Milestone.

An Information Note was submitted in June 2011 to the Internal Approvals Committee noting the enduring need for the Specialist Vehicles project after the Strategic Defence and Security Review, with change to the Defence Planning Assumptions and Planning Round 11. It also noted the assumption that General Dynamics UK Ltd would be the Prime Contractor for Recce Block 2 subject to demonstrating value for money and Internal Approvals Committee approval through a Review Note planned for later in 2012 following the announcement of Planning Round 12. A number of Programme Options have been scoped out during the year to inform this planning round, and as of 31 March 2012, no formal decision has been taken on which Programme Option would be run in Planning Round 2012.

In February 2012, an opportunity arose to conduct extra cannon integration tests and mine blast characterisation by 31 May 2012, at no cost or compromise to MoD. These trials provide additional design maturity understanding on exit from Preliminary Design Review, as useful risk reduction for Critical Design Review later in the project. Exit from the Preliminary Design Review is dependent on presentation and acceptance of maturity evidence and continuing risk reduction plans going forward.

Risk Assessment against Defence Lines of Development

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

Type 45 Destroyer

The Capability

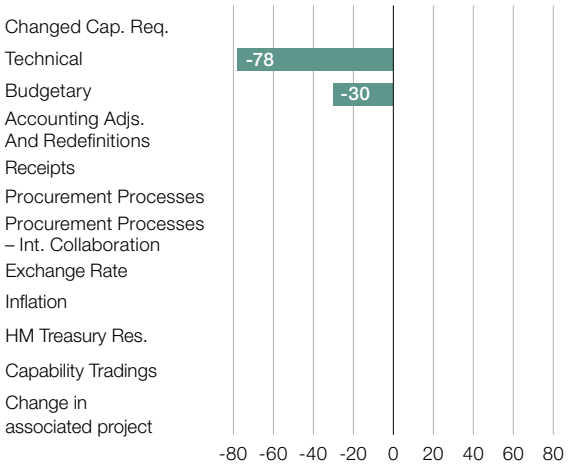
The Type 45 is a new class of six Anti-Air Warfare Destroyers, to replace the capability provided by the Royal Navy's existing Type 42s. The warship is being procured nationally. The Type 45 will carry the Principal Anti-Air Missile System (including the Aster missile, now known as Sea Viper) which is 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

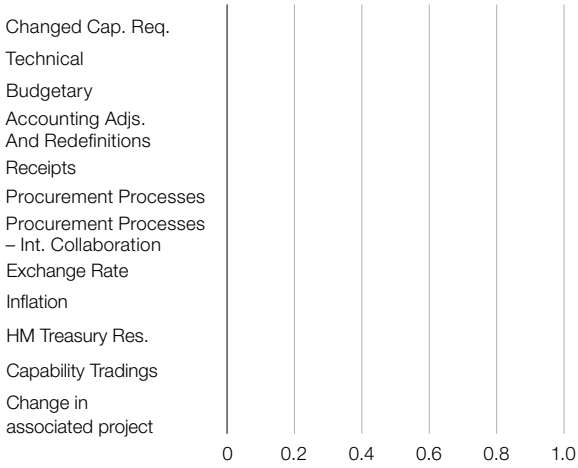
	Approved	Forecast/Actual	Variation	IY Variation
Cost of Assessment Phase	£213m	£232m	+£19m	–
Cost of Demonstration & Manufacture Phase	£4,757m	£5,556m	+£799m	-£108m
Cost of Support Phase – Initial Spares	£14m	£14m	0	0
Cost of Support Phase – Full Support	£804m	£747m	-£57m	+£5m
Duration of Assessment Phase		108 months		
In-Service Date	May 2007	July 2010	+38 months	0 months
Support Contract Go-Live – Initial Spares	June 2008	June 2008	0 months	0 months
Support Contract Go-Live – Full Support	April 2009	September 2009	+5 months	0 months
Support Contract End date – Initial Spares	–	–	–	–
Support Contract End date – Full Support	November 2017	–	–	–

In-year Cost and Time Variation Detail

In-Year Costs (£m)



In-Year Time (months)



Throughout the course of the last 12 months, up to end March 2012, the Type 45 programme continued to deliver against its target plans across the class of six ships. The most notable achievements were a successful High Seas Firing of the Sea Viper missile system from HMS Daring in April 2011 (the first from that ship), the declaration of In-Service Date of the third Type 45 HMS Diamond in July 2011, and the Acceptance Off Contract of the fourth Type 45 HMS Dragon in August 2011. In addition, sea trials of those ships yet to reach In-Service Date have also been successful with the fifth Type 45 Defender undertaking both of her contractor led trials and HMS Dragon completing sufficient of her MoD led trials to successfully demonstrate the level of military utility to enable the Transfer Of Asset to the front-line user, Navy Command, in February 2012.

The successful delivery of the above programme milestones has allowed the MoD to retire risk funding and for both Industry and MoD to re-cost remaining activities with greater certainty in the final outturn of the programme. These are the significant contributors to the in-year programme cost reduction of £108m.

Risk Assessment against Defence Lines of Development

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

Typhoon

The Capability

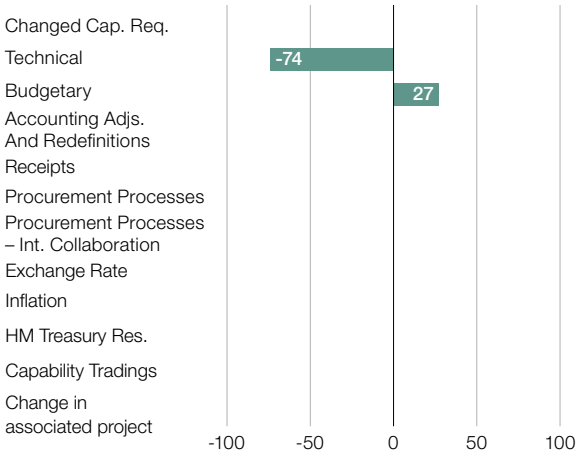
Typhoon is an agile, multi-role combat aircraft, which is being developed, produced and supported in a collaborative project with Germany, Italy and Spain. Typhoon entered service with the RAF in 2003 and commenced operational duties in June 2007 when it assumed Quick Reaction Alert responsibility for 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 enhancements to the Typhoon aircraft, both in the air-to-air and air-to-surface roles, to sustain the RAF's Typhoon fleet's multi-role capabilities.

Overview of Cost, Time and Performance

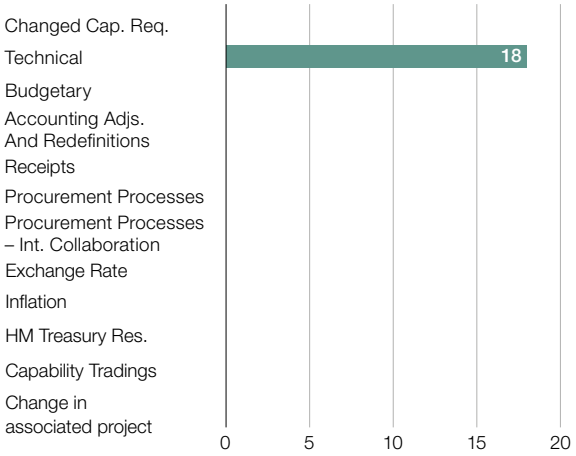
	Approved	Forecast/Actual	Variation	IY Variation
Cost of Assessment Phase	£132m	£123m	-£9m	
Cost of Demonstration & Manufacture Phase – Typhoon	£15,173m	£17,671m	+£2,498m	-£69m
Cost of Demonstration & Manufacture Phase – Typhoon Future Capability Programme	£402m	£441m	+£39m	+£22m
Cost of Support Phase	£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	December 2013	+18 months	+18 months
Support Contract Go-Live	–	–	–	–
Support Contract End	–	–	–	–

In-year Cost and Time Variation Detail

In-Year Costs (£m)



In-Year Time (months)



The outcome of the review into basing was announced by the Secretary of State for Defence in July 2011, which will result in the closure of Leuchars as an Air Force base and move the Typhoon Squadron to RAF Lossiemouth, redeploying aircraft from 2013 onwards.

A proposal was made in May 2010 by the Eurofighter GmbH consortium to slow down the rate of production of Typhoon Tranche 3A aircraft for all four partner nations. The Typhoon partner nations agreed to this proposal in July 2011. The agreement on production slowdown aims to protect the industrial capacity of the Eurofighter partner companies to service export orders for Typhoon while meeting the requirements of the partner nations. In March 2011, Typhoon aircraft were deployed overseas for the first time on contingent operations in support of the coalition plan to enforce United Nations Resolution 1973 (Libya).

Following Typhoon's first overseas contingent operational deployment in March 2011 on Operation ELLAMY, it was used initially in an air defence role and then as a ground attack aircraft against targets varying from tactical to strategic. The aircraft consistently demonstrated exceptional levels of reliability, performance, accuracy and overall cost-effectiveness over and above the MoD's very high expectations. Typhoon aircraft deployed on Operation ELLAMY returned to the UK in September 2011.

In June 2011, the ministers of the four core partner nations signed an agreement which signalled their intent to develop an operational requirement for an Electronically Scanned radar for the Eurofighter programme which would aim to introduce a harmonised new radar on to the aircraft, also enhancing the exportability of the aircraft to new overseas customers.

Risk Assessment against Defence Lines of Development

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

Warrior Capability Sustainment Programme

The Capability

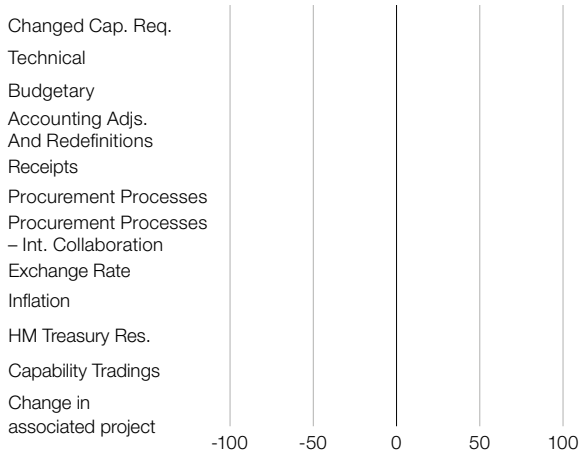
The Warrior Armoured Fighting Vehicle was brought into service in 1988 with an Out of Service Date of 2025. The requirement for the Warrior Capability Sustainment Programme is to sustain the capability of the Armoured Infantry within the balanced force against current and emerging threats, across the spectrum of conflict until the Warrior Out of Service Date.

Overview of Cost, Time and Performance

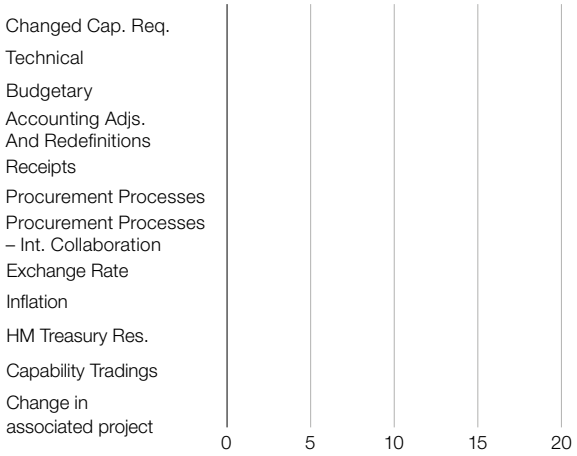
	Approved	Forecast/Actual	Variation	IY Variation
Cost of Assessment Phase	£83m	£77m	-£6m	–
Cost of Demonstration & Manufacture Phase	£1,319m	£1,319m	£0m	£0m
Cost of Support Phase – Battle Group Thermal Imaging	£61m	£67m	+£6m	£0m
Cost of Support Phase – Diesel Engines and Transmissions	£25m	£14m	-£11m	-£7m
Duration of Assessment Phase – Warrior		27 months		
Duration of Assessment Phase – Common Cannon		9 months		
In-Service Date – Warrior	November 2018	November 2018	0 months	0 months
Support Contract Go-Live – Battle Group Thermal Imaging	March 2004	March 2004	0 months	0 months
Support Contract Go-Live – Diesel Engines and Transmissions	April 2009	April 2009	0 months	0 months
Support Contract End date – Battle Group Thermal Imaging	March 2019	March 2019	0 months	0 months
Support Contract End date – Diesel Engines and Transmissions	March 2014	March 2014	0 months	0 months

In-year Cost and Time Variation Detail

In-Year Costs (£m)



In-Year Time (months)



The Warrior Capability Sustainment Programme is currently in month five of a five-year Demonstration phase contract, with an option to proceed to Manufacture. Since Contract Award, the Prime Contractor has mainly focused on building their delivery team.

The Programme Measurement Baseline (which includes the Integrated Master Schedule, the Work Breakdown Structure and the Organisational Breakdown Structure) was completed and signed off on 10th February 2012.

A System Requirements Review was conducted on 28th February 2012.

The Integrated Baseline Review will be conducted on 30th April 2012.

Joint Battlefield Training and Synthetic Environment Team have placed an Expression of Interest in a Commercial journal for the Warrior Training Solution.

Risk Assessment against Defence Lines of Development

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

Cipher

The Capability

Cipher will provide protection for all of MoD's sensitive information and communications both at home and overseas. The project encapsulates work to renew the MoD cryptographic inventory and key management systems. Cipher will replace a number of current systems, in particular the General Key Management System.

There are three business drivers for Cipher. The first is to overcome the obsolescence of existing equipment and key management systems. The second is to enable network agility and interoperability with our Allies. The final driver is to improve security and efficiency in the delivery of cryptographic services.

Cipher will be delivered in three increments. Increment 1 provides an Enduring Operational Capability, Increment 2 replaces all legacy services and Increment 3 provides the additional services required to satisfy new requirements.

Overview of Cost, Time and Performance

	Approved	Forecast/Actual	Variation	IY Variation
Cost of Assessment Phase	£19m	£44m	+£25m	–

The Assessment Phase

Cipher is a combination of two earlier MoD projects, the Future Crypto Programme (delivering the hardware) and Interoperable Electronic Key Distribution (the complementary system to deliver keying material, and other supporting configuration and management data).

Following Initial Gate approval, two consortia were down-selected and awarded Assessment Phase contracts in November 2008 to evaluate potential options, develop solutions, undertake demonstration programmes and deliver costed delivery phase proposals.

Recognising the importance of Cipher and its potential use across government, the Government Communication Headquarters has engaged proactively, providing guidance on standards to ensure that the resulting solutions and services can be readily adopted by other government departments and partners across government and be interoperable with our Allies.

Cipher has continued to proceed with the successful completion of the tender evaluation process in February 2012. The public announcement of the preferred bidder has been delayed (pending resolution of a number of significant commercially sensitive issues). As at March 2012, the intent remained to submit the Main Gate Business Case for Increment 1 to Investment Approvals Committee in September 2012.

A number of Planning Round 2012 options to realign finances have impacted the project which collectively will extend the transition period, delay the realisation of benefits and extend the life of the project (but overall affordability has improved as a result).

Core Production Capability

The Capability

To maintain a naval reactor Core Production Capability (CPC) to support the UK's nuclear submarine flotilla. All Royal Navy submarine propulsion nuclear reactor cores have been manufactured at the Rolls-Royce (RR) Raynesway site.

To conduct nuclear operations on the Raynesway Site, Rolls-Royce Marine Power Operations Limited is 'Licensed' formally by the Health and Safety Executive (Nuclear Department) as required by the Nuclear Installations Act.

The technological and manufacturing capability to produce submarine reactor cores has traditionally been sustained through successive contracts for their production. With the introduction of long life cores and the reduction in the submarine flotilla size the numerical requirement for cores has reduced.

The Strategic Defence and Security Review White Paper deferred the In-Service Date for the Successor submarine to 2028.

Overview of Cost, Time and Performance

	Approved	Forecast/Actual	Variation	IY Variation
Core Production Capability	£107m	£107m	–	

The Assessment Phase

In September 2007, the Investment Appraisals Board approved the Core Production Capability Initial Gate Business Case, to down select to the phased regeneration of the Rolls-Royce Raynesway Site, as the most cost-effective way of delivering the capability.

The Assessment Phase contract was let on 13th February 2008. The contract covers Assessment Phase work up to February 2010.

Support continued with Assessment Phase related work throughout the year, with work completed including:

- Two years operation and maintenance of the current facilities. This is essential to ensure that the Nuclear Site License is maintained.
- Maturing the design of the manufacturing facility and equipment. This work is essential to allow construction to start as planned to support the programme.
- Enabling works complete – Fencing and new security gates etc. This is part of the work on the Nuclear Licensed Site boundary to maintain security requirements and to provide site access for future regeneration works on the site.
- Significant value engineering undertaken and developed. The work has continued the value-for-money exercises, with regard to the design of the Manufacturing Facility and Product Assembly Building.

Main Phase Contract negotiations commenced in June 2011.

Marshall

The Capability

The Joint Military Air Traffic Services, now known as Marshall project, seeks to sustain the provision of Air Traffic Management at MoD Airfields and Air Weapons Ranges through the provision of new capability to meet new regulatory airspace management requirements set by the Civil Aviation Authority, 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
Assessment Phase 1	£3m	£3m	–	
Assessment Phase 2	£6m	£6m	–	

The Assessment Phase

An Official Journal of the European Union Notice, initiating the formal procurement process was issued in March 2011. This process culminated in three consortia, Aquila (Thales and National Air Traffic Services), BAE Systems, and Fusion (Lockheed Martin, Selex and Cobham) being selected to participate in the next phase of the project and this was planned to commence in October 2011. However, a review of the Invitation to Participate in Dialogue documentation in August 2011 highlighted that the documentation set was insufficiently mature to release to industry and some further work was required to complete this. A revised target date of March 2012 resulted.

HM Treasury issued a letter on 22nd December 2011 which challenged the MoD over the viability of the project and asked to review the project on a stop, revise, proceed basis.

In January 2012, and implementing the recommendations of an Office of Government Commerce Gateway Review, a dedicated Team Leader was appointed. During his initial review of the project, further issues were identified where some additional work was required to fully mature the Authority position (for example – use of military manpower). This has resulted in a further delay to issue of the Invitation to Participate in Dialogue and a revised target date of October 2012 is now forecast for documentation issue subject to necessary approvals.

As a result, there has been a corresponding slip to future milestones with contract award now forecast for late 2015. An additional Review Note is planned for June this year to seek an additional £1 million to enable completion of the Assessment Phase and to note the additional time required.

These delays present a significant risk to the timely implementation of the Mode Select Secondary Radar requirement and alternative strategies to mitigate this are now being explored. Any changes will be reflected in the next Major Project Report.

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
Assessment Phase	£44m	***	***	–

The Assessment Phase

Following assessment of initial Pre-qualification Questionnaires six companies were invited to proceed to the next stage of the competition. The competition was conducted over three stages Stage 1 – Invitation to Submit Outline Solutions took place over March to September 2010. Stage 2 – Invitation to Submit Detailed Solutions commenced in October 2010 and continued through to Invitation to Submit Final Bids in October 2011 which was issued to three companies; Daewoo Shipbuilding and Marine Engineering (Republic of Korea), Fincantieri (Italy), Hyundai Heavy Industries (Republic of Korea). Three companies withdrew earlier in the competition; Flensburger Schiffbau-Gesellschaft (Germany); Knutsen OAS Ltd in June 2011 and A&P Group Ltd in August 2011.

The Main Gate Business Case for the Military Afloat Reach and Sustainability Tankers was considered and approved by the Investment Approvals Committee in October 2011. The Performance Cost and Time envelope put forward for approval was based on indicative information available and the approval of which enabled the Department to proceed to the final bid stage of the competition, which was issued in October 2011. Further departmental and HM Treasury approval to proceed to contract award was received in January 2012 and Daewoo Shipbuilding and Marine Engineering was named as the preferred bidder on 22 February 2012. The contract was awarded on 9th March 2012. In accordance with the Department's approval process, the project performance, cost and time will be calculated using the detail of the winning bid and detail of the remainder of project activity and will be reported back to the Investment Approvals Committee in Spring/Summer 2012; this will form the Main Gate approval baseline for the Military Afloat Reach and Sustainability Tanker project. Following Planning Round 2012 the Tanker element of the programme is to be considered as part of the Core Equipment Programme. The Fleet Solid Support element of the programme will be considered a Non-Core Equipment Programme which will require further departmental review before further work is undertaken.

Network Enabled Airspace Defence and Surveillance

The Capability

The requirement for future integrated air defence includes ground based command and control, surveillance and weapons. This is a Defence capability priority, driven by the need to counter the future air threat. This will evolve from current aircraft (fixed wing and helicopters) to also include cruise missiles, unmanned air vehicles, rockets, artillery and mortars. The latter are described as difficult air targets.

Network Enabled Airspace Defence and Surveillance is a large and complex incremental acquisition programme, currently in Assessment Phase for Increment 1. The programme will address the capability gap described above by providing a capability to compile and distribute a timely and accurate air picture, conduct airspace management to allow safe operations and defeat the air threat throughout the Land environment area of operations.

Overview of Cost, Time and Performance

	Approved	Forecast/Actual	Variation	IY Variation
Continuous Assessment Phase	£9m	£9m	–	

The Assessment Phase

History

Approval for the Assessment Phase 1 was given by the MoD Investment Approvals Board in February 2010, and ratified in June 2010 as part of the review by the new coalition government.

The objective of the Assessment Phase 1 is to establish the most cost-effective solution to the Increment 1 requirement and early de-risking activities for Increment 2.

The current approval covers Assessment Phase work required to reach Main Gate 1, which leads to the Demonstration and Manufacture phase for Increment 1 and effectively Increment 2 Initial Gate.

As at 31 March 2012, the project is moving steadily forward to a Main Gate submission in ***. It has been delayed primarily due to the MoD wide Comprehensive Commitment Control Regime. This delayed the start of several key tasks by ten months.

Good progress has been made however, refining the Network Enabled Air Defence and Surveillance Increment 1 requirement, and starting the operational analysis to provide much of the underlying justification for the Main Gate submission.

Engagement with industry continues, with a series of one-to-one discussions with those companies who have expressed an interest in Increment 1 work.

Spearfish Upgrade

The Capability

Spearfish is the sole heavyweight torpedo in the UK arsenal and is carried aboard Trafalgar and Vanguard Class submarines. The weapon was introduced into service in 1994 and is the only submarine launched weapon for offensive and defensive operations against ships and other submarines. Spearfish will be deployed in the Astute Class from 2013 and an upgraded Spearfish weapon is the planning assumption for equipping the future Deterrent.

Overview of Cost, Time and Performance

	Approved	Forecast/Actual	Variation	IY Variation
Assessment Phase	£49m	£49m	–	

The Assessment Phase

History

The Spearfish Upgrade project was approved in April 2010. The Approval allows the project to proceed from the Assessment Phase into the Demonstration and Initial Manufacture Phase, subject to remaining within approved time and cost constraints together with the satisfactory achievement of the Assessment Phase technology milestones.

Progress

All technical aspects of the project are proceeding satisfactorily. The warhead design achieved the required level of technological maturity in January 2012 following successful land based and underwater scale test firings undertaken in Germany and the UK respectively.

The fibre optic dispensing system evaluation trials in April 2011 identified problems with the fibre optic specification which necessitated a change to a more ruggedised specification of fibre. This element is not on the critical path and remains on track within the overall programme.

Initial design work to define and develop the interface between the upgraded weapon and the submarine combat system was completed in February 2012. This work is now being taken forward in conjunction with the Submarine Combat System Team in Defence Equipment & Support and BAE Systems.

Successor

The Capability

In 2007, Parliament endorsed the government's decision set out in their 2006 White Paper, *The Future of the United Kingdom's Nuclear Deterrent*, Cm 6994, to maintain a Continuous At Sea Nuclear Deterrent by means of a new class of submarine. This will replace the current Vanguard class as it comes out of service.

The submarines are part of the MoD's committed core equipment programme as announced by the Secretary of State on 14th May 2012. Any decision to build will not be taken until after the next General Election expected in 2015 with any Main Gate Approval expected in 2016.

The expected overall cost of any replacement of the Nuclear Deterrent remains as set out in Para 5-11 of the 2006 White Paper as between £15–20bn for a four boat solution.

Overview of Cost, Time and Performance

	Approved	Forecast/Actual	Variation	IY Variation
Assessment Phase	£3,016m	£3,037m	+£21m	

The Assessment Phase

Progress

Immediately following approval, design activities commenced under an extension of the Concept contract while the full Design Phase and Engineering services framework contracts were finalised and signed with BAE Submarine Solutions and Babcock on 13th December 2011. These cover the period up to Main Gate and consist of an overarching framework structure with rolling waves of task packages. A contract amendment to align with these contracts was also placed with Rolls-Royce. A Collaborative Agreement between all three companies and the MoD was also signed. This governs the relationships between industrial parties' performance and profit retention.

An Integrated Master Schedule has been agreed with industry across the Programme.

The MoD and Integrated Programme Management teams have been established and teams built up in Barrow and Derby. Staff resource remains a challenge for the MoD in the face of overall MoD cuts.

A Review Note on progress in-year was submitted to the MoD's Investment Approvals Committee in July 2012. This is due to be followed in autumn 2012 by the first 'Successor' Annual Report to Parliament.

The approval for the Common Missile Compartment is not part of the Initial Gate approval, but the main investment decision will be in the Main Gate approval. It is planned that a Review Note regarding the build location will be submitted in 2012.

Milestones for the year 2012-13 are to hold a Whole Boat Strategic Design review and an extension of the Next Generation Nuclear Propulsion Plant contract.

Type 26 Global Combat Ship

The Capability

The Type 26 Global Combat Ship will replace the 13 Type 23 surface combatant capability before the safe operating standard for legacy ships is withdrawn and the Type 23 platforms become obsolete. This decision came out of the Strategic Defence and Security Review.

The Type 26 Global Combat Ship is a globally deployable and sustainable warship that will form the spine of the Royal Navy's future fleet. It is a task group enabled Anti-Submarine Warfare warship and will combine the capabilities necessary to protect maritime task groups, the strategic deterrent and land forces, with the flexibility to conduct a wide range of other tasks. The Type 26 Global Combat Ship retains the combat power that had been provisioned for the Type 26 C1 originally, while enhancing endurance and intelligence gathering attributes.

Overview of Cost, Time and Performance

	Approved	Forecast/Actual	Variation	IY Variation
Assessment Phase	£158m	£151m	-£7m	

The Assessment Phase

History

Following the Strategic Defence and Security Review, the decision was taken to change to a Type 26 Global Combat Ship design that is smaller, with reduced capability scope and more exportable while still meeting the needs of the Royal Navy and maintaining the needs of industrial sustainability. *The Strategic Defence and Security Review* reduced the total surface fleet to 19 frigates and destroyers, which will include six Type 45 destroyers and the current Type 23 frigates. The latter will be replaced by Type 26 Global Combat Ship after 2020. This has reduced the overall procurement cost of the programme (not including Support costs) from ***.

Progress

The design and study work for the Analysis of Options stage concluded in the Capability Decision Point, held in November 2011. This identified a baseline design from which more detailed design work has commenced, including the assessment of that design which is being matured during the remainder of the Assessment Phase. The Capability Decision Point informed the Main Gate 1 submission which has been endorsed by the MoD Investment Approvals Committee. Main Gate 1 provides approval for the Project Team to continue the Assessment Phase with the detailed design work on the Type 26 Global Combat Ship capability architecture, down selected on the basis of the Capability Decision Point output; and for the Support Solution to enter its Assessment Phase. The detailed design phase and industry engagement process will underpin the programme's Main Gate 2 at the end of the Assessment Phase, which is expected to conclude towards the middle of this decade, allowing the production phase to begin within the same timescales.

In order to maximise Type 26 Global Combat Ship export potential to realise wider benefits to the MoD, industry and the UK, engagement has begun with several countries to determine their requirements and how these can be matched with Type 26 Global Combat Ship. The design is being developed in close partnership with industry to improve the opportunities for these requirements to be realised in the design.

United Kingdom Cooperative Engagement Capability Frigate and Destroyers Programme

The Capability

The Cooperative Engagement Capability is a United States Naval System fitted to an increasing number of United States assets including ships, aircraft, and Army and Marine Corps land systems. It optimises war-fighting capabilities inherent in existing and future combat systems.

UK Cooperative Engagement Capability is a UK Network-Enabled Capability project which provides an advanced air and missile defence capability by sharing and fusing engagement quality data from suitably equipped platforms to deliver a single, coherent, stable air picture. It will fill the capability gap originally identified in Commander-in-Chief Fleet's Military Capability reports and reaffirmed in the Above Water Effects capability audit in 2007, updated in 2009, to detect, monitor, and counter Air-Warfare threats. It will also reduce a gap in interoperability with the United States.

Overview of Cost, Time and Performance

	Approved	Forecast/Actual	Variation	IY Variation
Assessment Phase	£25m	£53m	+£28m	

The Assessment Phase

History

The objective of the Assessment Phase is to establish the most cost-effective solution to the requirement for a Cooperative Engagement Capability for maritime platforms. It is a proven programme which the UK is considering purchasing via the Foreign Military Sales process. The UK, with United States assistance, is developing and testing the platform architecture and support and integration aspects, to reduce risk prior to Main Gate.

Progress

Continuation and resultant completion of Assessment Phase work with BAE Systems Surface Ships Limited. All Assessment Phase Deliverables have been received and accepted by Defence Equipment and Support. Three bids have been received from Industry to support Main Gate submission. The bids are from BAE Systems Surface Ships Limited, MBDA and Mission Systems. Parallel pricing work has been tasked to Cost Analysis & Assurance Services with four engineering tasks placed including an Independent Cost Estimate for software pricing. Evaluation of the bids are being carried out by the Delivery Team in anticipation of favourable Planning Round 12 outcome to proceed to Main Gate in Financial Year 2012-13. The Procurement Strategy has been fully endorsed by Intelligent Surveillance Targeting Acquisition & Reconnaissance Commercial Head. Delays in announcing Planning Round 12 resulted in a Main Gate forecast of September 2012.

Planning Round 2012 has announced United Kingdom Cooperative Engagement Capability Project Delete Option E12AW006S has been taken and is not part of the funded Core Programme. Delete Option also identified £1m to conduct project closedown activities in Financial Year.

Appendix Five

Inflation in the *Major Projects Report*

1 All the approvals and forecast costs reported within the *Major Projects Report* are on an outturn basis and therefore include the Department's assessment for inflation. All projects approved since 2000 have been approved on an outturn basis i.e. the cost is the actual amount of cash expected to be paid out in the year that spend is forecast to occur, taking into account assumptions about future inflation. Projects approved prior to 2000 were not approved on an outturn basis, but they were all converted in the *Major Projects Report 2000* to be comparable.[19]

2 When projects are forecasting costs, they assess the inflation assumptions they are using. Within the Department there is an organisation called the Defence Analytical Services Agency, who provide independent expertise on price indices. They are able to help projects in forecasting inflation for their specific industry. It is also mandated that they review inflation rates if they are built into contracts for new equipment.

3 We compare the forecast cost of a project to the approved outturn cost when the project passed its main investment decision. The data used is compiled by the Department.

4 When analysing the reasons for cost variations within the project summary sheet the Department attributes a category to the variation. Inflation is one of these factors available for the Department to use and has been used this year; for example, on the Future Strategic Tanker Aircraft project, where £336 million was attributed to fuel inflation, calculated over the whole life of the aircraft (see paragraph 1.3 second bullet). Other reasons why inflation would be a factor in a cost variation include:

- The actual rate of inflation has varied from what was used as the planning assumption.
- A project has significantly altered its timescale for delivery, as the timing of payments affect the amount of inflation incurred.

19 Comptroller and Auditor General, *Major Projects Report 2000*, Session 1999-2000, HC 970, National Audit Office. Available at: www.nao.org.uk/publications/9900/major_projects_report_2000.aspx

Appendix Six

Expenditure for operations

Figure 12

Approved expenditure for air transport and air-to-air refuelling for operations, and to mitigate delays to new capabilities, since 2001 (millions)

Reason	Platform	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	Total
Iraq	BAe146						5						5
	C-17				30								30
	Hercules		36	11			7	46					100
	Tristar				28								28
	VC10 and Tristar		2			3							5
Afghanistan	BA125						5						5
	BAe146							7	20				27
	C-17								1				1
	Hercules	10				1	7	53			5	3	79
	Tristar					30			16				46
												Operations subtotal	**326**
Mitigating delays to new capabilities	BAe146											47	47
	C-17									176		215	391
	Hercules											16	16
	Tristar											7	7
												Delays subtotal	**461**
												Grand total	**787**

Source: National Audit Office analysis of departmental data

Figure 13

Approved expenditure for helicopters for operations since 2002 (millions)

Operation	Platform	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	Total
Iraq	All			8		30						38
	Chinook	28	3									31
	Lynx	7	8		1	1	6	7				30
	Merlin				2		213		7			222
	Puma					1	8	12				21
	Sea King		1				2					3
Afghanistan	All				2		17		1	1		21
	Apache				5	2	34	16				57
	Chinook				5	18	77	1	23	33	1	158
	Lynx				1	3	8	74	24	85		195
	Merlin							45	11		1	57
	Sea King					25	6	46	22	2	12	113
										Grand total		**946**

Source: National Audit Office analysis of departmental data

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