National Audit Office

Report
by the Comptroller
and Auditor General

Ministry of Defence

Major Projects Report 2015 and the Equipment Plan 2015 to 2025

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Ministry of Defence

Major Projects Report 2015 and the Equipment Plan 2015 to 2025

Report by the Comptroller and Auditor General

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Sir Amyas Morse KCB
Comptroller and Auditor General
National Audit Office

20 October 2015

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This report combines the Major Projects Report and the Equipment Plan to give a rounded view of the Ministry of Defence's progress and maintenance of its equipment portfolio.

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Contents

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Key facts

£69bn
cost of the Ministry of Defence's 10-year Equipment Procurement Plan

£84bn
cost of the Department's 10-year Equipment Support Plan

£3.5bn
amount by which the 10-year Equipment Plan is higher than last year (procurement and support)

£247 million	the decrease in the forecast cost of the approved projects within our review of major projects – a 0.4% decrease in current forecast costs
£4.3 billion	Department's contingency budget to mitigate potential increases in the cost of the 10-year Equipment Plan
£5 billion	the extent to which project teams may be underestimating the financial risks within project budgets, according to the Department's independent Cost Assurance and Analysis Service
60 months	in-year time slippage of these projects, 52 months of which were attributable to one project to accommodate a new requirement – the net variance across other projects was 8 months
12 projects	number of procurement projects in our sample of 17 that display good practice in forecasting cost
£14.9 billion	amount the Department is planning to spend on equipment procurement and support in 2015-16, representing 46% of its core budget
0.3%	underspend against the original equipment budget in 2014-15, representing a better matching of expenditure to budget than previous years
5%	underspend against the final total programme of work for 2014-15, also an improvement on last year
99%	expected delivery of Key User Requirements of the approved projects within our review of major projects

Summary

Scope of the report

1 Since 2012, the Ministry of Defence (the Department) has published an annual Affordability Statement on the affordability of its 10-year plan to deliver and support the equipment that the Armed Forces require to meet their objectives.[1] We report on the robustness of the assumptions underlying the Statement.

2 Each year the Department also presents to the Committee of Public Accounts a Major Projects Report, which provides data on the cost, time and performance of the largest defence projects.[2] We review the information underlying in-year variations to cost, time and performance.

3 The Equipment Plan is the Department's forecast budget to cover the costs of procurement and support of military equipment for the next 10 years. In 2012, the Department adopted a new approach to generate greater stability in its procurement activity. This involved developing a budget for a 'core programme' of key equipment projects, with additional sums set aside for contingency and emerging requirements. The Equipment Plan is updated annually. For the period 2015 to 2025, the equipment budget is £166 billion, made up of procurement (£69 billion) and support (£84 billion) budgets, a central contingency reserve (£4.3 billion), and an unallocated budget (£9.5 billion) that the Department has not yet committed to specific programmes. The Plan is funded from the Department's overall budget, and makes up more than 40% of its planned spend.

4 This report combines the Major Projects Report and the Equipment Plan to give a rounded view of the Department's progress and maintenance of its equipment portfolio. We have selected a sample of 17 projects as the basis for reporting on performance and to support our review of affordability.[3] For continuity, we have used the same sample as in 2014. Together these projects make up a significant proportion of the Department's equipment spend.

5 Fiscal responsibility for the Equipment Plan is delegated to the three Front Line Commands of Air, Army and Navy, the Joint Forces Command and the Strategic Programmes Directorate within Head Office (collectively known as 'the Commands'). Responsibility for project delivery remains principally with the Defence Equipment and Support organisation with delivery of Information Systems and Services the responsibility of the Joint Forces Command.

1 These objectives are set out in: HM Government, *A Strong Britain in an Age of Uncertainty: The National Security Strategy*, Cm 7953, October 2010.
2 The project summary sheets the Department submits to Parliament are contained in Volume II of this report.
3 We also looked at the assumptions underlying a small additional sample of support projects.

6 We have not set out to offer a definitive view on the affordability of the Equipment Plan as it is, by its nature, based on assumptions about the future that will inevitably change. Rather, we review the assumptions that underpin the forecast costs and funding to assess whether they were reasonable and consistently applied when they were made. We explain our approach in Part One. We look at: the Department's assumptions underpinning the forecast costs of the Equipment Plan (Part Two); and the assumptions underpinning available future funding (Part Three). Parts Two and Three define whether the plan is affordable. In Part Four we review whether the disclosures in the Department's statement are sufficient for the reader to understand fully the sensitivities of the affordability position. Appendices One and Two contain full details of our audit procedures, and Figure 14 gives an overview of the projects included in our analysis. Summaries of the projects in our sample are included at Appendix Four. The full set of information for each project is set out in the project summary sheets prepared by project teams, which are included as Volume II of this report.

Key findings

The Department's ability to fund the Equipment Plan

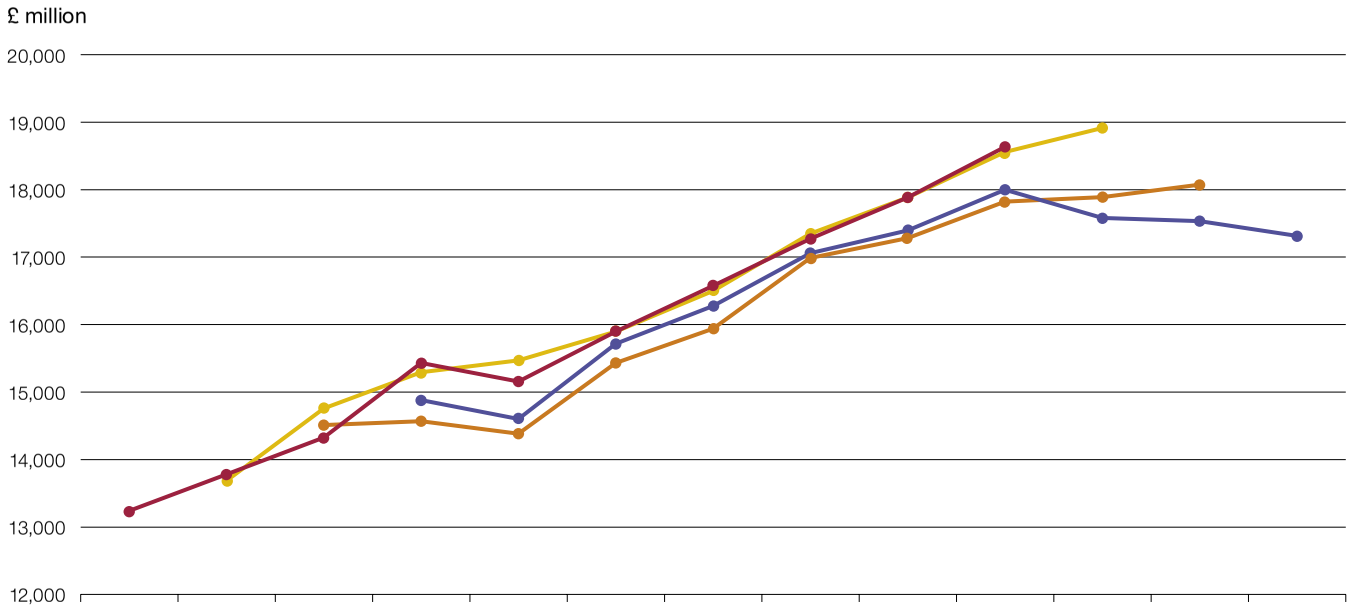
7 The forecast cost of the Equipment Plan 2015 to 2025 is £0.7 billion higher than the forecast cost of the 2014 to 2024 Equipment Plan across the 9 years they have in common. Overall, the forecast cost of the Equipment Plan 2015 to 2025 is £3.5 billion higher, mainly due to the effect of bringing 2025 into the 10-year planning period. The forecast cost of the plan for 2015 to 2025 is £166.4 billion compared with £162.9 billion for the period 2014 to 2024 (see **Figure 1**). Since 2012, the Department has emphasised the importance of the affordability of its core equipment programme. For the Department to have confidence that the Equipment Plan is affordable, the combined cost forecasts for its core programme of projects need to be contained within the sums made available by HM Treasury, allowing for the non-equipment commitments of the Department. The Department has held funding back for the period beyond 2021-22 to preserve flexibility ahead of the outcomes of the Spending Review and Strategic Defence and Security Review (paragraphs 2.2 and 2.3).

8 The Department was prudent in planning its Equipment Plan funding for 2015-16 on the basis of the previous year's assumptions about future funding of its core budget. Government announcements about future funding of the defence budget have confirmed that Defence can continue to plan on growing the Equipment Plan budget by 1% above inflation year-on-year for the remainder of this Parliament (although this is not guaranteed for the full period of the Equipment Plan). The Department can choose to spend more of its core budget than that on equipment procurement and support (paragraphs 3.3, 3.4 and 3.16).

Figure 1

The 10-year forecast cost profiles of the Equipment Plan 2014 and Equipment Plan 2015

This shows changes in the forecast plan between 2013 and 2015



	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22	2022-23	2023-24	2024-25
Comparable 2012 Budget	13,240	13,779	14,324	15,431	15,157	15,898	16,575	17,273	17,884	18,633			
2013 Budget		13,688	14,758	15,295	15,472	15,897	16,501	17,348	17,884	18,559	18,914		
2014 Budget			14,511	14,566	14,381	15,434	15,939	16,987	17,283	17,822	17,887	18,074	
2015 Budget				14,880	14,600	15,714	16,277	17,059	17,397	17,996	17,582	17,532	17,314

Note

1 The Equipment Plan covers a forecast 10-year period and is produced annually. Therefore, successive plans share a 9-year period in common, with an additional year brought into the scope of the Equipment Plan each year.

Source: National Audit Office analysis of Departmental data

9 Any judgement about whether funding levels will be adequate in the future depends upon the results of the government's Spending Review, due in November 2015, and Strategic Defence and Security Review. Government announcements about future funding of the defence budget in July 2015 confirmed the realism of the Department's March 2015 assumptions about money available for the 2015 Equipment Plan until 2020-21.In the meantime, the Department has budgeted prudently for the years beyond 2020-21 to maintain financial flexibility ahead of the Spending Review (paragraphs 3.2 and 3.4 to 3.5).

10 The Department's contingency may not be enough to mitigate the combined effects of underestimates in project team costs and equipment plan budgets. The Department has a £4.3 billion contingency budget across the 10-year Plan to mitigate potential cost increases within the core Equipment Plan. This is £0.7 billion less than the current 'realistic' estimate of cost outturn of the Equipment Plan made by the Department's Cost Assurance and Analysis Service. If this estimate proves to be correct, the Department may need to draw on the £9.5 billion it has set aside to deliver wider defence capability, which is not currently included in the core programme (paragraphs 2.13 and 3.9 to 3.11).

11 The Department's Affordability Statement should be clearer about uncertainties in the costs within the Equipment Plan. The Statement does not explain the range of possible cost outcomes across projects, even though it is good practice to express forecasts in these terms in recognition of the uncertainties within forecasts. Nor does it quantify risks not included in cost forecasts (paragraph 4.5).

Confidence in performance of major procurement projects

12 Our review of the forecast cost of 13 major projects where the Department has decided to buy equipment shows that in aggregate the cost and performance of these projects has remained stable during 2014-15. The forecast cost of these projects has reduced by £247 million (0.4%). This was largely due to an accounting adjustment on the Typhoon fighter jet project. Forecast costs reduced on 5 other projects and increased in 3, notably the Astute submarine project. The Department forecasts the projects will achieve 99% of their intended capability (paragraphs 2.6, 2.7 and Appendix Three).

13 With one notable exception, projects across our sample have reduced the overall level of time slippage compared to last year. During 2014-15 there were in-year time variations totalling a net 60 months (compared with 14 months in 2013-14) for 5 out of 12 projects. Most of this was a net 52-month deferment of the final stage of the Core Production Capability project. This was done to accommodate the production of an additional reactor core for HMS Vanguard and to maintain the capability to supply a further core for HMS Victorious, if required. This was a new requirement that the project team could not have foreseen and which was outside their control. The remaining projects had a net variation of 8 months, compared with 14 months in 2013-14 (Appendix Three).

14 The longstanding annual review of Major Projects does not align with the Department's more extensive internal performance reporting processes. Over the coming months the Department and the National Audit Office (NAO) will work together to develop a more cost-effective approach to keeping Parliament informed about the progress of major defence projects, capitalising on expected improvements in data quality to reduce the resources required for data validation (paragraphs 1.11 and 1.12).

Confidence in the longer-term forecasts of performance in our sample

15 Forecast costs for our sample of projects across the 10-year Equipment Plan period are largely stable. Alongside our review of the aggregate cost changes from the previous year (paragraph 10), we also undertook a detailed review of the major cost lines for 17 of the largest procurement projects to see whether costs were stable at the project level. We found that the forecast costs for the period 2015 to 2025 increased by £0.7 billion (1.6%) compared with the forecast cost last year (paragraph 2.5).

16 Projects in our sample have improved their cost forecasting and risk management practices. Twelve of the 17 procurement projects had generated a range of potential costs in line with good practice, compared with 9 projects in 2014. Most teams' approach to – and understanding of – risk management is now reasonable. However, we still have concerns about how a core of procurement and support teams in our sample value risks and incorporate those risks into cost models. In 7 projects we found that teams were using inflation rates which were either out-of-date or not evidence-based (paragraphs 2.16 to 2.20).

Confidence in the longer-term forecasts of performance in the Department's portfolio

17 There is evidence that the Department and its contractors are still underspending as they struggle to carry out planned activities on schedule, which could be an indicator of future slippage in delivering these projects. The Department spent £14.47 billion in 2014-15. This was a £41 million underspend against its original equipment budget, compared with an overspend of £185 million in 2013-14. The Department again programmed additional work against its budget on the assumption that not all of the planned spend would occur in-year, amounting to around £700 million in 2014-15. Without this additional work the underspend on the programme would have been £732 million. The Cost Assurance and Analysis Service's annual detailed review into the causes of project underspending was not available before publication of our report this year. Previous reports have shown that re-scheduling of activities to reflect slower-than-expected progress was an important contributory factor. There is evidence to support the view that this is still the case for our sample of procurement projects, which had a net underspend of £295 million in 2014-15, compared with a slight overspend in 2013-14. A significant contributory factor was the movement of activity into future years, both planned and unplanned (paragraphs 2.9 to 2.12).

18 How the Department manages a small number of very large procurement projects will be crucial in whether it maintains the affordability of the Equipment Plan. The Department's Cost Assurance and Analysis Service estimates that procurement costs could be underestimated by as much as £2 billion. Three-quarters of this amount is attributable to 4 projects, including the Successor and Astute submarines and Type 26 warship. The Department's Sentinel project monitoring system also gives high-risk ratings to some of these 4 projects (paragraphs 2.13 to 2.15 and Appendix Three).

19 The Department faces a continuing challenge in reining in support costs. The independent cost estimates of the Department's Cost Assurance and Analysis Service now cover a greater proportion of the support budget. As a result, it estimates that the level of understatement of support costs within the Equipment Plan has risen from £2 billion (based on 28% coverage) to £2.8 billion in 2015 (covering the total support plan). As the Equipment Plan period rolls forward, it is encompassing the entry into service of major new equipment. As a result, the budget for support of equipment not yet in service has risen 23% in 2 years. Our validation work continues to show that cost forecasts are not as well developed for support projects (paragraphs 2.3, 2.4 and Figure 7).

Conclusion

20 The Equipmqnt Plan looks more stable than last year and progress has been maintained. Analysis of our sample of major projects indicates that the Department has continued to maintain overall stability within the costs of the 10-year Equipment Plan. There was little sign of in-year cost growth or increase in forecast costs in the rest of the 10-year planning period. There are also indications that the Equipment Plan will remain affordable for the rest of the Parliament if this stability is maintained, based on the level of funding which seems likely to be made available.

21 The Department will need to remain vigilant, however. Uncertainties about future cost increases of some very high-value projects that are still at the pre-contract stage, together with the Department's need to make room in its budget for the support costs of a range of new equipment currently being procured, show that the drivers of cost increases remain present. The large time slippage on one project in our sample, due to a low-probability, high-impact risk materialising this year, shows the importance of incorporating such risks into cost plans and forecasts across all projects.

Recommendations

a **The Department should improve the transparency of the Affordability Statement by giving more insight into how the forecast costs of projects within the Equipment Plan might vary.** There are inherent uncertainties around projects at varying levels of maturity. The Department's guidance on good practice in costing projects explains that a range of potential costs should be reported to reflect levels of uncertainty, and that high impact, low probability risks should be accounted for in plans. The Department should also apply this at the portfolio level.

b **The Department needs to give urgent attention to closing systemic and project-specific capability gaps within project teams.** For example, a lack of capability in finance matters continues to give rise to large accounting corrections and adjustments. The success of the Defence Equipment and Support organisation's transformation programme relies on removing capability gaps of this sort.

c **The Department should enforce compliance with mandated guidance and recognised good practice on project management and other issues by its project teams.** This is integral to the Defence Equipment and Support organisation's transformation programme.

d **The Department should use the Affordability Statement to clarify its position on programming additional work in-year to ensure that it spends the equipment budget.** The Department continues to rely on the programming of additional work to compensate for likely underspends on core activities in the Equipment Plan. The Department should ask the Commands to explain how they will use their new responsibilities for in-year budget management to provide incentives for contractors to either deliver contracted levels of activity or develop more realistic delivery plans. The Department should develop a clear timetable for minimising or removing reliance on over-programming to spend its budget.

e **The Department should work with the NAO to produce a more timely and efficient Parliamentary accountability process to report progress on major projects.** The format of the Major Projects Report, developed more than 30 years ago, does not align with the information produced by the Department's internal systems.

Part One

Affordability of defence equipment

1.1 Since 2013 the Ministry of Defence (the Department) has published its annual Equipment Plan setting out its spending plans for the equipment the Armed Forces need to meet their objectives over the next 10 years.[4] From 1 April 2015 to 31 March 2025 the Equipment Plan has a total budget of £166.4 billion for:

- equipment procurement (£68.5 billion);
- equipment support (£84.1 billion);
- a contingency provision (£4.3 billion); and
- an unallocated budget of £9.5 billion, consisting of £7.3 billion of 'headroom', which has previously been allocated to Commands from 2017-18, and £2.2 billion retained by the Department centrally to meet longer-term needs.

1.2 Each year the Department also presents to Parliament a Major Projects Report. This gives data, as at 31 March, on the cost, time and performance of the largest defence projects where the Department has taken the decision to proceed to the main demonstration and manufacture stages of the project. This means that it has approved a budget and timetable. The Report also gives less detailed information about the largest projects where the Department has not yet taken a decision but project development work is ongoing.

Our review of progress

1.3 In this report we use information from both the Equipment Plan and the Major Projects Report to give a full overview of the Department's major procurement programmes. Relatively small changes to planned cost and delivery on large programmes can have an impact on the affordability of the Equipment Plan. By combining the two pieces of work, we can help Parliament to assess whether the performance of the projects supports the view that the Equipment Plan is affordable. The Equipment Plan and the Major Projects Report outline the procurement costs from the point of view of what is approved and what is expected.

4 The Armed Forces' objectives are set out in: HM Government, *A Strong Britain in an Age of Uncertainty: The National Security Strategy*, Cm 7953, October 2010; HM Government, *Securing Britain in an Age of Uncertainty: The Strategic Defence and Security Review*, Cm 7948, October 2010.

1.4 This report examines whether:

- the costings in the 2015 to 2025 Equipment Plan were based on broad assumptions that were reasonable and consistent. This includes how changes to the cost, time and performance of major projects beyond the 10-year period relate to overall affordability (Part Two). It draws on our examination of the data in the Department's Major Projects Report (summarised in Appendices Three and Four);
- the assumptions used in forecasting the total funding available to the Department and the funding allocated to the Equipment Plan are realistic (Part Three); and
- the Department's Affordability Statement contains enough appropriate information to make the reader aware of:
    - the Plan's key assumptions and risks; and
    - how much the assumptions would need to change for the Equipment Plan to become unaffordable (Part Four).

Strategic Defence and Security Review 2015

1.5 The government has started its 5-yearly Strategic Defence and Security Review, which will dictate the Armed Forces' capability and posture over the period to 2020. HM Treasury has confirmed that the Spending Review being conducted in parallel will set the Defence Budget for 5 years from 2016-17. The government expects the Spending Review to report in November 2015.

1.6 The National Audit Office (NAO) is publishing this report in October in order to provide a view of the affordability of the Equipment Plan as it stands at the point of publication of the review. We intend that Parliament will be able to use our findings as a baseline against which to assess the implications of the Reviews when they report.

Our approach

1.7 To support our review of the assumptions that underpin the forecast costs of the Equipment Plan, we looked in detail at 17 of the Department's largest procurement projects and 4 support projects. For the sampled projects we looked at whether the assumptions used to forecast the 10-year costs were reasonable and consistent. For the 17 procurement projects, we also looked at the progress of cost, time and performance against the original approvals (that being the data included in the Major Projects Report). Summaries of the projects in our sample are included at Appendix Four. The full set of information for each project is set out in the project summary sheets completed by project teams, which are included as Volume II of this report.

1.8 Our approach to examining the 10-year Equipment Plan was to look at the audit evidence that the costs are sufficiently robust for planning purposes by reviewing: the cost modelling; risk management; the Department's own assurance processes; and in-year performance against budget. We also worked closely with the Cost Assurance and Analysis Service of the Department to understand the work it has done through its independent cost reviews and estimates, both for the projects we sampled but also on the wider Equipment Plan, as well as their cost forecasting work on behalf of project teams.

1.9 The Equipment Plan covers a 10-year period, whereas the project approvals analysed in Appendix Three can cover a longer period. Therefore, the Equipment Plan and Major Projects Report measure the Department's performance in different ways. This is illustrated by **Figure 2**, which shows the cycle of the procurement projects and the sub-set of costs that are included in the 10-year Equipment Plan. The sample of support costs is shown in Appendix Two.

The path to a reasonable assurance engagement

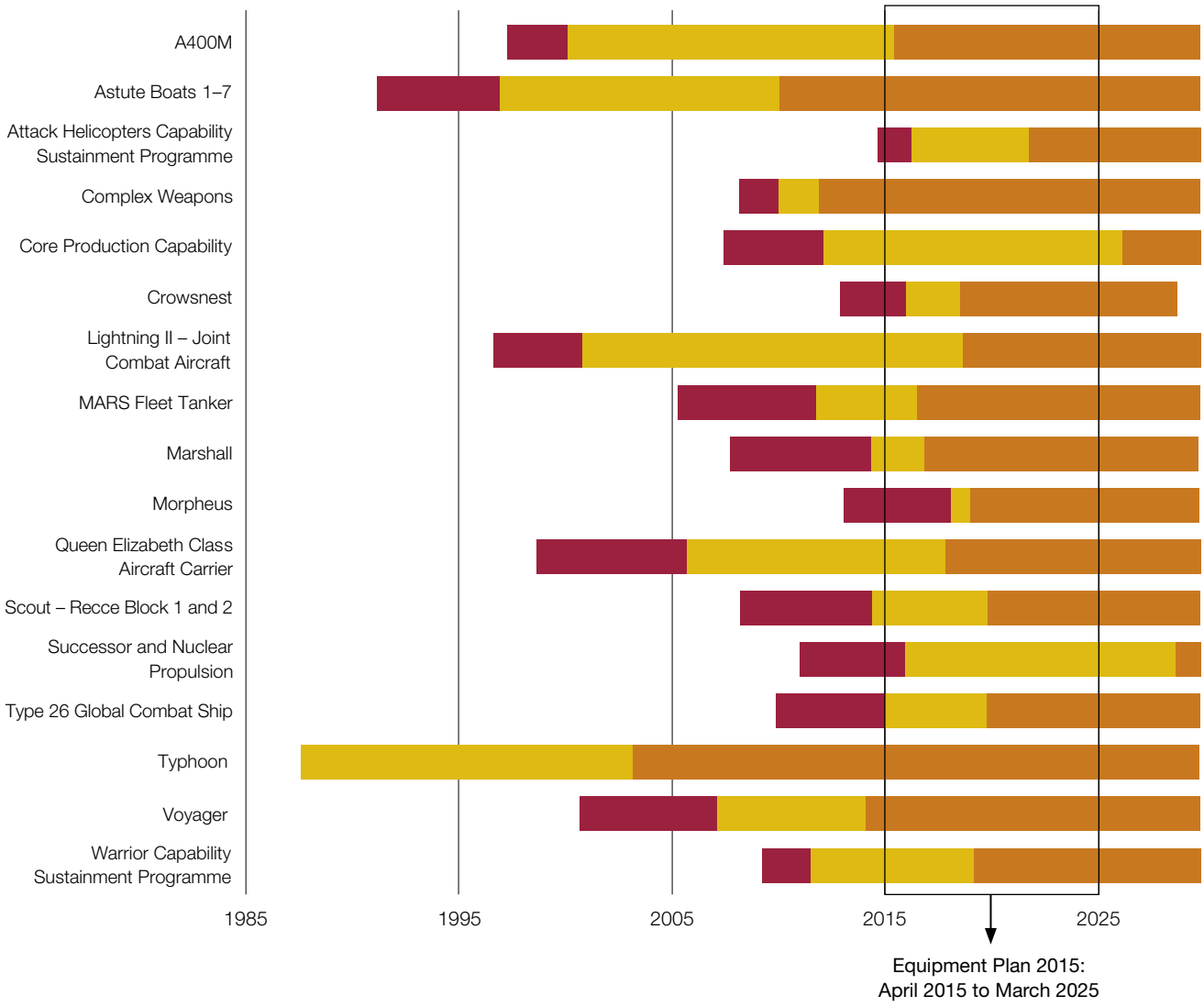
1.10 The NAO and the Department wish to move to a position whereby the Department is able to take much greater ownership of the information contained in the project summary sheets compiled by project teams in Defence Equipment and Support and Information Systems and Services (Volume II of this report, as summarised in Appendix Four and analysed in Appendix Three), and to develop a more efficient and sustainable means of producing and validating their content.

1.11 The process of preparing and validating the project summary sheet reports requires considerable effort on the part of our staff and that of Defence Equipment and Support and Information Systems and Services. This is because the format, developed more than 30 years ago, does not align with the information that the Department's internal systems produce to measure project progress. These systems have themselves been identified by Defence Equipment and Support's new private sector partners as priority areas for improvement during the organisation's current transformation. Over the coming months, we and the Department will work together to develop a more cost-effective way of keeping Parliament informed about the progress of major defence projects. We will take advantage of expected improvements in the quality of data to reduce the resources needed to validate data.

1.12 We will continue to provide assurance to Parliament each year about the affordability of the Equipment Plan by reviewing its underlying assumptions. Through our ongoing work to assess the capability and capacity of the Cost Assurance and Analysis Service we hope to reach a position where we can rely on the Department's internal controls. Having evidence that strong controls are in place will allow the Department to show stakeholders, particularly industry, that it is negotiating from a stable and credible position.

Figure 2
Project sample timelines up to 2030

The Equipment Plan covers a 10-year period, while project approvals frequently cover a longer period



Notes

1 The time period of January 1985 to January 2030 has been selected to illustrate that the Equipment Plan period covers only part of a particular project's life cycle. Most of the projects shown have out of service dates beyond 2030, and in those cases the full life-cycle is not included here.

2 The Major Projects Report data includes the total approved spend of a project, and may, therefore, include costs outside the Equipment Plan period shown.

3 The in-service period is measured from when the equipment met, or is forecast to meet, the initial operating capability. Procurement activity may be ongoing in this period eg Typhoon aircraft are in service and aircraft are still being delivered under existing contracts.

4 The boundaries of Demonstration/manufacture and In Service are indicative only because some programmes have a more complex delivery approach than can be fully represented in this graphic.

5 Assessment Phase projects above show indicative time frames but it should be noted that In-Service Dates are not formally set until Main Gate Approval.

Source: National Audit Office analysis of Departmemtal data

Part Two

Robustness of assumptions underpinning costs

2.1 The £166.4 billion Equipment Plan budget for the next 10 years (paragraph 1.1) consists of a core programme of procurement projects, and associated support budgets, and funds held in reserve. The core programme consists of projects identified as priorities by the Ministry of Defence (the Department). We have examined:

- changes to forecast project costs and budgets at the aggregate level and for a sample of 17 procurement projects (paragraphs 2.2 to 2.7); and
- the quality of cost forecasts for the procurement sample and 4 support projects (paragraphs 2.8 to 2.20).

Changes in forecast budgets and costs

Changes in forecast budgets

2.2 **Figure 3** describes the changes in budget totals since 2014-15 and the 10-year budget profile.

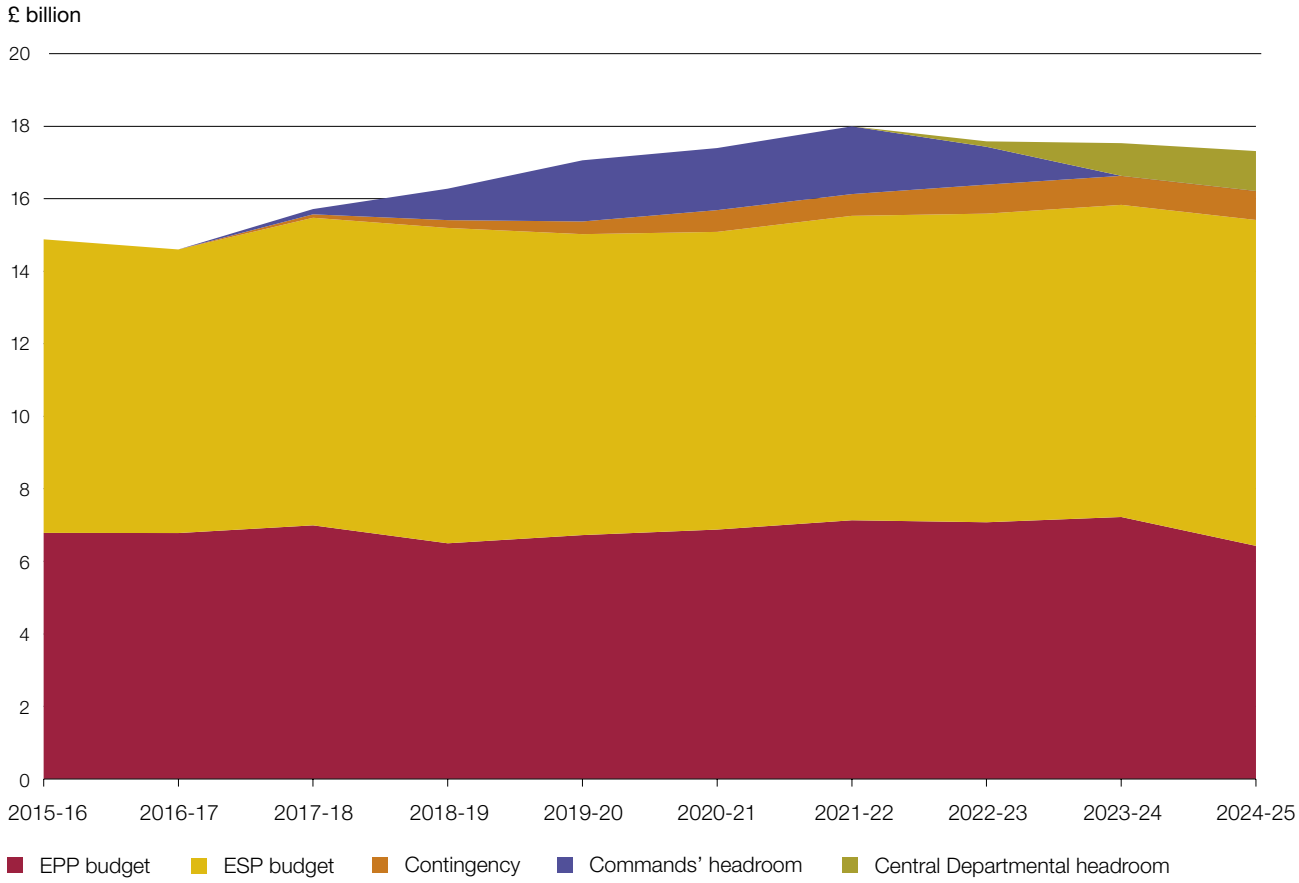
2.3 Between the 2013-14 and 2014-15 Equipment Plans there has been a net increase of £3.5 billion in the total Equipment Plan budget. This is entirely accounted for by increased funding for equipment support, split between support for new and in-service equipment. This partly offsets the £4.1 billion taken as efficiency savings from last year's support budget. As shown in **Figure 4** on page 18, the main impact of this increase is to use room in the budget created by the 2013-14 reductions to accommodate new support requirements for the Army, Navy and Air commands into the 2020s.

2.4 The support budget is split between support for equipment in-service and support for equipment being brought into service (such as the projects in our sample). In the past 2 years the support budget as a whole has fallen by 4%. The Department has managed to do this while making room in the budget to support major new equipment being brought into service, the provision for which has increased by 23% over the same period.

Figure 3

Breakdown of planned spending on equipment, 2015 to 2025

Procurement and support budgets are supplemented by contingency and headroom



	2015-16 (£m)	2016-17 (£m)	2017-18 (£m)	2018-19 (£m)	2019-20 (£m)	2020-21 (£m)	2021-22 (£m)	2022-23 (£m)	2023-24 (£m)	2024-25 (£m)	2015 Plan Total (£m)	2014 Plan Total (£m)
EPP budget	6,784	6,779	6,992	6,497	6,723	6,876	7,132	7,077	7,222	6,426	**68,508**	68,854
ESP budget	8,096	7,821	8,483	8,698	8,299	8,209	8,396	8,512	8,608	8,988	**84,110**	80,576
Contingency	0	0	95	215	350	600	600	800	800	800	**4,260**	4,600
Commands' headroom	0	0	145	868	1,686	1,712	1,869	1,043	0	0	**7,323**	8,003
Central Departmental headroom	0	0	0	0	0	0	0	150	902	1,100	**2,152**	1,152
Central over-programming												(300)
Total	**14,880**	**14,600**	**15,715**	**16,278**	**17,058**	**17,397**	**17,997**	**17,582**	**17,532**	**17,314**	**166,352**	**162,885**

Notes

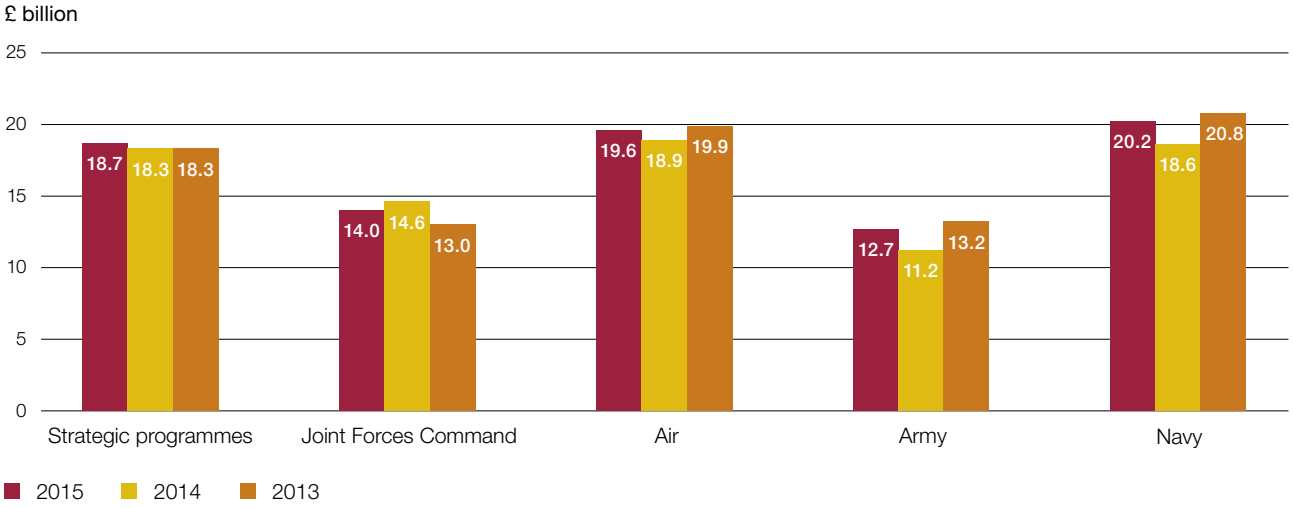
1 In 2014 'Central Departmental headroom' was described as 'central provision'.

2 Figures may not reconcile exactly because of rounding differences.

Source: Ministry of Defence

Figure 4
Support budgets of Commands 2013 to 2015

Navy and Air Commands have the largest support budgets



Note

1 Totals for Commands do not add up to the overall Equipment Plan total because of adjustments to the Plan made centrally by the Department.

Source: National Audit Office analysis of Ministry of Defence data

Changes in forecast costs

2.5 Across the 25 main cost lines in our sample of 17 projects, forecast procurement costs for the period 2015 to 2025 have increased on 8 projects and decreased on 9. The net effect has been an increase in procurement costs for our sample of £0.7 billion (**Figure 5**) across the 10-year period 2015 to 2025 (a 1.6% net increase in forecast project costs since 2014). Around £330 million of this is due to increases in the forecast production costs of the Type 26 Global Combat Ship project, partly due to the inclusion of the costs of the ship's 5-inch gun within the project, which was previously accounted for separately. Since the Department has approved expenditure on the demonstration phase and long-lead items associated with the manufacture phase for Type 26, but has not yet formally considered a business case for full investment in the manufacture phase, the costs may increase or decrease as understanding of the project improves.

Changes in forecast costs against project approvals

2.6 We reviewed the cost movements for the elements of the 13 projects in our sample where the Department has approved at least some expenditure on the main demonstration and manufacture stages of the project (see Appendix Three). These approvals, which cover a specific stage of the project in each case, might cover periods of less or more than the 10 years in the Equipment Plan. Although there were in-year variations against approved costs on 8 individual projects, the costs of the sample at the aggregate level were stable, with a net reduction in forecast costs against approvals of £247 million (0.4% of the current forecast costs for the sample).

Figure 5

Changes in forecasts for procurement costs sample, 2014-15

	Forecast project costs as at 31 March 2014 (£bn)	Forecast project costs as at 31 March 2015 (£bn)	Change (£bn)
Cost lines that have increased in cost	27.8	28.9	1.1
Cost lines that have decreased in cost	19.1	18.7	-0.4

Notes

1 Comparison over the same 10-year period achieved by removing year 1 from the 2014-15 budget and substituting year 11.

2 The 17 projects divide into 25 separate cost lines. A single project might have cost lines that have increased and ones that have decreased.

Source: National Audit Office analysis of Ministry of Defence data

2.7 The project with the largest variation was the Typhoon fighter aircraft. This had an overall net reduction of £202 million, mainly driven by an accounting adjustment after an examination of project costs by the Department's Cost Assurance and Analysis Service. Within the overall reduction of £247 million there was a net increase of £147 million across Astute submarines, made up of many individual variations with a range of causes. At the time of publication, the Department was considering its response to a report from the contractors of a potential increase of less than 1% in forecast costs by the contractors on the Queen Elizabeth Carriers project.

Quality of project team forecasting

2.8 The uncertainties about the likelihood of different scenarios and risks impacting on large defence projects mean that each project has a range of potential outturn costs. The Department requires project cost estimates in the Equipment Plan to be forecast at the median of the potential cost range; this is referred to as the '50th percentile cost'. At this point, each project is as likely to cost less than this estimate as it is to cost more. Some variation against this single point estimate is therefore to be expected. Forecasting requires judgement, so costs are not absolute and can be over- or understated. Nevertheless, the affordability of the Equipment Plan rests on the ability of the 50th percentile costs for each project within it being accurate enough for variances to be accommodated within the Department's contingency provisions.

Accuracy of cost forecasting in-year

2.9 If in-year expenditure is significantly above planned levels this will have an immediate impact on the Department's budgetary management. If it is significantly below, this will have implications for spending in future years as it is likely to indicate delays in project progress.

2.10 **Figure 6** shows that the Department programmed around £700 million of additional work to its core equipment budget of £14.5 billion during 2014-15 on the assumption, based on past experience, that not all of the planned spend would occur in-year, with the result that it spent within £41 million (0.3%) of its original budget. This is a much closer matching of expenditure to budget than in previous years. In 2013-14 we reported that the Department underspent on equipment by £948 million against the total value of its work programme for the year. For 2014-15 the equivalent figure was £732 million. From 2015-16 Commands will take on the responsibility for forecasting and managing their equipment programmes in-year. This will present additional challenges in managing the Department's overall spend against budget.

2.11 The projects in our sample had a net underspend of £295 million (6%) in 2014-15, compared with a £60 million overspend in 2013-14. The main reasons for this underspend were accounting errors and activity moving into later years:

- £238 million 'underspend' on the Typhoon project, which was largely due to a legacy accounting error recognised in the 2013-14 accounts.
- £75 million underspend on the A400M transport aircraft, which reflects differences between forecast and actual foreign exchange rates in 2014-15, a change in the accounting treatment for assets under construction and a re-profiling of aircraft deliveries.
- £53 million underspend on the FASGW(H) missile, reflecting scheduling changes following contract award.
- £51 million underspend on the Queen Elizabeth Carriers due to the contractors not achieving expected levels of activity.

Figure 6
Spend against the total approved programme of work on the Equipment Plan, 2014-15

	Programmed spend 2014-15 (£m)	Actual spend 2014-15 (£m)
Equipment Plan 2014-15 original budget	14,511	
Additional programmed work approved at the beginning of 2014-15	729	
Additional adjustments during the year	(38)	
Total work plan	**15,202**	**14,470**

Source: Ministry of Defence

2.12 By comparison, the Scout specialist vehicle project spent £79 million more than originally planned. This reflected the Army's decision to accelerate the project as explained in last year's report.[5]

Accuracy of cost forecasting over the longer term

2.13 Each year the Department's Cost Assurance and Analysis Service estimates the extent to which project teams may be underestimating the real costs of projects in the cost forecasts that together make up the 10-year Equipment Plan. **Figure 7** shows how the estimates have changed since last year. The Service has extended its coverage to the point where it is willing to give a forecast estimate for the Plan as a whole, both procurement and support. It reports that the cost of the Plan as a whole is likely to be underestimated by £5 billion. The Service's estimates are built on in-depth cost estimates for 38 of the largest procurement projects and 24 of the largest support projects. The equivalent figure for 2013-14, based on a less complete analysis, was £5.2 billion. Since this estimate covers the period 2015 to 2025 the level of understatement is reduced by any costs the Service has moved outside of the 10-year period because it considers current timetables to be unrealistic.

2.14 The Service has found that potential underestimates of costs are increasingly concentrated in a handful of large projects. The Type 26 Global Combat Ship, Astute submarines, Successor submarine platform and composite risks across the fixed wing portfolio between them account for 75% of the total underestimate on equipment procurement projects. We discuss some of these projects in Appendix Three. At the same time, the proportion of the total underestimate attributable to support costs now constitutes more than half of the total Equipment Plan variation.

Figure 7
Estimated level of understatement of project costs in the Equipment Plan

		2014 (£bn)	2015 (£bn)
Equipment procurement projects		3.2	2.2
Equipment support projects		2.0	2.8
Total		**5.2**	**5.0**
Proportion of project costs covered by specific cost estimates (by 10-year value)	Procurement	69%	71%
	Support	28%	48%

Note

1 An overall value for all projects is arrived at by quantifying underestimates for projects without cost estimates through modelling (procurement) and extrapolation (support).

Source: Cost Assurance and Analysis Service

5 Comptroller and Auditor General, *Major Projects Report 2014 and the Equipment Plan 2014 to 2024*, Session 2014-15, HC 941-I, National Audit Office, January 2015.

2.15 These variances can be partly explained by the level of uncertainty around projects that are not 'on contract'. These uncertainties can be accounted for in very different ways. For example, the Service may try to reduce the level of uncertainty by costing projects to a higher level of confidence, whereas the project team is required in almost all cases to forecast at a 50% confidence level.

Treatment of inflation in forecast costs

2.16 Headline rates of inflation are currently very low, but it is important to incorporate realistic estimates of inflation as these can be a significant element of future costs in defence projects due to the particular market conditions that apply in the sector and the long timescales for major defence procurements. Across our sample of procurement and support projects, we identified 7 cases where we had concerns about the treatment of inflation either because central guidance is not being followed or rates are not being revisited regularly. Overall there has been no improvement since last year in the treatment of inflation.

Cost modelling

2.17 Generating a range of probable costs is good practice as a means of allowing for the uncertainties around projects under development, and helpful in understanding risk. Projects need to be aware of the likelihood and potential cost of risks that are not built into projects' budget lines ('risks outside costing'). Of the 17 procurement projects we examined, 12 had generated a range of potential costs in line with good practice, and could put a value on 'risks outside cost', an improvement on 9 projects in 2014. The total impact of these risks would be £2.4 billion if all risks were realised.

2.18 As with last year, the support projects in our sample are more likely to display poor practice in their cost modelling than the procurement projects, although this year we noted a number of improvements in the support elements of the Lightning fighter project. Last year, for example, we noted the lack of robust cost forecasts for the Typhoon In-Service Support project. The team have worked since last year to better understand costs and risks, and have continued to identify cost reductions for the project. The project has several separate cost models which have been reviewed by HM Treasury and which represent separate international and national contracts within their overall approved support budget. The Project team do not have an overarching cost model for Typhoon support costs as a whole, but will work towards achieving this.

Accounting for risk

2.19 All 17 procurement projects we reviewed had a formal process for assessing risk. It is not unreasonable to exclude some risks from the forecast costs, for example where they are low probability but high impact, or when the risk is outside the team's control. The degree to which teams are able to pursue good practice can also be affected by the stage reached by the project, although most projects in our sample are now at a mature stage of development. Most teams have developed an acceptable approach to risk management and understanding, but we consider that 6 procurement and support teams continue to display poor practice in their valuation of risks and incorporation of those risks into cost models.

2.20 Last year we reported that the Defence Equipment and Support organisation had set up a cost forecasting improvement programme. This ran until February 2015. The key proposal that has emerged from it is the setting up of a new professional function within the organisation around project controls. This is designed to improve organisational capability in risk management, schedule management, cost estimating and cost controls. The organisation is defining standards and the relevant staff will be trained as part of the organisation's transformation programme to demonstrate clear improvements in these areas by April 2017. The Department has a risk contingency in the Equipment Plan that it considers addresses some of these financial risks (see paragraph 3.9).

Part Three

Assumptions underpinning funding

3.1 The Ministry of Defence (the Department) funds the Equipment Plan, with the budget allocated by HM Treasury through the Spending Review process. The Department has to allocate its budget for equipment costs internally, ensuring that there is also enough budget to meet non-equipment costs, such as the management of the Defence Estate and costs of Armed Forces personnel. The Department is planning to spend £14.9 billion on equipment procurement and support in 2015-16. This is 43% of its core budget in 2015-16 (see **Figure 8**).

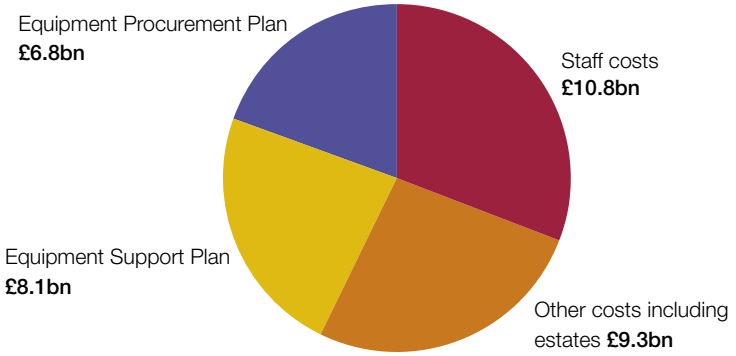
Sufficiency of departmental funding

Level of funding over the 10-year Equipment Plan

3.2 The Department's budget for the 2015 to 2025 Equipment Plan was based on assumptions made before the 2015-16 budget. Announcements in the budget confirmed the realism of the Department's March 2015 assumptions about money available for the 2015 Equipment Plan until 2020-21. The government has also committed to meeting the NATO target of spending 2% of GDP on defence for the rest of the decade. Under the existing NATO definition, which allows the government to include all defence spending and military pensions within the calculation, the government should meet this target until 2022-23 on current plans.

Figure 8
Breakdown of departmental spending, 2015-16

The Equipment Plan accounts for 43% of the Department's forecast spending in 2015-16



Source: National Audit Office analysis of Ministry of Defence 2015-16 estimates

3.3 In **Figure 9** overleaf we show funding for the 2015 Equipment Plan; the likely level of future funding within the core departmental budget from which the Equipment Plan is drawn (based on assumptions at March 2015); and the Department's funding against the NATO target.

Proportion of funding allocated to the Equipment Plan

3.4 Equipment Plan funding for the remainder of the Parliament remains in line with the Equipment Plan funding settlement set out by HM Treasury in July 2011, for spending on the Plan to increase by 1% above inflation to 2020-21. In our scenario the 10-year Equipment Plan's share of the core budget would have increased from 44% in 2013-14 to 46% in 2015-16, and would average 47% across the 10-year period (see Figure 9). The Department does not aim for a particular percentage of the core budget to be allocated to the Equipment Plan. Instead, it responds to changes in its register of capability risks. In July the Government announced that the whole defence budget would increase by 0.5% above inflation until 2020-21. In practice this makes little difference to the projected amount available for the Equipment Plan in the future, as resulting increases are offset by reductions in the latest forecast rates of inflation.

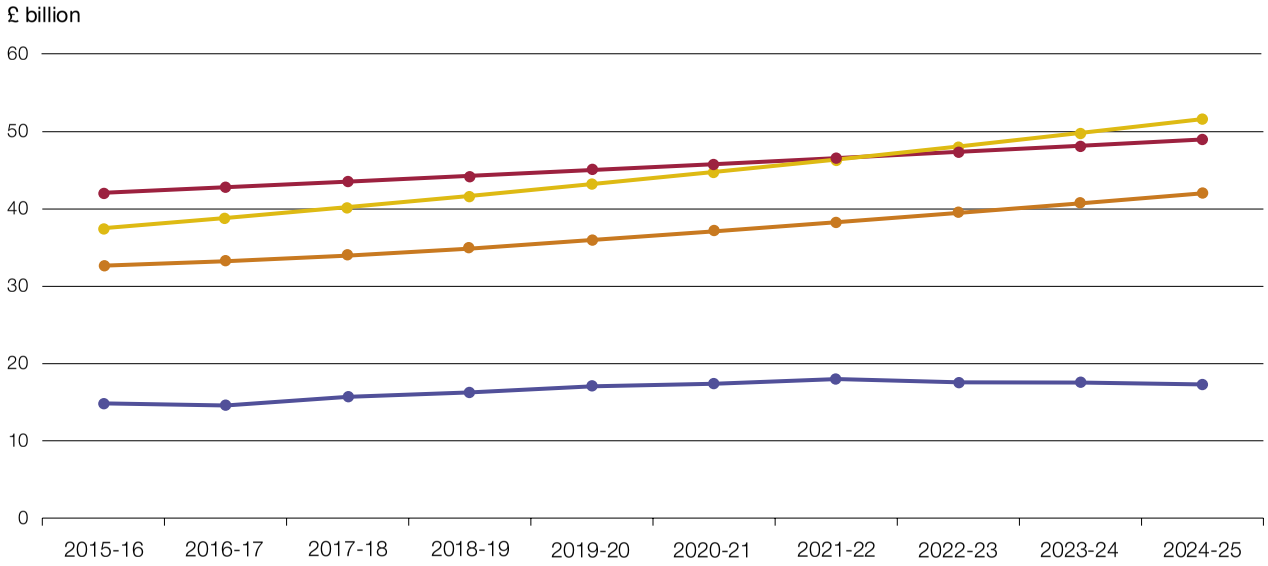
3.5 The proportion of the Department's total budget that is available for the Equipment Plan depends on the settlement that will be agreed with HM Treasury in the next Spending Review. The Department has budgeted conservatively for the latter years of the Equipment Plan (see Figure 3). Beyond 2021-22 the amounts within the 2015 Plan are lower compared with the 2014 and 2013 Plans. Whether the Department can allocate a greater proportion of its budget to the Equipment Plan also depends on whether it can achieve plans to reduce staff and its Defence Estate.

Funding changes between 2014 and 2015

3.6 The Department's ability to fund non-equipment costs is also dependent on it controlling planned growth in the Equipment Plan. There is a net increase of £3.5 billion to £166.4 billion between the 2014 to 2024 and 2015 to 2025 Plans. However, across the 9 years that the two plans have in common (2015–2024) there is a smaller increase of £0.7 billion (see **Figure 10** on page 27). Since April 2014 Commands have had control of equipment budgets. They have increased commitments to specific projects, partly by drawing money from headroom and contingency provisions.

Figure 9
Projected Departmental and Equipment Plan funding

Equipment Plan funding is found from within the core Defence Budget



	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22	2022-23	2023-24	2024-25
Projected funding for whole Defence Budget using July 2015 assumptions, including pensions and expenditure on demand-led items (£m)	42,103	42,821	43,552	44,295	45,050	45,819	46,601	47,396	48,204	49,026
Estimated funding level required to meet 2% of GDP (£m)	37,520	38,844	40,253	41,714	43,228	44,796	46,422	48,106	49,852	51,660
Projected funding levels for core Defence Budget using March 2015 assumptions (£m)	32,953	33,135	33,819	34,689	35,756	36,857	37,992	39,164	40,373	41,620
2015 Equipment Plan funding (£m)	14,880	14,600	15,714	16,277	17,059	17,397	17,996	17,582	17,532	17,313

Notes

1 March 2015 assumptions for core departmental budget based on extrapolation of 2013 Spending Review figure for 2015-16.

2 In March, HM Treasury forecast inflation rates as far as 2019-20. We have extrapolated beyond this using the 2019-20 rate.

Source: National Audit Office analysis of Ministry of Defence, Office for National Statistics and Office of Budget Responsibility data

Figure 10
Increase in the Equipment Plan budget 2015 to 2024

	£000
2014 budget	148,374
Net transfers of funds by Commands into the Equipment Plan	1,545
Other technical adjustments and in-year budgetary movements	329
Less Net reductions in headroom and contingency	(1,210)
2015 budget	149,038

Note

1 Transfers of funding into the Plan by Commands partly offset by transfer of funds to Defence Equipment and Support organisation to replace private sector support with in-house capacity.

Source: National Audit Office analysis of Ministry of Defence data

Management of costs and risks at portfolio level

Progress in making savings within the Equipment Plan

3.7 Maintaining the affordability of the Equipment Plan depends, among other things, on achieving billions of pounds of savings built into the Plan. The main savings initiatives are shown in **Figure 11** overleaf. They cover different time periods and were developed using different methodologies, and the Department cannot therefore measure the degree to which they are 'on target'. There are 3 main initiatives:

- The 2014 to 2024 plan removed £4.1 billion from support budgets in anticipation of the Commands making savings, working with the support of external contractors. The actual savings made so far are higher than £2.5 billion, but some are required to offset increases in the cost of projects that were not reflected in forecasts within the Plan.
- The Complex Weapons procurement approach estimated financial benefits of £1.2 billion over 10 years from 2010. This represents the forecast net savings to be delivered through the current 'partnered portfolio management' procurement approach compared to open competition. A review by the Cost Assurance and Analysis Service in September 2015 judged that the target remained achievable, albeit highly dependent on successful execution of its component projects and the value and sequencing of the programme being broadly maintained.
- The Submarine Enterprise Performance Programme involves the Department and its industrial partners working together to realise savings in the submarines and nuclear deterrent programmes.

Figure 11

Progress against major efficiency savings programmes in the Equipment Plan

Source of savings	Target (£bn)	To be achieved by	Savings to date (£bn)
Support budget	4.1	2023-24	2.5
Complex Weapons pipeline	2.1 gross[3] (1.2 net)	2019-20	0.43 gross[3]
Submarine Enterprise Performance Programme	1.05	2020-21	0.58

Notes

1 Support budget savings as at May 2015: Complex Weapons savings as at September 2015: submarine programme savings as at March 2015.

2 The target savings figures for the support budget and Complex Weapons pipeline have already been removed from the Plan. Submarine Enterprise Performance Programme savings, once identified, are removed from the Plan after a validation process.

3 The Complex Weapons target is £2.1 billion gross savings, which gives £1.2 billion actual savings after netting off the notional additional cost of single source procurement from the benefits of the current procurement strategy.

Source: Ministry of Defence

3.8 The Department also needs to identify £553 million of savings over the 10-year period from the Defence Core Network Services programme, part of our sample of support projects. The programme was a group of interrelated IT projects, which was separated into its component parts at the end of 2013-14. This followed a report by the Major Projects Authority which concluded that the programme was too large and complex to be delivered successfully. The savings are the amount by which current cost estimates across all the projects exceed provision for them within the Equipment Plan.

Sufficiency of contingency

3.9 Contingency funding is intended to cover the risk of:

- cost growth;
- failures to meet savings targets;
- risks materialising;
- unexpected events that have financial impacts; and
- over-optimism in project teams' costings.

3.10 The Equipment Plan contingency funding of £4.26 billion is available for use from 2017-18 onwards, and is included within the Plan to mitigate increased uncertainty in forecasting costs in later years. During 2014-15 £340 million of contingency was allocated to accelerate production of the Scout armoured vehicle and to underwrite capitalisation of the Rotary Wing Military Flying Training System PFI scheme.

3.11 At paragraph 2.13 we explained that the Cost Assurance and Analysis Service estimates that forecast costs across the Equipment Plan as a whole may be underestimated by as much as £5 billion. This would exceed the current contingency provision by £0.74 billion if all risks were realised.

Achievability of strategic objectives

3.12 The Department's ability to achieve its wider objectives will depend on its ability to make a success of its new operating model and make efficiency savings. It will also have to adjust to meet the new strategic objectives set out in the forthcoming Strategic Defence and Security Review.

3.13 We recently reported on the Department's efforts to improve its strategic financial management, which will be crucial in maintaining the affordability of the Equipment Plan.[6] We found that commands are taking greater ownership of Equipment Plan budgets but they are still building the capacity that will allow them to develop financial management skills and fully understand equipment costs.

3.14 Within the 2015 to 2025 Equipment Plan, there is unallocated procurement expenditure – 'command headroom' – of £7.3 billion, available from 2017 to 2023. Commands can use this money to fund extra projects beyond the current core programme according to their military priorities (and assuming they are affordable), so that they can reach the full equipment capability needed to meet their longer-term objectives. The amount remaining unallocated has fallen from £8.4 billion 2 years ago, as they have begun to fund additional capability.

3.15 Army Command is provisionally allocated more than 50% (£3.9 billion) of the command headroom. As was the case last year, it has allocated some of this to fund enhanced capability in its Scout and Warrior armoured vehicles. Navy Command are the only other command to have utilised some of the headroom allocated to it, although all commands have planned how their allocations are to be spent.

3.16 Part of the fall in command headroom is because, beyond 2023, 'headroom' is being held centrally. Central Departmental headroom has increased from £1.15 billion to £2.15 billion this year. This gives the Department the option of using this money for equipment or to meet other capability objectives. The Department has taken these steps for two reasons:

- HM Treasury's current agreement to increase Equipment Plan expenditure by 1% above inflation each year runs out in 2021.
- The forthcoming Strategic Defence and Security Review and Spending Review, due to be published in November, may require rationalisation of the portfolio or the re-prioritisation of activities across the Department as a whole, or both.

3.17 The Department's ability to spend the intended amounts on the Equipment Plan also depends on it achieving planned savings initiatives and disposing of expected levels of surplus land. As we reported in July, the Department asserts that it is on track to deliver most of the cost reductions and savings to which it has committed.[7] In the 2010 Spending Review the Department was set a target of achieving £1.8 billion from land disposals over 10 years. At the time of publication, the Department had accrued £0.7 billion of savings towards this target.

6 Comptroller and Auditor General, *Strategic financial management in the Ministry of Defence*, Session 2015-16, HC 268, National Audit Office, July 2015.
7 See footnote 6.

Part Four

Disclosures within the Department's affordability statement

4.1 The Ministry of Defence (the Department's) annual Statement on the Affordability of the Equipment Plan (the Statement) should:

- aid transparency;
- show whether the Equipment Plan is affordable and achievable; and
- give the defence industry more information for planning.

4.2 Using International Assurance Standards (see Appendix One), we examined whether the Statement contains adequate and sufficient disclosures for users of the Equipment Plan to fully understand the key assumptions that:

- have been used to generate the Equipment Plan costs and the sensitivity of the costs to changes in those assumptions; and
- the Department has made about the level of available future funding, and the sensitivity of affordability of the Equipment Plan to changes in those assumptions.

Disclosure regarding cost assumptions

4.3 The Statement for 2014-15 is similar in format and content to those of earlier years. It breaks down the Equipment Plan budget into its component parts. This enables the reader of the Statement to identify:

- the costs related to procurement and support;
- the unallocated budget; and
- the contingency provision detailed on a year-by-year basis for the reported 10-year period.

4.4 There is sufficient discussion for the reader to understand the nature of and rationale for the different components of the Equipment Plan, including the contingency provision and unallocated budget.

4.5 The Statement's disclosures have not, however, noticeably built on the improvements we noted last year in a way that would help readers to fully understand the fundamental assumptions that underpin the Equipment Plan, and the risks and sensitivities in implementing it within budget. Specifically, there is still scope to explain:

- the range of possible amounts that the total Equipment Plan could cost. In line with good practice most of our sample of projects now present a range of possible costs for the project to reflect, for example, greater levels of uncertainty at an early stage of development, and the Plan does not reflect this, nor does it give an indication of which projects present the greatest threat to the Plan's overall affordability as a result;
- associated with this, the total value of 'risks outside costing' (see paragraph 2.17) and the impact on affordability should these risks materialise;
- the drivers for the increase in the budget this year;
- the approach to inflation and foreign exchange assumptions and the sensitivity to these assumptions; and
- further information on the milestones against which savings targets are being measured (paragraph 3.7).

Disclosure regarding funding assumptions

4.6 The Statement adequately discloses that funding available to the Equipment Plan is underpinned by an agreement with HM Treasury that provides for a minimum level of funding based on a 1% increase above inflation until 2020-21. It is also clear about the method and rationale for allocating funding to a core programme while retaining an unallocated budget (headroom). However, for the user to fully understand the effect that changes in the funding assumptions could have on affordability, the Statement should also contain information on how the Department's assumed funding level for the Equipment Plan budget relates to its assumptions for departmental funding as a whole. It should also explain the sensitivity of the Plan's affordability should these change, for example through failure to meet cost reduction targets in non-equipment areas of the Department's budget.

Appendix One

Our audit approach

1 For the second year running we have combined what were previously two separate outputs, the Major Projects Report and our review of the affordability of the Equipment Plan. This reflects the close relationship between the two pieces of work:

- The sample of projects for our Major Projects Report is also used for our review of the Equipment Plan.
- The Major Projects Report looks at the impact of changes to cost, time or performance measures. It provides some evidence of the stability of the programme on which the forward assumptions in the Equipment Plan are based. Our review of the Equipment Plan provides further detail on the accuracy and risks to the project cost and time forecasts in the Major Projects Report.

2 Our work is based on a sample of major military equipment projects. These include 17 of the Ministry of Defence's (the Department's) largest procurement projects. We also looked at 4 of the largest equipment support projects for our Equipment Plan work.

Affordability of the Equipment Plan

3 As in our previous reports, we built a model to test the Department's assertions within its assessment of the cost of the Equipment Plan and the funding available. The model breaks these assertions down into a set of hypotheses, as set out in **Figure 12** on pages 34 and 35. Appendix Two sets out the evidence we used to test these hypotheses.

4 The procedures we performed have been selected by drawing on the principles set out in the professional standard 'ISAE 3000: Assurance Engagements Other Than Audits or Reviews of Historical Financial Information'.

Project cost, time and performance

5 This is the thirty-second year in which we have examined the in-year changes to the cost, time and technical performance of the Department's largest equipment projects.

6 We have published the Department's data for the 17 projects in this sample, covering cost, time and performance against what was originally planned at the main investment decision. We validate but do not audit these data. We perform analysis to report on overall trends and in-year performance. We also validate and publish more limited data on the projects where the main investment decision is yet to be taken.

Assessing whether Affordability Statement disclosures are adequate

7 To assess whether the disclosures in the Department's Affordability Statement are adequate and sufficient, we used as a framework the 'International Standard on Assurance Engagements 3400: The Examination of Prospective Financial Information' (the Standard). The relevant elements extracted from the Standard that are applicable to this engagement are as follows:

- The presentation of prospective financial information is informative and not misleading.
- The assumptions are adequately disclosed in the notes to the prospective financial information. It should be clear whether assumptions represent management's best estimates or are hypothetical. Where assumptions are made in areas that are material and subject to a high degree of uncertainty, this uncertainty and the resulting sensitivity of results need to be adequately disclosed.
- The date as of when the prospective financial information was prepared is disclosed. Management needs to confirm that the assumptions are appropriate as of this date, even though the underpinning information may have been accumulated over a period of time.
- The basis of establishing points in a range is clearly indicated and the range is not selected in a biased or misleading manner when results shown in the prospective financial information are expressed in terms of a range.

Figure 12
Testable assertions and key findings relating to the Equipment Plan

High-level assertion

The cost of the Equipment Plan over the 10-year period is equal or less than the available funding.

Sub-level assertions

The forecast cost of the Equipment Plan is sufficiently robust to be used as a reasonable basis on which to plan.

The assumed funding available for the Equipment Plan is realistic.

Test-level assertions

The individual project costs that constitute the Equipment Plan are sufficiently robust for planning purposes.

Risk and uncertainty are adequately incorporated into project costings.

The Equipment Plan costs are adequately managed at the portfolio level.

Hypotheses

The costs of individual projects are a product of thousands of implicit assumptions.

Project teams use cost modelling to understand risk and uncertainty, and use the 50th percentile cost for planning.

The Department assumes that the sum of the 50th percentile costs for individual projects gives a reasonable most likely cost of the programme as a whole.

Key findings

The Department has maintained its cost challenge process for procurement costs and has improved its internal review processes. Inflation assumptions are reasonable in most, but not all, cases. There is evidence that some costings are still over-optimistic. In some cases the project teams are unable to provide an adequate audit trail to support their costings.

The Department's costing techniques are relatively sophisticated and there are examples of good practice; however, the use of costing techniques is not consistent throughout project teams. A core of procurement and support projects lack procedures for assessing risks. Quantification of risks outside costing is patchy.

Aggregating the 50th percentile project costs as a basis for planning demands strong forecasting skills and cost control mechanisms. Significant underspend continues against the work plan but analysis indicates that this might be due as much to internal re-profiling and accounting adjustments as to project performance.

High-level findings

There is evidence from our sample that the Department has improved its internal project costing techniques, although this may also indicate that projects have reached a more mature stage of development. However, not all project teams are able to provide an adequate audit trail for their cost estimates, and there is a lack of consistency in how effectively costings techniques are used. The Department is developing its understanding of support costs, but even with ambitious savings there will be continuous upward pressure on support costs in future years.

Conclusion

The Department's ability to maintain the affordability of the current projects within the Equipment Plan is contingent on a number of factors, including the achievement of significant savings in its support cost budget and mitigating the effects of over-optimism in project team costings.

Notes

1 The 50th percentile cost is derived from cost modelling, which gives a profile of possible costs for a project. The 50th percentile is the mid-point of the range of costs. Each project is as likely to cost less than this estimate as it is to cost more.

2 (SDSR) – Strategic Defence and Security Review; (CSR) Comprehensive Spending Review.

Source: National Audit Office

The centrally held contingency budget is sufficient to allow management of cost growth within the allocated funding.	The level of funding on which the Department is planning for the 10-year period is realistic.	The proportion of the funding the Department is allocating to the Equipment Plan is realistic.	The Department can deliver the equipment and support to reach the Future Force 2020 objective within the available funding.
Although the £4.3 billion provision is below historic trends of cost growth, the Department assumes it to be sufficient to manage cost growth, drawing on analysis from the Cost Assurance and Analysis Service.	The Department has agreed funding for the Spending Review settlement period.	The Department has assumed that it will be able to manage both equipment and non-equipment costs from the planned funding, achieving such cost savings as are required.	The core Equipment Plan will deliver the most important elements of Future Force 2020; the £9.5 billion total unallocated budget will be needed to deliver the full intent. If it is used for the core programme, capability issues will be addressed through adjusting strategic objectives.
The inclusion of the contingency budget provides a buffer to allow the Department to cope with cost increases. We have concerns that it may not be sufficient if risks materialise or the cost of the Equipment Support Plan increases.	The funding for the Equipment Plan itself is based on agreements with HM Treasury up until 2020-21. The Department has planned for tight spending settlements in the years beyond this.	Having the required amount of funding available for the Equipment Plan is always contingent on savings being achieved elsewhere in the budget. However, there are indications that the level of overall funding available might leave room for some Plan growth in the future.	The Department has adopted a prioritised approach to project funding that protects the budget for the core programme. The results of the SDSR and CSR in November will be crucial in determining how unallocated budget is used to deliver capabilities beyond the core programme.

The planned funding is based on an agreement with HM Treasury and the affordability position is highly sensitive to changes in the funding. The core is protected by the £4.3 billion contingency provision and, beyond that, the £9.5 billion unallocated budget. However, if the unallocated budget is required to deliver the core programme then capability gaps may arise. Affordability is also contingent on achieving savings in the non-Equipment Plan budget.

Appendix Two

Our evidence base

1 We reached our conclusions based on our analysis of evidence collected during fieldwork between June and August 2015.

Affordability of the Equipment Plan

2 We built a model to test the Ministry of Defence's (the Department's) assertions within its assessment of the cost of the Equipment Plan and the funding available. The model breaks these assertions down into a set of hypotheses. Our audit approach is set out in Appendix One. We referred to the following sources of evidence to test these hypotheses:

- We reviewed alternative cost estimates generated by the Department's internal Cost Assurance and Analysis Service. Where there were significant differences between the Service's and the project teams' estimates we evaluated the risk to the affordability assertion.
- We reviewed the cost models and cost-estimating techniques used in generating cost forecasts; risk management; and how uncertainty and risk are built into costings. We also matched actual spend to contracted amounts.
- We reviewed the application of central government guidance on how to treat inflation and foreign exchange.
- We reviewed historical data on actual costs against planned spending. This enabled us to assess the Department's ability to forecast costs accurately.

Project cost, time and performance

3 We report to Parliament on in-year changes to the cost, time and technical performance of major projects. We publish the Department's data for the 17 projects; these data cover cost, time and performance against the original plans when the decision to proceed to the demonstration and manufacture phase was made. Our audit approach is detailed in Appendix One.

4 For the time, cost and performance of major projects we measured the largest projects' forecasts against original approvals:

- The project teams in Defence Equipment and Support and Information Systems and Services put together the project summary sheets that 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.
- We collected qualitative and quantitative data to consider whether the Department is anticipating that the project will meet the budget, time and performance expected when the main investment decision was made.

The sample of projects

5 The 13 procurement projects in our sample which have progressed to the point where the Department has approved expenditure on the main Demonstration and Manufacture phases are detailed in **Figure 14** on pages 42 and 43. Our sample also includes 4 projects that are still in the assessment phase;

- the Apache attack helicopter capability sustainment programme;
- the Crowsnest radar system for the Merlin helicopter;
- the Morpheus tactical communications programme; and
- the Successor platform and propulsion unit to maintain the Continuous At-Sea Deterrent.

6 For our validation of the assumptions within the Equipment Plan we also examined 4 large projects within the support budget of the Plan:

- in-service support to the Typhoon fighter aircraft;
- in-service support to the Lightning II fighter aircraft;
- in-service support to the Type 45 destroyer; and
- the Defence Core Network Services programme to upgrade the Department's communications infrastructure.

Appendix Three

Major projects: cost, time and performance in 2014-15

Scope of the review

1 Each year the Ministry of Defence (the Department) presents to Parliament a Major Projects Report that provides data on the cost, time and performance of the largest defence projects where the decision to proceed to the Demonstration and Manufacture stage has been taken (13 of the projects in our procurement sample).[8] Full details of the projects are shown in Figure 14 on pages 42 and 43. The Department's report also contains less detailed information on the largest projects where the main investment decision has not yet been taken. We validate, but do not fully audit, the data. This report presents our analysis and key conclusions. Short summaries of each project can be found at Appendix Four and the full project summary sheets are contained in Volume II of this report. As explained in paragraph 4 of our Summary, we have used the same samples in this review as our work on the Equipment Plan. An explanation of our approach is in Appendix One.

Cost

2 We examined the cost movements for the elements of the 12 projects in our sample where the Department has decided to proceed to the main Demonstration and Manufacture stages of the project (see paragraphs 3 and 4 below). We also examined the cost movements of the entire sample.

3 Across the projects we found that, as for last year, there has been relative stability in the cost forecasts during 2014-15 at the aggregate level. Overall, we found a net cost reduction of £247 million during 2014-15 (0.4% of the current forecast cost to completion of £65.8 billion).[9]

8 Includes the Type 26 warship, where some expenditure on the Demonstration and Manufacture stages has been approved in advance of submission of the business case for full approval. We count the Complex Weapons portfolio as a single project for these purposes.

9 In almost all cases this is the 50th percentile cost, derived from cost modelling, which gives a profile of possible costs for a project. The 50th percentile is the mid-point of the range of costs. Each project is as likely to cost less than this estimate as it is to cost more. It is used by the Department for equipment planning purposes.

4 Within the sample, there are cost fluctuations within individual projects. The major reductions are on the fighter aircraft projects, most notably a net reduction of £202 million in the Typhoon project, due to an accounting adjustment following an examination of project costs by consultants. Within the overall reduction there was a net increase of £147 million across the Astute submarines, made up of a large number of individual variations with a range of causes.

5 During 2014-15 the Aircraft Carrier Alliance has reported a potential increase in forecast costs as a result of the need to recover time slippage in the construction of HMS Queen Elizabeth. However, the Department has to date not accepted the validity of this forecast. The Senior Responsible Owner and project team will update the Department's Investment Approvals Committee on developments in the autumn, in order that it can formalise the Department's position on whether to acknowledge a change to the forecast cost of the project.

Time

6 The total net additional delay in 2014-15 to the operational delivery of 12 projects in our sample with in-service dates was 60 months. The additional delays were:

- 52 months for the Core Production Capability project. The unforeseen need to produce an additional reactor core as a consequence of the refuelling of HMS Vanguard and to retain the capability to produce a core for HMS Victorious, if required, means that the final phase of regeneration of the production facility has been deferred. This is to maintain the capability for the production of existing cores, while minimising the risk to the capability for producing cores for Successor;
- 6 months for the A400M transport aircraft, due to slippage in the aircraft delivery schedule;
- 6 months for the Brimstone 2 missile, due to technical issues with the missile; and
- 2 months for the Queen Elizabeth Carriers as a consequence of the first recalculation of the 'budgeted for' in-service date following the re-baselining of the project in October 2013.

These increases are partly offset by the earlier forecast in-service date for the Scout Specialist Vehicle by 6 months compared to the approved date. This was because the contractor submitted an accelerated production schedule.

Performance

7 When the Department takes the main investment decision it approves a number of key performance measures for each project. These provide an indicator of whether the equipment is expected to provide the intended military capability. Within our sample the Department has set 208 key performance measures across 12 projects. It expects to achieve all but 1 of these, although it has identified risks to achieving 10 others.

8 Each project also reports against 8 defence lines of development. These measure the other elements of capability, such as trained personnel and logistical support, which the Department needs to develop and deliver at the right time to ensure that it can best use the equipment. It expects to deliver all of the defence lines of development on time, with risks attached to 20% of the lines.

Overall view of risks

9 The Defence Equipment and Support organisation uses a project assessment tool called Sentinel, which tracks project health over time. In addition to cost and time forecasting metrics, Sentinel includes a wider range of assessment criteria such as earned value management scores,[10] external dependencies and reviews, project staffing levels and judgements about progress by senior staff within the organisation. **Figure 13** gives an overview of the Sentinel scores for the projects in our sample as at March 2015. The larger the value of the project, the greater the impact on the affordability of the Equipment Plan if it encounters delays and cost overruns.

10 Two projects were rated 'red' in March:

- In the approach to the Main Gate investment decision, the Type 26 Global Combat Ship project is working to determine a robust proposition in terms of schedule, costs and risks. This work, involving Defence Equipment and Support, the prime contractor and third party independent support, has been running since July 2014 and will establish the baseline for seeking approval to move forward to the manufacturing stage, against which subsequent variances can be measured and managed.
- Astute submarines boats 4-7 face risks to significant milestones and have received low earned value management scores.

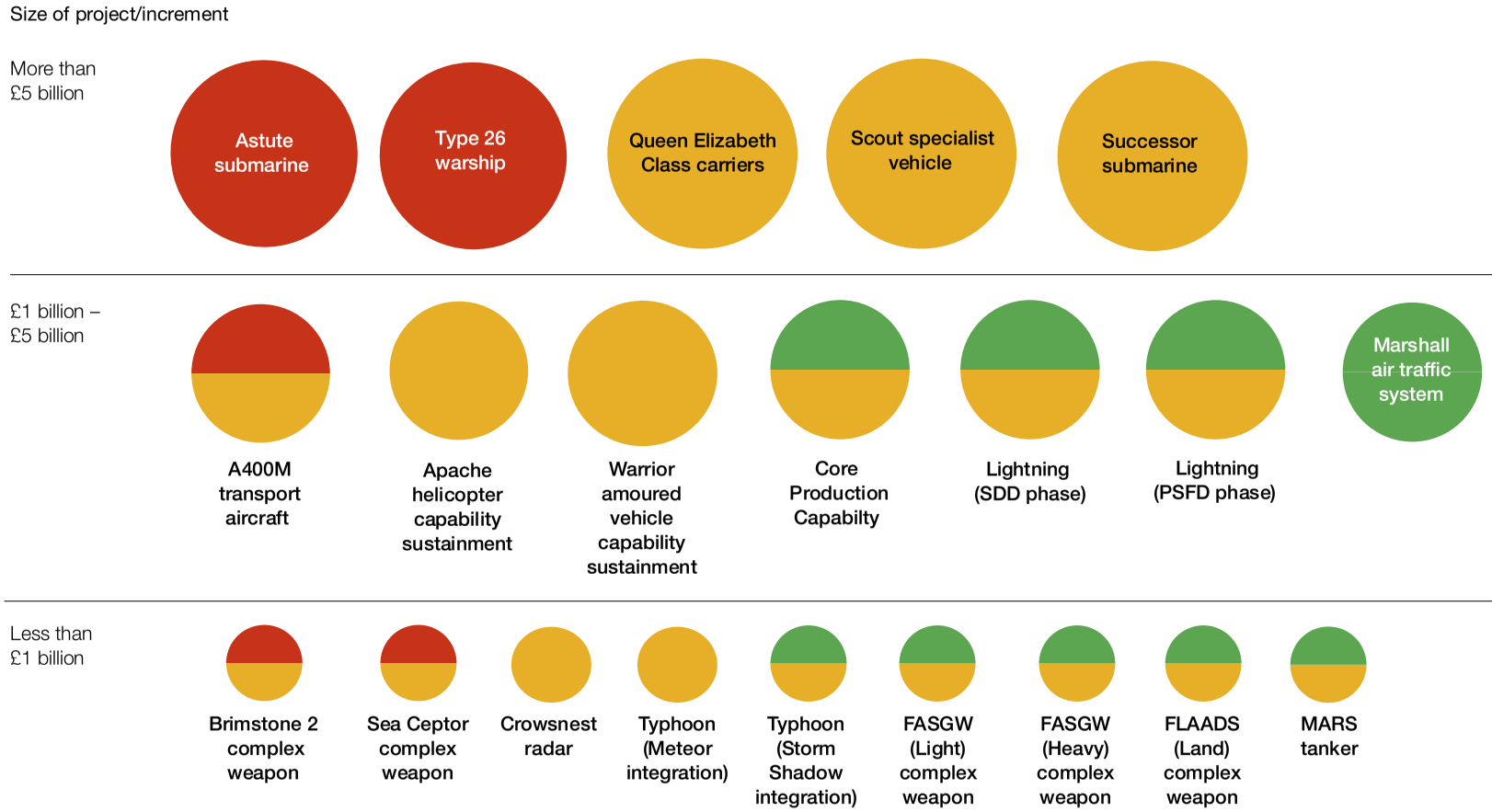
The Sentinel scores also draw on the Cost Assurance and Analysis Service's cost estimating work (paragraph 2.14). At the end of 2014-15 the estimates of most likely 10-year outturn cost for the 2 red-rated projects were £0.75 billion higher than the project teams' 50th percentile estimates. The Service's forecast underestimate for the constituent elements of the Successor project was £0.8 billion.[11]

10 Earned Value Management is a project management tool for measuring progress and is mandated within Defence Equipment and Support for projects at the manufacturing stage.
11 Within our sample, the Successor project is made up of 2 elements: the platform and the Nuclear Reactor and Steam Propulsion System.

Figure 13

Defence Equipment and Support assessment of project delivery confidence (March 2015)

Defence Equipment and Support faces challenges in managing the delivery of some projects, which could impact on the affordability of the Equipment Plan



Notes

1 Not all projects in our sample have a Sentinel score, depending on stage reached.

2 The Astute Sentinel score covers boats 4-7.

3 Sentinel scores as at March 2015.

4 Sentinel scores may not correspond with published ratings from the Government Major Projects Portfolio, as their analysis is based on a different range of factors.

Source: National Audit Office analysis of Ministry of Defence data

Figure 14

The 13 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)
A400M	Large transport aircraft	2,238	2,710
Astute	Attack submarine: Boats 1–3	2,233	3,536
	Attack submarine: Boat 4	1,279	1,492
	Attack submarine: Boat 5	1,464	1,420
	Attack submarine: Boat 6	1,579	1,533
	Attack submarine: Boat 7	1,642	1,640
Core Production Capability	Nuclear core production	1,372	1,360
Complex Weapons	Pipeline Weapons funding: Interim Main Gate 1 – Fireshadow	246	256
	Pipeline Weapons funding: Interim Main Gate 1 – Brimstone 2		
	Pipeline Weapons funding: Interim Main Gate 2 – Sea Ceptor	850	849
	FLAADs GBAD Phase 1 – Land Ceptor	384	361
	Future Anti-Surface Guided Weapon (Heavy)	392	374
	Future Anti-Surface Guided Weapon (Light)	311	311
Future Strategic Tanker Aircraft (Voyager)	Air-to-air refuelling and passenger aircraft	11,779	11,409
Lightning II	Fighter or attack aircraft	5,622	4,947
Marshall	Air traffic control system	1,890	1,890
Military Afloat Reach and Sustainability	Naval logistic support	596	552
Queen Elizabeth Class Aircraft Carriers	Aircraft carrier	3,541	6,212
Scout Specialist Vehicle	Armoured Fighting Vehicle	5,480	5,480
Type 26[1]	Demonstration phase and long lead items	***	***
Typhoon	Fighter aircraft	15,173	17,341
	Aircraft software upgrade: Future Capability Programme	403	401
	Meteor integration	130	108
	Storm Shadow integration	172	153
	Brimstone 2 integration	186	186
Warrior	Capability Sustainment Programme	1,319	1,312
Total		**60,281**	**65,833**

Note

1 The Department has approved expenditure on the demonstration phase and long-lead items associated with the manufacture phase for Type 26, but has not yet formally considered a business case for full investment in the manufacture phase. For this reason the forecast costs remain commercially sensitive.

Source: National Audit Office analysis of Ministry of Defence data

Total cost variation	In-year change on costs to completion	Expected in-service date at approval	Current forecast in-service date	Total time variation	In-year change to in-service date	Defence lines of development				
						To be met	To be met, with risks	Not to be met	In-year change, to be met, with risks	In year change – not to be met
(£m)	(£m)			(months)	(months)					
472	-42	Feb 2009	Sep 2015	79	6	6	2	0	-2	0
1,303	103	Jun 2005	Apr 2010	58	0					
213	0	Aug 2015	Jan 2018	29	0					
-44	55	Aug 2020	Aug 2020	0	0	8	0	0	0	0
-46	18	May 2022	May 2022	0	0					
-2	-29	Mar 2024	Mar 2024	0	0					
-12	16	May 2021	Jun 2026	61	52	7	0	0	0	0
10	-1	Mar 2012	Mar 2012	0	0	N/A	N/A	N/A	N/A	N/A
		Oct 2012	May 2016	43	6	8	0	0	0	0
-1	0	Nov 2016	Nov 2016	0	0	8	0	0	0	0
-23	-23	Mar 2019	Mar 2019	0	0	7	1	0	N/A	N/A
-18	-17	Oct 2020	Oct 2020	0	0	7	1	0	0	0
0	5	Oct 2020	Oct 2020	0	0	7	1	0	0	0
-370	7	May 2014	May 2014	0	0	8	0	0	0	0
-675	-89	Dec 2018	Dec 2018	0	0	3	5	0	0	0
0	0	Feb 2017	Feb 2017	0	0	6	2	0	N/A	N/A
-44	-10	Oct 2016	Oct 2016	0	0	4	4	0	0	0
2,671	0	Jul 2015	Feb 2018	31	2	1	7	0	1	0
0	0	Jul 2020	Jan 2020	-6	-6	8	0	0	0	0
0	0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
2,168	-202	Dec 1998	Jun 2003	54	0					
-2	-2	Jun 2012	Dec 2013	18	0	6	2	0	2	0
-22	-15	Jun 2018	Jun 2018	0	0					
-19	-19	Aug 2018	Aug 2018	0	0					
0	0	Dec 2018	Dec 2018	0						
-7	-2	Nov 2018	Jul 2019	8	0	8	0	0	0	0
5,552	**-246**			**375**	**60**	**102**	**25**	**0**	**1**	**0**

Key performance measures					Number to be procured	
To be met	To be met, with risks	Not to be met	In-year change to be met, with risks	In-year change not to be met	Approved	Current plan
9	0	0	0	0	25	22
9	0	0	0	0	3	3
10	0	0	0	0	1	1
10	0	0	0	0	1	1
10	0	0	0	0	1	1
10	0	0	0	0	1	1
2	0	0	0	0	N/A	N/A
N/A	N/A	N/A	N/A	N/A	N/A	N/A
9	0	0	0	0	N/A	N/A
10	0	0	0	0	N/A	N/A
9	0	0	0	0	N/A	N/A
5	0	0	0	0	N/A	N/A
5	0	0	0	0	N/A	N/A
9	0	0	0	0	14	14
5	2	0	0	0	Not yet determined	Not yet determined
5	2	0	0	0	N/A	N/A
11	0	0			4	4
6	3	0	2	0	2	2
11	0	0	0	0	589	589
N/A	N/A	N/A	N/A	N/A	Not yet determined	Not yet determined
8	1	1	0	0	232	160
5	2	0	2	0		
10	0	0	0	0		
10	0	0	0	0		
10	0	0	N/A	N/A		
9	0	0	0	0	445	445
197	**10**	**1**	**4**	**0**		

Appendix Four

Executive project summary sheets

Projects with approval to spend on demonstration and manufacture stages

A400M

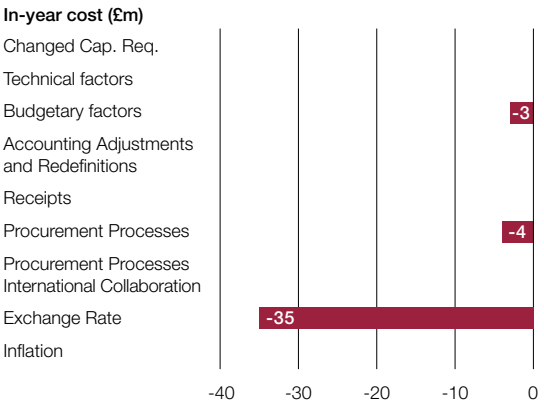
A400M is a collaborative programme involving seven European nations (Belgium, France, Germany, Luxemburg, Spain, Turkey and United Kingdom). It is planned to provide tactical and strategic mobility to all three Services. The required capabilities include: operations from airfields and semi-prepared rough 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.

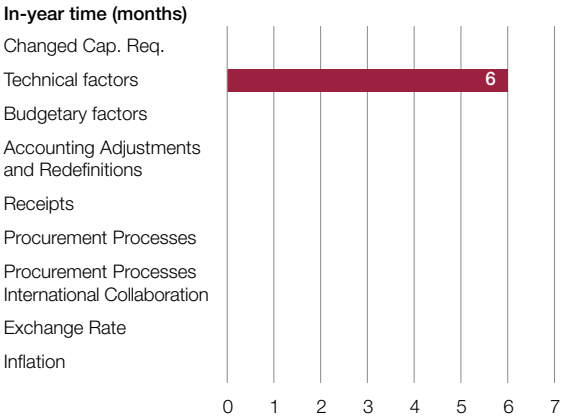
The 1998 Strategic Defence Review confirmed a requirement for an airlift capability to move large single items such as attack helicopters and some Royal Engineers' equipment and concluded that this would be met, in the latter part of the first decade of the 21st century by Future Transport Aircraft. 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	In-year variation
Cost of Assessment Phase: A400M	£2m	£1m	-£1m	–
Cost of Assessment Phase: Training Service	£1m	£1m	–	–
Cost of Demonstration & Manufacture Phase	£2,238m	£2,710m	+£472m	-£42m
Duration of Assessment Phase	–	34 months	–	–
In-Service Date	February 2009	September 2015	+79 months	+6 months

In-year cost variation detail





In-year progress

On 30 August 2014, the first flight of MSN015 (designated to become ZM400, the first RAF A400M aircraft) took place in Seville, an important waymarker in the process leading to delivery of this aircraft.

On 29 September 2014, following the successful conclusion of negotiations, a contract to provide a support service for the RAF A400M fleet was signed with Airbus Military Sociedad Limitada. The service, based at RAF Brize Norton, provides all lines of aircraft maintenance and draws upon proven civil aviation practices. It was officially certified by the UK Military Aviation Authority on 16 October 2014, meaning that it was ready to receive and support A400M aircraft.

On 17 November 2014, ZM400, the first UK aircraft, arrived at RAF Brize Norton, and was flown on training sorties on 18 November. This occasion, when the UK became the third partner nation to operate the A400M, was officially marked with a ceremony at RAF Brize Norton on 27 November 2014. Separately, on 26 November 2014, MSN016 (designated as ZM401) left the Airbus Final Assembly Line production facility in Seville and transferred to the Airbus facility at Getafe, Madrid, to undergo modification work to enable the aircraft to operate a defensive aids sub-system.

On 8 December 2014, building upon the recently signed in-service support contract, and in furtherance of the objectives of the 2010 Anglo-French Lancaster House Treaty, the UK and France signed a contract for the provision of joint elements for their national in-service support contracts.

On 18 December 2014, Germany became the fourth partner nation to operate the A400M when it took delivery of its first aircraft.

On 9 February 2015, at a ceremony held at the Airbus facility at Filton, ZM400 was officially named *City of Bristol*.

On 27 February 2015, ZM402, the second RAF A400M aircraft, arrived at RAF Brize Norton. On the same day, the Airbus Group announced its 2014 annual results accompanied by a statement relating to issues around the A400M programme and announced a "revised baseline and delivery schedule". Details of the proposal for a revised plan were delivered in early March 2015, and are being assessed by senior officials from partner nations. Ahead of this announcement, and in acknowledgement of the delays that had already occurred to aircraft deliveries, the UK had revised its forecast of achievement of in-service date from March to September 2015.

On 10 March 2015, Malaysia took delivery of MSN022, and became the first A400M export customer.

Risk assessment against Defence Lines of Development

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

Astute Class Submarines

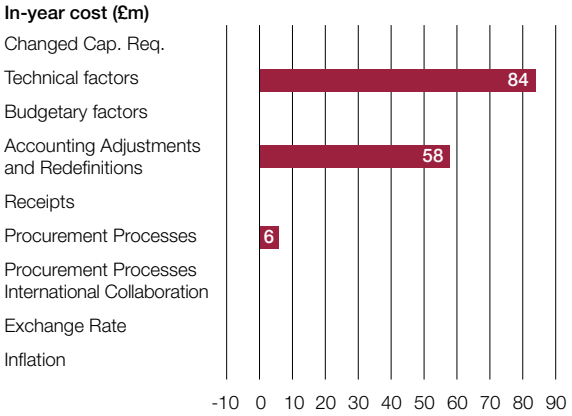
The military requirement is for up to 8 Astute Class nuclear-powered attack submarines to replace the existing Trafalgar Class of nuclear-powered attack submarine.

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	In-year variation
Cost of Assessment Phase	£33m	£29m	-£4m	–
Cost of Demonstration & Manufacture Phase Boats 1–3	£2,233m	£3,536m	+£1,303m	+£103m
Cost of Demonstration & Manufacture Phase Boat 4	£1,279m	£1,492m	+£213m	–
Cost of Demonstration & Manufacture Phase Boat 5	£1,464m	£1,420m	-£44m	+£55m
Cost of Demonstration & Manufacture Phase Boat 6	£1,579m	£1,533m	-£46m	+£18m
Cost of Demonstration & Manufacture Phase Boat 7	£1,642m	£1,640m	-£2m	-£29m
Duration of Assessment Phase		69 months		
In-Service Date Boats 1–3	June 2005	April 2010	+58 months	–
In-Service Date Boat 4	August 2015	January 2018	+29 months	–
In-Service Date Boat 5	August 2020	August 2020	–	–
In-Service Date Boat 6	May 2022	May 2022	–	–
In-Service Date Boat 7	March 2024	March 2024	–	–

In-year cost variation detail



In-year progress

Approvals

Following whole Astute Programme approval in 2012, an annual Information Note is submitted each year to provide an update on status of the Programme. The 2014 Information Note was submitted to IAC in December 2014 within which the cost to completion was estimated to exceed approval (50%) by £80 million. The same financial pressure is not evident within this report due to variations between the scope of the extant approval and MPR, in particular the recognition of the sunk costs on Boats 1–3. It is, however, worth noting that the programme is pursuing a number of business improvement opportunities that aim to improve schedule performance and generate further cost efficiency.

Boat 1 – HMS *Astute*

As previously reported in MPR 14, on 25 April 2013, HMS *Astute* achieved Operational Handover whereby the scheduling authority transferred from Defence Equipment & Support (DE&S) Submarine Production to the Royal Navy and is now a deployable submarine.

Boat 2 – HMS *Ambush*

As previously reported in MPR 14, on 26 June 2013 HMS *Ambush* achieved Operational Handover whereby the scheduling authority transferred from Defence Equipment & Support (DE&S) Submarine Production to the Royal Navy and is now a deployable submarine.

Boat 3 – *Artful*

Artful was launched in May 2014 in a significantly better material state than Astute Boats 1 & 2; this has resulted in a reduction in the length of the 'in-water' test and commissioning phase (from c.21 months to c.13 months). The submarine is currently berthed alongside Wet Dock Quay at BAE Systems' Shipyard in Barrow-in-Furness having successfully completed its initial dive in early October 2014. The next key event was the start-up & testing of the nuclear reactor, which was due to commence in early May 2015. The submarine was scheduled to Exit Barrow in early July 2015 before embarking on a focused sea trials package prior to Operational Handover in autumn 2015.

Boat 4 – *Audacious*

Construction and testing of *Audacious* continues in the Devonshire Dock Hall at Barrow-in-Furness. Diesel Generator Trials were successfully completed in June 2014. There has been schedule slippage on the Reactor Line (critical path) during the reporting period primarily as a result of a programme clash between the reactor commissioning milestones of Primary Circuit Initial Fill in *Audacious* and Power Range Testing in *Artful.* Key initiatives within BAES' Business Improvement Programme (PULSAR) have been successfully rolled out in *Audacious* and agreement has been reached for the workforce to move to a more agile shift-working pattern. Forthcoming milestones include Primary Circuit Initial Fill (April 2015), Reactor Core Load (March 2016) and Launch (September 2016).

Boat 5 – *Anson*

Anson has continued its 'open outfit' phase with all major pressure hull Units having now been delivered to the Devonshire Dock Hall. Key milestones achieved during the period include completion of fabrication of the Aft End Construction, closure of the Unit 1/Unit 2 butt weld and completion of the first phase of Primary Circuit Loop build. Areas of focus for the next 12 months include completion of the Unit 4/Unit 5 butt weld (April 2015), which is a major milestone of activity on the Reactor Line (critical path). A number of other butt closures are scheduled as the build transitions from the 'open outfit' to 'closed outfit' phase; Unit 3/Unit 4 (August 2015), Unit 7/Unit 8 (January 2016) and Unit 2/Unit 3 (April 2016).

Boat 6 – *Agamemnon*

Agamemnon's Command Deck Module has been delivered from Cammell Lairds and is being outfitted. Units are now beginning to be shipped from the New Assembly Shop to the Devonshire Dock Hall in readiness for butt completion.

Boat 7 – Unnamed

Fabrication of main sub units is progressing within the New Assembly Shop with the production of the Top Half Gear Case and assembly of the Main Machinery Raft delivered to baseline.

Astute Class Training Service

The Astute Class Training Service (ACTS) has continued to provide training for ships companies of HMS *Astute*, HMS *Ambush* and *Artful*. Preparation of media and facilities continues for the service delivery of training for Boat 4 crews from July 2015. On 18 December 2014, the IAC approved the ACTS Review Note for supplier engagement for extension of training service for Boat 5 and recommended that negotiation include options for contract extension to cover Boats 6 and 7. The supplier has been requested to propose a solution.

Support

The Astute support solution continues to mature as further experience is gained from sea time. Current focus is on preparations for *Artful* exit and acceptance activities in the lead-up to Contractor Acceptance Stage 1 (CAS1) and Operational Handover (OH) later in 2015. In addition, work continues to the optimisation of Astute support to deliver increased reliability and availability.

Foundation Contract

The MoD's 2010 Strategic Defence and Security Review (SDSR) plan to save at least £879 million from the costs of the submarine programme to 2021 under the Submarine Enterprise Performance Programme (SEPP) resulted in a Foundation Contract with BAES M-S being signed on 17 July 2013. This committed the company to a share of the total £900 million efficiency savings, through performance improvement, totalling at least £386 million over an 8-year period, of which a target of £195 million will fall to the Astute programme. Across the period 17 July 2013 to 31 March 2015, the *Astute* programme has secured efficiencies that yield financial savings of £92.8 million.

Risk assessment against Defence Lines of Development

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

Complex Weapons Pipeline

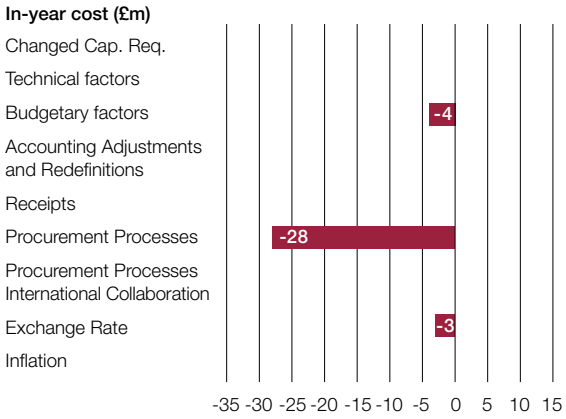
The Team Complex Weapons initiative is based on meeting the UK's enduring requirement to have battle-winning military capability through the use of Complex Weapons; to be assured that the weapons will perform as expected; and to retain the ability to develop leading-edge Complex Weapons technologies.

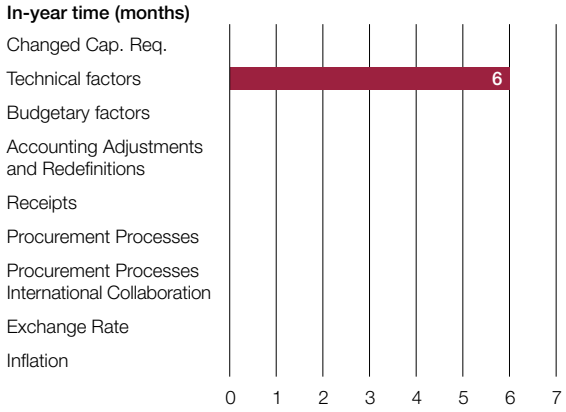
Within this context, the initiative aims to deliver: Improved, adaptable and flexible Complex Weapons that can be shaped to meet current and future military capability needs; and freedom of action and operational advantage in our Complex Weapons through a sustained indigenous industrial construct.

Overview of cost, time and performance

	Approved	Forecast/Actual	Variation	In-year 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	£198m	£191m	-£7m	–
Cost of Assessment Phase – Future Local Area Air Defence System (Land)	£40m	£40m	–	–
Cost of Demonstration & Manufacture Phase: Fire Shadow and Brimstone 2	£246m	£256m	+£10m	-£1m
Cost of Demonstration & Manufacture Phase: Sea Ceptor	£850m	£849m	-£1m	–
Cost of Demonstration & Manufacture Phase: FLAADS GBAD Phase 1	£384m	£361m	-£23	-£23m
Cost of Demonstration & Manufacture Phase: Future Anti-Surface Guided Weapon (Heavy)	£392m	£374m	-£18m	-£17m
Cost of Demonstration & Manufacture Phase: Future Anti-Surface Guided Weapon (Light)	£311m	£311m	–	+£5m
Duration of Assessment Phase				
Complex Weapons	–	22 months	–	–
Future Local Area Air Defence System (Land)	–	18 months	–	–
In-Service Date Fire Shadow	March 2012	In-service date was not met	–	–
In-Service Date Brimstone 2	October 2012	May 2016	+43 months	+6 months
In-Service Date Sea Ceptor D	November 2016	November 2016	–	–
Future Anti-Surface Guided Weapon (Heavy)	October 2020	October 2020	–	–
Future Anti-Surface Guided Weapon (LightLand	October 2020	October 2020	–	–
Land Ceptor	March 2019	March 2019	–	–

In-year cost variation detail





In-year progress

Sea Ceptor

The two planned Guided Firings of the Common Anti-Air Modular Missile were completed successfully in May/June 2014. The Intent-to-Fit on the First-of-Class vessel was confirmed by the Chair of the Sea Ceptor Project Board and the Type 23 Platform Duty Holder in June 2014. The Design Freeze Review started in May 2014 and was concluded in November 2014.

The Land Ceptor GBAD Phase 1 Demonstration Phase

The assessment phase programme fed into the Ground Based Air Defence Phase 1 Main Gate Business Case, which was brought forward to December 2014. The remainder of the assessment phase will continue to July 2015 and inform the FLAADS (Land) Demonstration Phase, which has now commenced.

The Land Ceptor GBAD Phase 1 contract was placed on 5 January 2015.

Land Ceptor forms part of Phase 1 of the wider Ground Based Air Defence Programme, led by the Joint Sensor and Engagement Networks (JSENS) Delivery Team within the Intelligence Surveillance Target Acquisition & Reconnaissance Operating Centre. JSENS are responsible for delivery of Battlefield Mission Command, Control, Communication, Computers and Intelligence (as part of Phase 2 of GBAD, which is currently in its assessment phase), Giraffe Agile Multi-Beam (G-AMB) sensors and, in conjunction with the SRO, all associated non-equipment Defence Lines of Development.

The Short Range Air Defence Project Team, within the Weapons Operating Centre, is responsible for the development and delivery of the Launcher, direct integration with the G-AMB radar, the procurement of the Common Anti-Air Modular Missile stockpile and the Land Ceptor-specific training, Infrastructure and Logistics requirements.

While the SHORAD Project Team retains responsibility for Land Ceptor and its integration with the G-AMB radar, it is not responsible for the availability of G-AMB, nor leading on the non-equipment DLODs; accountability remains withi the SRO, with JSENS as the DE&S lead.

The money for the Land Ceptor element of Phase 1 sits within Weapons, Evaluation & Capability Assurance and therefore the Through-Life Enabling Contract was seen as the most logical route for placing the work on contract with MBDA.

Future Anti-Surface Guided Weapon (Light)

A contract with Thales for FASGW(L) was placed on 12 June 2014, followed by a contract with Agusta Westland for the integration of FASGW onto the Wildcat helicopter that was placed on 13 June 2014. The Preliminary Design Review for FASGW(L) was completed by March 2015.

Future Anti-Surface Guided Weapon (Heavy)

The Preliminary Design Review for FASGW(H) was held in June 2014. The first Product Gate 1 Ballasted Dummy Missile became available on 28 February 2015.

Brimstone 2

Qualification of both energetic sub-systems (warhead and rocket motor) completed successfully in July 2014, two months ahead of schedule. Certificates of Design were issued for Brimstone 2 Missiles and Weapon Systems and signed by the Maritime & Air Weapon Systems Project Team Leader in November 2014, two months ahead of schedule. Final 'Operational Evaluation Trial' commenced in February 2015 as planned. While the majority of trials objectives were met, several warheads did not detonate, requiring further work to ensure that the issue does not recur. The trial was suspended and an investigation into the cause of failures commenced. Missile production was halted until identification and agreement of a resolution. The In-Service Date will not be met but Initial Operating Capability will be maintained.

SPEAR Cap 3

On December 2013, the Surface Attack Project Team presented a Review Note to the Investment Approvals Committee seeking approval for an increase in the cost and time of the project's Assessment Phase. In March 2014, Director General Finance directed that further work be undertaken before approval could be given. This work was completed and in April 2014, the required clarifications were provided to Defence Portfolio and Approvals Secretariat.

In June 2014, DG Finance approved part of the cost increase and requested a project update at the turn of the year. In February 2015, after a comprehensive project review, the Investment Approvals Committee approved the full cost and time increases to the Assessment Phase. There is clear Operational Analysis that supports the UK procurement of SPEAR Cap 3.

The Investment Approvals Committee also approved the SPEAR Cap 3 Main Gate being deferred until 2018 with the development of the SPEAR Cap 3 weapon being continued through to 2018 with MBDA via an Assessment Phase extension, a business case for which is planned for submission to the Investment Approvals Committee in January 2016.

Brimstone Unified Support Environment

USE achieved Full Service Capability in Quarter 3 of 2014. Since then the Unified Support Environment contract was challenged by a significant increase in demand for Dual Mode Brimstone as a result of Operation SHADER (the British participation in the ongoing military intervention against Islamic State in Iraq). A significant increase in availability of the existing stockpile was enabled by joint working between MBDA UK Ltd and Defence Equipment and Support as well as an uplift in stock. This has continued with Operation SHADER now expected to be an enduring commitment.

Advanced Short Range Air to Air Missile (ASRAAM) USE

A Business Case seeking approval for an In-Service Support (ISS) solution using an Asset Availability Service was presented on 11 June 14. On 22 August 2014, Weapons, Evaluation & Capability Assurance approved the case and on 29 August the case was approved by Defence Portfolio and Approvals Secretariat. The contract was let the following month and progress against the USE contract has been satisfactory. In the initial stages of the contract, there were some minor issues with meeting the customer requirements for some assets at specific locations. However, the shortcomings were within the permitted levels for that point in the contract.

The Contract Go Live date in Section C of the Project Summary Sheet (Appendix Six) shows April 2014. This is when MBDA began to provide the service. Between April and September, the Company provided the service at their own risk in advance of the contract being formally approved.

Risk assessment against Defence Lines of Development

Brimstone 2

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

Sea Ceptor

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

FLAADS GBAD Phase 1

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

Future Anti-Surface Guided Weapon (Heavy)

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

Future Anti-Surface Guided Weapon (Light)

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

Core Production Capability

The requirement is 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. CPC is composed of Sustainment that continues and improves core manufacture, and Regeneration that is replacing the old manufacturing facilities. The Regeneration programme does not interrupt the manufacture of cores.

To conduct nuclear operations on the Raynesway site, Rolls-Royce Marine Power Operations Limited is 'Licensed' formally by the Office of Nuclear Regulation 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.

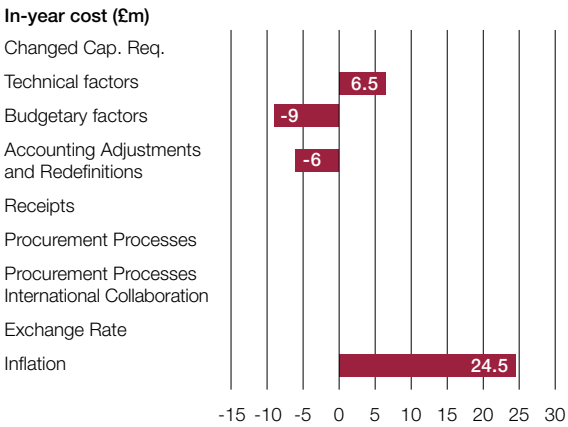
The 2010 Strategic Defence and Security Review white paper deferred the In-Service Date for the Successor submarine to 2028.

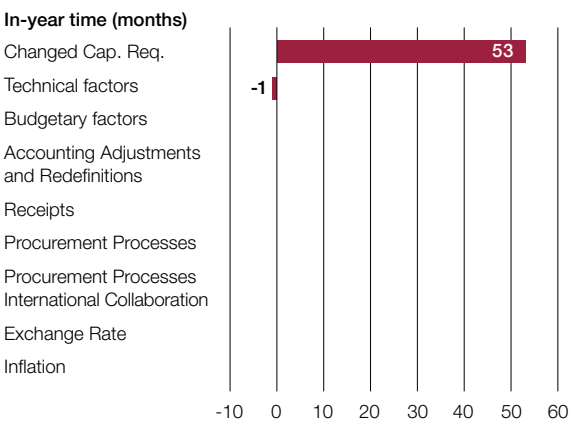
On 6 March 2014 the Secretary of State for Defence announced to Parliament that as a result of a Fuel Element Breach within the core of the reactor at the Nuclear Reactor Test Establishment in Dounreay, he had decided that HMS *Vanguard* would be refuelled at her forthcoming Deep Maintenance Period and that he would be maintaining the option to also refuel HMS *Victorious* at a later date. To meet this requirement it has been necessary to defer the final phase of Regeneration of the Core Production Capability Project. This is to maintain a seamless capability for the production of existing cores, without risking the capability for producing the cores for Successor.

Overview of cost, time and performance

	Approved	Forecast/Actual	Variation	In-year variation
Cost of Assessment Phase	£107m	£107m	–	–
Cost of Demonstration & Manufacture Phase	£1,372m	£1,360m	-£12m	+£16m
Duration of Assessment Phase	–	56 months	–	–
Core Production Capability Date	May 2021	June 2026	+61 months	+52 months

In-year cost variation detail





In-year progress

April 2014: Decision to enhance the core production inspection regime for Core J following manufacturing review in light of the Fuel Element Breach on H Core.

September 2014: Commenced Manufacturing Facility 1st Build building services fit out.

October 2014: Completion of Reception Centre building structure and exterior walls.

November 2014: Revised Core H Production rates established to deliver a reduced 12-month float on delivery for H10, H11 and H12 and 9-month float on H13 (replacement core for Astute Boat 7 – see below) and H14 (if required for HMS *Victorious*).

December 2014: Completion of Manufacturing Facility 1st Build structural frame.

January 2015: Core H Refuel and Resilience (CHRAR) Review Note submitted to the MoD Investment Appraisal Committee (IAC).

January 2015: Inspection capacity increased to de-risk product quality issues in the light of the Fuel Element Breach.

March 2015: On the 9th, the IAC approved the Core H Refuel and Resilience Review Note. The Review Note included annexes from all 9 projects impacted by the Secretary of State for Defence's announcement to Parliament on 6 March 2014. The CPC annex sought approval of a deferred Full Operating Capability date (5 years) and £196 million to meet the requirement to manufacture at least one core and make provision for a second.

March 2015: Core H9 containerised ready for delivery to Barrow-in-Furness in Q2 2015 to meet the core load programme in Q2 2016.

April 2015: Core H production rates established and maintaining the 12-month float for H11 and H12 and 9 months for H13 and H14.

As a result of the diversion of Core H10 from the Astute programme to refuel HMS *Vanguard*, and the consequential extension of H Core production, to include an additional H Core, there is increased pressure on the manufacturing programme, resulting in reduced CPC programme float of 12 months for H11 and H12 and 9 months for H13 and H14. H10 is completed and awaiting despatch to HMS *Vanguard*.

The development and production of core J1 for Successor Boat 1 remains on track to meet the required delivery date to Barrow-in-Furness to support the required In-Service Date of 2028.

Risk assessment against Defence Lines of Development

● Equipment	● Training	● Logistics	● Infrastructure
● Personnel	N/A Doctrine	● Organisation	● Information

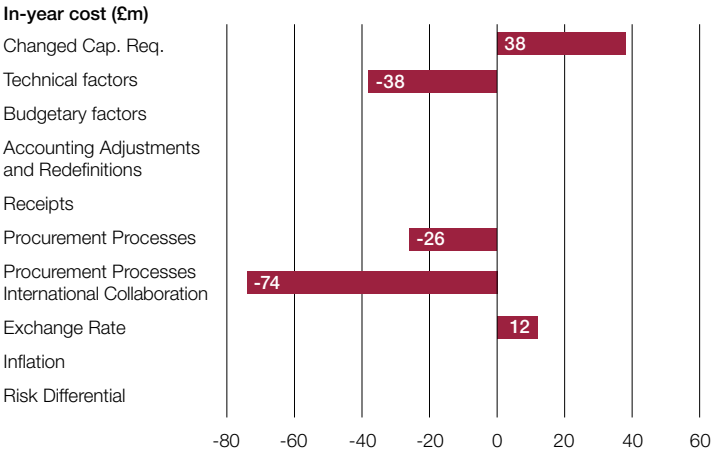
Lightning II

The Joint Strike Fighter (F35- Lightning II) 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	In-year variation
Cost of Assessment Phase	£150m	£144m	-£6m	–
Cost of Demonstration & Manufacture Phase	£5,622m	£4,947m	-£675m	-£89m
Duration of Assessment Phase	–	–	–	–
In-Service Date	December 2018	December 2018	–	–

In-year cost variation detail



In-year progress

In November 2014, the UK ordered 4 F-35B aircraft. The Lightning II Main Operating Base at RAF MARHAM reached initial gate approval (Project Anvil) for general F-35 basing facilities and infrastructure. In January 2015, 17(R) Squadron was established as the UK's F-35 Test and Evaluation squadron at Edwards Air Force Base in California USA. BK1 and BK2 were transferred to 17(R) Squadron. In March 2015, BK3 was transferred to US Marine Corps Air Station at Beaufort in North Carolina USA to continue UK core pilot and maintainer training.

Risk assessment against Defence Lines of Development

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

Marshall

The Marshall project is a Terminal Air Traffic Management capability that will enable air vehicles to operate safely and effectively with tactical freedom, in all weather conditions and in any environment, within UK Areas of Responsibility, including permanent overseas airfields, and in support of UK and coalition forces worldwide. The project will provide this capability via a contract of up to 22 years' duration with a service provider for the design, acquisition, installation, sustained delivery and assurance of a military Terminal Air Traffic Management Service.

Overview of cost, time and performance

	Approved	Forecast/Actual	Variation
Cost of Assessment Phase 1	£3m	£3m	–
Cost of Assessment Phase 2	£7m	£7m	–
Cost of Demonstration & Manufacture Phase: Marshall Equipment Transition Phase	£410m	£410m	–
Cost of Demonstration & Manufacture Phase: Marshall In-Service (Duration Transition Phase)	£344m	£344m	–
Marshall Full Operating Capability Phase	£1,136m	£1,136m	–
Duration of Assessment Phase 1	–	22 months	–
Duration of Assessment Phase 2	–	55 months	–
In-Service Date	February 2017	February 2017	–

In-year progress

Following review by the Chief of Defence Materiel on 31 March 2014, timescales for contract award were accelerated to de-conflict with purdah ahead of the General Election. The Main Gate Business Case was signed on 11 August 2014. Evaluation of final tender bids commenced on 28 August 2014 and concluded on 28 September 2014. The contract was signed between MoD and Aquila Air Traffic Management Services on 28 October 2014. Contract signature was followed by a 6-month mobilisation phase in preparation for Aquila taking on responsibility for the availability of in-scope legacy equipment on 1 April 2015. The mobilisation phase included the preparation for Transfer of Undertakings Protection of Employment (TUPE) Transfer of MoD and contractor staff; development of working practices for operation and maintenance personnel; development of governance structures and procedures for equipment installation to enable Aquila to take on service delivery responsibility from 1 April 2015.

Risk assessment against Defence Lines of Development

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

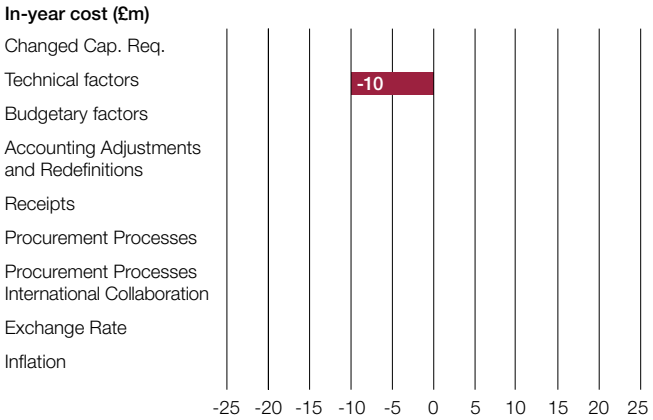
Military Afloat Reach and Sustainability

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 single hull tanker flotilla. The main focus of this report is the MARS Tankers, which will provide bulk fuels and forward aviation support to the maritime task group.

Overview of cost, time and performance

	Approved	Forecast/Actual	Variation	In-year variation
Assessment Phase	£44m	£17m	-£27m	–
Cost of Demonstration & Manufacture Phase	£596m	£552m	-£44m	-£10m
Duration of Assessment Phase	–	78 months	–	–
In-Service Date	October 2016	October 2016	–	–

In-year cost variation detail



In-year progress

Critical Design Review was completed in June 2014 and construction of the first ship of the class RFA *Tidespring* commenced in that month. Keel laying of the first and steel cut of the second, RFA *Tiderace*, was achieved in December 2014. RFA *Tidespring* was launched during a float-out from Daewoo Shipbuilding and Marine Engineering's No 2 Dock in April 2015. While work to complete the Integrated Logistic Support deliverables continues, outstanding from initial deliverables provided in Dec 2014 are being addressed through a revised programme and are not expected to impact on platform delivery.

Following competition, A&P Group in Falmouth was awarded the UK Customisation, Capability Assessment Trials and Support contract in January 2015, in order to complete customisation of sensitive elements and undertake final military trials in the UK. A&P are also on contract to provide initial in-service support to June 2018.

Risk assessment against Defence Lines of Development

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

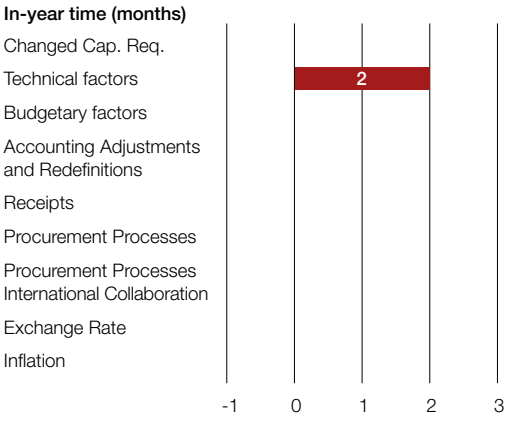
Queen Elizabeth Class Aircraft Carriers

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	In-year variation
Cost of Assessment Phase (including Conversion)	£176m	£343m	+£167m	–
Cost of Demonstration & Manufacture Phase	£3,541m	£6,102m	+£2,561m	–
Duration of Assessment Phase	–	84 months	–	–
In-Service Date	July 2015	February 2018	+31 months	+2 months

In-year time variation detail



In-year progress

Assembly of HMS *Prince Of Wales* began on 9 September 2014 with the double docking of two of the ship's largest hull sections – Lower Block 02 (6,000 tonnes) and Lower Block 03 (8,000 tonnes).

The movement of the blocks into the dock at Rosyth marked the beginning of the ship's assembly phase and came only days after Prime Minister David Cameron announced at the NATO Summit in Newport that HMS *Prince of Wales* will enter service with the Royal Navy.

An important milestone was achieved on 24 October 2014 when HMS *Queen Elizabeth* was supplied with shore-based High Voltage (HV) electricity for the first time. This allows all the systems on-board to be brought to life and tested ahead of autonomous power from the ship's generators coming on-stream in 2015. Installation of the first MT30 Gas Turbine Alternator (GTA) package into HMS *Prince of Wales* was successfully completed on 28 February 2015.

In March, HMS *Queen Elizabeth* received her first delivery of fuel (500 tonnes), the flushing of the lubrication oil system for the diesels was completed and the first run of the diesel generators is expected to take place at the end of May.

On 28 April 2015 (shortly after 2014-15 financial year-end), the steel was cut for the final block of HMS *Prince of Wales* (and, therefore, the Queen Elizabeth Class carriers programme as a whole). All 25 blocks that make up HMS *Prince of Wales* are now in production. More than 30,000 tonnes are already assembled in the dry dock at Rosyth.

Risk Assessment against Defence Lines of Development

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

Scout Specialist Vehicles

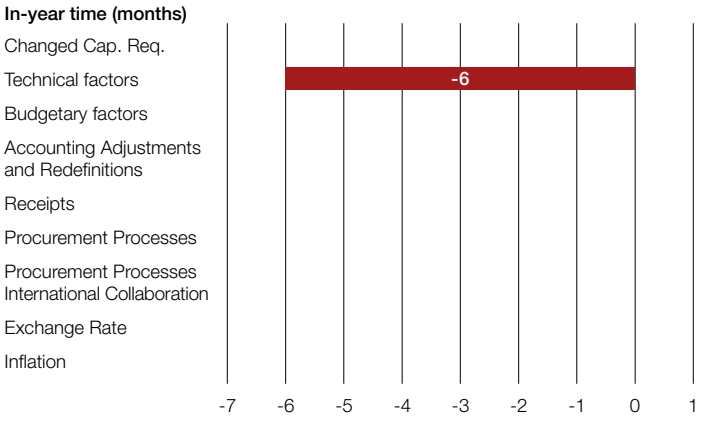
Scout SV will provide the mounted reconnaissance capability integral to Army 2020 by equipping the Army with a fully digitised tracked armoured vehicle, designed as a manned, all-weather persistent, intelligence gathering capability with built-in growth. Integral to Army 2020 plans, it delivers a Base ISTAR-like capability from a globally deployable ground platform to meet the demands of contingent operations.

Scout was renamed Ajax on 15 September 2015.

Overview of cost, time and performance

	Approved	Forecast/Actual	Variation	In-year variation
Cost of Assessment Phase	£109m	£83m	-£26m	–
Cost of Demonstration & Manufacture Phase	£5,480m	£5,480m	–	–
Duration of Assessment Phase	–	Continuous	–	–
Duration of Assessment Phase Recce Block 1 Demonstration	–	74 months	–	–
In-Service Date	July 2020	January 2020	-6 months	-6 months

In-year time variation detail



In-year progress

MAIN GATE 2 – MANUFACTURE PHASE: This was achieved in September 2014, securing a fleet of 589 vehicles broken down into 9 different variants (including the Special to Role variants). This approval also included the initial two years' in-service support. Approval for the longer-term in-service support contract is planned for Q3 2016 at Main Gate 3, following an open competition.

Demonstration phase progress continues with the achievement of the following milestones:

- May 2014: K11A SCOUT Base Platform Critical Design Review.
- June 2014: K13 Protected Mobility Reconnaissance Support Critical Design Review.
- October 2014: K17 Equipment Support Roles Critical Design Review.
- December 2014: K16 SCOUT Critical Design Review.
- January 2015: K15 Protected Mobility Reconnaissance Support Training Readiness Review.

Risk assessment against Defence Lines of Development

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

Type 26 Global Combat Ship

There is a need to replace the 13 ship Type 23 capability before the safe operating standard for legacy ships is withdrawn and the platforms become obsolete. Following the Strategic Defence and Security Review, it was confirmed that this enduring requirement will be delivered by the Type 26 Global Combat Ship.

The Type 26 Global Combat Ship is planned to 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. Type 26 Global Combat Ship retains the combat power that had been originally envisaged within the Future Surface Combatant C1 and C2 variants, while enhancing endurance and intelligence-gathering capabilities in a common, acoustically quiet hull.

The current planning assumption is to replace Type 23 under the Type 26 Global Combat Ship programme, based on one class of 13 ships delivered in two variants: Anti-Submarine Warfare and general purpose vessels.

Overview of cost, time and performance

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

In-year progress

August 2014: The MoD implemented a revised incremental approach to approvals and commitment on the Type 26 Global Combat Ship programme, with separate approvals covering the Demonstration Phase, shipbuilding facilities investment and the Manufacture Phase. This approach draws on key lessons from the Queen Elizabeth Class Aircraft Carrier programme. It will ensure that the ship design is sufficiently mature, the supply chain is fully mobilised early in the programme, and a full joint analysis of programme risk is completed before awarding contract(s) to build the ships.

Rigorous analysis is now re-setting the schedule, cost base and risk position to arrive at a robust realistic proposal for Main Gate 2.

January 2015: A Review Note was submitted in January 2015 to approve the Type 26 Global Combat Ship project proceeding to the Demonstration Phase, covering the period 1 April 2015 to 31 March 2016.

February 2015: The IAC approved the advancement to the Demonstration Phase on 20 February 2015 and the Prime Minister made a public announcement of the £859 million contract. The 12-month Demonstration Phase covers the continued progression of the Type 26 Global Combat Ship project including investment in essential Long Lead Items, Shore Testing facilities and the analysis of the potential shipbuilding facility investment options for Type 26 Global Combat Ship. The contract also commits to key initial equipment for the first 3 Type 26 Global Combat Ship vessels (extending beyond 12 months) providing certainty to UK suppliers; The Demonstration Phase sustains momentum on the programme as well as enabling time to demonstrate a robust proposal and readiness for manufacture.

Typhoon

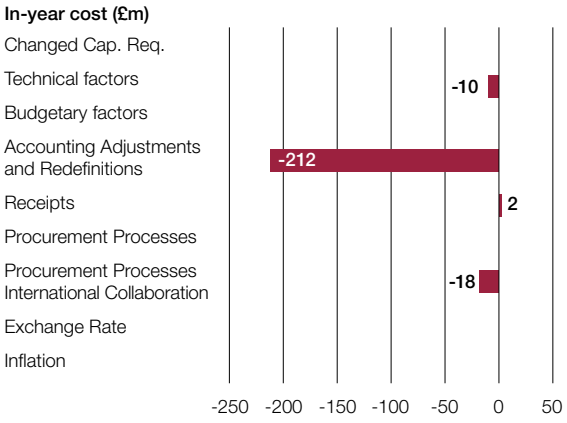
Typhoon is an agile, multi-role combat aircraft which is being developed, produced and supported in a collaborative project with Germany, Italy and Spain. The project is managed on behalf of the 4 partner nations by the NATO Eurofighter and Tornado Management Agency. To date, contracts have been placed for the Royal Air Force to receive 160 aircraft in 3 tranches.

Typhoon support is being delivered through the letting of long-term contracts against 5 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.

Overview of cost, time and performance

	Approved	Forecast/Actual	Variation	In-year variation
Cost of Assessment Phase (unclassified)	£381m	£364m	-£16m	–
Cost of Demonstration & Manufacture Phase – Typhoon	£15,173m	£17,341m	+£2,168m	-£202m
Cost of Demonstration & Manufacture Phase – Typhoon Future Capability Programme	£403m	£401m	-£2m	-£2m
Cost of Demonstration & Manufacture Phase – Meteor Integration	£130m	£108m	-£22m	-£15m
Cost of Demonstration & Manufacture Phase – Storm Shadow Integration	£172m	£153m	-£19m	-£19m
Cost of Demonstration & Manufacture Phase – Brimstone 2 Integration	£186m	£186m	–	–
In-Service Date – Typhoon	December 1998	June 2003	+54 months	–
In-Service Date – Typhoon Future Capability Programme	June 2012	December 2013	+18 months	–
In-Service Date – Meteor Integration	June 2018	June 2018	–	–
In-Service Date – Storm Shadow Integration	August 2018	August 2018	–	–
In-Service Date – Brimstone 2 integration	December 2018	December 2018	–	–

In-year cost variation detail



In-year progress

The governments continued the signing of 2 key weapon integration agreements during the period, marking commitment to the growth of Typhoon capability. A £120 million agreement was signed at the Farnborough International Air Show in July 2014 to integrate the Storm Shadow missiles onto Typhoon. Storm Shadow will provide long-range air-to-surface capability and will be fitted to Typhoon Tranche 2 and 3 aircraft. This was followed by the £165 million contract for the Typhoon Phase 3 Enhancements (P3E) programme, which was awarded in February 2015.

The P3E programme will deliver a number of upgrades to the UK's Typhoon Tranche 2 and 3 mission and maintenance systems and includes the integration of the Brimstone 2 weapon system that will introduce a short-range, low-collateral damage weapon capability designed specifically to combat fast-moving surface targets. It is anticipated that both Storm Shadow and Brimstone 2 will be ready for service with the RAF in 2018.

The Typhoon Future Capabilities (FCP1) Programme introduces precision air-to-surface bombing capability onto Tranche 2 and Tranche 3 aircraft. The second of two sequential phases, (P1Eb) was delivered into service with the RAF in July 2014 and declared operational in April 2015. The precision bombing capability is provided principally through the integration of the Paveway IV bomb and Laser Designator Pod.

In September 2014, Typhoon aircraft of 1 (Fighter) Squadron relocated from RAF Leuchars to RAF Lossiemouth. Along with 6 Squadron, they provide Quick Reaction Alert (QRA) cover for the north of the UK, together with QRA South, based at RAF Coningsby. From 2015, Leuchars will become home to the Army.

An £800 million contract for the development of a new electronic radar system for Typhoon was awarded in November 2014. The contract, which followed the UK's signing of a £72 million technology de-risking and demonstration 'Extended Assessment Phase' with BAES in July 2014, marks the next stage in the full development of an Active Electronically Scanned Array (AESA) radar capability for Typhoon. The introduction of an AESA radar will support new mission capabilities for Typhoon, through simultaneous multirole air-to-air and air-to-ground tracking of targets with increased fidelity and range, while utilising the Radio Frequency spectrum for Electronic Warfare.

The Typhoon fleet continues to grow as planned, with 127 aircraft delivered to the RAF by the end of March 2015. In December 2014, Typhoon Tranche 3 Release to Service (RTS) was declared. The 40 Tranche 3a aircraft will be delivered to the RAF by 2018 and, along with the 67 Tranche 2 aircraft, will be the core of the Typhoon fleet through to its out-of-service date.

In December 2014, the MoD extended the TAS contract for a further 15 months, to better align its future renewal with the international spares and repairs contracts, which support it. The contract delivers aircraft depth maintenance to the RAF Typhoon Force, a spares and repairs management service, RAF aircrew and ground crew training and an engineering/ technical resolution service, ensuring the availability of the RAF's Typhoon fleet to meet the military commitments.

Risk assessment against Defence Lines of Development

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

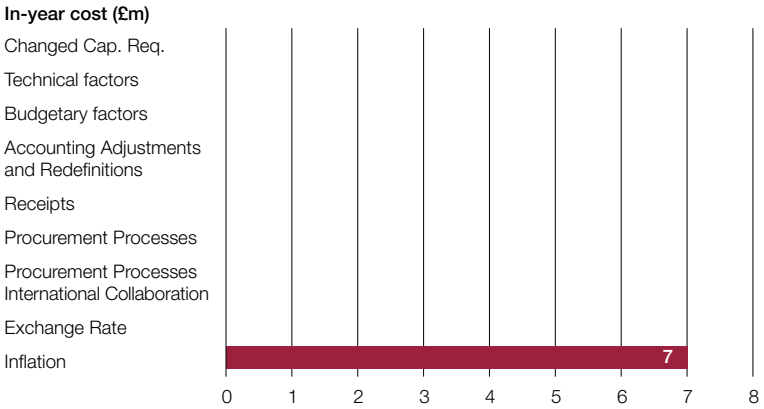
Voyager

The 'Voyager' Future Strategic Tanker Aircraft will provide the Air-to-Air Refuelling and the passenger Air Transport capability previously 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	In-year variation
Cost of Assessment Phase	£13m	£38m	+£25m	–
Support Cost	£11,779m	£11,409m	-£370m	+£7m
Duration of Assessment Phase	–	77 months	–	–
In-Service Date (Air-to-air refuelling)	May 2014	May 2014	N/A	N/A
Contract Go-Live	March 2008	March 2008	–	–
Contract End	March 2035	March 2035	–	–

In-year cost variation detail



In-year progress

FSTA has continued to deliver exemplary Air-to-Air Refuelling (AAR) and Air Transport (AT) capabilities. With a number of Operational Emergency Clearances for overseas aircraft Voyager has provided Air-to-Air Refuelling to UK and coalition aircraft involved in operations against the Islamic State since August 2014. At the end of the reporting period, Voyager had provided in excess of 8 million litres in operations and had broken a number of UK AAR records.

The 7th modified aircraft was delivered during May 2014 and the 8th modified aircraft was being prepared for RAF usage following accelerated implementation of the Enhanced Platform Protection modification. As all critical military capabilities required to meet the current operational demand had been delivered the aircraft was deemed ready to enter service in May 2014. All modified Future Strategic Tanker Aircraft in the fleet are capable of refuelling operations simultaneously with any 2 of Air-to-Air Refuelling probe-equipped Fast Jets and, as specified, 5 aircraft are equipped to transfer fuel to large aircraft. The currently reported 'green' unmodified aircraft is now in conversion and will be delivered in October 2015.

Risk assessment against Defence Lines of Development

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

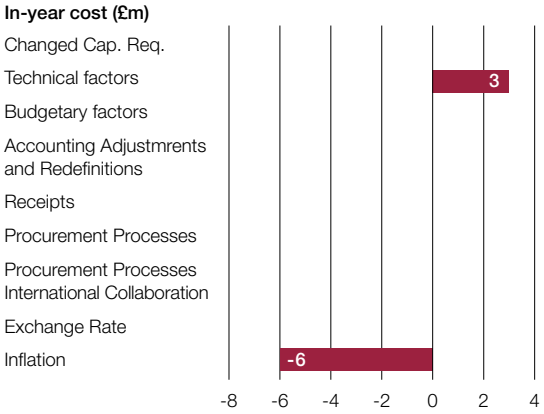
Warrior Capability Sustainment Programme

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 revised Warrior Out-of-Service Date well beyond 2035.

Overview of cost, time and performance

	Approved	Forecast/Actual	Variation	In-year variation
Cost of Assessment Phase	£83m	£73m	-£10m	-£5m
Cost of Demonstration & Manufacture Phase	£1,319m	£1,312m	-£7m	-£2m
Duration of Assessment Phase – Warrior	–	27 months	–	–
Duration of Assessment Phase – Common Cannon	–	9 months	–	–
In-Service Date – Warrior	November 2018	July 2019	+8 months	–

In-year cost variation detail



In-year progress

April 2014 – FV 510 /511 Delta Design Review in accordance with LMUK process.

- May 2014 – Unit 0 Block 2 Commencement of Hull integration activities at LMUK, Ampthill.
- July 2014 – Unit 0 Unmanned Firing (Anchor).
- October 2014 – LF3 Stage 2 Static Fire.
- February 2015 – Unit 0 Turret Integration and Test completion.
- February 2015 – Unit 0 Manned Firing (Anchor).

Armoured Battlefield Support Vehicle

Initial Gate was planned for Quarter 3 2014, however, Army Headquarters reviewed the scope of the Armoured Battlefield Support Vehicle programme with a view to harmonising the requirement across the broader Army programme. Both the quantity of vehicles and the number of variants required for Armoured Battlefield Support Vehicle are expected to increase as a consequence of this review and Defence Equipment & Support are awaiting an Implementation Order to increase the numbers and variants of Armoured Battlefield Support Vehicle as well as deferring the project by two years. Once implemented Armoured Battlefield Support Vehicle will become its own CAT A project.

Main Weapon Selection – Cased Telescope 40mm Cannon

The qualification of the Case Telescoped 40mm Cannon, Armour Piecing Fin Stabilised Discarding Sabot-Tracer and Target Practice-Tracer ammunition was completed in May 2014 when the Safety and Environmental Case Report was approved by the Ordinance Safety Review Panel. Some minor limitations were applied in the initial use period for the cannon, but a series of 'gap closure' activities has now addressed almost all these limitations, which await only the final paperwork for completion. The remaining limitations relate to barrel wear and are expected to be resolved in early 2016. On this basis a £200 million contract for 515 Case Telescoped 40mm Cannons was signed with CTAI on 27 March 2015 (245 for Warrior Capability Sustainment Programme and Scout Specialist Vehicle and 25 for training and further qualification activities). Work on qualifying the General Purpose Round – Point Detonating – Tracer and General Purpose Round – Air Burst – Tracer has continued during 2014. We expect final qualification of the former in 2016 and the latter by 2019. Initial work has commenced on the High Explosive Training Reduced Range – Trace and Kinetic Energy Reduced Range – Trace rounds, which will offer a cheaper training round that can be fired within a smaller safety template, in order to optimise use of the training estate. These latter ammunition natures should be qualified by 2022.

SUPPORT – Diesel Engines and Transmissions

The previously reported contract with Caterpillar Defence Products for the repair of Diesel Engines and Transmissions expired in March 2014. A new contract was placed with Caterpillar in September 2014 to continue the support arrangement for these items, following approval of the Business Case from the approving authorities.

Risk assessment against Defence Lines of Development

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

Assessment phase projects

Apache Attack Helicopter Capability Sustainment Programme

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, 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 Apache Attack Helicopter Capability Sustainment Programme 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
Cost of Assessment Phase	£14m	£13m	-£1m

In-year progress

The Initial Gate Business Case was approved by ministers on 25 November 2014 and confirmed by the Investment Approvals Committee on 19 December 2014. Leading up to the approval, a common statement of requirements and the associated procurement documentation was prepared that was released to the US government and AgustaWestland on 25 November 2014. The Project Team has since been engaged in responding to points of clarification ahead of the expected receipt of proposals by 15 September 2015.

The period leading up to the Initial Gate approval was treated as an extended Concept Phase to enable some early analysis relating to aircraft engineering and certification to be taken forward that was agnostic of the eventual procurement route. This has continued during the Assessment Phase with further work that will result in the determination of the aircraft Type Certification Basis under UK airworthiness regulations. This work will also develop the safety requirements and obtain the information needed to support or to identify potentially significant safety risks, which will inform the future Development & Manufacture Phase programme of work.

The extended Concept Phase also enabled some early work on training and support analysis to be taken forward. The support solution analysis will inform the Main Gate Business Case for longer-term support.

Crowsnest

Crowsnest will provide an airborne surveillance, control and early warning capability to Carrier Enabled Power Projection, Littoral Manoeuvre, and Maritime Task Groups at all scales of operation. Following the 2010 Strategic Defence and Security Review, the Crowsnest capability is required to be delivered as a role-fit mission system integrated into the Merlin Mk2. The Crowsnest project will procure 10 role-fit mission systems, and convert all 30 Merlin Mk2 aircraft to make them 'fit-to-receive' the Crowsnest role-fit equipment.

Overview of cost, time and performance

	Approved	Forecast/Actual	Variation
Cost of Assessment Phase	£43m	£43m	-£0m
Duration of Assessment Phase	–	***	–

In-year progress

Flight Trials: Lockheed Martin trialled 2 x prototype radar pods, one on each side of the aircraft, to demonstrate radar performance and the ability to deliver full 360° surveillance; meanwhile, Thales trialled a prototype radar deployment mechanism to demonstrate the ability to lower and raise the radar.

Capability Performance: both Mission System Suppliers constructed a mission system Synthetic Environment to allow a competitive 'fly-off' of the 2 systems using 2 operators manning a prototype mission console to conduct real-time operation of the system against representative military scenarios.

Design Maturation: both Mission System Suppliers conducted further design reviews in June/July and November 2014, leading to design freezes in December 2014 in advance of proposal submission.

Proposals were received from both Mission System Suppliers at end-January 2015, which have been evaluated by the combined Prime Contractor and MoD assessment team, and an announcement of the preferred bidder is anticipated in spring 2015.

During the year the forecast cost of the Assessment Phase has increased from £34 million to the approval value of £43 million to allow de-risking activity ahead of the Main Gate decision and to continue with the preferred supplier in order to maintain the schedule to the projected ISD of October 2018.

Morpheus

The Morpheus Project is the future capability element of the Land Environment Tactical Communications and Information Systems Capability Change programme. It is planned to provide tactical Communication Information Systems for Littoral, Land and Air-Land force elements operating in the Land Environment. This includes Dismounted Situational Awareness for close combat troops. Morpheus will replace the current portfolio of tactical communication capability, dominated by Bowman. The options being assessed range from sustaining the current systems, to evolution of these systems, through to their wholesale replacement.

Overview of cost, time and performance

	Approved	Forecast/Actual	Variation
Cost of Assessment Phase 1	£51m	£41m	-£10m
Cost of Assessment Phase 2	–	£190m	–
Duration of Assessment Phase (Morpheus Assessment Phase 1)	–	39 months	–
Duration of Assessment Phase (Morpheus Assessment Phase 2)	–	***	–

In-year progress

On 5 January 2015, the MORPHEUS Systems House contract was awarded to PA Consulting as the lead for the NEO consortium with QinetiQ, Roke and CGI as partners. The purpose of Systems House is to gather evidence and develop Acquisition Options to support the Authority's initial investment decision at Review Note. The Systems House underwent a short but aggressive mobilisation period and is now engaging across industry to develop Acquisition Options based upon current market experience and future technology plans. System characteristics of the current capabilities are being documented, and together with MoD options for sustaining the current systems, will form the baseline for the Systems House to commence design work on the future systems. Five MoD personnel are embedded with Systems House.

Successor

In 2007 Parliament endorsed the government's decision set out in their 2006 white paper, *The Future of the United Kingdom's Nuclear Deterrent*, 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. An investment decision is expected in 2016.

The expected overall cost of any replacement of the Nuclear Deterrent remains as set out in Paragraphs 4–11 of the 2006 white paper as between £15 billion–£20 billion for a 4 boat solution.

Overview of cost, time and performance

	Approved	Forecast/Actual	Variation
Cost of Concept Phase[1]	£905m	£870m	-£35m
Cost of Assessment Phase	£3,276m	£3,411m	£135m
Duration of Assessment Phase	–	65 months	–

1 Concept Phase costs are usually relatively small, but given the size of this project they have been included for full disclosure.

In-year progress

The platform entered design stage in July 2014; this sees the spatial arrangements developed. A wholeboat Preliminary Design Review was held in November 2014 and the Pressurised Water Reactor 3 (PWR3) Critical Design Review in December 2014. Achievement of the latter two Reviews was within a week of the date set three years previously.

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