



National Audit Office

Report

by the Comptroller
and Auditor General

Ministry of Defence

The Major Projects Report 2013

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Ministry of Defence

The Major Projects Report 2013

Report by the Comptroller and Auditor General

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Amyas Morse
Comptroller and Auditor General
National Audit Office

10 February 2014

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second volume comprising of – Ministry of Defence:
The Major Projects Report 2013 Appendices and Project
Summary Sheets HC 817-II

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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This report can be found on the National Audit Office website at www.nao.org.uk/mpr-2013-i

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Key facts

Cost:
£708m

increase during 2012-13 in forecast costs to complete all projects

Time:
17 months

increase during 2012-13 in forecast delay to complete all projects

Quality:
98%

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

£754 million

the increase in the cost of Carriers following the negotiations that were concluded in November 2013

1,409 months

planned total time to complete the 11 projects when they were approved

176

the total number of technical specifications that the 11 projects are measured against

£46.0 million

the reduction during 2012-13 in the cost of the remaining 10 projects

3

the number of technical specifications that are not expected to be met

£55.6 billion

current forecast cost to complete the 11 projects

1,710 months

current estimated time to complete the 11 projects

£6.1 billion

cost increase on the 11 projects since approval

301 months

total delay to the 11 projects since approval

12.3 per cent

the overall cost increase of the 11 projects since approval

21 per cent

the overall time slippage against original planned project length

Summary

1 Each year the Ministry of Defence (the Department) presents a major projects report to Parliament. The report has data on the cost, time and performance of the largest defence projects where the Department has taken the decision to invest, together with less detailed information on the largest projects where it has not yet taken the decision to invest. This report presents our analysis of the Department's data and the key findings arising from the data. The report is published alongside our examination of the Department's Equipment Plan, which examines the assumptions underpinning the Department's forecast of costs over the period 2013 to 2023. Together, these two reports aim to provide an informed basis for Parliament to examine how the Department is managing the procurement and support of the UK's defence capability.

2 The analysis in the report is based on an examination of a sample of 16 of the largest defence projects. This year we used the same sample of projects for this report as for the *Equipment Plan 2013 to 2023*. The sample comprises 11 projects for which the Department has decided to invest.

3 In November 2013, the Department concluded its negotiations with industry for the Queen Elizabeth Class aircraft carriers (Carriers). Although the *Major Projects Report 2013* covers the 2012-13 financial year and the negotiations for the Carriers were not concluded until November 2013 (outside the *Major Projects Report 2013* reporting period), the Department had allocated a budget for the additional cost in its *Equipment Plan 2013 to 2023*. As the negotiations have now been completed, the total forecast cost of the Carriers can now be disclosed and included in this report. Therefore, the report includes the cost variation resulting from the deal as if it was a 2012-13 in-year variation. All other project costs are reported as at 31 March 2013, and do not include any cost or time changes that may have occurred since that date.

Key findings

Costs

4 **In 2012-13, there was a net cost increase of £708 million across the 11 projects in our analysis.** The total planned cost of these projects was £49.5 billion, so this represents a cost growth of 1.4 per cent.

5 **The main driver for this was a £754 million cost increase on Carriers following the conclusion of the negotiations in November 2013.** The cost growth was caused by a number of factors including the delay to the schedule, and Industry's underestimation of the level of labour and materials required to build the ships, which resulted from a lack of design maturity.

6 The impact of the Department's decision in 2012 to revert back to the Short Take-Off Vertical Landing (STOVL) variant of the Joint Strike Fighter added £120 million to the cost of the Carriers. This was to cover the cost of re-instating the ramp and other STOVL-specific equipment and of restarting the work that was stopped as a result of the decisions taken in the 2010 Strategic Defence and Security Review. In addition, the Department now expects to write-off up to £55 million due to the reversion decision, lower than the estimate of £74 million that we reported in May 2013. This figure is being treated separately to the main Carrier cost and is not reflected in the cost growth figure of £754 million.¹

7 Excluding Carriers, there was a net cost decrease of £46 million across the ten remaining projects. The costs of all but one of these have changed during 2012-13 with three projects showing increased costs and six reduced costs.

8 The Department has changed its inflation assumptions on two of the projects, and this has accounted for more than £100 million of cost increases. Changes to inflation assumptions during the year resulted in a £56 million cost increase for the Warrior Capability Sustainment Programme and a £45 million cost increase on the Future Strategic Tanker Aircraft. As reported in the *Equipment Plan 2013 to 2023*, changes in inflation assumptions may affect the overall affordability of the Equipment Plan, as small changes may have significant cost implications on long-term projects.

9 Costs have been reduced by improving commercial arrangements. The Department reduced its forecast costs by £26 million on the Core Production Capability project by renegotiating the profit rate with industry. It reduced costs by £19 million on the Future Strategic Tanker Aircraft project by finalising contract terms with industry. A reduction in forecast costs of £26 million was made on the Astute programme as a result of improved efficiency across the submarine sector.

10 There continues to be a wide gap between forecast costs and approved costs largely due to historical performance. The 73 projects included in our analyses since 2000 have a total forecast value of £106.9 billion, 9.0 per cent above their approved value. The eight projects in our analysis that have been approved since the 2010 Strategic Defence and Security Review, which have a combined approval value of £9.2 billion, are forecasting a slight decrease of £151 million (1.6 per cent). Carriers is the only significant cost increase to have occurred over the past two years.

11 Larger projects are responsible for the big cost increases over the years. The Department's 11 largest projects account for all of the £8.8 billion cost growth since 2000. By contrast, there are 47 projects in our analysis with an approval value of less than £1 billion, only two of which have increased in cost by more than £100 million. Together, the 47 projects have decreased in cost by £224 million.

¹ Comptroller and Auditor General, *Ministry of Defence: Carrier Strike: The 2012 Reversion Decision*, Session 2013-14, HC 63, National Audit Office, 10 May 2013

12 In recent years, the overall size and value of approved projects has decreased and the Department has broken up larger projects into smaller increments.² The total value of approved increments and upgrades is nearly three times the amount approved for new projects since 2005. In the weapons and land equipment sectors, the Department moved away from approving many of its projects in a single block and is now more likely to approve projects in smaller increments. For example, the Complex Weapons Programme aims to procure a range of weapons through a 'pipeline of work' with industry partners. The Department originally intended to have one approval for the ten-year pipeline. However, it agreed with HM Treasury to seek approvals for specific weapons and smaller work packages within the pipeline.

Time

13 We are unable to report on timings for two of the 11 projects we examined – Lightning II and Specialist Vehicles. This is because the Department has not yet taken the final decision to fully manufacture and introduce them into service. Therefore, we are unable to report on the progress of these projects towards their entry into service dates and so they are not subject to the same level of Parliamentary scrutiny as the other projects which do have approved entry into service dates. This should be considered when interpreting the findings from the remaining nine projects in this report.

14 There was a net delay this year on the remaining nine projects of 17 months. The total planned length of these projects was 1,409 months, so this represents a delay of 1.2 per cent. This means that the timescales for these nine projects are now expected to be 21 per cent longer than the Department originally planned. Last year, the Department said it was taking a more realistic approach to planning project timescales. This year, three of the nine projects we examined reported delays during the year: a nine-month delay on Complex Weapons due to technical problems with Brimstone 2, one of the weapons in the Programme; a five-month delay to the Carriers programme which was agreed as part of the new deal; and a three-month delay on the Core Production Capability project because of renegotiations with industry over reduced profit rates. This compares favourably with last year, when eight of the 14 projects had delays, and six of these were for more than a year.

15 The average delay for projects approved since 2000 is 23 months, which brings the increase in length to 35 per cent. More than half of the 71 projects approved since 2000 have experienced delays of more than a year, and eight of more than five years. The eight projects covered in our analysis that have been approved since the 2010 Strategic Defence and Security Review have reported a total slippage of nine months (1.3 per cent) against an approved duration of 713 months.

² The exception is the Future Strategic Tanker Aircraft project, with an approval value of £11.7 billion. This is a private finance initiative deal spanning 27 years and the value includes the whole-life costs rather than just the procurement cost, which is the case for all other projects in our analysis.

Performance

16 This year the Department expects to achieve 98 per cent of its key performance measures. These measures are set for each project at the time the Department decides to invest and indicate whether the equipment will provide the required military capability. The Department also expects to achieve all but one of the 103 defence 'lines of development' across the 11 projects. These lines of development relate to other elements of military capability that the Department needs to develop and complete to ensure that it can best use the equipment.

The Complex Weapons Programme

17 We examined the Department's Complex Weapons Programme (the Programme), one of the projects in our sample, in more detail this year.

The Complex Weapons Programme is a new approach to defence acquisition that comprises a number of interrelated weapons projects. These projects are managed as a portfolio, which aims to be more effective and reduce costs.

18 The Department established the pipeline as there was a need to sustain appropriate sovereign skills, to meet the UK's complex weapons requirements, to protect sovereignty and to deliver value for money. There is a clear pipeline of work with a value of £7.7 billion up to 2022-23. This means that industry can be more certain of the Department's future plans in the sector, thus enabling industry partners to plan and sustain their skills and resources.

19 The Department aims to achieve net financial benefits of £1.2 billion over ten years using this approach. The Department expects to achieve these benefits by using common components and being flexible in its contracts with industry partners. Other benefits could be achieved through collaborative working with industry and by having contracts that allow requirements and costs to be traded across the weapons portfolio. In addition, the Department anticipates significant additional financial benefits from exports.

20 These benefits could be lost if the value of the pipeline is reduced or requirements are changed. The £1.2 billion in financial benefits has already been 'banked' by the Department and included in its spending assumptions as part of its Equipment Plan. If projects in the pipeline are delayed or cancelled, some of these benefits may be lost. The Department will then incur spending above budgeted levels or will need to reduce spending elsewhere.

21 The pipeline's value has already decreased as the Department has deferred, cancelled or reduced the scope of some projects. In 2010-11, the value of the pipeline was reduced from £650 million to £600 million per year and some early expenditure was deferred into the latter half of the ten-year period. Since 2008-09, expenditure has been below £600 million each year, which has already resulted in some of the expected benefits being lost, although this has been mitigated by identification of other new benefits.

22 The requirements for some weapons in the pipeline have changed. The Department approved the Programme six months before the 2010 *Strategic Defence and Security Review*, without considering the impact of the review. The Department was not prepared for the significant changes made to weapons and aircraft requirements, and this has meant that the work plan agreed with industry has changed.

23 The Complex Weapons team was 18 per cent below its budgeted staffing levels in early 2013, and both the Department and industry recognise that this is a key risk to delivery of the Programme. The Department has 27 business cases to complete over the next two years to develop projects in the Programme and to ensure that the pipeline of work materialises. Without sufficient skilled people to produce the required evidence for the business cases there could be delays in the work schedule. These delays could result in cost increases due to inflation, disruption to industry and intended benefits being lost.

Conclusion

24 With the exception of Carriers, where costs have increased by £754 million, the performance of the other major projects during 2012-13 has resulted in no overall significant cost increases and minimal delays in comparison to previous years. However, the cost increase on Carriers shows that there remains a legacy of large complex projects across the Department that continue to have a significant impact on the portfolio as a whole.

25 The Department is, through different ways of procurement, seeking to reduce the cost of some of its major projects in order to balance its budget. For example, it has introduced a portfolio approach to the procurement of its complex weapons, which is expected to bring financial benefits of £1.2 billion in the period 2010 to 2019. Cost increases, delays and any change to the scope and volume of the Programme could put these benefits at risk. As these have already been assumed in the Department's overall spending plans, this could have a significant destabilising effect on the Department's ability to balance its budget in the years to come.

Part One

Project cost, time and performance

Scope of the report

1.1 Each year the Ministry of Defence (the Department) presents a major projects report to Parliament that provides data on the cost, time and performance of the largest defence projects for which the main decision to invest has been taken. The Department's report also contains less detailed information on the largest projects for which the main investment decision has not yet been taken. We validate, but do not fully audit, the data, and this report presents our analysis and the key findings arising from the data.

1.2 Our report looks at the year's performance and is published alongside our examination of the Department's Equipment Plan, which examines the assumptions underpinning the Department's forecast of costs over the period 2013 to 2023.³ Taken together, the two reports aim to provide an informed basis for Parliament to examine how the Department is managing the procurement and support of the UK's defence capability.

1.3 This year we used the same sample as the basis of our analyses for the two reports. Our analysis is based on a sample of 16 of the largest defence projects, 11 of which are projects for which the Department has decided to invest and has set their performance, cost and time parameters. This report covers the Department's progress against these parameters for those 11 projects.⁴ A full explanation of our sampling approach is at Appendix One.

³ Comptroller and Auditor General, Ministry of Defence: *Equipment Plan 2013 to 2023*, Session 2013-14, HC 816, National Audit Office, February 2014.

⁴ Volume II of this report includes the 16 project summary sheets the Department submits to Parliament. These consist of the 11 projects where the Department has decided to invest, plus a further five projects where the main investment decision has yet to be taken. Copies of the executive project summary sheets are contained within Appendix Six of this report.

1.4 This report covers the 2012-13 financial year for all projects with the exception of Carriers, where we have included the cost increase that occurred outside the reporting period as if it were a 2012-13 in-year variation. The report uses financial data from the Department's *Equipment Plan 2013 to 2023*, which was formally agreed by the Secretary of State in March 2013. As the forecast costs of projects extend a number of years into the future, they are based on many assumptions, including inflation and foreign exchange. Project teams' estimated costs are given as the point where costs are as likely to be an overestimate as an underestimate (this is known as the 50th percentile). This is the same approach the Department takes in assessing the affordability of the Equipment Plan. Our *Equipment Plan 2013 to 2023* found that the Department has improved how it challenges and scrutinises procurement projects costs and is making efforts to ensure that the cost lines are forecast at a reasonable level. However, good practice in costing techniques is inconsistent across project teams and we remain concerned that the Department may be inadequately incorporating risk and uncertainty in its project costs. Therefore, project cost forecasts in this report may be over-optimistic in some cases.

1.5 In this part, we examine changes during the year to the forecast cost, time and performance measures for the 11 projects where the Department has decided to invest. We also examine longer term trends in cost and time variations by looking at all the projects that have been included in the Major Projects Report analyses since 2000.

Renegotiation of the Queen Elizabeth Class aircraft carrier contract

1.6 In November 2013, the Department concluded renegotiations with industry for the Queen Elizabeth Class aircraft carriers (Carriers). This marked the end of a process that had started in May 2012 when the Aircraft Carrier Alliance (ACA),⁵ responsible for building the Carriers, began a review of costs.

1.7 The Department considered that this was necessary, not just because of the increasing cost of the Carriers, but to address a shortfall in warship building work between the completion of the Carriers and the start of Type 26 Global Combat Ship production.⁶ In 2009, the Department signed a 15 year Terms of Business Agreement which guaranteed industry a certain level of skilled warship building work. The Department has now filled this shortfall with an order for three new Offshore Patrol Vessels which it estimates will cost up to £100 million.⁷

5 The scale of the design and construction task, and the risks for the Department and any single contractor taking on the project, led the Department and industry to form the Aircraft Carrier Alliance to build the carriers. The Alliance comprises the main industrial participants – BAE Systems, Thales, Babcock Marine – and the Department.

6 Comptroller and Auditor General, *Ministry of Defence: Carrier Strike*, Session 2010–2012, HC102, National Audit Office, 7 July 2011, pages 17-18.

7 The Secretary of State for Defence (Mr Philip Hammond): 6 Nov 2013: Column 251. The agreed firm price contract value for the Offshore Patrol Vessels is £348 million. However, only up to an extra £100 million is required due to the agreed minimum payments to industry set out in the 2009 Terms of Business Agreement.

1.8 In 2012, the Department took the decision to revert to the Short Take-Off Vertical Landing (STOVL) variant of the Joint Strike Fighter – the aircraft that will fly off the carrier. The decision was the result of spiralling costs to convert one carrier⁸ to operate the carrier variant of the Joint Strike Fighter. This reversed the decision taken in the 2010 Strategic Defence and Security Review, and means that the Department now has the option to operate two STOVL carriers. The Committee of Public Accounts said that the 2010 decision was “deeply flawed” and that it wasted £74 million.⁹ However, over the past year the Department has conducted further work and now does not expect the resultant write-off to exceed £55 million.

1.9 Following its review of costs, the ACA submitted a formal proposal to the Department in July 2013 which the Department examined to identify areas of potential cost savings to inform the negotiations. In September 2013, the Department began negotiations with the ACA. In November 2013, a new deal was agreed on Carriers and the future of the UK warship building industry. Following the conclusion of the negotiations, industry started an exercise to determine where savings, agreed as part of the negotiated cost, will be found from each individual cost line and industrial partner. This exercise is ongoing and is due to be completed by March 2014. The deal reached with the ACA also means that any future cost growth will be shared equally between the Department and industry.

1.10 Since the negotiations were concluded, we have worked with the Department and industry to develop a fuller understanding of the cost increase, which has been used for our analysis in this report. We have not audited the information industry provided, but the Department has assured us that the figures provided by industry are reasonable and that the current cost is comparable with that previously reported.

1.11 Although the negotiations for Carriers were concluded in November 2013 (outside the Major Projects Report 2013 reporting period), the Department had allocated a budget for the additional cost in its Equipment Plan. Until the Carrier deal was agreed, we could not report on the Department’s budgeted total forecast cost of the Carriers due to the ongoing commercial negotiations. The cost disclosed in this report is consistent with the Secretary of State’s announcement on 6 November 2013 and is reflected in the Department’s financial plans. Therefore, this report includes the cost variation that has resulted from the deal as if it were a 2012-13 in-year variation. All other project costs included in this report are as at 31 March 2013, and do not include any cost variations that may have occurred since then.

⁸ In 2010, the Department decided that it would build both carriers but would only operate one of them. Therefore only one carrier was planned to be converted to operate the carrier variant of the Joint Strike Fighter. It is still the intention of the Department to operate only one carrier.

⁹ HC Committee of Public Accounts, *Carrier Strike the 2012 Reversion Decision*, Eighteenth Report of Session 2013-14, HC 63, September 2013, paragraph 2, page 5.

Cost

1.12 The total forecast cost of the 11 projects we analysed is £55.6 billion, an increase of £6.1 billion (12.3 per cent) since the main investment decision was taken. In 2012-13, costs rose by £708 million (1.4 per cent of their approval value). The main driver for this was the £754 million cost increase on Carriers (21.3 per cent of its approval value) following the conclusion of the negotiations in November 2013, bringing the total cost increase for Carriers to £2.6 billion (72.3 per cent) since its approval. Excluding Carriers, there has been a net reduction in cost of £46 million (0.1 per cent) across the remaining ten projects.

1.13 According to the ACA, the cost increase on Carriers is largely driven by **technical factors (+£721 million)**. This has emerged as the design has matured through the development process and as the ACA have gained a clearer understanding of the activity needed to deliver the contracted scope. Specifically:

- A delay to Carriers entering service has meant that labour, warehousing and storage costs have increased to take account of the longer time the ships will be in assembly (+£261 million).
- As the design has matured, changes to the build programme have resulted in reworking of previous work, additional work and work being undertaken out of sequence (+£150 million). In addition, there have been changes to the Ship Deliverables List (+£12 million).
- Material costs were revised because of incorrect design quantities and part specifications assumed in the previous contract (+£123 million).
- Cost estimates for paint and access (+£65 million) and outfit and assembly (+£19 million) were revised due to underestimation of the scope and scale of the task.
- Further investment has been made to industry's management team to strengthen its programme management going forward building on the lessons learned to date (+£33 million). However, savings have been made through optimising the use of engineering resources and project management reorganisation (-£23 million).
- Many opportunities for cost savings factored into the previous contract have not been realised and have resulted in a cost increase (+£216 million). The risk budget included in the previous contract has been fully consumed because of the cost growth (-£259 million).
- Other cost growth results from reviews of the programme covering overhead allocation, vessel acceptance procedures and external consultancy.

1.14 Further cost variations have occurred across budgetary factors, procurement processes and inflation:

Budgetary factors (+£155 million):

- The 2012 STOVL reversion decision increased costs by £120 million. STOVL work that was stopped as a result of the decision taken in 2010 had to be restarted including the reinstatement of the ramp, and other STOVL-specific equipment. This is in addition to the £55 million write-off cost already mentioned (paragraph 1.8) for which the Department made provision within its Equipment Plan.¹⁰
- Costs previously assumed to be covered under the Carrier support arrangements have now been incorporated into the procurement contract as understanding of the programme matured (+£35 million).

Procurement processes (-£223 million):

- In July 2013, the revised cost presented by the ACA was set at a certainty level that was higher than the level used for all other projects in the Department's Equipment Plan. This accounted for £144 million of the cost increase.
- During the negotiations that followed, the Department secured £348 million of cost savings against industry's original proposal. The Department's Cost Assurance and Analysis Service conducted an in-depth review of industry's proposal and identified potential areas of cost reduction, over-estimates, inefficiencies and double-counting in the ACA's July proposal. Cost efficiencies were also identified in the Carrier sea trials programme. The savings may reduce the final certainty level associated with Carriers, but this will not be known until completion of the exercise in March 2014 to allocate the negotiated savings across individual cost lines.

Inflation (+£101 million):

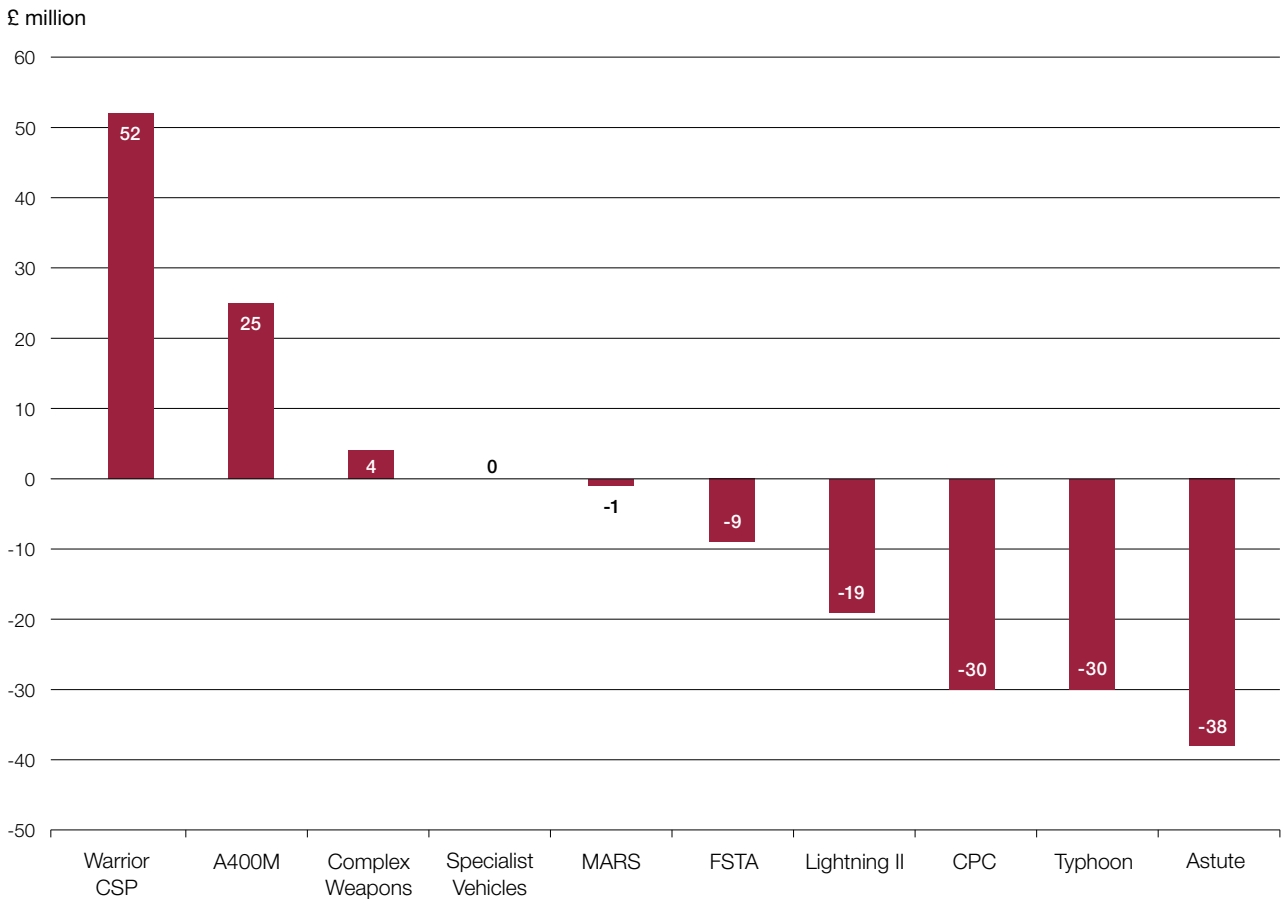
- The cost increase has resulted in an increase in inflation, particularly due to additional costs towards the end of the build programme in 2018.

1.15 There has been a modest net reduction during the year of £46 million (0.1 per cent) in the total costs across the ten remaining projects. There have been net cost changes on all but one of the ten projects during the year: three projects showed increased costs and six reduced costs (**Figure 1**).

¹⁰ Had the Department not reverted back to the STOVL aircraft in 2012, it estimated it would have cost a further £2 billion to convert one carrier to operate the carrier variant of the Joint Strike Fighter. Overall, over the next ten years the Department avoided £1.2 billion in costs across the whole carrier strike capability (which includes the carriers, the aircraft that operate from them and a helicopter-based radar system, known as Crowsnest) through the reversion decision.

Figure 1
Project cost variations, 2012-13 excluding Carriers

Most projects have experienced modest net cost variations during 2012-13



Notes

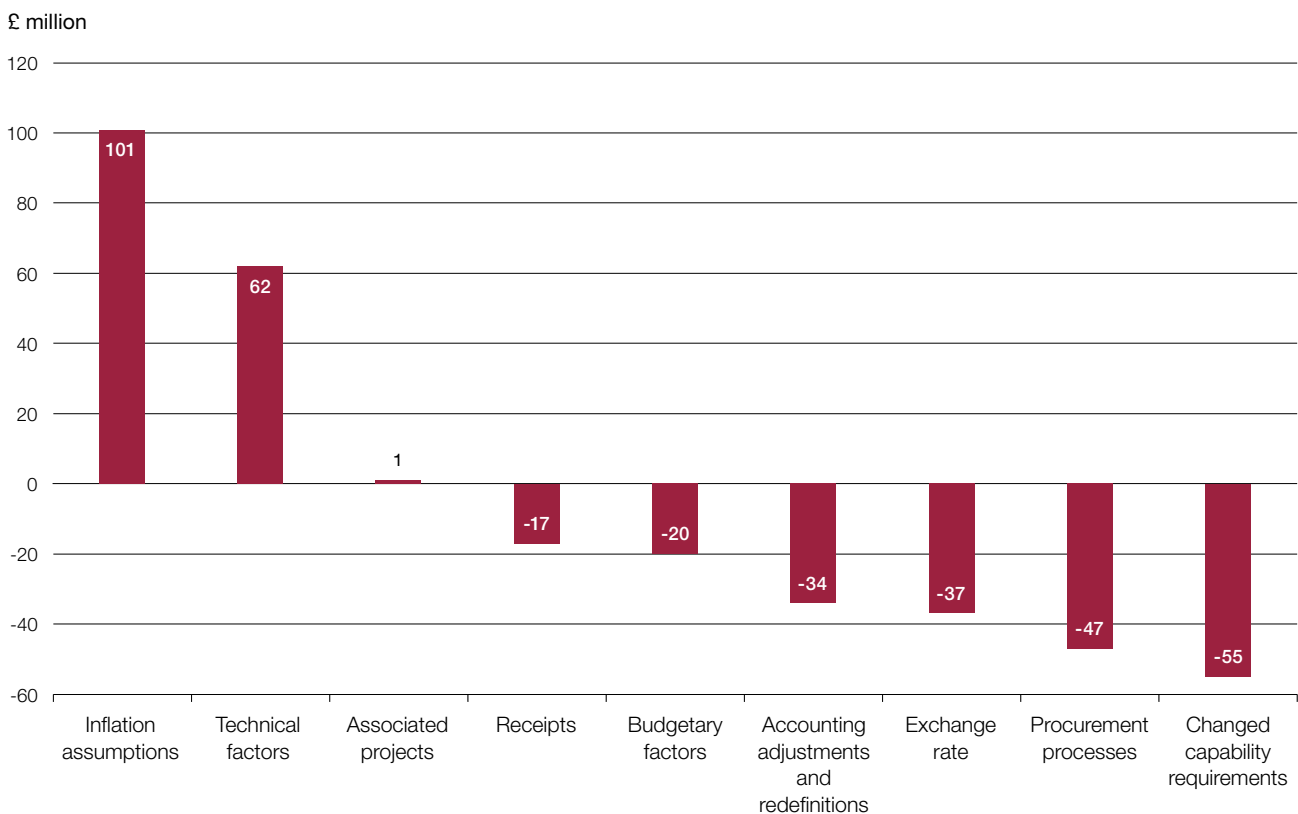
- 1 CSP – Capability Sustainment Programme; MARS – Military Afloat Reach and Sustainability; CPC – Core Production Capability; FSTA – Future Strategic Tanker Aircraft.
- 2 Lightning II (formerly Joint Combat Aircraft) includes both the System Development and Demonstration and Production Sustainment and Follow-on Development phases of the project.
- 3 Astute covers all seven boats.
- 4 Complex Weapons includes Brimstone 2 and Sea Ceptor.

Source: National Audit Office analysis of departmental data

1.16 The net decrease in forecast costs of £46 million across the ten projects excluding Carriers, has been caused by a number of factors across a number of projects. **Figure 2** shows that the biggest factor this year has been changes in the Department’s inflation assumptions.

Figure 2
Factors affecting cost increases, 2012-13, excluding Carriers

Changes to inflation assumptions were the biggest driver of cost increases during the year



Source: National Audit Office analysis of departmental data

1.17 All the approvals and forecast costs reported in our analysis included the Department’s assessment of the impact of inflation. When project teams forecast costs, they have to review the inflation rates they are using. The Department’s Defence Analytical Services Agency gives independent advice on price indices specific to particular sectors that project teams should use when planning and updating forecasts. Costs will vary if the Agency advises project teams to change the inflation rate they apply. Our *Equipment Plan 2013 to 2023* examined the inflation rates applied to all the projects in the sample over the ten-year period and found them to be reasonable.¹¹

¹¹ Comptroller and Auditor General, Ministry of Defence: *Equipment Plan 2013 to 2023*, Session 2013-14, HC 816, National Audit Office, February 2014, page 16, paragraph 29.

1.18 Changes to inflation assumptions were made on two projects during the year: the Warrior Capability Sustainment Programme (resulting in a cost increase of £56 million) and Future Strategic Tanker Aircraft (resulting in a £45 million increase). Both increases are due to applying an increased inflation rate forecast from the Defence Analytical Services Agency to anticipated project costs for the ten-year Equipment Plan period (2013-14 to 2022-23). For the remaining 12 years of the Future Strategic Tanker Aircraft project beyond 2022-23, the Department decided that it was most appropriate to use the government's long-term target for inflation as the basis for the forecast. Small changes in future inflation rate assumptions, when applied to multi-billion pound projects like this, could result in cost variations amounting to several hundreds of millions of pounds.

1.19 Some projects are not subject to changes in the inflation rate, as the contract does not allow the price to be altered. The Military Afloat Reach and Sustainability (MARS) Tanker project has a firm price contract that sets out the payments the Department needs to make. These payments are not affected if the inflation or exchange rate changes. Where a contract allows for variation, the Department agrees to increase or reduce the price paid to the contractor in line with the agreed inflation rate.

1.20 Other factors have also resulted in significant cost variations:

Technical factors (+£62 million)

- Large cost fluctuations occurred for each of the seven individual Astute boats but this resulted in the overall cost decreasing by £38 million (Figure 1). However, material and labour costs increased by £38 million as a result of the Department reallocating these between the boats to reflect where it believes risks may emerge during the build phase of the project. Man-hours were shifted to later in the programme, which means that the impact of inflation is greater, while the amount of labour and materials required reduced.
- There were cost increases of £30 million and £20 million on the A400M transport aircraft and the Lightning II aircraft respectively. These were due to additional work being required to tailor it for UK use. Both these projects are multinational but the UK conducts its own trials and requires some UK-specific systems and weapons to be integrated.
- Risk reduction work continued on Typhoon. This released £18 million back to the Department on top of the £96 million released in 2012.¹²
- There were also two cost variations on the Typhoon programme – an increase of £11 million and a decrease of £7 million – for which we received insufficient evidence and explanation to fully validate the variations.

¹² The *Major Projects Report 2012* stated that Typhoon, along with Astute and Type 45, held contingency funds against risks during their build programmes. These funds have now been given back to the centre of the Department as the projects have matured.

Accounting adjustments and receipts (-£34 million and -£17 million respectively)

- The Astute boats decreased by £72 million due to accounting adjustments made to accruals as a result of the external audit of the Department's accounts during 2012-13.¹³ This was partly offset by an increase of £39 million due to accelerated depreciation against BAE Systems' Enterprise Resource Planning System.
- In addition, a VAT refund of £17 million was made by HM Treasury after HM Revenue & Customs approved a zero rating for VAT purposes on Boat 6.¹⁴

Budgetary factors (-£20 million)

- A reduction of £26 million from the batch buying of materials for Astute Boats 5, 6 and 7 was achieved through the Submarine Enterprise Performance Programme, which aims to improve commercial arrangements and efficiency across the whole submarine sector over the next decade.¹⁵

Exchange rate (-£37 million)

- As with inflation, each year the Department reviews its assumptions for the exchange rates for payments made in foreign currencies. This led to a saving of £9 million on the Warrior Capability Sustainment Programme. The decrease for Lightning II resulted from a separate approval for foreign exchange risk of £28 million, which has not yet been needed. In the *Equipment Plan 2013 to 2023* we found that all projects had appropriately applied the Department's standard exchange rate assumptions.

Procurement processes (-£47 million)

- The Department negotiated better contract terms with industry, resulting in a decrease of £45 million across the Core Production Capability project (-£26 million) and Future Strategic Tanker Aircraft project (-£19 million). On the Core Production Capability, the project team was instructed by the Department's Investment Approvals Committee to negotiate better terms with Rolls-Royce as a condition of approval and this resulted in the cost decreasing. The saving on Future Strategic Tanker Aircraft was obtained by finalising a contract to provide enhanced self-protection measures for the aircraft.

¹³ Ministry of Defence, *Annual Report and Accounts 2012-13*, July 2013.

¹⁴ HM Revenue & Customs notice 744C July 2011 outlines the criteria relating to VAT for ships and submarines, primarily that the equipment needs to be "of a kind ordinarily installed or incorporated in the propulsion, navigation or communications systems, or the general structure of a qualifying ship". Boat 5 was zero-rated for VAT in 2012 and a VAT refund of £50 million was made to the Department, as reported in the *Major Projects Report 2012*. Boat 7 should be zero-rated for VAT in the near future, once the above criteria are met.

¹⁵ *Securing Britain in an Age of Uncertainty: The Strategic Defence and Security Review*, October 2010.

Changed capability requirement (-£55 million)

- Following the government's plans announced in the *Strategic Defence and Security Review 2010* to retire the Tornado aircraft early and withdraw the Harrier from service, the Department in reassessing the future planned use of air-to-air refuelling and air transport currently considers that the Future Strategic Tanker Aircraft's cost will decrease by £42 million.
- A saving of £13 million was made as a result of a changed requirement to the Typhoon aircraft.

Cost: longer term trends

1.21 To look at longer term trends in the Department's costs, we analysed all 73 projects, including the Carriers, that have featured in our major projects reports since 2000. These projects have a total approval value of £98.1 billion and a combined total forecast cost of £106.9 billion.¹⁶ This represents an increase of £8.8 billion or 9.0 per cent compared with the approved costs.

1.22 Figure 3 overleaf shows that projects with an approval value of more than £2 billion are responsible for the biggest cost growth. In fact, they are responsible for all of the £8.8 billion cost growth since 2000. There are 47 projects with an approval value of less than £1 billion. Only two of these have had cost increases of more than £100 million, while the net effect across all 47 projects is a cost decrease of £224 million.

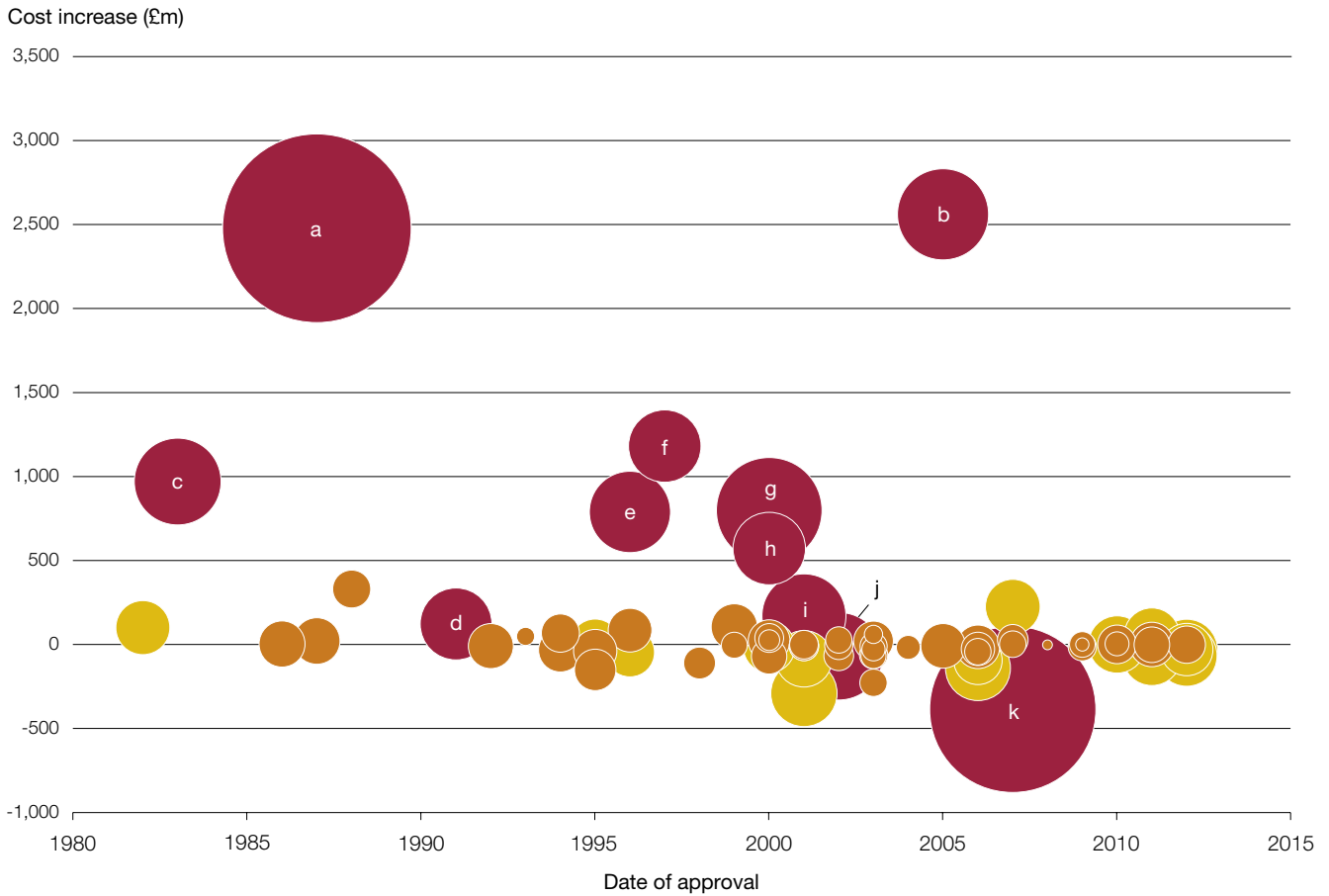
1.23 Figure 4 on page 21 shows that, on average, cost growth is higher across the ships, combat air projects (such as Typhoon), and submarines sectors.¹⁷ These projects typically cost billions of pounds and take a long time to build.

¹⁶ Cost of capital has been removed from all post-2011 projects to ensure comparability with earlier projects. This means some figures do not correspond with those in the *Major Projects Report 2011* when we last carried out this analysis. Cost of capital was a notional opportunity cost from using money in capital expenditure projects instead of alternative investment opportunities. HM Treasury revised its guidelines relating to the treatment of cost of capital for financial year 2010-11. Cost of capital has not been included within the Department's cost estimates since this date and therefore is not included in our analysis.

¹⁷ The allocation of projects by sector is based on the Department's analysis, which is contained within the Ministry of Defence: *Statement on the Affordability of the Equipment Plan 2013 to 2023*.

Figure 3
 Cost increases by size of approval

Projects with larger approval values generally suffer greater cost growth while smaller projects have suffered little or no cost growth



- Approval value of more than £2 billion
- Approval value of more than £1 billion but less than £2 billion
- Approval value of less than £1 billion

- | | |
|---|------------------------------------|
| a Typhoon | g Type 45 |
| b Queen Elizabeth Class aircraft carriers | h A400M |
| c Merlin HM Mk 1 | i Attack Helicopter Apache |
| d Challenger 2 | j Skynet 5 |
| e Nimrod MRA 4 | k Future Strategic Tanker Aircraft |
| f Astute Boats 1-3 | |

Note

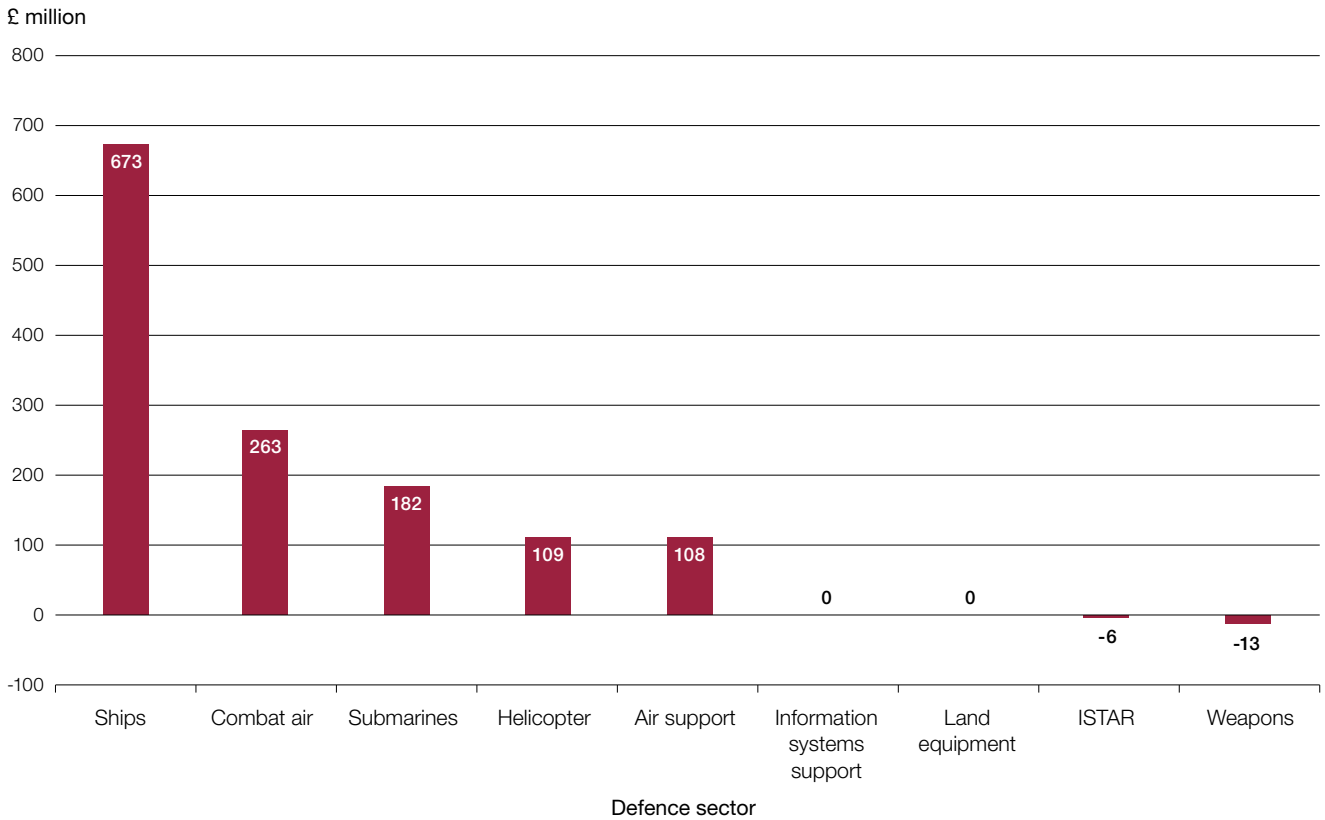
1 Future Strategic Tanker Aircraft is a private finance initiative deal spanning 27 years, which includes the whole-life costs rather than just the procurement cost as with all other projects above.

Source: National Audit Office analysis of departmental data

Figure 4

Defence sectors: cost growth since approval

Average cost growth across all 73 projects is largest in the ships, combat air and submarines sectors



Note

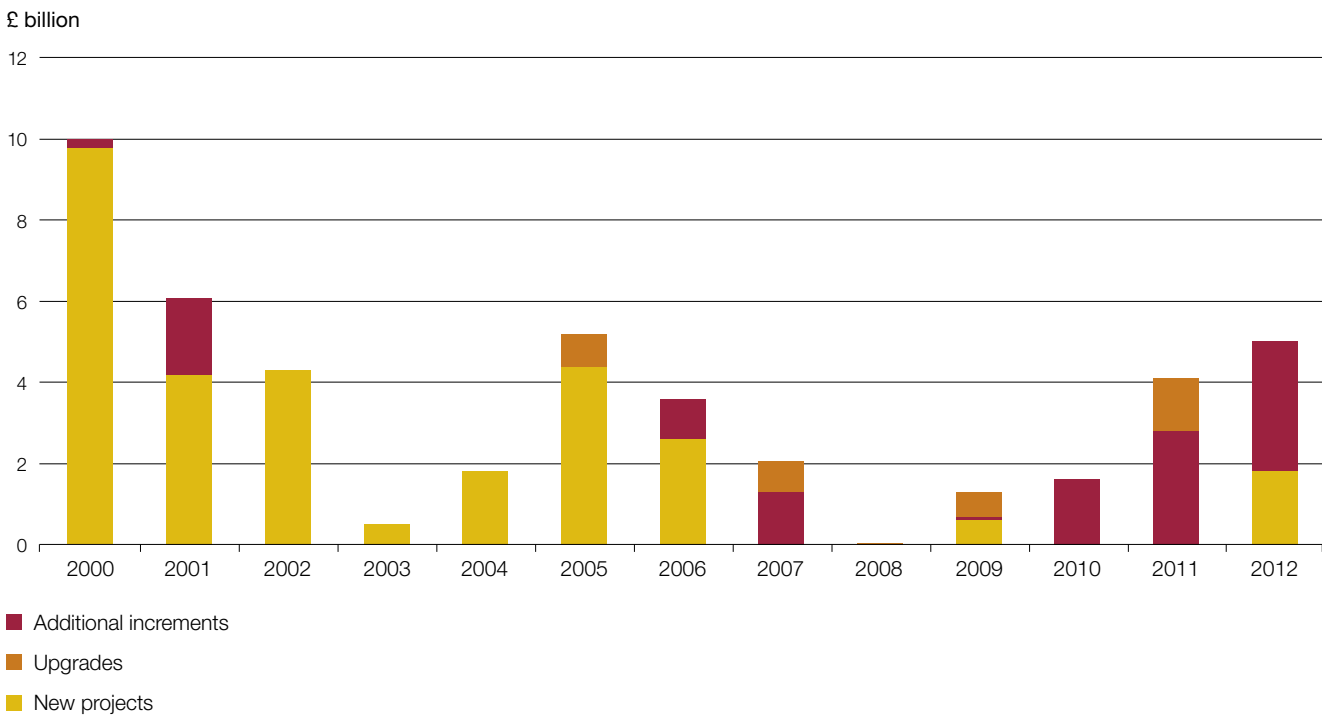
1 ISTAR – Intelligence Surveillance, Target Acquisition and Reconnaissance.

Source: National Audit Office analysis of departmental data

1.24 Although large and complex programmes have been initiated by the Department, it has more recently chosen to break these up into smaller stages and approve them incrementally rather than in a single block. The proportion of approvals for additional increments and project upgrades as opposed to new projects has increased significantly since 2005 (**Figure 5**).¹⁸ The total value of increments and upgrades is nearly three times higher than that of new projects since 2005. In contrast to this, between 2000 and 2004, only two additional increments were approved. These were Lightning II (Joint Combat Aircraft) System Design and Demonstration in 2001 for £1.9 billion¹⁹ and the Aircrew Synthetic Training Aid for Typhoon in 2000 for £0.2 billion. This incremental approach reduces the Department’s commitments, for example in relation to equipment numbers and delivery dates. The Department also believes this enables it to respond more quickly to changing requirements and to alter its plans to address the needs of the armed forces without having to renegotiate contracts.

Figure 5
New projects, additional increments and upgrades to existing equipment

The value of new projects the Department approved has significantly decreased compared to additional increments and upgrades



Note
1 Future Strategic Tanker Aircraft has been excluded as it is a private finance initiative deal spanning 27 years, which includes the whole-life costs rather than just the procurement cost as with all other projects above.

Source: National Audit Office analysis of departmental data

18 An increment is a further element or the next stage of a project, for example subsequent Astute boats. A project upgrade enhances or extends the life of existing capability.
19 This represents the UK’s first contribution to the development of the Joint Strike Fighter aircraft, which is being developed by the US.

1.25 Examples of where the Department has used this incremental approach include:

Weapons: Complex Weapons

- In 2010, to procure many of its complex weapons, the Department entered into a portfolio management agreement with MBDA UK Ltd to provide a portfolio of complex weapons. Initially, it intended to seek a single approval for the ten-year programme, following a series of stages known as ‘interim main-gates’. So far, two of these have been approved with a total value for the Demonstration and Manufacture phase of £787 million.²⁰ In 2012, the Department decided to move to smaller work packages which will be approved separately, as required by the projects that make up the Programme. We examine the Complex Weapons Programme in more detail in Part Two.

Land equipment: medium-weight reconnaissance armoured vehicles

- To replace the existing fleet of reconnaissance armoured vehicles, in 2010, the Department approved £1.4 billion for the demonstration phase plus long lead items for Scout, one of four variants sharing a common platform design. The Department expects the remaining vehicles to use the same common platform are planned over the coming years. Through various planning rounds since 2010 the Department has adjusted vehicle types and number of vehicles to meet affordability challenges and Army requirements.

1.26 In addition, the procurement of the Astute submarines has used a phased approach. The Department approved the seven boat programme in 1997 and the 2010 *Strategic Defence and Security Review* later confirmed the boat numbers.²¹ The first three boats were contracted for as a batch with Boat 4 being built on an individual whole-boat contract. Whole-boat contracts for the remaining boats are yet to be confirmed and are subject to HM Treasury approval. In November 2012, HM Treasury approved the contract for the fourth boat but the contracts for the remaining boats are yet to be confirmed.

1.27 These examples are in contrast to the early part of the decade where all 25 A400Ms were approved in 2000 at a value of £2.2 billion. Technical issues with the design and cost overruns led to a renegotiation of the contract with industry in 2009. To avoid further financial commitment, the Department decided to receive three fewer aircraft for the same cost. Also, in 2000, six Type 45 Destroyers were approved in one block for a value of £4.8 billion. Both projects have suffered large cost increases because of changing requirements or technical problems.

²⁰ A third interim main-gate was approved by the Department in January 2012 subject to negotiations concluding with France and the project receiving France’s national approval. As at 31 March 2013, this had not occurred.

²¹ The military requirement is for up to eight Astute boats.

1.28 However, there are risks in splitting a project into smaller increments, for example losing economies of scale, and, for suppliers, the loss of certainty about future orders. For example, in the Complex Weapons Programme, although industry understood why a ten-year programme could not be approved in a single block, approving projects individually has been a source of frustration to industry because it reduces their certainty over future orders.

1.29 Eight of the projects covered in our analysis have been approved since the Strategic Defence and Security Review in 2010. These had a total value at the time of their approval of £9.2 billion.²² Taken together, these eight more recent projects have shown a slight cost decrease since approval of £151 million (1.6 per cent). By contrast, the 65 older projects approved prior to the Strategic Defence and Security Review have increased in cost by 10.0 per cent since approval. Although this may indicate an improvement in the Department's performance, the post-Review projects have only recently been approved and have several years yet until they are complete and enter service.

Time

1.30 The total delay to completing projects this year is 17 months (1.2 per cent). However, this is not the complete picture as there are two projects – Specialist Vehicles and Lightning II – for which we cannot report variations to project delivery. This is because the Department has not yet taken the final decision to fully manufacture and introduce them into service. Therefore, we are unable to report on the progress of these projects towards their entry into service dates and so they are not subject to the same level of Parliamentary scrutiny as the other projects which do have approved entry into service dates. This should be considered when interpreting the findings from the remaining nine projects in this report.

1.31 Of these remaining nine projects, three experienced delays during the year, together amounting to 17 months. This takes the total forecast delay to the in-service date for these nine projects to 301 months, an increase of 21 per cent in the forecast time to complete the projects since approval. The three in-year delays were:

Complex Weapons Programme

- The Programme was delayed for nine months because of technical factors. The delay was on Brimstone 2, an air-launched ground attack missile, caused by problems with the design and performance of the proposed rocket motor solution and the warhead. Further rocket motor trials activity was halted while investigations were undertaken. These had not concluded at the time of our analysis.

²² The eight projects are: Astute Boat 5, Astute Boat 6, Astute Boat 7, Chinook New Buy, Complex Weapons Interim Main-Gate 2 – Sea Ceptor, Core Production Capability, Military Afloat Reach and Sustainability and Warrior Capability Sustainment Programme.

Carriers

- Carriers were delayed by five months because of technical factors, which results in a total delay of 29 months. This is because construction of the individual elements of the ships at the build yards was not complete when they were transferred to the integration yard at Rosyth. This meant that additional 'carry-over' work was necessary before the integration could start. This has also led to the disruption of other tasks, which have subsequently been delayed. The ships' commissioning and defect rectification periods were also underestimated. Some of the delays have been partly offset through a change in the shift patterns of workers, including increased night shifts.

Core Production Capability

- The project was delayed for three months because of procurement processes. The Department approved it in June 2011, but subject to the project team agreeing a reduced profit rate with Rolls-Royce. These negotiations took almost a year to conclude. They led to a saving of £26 million (paragraph 1.20) but also delayed the delivery date by three months. However, the Department successfully took proactive measures to reduce the delay by seeking advance funding to start activities earlier than planned.

1.32 Our *Equipment Plan 2013 to 2023* highlights that the Department underspent by £1.2 billion in 2012-13, and that it does not fully understand whether these costs will occur in later years. The underspend is likely to have been because planned work on projects did not occur during the year, meaning work has been delayed with a possible impact on delivery of equipment.

Time: longer term trends

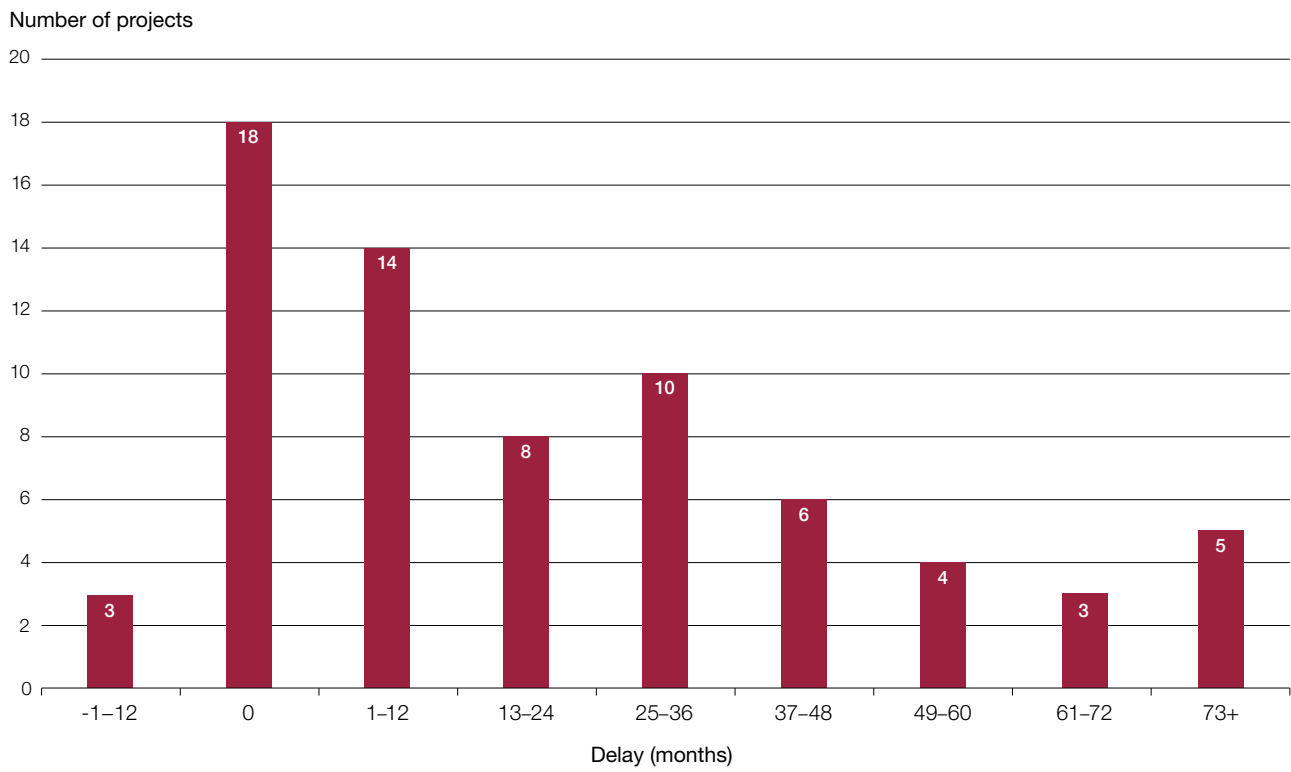
1.33 The average delay across all the 71 projects²³ included in the wider set of projects since 2000 is 23 months. This is a 35 per cent increase in the total length of projects envisaged by the Department when it approved them. There has been a significant reduction in the reported in-year slippage this year of 17 months compared with the 139 months reported in *Major Projects Report 2012*.

1.34 **Figure 6** overleaf shows that more than half of the 71 projects (36 projects) have been delayed by more than a year. It also shows that 21 projects have suffered no delay or are scheduled to complete early. However of these 21 projects, 12 were only approved by the Department in the last three years.

²³ The total population is 73 projects but as stated in paragraph 1.29 we cannot monitor time for Specialist Vehicles or Lightning II.

Figure 6 Project delays

More than half of the 71 projects are delayed by more than a year



Note

1 Specialist Vehicles and Lightning II are not included in this analysis as the Department is yet to approve in-service dates for these projects.

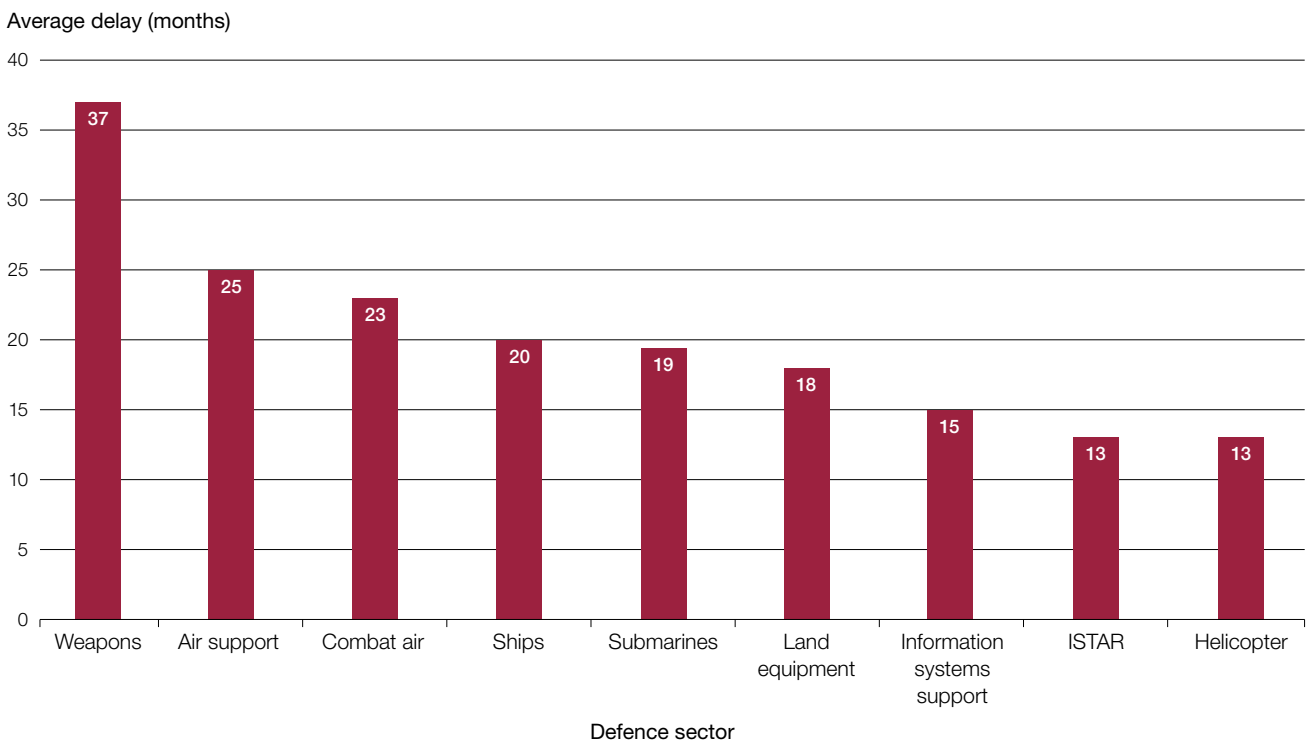
Source: National Audit Office analysis of departmental data

1.35 Figure 7 shows that delays occur to projects across all sectors, with delays to weapons projects longer than projects in any other sector. All but three of the 17 projects in this sector have suffered delays. This is in contrast to Figure 4, which showed that there are no net cost increases in this sector. Ships, submarines and combat air projects, which Figure 4 showed had the largest cost increases, also suffer significant delays to delivery. The air support sector has an average delay of 25 months. However, the average delay is driven by Nimrod MRA 4 reconnaissance aircraft, which had a delay of 114 months. The average delay in this sector excluding Nimrod is 13 months.

Figure 7

Defence sectors: time delays since approval

Projects in the weapons sector suffer the longest delays on average



Note

1 ISTAR – Intelligence Surveillance, Target Acquisition and Reconnaissance.

Source: National Audit Office analysis of departmental data

1.36 Two of the eight projects covered in our analysis that have been approved since the 2010 Strategic Defence and Security Review have experienced delays totalling nine months. These delays mean that the total length of the eight projects has increased by 1.3 per cent against their total approved duration of 713 months. This compares with the total length of older projects approved before the Strategic Defence and Security Review, which has increased by 39.7 per cent compared with the project timescales envisaged at the time of their approval.

Performance

1.37 When the Department takes the main investment decision it approves a number of key performance measures for each project. These indicate whether the equipment is providing the intended military capability. Across the 11 projects, the Department has set 176 key performance measures, and expects to achieve 173 (98 per cent) of these. However, it has identified risks to achieving ten (6 per cent) of these measures (**Figure 8**). There are three key performance measures that are not expected to be met:

- The Astute programme has yet to demonstrate its ‘top speed’ key performance measure. Full speed trials have been undertaken and the results are subject to ongoing analysis and discussion with BAE Systems.
- Since 1995, the Department has accepted that in the most adverse conditions the required landing distance for a Typhoon aircraft would not be achieved. The Department has no plans to implement measures to address this.
- Carriers is forecast not to meet its ‘availability’ key performance measure, because of the 2010 Strategic Defence and Security Review decision to only have one carrier in service.

1.38 Each project also reports against eight defence lines of development (DLODs). These measure the other elements of capability, such as trained personnel and logistical support, which the Department needs to develop and provide at the right time so it can best use the equipment.²⁴ The Department expects to provide 99 per cent of the defence lines of development on time, with risks attached to 23 per cent of the lines. Only one line of development is not expected to be provided on time. This is on the Astute programme and was caused by delays in previous years in delivering the boats.

1.39 In last year’s report, we reported three risks on the Typhoon project attached to the equipment, training and logistics lines of development due to the 18-month delay to the Typhoon Future Capability Programme. After reviewing the programme the Department has addressed these risks. However, new risks have arisen on the training line, owing to further concerns about timing, and the logistics line, because of problems with the timely supply of spares and repair of equipment under collaborative support contracts.

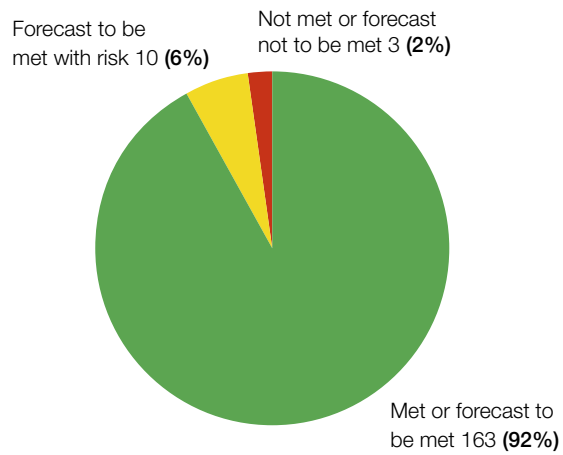
²⁴ The eight defence lines of development are: equipment, training, logistics, infrastructure, personnel, doctrine, organisation and information. Collectively, they form the constituent parts that come together to generate military capability.

Figure 8

Key performance measures and Defence lines of development

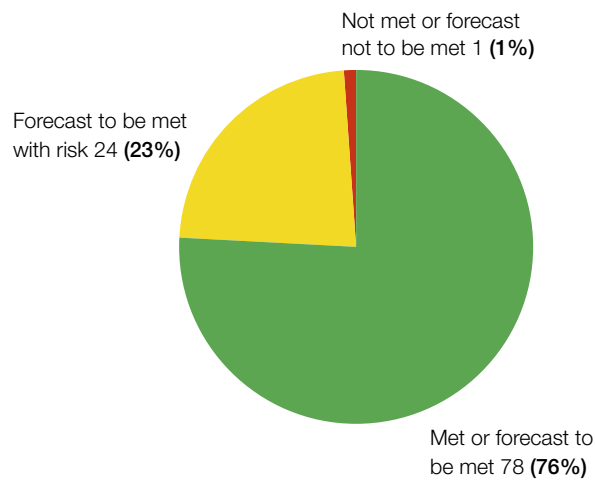
a) Key performance measures

Most projects are meeting or expecting to meet all their key performance measures



b) Defence lines of development

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



Source: National Audit Office analysis of departmental data

Part Two

The Complex Weapons Programme

2.1 Over the next ten years the Ministry of Defence (the Department) expects to spend £7.7 billion on providing complex weapons to the armed forces.²⁵ Complex weapons projects have not suffered large cost increases over the last decade, but they have been delayed more than other projects. In 2010, the Department entered into a Portfolio Management Agreement with MBDA UK Ltd (MDBA). This was renegotiated in 2013, with the aim of giving greater certainty to industry while meeting the UK's complex weapons requirements, ensuring Freedom of Action and Operational Advantage and delivering value for money.²⁶ This part examines the development of the Complex Weapons Programme (the Programme) and progress towards realising the expected benefits from this new approach to defence acquisition.

Developing the approach

2.2 The main component of the Programme is a partnering arrangement between the Department and industry.²⁷ The Programme is designed to sustain the supply and support of the complex weapons portfolio and was partly a response to having to sustain the necessary complex weapons skills in UK industry and maintain Freedom of Action and Operational Advantage of UK complex weapons. The Programme is intended to benefit both the Department and industry (**Figure 9**).

²⁵ Complex weapons are tactical weapons that rely on guidance from systems to achieve precision effects. They fall into five categories: air-to-air, air defence, air-to-surface, anti-ship or anti-submarine (including torpedoes) and surface-to-surface. It should be noted that the Complex Weapons Programme does not include torpedoes, non-UK sourced missile systems or some legacy systems.

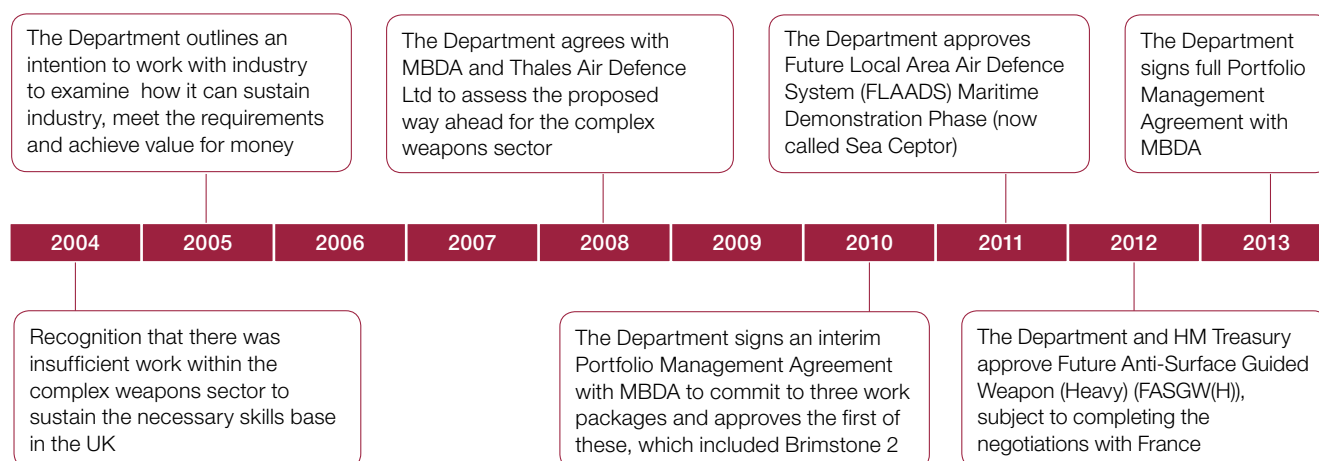
²⁶ Freedom of Action is defined as "the ability to conduct combat operations at a time and place of our choosing and act in the country's interests free from intervention by other states or entities". Operational Advantage is defined as "the ability to find and maintain an edge over potential adversaries, both to increase the chances of our success in hostile situations and to increase the protection of the UK assets involved, especially our people".

²⁷ The agreement sets out the high-level rights and obligations of both parties to provide the UK armed forces' long-term complex weapons requirements.

Figure 9

How the Complex Weapons Programme evolved

The Programme is designed to maintain UK skills in the complex weapons sector



Source: National Audit Office analysis of departmental data

2.3 The Programme comprises a number of interrelated projects, which are sourced in the UK and managed as a portfolio.²⁸ It has a forecast value of £7.7 billion over the ten-year period from 2013-14 to 2022-23 (**Figure 10** overleaf).

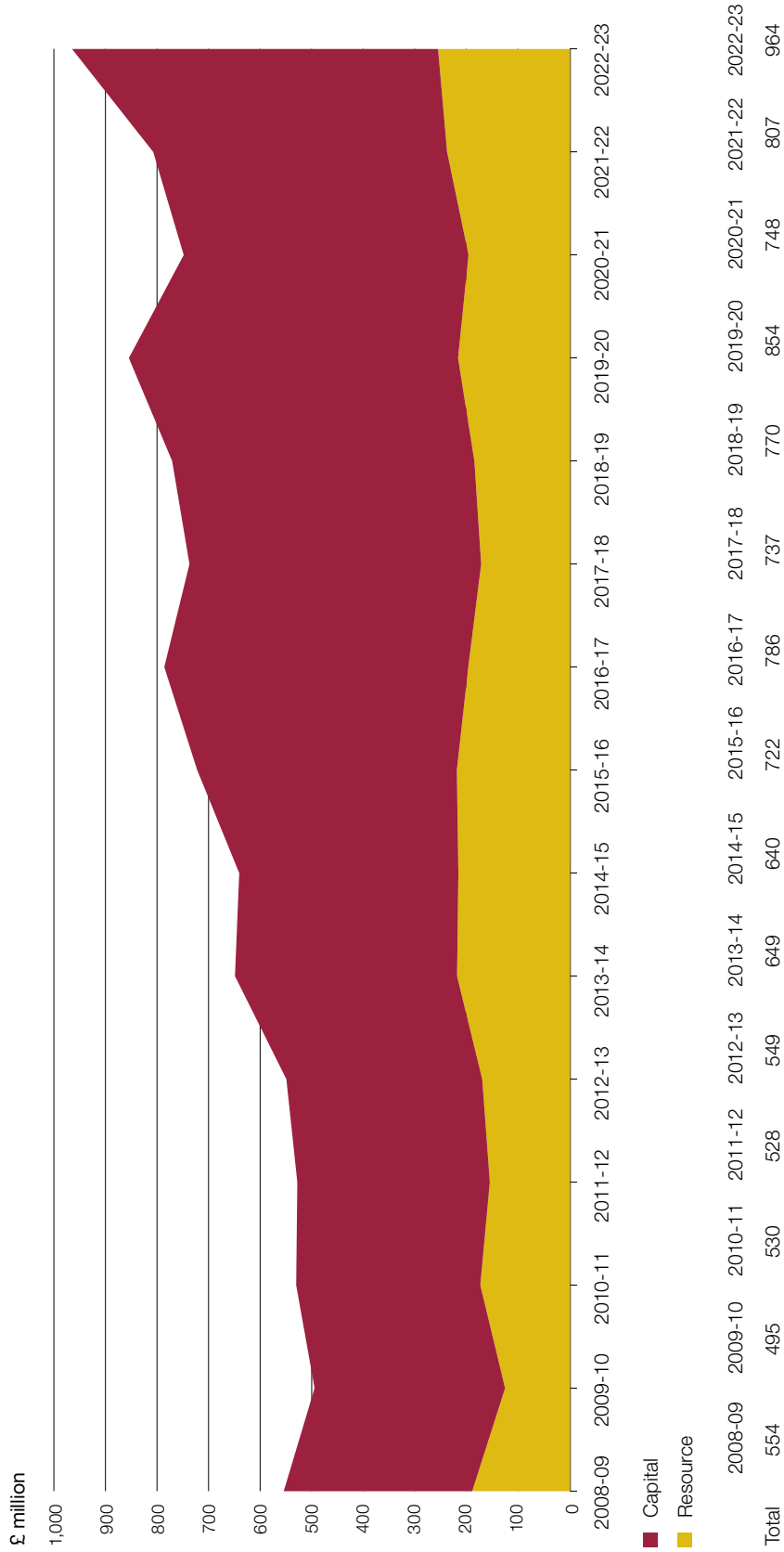
2.4 The Programme aims to provide net financial benefits of £1.2 billion to the Department over the period 2010 to 2019. Just under half (47 per cent) of the financial benefits are expected to be achieved by sharing common components between projects. For example, the Future Local Area Air Defence System (FLAADS) programme aims to provide the same missile for two requirements: replacing Seawolf on the Type 23 Frigate (and subsequently the Type 26 Global Combat Ship) for the Royal Navy and Rapier for the British Army. The Department's aim is to reuse many of the maritime components in the Land version, notably the munitions, providing a common stockpile between both variants. Other benefits are expected to be achieved through having more flexible contracts so requirements and costs can be traded across the weapons portfolio (21 per cent of the total), replacing Sea Wolf with FLAADS (Maritime) earlier than previously planned (9 per cent) and collaborative working with France (8 per cent).

2.5 Although not included in the calculated benefits, the portfolio approach is also expected to have wider benefits. These include increased exports of UK-developed weapons, and the subsequent long-term sustainability of the industry because of its export programmes. The Department estimates significant direct financial benefits to the Department from exports through the commercial exploitation levy and through savings achieved as a result of economies of scale.²⁹

²⁸ Appendix Five contains details of the weapons in the programme and the project approvals.

²⁹ The commercial exploitation levy (CEL) is a form of royalty for any commercial sales of a design, use of special tooling or granting licences where the Department has contributed wholly, or in part, to research and development costs.

Figure 10
Expenditure on the Complex Weapons Programme 2008-09 to 2022-23



Source: 2008-09 to 2012-13, National Audit Office analysis of Department's financial accounts 2013-14 to 2022-23, Ministry of Defence, Complex Weapons Capability Management Strategy, April 2013

Risks to realising the benefits

2.6 The financial net benefit of £1.2 billion for the period 2010 to 2019 has already been assumed in the Department's forecast budget assumptions as part of its Equipment Plan 2013 to 2023. Not achieving these benefits would have an impact on budgets across the Department. The assumed benefits are based on the plan of work it agreed with industry in 2010 but these plans have changed significantly since that agreement.

2.7 The 2010 Strategic Defence and Security Review made significant cuts to the Programme as well as changing the requirements for some of the individual weapons projects. The agreed annual value of work, known as the pipeline, on which industry could plan was reduced from approximately £650 million in 2010-11 to approximately £600 million per year, and some early expenditure was deferred into the latter half of the ten-year period. This lower than anticipated level of expenditure has already resulted in some of the expected benefits being lost. However, in October 2013, the Department reassessed the benefits the Programme would deliver and confirmed that they still expected £1.2 billion to be realised as a result of new benefits being identified.

2.8 The Department has not specified precisely how much the Programme could be reduced before it ceases to be viable. However, in 2010, the Department examined the impact of different levels of reduction in the value of the pipeline. It concluded that reductions to below the £600 million per year threshold would threaten the viability of the business model and of achieving the benefits. Since 2008-09, expenditure has been below £600 million each year, but is forecast to rise above this level in 2013-14 and remain above £600 million a year for the remainder of the programme (Figure 10).

2.9 The Department told us that each project is compared to the option of procuring through international competition. There are no legal or contractual obligations on the Department to commit to future work packages and the Department retains the option to procure outside the pipeline. However, if the value of the pipeline is reduced, industry overheads would be spread across a lower volume of work and thereby increase the Department's costs. The Department may also incur liabilities under the government accounting conventions if the volume of work dropped to a level that required redundancies.³⁰ For example, the Department stated in its business case that there was an urgent need to approve Brimstone 2, the first project approved in the Programme, to protect jobs within industry and avoid triggering uncapped financial liabilities at least comparable to that of the value of the project.

³⁰ Under long-standing 'Yellow Book' rules, the government has to meet certain costs, to guarantee work in certain industries. These costs include those of redundancies.

2.10 The decisions within the Strategic Defence Security Review also changed the requirements for some of the weapons in the Programme. For example, Brimstone 2 was planned to be fitted to both the Tornado and Harrier aircraft. However, significant changes were made to both these aircraft following the Review. Tornado is to be retired seven years early in 2019 and Harrier was withdrawn from service.³¹ The Department is now planning that Brimstone 2 will be fitted to Typhoon but not until 2021, resulting in a two-year capability gap after retiring Tornado in 2019. The Department is currently working to determine how best to mitigate this capability gap.

The Department's ability to manage the programme

2.11 In 2012, the Major Projects Authority raised concerns about the Department's resources, to provide capability and portfolio oversight. In May 2013, the teams responsible for implementing the Programme were 39 members of staff (18 per cent) short of its 217 full-time equivalent posts. Industry and the Department recognise that the Department is under-resourced and that this is a key risk to implementing the Programme. The Department's Investment Approvals Board has also raised concerns at the project team's lack of commercial skills to manage the portfolio.³² Both industry and the Department recognise that the Programme is a new approach to procurement that requires different skills and new ways of working. Consequently, over the past three years, a significant joint Department/MBDA training programme has been introduced to address this. This includes a bespoke complex weapons portfolio skills training course developed in conjunction with Cranfield University.

2.12 In July 2013, 27 programme-related business cases were due to be submitted within the next two years. Delays to preparing business cases, and hence approvals, are likely to increase costs, because of inflation and disruption to industry. For example, in April 2011, MBDA set out the consequences of delaying the approval for the maritime version of FLAADS. They estimated that a six-month approval delay would result in run-on costs of approximately £50 million for Seawolf, which the project was due to replace, as well as project escalation costs on FLAADS of approximately £35 million.

31 Tornado was planned to be in service until 2026 but as part of the Strategic Defence and Security Review in 2010 the Department brought this forward to 2019.

32 The Investment Approvals Board was renamed the Investment Approvals Committee in 2011 as part of wider changes announced in Defence Reform.

2.13 There have also been instances where project teams have relied too heavily on its industry partners, owing to resourcing problems. For example, the Department's Scrutiny Team assessed in January 2012 that the teams responsible for implementing the heavy variant of the Future Anti-Surface Guided Weapon appeared to have entirely relied on its industry partners to plan the weapon's integration on to Wildcat and it was not evident they had the necessary skills and staff required to successfully manage the integration. While funding is in place, the team has had difficulty in recruiting and retaining staff. The project team is currently conducting a review of staffing requirements to deliver this project.

2.14 Some Front Line Commands had reservations about the Programme with some unsure of the overall strategy. Industry believes that some project teams had not fully bought into the portfolio and had a tendency to be more focused on their own projects than the wider portfolio interests. Industry also expressed concerns that the Department's transformation programme could damage the portfolio approach. Although the Programme has not been decentralised, as requirements are set by the Front Line Commands, there is a risk of reverting to individual weapons procurements, which would erode the benefits of the portfolio approach.

Appendix One

Our audit approach

1 This study, now in its 30th year, is our annual report to Parliament. In it, we examined the in-year changes to the cost, time and technical performance of the Department's 11 largest military equipment projects.

2 We publish the Department's data for the 11 projects, covering 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 forecasts or assumptions of the Department's long-term costings unless better information becomes available.³³ We perform analysis to report on overall trends and in-year performance. We also validate and publish more limited data on the five largest projects where the main investment decision is yet to be taken.

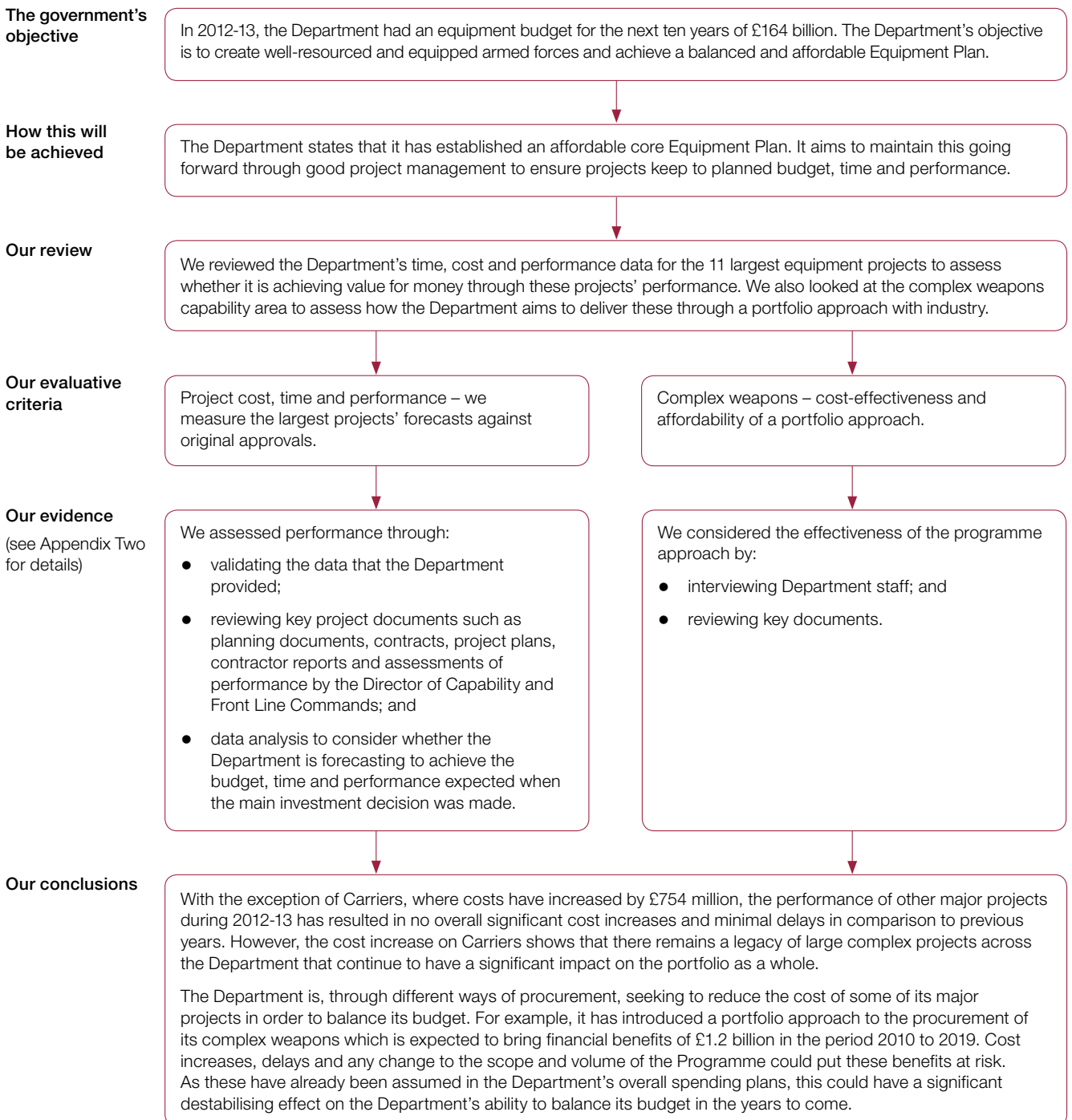
3 This year we also undertook a more detailed review of the Complex Weapons Programme, the way the Department is managing the procurement of complex weapons through a portfolio approach.

4 Our audit approach is summarised in **Figure 11**. Our evidence base is described in Appendix Two.

³³ However, our accompanying work on the Equipment Plan looks at whether the underlying assumptions are reasonable, consistent and honest.

Figure 11

Our audit approach



Appendix Two

Our evidence base

- 1 We reached our conclusions on the overall value for money from the top 11 equipment projects based on the data collected during fieldwork in June and July 2013. The interviews for the case studies were carried out between June and August 2013.
- 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 analysed variations to the budget, time and performance set when the main investment decision was made.
- 3 We included the cost increase on the Queen Elizabeth Class aircraft carriers:
 - In November 2013, the Department concluded its negotiations with industry for the Queen Elizabeth Class aircraft carriers (Carriers). Although the *Major Projects Report 2013* covers the 2012-13 financial year and the negotiations for the Carriers were not concluded until November 2013 (outside the *Major Projects Report 2013* reporting period), the Department had allocated a budget for the additional cost in its *Equipment Plan 2013 to 2023*. As the negotiations have now been completed, the total forecast cost of the Carriers can now be disclosed and included in this report. Therefore, the report includes the cost variation resulting from the deal as if it was a 2012-13 in-year variation. All other project costs are reported as at 31 March 2013, and do not include any cost or time changes that may have occurred since that date.
- 4 We looked at the effectiveness of the portfolio approach for project delivery in the complex weapons capability area. Our case study was 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

The 11 largest equipment projects where the Department has taken the main decision to invest

Figure 12

The 11 largest equipment projects where the Department has taken the main decision to invest

Project	Description	Expected cost to completion at approval (£m)	Current forecast cost to completion (£m)	Total cost variation (£m)	In-year change on costs to completion (£m)	Expected in-service date at approval	Current forecast in-service date	Total time variation (months)	In-year change to in-service date (months)	Defence lines of development				Key performance measures				Number to be procured	
										To be met	To be met, 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	2,238	2,809	+571	+25	Feb 2009	Mar 2015	+73	0	4	4	0	No change	9	0	0	No change	25	22
Astute	Attack submarine: Boats 1–3	2,233	3,414	+1,181	+28	Jun 2005	Apr 2010	+58	0					8	0	1	No change	3	3
	Attack submarine: Boat 4	1,279	1,504	+225	+56	Aug 2015	Jan 2018	+29	0					10	0	0	No change	1	1
	Attack submarine: Boat 5	1,464	1,394	-70	-59	Aug 2020	Aug 2020	0	0	6	1	1	No change	7	3	0	No change	1	1
	Attack submarine: Boat 6	1,579	1,510	-69	-54	May 2022	May 2022	0	0					10	0	0	No change	1	1
	Attack submarine: Boat 7	1,642	1,608	-34	-9	Mar 2024	Mar 2024	0	0					10	0	0	No change	1	1
Core Production Capability	Nuclear core production	1,176	1,110	-66	-30	May 2021	Aug 2021	+3	+3	7	0	0	No change	2	0	0	No change	N/A	N/A
Complex Weapons (see Appendix Five)	Pipeline Weapons funding: Interim main-gate 1 – Loitering Munition	246	247	+1	+4	Mar 2012	Mar 2012	0	0	8	0	0	No change	24	0	0	No change	N/A	N/A
	Pipeline Weapons funding: Interim main-gate 1 – Brimstone 2					Oct 2012	Nov 2015	+37	+9	7	1	0	No change	6	3	0	No change	N/A	N/A
	Pipeline Weapons funding: Interim main-gate 2 – Sea Ceptor					Nov 2016	Nov 2016	0	0	8	0	0	No change	10	0	0	No change	N/A	N/A
Future Strategic Tanker Aircraft	Air-to-air refuelling and passenger aircraft	11,779	11,393	-386	-9	May 2014	May 2014	0	0	6	2	0	No change	9	0	0	No change	14	14
Lightning II	Fighter or attack aircraft	2,873	2,488	-385	-19	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
Military Afloat Reach and Sustainability	Naval logistic support	596	595	-1	-1	Oct 2016	Oct 2016	0	0	4	4	0	No change	11	0	0	No change	4	4
Queen Elizabeth Class	Aircraft carrier	3,541	6,102	+2,561	+754	Jul 2015	Dec 2017	+29	+5	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
Typhoon	Fighter aircraft	15,173	17,652	+2,479	-19	Dec 1998	Jun 2003	+54	0	4	4	0	-3	8	1	1	No change		
	Aircraft software upgrade: Future Capability Programme	402	430	+28	-11	Jun 2012	Dec 2013	+18	0					7	0	0	No change	232	160
Warrior Capability Sustainment Programme	Sustainment of the existing Warrior Armoured Fighting Vehicles	1,319	1,371	+52	+52	Nov 2018	Nov 2018	0	0	8	0	0	No change	9	0	0	No change	445	445
Total		49,475	55,561	+6,086	+708			+301	+17										

Notes

1 Approval values have decreased on A400M and Future Strategic Tanker Aircraft projects. See Appendix Seven for a full reconciliation.

2 Approval values on Astute boats 6 and 7 as well as Lightning II has increased since last year. See Appendix Seven for a full reconciliation.

3 Lightning II and Specialist Vehicles are yet to have the number of platforms to be procured, or the in-service dates, approved.

Source: National Audit Office analysis of Departmental data

Appendix Four

Aligning the Equipment Plan 2013 to 2023 and the Major Projects Report 2013

1 The same project sample was used for the *Equipment Plan 2013 to 2023* and *Major Projects Report 2013*, to bring the two engagements into closer alignment. However, the *Major Projects Report 2013* defines projects by how they are approved whereas the *Equipment Plan 2013 to 2023* considers projects by cost lines selected from the Department's ten-year forward plan. A procurement project may consist of one or more cost lines depending on how the Department budgets for the costs. **Figure 13** shows how the 11 projects reviewed as part of the *Major Projects Report 2013* are mapped to the 13 cost lines sampled for the *Equipment Plan 2013 to 2023*; in many cases the project has only one cost line. The *Equipment Plan 2013 to 2023* excluded a number of cost lines that had a relatively lower remaining spend over the ten-year period and would not have a material impact in our review of affordability.

2 The *Major Projects Report 2013* also reviewed five projects where the main investment decision has not been taken. This represents seven further cost lines that were sampled for the *Equipment Plan 2013 to 2023* and is illustrated in **Figure 14** on page 44.

3 In total, the *Major Projects Report 2013* includes 16 projects that, for the purposes of the *Equipment Plan 2013 to 2023*, have been treated as 20 distinct cost lines. However, the *Major Project Report 2013* and the *Equipment Plan 2013 to 2023* take data from the same source; the differences between the two reports lie principally in the way that data is analysed. This is illustrated in **Figure 15** on page 45. Future reviews will look to align the two engagements further.

Figure 13

A comparison of the projects and cost lines examined as part of the *Major Projects Report 2013* and *Equipment Plan 2013 to 2023* where the Department has taken the main decision to invest

Project		<i>Major Projects Report 2013</i>	<i>Equipment Plan 2013 to 2023</i>
A400M		✓	✓
Astute		✓	✓
Core Production Capability		✓	✓
Complex Weapons	Brimstone 2	✓	Outside sample
	Sea Ceptor	✓	✓
	100 Kg Selective Precision Effects at Range Capability 3	Not approved	✓
Future Strategic Tanker Aircraft		✓	✓
Lightning II	System Demonstration and Development	✓	
	Production Sustainment and Follow on Development	✓	✓
Military Afloat Reach and Sustainability		✓	✓
Queen Elizabeth Class aircraft carriers		✓	✓
Specialist Vehicles	Scout	✓	
	All Vehicles	Not approved	✓
Typhoon	Tranche 1, 2 and 3	✓	✓
	Future Capability Programme	✓	Outside sample
	Typhoon Missile Integration	Not approved	✓
Warrior Capability Sustainment programme		✓	✓

Note

1 Although the Department has taken the decision to invest in Lightning II and Specialist Vehicles, the final decision to fully manufacture and introduce the equipment into service has not yet been taken. Therefore, these projects do not have approved entry into service dates.

Source: National Audit Office analysis of departmental data

Figure 14

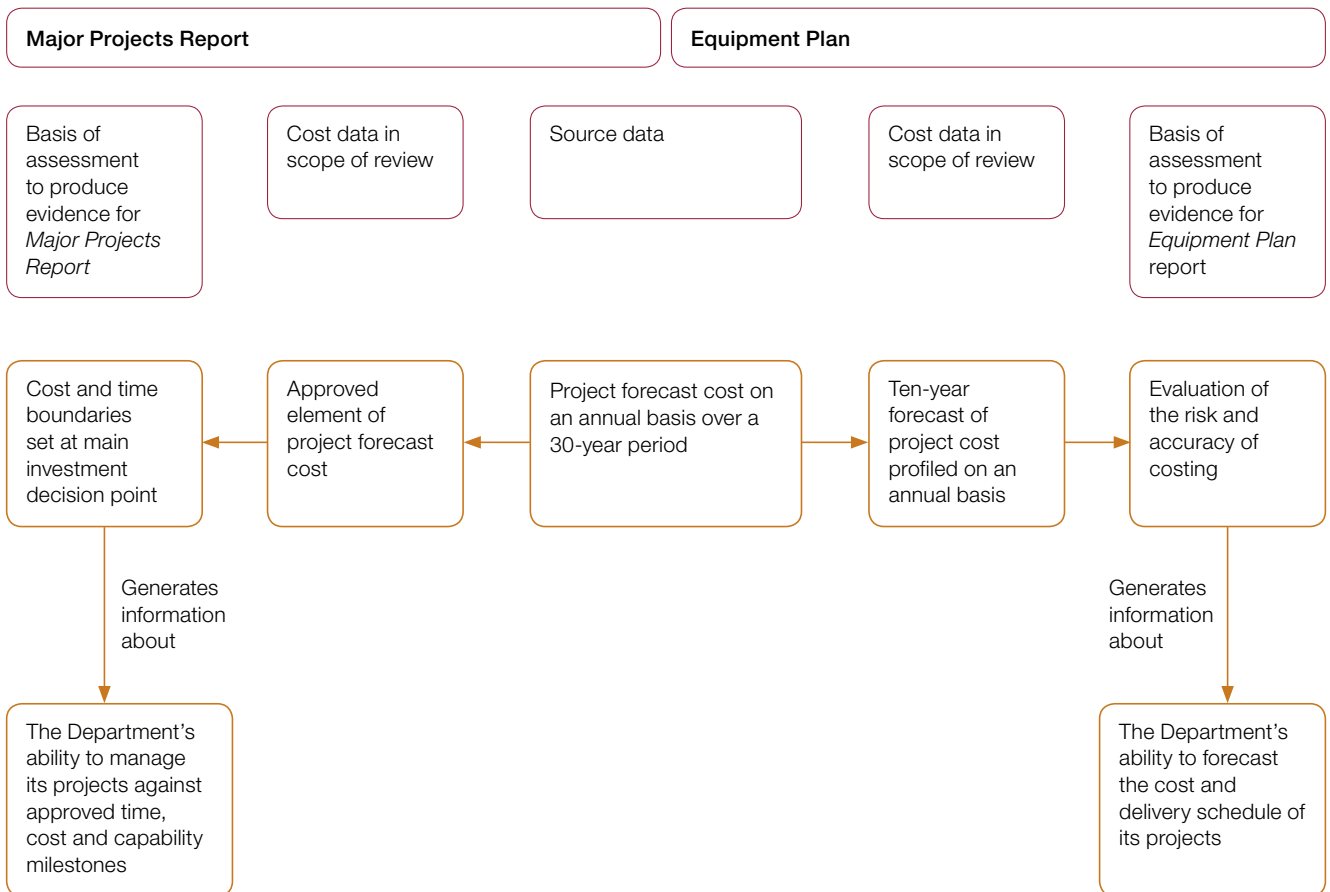
A comparison of the projects and cost lines examined as part of the *Major Projects Report 2013* and *Equipment Plan 2013 to 2023* where the Department has not yet taken the main decision to invest

Project	<i>Major Projects Report 2013</i>	<i>Equipment Plan 2013 to 2023</i>
Cipher	✓	✓
Successor		✓
Successor Platform		✓
Next Generation Nuclear Propulsion Plant	✓	✓
Common Missile Compartment		✓
Type 26 Global Combat Ship	✓	✓
Utility Vehicles	✓	✓
Attack Helicopter Capability Sustainment Programme	✓	✓

Source: National Audit Office analysis of departmental data

Figure 15

A flow diagram to show how the same source data is analysed in different ways to produce evidence for the *Major Projects Report* and the *Equipment Plan*



Source: National Audit Office

Appendix Five

Projects in the Complex Weapons Programme

Figure 16

The current composition of the Complex Weapons Programme and the value the Department has approved to date

Approval	Project	Description	Approval stage	Value (£m)
Interim Main-Gate 1 April 2010	Loitering Munition (Fires shadow)	Munition designed to loiter above a battlefield before attacking a stationary or mobile target	Demonstration and Manufacture	246
	Selective Precision Effects at Range Capability 2 Block 1 – now called Brimstone 2	Air-launched ground attack missile to be fitted on to Tornado GR4 and is intended for integration on Typhoon	Demonstration and Manufacture	
	Selective Precision Effects at Range Capability 2 Block 2	Warhead and guidance improvements to Brimstone 2 but cancelled in 2011	Assessment	145
	Selective Precision Effects at Range Capability 3	Integration of SPEAR Capability – an air-to-surface weapon – onto Lightning II	Assessment	
Interim Main-Gate 2 December 2011	Future Local Area Air Defence System (Land)	Short-range ground-based air-defence capability for use by the British Army	Assessment	541
	Future Local Area Air Defence System (Maritime) – now called Sea Ceptor	Air Defence System for the Type 23 Frigate to replace Sea Wolf. It is planned that Sea Ceptor will also be fitted on to the Type 26 Global Combat Ship	Demonstration	
September 2013			Manufacture	309
Interim Main-Gate 3 January 2012	Future Anti-Surface Guided Weapon (Heavy)	Anti-surface missile to be fitted to the Lynx Wildcat helicopter	Demonstration and manufacture	452

Figure 16 *continued*

The current composition of the Complex Weapons Programme and the value the Department has approved to date

The projects below are expected to form part of the Complex Weapons Programme but are yet to be approved by the Department.

Project	Description
Future Anti-Surface Guided Weapon (Light)	Anti-surface missile to be fitted to Lynx Wildcat helicopter
Beyond Visual Range Air-to-Air Missile on to Lightning II	Integration of Beyond Visual Range Air-Air Missile on to Lightning II aircraft
Indirect Fire Precision Attack Simple	Simple Indirect Fire Precision Attack Capability, to be launched from British Army guns
Indirect Fire Precision Attack Complex	Complex Indirect Fire Precision Attack capability for British Army
Stormshadow Mid-Life Re-Life	Extension of Stormshadow's – an air-launched weapon to engage strategic military targets – out of service date
Advanced Short Range Air-to-Air Missile Capability Sustainment Programme	Sustainment programme to extend Advanced Short Range Air-to-Air Missiles – a short-range air-to-air missile for Typhoon and Lightning II aircraft – out of service date
Unified Support Contract -1	Support of in-service weapons
50kg/Brimstone Spiral	Capability Sustainment Programme to provide Brimstone 2, and potentially Apache
Very Short-Range Air-Defence Effectors	Dismounted and vehicle-mounted Very Short-Range Air-Defence Capability for British Army
Future Long-Range Deep Fires Capability	Long-range strike weapon capability
Future Offensive Surface Warfare	Long-range anti-ship weapon capability
Deep Fires Rocket System	Precision strike rocket system for British Army
Dismounted Effects	Future man-portable weapon capability

Notes

- 1 Information correct as at 30 November 2013.
- 2 Future Anti-Surface Guided Weapon (Heavy) was approved by the Department in January 2012 subject to negotiations concluding with France and the project receiving France's national approval.

Source: National Audit Office analysis of departmental data

Appendix Six

Executive project summary sheets

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Attack Helicopter Capability Sustainment Programme 70

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A400M

The Capability

A400M is a collaborative programme involving seven European nations (Belgium, France, Germany, Luxemburg, Spain, Turkey and United Kingdom). It 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 Hercules C-130K fleet.

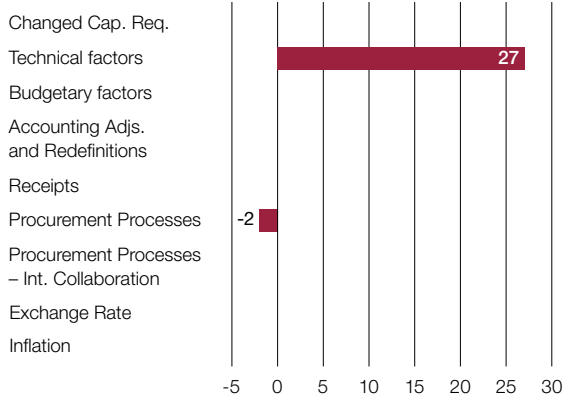


Overview of Cost, Time and Performance

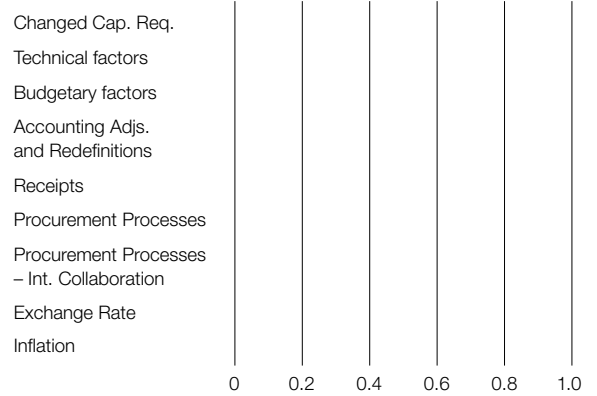
	Approved	Forecast/Actual	Variation	IY Variation
Cost of Assessment Phase	£2m	£1m	-£1m	
Cost of Demonstration & Manufacture Phase	£2,238m	£2,809m	+£571m	+£25m
Duration of Assessment Phase	-	34 months	-	-
In-Service Date	February 2009	March 2015	+73 months	0 months

In-year Cost and Time Variation Detail

In-year costs (£m)



In-year time (months)



The UK A400M training service achieved Main-Gate approval in July 2012. It will now be reported as a separate increment to the main A400M programme and be measured against its own Main-Gate approval.

Consequently the original Main-Gate approval which, in addition to aircraft acquisition included elements of initial training and initial in-service support, no longer represents an accurate baseline. As a result, the constituent elements of the original A400M platform Main-Gate approval (achieved in 2000) have been separated out and the A400M 'Budgeted For' and 'Highest Approved' figures have been adjusted to reflect this change. Although the overall Demonstration and Manufacture forecast figure being reported has come down, previously validated variations which remain within the scope of the original platform (aircraft acquisition) Main-Gate approval will continue to be reported against this element of the programme, so that a consistent measure of project performance against the initial baseline is maintained.

Additionally, in anticipation of the achievement of UK A400M in-service support Main-Gate approval later this year, these elements of the original Main-Gate approval have also been extracted.

At the Farnborough International Airshow in July 2012 the Prime Minister announced that an order for the first UK A400M full flight simulator had been agreed.

On 4 March 2013, Minister (Defence, Equipment, Support and Technology) announced that two further contracts relating to the A400M programme had been placed. The Training Service Support Contract will provide a specialist training school for personnel who will operate, support and maintain the A400M. A separate contract for the development, manufacture and installation of modifications required to operate the large aircraft infrared countermeasures defensive aids system when flying in hostile environments has also been let.

Following the conclusion of all of the required flight trials activity, the European Aviation Safety Agency granted a full Type Certificate to A400M on 13 March 2013.

Risk Assessment against Defence Lines of Development

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

Astute Class Submarines

The Capability

The military requirement is for up to eight Astute Class Submersible Ship Nuclear to replace the existing Trafalgar Class 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.

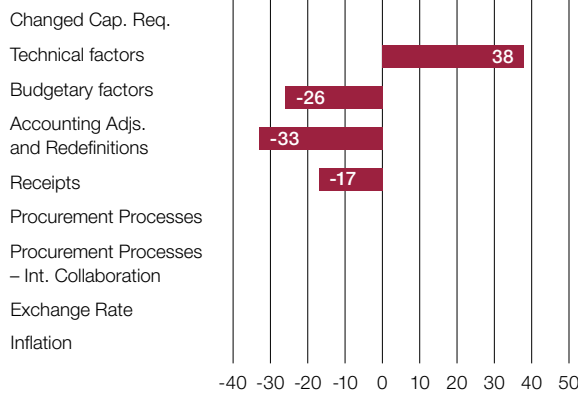


Overview of Cost, Time and Performance

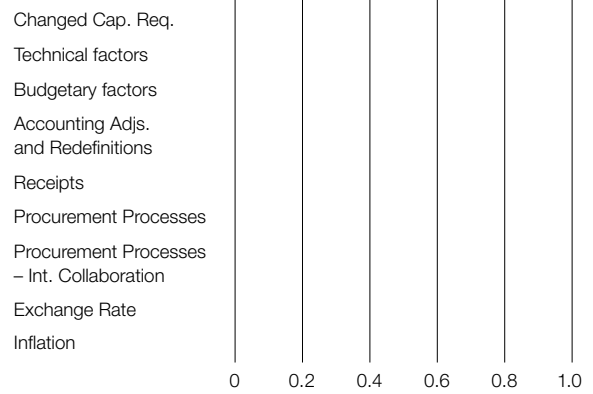
	Approved	Forecast/Actual	Variation	IY Variation
Cost of Assessment Phase	£33m	£29m	-£4m	-
Cost of Demonstration & Manufacture Phase Boats 1-3	£2,233m	£3,414m	+£1,181m	+£28m
Cost of Demonstration & Manufacture Phase Boat 4	£1,279m	£1,504m	+£225m	+£56m
Cost of Demonstration & Manufacture Phase Boat 5	£1,464m	£1,394m	-£70m	-£59m
Cost of Demonstration & Manufacture Phase Boat 6	£1,579m	£1,510m	-£69m	-£54m
Cost of Demonstration & Manufacture Phase Boat 7	£1,642m	£1,608m	-£34m	-£9m
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
In-Service Date Boat 6	May 2022	May 2022	0 months	0 months
In-Service Date Boat 7	March 2024	March 2024	0 months	0 months

In-year Cost and Time Variation Detail

In-year costs (£m)



In-year time (months)



Approvals

On 8 June 2012, HM Treasury approved the whole Astute Programme (Boats 1–7) and corresponding Astute Support Solution.

HMS ASTUTE has spent the year at sea concluding the majority of the extensive first of class sea trials programme, including demonstration of the full capability of the platform.

Boat 2 HMS AMBUSH exited the shipyard in Barrow-in-Furness on 15 September 2012 and undertook the initial platform proving phase of Contractors Sea Trials through to December 2012. HMS AMBUSH was formally commissioned into the Royal Navy at HMNB Clyde on 1 March 2013, and is on schedule to achieve Operational Handover in May 2013.

Boat 3 ARTFUL continues construction in the Devonshire Dock Hall at Barrow-in-Furness and remains on track to achieve Operational Handover in 2015.

Boat 4 AUDACIOUS submarine construction and outfit has continued in the Devonshire Dock Hall.

Boat 5 ANSON submarine has continued the open outfit stage in the Devonshire Dock Hall with some fabrication continuing in the New Assembly Shop.

Boats 6 and 7 – Further tranches of material have been procured for Boat 6 and procurement of long lead items for Boat 7 have commenced. Following receipt of Whole Programme approval in June 2012 the programme has pursued a number of opportunities to batch buy materials for Boats 5–7, delivering cost savings to the programme.

The Astute Class Training Service (ACTS) has continued to provide training for ships companies of both HMS ASTUTE and HMS AMBUSH and commenced training for the crew of ARTFUL. The training service provider, FAST, have submitted their bid for the addition of training for Boat 4 crews from May 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:

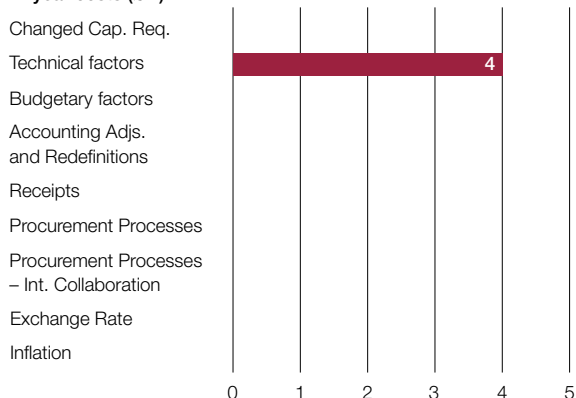
- a Improved, adaptable and flexible Complex Weapons that can be shaped to meet current and future military capability needs;
- b Freedom of Action and Operational Advantage in our Complex Weapons through a sustained indigenous industrial construct.

Overview of Cost, Time and Performance

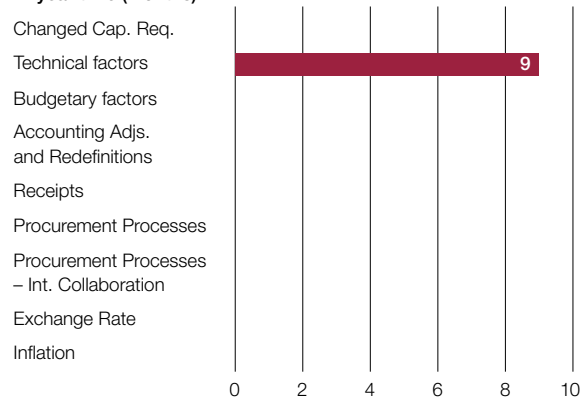
	Approved	Forecast/Actual	Variation	IY Variation
Cost of Assessment Phase – Complex Weapons	£239m	£236m	-£3m	–
Cost of Assessment Phase – SPEAR Capability 3, SPEAR Capability 2 Block 2 and Sea Ceptor Assessment phase elements	£145m	£139m	-£6m	–
Cost of Demonstration & Manufacture Phase: Fire Shadow and Brimstone 2	£246m	£247m	+£1m	+£4m
Cost of Demonstration & Manufacture Phase: Sea Ceptor Demonstration	£541m	£540m	-£1m	-£0m
Duration of Assessment Phase	–	22 months	–	–
In-Service Date Fire Shadow	March 2012	In-service date was not met	–	–
In-Service Date Brimstone 2	October 2012	November 2015	+37	+9
In-Service Date Sea Ceptor D	November 2016	November 2016	0 months	0 months

In-year Cost and Time Variation Detail

In-year costs (£m)



In-year time (months)



Brimstone 2

Significant technical issues (e.g. propellant cracking and liner de-bonding) on the Vulcan rocket motor, manufactured by Roxel, were discovered in January 2012. Following considerable Red Team expert activity since March 2012 there is now increased confidence in this Roxel solution passing the testing environment and achieving In-Service Date by November 2015. This is significantly later than that originally planned, but the Red Team continues to work with Roxel to deliver the capability, although fall back options remain under consideration. To monitor Roxel's progress a series of Risk Gate reviews have been established with the final one, Risk Gate (4), planned for June 2013, which is a prerequisite before seeking Investment Approvals Committee approval for the programme later this year.

In order to mitigate the risk on Operation HERRICK and potential Contingent Operations, resulting from the delay to the programme, the Defence Board has approved a Decision Point 2 Option for a further buy of Dual Mode Seeker (non-Insensitive Munition) Brimstone missiles. This additional buy is jointly funded by MoD and MBDA and will be delivered later this year.

Sea Ceptor Demonstration

Seeker Critical Design Review was held on 22 August 2012 with the Defence Science and Technology Laboratory, which demonstrated seeker readiness for air carriage trials. A Guided Firing Readiness Review (Significant Milestone) was conducted on 27 June 2012 and the deliverable was accepted by the Project Team by 30 September 2012. Critical Design Review commenced on 19 March 2013 with performance aspects to be completed in September 2013. Two Instrumented firings trials successfully conducted at Vidset in April 2013.

The latest MBDA schedule risk analysis conducted in February 2013 concluded that the 50% date for T23 Full Operating Capability In-Service Date in 2016 was within three weeks of the approved baseline. The Project Team is now conducting risk mitigation and further analysis in order to close this variance. MBDA's project schedule has been refined from 2000 to 8000 lines of detail since April 2011, as part of routine Demonstration Phase business, bringing significantly greater granularity to task elements. Greater confidence can be derived.

Fire Shadow

Fire Shadow was initially expected to deploy on Op HERRICK in April 2012, but due to changes in the strategic Operation task it was agreed that it should not deploy. In September 2011, the MoD Sponsor directed that a User-led activity should be instigated, dubbed the Fire Shadow Capability Demonstration, to inform future planning and investment decisions. The Fire Shadow Capability Demonstration was outside of the scope of the original Interim Main-Gate 1 and a Category D Capability Concept Demonstrator business case for the Fire Shadow Capability Demonstration was raised and approved in February 2012. Trials were completed in June 2012 and the final User report issued in November 2012.

Driven largely by experience in contemporary operations, the overall Indirect Fire Precision Attack requirement (of which Fire Shadow is a part) was revised in 2012. As a result, before embarking on further Demonstration and Manufacture activity, an Assessment Phase is being planned to assess the optimum means to meet the new requirement. It will include the assessment of the extent to which existing systems and technologies, including those from the initial increment of Fire Shadow, will be exploited.

Risk Assessment against Defence Lines of Development – Fire Shadow

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

Risk Assessment against Defence Lines of Development – Brimstone 2

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

Risk Assessment against Defence Lines of Development – Sea Ceptor D

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

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.

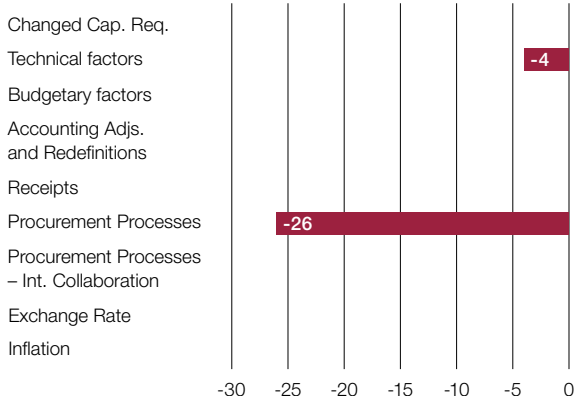


Overview of Cost, Time and Performance

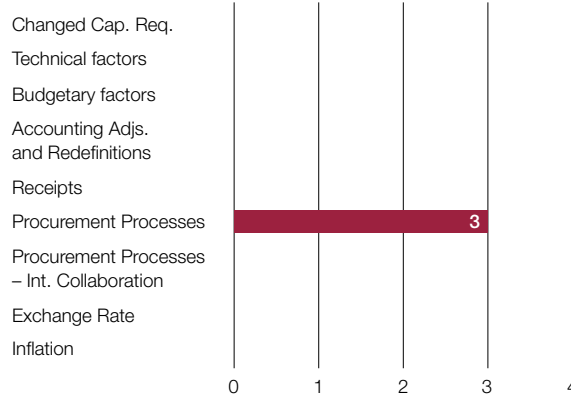
	Approved	Forecast/Actual	Variation	IY Variation
Cost of Assessment Phase	£107m	£107m	–	–
Cost of Demonstration & Manufacture Phase	£1,176m	£1,110m	-£66m	-£30m
Duration of Assessment Phase	–	56 months	–	–
Core Production Capability Date	May 2021	August 2021	+3 months	+3 months

In-year Cost and Time Variation Detail

In-year costs (£m)



In-year time (months)



May 2012 to January 2013: Construction Contract tender evaluation.

November 2012: following the Licensed Site Periodic Safety Review (PSR), The Health and Safety Executive's (HSE) Office for Nuclear Regulation (ONR) concluded that normal operation of the Licensed Site can continue while a programme of work to implement a number of improvements is progressed.

December 2012: Rolls-Royce place contract with subcontractor CH2MHILL to provide the project support.

January 2013: Rolls-Royce place contract for construction with Graham Construction. Work commenced on site. The demolition of Nuclear Manufacturing Services was completed in January 2013 in preparation for the start of Phase 1.

March 2013: Demolition of the Operations Management Centre was completed.

May 2013: Manufacturing Facility 1st Build (MF1B) piling commenced.

Cores have been delivered in-year to support the submarine programme.

Future Strategic Tanker Aircraft

The Capability

The Future Strategic Tanker Aircraft Service will provide 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.

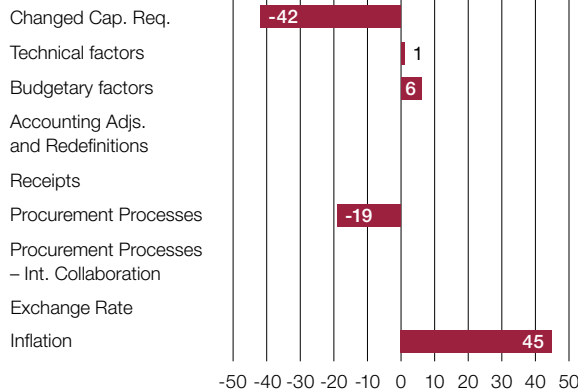


Overview of Cost, Time and Performance

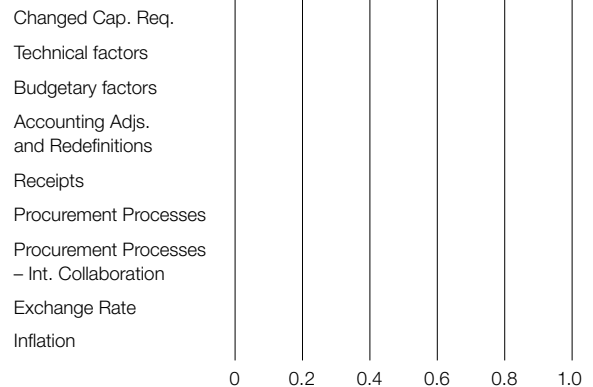
	Approved	Forecast/Actual	Variation	IY Variation
Cost of Assessment Phase	£13m	£38m	+£25m	–
Support Cost	£11,779m	£11,393m	-£386m	-£9m
Duration of Assessment Phase	–	77 months	–	–
In-Service Date (Air-to-air refuelling)	May 2014	May 2014	0 months	0 months
Contract Go-Live	March 2008	March 2008	0 months	0 months
Contract End	March 2035	March 2035	0 months	0 months

In-year Cost and Time Variation Detail

In-year costs (£m)



In-year time (months)



Future Strategic Tanker Aircraft project has previously been reported in the Major Projects Report on a forecasted Whole-Life Cost basis, including all costs (up to 2035) for PFI contract and other costs incurred by MoD in use of the PFI service.

MoD and NAO have agreed for Major Projects Report 2013 that Future Strategic Tanker Aircraft project would not report the cost of fuel, in line with conventional projects, following a recommendation from the Committee of Public Accounts on 4 February 2013. This results in a reduction in the approval value from £12,307 million, reported in 2012, to £11,779 million reported this year.

FSTA continues to build capability. The 1st Voyager aircraft is in trials programme with Airbus Military. The 2nd aircraft (MoD's 1st delivered) was granted a Release To Service for Air Transport on 4 April 2012, was placed on Military Aircraft Register on 5 April 2012 and commenced operational flying.

Following experience on the 3rd and 4th aircraft conversions, industry decided in June 2012 to move remaining ten conversions to Airbus Military facility in Getafe near Madrid. The 3rd aircraft was delivered end of December 2012, transferred to the Military Register and commenced Air Transport tasking.

A standard (un-converted) Airbus A330 has been used since 5 January 2013 by AirTanker Services. This 'green' aircraft has alleviated pressure on AAR crew training during 2013 through being used for Air Transport operations instead of other Voyager aircraft. It will be fed back into the conversion programme in January 2015.

MoD placed on contract the enhanced FSTA Aircraft Platform Protection system (EDAS). Embodiment is under way, as planned in the programme and is also reflected in wider defence capability planning.

Voyager infrastructure at Royal Air Force Brize Norton completed, also the training service stood up with the full flight simulator operational and used to train crews.

The 4th Voyager aircraft was delivered on time at the end of April 2013. The remaining deliveries remain on schedule and the May 2014 ISD remains unchanged.

The agreed rectification programme was completed with the initial AAR system problems resolved through modifications. However, during flight trials of the modified equipment, another problem emerged of 'basket tipping' with resulting risk of either receiver aircraft damage or pilot disorientation. An interim solution to address this issue has been agreed utilising a different drogue. Airborne trials were held in late 2012 and an operational clearance Release To Service (RTS) within a limited envelope (which is planned to widen during 2013) for Voyager to refuel Tornado was granted 16 May 2013 with operational AAR sortie flying from 20 May 2013. Work continues during 2013 toward achievement of RTS for Voyager to refuel Typhoon and C130.

Risk Assessment against Defence Lines of Development

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

Lightning II

The Capability

The Joint Strike Fighter has been selected as the aircraft to meet the Joint Combat Aircraft requirement, and provides the UK with a fifth-generation air system. Joint Combat Aircraft will provide the UK with an expeditionary multi-role fighter with the ability to enter and operate within contested airspace. Using secure links it will operate as a Combat Intelligence, Surveillance, Target Acquisition and 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.

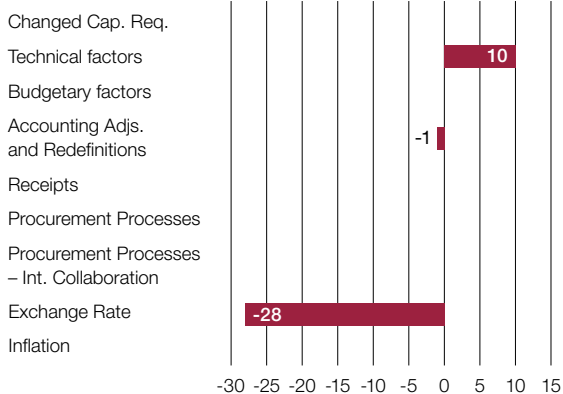


Overview of Cost, Time and Performance

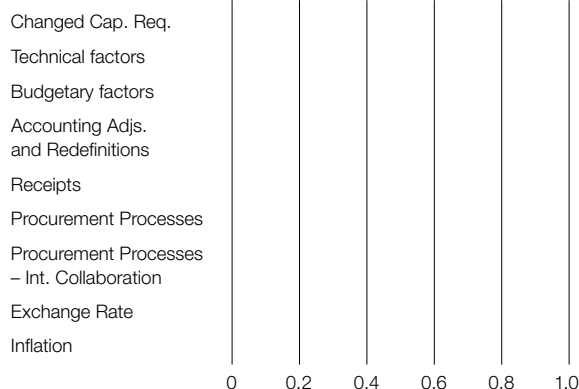
	Approved	Forecast/Actual	Variation	IY Variation
Cost of Assessment Phase	£150m	£144m	-£6m	-
Cost of Demonstration & Manufacture Phase	£2,873m	£2,488m	-£385m	-£19m
Duration of Assessment Phase	-	-	-	-
In-Service Date	-	-	-	-

In-year Cost and Time Variation Detail

In-year costs (£m)



In-year time (months)



In the UK the Joint Strike Fighter aircraft is now formally named and referred to as Lightning II.

In May 2012, the UK government reverted to the Joint Strike Fighter Short Take-Off and Vertical Landing variant due to the increased cost and delay associated with converting the Queen Elizabeth Class carriers to receive the Joint Strike Fighter Carrier Variant.

A formal Initial Operating Capability for the Joint Combat Aircraft requirement will not be set until the Main-Gate 4 decision point. However, the Department is planning to deliver a capability from both land and sea that is consistent with Her Majesty's Government policy to introduce a carrier strike capability around 2020.

On 19 July 2012, the UK took delivery of its first Joint Strike Fighter aircraft at Lockheed Martin's Fort Worth facility in Texas USA.

In October 2012, the UK took delivery of its second Joint Strike Fighter aircraft.

The two UK aircraft are based at Eglin Air Force Base in Florida where UK pilots and UK aircraft engineers are undergoing training to operate on the aircraft.

The project team received Investment Approvals Committee and HM Treasury Approval for Main-Gate 3 Review Note 2, which covered the order of a fourth aircraft, long-lead items for the Low Rate Initial Production 8 aircraft, and the Financial Year 2013-14 Composite Share Ratio contribution.

Risk Assessment against Defence Lines of Development

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

Military Afloat Reach and Sustainability

The Capability

The Military Afloat Reach and Sustainability (MARS) 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. MARS Tankers will provide bulk consumables and forward aviation support to the maritime task group.

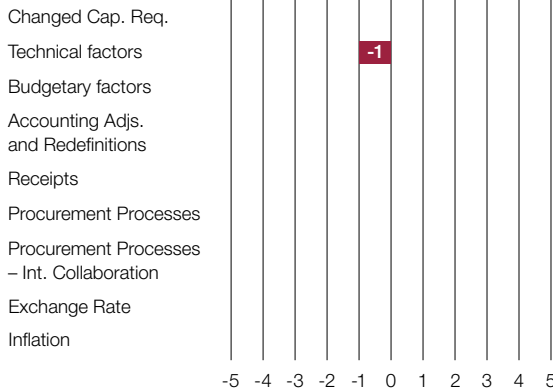


Overview of Cost, Time and Performance

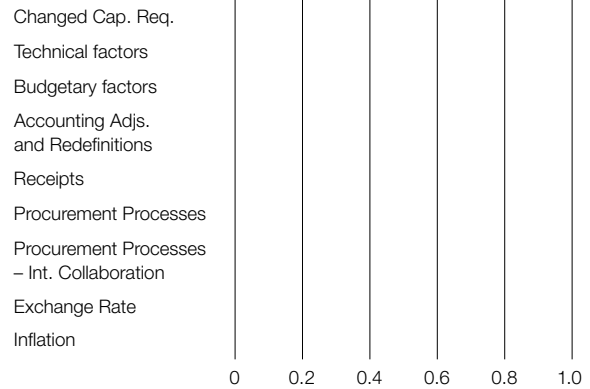
	Approved	Forecast/Actual	Variation	IY Variation
Assessment Phase	£44m	£17m	–£27m	–
Cost of Demonstration & Manufacture Phase	£596m	£595m	–£1m	–£1m
Duration of Assessment Phase	–	78 months	–	–
In-Service Date	October 2016	October 2016	–	–

In-year Cost and Time Variation Detail

In-year costs (£m)



In-year time (months)



In accordance with the Department's approvals process the final Performance Cost and Time metrics were approved in December 2012 providing the project's baseline. In June 2012, Her Majesty the Queen approved the names of the Tankers confirmed to be RFA TIDESPRING, RFA TIDERACE, RFA TIDESURGE, RFA TIDEFORCE.

The Preliminary Design Review was completed in July 2012. Progress has been made towards design transition from BMT Defence Services' basic design phase to Daewoo Shipbuilding and Marine Engineering detailed design phase, which is due to complete in summer 2013.

Risk Assessment against Defence Lines of Development

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

Queen Elizabeth Class Aircraft Carriers



The Capability

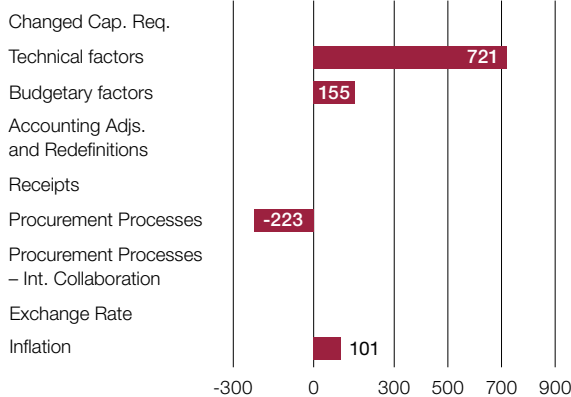
The platform element of the Carrier Strike capability will be provided by the Queen Elizabeth Class aircraft carriers. A staged approval to Main-Gate in 2007 led to the formation of the Aircraft Carrier Alliance (comprising MoD and industry) and contract award in 2008 to deliver the programme with In-Service 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

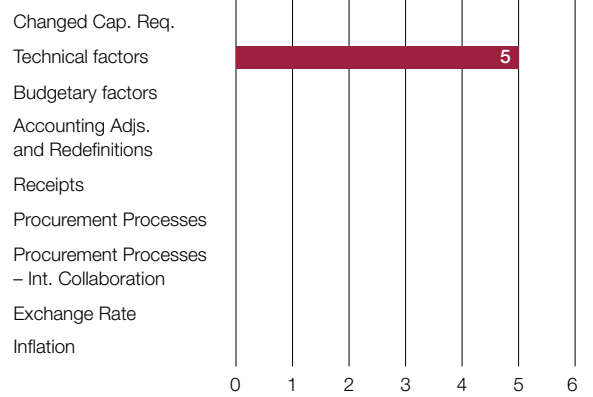
	Approved	Forecast/Actual	Variation	IY Variation
Cost of Assessment Phase (including Conversion)	£176m	£343m	+£167m	–
Cost of Demonstration & Manufacture Phase	£3,541m	£6,102m	+£2,561m	+£754m
Duration of Assessment Phase	–	84 months	–	–
In-Service Date	July 2015	December 2017	+29 months	+5 months

In-year Cost and Time Variation Detail

In-year costs (£m)



In-year time (months)



The build of the first carrier has made significant progress this year, with more than 50,000 tonnes now in the dock at Rosyth. Both gas turbines have been installed, the forward and aft islands have been lowered into place on the flight deck and the ramp has been installed. Work on the second carrier is increasing, with work under way on four Lower Blocks, two Centre Blocks and some of the Sponsons.

In May 2012, the Secretary of State announced the Department's decision to revert to the pre-Strategic Defence and Security Review position of operating the Queen Elizabeth Class as a Short Take-Off Vertical Landing platform. This meant that the Carrier Development Phase work – the activity to investigate options to convert one Carrier to operate the carrier variant of the Joint Strike Fighter (F-35C) formally initiated in May 2011 – was cancelled. The decision to revert will result in a write-off of costs accrued up to 10 May 2012. As at 31 March 2013 the estimated write-off costs were not expected to exceed £55 million. The full impact of reverting to Short Take-Off Vertical Landing is currently being considered and will form part of the final write-off business case.

The ACA formally began rebaselining the QEC programme in July 2012 and provided their initial findings to the MoD-chaired Alliance Management Board (AMB) in November 2012. Faced with a significant level of cost growth, the Department began detailed discussions with the ACA, with the aim of rebalancing the risk/reward mechanism.

These continued throughout the first half of 2013, culminating in a formal proposal from the ACA on 19 July 2013. On receipt of this proposal, the MoD Cost Assurance and Analysis Service (CAAS) was commissioned to undertake further investigations, which once again highlighted a series of challenges, or areas where cost could be reduced. MoD 2* and 3* led sessions were convened to ensure appropriate rigour had been applied in reviewing the ACA proposal and to agree resolution. Through this mechanism some £252 million of costs were driven out prior to final negotiations. During the negotiations in late October 2013, a further cost reduction of £96 million was achieved, resulting in a total cost reduction of £348 million compared to the ACA's July 2013 proposal position. Subsequently, a Heads of Terms agreement was signed between MoD and the ACA on 6 November 2013, which set out the commercial principles covering the agreement and work is now under way to obtain programme re-approval from the MoD Approving Authorities. A revised contract will be signed once this has been achieved.

At the industrial level, the revised QEC programme underpins the wider deal reached with BAES on the future of UK shipbuilding announced by the Secretary of State on 6 November 2013.

Risk Assessment against Defence Lines of Development

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

Specialist Vehicles

The Capability

Specialist Vehicles will provide a key element to the Army's multi-role brigades. The Scout platform and supporting variants will offer improved fightability, survivability, lethality, 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	£82m	-£27m	-
Cost of Demonstration & Manufacture Phase	£1,394m	£1,394m	-	-
Duration of Assessment Phase	-	Continuous	-	-
Duration of Assessment Phase – Recce Block 1 Demonstration	-	21 months	-	-
In-Service Date	-	-	-	-

In-year Cost and Time Variation Detail

During the year the programme continued to make progress with a number of design maturity events completed in the run up to Preliminary Design Review Exit in December 2012. This included:

- May 12 – Mine Blast De-risking Trial
- June 12 – Mobile Test Rig Roll-out (start of mobility trials)
- September 12 – Ambulance role mock-up
- December 12 – Preliminary Design Review Exit
- January 13 – Risk Review (Interim)

The Mine Blast de-risking trial completed in May 2012, providing valuable data on design maturity.

In parallel, assessment studies, including representative mock-ups, confirmed that Ambulance, Command and Engineer Recce roles could be delivered by sub-system installation on the Protected Mobility Recce Support vehicle. Assessment studies continued on options for the remaining roles of Formation Recce (Overwatch), Joint Fires Command and Ground Base Surveillance roles, against the existing User Requirements, to determine whether incremental upgrades are required to develop their capability further.

Planning Round 12 made a number of assumptions on fleet numbers, the follow-on Recce Block 2 and 3 assessment, and the Planning Assumption for Service Entry, pending Army 2020, Rebasing and Main-Gate 2.

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. The project is managed on behalf of the four partner nations by the NATO Eurofighter and Tornado Management Agency. To date, contracts have been placed for the Royal Air Force to receive 160 aircraft in three tranches. Typhoon support is being delivered through the letting of long-term contracts against five areas of support. Typhoon entered service with the Royal Air Force in 2003 and commenced operational duties in June 2007 when it assumed Quick Reaction Alert responsibilities for defence of UK airspace.

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 Royal Air Force's Typhoon fleet's multi-role capabilities.

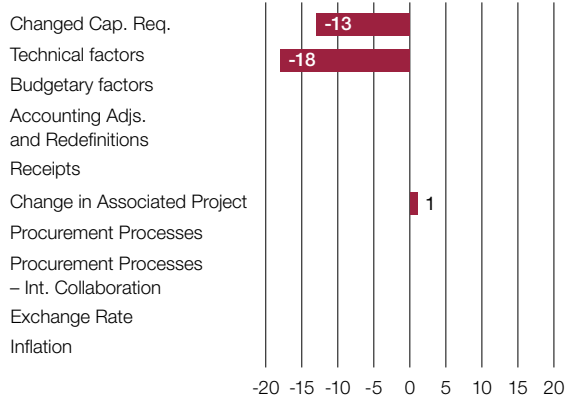


Overview of Cost, Time and Performance

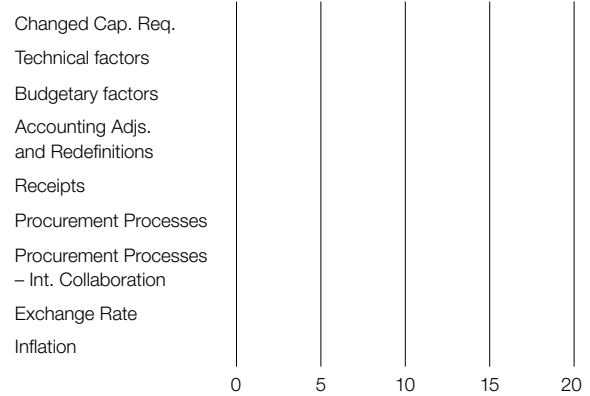
	Approved	Forecast/Actual	Variation	IY Variation
Cost of Assessment Phase	£132m	£132m	£0m	£0m
Cost of Demonstration & Manufacture Phase – Typhoon	£15,173m	£17,652m	£2,479m	£19m
Cost of Demonstration & Manufacture Phase – Typhoon Future Capability Programme	£402m	£430m	£28m	£11m
In-Service Date – Typhoon	December 1998	June 2003	+54 months	0 months
In-Service Date – Typhoon Future Capability Programme	June 2012	December 2013	+18 months	0 months

In-year Cost and Time Variation Detail

In-year costs (£m)



In-year time (months)



Typhoon capability upgrades continue to be progressed and capitalise on the aircraft's growth potential during the early stages of its operational life as a multi-role air defence platform in the 21st century. Planned upgrades include; the integration of the Meteor Beyond Visual Range Air-to-Air Missile following its successful launch from a Typhoon aircraft in 2012; continuing work to mature the technology required to replace the existing mechanically scanned radar with a new electronically scanned radar.

An announcement was made in December 2012 for the contract between BAES and the Sultanate of Oman for the delivery of 12 Typhoon aircraft to the Royal Omani Air Force. This will increase the number of Typhoon users to seven.

Under the programme known as Retrofit 2, 43 Typhoon aircraft have been upgraded to the Tranche 1 Block 5 standard, which includes installation of the Forward-Looking Infrared system, sensor fusion and the enhancement of air-to-air capability.

Typhoon undertook its first 'major' maintenance interval after completing 1,600 flying hours. The 'major' maintenance programme typically takes around nine months per aircraft to complete and is carried out as part of the Typhoon Availability Service at Royal Air Force Coningsby.

Typhoon played a key role during the 2012 Olympics by providing air defence capability when they were deployed to Royal Air Force Northolt to protect London as part of Operation Olympic Guardian. The aircraft also took part in fly-pasts over London during the Diamond jubilee celebrations.

The first phase of the Future Capability Programme has shown good progress over the past year now that the project schedule has been rebaselined, through joint working between the Department and industry. This accommodated the 18-month delay which was highlighted in Major Projects Report 2012.

The Typhoon front line fleet continues to build with well over half of the contracted deliveries of 160 aircraft in three tranches now in service with the Royal Air Force.

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.

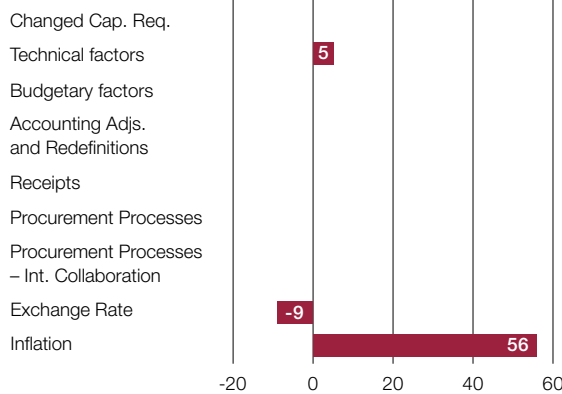


Overview of Cost, Time and Performance

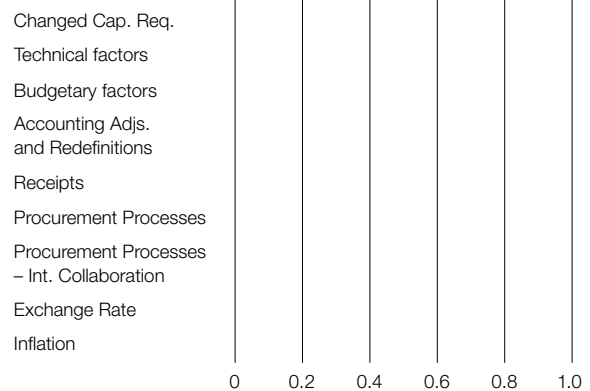
	Approved	Forecast/Actual	Variation	IY Variation
Cost of Assessment Phase	£83m	£79m	-£4m	-
Cost of Demonstration & Manufacture Phase	£1,319m	£1,371m	+£52m	+£52m
Duration of Assessment Phase – Warrior	-	27 months	-	-
Duration of Assessment Phase – Common Cannon	-	9 months	-	-
In-Service Date – Warrior	November 2018	November 2018	0 months	0 months

In-year Cost and Time Variation Detail

In-year costs (£m)



In-year time (months)



An increase in Retail Price Index (RPI) forecast from DASA DESA is driving significant cost growth in the Manufacturing years. Manufacture with the Prime is subject to a Fixed Price Contract with a Variation of Price Clause based on RPI. The Main-Gate approval for Warrior Capability Sustainment Programme capped the cost of the project at £1,319 million. While the project is cost capped a decision is not required until the end of the Demonstration Phase when we commit to manufacture, which will be supported by an Information/Review Note.

During the year a number of milestones were achieved including Integrated Baseline Review (April 2012), System Design Review (May 2012) and System Architecture Design Review (November 2012).

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	£66m	+£47m	–

In-year Cost and Time Variation Detail

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.

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).

This difficult and complex project has continued to address the challenges of the Cipher design over the past year and has failed to make the expected progress. In order to mitigate the risk of project failure, as is prudent and routine for major projects, a series of alternative approaches and fallbacks were considered and developed. Detailed consideration was given to these alternatives but none offered the required equipment capability at long-term value for money.

Since the end of the reporting year an internal review within MoD concluded that risk-reduction work and associated contracts on Cipher should cease and this decision was implemented. Since this time, MoD has been developing options for taking the requirement forward.

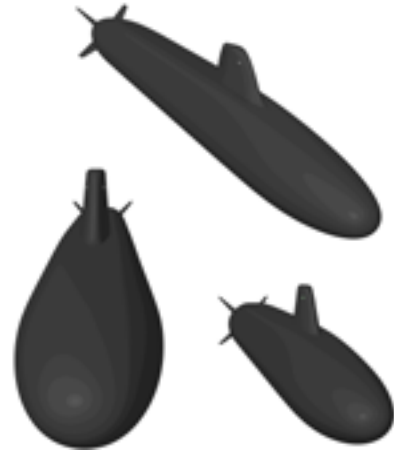
Successor

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 14 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 and £20 billion for a four boat solution.



Overview of Cost, Time and Performance

	Approved	Forecast/Actual	Variation	IY Variation
Assessment Phase	£3,015m	£2,936m	–£79m	–
Duration of Assessment Phase	–	65 months	–	–

The Assessment Phase

The Ship Specification, which decomposes the user requirement into specific requirements for each submarine system and attribute, has been fully developed and placed under configuration control with the exception of Outfitting Requirements. The first phase of the platform detailed design programme, Design Intent Definition, which confirms the system architectures, completed to plan in December 2012 with a major design review (System Definition Review, SDR) across all of the major systems areas. The detailed design of the Pressurised Water Reactor 3 (PWR3) plant is now over half-way through the design phase. All significant design decisions have been taken, with the design on track for its Critical Design Review in December 2014; the primary propulsion system exceeded the design maturity requirements for SDR.

During December 2012, the Annual Report to Parliament was submitted and in March 2013, the MoD Investment Approvals Committee approved the build strategy for the Common Missile Compartment.

The Main-Gate Investment decision point has been updated to September 2016. This revised date reflects the point at which the project will transition into the build phase. The forecasted assessment phase costs have also reduced compared to the previous submission, based on updated forecasts from industry and maturity of estimates for the assessment phase.

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 platforms become obsolete. The decisions came out of the Strategic Defence and Security Review.

The Type 26 Global Combat Ship will be a globally deployable and sustainable warship that will form the spine of the Royal Navy's future fleet. It will be 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) and C2 originally, while enhancing endurance and intelligence gathering attributes.



Overview of Cost, Time and Performance

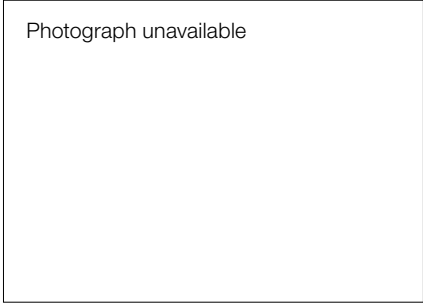
	Approved	Forecast/Actual	Variation	IY Variation
Assessment Phase	£158m	–	–	–
Duration of Assessment Phase	–	–	–	–

The Assessment Phase

Since the MoD Investment Approvals Committee endorsement of the programme at Main-Gate 1 in May 2012, the project team has continued the Assessment Phase to develop the detailed specifications of the ship design and maturity of data in order to move forward successfully in to the Demonstration, Manufacture and Support Phases at Main-Gate 2, the main investment decision. Work has continued to ensure the ship design and cost data are fully mature at cut steel while continuing supply chain engagement. This will reduce the risks and associated cost of downstream work, thus avoiding problems encountered by recent programmes.

Maritime Indirect Fire System has been brought under the programme umbrella, and its Main-Gate approval will be integrated into the T26 Main-Gate 2 submission. Maritime Indirect Fire System is an open competition led by the MoD for a medium calibre gun system and which passed its own Initial Gate in September 2012. The Invitation to Negotiate was issued in March 2013 to companies who successfully completed the Pre-Qualification Questionnaire.

Attack Helicopter Capability Sustainment Programme



The Capability

UK Defence competed to provide an Attack Helicopter capability to replace the Lynx/Tube-Launched Optically Tracked Wire-guided missile (TOW) combination during the 1990s. The competition resulted in the selection of the AgustaWestland (then GKN Westland) Apache WAH-64, known to the British Army as the Apache AH Mk1, and which entered service in 2004.

The UK's Apache AH Mk1 is a modified US AH-64D Block 1 and is becoming increasingly obsolescent. The Attack Helicopter Capability Sustainment Programme (AHCSP) addresses existing and forecast critical obsolescence issues that will progressively degrade operational capability of the current Apache AH Mk1 towards the end of the decade, following the withdrawal from service of the equivalent US Apache model, and which, if left untreated, would result in the complete loss of the Attack Helicopter capability in the period 2020 to 2025. The aim of the Capability Sustainment Programme is to deliver the sustainment of the required Attack Helicopter capability in support of extant Defence policy across the full spectrum of warfare until 2040.

Overview of Cost, Time and Performance

	Approved	Forecast/Actual	Variation	IY Variation
Cost of Assessment Phase	-	-	-	-

The Concept Phase has seen the production, delivery and endorsement of the Key User Requirements. The AHCSP options analysis, based on engineering analyses and cost modelling, have largely been completed with the final validation and verification of the Investment Appraisal of the options considered as the main outstanding issue. The options and associated procurement strategy was due to be taken to the Department's Investment Approval Committee in Quarter 4 2013 for Initial Gate Approval to launch the Assessment Phase. The time-phased budget of work for the platform, training and Integrated Logistic Support requirements is being developed to support the Initial Gate Business Case.

Utility Vehicles

Photograph unavailable

The Capability

Primarily Utility Vehicles will equip the A2020 Utility Vehicles Infantry Battalions and the supporting Combat Support, e.g. Artillery and Engineers, and Combat Service Support, e.g. Medics and the Royal Electrical and Mechanical Engineers.

The Army 'battle groups' its assets to deliver combined arms capability, meaning Utility Vehicles Battalions elements will operate with Armoured (Challenger 2) and Armoured Infantry (Warrior) groupings, among others. Similarly, Combat Support and Combat Service Support elements will also operate in such groupings and be equipped with Utility Vehicles. Utility Vehicles will therefore cover a multitude of roles across the full spectrum of operations.

Overview of Cost, Time and Performance

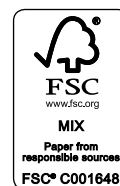
	Approved	Forecast/Actual	Variation	IY Variation
Cost of Assessment Phase	–	–	–	–

The Assessment Phase

The Utility Vehicle User Requirement Document remains extant and defines a fleet of medium weight armoured wheeled vehicles to replace the obsolete Saxon and ageing Fighting Vehicle 432 legacy platforms.

Utility Vehicles was originally part of the Future Rapid Effect System programme. In December 2008, the Equipment Examination restructured the programme prioritising Scout Specialist Vehicles Reconnaissance Block 1 over Utility Vehicles.

Pre-concept work is under way between Director Combat (Sponsor) and Defence Equipment and Support to refine the roles and associated requirements for Utility Vehicle as part of the Armoured Vehicle Programme Estimate before programme relaunch in 2015.



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