



National Audit Office

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## **Report**

by the Comptroller  
and Auditor General

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## **Ministry of Defence**

# Major Projects Report 2013 Appendices and project summary sheets

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Our public audit perspective helps Parliament hold government to account and improve public services.

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Ministry of Defence

# Major Projects Report 2013 Appendices and project summary sheets

Report by the Comptroller and Auditor General

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Amyas Morse  
Comptroller and Auditor General  
National Audit Office

10 February 2014

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This report can be found on the  
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[www.nao.org.uk/mpr-2013-ii](http://www.nao.org.uk/mpr-2013-ii)

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# Appendix Seven

## Reconciling the 2012 and 2013 Major Projects Reports

*The Major Projects Report 2012* included 16 projects where the Department has decided to invest (post-main-gate). This year's report contains 11 post-main-gate projects. During 2012-13, there were changes to the approvals of some of the projects. This was because either the project received additional approvals for new equipment or the approval was revised because of changes to elements that are reported. **Figure 1** provides a reconciliation of the differences in approval values between *Major Projects Report 2012* and *Major Projects Report 2013*.

**Figure 1**

Reconciliation between the approved costs in Major Projects Reports 2012 and 2013

Project	MPR 2012 approved cost (£m)	MPR 2013 approved cost (£m)	Change (£m)	Reason
A400M	2,498	2,238	-260	The original approval included elements for training and support which are now subject to their own, separate approvals and will be covered separately in this and future reports.
Astute class submarines boats 1-3	2,233	2,233	-	-
Astute class submarines boat 4	1,279	1,279	-	-
Astute class submarines boat 5	1,464	1,464	-	-
Astute class submarines boat 6	632	1,579	+947	Astute boats 5, 6 and 7 are currently being procured incrementally. In 2012 only initial build of boat six and long lead items of boat seven had been approved. In June 2012 HM Treasury gave whole programme approval.
Astute class submarines boat 7	325	1,642	+1,317	
Complex Weapons: Brimstone 2	246	246	-	-
Complex Weapons: Sea Ceptor	541	541	-	-
Future Strategic Tanker Aircraft	12,307	11,779	-528	The Public Accounts Committee agreed in January 2013 that the fuel costs should be removed from the reported costs to ensure comparability with other projects. <sup>4</sup>
Lightning II – System Development and Demonstration	1,874	1,874	-	-

**Figure 1** *continued*

Reconciliation between the approved costs in Major Projects Reports 2012 and 2013

Project	MPR 2012 approved cost (£m)	MPR 2013 approved cost (£m)	Change (£m)	Reason
Lightning II – Production, Sustainment & Follow on Development	692	999	+307	The Lightning II aircraft is being procured incrementally. This increase represents the addition of a fourth aircraft, initial spares provision, support for the three aircraft that have been delivered, long lead items for further aircraft and our contribution to Composite Share Ratio. <sup>5</sup>
Queen Elizabeth Class aircraft carrier	3,541	3,541	–	–
Specialist Vehicles	1,394	1,394	–	–
Typhoon	15,173	15,173	–	–
Typhoon Future Capability Programme	402	402	–	–
Warrior Capability Sustainment Programme	1,319	1,319	–	–
Core Production Capability	–	1,176	New projects included for the first time in <i>Major Projects Report 2013</i>	
Military Afloat Reach and Sustainability	–	596		
Airseeker	633			
Beyond Visual Range Air to Air Missile	1,136			
Chinook New Buy	841			
Chinook Project Julius	280			
Falcon (Increments A, C and Urgent Operational Requirement)	395			Projects that are no longer included in <i>Major Projects Report 2013</i> as their remaining spend was insufficient to include them within the sample of largest projects
Lynx Wildcat	1,803			
Merlin Capability Sustainment Programme	805			
Type 45 Destroyer	4,757			
<b>Total</b>	<b>56,570</b>	<b>49,475</b>		

**Notes**

- 1 The *Major Projects Report 2012* approved costs are as stated in 2012 project summary sheets.
- 2 The *Major Projects Report 2013* approved costs are as stated in this year's project summary sheets.
- 3 All costs are excluding cost of capital which was removed in 2011.
- 4 *Public Accounts Committee, Major Projects Report 2012 and Equipment Plan*, January 2013, HC 868-i.
- 5 A formula used to calculate the Participants' proportionate share of the costs under this Memorandum of Understanding, based on the Participants' estimated Joint Strike Fighter aircraft procurement quantities.

Source: National Audit Office analysis of departmental data

## Appendix Eight

### Definitions and classifications of cost, time and performance causal factors

These classifications represent a broad categorisation of cost, time and performance variations in the project summary sheet. The Department attributes these categories to time, cost and performance variations in the project summary sheet. We validate the appropriate use of each category. These categories are grouped into three broad headings:

- **Corporate decisions**, that is decisions that are taken at the top of the Department by senior management or ministers.
- **Project/technical issues** reflect variations at a lower project level.
- **Macro-economic** or accounting adjustments, mainly resulting from changes the Department makes in assumptions regarding exchange rates and inflation.

Three categories (receipts, changes in associated projects and HM Treasury reserve) do not fit within these classifications. Variations attributed to these are often relatively small.



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**Corporate decisions**

Changed capability requirement	Variations due to changes in the customer's requirement for the equipment, flowing from operational reassessment rather than budgetary factors or because of support to current operations.
Budgetary factors	Variations due to changes in the customer's requirement for equipment, flowing from changed budgetary priorities.

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**Project or technical issues**

Technical factors	Variations which are due to changes in technical ability to deliver the project.
Procurement processes	Variations due to changes associated with the contractual process including time taken in contract negotiations and placing contracts, effect of comparing contractor bids to estimates and variations due to changes in overall procurement strategy, e.g. change to collaborative options, or from competitive to single source.
Procurement processes – international collaboration	As above, but relating to international contract negotiations.
Contracting process (not included from 2009 onwards)	Variations due to changes associated with the contractual process, including time taken in contract negotiations and placing contracts, international contract negotiations and effect of comparing contractor bids with estimates.

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**Macro-economic or accounting adjustments**

Inflation	Variations due to changes in inflation assumptions.
Exchange rate	Variations due to changes in exchange rate assumptions.
Accounting adjustments and redefinitions	Variations that do not reflect any substantive change, and result from changes to accounting rules, or adjustments to reflect changes in defining terms.

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**Other (not classified into the three broad headings)**

Receipts	Variations due to changes in expectation of receipts, e.g. liquidated damages, commercial exploitation levy.
Change in associated project	Variations due to changes in an associated project, e.g. availability of equipment from another project for trials.
HM Treasury reserve	Recovery of additional costs incurred in support of current operations.

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Project summary sheets

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## **POST-MAIN-GATE PHASE PROJECTS**

Project Title		
A400M		
Team Responsible		
A400M		
Senior Responsible Owner	Date Appointed	Planned end date
Air Commodore Jon Ager	25 April 2013	
Project/Increment Name	Current Status of Projects / Increments	
A400M	Post-Main Investment Decision	
Training Service	Post-Main Investment Decision	

## A. Section A: The Project

### A.1 The Requirement

A400M is planned to provide tactical and strategic mobility to all three Services. The required capabilities include: operations from airfields and semi-prepared rough landing areas in extreme climates and all weather conditions by day and night; carrying a variety of equipment including vehicles and troops over extended ranges; air dropping paratroops and equipment; and being unloaded with the minimum of ground handling equipment. The 1998 Strategic Defence Review confirmed a requirement for an airlift capability to move large single items such as attack helicopters and some Royal Engineers' equipment and concluded that this would be met, in the latter part of the first decade of the 21st century by Future Transport Aircraft. The A400M was selected to meet this requirement. It will replace the remaining Hercules C-130K fleet.

A400M is a collaborative programme involving seven European nations (Belgium, France, Germany, Luxemburg, Spain, Turkey and United Kingdom). The design phase is nearing completion and manufacture activities have commenced. Delivery of the first UK aircraft to the Royal Air Force is expected in 2014.

### A.2 The Assessment Phase

The Government announced in December 1994 that it would replace its aging C-130K Hercules fleet, in part by procuring 25 C-130J's from Lockheed Martin and in addition, subject to certain conditions, by re-joining the next phase of the collaborative Future Large Aircraft programme (now known as A400M). The Future Large Aircraft 'Initial Gate' approval was achieved in July 1997 and in the same year the solution assumed for costing purposes was changed to an initial lease of four C-17 and subsequent procurement of 25 Future Large Aircraft. A Request For Proposals was issued to Airbus in September 1997 on behalf of the seven Future Large Aircraft nations (Belgium, France Germany, Italy, Spain, Turkey and UK). Subsequently, in July 1998, four nations (Belgium, France, Spain and UK) issued a "competitive Request For Proposals" for a Future Transport Aircraft to Airbus Military (A400M), Boeing (C-17) and Lockheed Martin (C-130J).

Proposals were received on 29 January 1999 and parallel national and international assessments were undertaken. These covered Combined Operational Effectiveness and Investment Appraisal, technical and commercial compliance, risk assessment, and an appraisal of the international dimensions. This work also led to parallel negotiations and clarification with the three bidders. At the direction of the Equipment Approvals Committee in December 1999, additional work was undertaken to inform the Main Gate submission. On 16 May 2000 the Government announced the decision to procure 25 A400M aircraft to meet the Future Transport Aircraft requirement.

### A.3 Project History

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

On 27 May 2006 the Investment Approvals Board granted Initial Gate approval and the A400M In Service Support Assessment Phase commenced.

On 26 June 2008 the first complete A400M aircraft was rolled out from the Airbus Military Final Assembly Line facility in Seville.

## A400M

On 25 September 2008 Airbus announced a delay to the first flight of the A400M prototype aircraft and, on 25 November, announced that it could further slip until the "second half" of 2009. On 27 November, Airbus Military briefed the A400M Programme Board (the senior multinational governance body) on its progress with reassessing the aircraft delivery schedule.

On 17 December 2008 the first flight of the A400M Flying Test Bed (an adapted C-130 aircraft) to undertake testing of the specially designed TP-400 turbo prop engine developed for A400M took place in Cambridge.

On 19 December 2008, Airbus Military sent a revised production schedule to OCCAR and, on 9 January 2009, Airbus Military proposed a "new approach" to the A400M programme and sought negotiations with partner nations.

On 12 March 2009 a meeting of A400M partner nation defence ministers (at which the UK was represented by the Secretary of State) agreed to a "standstill agreement" with Airbus Military. This enabled discussions about options and possible outcomes for the A400M programme to take place whilst the rights of all parties under the original contract were protected. A period of intensive negotiation, combined with a thorough review of all aspects of the programme, then followed.

On 11 December 2009 the first flight of MSN001 (the first A400M prototype aircraft) took place in Seville.

On 12 March 2010 the Investment Approvals Board reapproved the UK A400M programme with a revised In Service Date of 2015.

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

On 8 April 2010 the first flight of MSN002 (the second prototype aircraft) took place in Seville, followed on 9 July 2010 by the first flight of MSN003 (the third prototype), also in Seville.

On 19 October 2010 the Strategic Defence and Security Review announcement stated that A400M would be a key element of the RAF future air transport fleet. It also announced the bringing forward of the Hercules C-130J Out of Service Date from 2030 to 2022.

On 5 November 2010 the substantive contract amendment (which included revised aircraft production and delivery schedules) was agreed by partner nations' representatives and sent for national staffing and approval prior to signature. The UK had already achieved reapproval in March.

On 20 December 2010 the first flight of MSN004 (fourth prototype aircraft) took place in Seville. On 7 April 2011 the amended Development and Production Phase contract was signed by OCCAR (on behalf of partner nations) with Airbus Military. This included the revised UK order of 22 aircraft. Investigation work into the causes of engine problems encountered in June 2011 during flight trials have concluded and solutions have been developed. Although this caused some disruption to the flight trials programme, this is not expected to have any significant impact on the aircraft production schedule.

The first flight of MSN006 (the fifth and final prototype aircraft) took place on 20 December 2011 in Seville.

Although the A400M is a military transport aircraft, its design will be predominantly civil certified with additional military certification as necessary. Following evaluation of evidence produced by the multinational flight trials programme, the European Aviation Safety Agency granted a restricted Type Certificate to A400M on 30 April 2012.

## A400M

### A.4 In-year Progress

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

Consequently the original Main Gate approval which, in addition to aircraft acquisition included elements of initial training and initial in service support, no longer represents an accurate baseline. As a result, the constituent elements of the original A400M platform Main Gate approval (achieved in 2000) have been separated out and the A400M "Budgeted For" and "Highest Approved" figures (section B2 and B3, respectively) have been adjusted to reflect this change. Although the overall Demonstration and Manufacture forecast figure being reported in section B3 has come down, previously validated variations which remain within the scope of the original platform (aircraft acquisition) Main Gate approval will continue to be reported against this element of the programme, so that a consistent measure of project performance against the initial baseline is maintained.

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

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

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

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

### A.5 Capability Risks

Not proceeding with this capability would significantly reduce the UK's tactical air transport capability due to having to rely solely on C-130J aircraft to provide support to operations after the C-130K Out of Service Date in 2013. Furthermore, not proceeding would mean that the UK will not have any tactical air transport capability after 2022, (the revised Out of Service Date for the C-130J declared in the Strategic Defence and Security Review) and less than the planned for Strategic lift capability, as it would be dependant solely on the current fleet of eight C-17 aircraft.

The achievement of Type Certificate has significantly derisked the programme, and is another major step towards achieving a deliverable aircraft. Future capability risks include the ongoing development of military functionality, the delivery of an appropriate support solution and the provision of trained crews to match aircraft deliveries. These risks are well understood and work is ongoing to undertake effective mitigation activity.

### A.6 Associated Projects

### A.7 Procurement Strategy

Project / Increment Title	Contractor	Contract Scope	Contract Type	Procurement Route
A400M	Airbus Military Sociedad Limitada (AMSL)	Development, Production and Initial In Service Support.	Fixed Price, subject to Variation of Price (VOP)	Competitive - International



## A400M

### A.8 Support Strategy

Description				
<p><b>Training</b></p> <p>The UK A400M Training Service achieved Main Gate approval in July 2012 and will now be reported as a separate increment. The A400M Training Service will be provided as follows:</p> <ul style="list-style-type: none"> <li>a. Training for an initial cadre of all User Groups will be undertaken at the International Training Centre using the A400M training courses offered by AMSL;</li> <li>b. UK-specific courses for all User Groups will be developed by Authority personnel, with some contractor support;</li> <li>c. An 'A400M Schoolhouse' will be established at RAF Brize Norton and comprise 2 x Full Flight Simulators, 1 x Cargo Hold Trainer - Enhanced, 1 x LoadMaster WorkStation Trainer, 1 x Cockpit Maintenance Operations Simulator and a suite of Computer Based Training equipment.</li> <li>d. Three Part Task Trainers will be provided at Brize Norton for use by 3rd User Group (3UG) personnel;</li> <li>e. Aircrew instruction will be provided by Authority personnel with limited support from contractor instructors; maintenance instruction will be provided by contractor personnel; 3UG instruction will be provided by Authority personnel;</li> <li>f. Training equipment and the Schoolhouse infrastructure will be contractor-maintained and supported.</li> </ul> <p><b>In-Service Support</b></p> <p>An Assessment Phase for in service support is currently underway. Subject to Main Gate approval (see Section A.4 above), this will be reported separately in MPR 14.</p>				
Support Title	Contractor	Contract Scope	Contract Type	Procurement Route
Training Service	Airbus Military Sociedad Limitada	Development and Production of Training Aids	Fixed Price, subject to Variation of Price (VOP)	Competitive - International
Training Service	A400M Training Services Limited	Provision of infrastructure and support of Training Aids	Fixed Price, subject to Variation of Price (VOP)	Single Source

## B Section B: Cost

### B.1 Cost of the Assessment Phase

Project/ Increment Title	Approved Cost (£m)	Actual / Forecast Cost (£m)	Variation (£m)	Approved cost as a proportion of total estimated procurement expenditure (%)	Actual Cost as a proportion of total estimated procurement expenditure (%)
A400M	2	1	-1	0%	0%
Training Service	1	1	0	0%	0%
<b>Total (£m)</b>	<b>3</b>	<b>2</b>	<b>-1</b>	<b>0%</b>	<b>0%</b>

### B.2 Actual cost boundaries for Demonstration and Manufacture Phase / PFI

Project/Increment Title	Lowest Approved (£m)	Budgeted For (£m)	Highest Approved (£m)
A400M	-	2238	2339

### B.3 Cost of the Demonstration and Manufacture Phase

Project/Increment Title	Budgeted For Cost (£m)	Forecast Cost (£m)	Variation (+/- £m)	In-Year Variation (+/- £m)
A400M	2238	2809	+571	+25
<b>Total (£m)</b>	<b>2238</b>	<b>2809</b>	<b>+571</b>	<b>+25</b>

#### B.3.1 Cost variation against approved cost of the Demonstration and Manufacture Phase

##### B.3.1.1 A400M

Date	Variation (£m)	Category	Reason for Variation
March 2013	-2	Procurement Processes	A reduction in the cost of the design and development work required to enable UK A400M aircraft to operate the defensive aids system.
March 2013	-8	Technical Factors	A reduction in the forecast cost of the fuel tank inerting system
January 2013	+2	Technical Factors	An increase due to the refinement of the mission planning system requirement
June 2012	+3	Technical Factors	An increase due to the need to ensure future interoperability of cryptographic components.
April 2012	+30	Technical Factors	An increase due to an increased requirement for UK specific trials and evaluation work in support of aircraft entry into service
Historic	-8	Procurement Processes	A reduction due to repricing.

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Historic	-10	Technical Factors	Reduced Defensive Aids hardware device procurement following the drawdown of other aircraft platforms in the 2010 Strategic Defence and Security Review.
Historic	-5	Technical Factors	Changes to Integration contingency
Historic	+1	Technical Factors	Increased cost of OCCAR management Agency
Historic	+3	Technical Factors	Increased cost of integrating equipments to the A400M Platform. (+£3M) DASS (-£3M) Mission Planning System, Technical Support (+£3M)
Historic	+175	Procurement Processes - International Collaboration	UK contribution to the multinational Export Levy Facility provided to EADS by A400M partner nations.
Historic	***	Changed Capability Requirements	A Planning Round 2011 Option to swap an early delivery aircraft with one due to be delivered later to ensure that the whole fleet has the same specification.
Historic	***	Procurement Processes - International Collaboration	A Planning Round 2011 Option to reprofile payments to align them with the revised delivery schedule agreed in the six nation international collaborative contract (***) and associated risk (***)
Historic	***	Procurement Processes - International Collaboration	A change due to a realignment of payments with the revised programme schedule agreed in the six nation international collaborative contract.
Historic	***	Exchange Rate	Foreign Exchange increases due to changes in planning assumptions.
Historic	***	Inflation	An increase due to changes in inflation assumptions in the 2011 Planning Round.
Historic	***	Accounting Adjustments and Re-definitions	Removal of Indirect RDEL (Foreign Exchange) in accordance with a change in Departmental policy.
Historic	***	Accounting Adjustments and Re-definitions	Removal of Cost of Capital due to Clear line of Sight policy implemented by HM Treasury.

**A400M**

Historic	***	Exchange Rate	An In Year gain due to the increase in the value of £ vs € due to the difference between the set planning exchange rate and actual outturn.
Historic	***	Procurement Processes - International Collaboration	A change due to programme rebalancing as a result of work undertaken in support of concluding an amended contract.
Historic	***	Exchange Rate	Loss due to the difference between the set planning exchange rate and forecast outturn.
Historic	***	Procurement Processes	Revised costing for Mission Planning System due to change from acquisition only to also include support.
Historic	***	Exchange Rate	A loss in 2008/2009 due to the fall in value of £ vs €
Historic	***	Changed Capability Requirements	Portable Removable On-Board Inert Gas Generation System fuel tank inerting system.
Historic	***	Inflation	An increase based on latest delivery schedule.
Historic	***	Exchange Rate	An increase in 2008/2009
Historic	***	Technical Factors	Inclusion of additional airworthiness support to cover aircraft release to service.
Historic	***	Exchange Rate	Variation in 2008/2009
Historic	***	Inflation	An increase in 2008/2009.
Historic	-77	Budgetary Factors	Departmental Reviews have identified savings to programme risks (-£20m). Changed delivery profile from that in the Business Case (-£61m). Minor realism adjustments, includes UK share of Organisation Conjointe de Coopération en matière d'Armement (OCCAR) Programme Division costs (+£5m), QinetiQ Support costs increased (+£1m), unidentified variance (+£1m). Realism reprofile of Development Production Phase contract together with Directed Infra-Red Counter Measures and Cargo Hold Mock-up costs (-£3m)

A400M

Historic	-329	Changed Capability Requirements	Fuel Tank Inertion System Pipe work (+£6m). Deletion of Centralised Crypto Management Unit requirement (-£12m). Deletion of Civil Pallets Configuration Item (-£5m). Addition of Propeller Brake (+£6m). Programme measure to move deferred configuration Items back into aircraft delivery profile (-£2m). Reduction in number of aircraft to be equipped with Defensive Aids Sub-System from 25 to 9 (-£238m). Programme option to delete and defer Configuration Items and to slip In Service Date by 12 months. (-£81m). Delay of programme by 9 months (-£12m), Option bringing the Defensive Aids Sub-System forward onto aircraft 1-9 (+£9m).
Historic	+345	Procurement Processes	Realism to reflect 3 month delay in 2000/01 to contract effectivity (+£52m). Slip of aircraft payments and associated equipment to reflect above contract let decision (+£15m). Improved costing data for Configuration Items available (+£160m). Contract Effectivity Date slipped from November 2001 - October 2002 (+£149m). Contract Effectivity Date slipped from October 2002 - April 2003 (-£59m). Adjustments in line with increased knowledge of Programme (+£58m). Contract Effectivity Date slipped from April 2003 - May 2003, includes redefinition of Asset Deliveries to align with aircraft delivery schedule (-£30m).
Historic	-8	Exchange Rate	A decrease in 2005/2006 (-£21m). Variation in 2004/2005 (+£35m). Variation in exchange rate assumptions used in the Business Case, 2000/2001, 2001/2002 and 2002/2003 (-£206m). Variation in 2003/04 (+£198m). Exchange rate changes (-£14m)

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Historic	+10	Inflation	An increase in 2005/2006 (+£12m). An increase in 2004/2005 (+£7m). Changes between inflation rate assumed in the Business Case and yearly inflation indices resulting in a decrease 2000/2001 (-£6m), an increase 2001/2002 (+£6m), a decrease 2002/2003 (-£9m).
Historic	+65	Procurement Processes	Total number of aircraft ordered by participating nations higher than anticipated, and consequent reduction in Unit Production Cost (-£65m). Subsequent contract renegotiation due to German reduction in off take (+£130m).
Historic	+1	Technical Factors	Programme realism with regard to costing Technical Publications (-£5m); Identification of UK only certification requirements (+£6m).
Historic	-27	Technical Factors	Costing realism in line with better programme understanding including adjustment for actual sunk costs (-£6m). Costing re-adjusted with understanding of future programme – Certification (-£15m), Government Furnished Equipment (+£4m), Mission Planning & Restitution System (-£10m)
<b>Net Variation (£m)</b>	<b>+571</b>		

**B.3.2 Operational Impact of cost variations of Demonstration and Manufacture Phase - N/A**

**B.4 Progress against approved Support / PFI Cost**

<b>Project/Increment Title</b>	<b>Approved Cost (£m)</b>	<b>Forecast cost (£m)</b>	<b>Variation (+/- £m)</b>	<b>In-Year Variation (+/- £m)</b>
Training Service	502	502	-0	-0
<b>Total (£m)</b>	<b>502</b>	<b>502</b>	<b>-0</b>	<b>-0</b>

**B.4.1 Cost variation against approved Support / PFI Cost - N/A**

**B.4.2 Operational Impact on Support / PFI Cost - N/A**

## A400M

### B.5 Expenditure to date

Description	Previous expenditure to 31 March 2012 (£m)	In-year expenditure (£m)	Total expenditure to 31 March 2013 (£m)
Assessment Phase	1	0	1
Demonstration and Manufacture Phase	884	58	942
Support Phase / PFI Cost	0	76	76
<b>Total Expenditure</b>	<b>885</b>	<b>134</b>	<b>1019</b>

As a result of the UK A400M training service achieving Main Gate approval in July 2012 and now being reported as a separate increment, and in anticipation of achievement of Main Gate approval for UK A400M in service support later this year, the "Actual cost boundaries" and "Budgeted for cost" of the Demonstration and Manufacture Phase (sections B2 and B3) have been revised from previous Project Summary Sheets. Previously reported variations against the training and in service support elements of the original Main Gate approval have been removed as these were forecast figures rather than actual commitments or expenditure; any future variations will be reported against the relevant Main Gate approval. The remaining variations listed at section B3.1.1 relate to the main aircraft acquisition programme. The Department is currently seeking approval funding for the Export Levy Facility. This will ensure that the A400M programme remains within its revised approval limits.

## C Section C: Timescale

### C.1 Length of the Assessment Phase

Project/Increment Title	Date of Initial Investment Decision Approval	Actual Date of Main Investment Decision Approval	Length of Assessment Phase
A400M	July 1997	May 2000	34

### C.2 Actual Boundaries for In Service Date or Initial Operating Capability

Project/Increment Title	Earliest Approved	Budgeted For	Latest Approved
A400M		February 2009	December 2009

### C.3 In-Service Date/Initial Operating Capability

#### C.3.1 Definition

Project/Increment Title	In-Service Date/Initial Operating Capability
A400M	In-Service Date defined as delivery of the seventh aircraft with Military Aircraft Release and Support arrangements.

#### C.3.2 Progress against approved Dates

Project/Increment Title	Approved Date	Actual / Forecast Date	Variation (+/- months)	In-Year Variation (+/- months)
A400M	February 2009	March 2015	73	0

#### C.3.3 Timescale variation

##### C.3.3.1 A400M

Date	Variation (+/- months)	Category	Reason for Variation
Historic	***	Procurement Processes - International Collaboration	A change due to programme rebalancing.
Historic	***	Technical Factors	Updated programme estimate based upon A400M Task Force outputs and Air Support Cluster assessment.
Historic	***	Technical Factors	Updated programme proposal received from Airbus Military, including revised production approach.
Historic	***	Technical Factors	Programme delays affecting engine and aircraft first flight.
Historic	***	Technical Factors	Reflects latest delay and risk assessment beyond first flight.
Historic	+9	Technical Factors	Contractor delay to aircraft delivery.



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Historic	+16	Budgetary Factors	Change in the Customer's requirement flowing from changed budgetary priorities.
Historic	+9	Procurement Processes	Delay in bringing contract into effect as a result of delayed approvals in Germany.
<b>Net Variation (+/- months)</b>	<b>+73</b>		

**C.3.4 Other costs / savings resulting from timescale variation**

Project/Increment Title	Date	£m (+ Cost / - Saving)	Category	Reason for expenditure or saving
A400M	Historic	+41		The Department has extended the service life of the Hercules C-130K until the end of 2012.
<b>Total</b>		<b>+41</b>		

**C.3.5 Operational Impact of In-Service Date/Initial Operating Capability variation**

Project/Increment Title	Operational Impact
A400M	The revised forecast A400M In Service Date no longer aligns with the C-130K Out of Service Date of 2013. This increases the pressure on existing tactical airlift capability from 2013 to 2015. Interim measures to mitigate this include action to increase the availability of the remaining C-130J fleet.

**C.4. Full Operating Capability - N/A****C.5. Support / PFI Contract****C.5.1 Scope of Support / PFI Contract**

Project/Increment Title	Scope
Training Service	Provision and support of the A400M Schoolhouse, support of training equipment, provision of instructors and course design personnel.

**C.5.2 Progress against approved Support / PFI Contract Go-Live Date**

Project/Increment Title	Approved Date	Actual Date	Variation (+/- months)	In-year Variation (+/- months)
Training Service	February 2013	February 2013	0	0

**C.5.3 Progress against approved Support / PFI Contract End Date**

Project/Increment Title	Approved Date	Actual / Forecast Date	Variation (+/- months)	In-year Variation (+/- months)
Training Service	March 2030	March 2030	0	0

**C.5.4 Other costs / savings resulting from Support Cost variation - N/A****C.5.5 Operational Impact of Support / PFI Support Contract variation - N/A**

## D Section D: Performance

### D.1. Sentinel Score

Current score	Last years score	Comments
79% Amber	80% Green	Change is due to accounting treatment of the Export Levy Facility

### D.2.1 Performance against Defence Lines of Development

Line of Development	Description	Met / Forecast to be met (with risks)	Not met / Forecast not to be met
1. Equipment	22 A400M aircraft, mission planning and ground support systems	Yes	
2. Training	UK A400M training solution, including interim use of the International Training Centre in Seville.	Yes (with risks)	
3. Logistics	In-Service Support contract.	Yes (with risks)	
4. Infrastructure	A400M infrastructure projects, including an electronic warfare facility at RAF Waddington and necessary modifications at the Main Operating Base, RAF Brize Norton.	Yes (with risks)	
5. Personnel	Formation of squadrons and related Service personnel	Yes	
6. Doctrine	Agreed capability milestones, including aerial delivery and tactical operation concepts.	Yes	
7. Organisation	A400M is being overseen by Strategic Mobility (Air) Project Board & Future Brize Project Board.	Yes	
8. Information	Integration of the mission planning (including electronic warfare) and ground support systems into wider MOD operational and logistic support structures.	Yes (with risks)	
Current forecast (with risks)		8 (4)	0
Last year's forecast (with risks)		8 (3)	0

### D.2.2 Defence Line of Development variation

Date	Defence Line of Development	Category	Reason for Variation
March 2013	Information	Technical Factors	Due to ongoing Airbus redesign of aircraft Ground Support Systems and security accreditation pressures
Historic	Equipment	Technical Factors	Reflects that the amended contract includes revised aircraft production and delivery schedules.

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Historic	Training	Technical Factors	Reflects that the Training Service Assessment Phase is still underway.
Historic	Equipment	Technical Factors	Reflects potential impact of the re-baselined programme, and that an amended contract is still to be concluded.
Historic	Logistics	Technical Factors	Reflects potential impact of depth maintenance facility risk on delivery of logistic support solution.
Historic	Infrastructure	Technical Factors	Reflects that the Support Assessment Phase is still underway.
Historic	Equipment	Technical Factors	Updated programme proposal received from Airbus Military, including revised production approach.
Historic	Infrastructure	Technical Factors	Reflects latest delay and the wider Future Brize Norton study.

**D.3. Performance against Key Performance Measures****D.3.1 A400M****D.3.1.1 Performance against Key Performance Measures**

Key Performance Measure	Related Defence Lines of Development	Description	Met / Forecast to be met (with risks)	Not met / Forecast not to be met
1	1,2,6,8	The A400M fleet must be capable of the deployment of 4200 tonnes of freight over 3200 nm in a 7-day period.	Yes	
2	1	A400M must be capable of carrying a payload of 32 000kg.	Yes	
3	1	A400M is to be capable of operating by day or by night, in all weather conditions commensurate with world wide Air Transport operations.	Yes	

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4	1,6	A400M is to be capable of autonomous operations from semi-prepared surfaces with a runway length of 3 500 ft.	Yes	
5	1,6,8	A400M is to have a self-contained, non-radiating navigation system. The navigation system's performance is to be compatible with low-level and aerial delivery operations world-wide.	Yes	
6	1	A400M is to meet mandatory interoperability requirements for civil General Air Traffic operations and UK military operations.	Yes	
7	1	A Defensive Aids Suite is required.	Yes	
8	1,2,6	A400M is to be capable of aerial delivery of paratroops, vehicles and stores.	Yes	
9	2,5,7	A400M is to be capable of being operated on routine Strategic and Tactical missions by a Combat Ready crew comprising of two Pilots and one Air Loadmaster. For more demanding Tactical scenarios, a requirement for a third flight deck crewmember will be acceptable.	Yes	
Current forecast (with risks)			9 (0)	0
Last year's forecast (with risks)			9 (0)	0

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### D.3.1.2 Key Performance Measures Variation

### D.3.1.3 Operational Impact of variation

## D.4 Support Contract

### D.4.1 Training Service

#### D.4.1.1 Performance against Key Performance Measures

Key Performance Measure	Related Defence Lines of Development	Description	Met / Forecast to be met (with risks)	Not met / Forecast not to be met
KUR 1	1, 2, 4	The User shall have A400M training by Capability Milestone 4 (Initial deployment Capability) that is able to react at short notice to changing environments and operational demands.	Yes (with risks)	
KUR 2	1, 2, 4, 6	The User shall be able to train sufficient numbers of aircrew to maintain the required readiness states and have the knowledge and skills to utilise the A400M in accordance with UK operational requirements across its entire spectrum of operations by Capability Milestone 8 (Full Operational Capability).	Yes	

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KUR 3	1, 2, 3, 4, 6	The User shall be able to train sufficient numbers of support personnel to maintain the required readiness states and have the knowledge and skills to utilise the A400M in accordance with UK operational requirements across its entire spectrum of operations by Capability Milestone 8 (Full Operational Capability).	Yes	
KUR 4	1, 2, 3, 4, 6	The User shall be able to train Maintenance Personnel and Aircraft Ground Engineers, including Survival Equipment Fitters and Weapons Technicians, to provide Forward and Depth engineering support to the A400M, to meet UK operational requirements, by Capability Milestone 8 (Full Operational Capability).	Yes	
KUR 5	1, 2, 3, 4, 6	The User shall be able to train Air Despatch, Airborne Delivery, Air Movements, Aeromedical and other personnel to meet UK operational requirements.	Yes	

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KUR 6	1, 2, 6, 8	For all aircraft upgrades or modifications to the aircraft through to out-of-service date, the Users shall be provided with a capability to update synthetic training hardware, software and documentation to accurately reflect all changes or upgrades in the real aircraft equipment and software programs	Yes (with risks)	
Current forecast (with risks)			6 (2)	0
Last year's forecast (with risks)			NA	NA

**D.4.1.2 Key Performance Measures variation**

Date	Key Performance Measure	Category	Reason for Variation
March 2013	1	Technical Factors	Initial Assessment. Reflects current status of progress against the plan to meet this KPM, which is in its early stages.
March 2013	6	Technical Factors	Initial Assessment. Reflects the risk that it might not prove practicable for the Training Solution to replicate a future aircraft modification or amendment to live training procedures.

**D.4.1.3 Operational Impact of variation - N/A**

<b>Project Title</b>		
Astute Class Submarines		
<b>Team Responsible</b>		
Submarine Production		
<b>Senior Responsible Owner</b>	<b>Date Appointed</b>	<b>Planned end date</b>
Commodore Richard Stokes (Deterrent and Under Water Capability)	19 June 2012	
<b>Project/Increment Name</b>		
<b>Current Status of Projects / Increments</b>		
Astute Boats 1 -3	Post-Main Investment Decision	
Astute Boat 4	Post-Main Investment Decision	
Astute Boat 5	Post-Main Investment Decision	
Astute Boat 6	Post-Main Investment Decision	
Astute Boat 7	Post-Main Investment Decision	
Initial Astute Support Solution	Post-Main Investment Decision	
Astute Class Support	Post-Main Investment Decision	
Astute Class Training Service Boats 1-3	Post-Main Investment Decision	
Astute Class Training Service Boat 4	Post-Main Investment Decision	



## A. Section A: The Project

### A.1 The Requirement

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

Astute Class submarines are required to perform a range of military tasks; these unique requirements are combined within the Astute design to provide global reach, endurance, covertness, sustained high speed and the ability to conduct unsupported operations in hostile environments.

### A.2 The Assessment Phase

In June 1991 (equivalent of Initial Gate) approval was given to proceed with a programme of studies at an estimated cost of £6 million (1991/1992 prices) to define the Batch 2 Trafalgar Class Boat (now known as the Astute Class). This programme of studies led to the issue of an Invitation to Tender for the design and build of an initial batch of three Astute Class Submersible Ship Nuclear and a further approval of £2 million (1992/1993 prices) for contractor and Defence Research Agency support to MOD during the tendering exercise in 1994.

In July 1994, as a result of concerns over the overall affordability of the programme, Minister (Defence Procurement) and the Treasury approved a further £24 million (at 1993/1994 prices) for risk reduction studies to be undertaken in parallel with the formal bid phase of the project. To maintain an effective competition, contracts for risk reduction were awarded to both bidders, GEC Marconi (now BAE Systems (Submarine Solutions)) and Vickers Shipbuilding and Engineering Ltd.

GEC-Marconi was identified as MOD's preferred bidder in December 1995. Using the policy of No Acceptable Price No Contract, a Prime Contract was placed in March 1997 for the design, build and initial in service support of the first three of the Class.

### A.3 Project History

For Astute Class Programme historical data please refer to previous MPRs.

#### Approvals

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

#### Boat 1 HMS ASTUTE

In June 2011 HMS ASTUTE successfully completed the UK phase of Contractor Sea Trials. While on a comprehensive sea trials programme in US waters the submarine successfully completed the first of class British Tomahawk Land Attack Missiles Firing Trials, final Spearfish deep discharge trials and underwater Magnetic Silencing; returning to Her Majesty's Naval Base Clyde in March 2012 to commence Base Maintenance Period number 6. As a further element of the First of Class sea trials programme HMS ASTUTE has been fitted with a Payload Bay and will prove and demonstrate this additional capability during the next phase of sea trials.

#### Boat 2 AMBUSH

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

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### Boats 3 to 5

Boat 3 ARTFUL continues construction in the Devonshire Dock Hall at Barrow and is making good progress with Diesel Generator Trials successfully completed in August 2011. It is anticipated that ARTFUL will leave the Devonshire Dock Hall in 2013 and exit Barrow approximately 12 months later to commence sea trials. Boat 4 AUDACIOUS; all hull and casing units have been moved to the Devonshire Dock Hall and a number of the internal equipment modules have also been shipped inside the respective units. First phase of reactor loop build was successfully completed and Main Propulsion Machinery Package shore trials have begun (pre-shipping). Two key pressure hull unit-to-unit welds have commenced. Boat 5 ANSON had her 'keel laid' on 13th October 2011, at a traditional keel laying ceremony where the Minister for International Security Strategy, Gerald Howarth unveiled a section of her hull.

### ASTUTE CLASS TRAINING SERVICE

The Astute Class Training Service (ACTS) has provided training for the ships companies of both HMS ASTUTE and AMBUSH throughout the last twelve months. This year saw the first delivery of the Submariner Qualification course for the Royal Navy. A Formal Notice of Change was issued to the Training Service Provider, FAST Training Services Limited, for the inclusion of Boat 4 AUDACIOUS into the training service programme. On 15th February 2012 the Investment Approvals Committee approved the Astute Class Training Service Boat 4 Information Note which articulated a revised funding approach for the ACTS Boat 4 change delivering a saving against the 2007 Astute Class Training Service Boat 4 approval. Boat 4 will be placed on contract with FAST during 2013.

### SUPPORT

Our revised approval sought to extend the principles and structure of the Initial Astute Support Solution model to Operational Handover (plus 3 months) for each of the 7 submarines. The additional 3 months post Operational Handover is to capture any residual transition costs that fall beyond the Operational Handover milestone for each submarine.

## A.4 In-year Progress

### Approvals

On 8 Jun 12 Her Majesty's Treasury approved the whole Astute Programme (Boats 1 – 7) and corresponding Astute Support Solution.

### Boat 1 HMS ASTUTE

HMS ASTUTE has spent the year at sea concluding the majority of the extensive first of class sea trials programme, including demonstration of the full capability of the platform. An integral part of this is the Payload Bay capability which has now been proven and demonstrated its additional capability. It is planned to transfer the scheduling authority for the submarine (Operational Handover) on 25 April 2013, the submarine will then undergo a short maintenance period commencing 20 May 2013 and, subsequent Force Generation prior to operational tasking.

Boat 2 HMS AMBUSH exited the shipyard in Barrow-in-Furness on 15 September 2012 and undertook the initial platform proving phase of Contractors Sea Trials through to December 2012. Following a maintenance period at HM Naval Base Clyde, the submarine is continuing with the second, Capability Proving Sea Trial phase planned to complete end of July 2013. HMS AMBUSH reached Contract Acceptance Stage 1 Platform Demonstration, on 14 Dec 2012 from which point it has been managed as an In-Service Submarine under MOD rather than contractor direction. HMS Ambush was formally commissioned into the Royal Navy at HMNB Clyde on 1 Mar 2013, and is on schedule to achieve Operational Handover in May 2013

### Boats 3 to 5

Boat 3 ARTFUL continues construction in the Devonshire Dock Hall at Barrow-in-Furness. A delay in supply of key Nuclear Steam Raising Plant components and a shortfall in volume of construction and outfit work against the plan has prevented scheduled Core Load from being achieved. A number of performance improvement activities have been put in place by the contractor to ensure that the programme remains on track to achieve Operational Handover in 2015.

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Boat 4 AUDACIOUS Submarine construction and outfit has continued in the Devonshire Dock Hall. The Whole Boat Contract , which introduces revised management arrangements and more robust terms aimed at driving delivery, was signed 01 Nov 2012.

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

### Boats 6 and 7

Further tranches of material have been procured for Boat 6 and procurement of long lead items for boat 7 have commenced. Following receipt of Whole Programme approval in Jun 12 the programme has pursued a number of opportunities to batch buy materials for boats 5-7, delivering cost savings to the programme and protecting the later boats from the potential impact of material shortfalls.

### ASTUTE CLASS TRAINING SERVICE

The Astute Class Training Service (ACTS) has continued to provide training for ships companies of both HMS ASTUTE and HMS AMBUSH and commenced training for the crew of ARTFUL. The training service provider, FAST, have submitted their bid for the addition of training for Boat 4 crews from May 2015.

### SUPPORT

The Astute support solution continues to mature as further experience is gained from sea. Both HMS ASTUTE and HMS AMBUSH have been successfully maintained through intensive trials periods and further action is underway to ensure that appropriate arrangements are in place to support the submarines as they progress towards operational deployments.

## A.5 Capability Risks

Delivery of HMS ASTUTE is critical to the submarine's readiness profile. HMS ASTUTE's delay will result in the delayed introduction of improved capability over current classes. The Astute Class will also de-risk capability essential for an affordable Successor deterrent programme.

## A.6 Associated Projects

Title of Associated Project	Forecast In Service Date/ Initial Operating Capability	Approval Status
Swiftsure & Trafalgar Class Update Final Phase	2004	In- Service

## A.7 Procurement Strategy

Project / Increment Title	Contractor	Contract Scope	Contract Type	Procurement Route
Astute Boats 1 -3	BAE Systems Maritime-Submarines (formerly BAE Systems (Submarine Solutions) and BAE Systems Electronics Ltd – Astute Class Project and BAE Systems Astute Class Ltd)	Demonstration to In-Service	Boat One – Target Cost Incentive Fee Boats Two & Three – Target Cost Incentive Fee with Maximum Prices	Competitive - UK

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Astute Boat 4	BAE Systems Maritime-Submarines	Boat 4 and Design for Cost Reduction for Boats 4 to 7	Target Cost Incentive fee with maximum price.	Single Source
Astute Boat 5	BAE Systems Maritime-Submarines	Boat 5 Long Lead items & Initial Build	Limit of Liability placed for Minimum Long Lead Items Scope of Work	Single Source
Astute Boat 6	BAE Systems Maritime-Submarines	Boat 6 Long Lead Items	Limit of Liability placed for Minimum Long Lead Items Scope of Work	Single Source
Astute Boat 7	BAE Systems Maritime-Submarines	Boat 7 Long Lead Items	Limit of Liability placed for Minimum Long Lead Items Scope of Work	Single Source

### A.8 Support Strategy

Description				
<p>The Initial Astute Support Solution was approved in July 2006; it follows a traditional support model, but recognises Astute's differences and introduces additional arrangements as appropriate. Provision has been made to employ the build contractor (BAE Systems) as the Astute Technical Authority; MOD will be the Approving Authority, with the Nuclear Propulsion Project Team responsible for the Nuclear Steam Raising Plant. MOD Equipment Project Teams will support specific equipments with Head of In-Service Submarine (Head of Submarine Production up to Operational Handover) maintaining a Platform focus and providing the flotilla wide single point of contact for Navy Command. Astute Class Maintenance at the waterfront will be conducted under existing Warship Support Modernisation Initiative arrangements.</p> <p>The Astute Class Training Service is a Private Finance Initiative contract, initially approved for 36 years to provide Astute Class specific training to the Royal Navy for Boats 1-3. Approval was given in 2007, to extend to a 38 year contract, to cover the life of Boat 4 and the contract for this scope will be in place by October 2013. Approval for later Boats will be considered during FY14/15 as part of the option set for the delivery of a coherent training solution led by Underwater Training Capability Programme.</p> <p>The revised approach was included as part of the whole programme approval in June 2011.</p> <p>MPR13 reports against the Astute Support Solution approved by HM Treasury in May 2012. This extends the principles of the Initial Astute Support Solution model to 3 months beyond the operational handover of each Astute class submarine. The end of the reporting of the Initial Astute Support Solution end date has been brought forward from December 2012 (the date originally set out in the approval) to March 2011 when the new approval support solution began. The approval value and costs of the Initial Astute Support Solution have been reduced to reflect this change. This approach has been agreed with the NAO.</p>				
Support Title	Contractor	Contract Scope	Contract Type	Procurement Route
Technical Authority Support Contract	BAE Systems	Provision of Technical Authority services	Firm Price	Single Source

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Astute Class Training Service Boats 1-3	FAST Training Services Limited; 47.5% owned by BAE Systems, 47.5% owned by L- 3 MAPPS and 5% owned by VT Group	Training	PFI	Competitive Tender
Astute Class Training Service Boats 4-7	FAST Training Services Limited; 47.5% owned by BAE Systems, 47.5% owned by L- 3 MAPPS and 5% owned by VT Group	Training	PFI	Single Source

## B Section B: Cost

### B.1 Cost of the Assessment Phase

Project/ Increment Title	Approved Cost (£m)	Actual / Forecast Cost (£m)	Variation (£m)	Approved cost as a proportion of total estimated procurement expenditure (%)	Actual Cost as a proportion of total estimated procurement expenditure (%)
Astute	33	29	-4	1%	1%
<b>Total (£m)</b>	<b>33</b>	<b>29</b>	<b>-4</b>	<b>1%</b>	<b>1%</b>

### B.2 Actual cost boundaries for Demonstration and Manufacture Phase / PFI

Project/Increment Title	Lowest Approved (£m)	Budgeted For (£m)	Highest Approved (£m)
Astute Boats 1 -3	-	2233	-
Astute Boat 4	1224	1279	1351
Astute Boat 5	1369	1464	1467
Astute Boat 6	-	1579	-
Astute Boat 7	-	1642	-

### B.3 Cost of the Demonstration and Manufacture Phase

Project/Increment Title	Budgeted For Cost (£m)	Forecast Cost (£m)	Variation (+/- £m)	In-Year Variation (+/- £m)
Astute Boats 1 -3	2233	3414	+1181	+28
Astute Boat 4	1279	1504	+225	+56
Astute Boat 5	1464	1394	-70	-59
Astute Boat 6	1579	1510	-69	-54
Astute Boat 7	1642	1608	-34	-9
<b>Total (£m)</b>	<b>8197</b>	<b>9430</b>	<b>+1233</b>	<b>-38</b>

#### B.3.1 Cost variation against approved cost of the Demonstration and Manufacture Phase

##### B.3.1.1 Astute Boats 1 -3

Date	Variation (£m)	Category	Reason for Variation
March 2013	+86	Technical Factors	Prime contract increase (+£73m a mixture of labour, overheads and risk). Past optimism in BAES capacity to spend up to their annual forecasts that has resulted in provisions needing to be carried forward. Non prime increases of (+£13m). Non prime consists of a mixture of nuclear site safety, combat systems and other non construction costs.
September 2012	-58	Accounting Adjustments and Re-definitions	Re-adjustment of Sunk Costs for BAES labour material overhead and profit costs following on from NAO Audit post MPR12.

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Historic	-30	Budgetary Factors	Submarine Enterprise Performance Programme saving Option
Historic	-43	Technical Factors	Prime contract decreases (a mixture of overheads, material and labour). (-£36m). Non Prime decreases (a mixture of combat systems, nuclear power management, safety platform and design and other non construction costs). (-£7m)
Historic	+1	Receipts	Shipbuilders Relief not claimed in forecast year 2011/12 (£1m)
Historic	-5	Receipts	Change in profile of Shipbuilders Relief. (-£5m)
Historic	-17	Technical Factors	Prime contract decreases (a mixture of overheads, material and labour). (-£18m). Non Prime decreases (a mixture of combat systems, nuclear power management, safety platform and design and other non construction costs). (+£1m)
Historic	+6	Technical Factors	Prime contract increases (a mixture of overheads, materials and labour). (+£6m).
Historic	+28	Budgetary Factors	Non Prime increases (a mixture of combat systems, nuclear power management, safety platform and design and other non construction costs) (+28m). This is as a result of aligning the Non Prime costs to the revised deferred build programme issued under Planning Round 2011 option.
Historic	+144	Budgetary Factors	An option was taken during the 2011 Planning Round to defer the Successor In-Service Date and modify build delivery rate. Astute build "drumbeat" was revised to match Successor revised In-Service Date. (+£144m).
Historic	+1	Technical Factors	Cost of HMS Astute's grounding incident. (+£1m).
Historic	-412	Accounting Adjustments and Re-definitions	Removal of Cost of Capital due to Clear Line of Sight policy implemented by HM Treasury (-£412m).

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Historic	+22	Technical Factors	Prime contract increases (a mixture of overheads, materials and labour). (+£31m). Non Prime decrease (a mixture of combat systems, nuclear power management, safety platform and design and other non construction costs) (-£9m).
Historic	-2	Receipts	Increase in receipt for Shipbuilders Relief (-£2m).
Historic	+9	Budgetary Factors	A savings option, Defer Successor (Future Deterrent) In Service Date and modify the build programme of later Astute hulls, was taken in Planning Round 2010 which increases the cost of Astute Boats 1-3 by (£9m).
Historic	+40	Technical Factors	Prime increases (a mixture of labour, materials, sub-contractors and risk/indemnity/warranty and other construction costs) (+£76m). Non Prime decrease (a mixture of combat systems, nuclear power management, safety platform and design and other non construction costs) (-£36m).
Historic	+3	Receipts	Reduction in receipt for Shipbuilders Relief (+£3m).
Historic	+87	Budgetary Factors	A savings option was taken in the 2009 Planning Round which removed £139M of funding over the 4 years from 2009/10 from the Astute Boats 2-7 build programme, the consequent programme slippage results in additional cost growth in later years of £539m. Of this, £87m relates to boats 1-3.
Historic	-23	Accounting Adjustments and Re-definitions	Increase in shipbuilders relief (-£12m). Re-costing of Non-Attributable items since MPR06 (Items not Included in the original approval) (+£51m). Shipbuilders Relief (-£58m) and Sunk cost corrections (-£3m) made in project account. Decommissioning and Decontamination costs (-£1m).



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Historic	+47	Accounting Adjustments and Re-definitions	Reallocation of Pension cost increases since MPR05 (-£5m). Re-costing of Non-Attributable items since MPR07 (i.e. those items not included in original approval) (+£28m). Shipbuilders Relief correction (+£6m). Recosting of Non-Attributable items since MPR05 (items not included in the original approval) (+£29m). Removal of items wrongly attributed to Astute Approval in previous years (-£11m)
Historic	-177	Accounting Adjustments and Re-definitions	Decrease reflects difference between anticipated resource profile at approval and current profile (Equipment Plan 2001) (-£74m). Removal of Astute Class Training Service costs that have been incorrectly included in previous MPRs – training not part of original Astute Main Gate approval (-£62m). Removal of items wrongly attributed to Astute Approval in previous Years (-£41m).
Historic	+257	Changed Capability Requirements	Includes change to fore end design, completion of land attack missile capability and improved tactical data link capability (+£32m). Additional Capability originally part of Astute second buy which has been brought forward into the first buy (+£225m).
Historic	+39	Procurement Processes	BAE Systems to forego any incentive payments on Boat One(-£13m). Reduction in Warranty to be provided by BAE Systems from three years to one year (-£3m). Planned Contract Amendments (+£55m).
Historic	+40	Inflation	Variation between anticipated rates for GDP and Variation on Price on contract (sunk costs only) (+£14m). Correction in previous Variation on Price calculation – incorrect split between labour and materials (+£26m).

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Historic	+115	Technical Factors	Sustainability costs of maintaining submarine build capability removed (-£204m). Option E07UW178S – capability reduction to a 7 Boat Astute Programme, taken in Equipment Plan 2007 (-£29m). Option E07UW601S – compress Astute class Boats1-3 sea trials programme, taken in EP07 (-£3m). Cost Growth from Review Year 06 to EP07. Materials (+£164m), Labour (+£68m), GDP (+£65m), Risk (+£50m), Profit (+£7m), Non-Prime (-£66m), Overhead (-£12m), Shipbuilder Relief (+£58m). Cost growth in provision of some elements of nuclear safety cases (+£17m).
Historic	+272	Technical Factors	Departmental review identified savings opportunities within other elements of nuclear safety cases (-£20m). Increase in cost as a result of the reassessment of risk, specifically, Team Leader challenge in MPR05 (+£123m). Cost increase identified as part of the Integrated Project Team's internal review in 2005/06 Prime Contract Overheads (+£97m), Prime Contract Materials (+£61m), Prime Contract Labour (+£26m) and unallocated cost growth (+£21m). Changes in throughput assumptions between MPR05 and MPR06 (-£73m). Reduced Requirement for Technology Insertion post MPR05 (CDEL -£17m. Prime Contract pricing assumptions and changes to costing (+£19m). Reassessment of risk (+£51m). Reduction of risk on Sonar 2076 programme (-£16m).

## ASTUTE

Historic	+751	Technical Factors	Re-costing of land attack missile interface & integration (+£5m). Re-costing of External communications (+£5m). Increase in overall BAE Systems base costs (shipyard and sub contracts) reflecting a re-estimate as well as cost of delay (+£571m). Increase in risk provision owing to technical complexity (+£152m). Changed cost reflecting Astute Agreement of February 2003 (+£52m). Re-assessment of overhead rates used in costing (-£36m). Man-hour reduction on Prime contract (-£20m). Removal of Risk funding post Boat 3 delivery (-£2m). Expenditure not apportionable to specific elements of the programme due to 2007 budgeting baseline being overstated which has subsequently been corrected (+£25m). Prime increase (+£27m). Non Prime decrease (-£28m).
<b>Net Variation (£m)</b>	<b>+1181</b>		

### B.3.1.2 Astute Boat 4

Date	Variation (£m)	Category	Reason for Variation
March 2013	+6	Accounting Adjustments and Re-definitions	Accelerated Depreciation against BAES Enterprise Resource Planning System (Project Genesis). (+£6m).
March 2013	+11	Technical Factors	Increase in BAES build forecast for financial year 12/13 driven by labour, overheads, material and profit (+£11m).
March 2013	-29	Technical Factors	Decrease in financial year 12/13 costs driven by non BAES forecast consisting of nuclear power management (-£4m), risk (-£15m), Barrow costs (-£3m), combat systems (-£4m) and other (-£3m)
January 2013	+84	Technical Factors	Increase in BAES build ABC13 costs driven by labour, overheads & material (+£70m). Non prime increases (a mixture of combat systems, nuclear power management, platform safety and other non construction costs) (+£14m).

# ASTUTE

January 2013	-12	Budgetary Factors	Submarine Enterprise Performance programme savings in respect of platform materials savings, combat systems savings and Rolls Royce material savings (-£12m).
September 2012	-4	Accounting Adjustments and Re-definitions	Re-adjustment of Sunk Costs for BAES labour, material, overhead and profit costs following on from NAO Audit post MPR12 (-£4m).
Historic	+51	Technical Factors	Increase driven by changes to the Prime data (Labour, Overheads, Material) (+£51m)
Historic	-7	Technical Factors	A decrease in 11/12 Forecast of Outturn Year due to Combat Systems (-£4m), Platform (-£3m), Core H9 (-£2m) offset by an increase in Prime Contract for Baseband Coherency (+£2m).
Historic	+56	Budgetary Factors	An option was taken during the 2011 Planning Round to defer the Successor In-Service Date and modify build delivery rate. Astute build drumbeat was revised to match Successor revised In-Service Date. (+56m)
Historic	+15	Technical Factors	Prime contract increase, a mixture of labour overheads, materials and VAT (+£20m). Non Prime contract decrease, a mixture of Electric Boat, Government Furnished Materiel and Nuclear (-£5m).
Historic	-26	Technical Factors	Prime contract decrease, a mixture of labour overheads, materials and VAT (-£25m). Non Prime contract decrease, a mixture of Combat systems and Nuclear (-£1m).
Historic	+10	Budgetary Factors	A savings option to defer Successor (Future Deterrent) In-Service Date and modify the build programme of later Astute hulls, was taken in Planning Round 2010 which increases the cost of Boats 4-7 by £322m. Of this, £10m relates to Boat 4.

## ASTUTE

Historic	+102	Budgetary Factors	A savings option was taken in the 2009 Planning Round which removed £139M of funding over the 4 years from 2009/10 from the Astute Boats 2-7 build programme, the consequent programme slippage results in additional cost growth in later years of £539m. Of this, £102m relates to Boat 4.
Historic	+19	Technical Factors	Increase in Build, Nuclear Plant and Safety costs (+£19m).
Historic	-51	Receipts	VAT Receipt relating to sunk costs (-£51m).
<b>Net Variation (£m)</b>	<b>+225</b>		

### B.3.1.3 Astute Boat 5

Date	Variation (£m)	Category	Reason for Variation
March 2013	-47	Technical Factors	Decrease in the ABC13 costs driven by BAES labour, overheads and material (-£25m), and non BAES costs decrease driven by nuclear safety, platform design, risk and government furnished materiel. (-£22m)
March 2013	+9	Accounting Adjustments and Re-definitions	Accelerated Depreciation against BAES Enterprise Resource Planning System (Project Genesis). (+£9m).
March 2013	-5	Technical Factors	Decrease in financial year 12/13 final outturn costs driven by decrease in BAES labour, material and overheads (-£2m), nuclear safety (-£3m).
January 2013	-14	Budgetary Factors	Submarine Enterprise Performance programme savings in respect of platform materials savings, combat systems savings and Rolls Royce material savings. (-£14m),
September 2012	-2	Accounting Adjustments and Re-definitions	Re-adjustment of Sunk Costs following on from NAO Audit post MPR12 (-£2m).
Historic	+55	Technical Factors	Prime data increase in future years against pre approval baseline profile, driven by a mixture of labour, overheads and materials (+£55m)

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Historic	+21	Technical Factors	Prime data increase in FY11/12 against pre approval baseline profile, driven by a mixture of labour, overheads and materials (+£21m)
Historic	-50	Receipts	VAT receipt relating to sunk costs (-£50m)
Historic	+11	Budgetary Factors	A savings option to defer Successor (Future Deterrent) In-Service Date and modify the build programme of later Astute hulls, was taken in Planning Round 2010 which increases the cost of Boats 4-7 by £322m. Of this, £11m relates to Boat 5.
Historic	-15	Budgetary Factors	Reduction in the expected cost of Boat 5 reactor core.
Historic	-33	Budgetary Factors	The variance of £32m generated between the expected cost outturn of Boat 5 and the relevant Boat 5 approval results from the Boat re-design activities, an element of which have been approved against Boats 4 and 5, as a batch solution, but are contracted for solely against Boat 4. As the re-design work is a batch solution BAE have not been able to provide costs on a Boat by Boat basis which would align with separate IAB approvals. Sunk Costs have therefore been scored against the Boat 4 within the Submarine Project Team accounts which has created the variation between outturn boat costs and boat approval for Boat 5.
<b>Net Variation (£m)</b>	<b>-70</b>		

## ASTUTE

### B.3.1.4 Astute Boat 6

Date	Variation (£m)	Category	Reason for Variation
March 2013	-25	Technical Factors	Decrease in costs for financial year 12/13 for BAES labour, overhead and material (-£27M). Increase in nuclear power management (+£2m).
March 2013	-17	Receipts	VAT Receipt relating to sunk costs (-£17m).
March 2013	+11	Accounting Adjustments and Re-definitions	Accelerated Depreciation against BAES Enterprise Resource Planning System (Project Genesis). +£11m.
September 2012	-8	Accounting Adjustments and Re-definitions	Re-adjustment of Sunk Costs following on from NAO Audit post MPR12.
June 2012	-15	Technical Factors	Additional Whole Boat Approval of £947m granted in June 2012 by HM Treasury. The costed increase in BAES labour, overheads and material was £874m and Non BAES cost was £58m. The result is a net decrease against approval of -£15m.
Historic	-11	Budgetary Factors	Impact of Option taken against the Astute Batch 2 Programme to reprofile costings. The £11M has come back into the programme but outside of the time line of the existing Boat 6 Approval.
Historic	-2	Technical Factors	Prime data decrease in FY11/12 against pre- approval baseline profile, driven by a mixture of labour, overheads and materials (-£2m)
Historic	-1	Budgetary Factors	Revised estimate of cost of the Nuclear Reactor Core for Astute Boat 6. (-£1m)
Historic	+1	Accounting Adjustments and Re-definitions	Removal of Cost of Capital due to Clear Line of Sight policy implemented by HM Treasury. (+£1m)
Historic	-2	Budgetary Factors	Revised estimate of cost of the Nuclear Reactor Core for Astute Boat 6 (-£2m)
<b>Net Variation (£m)</b>	<b>-69</b>		

## ASTUTE

### B.3.1.5 Astute Boat 7

Date	Variation (£m)	Category	Reason for Variation
March 2013	+2	Technical Factors	Increase in costs relating to financial year 12/13 for BAES labour, overhead and material (+£4m) offset by reduction in Risk (-£2M)
March 2013	+13	Accounting Adjustments and Re-definitions	Accelerated Depreciation against BAES Enterprise Resource Planning System (Project Genesis). +£13m.
June 2012	-24	Technical Factors	Additional Whole Boat Approval of £1316m granted in June 2012 by HM Treasury. The costed increase in BAES labour, overheads and material was £1,221 and non BAES Costs was £71m. This results in a net decrease against approval of -£24m.
Historic	-25	Budgetary Factors	Impact of Option taken against the Astute Boats 4-7 to reprofile costings. The £25M has come back into the programme but outside of the time line of the existing Boat 7 Approval.
<b>Net Variation (£m)</b>	<b>-34</b>		

### B.3.2 Operational Impact of cost variations of Demonstration and Manufacture Phase

### B.4 Progress against approved Support / PFI Cost

Project/Increment Title	Approved Cost (£m)	Forecast cost (£m)	Variation (+/- £m)	In-Year Variation (+/- £m)
Initial Astute Support Solution	190	144	-46	0
Astute Class Support	590	548	-42	-42
Astute Class Training Service Boats 1-3	151	651	+500	-9
Astute Class Training Service Boat 4	260	191	-69	-10
<b>Total (£m)</b>	<b>1191</b>	<b>1534</b>	<b>+343</b>	<b>-61</b>



## ASTUTE

### B.4.1 Cost variation against approved Support / PFI Cost

#### B.4.1.1 Initial Astute Support Solution

Date	Variation (£m)	Category	Reason for Variation
Historic	-3	Technical Factors	Cost reduction due to re assessment of the cost of supporting boats. (-£3m).
Historic	-25	Technical Factors	Cost reduction due to not needing to support boats as a result of slippage (-£25m).
Historic	-18	Technical Factors	Cost reduction due to not needing to support boats as a result of slippage (-£18m).
<b>Net Variation (£m)</b>	<b>-46</b>		

#### B.4.1.2 Astute Class Support

Date	Variation (£m)	Category	Reason for Variation
March 2013	-42	Technical Factors	Change in cost is based on more realistic estimates due to experience gained in supporting HMS Astute and HMS Ambush since contract acceptance and consists of a mixture of capital spares, post design service, information systems and technical support.
<b>Net Variation (£m)</b>	<b>-42</b>		

#### B.4.1.3 Astute Class Training Service Boats 1 - 3

Date	Variation (£m)	Category	Reason for Variation
March 2013	-1	Technical Factors	Reduction in risk costs (-£2m). Reduction in estimates for future change costs (-£1m). Increase in PFI estimates (+£2m).
March 2013	-4	Technical Factors	Reduction in FAST infrastructure costs (-£4m).
March 2013	-4	Technical Factors	Reduction in cost for risk associated with assumptions for training throughput (-£4m).
Historic	+10	Technical Factors	Re-alignment of training to the latest Astute class programme (+£10m).

### ASTUTE

Historic	+2	Budgetary Factors	Increase in amount of recoverable VAT due to re-assessment of costs. (+£2m).
Historic	+4	Technical Factors	Re-assessment of costs relating to risk, future changes to Astute Class Training Service training and infrastructure (+£4m).
Historic	+41	Budgetary Factors	An option was taken during the 2011 Planning Round to defer the Successor In-Service Date and modify build delivery rate. Astute build "drumbeat" was revised to match Successor revised In-Service Date which impacts on Astute training (+£41m).
Historic	+15	Budgetary Factors	Increase in amount of recoverable VAT due to re-assessment of costs (+£4m). VAT rate increase to 20% (+£11m)
Historic	-1	Technical Factors	Re-assessment of costs (-£1m).
Historic	-2	Budgetary Factors	Reduction in amount of recoverable VAT due to re-assessment of costs (-£2m).
Historic	+357	Technical Factors	Re-assessment of costs for training/policy changes.(+£14m). Re-alignment of Astute Class Training Service to the revised Astute Boat Programme and extending the contract from 25 to 36 years. (+£343m).
Historic	+83	Budgetary Factors	Addition of recoverable VAT to ensure that the forecast cost is consistent with the approved cost.
<b>Net Variation (£m)</b>	<b>+500</b>		

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### B.4.1.4 Astute Class Training Service Boat 4

Date	Variation (£m)	Category	Reason for Variation
March 2013	+2	Technical Factors	Re-assessment Boat 4 initial acquisition risk (£2m), capability evolution changes (-£2m), generic training equipment and other Boat 4 training changes (£2m)
March 2013	-32	Technical Factors	Reduction of Boat 4 PFI costs following stringent review of the requirement and reduction in a number of FAST costs embedded within the PFI contract (-£32m).
March 2013	+19	Accounting Adjustments and Re-definitions	Addition of Boat 4 risk costs from financial year 23/24 onwards.
March 2013	+3	Changed Capability Requirements	Extension of requirement for external advisors.
March 2013	+2	Technical Factors	Re-assessment of initial Boat 4 acquisition risk
March 2013	-4	Technical Factors	Reduction in direct capital procurement costs for Boat 4 (-£4m).
Historic	-117	Changed Capability Requirements	Reduction in requirement (-£117m).
Historic	+3	Technical Factors	Re-assessment of infrastructure costs and refinement of Fleet training requirements (+£3m).
Historic	+48	Budgetary Factors	An option was taken during the 2011 Planning Round to defer the Successor In-Service Date and modify build delivery rate. Astute build drumbeat was revised to match Successor revised In-Service Date which impacts on Astute training. (+£48m).
Historic	+7	Technical Factors	Re-assessment of Private Finance Initiative costs (+£5m). Extension of FAST Training Services Ltd infrastructure costs (+£3m). Other minor decreases (-£1m)
<b>Net Variation (£m)</b>	<b>-69</b>		

### B.4.2 Operational Impact on Support / PFI Cost

## ASTUTE

### B.5 Expenditure to date

Description	Previous expenditure to 31 March 2012 (£m)	In-year expenditure (£m)	Total expenditure to 31 March 2013 (£m)
Assessment Phase	29	0	29
Demonstration and Manufacture Phase	4411	578	4989
Support Phase / PFI Cost	275	26	301
<b>Total Expenditure</b>	<b>4715</b>	<b>604</b>	<b>5319</b>

Previously in MPR2012 Boat 6 had only Initial Build approved and Boat 7 had only Long Lead Items approved. Following the Astute Whole Programme approval in June 2012, all boats now have Full Build approved. This has resulted in an increase to the approval level stated in B.2. The total and in year variations are calculated on the total cost of the programme and includes those elements previous reported.

## C Section C: Timescale

### C.1 Length of the Assessment Phase

Project/Increment Title	Date of Initial Investment Decision Approval	Actual Date of Main Investment Decision Approval	Length of Assessment Phase
Astute Boats 1 -3	June 1991	March 1997	69
Astute Boat 4	-	May 2007	-
Astute Boat 5	-	June 2011	-
Astute Boat 6	-	June 2011	-
Astute Boat 7	-	June 2011	-

### C.2 Actual Boundaries for In Service Date or Initial Operating Capability

Project/Increment Title	Earliest Approved	Budgeted For	Latest Approved
Astute Boats 1 -3	-	June 2005	-
Astute Boat 4	February 2015	August 2015	103 months from contract signature
Astute Boat 5	May 2020	August 2020	April 2021
Astute Boat 6	February 2022	May 2022	January 2023
Astute Boat 7	December 2023	March 2024	November 2024

### C.3 In-Service Date/Initial Operating Capability

#### C.3.1 Definition

Project/Increment Title	In-Service Date/Initial Operating Capability
Astute Boats 1 -3	<p><b>Original In Service Date definition:</b> Contract Acceptance Schedule Stage 1 (safe operation and start of operational work up)</p> <p><b>MPR2011 Definition:</b> Successful completion of deep dive and full power trials.</p> <p><b>Reason for Change:</b> In-Service Date has been declared on successful completion of deep dive and full power trials and demonstrates that the submarine can operate safely and independently in the operational environment. HMS Astute is now a valuable training asset for Navy Command. There was also financial and commercial benefit to MoD removing the link between contract acceptance and In-Service Date.</p>
Astute Boat 4	<p><b>Original In Service Date definition:</b> Platform and Weapons acceptance against all requirements as defined within the Astute Class Through Life Management Plan, issue 6 dated April 2006.</p> <p><b>MPR 2009 definition:</b> Boat 4 Operational Handover to Fleet</p> <p><b>Reason for change:</b> To align In Service Date with asset being utilised by Navy Command.</p>
Astute Boat 5	Operational Handover to Fleet
Astute Boat 6	Operational Handover to Fleet
Astute Boat 7	Operational Handover to Fleet

## ASTUTE

### C.3.2 Progress against approved Dates

Project/Increment Title	Approved Date	Actual / Forecast Date	Variation (+/- months)	In-Year Variation (+/- months)
Astute Boats 1 -3	June 2005	April 2010	58	0
Astute Boat 4	August 2015	January 2018	29	0
Astute Boat 5	August 2020	August 2020	0	0
Astute Boat 6	May 2022	May 2022	0	0
Astute Boat 7	March 2024	March 2024	0	0

### C.3.3 Timescale variation

#### C.3.3.1 Astute Boats 1 -3

Date	Variation (+/- months)	Category	Reason for Variation
Historic	-3	Technical Factors	Re-definition of In-Service Date approved by the Investment Appraisals Board, giving retrospective achievement date of In-Service Date from July 2010 to April 2010. (-3 months).
Historic	+4	Technical Factors	Technical and programme difficulties with Boat 1 First of Class undertaking trials for the first time in 17 years. (+4 months).
Historic	+10	Technical Factors	Further delays have occurred during Astute (Boat 1) testing and commissioning phase. These were caused by technical factors the rapid resolution of which was hampered by the lack of skilled personnel with recent submarine testing and commissioning experience. (+10 months).
Historic	+47	Technical Factors	Risk analysis, taking into account opportunities to reduce construction time, predicts most likely In-Service Date of November 2008 (-1 month). Risk analysis, taking in to account opportunities to reduce construction time, predicts a most likely In-Service Date of December 2008 (-1 month). Exceptional difficulties arose with the introduction of a computer aided design system, the availability of trained staff and project management (+43 months). Effect of technical problems assessed a six month slip in In-Service Date (completion of the first phase of sea trials) (+6 months).
<b>Net Variation (+/- months)</b>	<b>+58</b>		

## ASTUTE

### C.3.3.2 Astute Boat 4

Date	Variation (+/- months)	Category	Reason for Variation
Historic	+13	Budgetary Factors	An option was taken during the 2011 Planning Round to defer the Successor In-Service Date and modify build delivery rate. Astute build drumbeat was revised to match Successor revised In-Service Date which impacts on Astute Operational Handover dates.
Historic	+16	Budgetary Factors	A savings option was taken in the 2009 Planning Round which removed funding from Boats 2-7 build programme leading to delayed delivery dates, 16 months delay is attributed to Boat 4. This variation was not shown in MPR10 as the project was not measuring against the 50% date at that time.
<b>Net Variation (+/- months)</b>	<b>+29</b>		

### C.3.3.3 Astute Boat 5 - N/A

### C.3.3.4 Astute Boat 6 - N/A

### C.3.3.5 Astute Boat 7 - N/A

### C.3.4 Other costs / savings resulting from timescale variation

Project/Increment Title	Date	£m (+ Cost / - Saving)	Category	Reason for expenditure or saving
Support costs and current equipment	-	-	-	Costs from this delay have been factored and subsumed into the Department's revised assessment of Force Level Requirements.
Other	-	-	-	Costs from this delay have been factored and subsumed into the Department's revised assessment of Force Level Requirements.
<b>Total</b>		<b>0</b>		

## ASTUTE

### C.3.5 Operational Impact of In-Service Date/Initial Operating Capability variation

Project/Increment Title	Operational Impact
Astute Boats 1 -3	The Astute delay resulted in the delayed introduction of improved capability over current classes; such as improved detection, greater weapon load and increased availability. Since these delays the Department has fully considered the plans for submarine capability in the light of this and many other factors.
Astute Boat 4	Reduced ability to fulfil Fleet tasking.

### C.4. Full Operating Capability

#### C.4.1 Definition

Project/Increment Title	Full Operating Capability	Progress to date
Astute Boats 1 -3	FOC will be declared when the Submarines are available for operational tasking i.e following achievement of Operational Handover, generation and operational work up by Navy Command.	-
Astute Boat 4	FOC will be declared when the Submarine is available for operational tasking i.e following achievement of Operational Handover, generation and operational work up by Navy Command.	-
Astute Boat 5	FOC will be declared when the Submarine is available for operational tasking i.e following achievement of Operational Handover, generation and operational work up by Navy Command.	-
Astute Boat 6	FOC will be declared when the Submarine is available for operational tasking i.e following achievement of Operational Handover, generation and operational work up by Navy Command.	-
Astute Boat 7	FOC will be declared when the Submarine is available for operational tasking i.e following achievement of Operational Handover, generation and operational work up by Navy Command.	-



## ASTUTE

### C.5. Support / PFI Contract

#### C.5.1 Scope of Support / PFI Contract

Project/Increment Title	Scope
Initial Astute Support Solution	The BAE Systems contracted element of the Initial Astute Support Solution provides Design Management of the Astute Platform; maintenance of the Safety Case, configuration management of the design including design change and maintenance of the Certificate of Design.
Astute Class Support	The BAE Systems contracted element of the Astute Support Solution provides Design Management of the Astute Platform; maintenance of the Safety Case, configuration management of the design including design change and maintenance of the Certificate of Design.
Astute Class Training Service	The Astute Class Training Service is a Private Finance Initiative contract to provide Astute specific team and individual training to the Royal Navy for Boats 1-3. Approval was given in 2007, to extend to a 38 year contract, to cover the life of Boat 4.

#### C.5.2 Progress against approved Support / PFI Contract Go-Live Date

Project/Increment Title	Approved Date	Actual Date	Variation (+/- months)	In-year Variation (+/- months)
Initial Astute Support Solution	May 2007	May 2007	0	0
Astute Class Support	April 2011	April 2011	0	0
Astute Class Training Service Boats 1-3	January 2004	March 2008	+50	0
Astute Class Training Service Boat 4	December 2013	May 2015	+17	0

##### C.5.2.1 Go-Live Date Variation

##### C.5.2.2 Initial Astute Support Solution - N/A

##### C.5.2.3 Astute Class Support - N/A

##### C.5.2.4 Astute Class Training Service Boats 1 - 3

Date	Variation (+/- months)	Category	Reason for Variation
Historic	+50	Technical Factors	Re-alignment of Astute Class Training Service to the revised Astute Boat Programme.
<b>Net Variation (+/- months)</b>	<b>+50</b>		

## ASTUTE

### C.5.2.5 Astute Class Training Service Boat 4

Date	Variation (+/- months)	Category	Reason for Variation
Historic	+13	Budgetary Factors	Aligning Boat 4 crew joining and training dates with Boat 4 delivery post Planning Round 2011 Option delay
Historic	+22	Technical Factors	2nd Manoeuvring Room Trainer procurement no longer required in advance of Boat 4 due to greater understanding of the impact of Reactor Control & Indication update on Boats 1-3 training and decision to direct fund Astute Class Training Service capital expenditure through the PFI, months to align delivery of 2nd MRT with crew joining date and training need for Boat 4 (+ 22 months)
Historic	-18	Changed Capability Requirements	To offset the risk of design changes, increased training throughput and to ensure retention of key supplier resources.
<b>Net Variation (+/- months)</b>	<b>+17</b>		

### C.5.3 Progress against approved Support / PFI Contract End Date

Project/Increment Title	Approved Date	Actual / Forecast Date	Variation (+/- months)	In-year Variation (+/- months)
Initial Astute Support Solution	December 2012	March 2011	-21	-21
Astute Support	Boat 7 Operation Handover plus 3 months	Boat 7 Operation Handover plus 3 months	0	0
Astute Class Training Service Boats 1-3	September 2026	September 2037	+132	0
Astute Class Training Service Boat 4	September 2039	September 2039	0	0

#### C.5.3.1 End of Contract Date Variation

#### C.5.3.2 Initial Astute Support Solution

Date	Variation (+/- months)	Category	Reason for Variation
March 2013	-21	Accounting Adjustments and Re-definitions	Reduction is due to redefinition and timeline of the Astute Initial Support Solution which has now been superseded by the revised Astute Class support approval which started in April 2011.
<b>Net Variation (+/- months)</b>	<b>-21</b>		

## ASTUTE

### C.5.3.3 Astute Class Support - N/A

### C.5.3.4 Astute Class Training Service Boats 1 - 3

Date	Variation (+/- months)	Category	Reason for Variation
Historic	+72	Technical Factors	Re-alignment of Astute Class Training Service to the revised Astute Boat Programme.
Historic	+60	Procurement Processes	Decision to extend contract by 5 years to obtain better value for money.
<b>Net Variation (+/- months)</b>	<b>+132</b>		

### C.5.3.5 Astute Class Training Service Boat 4

### C.5.4 Other costs / savings resulting from Support Cost variation - N/A

### C.5.5 Operational Impact of Support / PFI Support Contract variation - N/A

## D Section D: Performance

### D.1. Sentinel Score

Current score	Last years score	Comments
75 Green	75 Green	No Change

### D.2.1 Performance against Defence Lines of Development

Line of Development	Description	Met / Forecast to be met (with risks)	Not met / Forecast not to be met
1. Equipment	The provision of the platform and equipment/systems to meet the user requirement.	Yes (with risks)	
2. Training	Delivery of trained submarine crew and support personnel, by the enduring provision of sufficient and suitable facilities, training media and instructors.	Yes	
3. Logistics	Capability being sustained in order that Astute Class can meet allocated military tasks in peacetime, conduct a transition to war and operate effectively in time of conflict.	Yes	
4. Infrastructure	How Astute Class will operate and interface with naval real estate such as dockyards, ammunition facilities, pilots and ranges.	Yes	
5. Personnel	The provision of trained people. Acceptance of the manning solution will be a staged process.	Yes	
6. Doctrine	Expression of the principles by which military forces guide their actions and is a codification of how activity is conducted today.	Yes	
7. Organisation	The Forces Structures component of Military Capability for Astute is measured against the number of vessels in the class and their readiness state against the requirement of the Royal Naval Plan		Yes
8. Information	The provision of a coherent development of data, information and knowledge requirements for capabilities and all processes designed to gather and handle data.	Yes	
Current forecast (with risks)		7 (1)	1
Last year's forecast (with risks)		7 (1)	1

## ASTUTE

### D.2.2 Defence Line of Development variation

Date	Defence Line of Development	Category	Reason for Variation
Historic	Training	Technical Factors	It is now assessed that the Training Capability for Boats 1-3 will be met. In the past 12 months a recovery plan has been instigated to address the shortfalls reported in March 2010. This action is now making significant progress such that it is now expected that the requirement will be met.
Historic	Equipment	Technical Factors	Equipment is considered to be at risk. The technical challenge of commissioning the capability is beginning to affect the schedule for the delivery of the entire Astute capability.
Historic	Organisation	Budgetary Factors	The Department's Equipment Procurement Plan balancing measures in the 2009, 2010, and 2011 Planning Rounds have deferred the delivery of the 7 Astute class boats such that the planned readiness as required by the Naval Plan cannot be met.
Historic	Training	Technical Factors	Training is at risk due to the extent of Boat design changes and the potential impact of these changes to Astute Class Training Service. Mitigation is that Astute Class Training course delivery has been prioritised to meet the known requirement and essential safety training updates are being optimised with the training delivery.
Historic	Logistics	Technical Factors	Logistics no longer considered at risk. Boat programme slippage has allowed logistics to catch up.
Historic	Logistics	Technical Factors	Risk remains to the support solution during the Transition phase from manufacture into service and in providing the initial provision of spares to the first of class.

## ASTUTE

### D.3. Performance against Key Performance Measures

#### D.3.1 Astute Boats 1 -3

##### D.3.1.1 Performance against Key Performance Measures

Key Performance Measure	Related Defence Lines of Development	Description	Met / Forecast to be met (with risks)	Not met / Forecast not to be met
1	1 to 7	Weapon system effectiveness	Yes	
2	1 to 7	Sonar performance	Yes	
3	1,3	Hull strength (survivability)	Yes	
4	1,2,3,5	Top speed		Yes
5	1,3	Endurance	Yes	
6	1,2,3,4,5,8	Acoustic signature	Yes	
7	3,5	Complement	Yes	
8	1 to 8	Land attack capability	Yes	
9	1 to 8	Capability dependencies	Yes	
Current forecast (with risks)			8 (0)	1
Last year's forecast (with risks)			8 (1)	1

##### D.3.1.2 Key Performance Measures Variation

Date	Key Performance Measure	Category	Reason for Variation
March 2013	Capability dependencies	Technical Factors	Limited suitably qualified and experienced personnel were available and have commissioned the support facilities
Historic	Capability dependencies	Technical Factors	Limited suitably qualified and experienced personnel available to commission the support facilities.
Historic	Top Speed	Technical Factors	Full speed trials have been undertaken and the results are subject to ongoing analysis and discussion with BAES. Further trials maybe required to confirm Top Speed.

##### D.3.1.3 Operational Impact of variation - N/A

## ASTUTE

### D.3.2 Astute Boat 4

#### D.3.2.1 Performance against Key Performance Measures

Key Performance Measure	Related Defence Lines of Development	Description	Met / Forecast to be met (with risks)	Not met / Forecast not to be met
1	1,2,4,5,6,7,8	Intelligence and Surveillance	Yes	
2	1,2,3,4,5,8	Interoperability	Yes	
3	1,2,3,4,5,6,8	Sustained Global Reach	Yes	
4	1 to 8	Theatre Mobility	Yes	
5	1 to 8	Mission Flexibility	Yes	
6	1 to 8	Force and Power Projection	Yes	
7	1 to 8	Battlespace Dominance	Yes	
8	1,2,3,5,8	Survivability	Yes	
9	1 to 5	Generation	Yes	
10	1,3,8	Through Life Adaptability	Yes	
Current forecast (with risks)			10 (0)	0
Last year's forecast (with risks)			10 (3)	0

#### D.3.2.2 Key Performance Measures variation

Date	Key Performance Measure	Category	Reason for Variation
March 2013	Interoperability. Battlespace Dominance. Survivability	Technical Factors	Following last year's report, HM Treasury funding approval has been received for both the Naval Extremely/Super High Frequency Satcom Terminal and Astute Capability Sustainment Programme projects.
Historic	Intelligence and Surveillance	Technical Factors	Communication and Radar integrated solution are now funded and in the Boat 4 baseline.
Historic	Intelligence and Surveillance	Technical Factors	Technical challenges with installing Communication and Radar Electronic Support Measures (CESM and RESM) capability.

## ASTUTE

Historic	Interoperability  Battlespace Dominance  Survivability	Technical Factors	Since last years report, funding has been provided for the Spearfish Upgrade. Funding approval from HM Treasury for both the Naval Extremely/Super High Frequency Satcom Terminal and Astute Capability Sustainment Programme projects remain outstanding.
Historic	Interoperability	Technical Factors	Three complementary projects (Naval Extremely/Super High Frequency Satcom Terminal, Spearfish Upgrade and Astute Capability Sustainment Programme) are still awaiting HM Treasury approval to proceed placing 3 Astute Boat 4 Key Performance Measure at risk.
Historic	Battlespace Dominance	Technical Factors	Three complementary projects (Naval Extremely/Super High Frequency Satcom Terminal, Spearfish Upgrade and Astute Capability Sustainment Programme) are still awaiting HM Treasury approval to proceed placing 3 Astute Boat 4 Key Performance Measures at risk.
Historic	Survivability	Technical Factors	Three complementary projects (Naval Extremely/Super High Frequency Satcom Terminal, Spearfish Upgrade and Astute Capability Sustainment Programme) are still awaiting HM Treasury approval to proceed placing 3 Astute Boat 4 Key Performance Measures at risk.

### D.3.2.3 Operational Impact of variation

Date	Key Performance Measure	Forecast	Operational impact of variation
Historic	2,7,8	At Risk	Without resolution there could be reduced operational effectiveness, employability and survivability against more capable threats.

### D.3.3 Astute Boat 5

#### D.3.3.1 Performance against Key Performance Measures

Key Performance Measure	Related Defence Lines of Development	Description	Met / Forecast to be met (with risks)	Not met / Forecast not to be met
1	1,2,4,5,6,7,8	Intelligence and Surveillance	Yes	
2	1,2,3,4,5,8	Interoperability	Yes (with risks)	



### ASTUTE

3	1,2,3,4,5,6,8	Sustained Global Reach	Yes	
4	1 to 8	Theatre Mobility	Yes	
5	1 to 8	Mission Flexibility	Yes	
6	1 to 8	Force and Power Projection	Yes	
7	1 to 8	Battlespace Dominance	Yes (with risks)	
8	1,2,3,5,8	Survivability	Yes (with risks)	
9	1 to 5	Generation	Yes	
10	1,3,8	Through Life Adaptability	Yes	
Current forecast (with risks)			10 (3)	0
Last year's forecast (with risks)			10 (3)	0

#### D.3.3.2 Key Performance Measures variation

Date	Key Performance Measure	Category	Reason for Variation
Historic	Interoperability	Technical Factors	Naval Extremely/Super High Frequency Satcom Terminal approved by HM Treasury (December 2011), Astute Capability Sustainment Programme still awaiting HM Treasury approval to proceed, however even though some elements are being pursued separately, three Astute Boat 4 Key Performance Measures still remain at risk for Boat 5.
Historic	Battlespace Dominance	Technical Factors	Naval Extremely/Super High Frequency Satcom Terminal approved by HM Treasury (December 2011), Astute Capability Sustainment Programme still awaiting HM Treasury approval to proceed, however even though some elements are being pursued separately, three Astute Boat 4 Key Performance Measures still remain at risk for Boat 5.
Historic	Survivability	Technical Factors	Naval Extremely/Super High Frequency Satcom Terminal approved by HM Treasury (December 2011), Astute Capability Sustainment Programme still awaiting HM Treasury approval to proceed, however even though some elements are being pursued separately, three Astute Boat 4 Key Performance Measures still remain at risk for Boat 5.

## ASTUTE

### D.3.3.3 Operational Impact of variation

Date	Key Performance Measure	Forecast	Operational impact of variation
Historic	2,7,8	At Risk	Without resolution there could be reduced operational effectiveness, employability and survivability against more capable threats.

### D.3.4 Astute Boat 6

#### D.3.4.1 Performance against Key Performance Measures

Key Performance Measure	Related Defence Lines of Development	Description	Met / Forecast to be met (with risks)	Not met / Forecast not to be met
1	1,2,4,5,6,7,8	Intelligence and Surveillance	Yes	
2	1,2,3,4,5,8	Interoperability	Yes	
3	1,2,3,4,5,6,8	Sustained Global Reach	Yes	
4	1 to 8	Theatre Mobility	Yes	
5	1 to 8	Mission Flexibility	Yes	
6	1 to 8	Force and Power Projection	Yes	
7	1 to 8	Battlespace Dominance	Yes	
8	1,2,3,5,8	Survivability	Yes	
9	1 to 5	Generation	Yes	
10	1,3,8	Through Life Adaptability	Yes	
Current forecast (with risks)			10 (0)	0
Last year's forecast (with risks)			N/A	N/A

#### D.3.4.2 Key Performance Measures variation - N/A

#### D.3.4.3 Operational Impact of variation - N/A

### D.3.5 Astute Boat 7

#### D.3.5.1 Performance against Key Performance Measures

Key Performance Measure	Related Defence Lines of Development	Description	Met / Forecast to be met (with risks)	Not met / Forecast not to be met
1	1,2,4,5,6,7,8	Intelligence and Surveillance	Yes	
2	1,2,3,4,5,8	Interoperability	Yes	
3	1,2,3,4,5,6,8	Sustained Global Reach	Yes	

### ASTUTE

4	1 to 8	Theatre Mobility	Yes	
5	1 to 8	Mission Flexibility	Yes	
6	1 to 8	Force and Power Projection	Yes	
7	1 to 8	Battlespace Dominance	Yes	
8	1,2,3,5,8	Survivability	Yes	
9	1 to 5	Generation	Yes	
10	1,3,8	Through Life Adaptability	Yes	
Current forecast (with risks)			10 (0)	0
Last year's forecast (with risks)			N/A	N/A

**D.3.5.2 Key Performance Measures variation - N/A**

**D.3.5.3 Operational Impact of variation - N/A**

<b>Project Title</b>		
Complex Weapons Pipeline		
<b>Team Responsible</b>		
Team Complex Weapons		
<b>Senior Responsible Owner</b>	<b>Date Appointed</b>	<b>Planned end date</b>
Dr Dai Morris	09 May 13	
FMC-WECA-Head		
<b>Project/Increment Name</b>	<b>Current Status of Projects / Increments</b>	
Fireshadow	Post-Main Investment Decision	
Brimstone 2	Post-Main Investment Decision	
Sea Ceptor Demonstration	Post-Main Investment Decision	
SPEAR Capability 2 Spiral Development	Pre-Main Investment Decision	
SPEAR Capability 3	Pre-Main Investment Decision	
Future Local Area Air Defence System (Land)	Pre-Main Investment Decision	
Future Anti Surface Guided Weapon (Heavy)	Pre-Main Investment Decision	
Future Anti Surface Guided Weapon (Light)	Pre-Main Investment Decision	

## **A. Section A: The Project**

### **A.1 The Requirement**

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

Within this context, the initiative aims to deliver:

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

### **A.2 The Assessment Phase**

In April 2008 an Initial Gate submission was made to the Investment Approvals Board for the Complex Weapons Sector. This was approved in June 2008. The Business Case sought approval to enter a non-competitive Assessment Phase with Team Complex Weapons. The Assessment Phase was designed to test the viability of UK Sovereign acquisition of Complex Weapons through a modular and funding pipeline approach that offered greater value for money. This was consistent with the Defence Industrial Strategy in maintaining operational sovereignty of UK Complex Weapons and sustaining UK industry's specialist capabilities.

Initial work considered a number of options, ranging from non-competitive based around Team Complex Weapons to full open competition. The options were assessed on their ability to meet military capability, operational sovereignty and value for money measured against the draft Concept of Analysis. The analysis strongly indicated that the continued use of competition would progressively erode the MOD's ability to secure affordable and effective military capability and restrict future choice and decision making.

### **A.3 Project History**

The Team Complex Weapons proposition is founded on the Defence Industrial Strategy that set out the UK's intent to preserve operational sovereignty of its Complex Weapons. The first step in assessing the viability of a UK sovereign acquisition was a non competitive Assessment Phase which was approved by the Investment Approvals Board (Initial Gate June 2008). This covered risk reduction work to develop solutions to meet the Future Anti-Surface Guided Weapon, Loitering Munition; Stormshadow Capability Enhancement Programme (SSCEP); Future Local Area Air Defence System; and Selected Precision Effects at Range (SPEAR) programmes. Review Note 1 (March 2009) sought approval of a second tranche of money to continue the Assessment Phase and Review Note 2 (November 2009) sought approval for funds to conclude the Assessment Phase and to address the questions raised by the Investment Approvals Board (July/October 2009). The Assessment Phase concluded that the preferred option was a long term partnering model based on bilateral arrangements with the Team Complex Weapons Prime Contractors.

With the Strategic Defence Review on the horizon Interim Main Gate 1 (March 2010) proposed entering into a shorter term Interim Portfolio Management Agreement (PMA-I) with MBDA UK. It also sought approval for expenditure to meet only immediate Complex Weapons requirements specifically:

Loitering Munition (Fire Shadow) (Demonstration & Manufacture);  
SPEAR Capability 2 Block 1 (Demonstration & Manufacture) (now Brimstone 2);  
Future Local Area Air Defence System (Assessment Phase);  
SPEAR Capability 2 Block 2 (now Spiral Development) (Assessment Phase); and  
SPEAR Capability 3 (Assessment Phase)

## COMPLEX WEAPONS

Interim Main Gate 2 was the second of three submissions which sought approval for the Demonstration Phase of the maritime element of the Future Local Area Air Defence System (Maritime). This was approved in principle by the Investment Approvals Committee in April 2011 and in December 2011 Director General Finance confirmed that it was affordable.

In the period since Interim Main Gate 1 and Interim Main Gate 2 were approved a number of the capabilities have been given formal names, viz:

Future Local Area Air Defence System Demonstration - Sea Ceptor D  
Loitering Munition - Fire Shadow  
SPEAR Capability 2 Block 1 - Brimstone 2

The formal names rather than the initial descriptors used in Interim Main Gate 1/2 will be used in the remainder of the Project Summary Sheet.

2011/12

Interim Main Gate 1

Fire Shadow

Demonstration and Manufacture of the initial increment of Fire Shadow (Block 1B) was approved under Interim Main Gate 1. Contract deliveries were made and accepted, as planned in March 2012, effectively concluding the delivery of the initial increment.

Brimstone 2

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

SPEAR Capability 2 Block 2

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

SPEAR Capability 3

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

Interim Main Gate 2

Following Investment Approvals Board approval in April 2011, Future Local Area Air Defence System (Maritime) (now officially known as Sea Ceptor) Type 23 Demonstration Phase Contract was placed in December 2011. MBDA is the prime contractor with supporting non-prime elements provided by BAE Maritime Services, QinetiQ and Defence Science and Technology Laboratory (dstl). Preliminary Design Review successfully concluded in February/March 2012.

## COMPLEX WEAPONS

### Interim Main Gate 3

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

### A.4 In-year Progress

#### Brimstone 2

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

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

#### Sea Ceptor Demonstration

Seeker Critical Design Review was held on 22 August 2012 with the Defence Science and Technology Laboratory which demonstrated seeker readiness for air carriage trials. A Guided Firing Readiness Review (Significant Milestone) was conducted on 27 June 2012 and the deliverable was accepted by the Project Team by 30 September 2012. Critical Design Review commenced on 19 March 13 with performance aspects to be completed in September 2013. Two Instrumented firings trials successfully conducted at Vidsel in April 2013.

The latest MBDA schedule risk analysis conducted in February 2013 concluded that the 50% date for T23 Full Operating Capability In Service Date in 2016 was within 3 weeks of the approved baseline. The Project Team is now conducting risk mitigation and further analysis in order to close this variance. MBDA's project schedule has been refined from 2000 to 8000 lines of detail since April 2011, as part of routine Demonstration Phase business, bringing significantly greater granularity to task elements. Greater confidence can be derived.

	Plan	Actual	%	Status
Milestones	6	5	83	On Track
Deliverables	40	50	125	Ahead of target
Government Furnished Equipment	35	35	100	On Track

## COMPLEX WEAPONS

### Fire Shadow

Fire Shadow was initially expected to deploy on Op HERRICK in April 2012, but due to changes in the strategic Operation task it was agreed that it should not deploy. In September 2011, the MOD Sponsor directed that a User-led activity should be instigated, dubbed the Fire Shadow Capability Demonstration, to inform future planning and investment decisions. The Fire Shadow Capability Demonstration was outside of the scope of the original Interim Main Gate 1 and a Category D Capability Concept Demonstrator business case for the Fire Shadow Capability Demonstration was raised and approved in February 2012. Trials were completed in June 2012 and the final User report issued in November 12.

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

### A.5 Capability Risks

#### Interim Main Gate 1

Brimstone 2 - replaces the legacy Brimstone missile's energetics and airframe with a new Insensitive Munitions (IM) compliant warhead, rocket motor and an upgraded seeker and airframe. Brimstone 2 will replace the Dual Mode Seeker Brimstone capability currently in service with the Royal Air Force and will be integrated onto Tornado GR4 and is intended for integration on Typhoon. Spear Capability 3 is a new 100kg class weapon. This capability will be the primary air-to-ground armament for the Joint Combat Aircraft (JCA)/F-35B Joint Strike Fighter from \*\*\*, and optimised for internal carriage. Spear Capability 3 will provide the means to destroy/defeat a wide range of targets at range, including mobile and re-locatable targets, in all weathers day and night, in complex environments under tight Rules of Engagements. The Indirect Fire Precision Attack programme will address the requirement to attack static and moving targets at various ranges. Within this, Fire Shadow will focus on the most complex targets where man-in-the-loop capability is required in order to ensure mission success and minimise the potential for collateral damage.

#### Interim Main Gate 2

The Sea Ceptor D implementation will provide increased capability over Sea Wolf that addresses the capability shortfall identified in the 2009 Capability Above Water capability audits.

The Sea Ceptor D solution is the only candidate to fill the capability gap that is both affordable and will meet the Key User Requirements (KURs) within the required timescales.

### A.6 Associated Projects

Title of Associated Project	Forecast In Service Date/ Initial Operating Capability	Approval Status
Tornado GR4	Brimstone 2 - Missile In Service Date - To Be Confirmed	In Service
Typhoon Future Capability Programme 2	Brimstone 2 - Typhoon Upgrade Programme – Missile In Service Date - To Be Confirmed	Pre-Main Gate
Lightning II	SPEAR Cap 3 - Expected prior to Joint Combat Aircraft Present Assumed Service Entry	Post Main Gate
Apache Helicopter	SPEAR Cap 2 Block 2 - ***	Concept Phase



## COMPLEX WEAPONS

### A.7 Procurement Strategy

Pre-Main Investment Decision Projects / Increments				
Project / Increment Title	Procurement Route			Approval Status
SPEAR Capability 2 Spiral Development	Non-Competitive - UK			Pre-Main Gate
SPEAR Capability 3	Non-Competitive - UK			Pre-Main Gate
Future Local Air to Air Defence System (Land)	Non-Competitive - UK			Pre-Main Gate
Future Anti Surface Guided Weapon (Heavy)	Non-Competitive - UK			Pre-Main Gate
Future Anti Surface Guided Weapon (Light)	Non-Competitive - UK			Concept Phase
Post-Main Investment Decision Projects / Increments				
Project / Increment Title	Contractor	Contract Scope	Contract Type	Procurement Route
Fire Shadow	MBDA UK	Demonstration and Manufacture	Prime Contractor	Non-Competitive - UK
Brimstone 2	MBDA UK	Demonstration to Manufacture	Prime Contractor	Non-Competitive - UK
Sea Ceptor Demonstration	MBDA UK	Demonstration to Manufacture	Prime Contractor	Non-Competitive - UK

### A.8 Support Strategy

Description				
<p>The current support approach is through individual contracts for each weapon type, e.g. Storm Shadow, Advanced Short Range Air to Air Missile, etc. The intent in Interim Main Gate 1 was to secure a long term arrangement for In Service Support under the Unified Support Environment with MBDA. The Unified Support Environment strategy has since been revised with the transfer of the explosives business stream of Joint Support Chain Services into Defence Equipment and Support (DE&amp;S) Weapons Operating Centre (WOC) and will be taken forward under the wider transformation activity required to deliver efficiencies into this business. The most recent contract with MBDA (April 2011) for the Sea Viper In Service Support arrangement will provide the benefits afforded by the Portfolio Management Agreement (Interim) including gainshare, and has the potential to act as a catalyst for In Service Support transformation in the longer term.</p>				
Support Title	Contractor	Contract Scope	Contract Type	Procurement Route
Unified Support Environment	MBDA UK Ltd	Manufacture to In Service	Prime Contractor	Non-Competitive - UK

## COMPLEX WEAPONS

### B Section B: Cost

#### B.1 Cost of the Assessment Phase

Project/ Increment Title	Approved Cost (£m)	Actual / Forecast Cost (£m)	Variation (£m)	Approved cost as a proportion of total estimated procurement expenditure (%)	Actual Cost as a proportion of total estimated procurement expenditure (%)
Complex Weapons Assessment Phase	239	236	-3	30%	30%
SPEAR Capability 3, SPEAR Capability 2 Block 2 and Sea Ceptor Assessment Phase Elements	145	139	-6	59%	56%
<b>Total (£m)</b>	<b>384</b>	<b>375</b>	<b>-9</b>	<b>49%</b>	<b>48%</b>

#### B.2 Actual cost boundaries for Demonstration and Manufacture Phase / PFI

Project/Increment Title	Lowest Approved (£m)	Budgeted For (£m)	Highest Approved (£m)
Fire Shadow	-	246	-
Brimstone 2			
Sea Ceptor Demonstration	-	541	-

#### B.3 Cost of the Demonstration and Manufacture Phase

Project/Increment Title	Budgeted For Cost (£m)	Forecast Cost (£m)	Variation (+/- £m)	In-Year Variation (+/- £m)
Fire Shadow	246	247	+1	+4
Brimstone 2				
Sea Ceptor Demonstration	541	540	-1	0
<b>Total (£m)</b>	<b>787</b>	<b>787</b>	<b>0</b>	<b>+4</b>

## COMPLEX WEAPONS

### B.3.1 Cost variation against approved cost of the Demonstration and Manufacture Phase

#### B.3.1.1 Fire Shadow & Brimstone 2

Date	Variation (£m)	Category	Reason for Variation
March 2013	+3	Technical Factors	In MPR 12 Team Complex Weapons was anticipating spending circa £3M in financial year 12/13 on Brimstone 2. Delays in the Project meant this money was not spent. The money should have been rolled forward in the Planning Round, but was not and as such the previous figure was understated by £3M.
January 2013	+1	Technical Factors	Seeker handover trials originally planned for the UK could not be carried out in time and had to be conducted in the US with an increase in cost of £1M.
Historic	-3	Capability Trading	Fire Shadow and Brimstone 2 are both in the Demonstration & Manufacture phase and have a combined approval of £196M (£96m + £100m). Spend on these two projects totals £243m giving a variance of +£47m. This would suggest that the Interim Main Gate 1 approval has been breached, however, in February 2009, prior to the Complex Weapons Pipeline approval, Team Complex Weapons received approval for Brimstone Insensitive Munition - £67m. The Project spent £17m on Brimstone Insensitive Munition and transferred the remainder (£50m) to Brimstone 2, to form part of the pipeline funding. When this additional approval is added to that in Interim Main Gate 1 (£196M) the combined approval is £246m. This gives overall approvals headroom of circa £3m.
<b>Net Variation (£m)</b>	<b>+1</b>		

## COMPLEX WEAPONS

### B.3.1.2 Sea Ceptor Demonstration

Date	Variation (£m)	Category	Reason for Variation
Historic	-1	Technical Factors	Of the £541m approved under Interim Main Gate 2, £483m is committed via a firm price contract with MBDA. The remaining £58m is for Non-prime activities, that is Contracts let with companies other than MBDA. These Contracts will be raised over the remaining period of the project and will not necessarily be firm price agreements. As such these costs are subject to change and the Project's current forecast is that there will be a slight underspend against approval of £1m.
<b>Net Variation (£m)</b>	<b>-1</b>		

### B.3.2 Operational Impact of cost variations of Demonstration and Manufacture Phase

### B.4 Progress against approved Support / PFI Cost

### B.5 Expenditure to date

Description	Previous expenditure to 31 March 2012 (£m)	In-year expenditure (£m)	Total expenditure to 31 March 2013 (£m)
Assessment Phase	307	36	343
Demonstration and Manufacture Phase	238	160	398
Support Phase / PFI Cost	0	0	0
<b>Total Expenditure</b>	<b>545</b>	<b>196</b>	<b>741</b>

## COMPLEX WEAPONS

### C Section C: Timescale

#### C.1 Length of the Assessment Phase

Project/Increment Title	Date of Initial Investment Decision Approval	Actual Date of Main Investment Decision Approval	Length of Assessment Phase
Complex Weapons	June 2008	April 2010	22

#### C.2 Actual Boundaries for In Service Date or Initial Operating Capability

Project/Increment Title	Earliest Approved	Budgeted For	Latest Approved
Fire Shadow	-	March 2012	-
Brimstone 2	July 2012	October 2012	December 2012
Sea Ceptor Demonstration	July 2016	November 2016	May 2018

#### C.3 In-Service Date/Initial Operating Capability

##### C.3.1 Definition

Project/Increment Title	In-Service Date/Initial Operating Capability
Fire Shadow	<p><b>Original definition:</b> The project will deliver 25 safe and useful munitions in March 2012 (50%). These will form a start-up capability for current operations.</p> <p><b>MPR 2012 definition:</b> These definitions are not applicable yet given the incremental acquisition approach. In Service Date and Initial Operating Capability would likely occur in later increments and be subject to definition and approvals at an appropriate time. However, an initial batch of weapons systems was delivered, on time, in March 2012. These were demonstrated in June 2012 and while the success rate was lower than desired, performance of the hardware met the Fire Shadow key performance measures.</p> <p><b>Reason for change:</b> The Senior Responsible Owner took a decision not to deploy the weapon for testing in Afghanistan as the capability was not sufficiently mature. It could therefore not meet its In-Service Date for use in Afghanistan so it has been re-defined.</p>
Brimstone 2	200 missiles and six aircraft modified to operate them
Sea Ceptor Demonstration	In Service Date is the date on which there is sufficient evidence across all Defence Lines Of Development (DLODS) to allow the Front Line Command to take control of the system. More specifically, In Service Date is achieved with successful completion of acceptance activities which includes completion of the first Type 23 platform integration and trials, including firings. For Sea Ceptor D Initial Operating Capability will coincide with the In Service Date.

## COMPLEX WEAPONS

### C.3.2 Progress against approved Dates

Project/Increment Title	Approved Date	Actual / Forecast Date	Variation (+/- months)	In-Year Variation (+/- months)
Fire Shadow	March 2012	In-Service Date was not met	-	-
Brimstone 2	October 2012	November 2015	+37	+9
Sea Ceptor Demonstration	November 2016	November 2016	0	0

### C.3.3 Timescale variation

#### C.3.3.1 Fire Shadow

#### C.3.3.2 Brimstone 2

Date	Variation (+/- months)	Category	Reason for Variation
March 2013	+9	Technical Factors	<p>Further technical issues with the TDW Warhead and with the Roxel (UK) Rocket Motor.</p> <p>Warhead; Redesign and modelling the consistency of penetration of the TDW Warhead lead to warhead consistency firings and UK design review to be scheduled for May 2013; the aim of the review is to close out outstanding design review actions originally planned for March 2011.</p> <p>Rocket Motor; The risk gate based approach for the Roxel (UK) rocket motor risk reduction testing encountered a setback when a fire occurred at the Roxel (UK) site and HSE (Health and Safety Executive) took control of key test and inspection facilities.</p> <p>Revision of Schedule Risk Analysis for the project to support a Review Note, due submission Q4 2013; Initial Operating Capability calculated as November 2015.</p>
Historic	+5	Technical Factors	Technical issues with Warhead and Rocket Motor; reported in Interim Main Gate 2.

## COMPLEX WEAPONS

Historic	+23	Technical Factors	Further technical issues with the Warhead and significant technical issues with Roxel manufactured Rocket Motor. A minor performance concession has been agreed to assist in resolving the technical issue with the Rocket Motor.
<b>Net Variation (+/- months)</b>	<b>+37</b>		

### C.3.3.3 Sea Ceptor Demonstration

### C.3.4 Other costs / savings resulting from timescale variation

Project/Increment Title	Date	£m (+ Cost / - Saving)	Reason for expenditure or saving
Brimstone 2	November 2012	14	<p><b>Technical Factors</b></p> <p>In March 2011 Dual Mode Seeker Brimstone assets were deployed on Operation ELLAMY. This significantly increased the assumed consumption rate, due to an increase in operational firings and Air Carriage Hours. Given this increased consumption and assuming current consumption rates on Operation HERRICK, the current stockpile of Dual Mode Seeker Brimstone will be exhausted by March 2014. This, combined with the currently estimated 24 month slip to the Brimstone 2 project, leaves the Royal Air Force with a capability gap until the planned end of UK commitment to Operation HERRICK in December 2014. It also leaves the UK with a gap on any potential near-term contingent operations, which require a low collateral, precision strike capability.</p> <p>As a result of these emerging capability gaps, a Decision Point 2 option, to provide *** Dual Mode Seeker Brimstone, was considered [and approved] by the Defence Board on 19 October 2012.</p>
<b>Total</b>		<b>14</b>	

## COMPLEX WEAPONS

### C.3.5 Operational Impact of In-Service Date/Initial Operating Capability variation

Project/Increment Title	Operational Impact
Brimstone 2	<p>To avoid an unacceptable operational impact arising from the In Service Date variation it is planned to deliver an Initial Operating Capability that will provide a fully functional Spear Capability 2 capability utilising current Brimstone 2 rocket motor and warhead (non Insensitive Munition standard) followed by Full Operating Capability when the Insensitive Munition rocket motor issues have been resolved.</p> <p>Delays to project Initial Operating Capability have been mitigated by Decision Point 2 Option, providing a follow-on buy of Dual Mode Seeker Brimstone Urgent Operational Requirement standard missiles. Initial Operating Capability will be the In Service Date of Brimstone 2 standard missiles.</p>

### C.4. Full Operating Capability

#### C.4.1 Definition

Project/Increment Title	Full Operating Capability	Progress to date
Fire Shadow	Full Operating Capability requirement under revision as part of wider Indirect Fire Precision Attack Programme.	The incremental approach has delivered an End- to- End Capability Demonstration which was successful in yielding information and understanding that will be used to inform Departmental planning on the way forward- not just in relation to Fire Shadow, but the whole Indirect Fire Precision Attack Project.
Brimstone 2	Full Operating Capability is defined as: full stockpile on Brimstone 2 delivered, all platforms modified to utilise its full capability, sufficient trained air and ground crews, full in-service support solution in place.	Warhead lethality and consistency requirement achieved. Three development firings completed successfully. Seeker trials completed, parameter set chosen to enable final software build.
Sea Ceptor Demonstration	As for Initial Operating Capability but with all remaining Type 23 Frigates (x12) fitted and a full missile stockpile (** total warshot incl initial **) delivered.	<p>(i) Achievement of Demonstration Phase Contract Award to deliver First of Class Platform - December 2011.</p> <p>(ii) Successful completion of the System Preliminary Design Review - March 2012.</p>



## D Section D: Performance

### D.1. Sentinel Score

Project/Increment Title	Current score	Last years score	Comments
Fire Shadow	N/A	84 GREEN	Following conclusion of D&M phase, March 2012, Sentinel Scoring has ceased.
Brimstone 2	78 AMBER	58 RED	The movement from Red to Amber is the result of significant progress made in producing a full Schedule Risk Analysis to support the Investment Approvals Committee Review Note submission planned for Quarter 4 of 2013.
Sea Ceptor Demonstration	82 GREEN	84 GREEN	Earned Value Management is a project management technique for measuring project performance and progress and forms part of the Sentinel Score. Where a project is on schedule it has a Schedule Performance Index (SPI) score of 1. Similarly, where a project is on budget it has a Cost Performance Index (CPI) score of 1. The CPI for Sea Ceptor D is 0.93 and SPI 0.82 which shows that the Project is currently forecasting to deliver slightly late and slightly over budget against the EVM baseline, noting that the EVM baseline is three months before approved ISD. The lower Sentinel score reflects this. MBDA is endeavouring to recover the position.

### D.2 Performance against Defence Lines of Development

#### D.2.1 Fire Shadow

Two CPS requirements were reported at-risk in MPR2012, these have now been met. Following changes to the overarching Indirect Fire Precision Attack requirement, arising in part from current operational experience, preparations for a new Indirect Fire Precision Attack Assessment Phase are underway. The Assessment Phase will consider the optimum solution/solutions to meet the revised Indirect Fire Precision Attack requirement, including exploiting investment to date across the Indirect Fire Precision Attack programme. Reporting against the Fire Shadow will not be carried forward in to future MPRs. Any follow on programme will be reported as appropriate.

## COMPLEX WEAPONS

### D.2.1.1 Performance against Defence Lines of Development

Line of Development	Description	Met / Forecast to be met (with risks)	Not met / Forecast not to be met
1. Equipment	Equipment has been delivered.	Yes	
2. Training	Troop have been trained.	Yes	
3. Logistics	Logistics requirements have been met, commensurate with equipment delivery	Yes	
4. Infrastructure	Facilities (inc training classroom) commissioned at Albermarle Barracks	Yes	
5. Personnel	Fire Shadow Troop Formed.	Yes	
6. Doctrine	CONOPS (Concept of Operations) Issued.	Yes	
7. Organisation	Troop formed for current phase. Future org plans TBC.	Yes	
8. Information	Requirements have been met, commensurate with equipment delivery	Yes	
Current forecast (with risks)		8 (0)	0
Last year's forecast (with risks)		8 (0)	0

### D.2.1.2 Defence Line of Development variation - N/A

### D.2.2 Brimstone 2

#### D.2.2.1 Performance against Defence Lines of Development

Line of Development	Description	Met / Forecast to be met (with risks)	Not met / Forecast not to be met
1. Equipment	Spiral development of Dual Mode Brimstone. Insensitive Munition Development	Yes (with risks)	
2. Training	Training provided for in-service users	Yes	
3. Logistics	Support provided for in-service use	Yes	
4. Infrastructure	Infrastructure sufficient to support stockpile at readiness.	Yes	
5. Personnel	Supply of sufficient qualified personnel	Yes	
6. Doctrine	Principles for capability employment	Yes	
7. Organisation	No change to organisation required.	Yes	
8. Information	Data handling and transmission sufficient.	Yes	
Current forecast (with risks)		8 (1)	0
Last year's forecast (with risks)		8 (1)	0

## COMPLEX WEAPONS

### D.2.2.2 Defence Line of Development variation

Date	Defence Line of Development	Category	Reason for Variation
Historic	Equipment	Technical Factors	Significant technical difficulties experienced with Rocket Motor and Warhead Development are being managed to minimise the impact on cost, time and capability performance.

### D.2.3 Sea Ceptor D

#### D.2.3.1 Performance against Defence Lines of Development

Line of Development	Description	Met / Forecast to be met (with risks)	Not met / Forecast not to be met
1. Equipment	Delivery, installation and acceptance of First of Class system	Yes	
2. Training	Delivery of Operator training solution through Maritime Composite Training System and maintainer training through Computer based training solution.	Yes	
3. Logistics	Industrial In-service support solution in place	Yes	
4. Infrastructure	Defence Munitions processing capability in place.	Yes	
5. Personnel	Supply of sufficient qualified personnel	Yes	
6. Doctrine	Principles for capability employment	Yes	
7. Organisation	Organisation in place to exploit capability.	Yes	
8. Information	information interfaces defined, proven and accredited	Yes	
Current forecast (with risks)		8 (0)	0
Last year's forecast (with risks)		8 (0)	0

#### D.2.3.2 Defence Line of Development variation

### D.3. Performance against Key Performance Measures

#### D.3.1 Fire Shadow

##### D.3.1.1 Performance against Key Performance Measures

Key Performance Measure	Related Defence Lines of Development	Description	Met / Forecast to be met (with risks)	Not met / Forecast not to be met
CPS 226	all	Man In The Loop Operation	Yes	
CPS 273	all	Range from Control Node	Yes	

### COMPLEX WEAPONS

CPS 279	all	Prosecution of target	Yes	
CPS 285	all	Operate in Climatic Zones	Yes	
CPS 431	all	Control Node transportable in transit cases	Yes	
CPS 361	all	Capable of operating in daylight	Yes	
CPS 416	all	Prosecution of target	Yes	
CPS 278	all	Endurance including transit	Yes	
CPS 432	all	Each Control Node package be a maximum *** man lift	Yes	
CPS 362	all	Capable of operating during darkness	Yes	
CPS 346	all	Image of sufficient quality at ***	Yes	
CPS 546	all	Responsiveness at range	Yes	
CPS 547	all	Responsiveness at range	Yes	
CPS 536	all	Control Node communications in all azimuths	Yes	
CPS 390	all	Engagement per Control Node	Yes	
CPS 289	all	Specified munition altitude ceiling	Yes	
CPS 388	all	*** launchers per hour, per Node	Yes	
CPS 385	all	Control Node into action less than *** hours	Yes	
CPS 433	all	Control Node operated from ***	Yes	
CPS 543	all	Moving Target-prosecution of target	Yes	
CPS 415	LOGISTICS	No need for dedicated handling or loading equipment	Yes	

### COMPLEX WEAPONS

CPS 230	LOGISTICS	Control Node transportable internally by CH47	Yes	
CPS 425	LOGISTICS	Launch Node transportable internally by CH47	Yes	
CPS 434	LOGISTICS	Munitions transportable internally by CH47	Yes	
Current forecast (with risks)			24 (0)	0
Last year's forecast (with risks)			24 (2)	0

#### D.3.1.2 Key Performance Measures Variation

Date	Key Performance Measure	Category	Reason for Variation
June 2012	CPS 285	Technical Factors	The CPS requirement was achieved with limitations in March 2012, as reported in MPR12. The limitations were removed in June 2012, following the receipt of Roxel boost motor qualification evidence and the subsequent Addendum to the Part 2 Safety Case Report
June 2012	CPS 434	Technical Factors	The CPS requirement was achieved with limitations in March 2012, as reported in MPR12. The limitations were removed in June 2012, following the receipt of Roxel boost motor qualification evidence and the subsequent Addendum to the Part 2 Safety Case Report.

#### D.3.1.3 Operational Impact of variation - N/A

#### D.3.2 Brimstone 2

##### D.3.2.1 Performance against Key Performance Measures

Key Performance Measure	Related Defence Lines of Development	Description	Met / Forecast to be met (with risks)	Not met / Forecast not to be met
KUR1, UR 1.1	Equipment	The User requires a capability that is effective against the specified target set at the stipulated max range.	Yes (with risks)	

### COMPLEX WEAPONS

KUR2, UR 1.4	Equipment	The User requires a weapon that can achieve a lethal effect against a wide variety of target types.	Yes	
KUR3, UR 1.7	Equipment	The User requires the ability to engage targets in complex scenarios with a high degree of confidence that only the intended targets will be engaged.	Yes (with risks)	
KUR4, UR 1.9	Equipment	The User requires a single weapon to be able to effectively prosecute moving / manoeuvring targets.	Yes (with risks)	
KUR5, UR 1.14	Equipment	The user requires the ability to engage targets in environments where collateral damage issues exist	Yes	
KUR7, UR 1.16	Equipment Information	The User requires that data be provided to Dstl to enable the Theatre Command Structure to complete Collateral Damage Assessment as part of the target clearance process for pre-planned missions.	Yes	
KUR10, UR 1.46	Equipment	The User requires a capability that allows an engagement to be aborted after launch	Yes	

### COMPLEX WEAPONS

KUR 11, UR 2.1	Operational and Logistical	The user required the all-up-round to be compliant with the external profile, mass and Centre of Gravity (including tolerances) for the specified in service weapon warhead	Yes	
KUR 12, UR 3.27	Operational and Logistical	The User requires that the warhead be compatible with the in-service components and equipment associated with legacy weapons as stated.	Yes	
Current forecast (with risks)			9 (3)	0
Last year's forecast (with risks)			9 (1)	0

#### D.3.2.2 Key Performance Measures variation

Date	Key Performance Measure	Category	Reason for Variation
December 2012	KUR1, UR 1.1. The User requires a capability that is effective against the specified target set at the stipulated max range.	Technical Factors	Batch 5 (Dec 12) & 6 Warhead proof and tandem firings successfully completed May 13 to prove consistency; further tandem firings are planned Sept 13 to provide additional evidence. Rocket motor design meets max range requirement but the design is still to be proven through the rocket motor recovery programme and qualification.
February 2013	KUR3, UR 1.7. The User requires the ability to engage targets in complex scenarios with a high degree of confidence that only the intended targets will be engaged.	Technical Factors	Analysis of the Seeker Quarry Trial in Feb 13, conducted to optimise Dual-Mode software, is ongoing and subsequent seeker performance modelling will be validated through the DEV 2 trial (to take place Sep-Oct 13).
February 2013	KUR4, UR 1.9. The User requires a single weapon to be able to effectively prosecute moving / manoeuvring targets.	Technical Factors	Analysis of the Seeker Quarry Trial in Feb 13, conducted to optimise Dual-Mode software, is ongoing and subsequent seeker performance modelling will be validated through the DEV 2 trial (to take place Sep-Oct 13) subject to IAC RN approval.

## COMPLEX WEAPONS

Historic	KUR4, UR 1.9; The User requires a single weapon to be able to effectively prosecute moving / manoeuvring targets.	Technical Factors	MPR13: Analysis of the Seeker Quarry Trial in February 2013, conducted to optimise Dual-Mode software, is on-going and subsequent seeker performance modelling will be validated through the DEV 2 trial (to take place Sep-Oct 2013) subject to Investment Approvals Committee Review Note approval. The Urgent Operational Requirement weapon configuration on which Brimstone 2 is based was not formally assessed under trials conditions due to the rapid timescales.
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### D.3.2.3 Operational Impact of variation - N/A

### D.3.3 Sea Ceptor Demonstration

#### D.3.3.1 Performance against Key Performance Measures

Key Performance Measure	Related Defence Lines of Development	Description	Met / Forecast to be met (with risks)	Not met / Forecast not to be met
KUR 1	Equipment Doctrine	The User shall be able to neutralise the Air Threats targeting the Host Platform.	Yes	
KUR 2	Equipment Doctrine	The User shall be able to neutralise the Air Threats targeting the Defended Asset.	Yes	
KUR 3	Equipment Doctrine	The User shall be able to neutralise the Stand-off Air Threat.	Yes	
KUR 4	Equipment Doctrine	The User shall be able to Control the Engagement.	Yes	
KUR 5	Equipment	The User shall be able to utilise in Environmental Conditions.	Yes	
KUR 6	Equipment Information	The User shall integrate to the Host Platform.	Yes	



## COMPLEX WEAPONS

KUR 7	Information	The Communication and Information System interoperability elements of the solution to this User Requirement Document shall be acquired in accordance with MOD Communication and Information System policy.	Yes	
KUR 8	Personnel Organisation	The User shall utilise with available manning.	Yes	
KUR 9	Training	The User shall be trained to Utilise	Yes	
KUR 10	Logistics Equipment	The User shall complete missions without Critical Failure	Yes	
Current forecast (with risks)			10 (0)	0
Last year's forecast (with risks)			10 (0)	0

**D.3.3.2 Key Performance Measures variation - N/A**

**D.3.3.3 Operational Impact of variation - N/A**

**D.4 Support Contract - N/A**

<b>Project Title</b>		
Core Production Capability		
<b>Team Responsible</b>		
Nuclear Propulsion Project Team		
<b>Senior Responsible Owner</b>	<b>Date Appointed</b>	<b>Planned end date</b>
Commodore R Stokes	01 June 2012	01 October 2016
<b>Project/Increment Name</b>	<b>Current Status of Projects / Increments</b>	
Core Production Capability	Post-Main Investment Decision	

## **A. Section A: The Project**

### **A.1 The Requirement**

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

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

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

The Strategic Defence and Security Review (SDSR) White Paper deferred the In-Service Date (ISD) for the Successor SSBN to 2028 with a 36 month drumbeat.

### **A.2 The Assessment Phase**

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

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

The Interim Contract was placed on 4th February 2010 to cover the work required to complete Assessment Phase activities up to placement of the Main Phase Contract on 23rd April 2012. In January 2012 the IAC approved the Review Note requesting release of funding against the Main Gate Business Case.

### **A.3 Project History**

April 2012: HMT approved the CPC Main Gate Business Case.

April 2012: Placement of the main phase CPC Contract.

May 2012: IAC approval of Main Gate Business Case.

### **A.4 In-year Progress**

May 2012 to January 2013: Construction Contract tender evaluation.

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

December 2012: Rolls-Royce place Contract with sub-contractor CH2MHILL to provide the project support.

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

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

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

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

## CORE PRODUCTION CAPABILITY

### A.5 Capability Risks

Delivery of the CPC project is essential in order to maintain the capability to manufacture nuclear reactor cores for the submarine programme and support development work on the Successor core design and manufacturing processes.

### A.6 Associated Projects

Title of Associated Project	Forecast In Service Date/ Initial Operating Capability	Approval Status
Successor (Incl Next Generation Nuclear Propulsion Plant)	ISD of 2028	Pre-Main Gate
Astute Boat 4	ISD of 2018 - Handover to Royal Navy	Post-Main Gate
Astute Boat 5	ISD of 2020 - Handover to Royal Navy	Post-Main Gate
Astute Boat 6	ISD of 2022 - Handover to Royal Navy	Post-Main Gate
Astute Boat 7	ISD of 2024 - Handover to Royal Navy	Post-Main Gate

### A.7 Procurement Strategy

Project / Increment Title	Contractor	Contract Scope	Contract Type	Procurement Route
Core Production Capability	Rolls-Royce	Demonstration and Manufacture	Target Cost Incentive Fee	Single Source

### A.8 Support Strategy

Description				
The CPC contract procures a capability to manufacture nuclear reactor cores for Astute and Successor. The support strategy is embeded in the CPC Procurement Strategy.				
Support Title	Contractor	Contract Scope	Contract Type	Procurement Route
-	-	-	-	-

## B Section B: Cost

### B.1 Cost of the Assessment Phase

Project/ Increment Title	Approved Cost (£m)	Actual / Forecast Cost (£m)	Variation (£m)	Approved cost as a proportion of total estimated procurement expenditure (%)	Actual Cost as a proportion of total estimated procurement expenditure (%)
Core Production Capability	107	107	0	10%	10%
<b>Total (£m)</b>	<b>107</b>	<b>107</b>	<b>0</b>	<b>10%</b>	<b>10%</b>

### B.2 Actual cost boundaries for Demonstration and Manufacture Phase / PFI

Project/Increment Title	Lowest Approved (£m)	Budgeted For (£m)	Highest Approved (£m)
Core Production Capability	1128	1190	1272

### B.3 Cost of the Demonstration and Manufacture Phase

Project/Increment Title	Budgeted For Cost (£m)	Forecast Cost (£m)	Variation (+/- £m)	In-Year Variation (+/- £m)
Core Production Capability	1176	1110	-66	-30
<b>Total (£m)</b>	<b>1176</b>	<b>1110</b>	<b>-66</b>	<b>-30</b>

#### B.3.1 Cost variation against approved cost of the Demonstration and Manufacture Phase

##### B.3.1.1 Core Production Capability

Date	Variation (£m)	Category	Reason for Variation
March 2013	-4	Technical Factors	This reflects reduction in the risk management provision. Although it appears that ~£10M might not be needed, ~£6M is required to make provision for unforeseen issues.
February 2013	-26	Procurement Processes	This reflects price reduction following negotiations with Rolls Royce.
Historic	-36	Procurement Processes	Variation due to the later than planned contract start.
<b>Net Variation (£m)</b>	<b>-66</b>		

#### B.3.2 Operational Impact of cost variations of Demonstration and Manufacture Phase - N/A

#### B.4 Progress against approved Support / PFI Cost - N/A

## CORE PRODUCTION CAPABILITY

### B.5 Expenditure to date

Description	Previous expenditure to 31 March 2012 (£m)	In-year expenditure (£m)	Total expenditure to 31 March 2013 (£m)
Assessment Phase	107	0	107
Demonstration and Manufacture Phase	0	73	73
Support Phase / PFI Cost	0	0	0
<b>Total Expenditure</b>	<b>107</b>	<b>73</b>	<b>180</b>

In May 2012, the Investment Approvals Committee approved £1190 million as the cost of the D&M phase. This includes £14 million which was subsequently advanced into the Assessment Phase in order to continue the programme whilst contract negotiations were finalised and has been accounted for as a cost to the Assessment Phase.

## C Section C: Timescale

### C.1 Length of the Assessment Phase

Project/Increment Title	Date of Initial Investment Decision Approval	Actual Date of Main Investment Decision Approval	Length of Assessment Phase
Core Production Capability	September 2007	May 2012	56

### C.2 Actual Boundaries for Full Operating Capability

Project/Increment Title	Earliest Approved	Budgeted For	Latest Approved
Core Production Capability	N/A	May 2021	N/A

### C.3 Full Operating Capability

#### C.3.1 Definition

Project/Increment Title	Full Operating Capability
Core Production Capability	Ability to manufacture a core through the new facility

#### C.3.2 Progress against approved Dates

Project/Increment Title	Approved Date	Actual / Forecast Date	Variation (+/- months)	In-Year Variation (+/- months)
Core Production Capability	May 2021	August 2021	+3	+3

#### C.3.3 Timescale variation

##### C.3.3.1 Core Production Capability

Date	Variation (+/- months)	Category	Reason for Variation
April 2012	+3	Procurement Processes	Delay in placing Main Gate Contract due to negotiations with Rolls Royce
<b>Net Variation (+/- months)</b>	<b>3</b>		

#### C.3.4 Other costs / savings resulting from timescale variation - N/A

#### C.3.5 Operational Impact of Full Operating Capability variation

Project/Increment Title	Operational Impact
Core Production Capability	Nil. Opportunities are being progressed to bring the forecast date for FOC to schedule.

### C.4 Full Operating Capability - See Above

### C.5 Support / PFI Contract - N/A

## D Section D: Performance

### D.1. Sentinel Score

Current score	Last years score	Comments
94%	N/A	Very High Confidence - Note: CPC did not begin reporting on Sentinel until mid 2012.

### D.2.1 Performance against Defence Lines of Development

Line of Development	Description	Met / Forecast to be met (with risks)	Not met / Forecast not to be met
1. Equipment	Production of Cores for the Astute Class and Successor.	Yes	
2. Training	Trained personnel to enable equipment DLOD.	Yes	
3. Logistics	Maintenance of a Nuclear Site Licence.	Yes	
4. Infrastructure	Facilities to manufacture Cores.	Yes	
5. Personnel	Maintenance of a Nuclear Site Licence.	Yes	
6. Doctrine	N/A	-	-
7. Organisation	Maintenance of a Nuclear Site Licence.	Yes	
8. Information	Maintenance of a Nuclear Site Licence.	Yes	
Current forecast (with risks)		7 (0)	0
Last year's forecast (with risks)		N/A	N/A

### D.2.2 Defence Line of Development variation - N/A



## CORE PRODUCTION CAPABILITY

### D.3. Performance against Key Performance Measures

#### D.3.1 Core Production Capability

##### D.3.1.1 Performance against Key Performance Measures

Key Performance Measure	Related Defence Lines of Development	Description	Met / Forecast to be met (with risks)	Not met / Forecast not to be met
The USER shall be supplied with a core production capability that can produce cores that comply with Astute and Successor specifications.	All DLODs except Doctrine	Supply of Astute and Successor SSBN Reactor Cores - must provide reactor cores to the specification defined by the Astute and Successor programmes, and which must be of sufficient quality to satisfy the NSRP Technical Authority, the Naval Reactor Plant Authorisee (NRPA), and MoD nuclear regulator: DNSR.	Yes	
The USER shall be supplied with cores according to the submarine programme	Equipment	The intention to renew the deterrent platform was stated in Defence White Paper "The future of the United Kingdom's Nuclear Deterrent". The white paper was endorsed by parliamentary vote early 2007. The provision of cores aligned with the submarine build programme reduces the storage requirement and ensures that approvals are aligned with platform requirements	Yes	
Current forecast (with risks)			2 (0)	0
Last year's forecast (with risks)			N/A	N/A

##### D.3.1.2 Key Performance Measures Variation - N/A

## CORE PRODUCTION CAPABILITY

### D.3.1.3 Operational Impact of variation - N/A

Project Title		
Future Strategic Tanker Aircraft		
Team Responsible		
Strategic Transport and Air to Air Refuelling Team		
Senior Responsible Owner	Date Appointed	Planned end date
Air Commodore Jon Ager	25 April 2013	
Project/Increment Name	Current Status of Projects / Increments	
Future Strategic Tanker Aircraft	Post-Main Investment Decision	

### **A. Section A: The Project**

#### **A.1 The Requirement**

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

#### **A.2 The Assessment Phase**

The Future Strategic Tanker Aircraft was nominated as a potential Private Finance Initiative project in 1997. An Assessment Phase, designed to confirm whether a Private Finance Initiative would offer best value for money, was launched following Initial Gate approval in December 2000.

The Assessment Phase confirmed industry's ability to meet the service requirement, programme timescales and costs and determined that the inclusion of passenger Air Transport capability in the contract would represent value for money. It also clarified the manning and personnel implications

#### **A.3 Project History**

The Main Gate Business Case was submitted to the Investment Approvals Board in January 2007 and was approved in May 2007. In March 2008 a 27 year Private Finance Initiative contract was signed. The final Approval envelope for Future Strategic Tanker Aircraft was set by the Investment Approvals Board in June 2008.

The Investment Approvals Board approved Contract Not To Exceed cost remains at £10.5 Bn. In addition there will be Front Line Command manpower and support costs leading to a total cost of £12.3 Bn.

The successful maiden flight of the first green Future Strategic Tanker Aircraft A330-200 aircraft took place on the 4th June 2009; the aircraft was subsequently delivered for conversion to the Airbus Military purpose-built hangar facility Getafé in Spain on the 10th July 2009. It was joined by the second Future Strategic Tanker Aircraft aircraft on the 7th September 2009; both aircraft have now been converted for their Future Strategic Tanker Aircraft role, which includes fitting of military avionics as well as the specialist refuelling equipment. Following this work both aircraft moved into the Certification and Qualification programme.

The Future Strategic Tanker Aircraft is not simply about the procurement of aircraft, but covers all aspects of an integrated worldwide aircraft service, ranging from the provision of the infrastructure, including a hangar complex (which allows for the maintenance of two aircraft simultaneously and houses the two Future Strategic Tanker Aircraft Squadrons, the maintenance crew; operations centre and associated office accommodation), a full flight crew and engineer training service, despatch and ground support. The new facility, known as the AirTanker Hub, was completed ahead of schedule and was officially opened on 31 March 2011, for the provision of the Future Strategic Tanker Aircraft service at Royal Air Force Brize Norton.

The construction of the training facility building was completed ahead of schedule.

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

European Aviation Safety Agency issued the Supplemental Type Certificate 1 and 2 to Airbus Military on 20 April 2011 and 29 July 2011 respectively. MOD and Air Tanker signed a contract on 11 July 2011 to allow C130 Hercules aircraft to use the hangar for line maintenance.

## FUTURE STRATEGIC TANKER AIRCRAFT

Secretary of State for Defence, Dr Liam Fox named the Future Strategic Transport Aircraft 'Voyager' at the Royal International Air Tattoo at Royal Air Force Fairford on 15 July 2011.

Cobham achieved the UK Civil Aviation Authority approval for the extension to their European Aviation Safety Agency Part-145 accreditation, to include Base and Line Maintenance for the Airbus A330-243 series aircraft on 23 August 2011, signifying the beginning of the conversion programme at Cobham.

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

The first Voyager aircraft arrived at Royal Air Force Brize Norton on 21 December 2011. On arrival, Air Tanker registered the aircraft and obtained the Civil Aviation Authority Certificate of Airworthiness. The originally planned flight trials to clear wing pod Air to Air Refuelling for Tornado and Typhoon finished in December 2011. These trials identified problems associated with fuel leakage at various parts of the Air to Air Refuelling clearance flight envelope. Rectification plans for these issues were finally agreed with Air Tanker and the Independent Technical Adviser on 31 January 2012. The Simulator Test Readiness Review completed successfully on 10 January 2012. The Type Certification Exposition version 5 for Air Transport & Aeromed 3 was issued on 2 February 2012. Capability Acceptance at Introduction To Service acknowledged that only the Air Transport and Aeromed 3 elements of the capability had been achieved on 2 February 2012, but not achievement of an acceptable Air to Air Refuelling capability. The Director Air Support signed the Voyager Release To Service Recommendation for Air Transport and Aeromed 3 only, on 21

### A.4 In-year Progress

Future Strategic Tanker Aircraft project has previously been reported in the Major Projects Report on a forecasted Whole Life Cost basis, including all costs (up to 2035) for PFI contract and other costs incurred by MOD in use of the PFI service. Public Accounts Committee on 4th February 2013 agreed that fuel costs would be removed from future reports.

MOD and NAO have agreed for Major Projects Report 2013 that Future Strategic Tanker Aircraft project should be reported on a basis similar to that of other projects. This results in a reduction in the approval value from £12,307 million, reported in 2012, to £11,779 million reported this year. The fuel elements have also been removed from the forecast cost and cost variations.

FSTA continues to build capability. The 1st Voyager aircraft is in trials programme with Airbus Military. The 2nd aircraft (MOD's 1st delivered) was granted a Release To Service for Air Transport on 4 April 12, was placed on Military Aircraft Register on 5 Apr 12 and commenced operational flying.

Following experience on the 3rd and 4th aircraft conversions, industry decided in Jun 12 to move remaining 10 conversions to Airbus Military facility in Getafe near Madrid. The 3rd aircraft was delivered end of Dec 12, transferred to the Military Register and commenced Air Transport tasking.

A standard (un-converted) Airbus A330 has been used since 5 Jan 13 by AirTanker Services. This "green" aircraft has alleviated pressure on AAR crew training during 2013 through being used for Air Transport operations instead of other Voyager aircraft. It will be fed back into the conversion programme in Jan 15.

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

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

The 4th Voyager aircraft was delivered on time at the end of April 2013. The remaining deliveries remain on schedule and the May 14 ISD remains unchanged.

## FUTURE STRATEGIC TANKER AIRCRAFT

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

### A.5 Capability Risks

The first VC10 aircraft entered service in the 1960s and these were converted to Air-to-Air refuelling tankers at various dates between 1980 and 1996. The aircraft has ageing and outdated technology, and the risks to maintaining reliability and value for money have grown and ultimately it will not be possible to sustain capability. These VC10 aircraft are planned to go out of service in 2013. The TriStar aircraft first entered airline service in the early 1970s and converted to their current tanker and tanker/freight roles between 1983 and 1987. These aircraft are planned to go out of service in 2014.

The Future Strategic Tanker Aircraft programme will provide the Royal Air Force with a reliable, safe and efficient Air Transport and Air to Air Refuelling service until its Out of Service Date in 2035.

The primary role for the Future Strategic Tanker Aircraft will be Air-to-Air Refuelling, and the objective of these operations is to enhance combat effectiveness by extending the range, payload or endurance, of front line fast jet aircraft and large aircraft types where and when it is needed. Timely delivery of FSTA aircraft and operational clearances is essential to maintain the UK's strategic deployment and tactical strike capabilities.

### A.6 Associated Projects

### A.7 Procurement Strategy

Project / Increment Title	Contractor	Contract Scope	Contract Type	Procurement Route
Future Strategic Tanker Aircraft	AirTanker Ltd	PFI Service Delivery	PFI	Competitive - International

### A.8 Support Strategy

Description				
Future Strategic Tanker Aircraft is a Private Finance Initiative programme that will provide an Air-to-Air Refuelling and passenger Air Transport service for 24 years. The contract will provide a comprehensive and integrated service solution, based on new Airbus A330-200 aircraft modified to provide Air-to-Air Refuelling capability. The service will include the provision of purpose designed training and maintenance facilities at Royal Air Force Brize Norton, together with through life training, maintenance and support.				
Support Title	Contractor	Contract Scope	Contract Type	Procurement Route
Future Strategic Tanker Aircraft	AirTanker Ltd	PFI Service Delivery	PFI	Competitive - International

## FUTURE STRATEGIC TANKER AIRCRAFT

### B Section B: Cost

#### B.1 Cost of the Assessment Phase

Project/ Increment Title	Approved Cost (£m)	Actual / Forecast Cost (£m)	Variation (£m)	Approved cost as a proportion of total estimated procurement expenditure (%)	Actual Cost as a proportion of total estimated procurement expenditure (%)
Future Strategic Tanker Aircraft	13	38	25	0%	0%
<b>Total (£m)</b>	<b>13</b>	<b>38</b>	<b>25</b>	<b>0%</b>	<b>0%</b>

#### B.2 Actual cost boundaries for Demonstration and Manufacture Phase / PFI

Project/Increment Title	Lowest Approved (£m)	Budgeted For (£m)	Highest Approved (£m)
Future Strategic Tanker Aircraft	-	11779	-

#### B.3 Cost of the Demonstration and Manufacture Phase - N/A

#### B.4 Progress against approved Support / PFI Cost

Project/Increment Title	Approved Cost (£m)	Forecast cost (£m)	Variation (+/- £m)	In-Year Variation (+/- £m)
Future Strategic Tanker Aircraft	11779	11393	-386	-9
<b>Total (£m)</b>	<b>11779</b>	<b>11393</b>	<b>-386</b>	<b>-9</b>

#### B.4.1 Cost variation against approved Support / PFI Cost

##### B.4.1.1 Future Strategic Tanker Aircraft

Date	Variation (£m)	Category	Reason for Variation
March 2013	+45	Inflation	Increased program costs due to RPI
March 2013	+3	Technical Factors	Increased costs for the purchase of drogues and fuel tank inerting.
March 2013	-7	Technical Factors	Risk provision reallocated to trials activity needed to bring Voyager into service
March 2013	+6	Budgetary Factors	Delays in refinancing of PFI Capital reduces assumed savings
March 2013	-19	Procurement Processes	Finalisation of EDAS commercial negotiations results in a £19M saving on EDAS.

## FUTURE STRATEGIC TANKER AIRCRAFT

March 2013	-42	Changed Capability Requirements	Air Command and 2 Gp are assessing Air to Air Refuelling demand with the effect of the draw down of Harrier, the reductions in Tornado and the new concurrency sets. ***
March 2013	+5	Technical Factors	Increased trials activity needed to bring Voyager into service
Historic	-98	Budgetary Factors	Increase in assumption of the amount that can be realised by refinancing.
Historic	+31	Inflation	Increase in Retail Price Index assumption
Historic	+24	Changed Capability Requirements	Inability to realise savings associated with proposed French utilisation of Voyager capability.
Historic	-10	Accounting Adjustments and Re-definitions	Revised VAT treatment of PFI training element.
Historic	-20	Budgetary Factors	Reassessment by Front Line Command of manpower and operating costs
Historic	-3	Budgetary Factors	Reduction in general office support costs due to budgetary constraints.
Historic	+2	Technical Factors	Implementation of civil aviation safety standards.
Historic	-5	Technical Factors	Introduction to Service and aircraft receiver trials delayed resulting in reduced service charge.
Historic	+124	Changed Capability Requirements	Costs associated with PR11 Options which address platform protection and greater utilisation of the a/c
Historic	-16	Budgetary Factors	Reduced costing due to reprofiling of project manpower required to support the programme and reduced in-year trials support costs.
Historic	+3	Accounting Adjustments and Re-definitions	Change in Vat rate from 17.5% to 20% resulting in an increase in costs.



## FUTURE STRATEGIC TANKER AIRCRAFT

Historic	-38	Accounting Adjustments and Re-definitions	Correction of IRDEL Double Counting
Historic	-8	Accounting Adjustments and Re-definitions	Reduction in costs associated with instrumentation of aircraft in support of Future Strategic Tanker Aircraft clearance trials.
Historic	-63	Accounting Adjustments and Re-definitions	Forecast based on expected levels of usage and fuel costs modelled in accordance with Front Line Command estimates.
Historic	-300	Accounting Adjustments and Re-definitions	Method for costing Military equipment obsolescence and change in law costs amended from using actual figures to a risk based assessment.
Historic	-50	Accounting Adjustments and Re-definitions	Correction of Defensive Aids Suite balance sheet treatment ot include RDEL reduction across the contact period.
Historic	-20	HM Treasury Reserve	Deployed operating costs subject to reimbursement from HM Treasury Reserve.
Historic	-20	Technical Factors	Improved definition of the technical requirements relating to integration and support of Communications and Information Systems.
Historic	+90	Accounting Adjustments and Re-definitions	Revised assessment of potential risk opportunities such as refinancing.
Historic	-50	Accounting Adjustments and Re-definitions	Correction of Defensive Aids Suite balance sheet treatment ot include RDEL reduction across the contact period.
Historic	-20	HM Treasury Reserve	Deployed operating costs subject to reimbursement from HM Treasury Reserve.
Historic	-20	Technical Factors	Improved definition of the technical requirements relating to integration and support of Communications and Information Systems.

## FUTURE STRATEGIC TANKER AIRCRAFT

Historic	+90	Accounting Adjustments and Re-definitions	Revised assessment of potential risk opportunities such as refinancing.
<b>Net Variation (£m)</b>	<b>-386</b>		

### B.4.2 Operational Impact on Support / PFI Cost

Project / Increment Title	Category	Explanation
Future Strategic Tanker Aircraft	Changed Capability Requirements	No operational impact to date, but Air Command and 2 Gp are assessing Air to Air Refuelling demand with the effect of the draw down of Harrier, the reductions in Tornado and the new concurrency sets. ***
Future Strategic Tanker Aircraft	Changed Capability Requirements	The enhanced platform protection measure will expand operational capability.

### B.5 Expenditure to date

Description	Previous expenditure to 31 March 2012 (£m)	In-year expenditure (£m)	Total expenditure to 31 March 2013 (£m)
Assessment Phase	38	0	38
Demonstration and Manufacture Phase	0	0	0
Support Phase / PFI Cost	73	239	312
<b>Total Expenditure</b>	<b>111</b>	<b>239</b>	<b>350</b>

## FUTURE STRATEGIC TANKER AIRCRAFT

### C Section C: Timescale

#### C.1 Length of the Assessment Phase

Project/Increment Title	Date of Initial Investment Decision Approval	Actual Date of Main Investment Decision Approval	Length of Assessment Phase
Future Strategic Tanker Aircraft	December 2000	May 2007	77

#### C.2 Actual Boundaries for In Service Date or Initial Operating Capability

Project/Increment Title	Earliest Approved	Budgeted For	Latest Approved
Future Strategic Tanker Aircraft	January 2014	May 2014	November 2014

#### C.3 In-Service Date/Initial Operating Capability

##### C.3.1 Definition

Project/Increment Title	In-Service Date/Initial Operating Capability
Future Strategic Tanker Aircraft	<p><b>Initial Operating Capability</b> Introduction to Service + 18 months is the definition of Initial Operating Capability in the Future Strategic Tanker Aircraft programme. This is the point when one operational Air-to-Air Refuelling aircraft will be available with Wing Pod and Centreline Fuselage Refuelling Unit.</p> <p><b>In-Service Date</b> At the point of Air-to-Air Refuelling In-Service Date there will be the capability to provide at least nine Future Strategic Tanker Aircraft capable of refuelling operations simultaneously with any two of Air-to-Air Refuelling-probe-equipped Fast Jets. Five of the nine Future Strategic Tanker Aircraft will be able to transfer fuel to large aircraft during day/night.</p>

##### C.3.2 Progress against approved Dates

Project/Increment Title	Approved Date	Actual / Forecast Date	Variation (+/- months)	In-Year Variation (+/- months)
Future Strategic Tanker Aircraft	May 2014	May 2014	0	0

##### C.3.3 Timescale variation - N/A

##### C.3.4 Other costs / savings resulting from timescale variation - N/A

##### C.3.5 Operational Impact of In-Service Date/Initial Operating Capability variation - N/A

## FUTURE STRATEGIC TANKER AIRCRAFT

### C.4. Full Operating Capability

#### C.4.1 Definition

Project/Increment Title	Full Operating Capability	Progress to date
Future Strategic Tanker Aircraft	The Full Operating Capability is when all the Future Strategic Tanker Aircraft are accepted into service, the complete service available for use and the Key Performance Measures are met.	Introduction to Service has been achieved.

### C.5. Support / PFI Contract

#### C.5.1 Scope of Support / PFI Contract

Project/Increment Title	Scope
Future Strategic Tanker Aircraft	Private Finance Initiative Contract covers full service

#### C.5.2 Progress against approved Support / PFI Contract Go-Live Date

Project/Increment Title	Approved Date	Actual Date	Variation (+/- months)	In-year Variation (+/- months)
Future Strategic Tanker Aircraft	March 2008	March 2008	0	0

##### C.5.2.1 Go-Live Date Variation - N/A

#### C.5.3 Progress against approved Support / PFI Contract End Date

Project/Increment Title	Approved Date	Actual / Forecast Date	Variation (+/- months)	In-year Variation (+/- months)
Future Strategic Tanker Aircraft	March 2035	March 2035	0	0

##### C.5.3.1 End of Contract Date Variation - N/A

#### C.5.4 Other costs / savings resulting from Support Cost variation - N/A

#### C.5.5 Operational Impact of Support / PFI Support Contract variation - N/A

## **D     Section D: Performance**

### **D.1.     Sentinel Score**

<b>Current score</b>	<b>Last years score</b>	<b>Comments</b>
88 Green	89 Green	-

### **D.2.1     Performance against Defence Lines of Development**

<b>Line of Development</b>	<b>Description</b>	<b>Met / Forecast to be met (with risks)</b>	<b>Not met / Forecast not to be met</b>
1.     Equipment	All aircraft will be modified to conduct the required roles, but specific equipment will only be added as required to meet the tasking. All aircraft will be two-point tankers: of these seven will also be three-point capable, with five centre-line systems being available for use. Aircraft will be fitted for a Defensive Aids Suite.	Yes (with risks)	
2.     Training	A comprehensive training service will be delivered by AirTanker as a key part of the contract. Aircrew will undergo type-related training on the A330 with additional Air-to-Air Refuelling role training conducted by military instructors. Ground crew will be trained to European Aviation Safety Agency standards and hold type-related licenses.	Yes (with risks)	
3.     Logistics	Logistics support for the fleet will be controlled by AirTanker as part of the service-delivery contract.	Yes	
4.     Infrastructure	A new hangar with bays for two A330 aircraft is being built at RAF Brize Norton, including maintenance bays and workshops. A training facility including a flight simulator will be housed in another complex nearby.	Yes	
5.     Personnel	Flight deck crews comprising military and military Sponsored Reserves will be trained, together with Mission Systems Operators. There will be cabin crew, ground crew and operations support personnel.	Yes	
6.     Doctrine	The solution meets the requirement identified within the Concept of Use.	Yes	

## FUTURE STRATEGIC TANKER AIRCRAFT

7. Organisation	The aircraft service will build up gradually from Introduction to Service to Air-to-Air Refuelling In-Service Date.	Yes	
8. Information	AirTanker Services will provide a bespoke Information Technology system to interface with current MOD Information Technology systems.	Yes	
Current forecast (with risks)		8 (2)	0
Last year's forecast (with risks)		8 (2)	0

### D.2.2 Defence Line of Development variation

Date	Defence Line of Development	Category	Reason for Variation
March 2013	Equipment	Technical Factors	Timely delivery and clearance of Voyager's Enhanced Defensive Aids System; and gaining a Release-To-Service for the aircraft as a three-point tanker (utilizing its fuselage refueling unit). New risk 2012/13.
March 2013	Training	Technical Factors	Training capacity will be adversely impacted if three-point tanker clearance (above) is not forthcoming or mitigated. This is because, from now on, all aircraft will be delivered as three-point tankers and the aircrew training plan relies upon being able to fly them. New risk 2012/13.
Historic	Training	Technical Factors	Uncertainty of the acceptance by 22 Group of the Commercial Off The Shelf and training validation. Risk mitigated 2012/13.
Historic	Equipment	Technical Factors	Development of avionics packages has fallen behind schedule. Increased resources have been identified as a mitigation strategy to ensure DLOD will be achieved. As at March 2011 the Military Avionics Integration issues remain. Key activities continue for the Certification of the aircraft. Risk mitigated 2012/13.
Historic	Personnel	Technical Factors	Engineer training manpower to be made available. Line of Development no longer at risk.
Historic	Logistics	Technical Factors	A series of workshops has identified processes to ensure support solution will be in place and no major risks have been identified. Line of development no longer at risk.

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Historic	Information	Technical Factors	Progress on interfaces has been made and no major risks have been identified. Line of Development no longer at risk.
Historic	Logistics	Technical Factors	Development of the detailed, practical aspects of the logistic support solution has identified areas of risk between contractor and MOD. These risk areas are being mitigated through logistic workshops and engagement with AirTanker to identify processes and solutions where required.
Historic	Personnel	Technical Factors	First ground crew go into training in December 2010. The manpower Establishment is to be in place by no later than July 2009 to allow for Candidates to be selected. Meetings are timetabled to progress this work.
Historic	Information	Technical Factors	A short term, manual, interface has been agreed between the Authority and AirTanker tasking and operations Information Technology systems. In the longer term an Application Programming Interface needs to be set up to allow direct communication between the 2 systems and the road-map to this solution is to be developed.

### D.3. Performance against Key Performance Measures

#### D.3.1 Future Strategic Tanker Aircraft

##### D.3.1.1 Performance against Key Performance Measures

Key Performance Measure	Related Defence Lines of Development	Description	Met / Forecast to be met (with risks)	Not met / Forecast not to be met
KUR 01	Equipment	The User shall be able to utilise Future Strategic Tanker Aircraft to refuel all receiver aircraft cleared to operate with Future Strategic Tanker Aircraft.	Yes	

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KUR 02	Equipment	The system shall be capable of transporting personnel and their associated personal equipment and freight.	Yes	
KUR 03	Equipment	The User shall be able to utilise an air system that is airworthy and meets all appropriate regulations, both military and civilian, at all times.	Yes	
KUR 04	Logistics	The User shall be able to operate the air system world-wide, in both Air-to-Air Refuelling and passenger Air Transport Roles.	Yes	
KUR 05	Equipment / Information	The User shall have the capability to interoperate with appropriately configured aircraft in a manner necessary to carry out the required function.	Yes	
KUR 06	Doctrine	The system shall meet the readiness requirements to provide sufficient capability to support the Military Tasks laid down in the RAF Management Plan.	Yes	



## FUTURE STRATEGIC TANKER AIRCRAFT

KUR 07	Logistics	The User shall be able to utilise an air system that is fully supportable (including maintenance, spares, manpower, facilities and support equipment) at the rates of effort specified, both at the Main Operating Base and when deployed world-wide at all times.	Yes	
KUR 08	Logistics	The system shall be capable of providing the required level of operational capability at all times.	Yes	
KUR 09	Training	The User shall be able to acquire and maintain the necessary skills to utilise the system across the spectrum of operation.	Yes	
Current forecast (with risks)			9 (0)	0
Last year's forecast (with risks)			9 (0)	0

### D.3.1.2 Key Performance Measures Variation

### D.3.1.3 Operational Impact of variation

### D.4 Support Contract - N/A

<b>Project Title</b>		
Lightning II		
<b>Team Responsible</b>		
Lightning Project Team		
<b>Senior Responsible Owner</b>	<b>Date Appointed</b>	<b>Planned end date</b>
Air Commodore Mark Hopkins (Air Capability)	27 April 2012	
<b>Project/Increment Name</b>	<b>Current Status of Projects / Increments</b>	
System Development & Demonstration	Post-Main Investment Decision	
Production, Sustainment & Follow on Development	Post-Main Investment Decision	

## A. Section A: The Project

### A.1 The Requirement

The Joint Combat Aircraft is the requirement for a multi-role aircraft to be operated jointly by the Royal Air Force and the Royal Navy from both land bases and the new Queen Elizabeth Class aircraft carriers.

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

### A.2 The Assessment Phase

Approval was obtained in November 1996 to enter the Concept Demonstration Phase on the Joint Strike Fighter programme under a Memorandum of Understanding signed in December 1995. The phase began in November 1996 with two competing United States Prime Contractors (Boeing and Lockheed Martin) designing and flying demonstration aircraft on which the selection of the preferred bidder was based. The phase completed in October 2001 with the announcement of Lockheed Martin as the successful bidder. Studies into alternative options to Joint Strike Fighter to meet the requirement were also conducted but were rejected on cost grounds. A Main Gate demonstration approval was obtained in January 2001 for the participation in the System Development and Demonstration phase of the Joint Strike Fighter programme.

### A.3 Project History

Following the 1998 Strategic Defence Review, UK participation in the Concept Demonstration Phase of the programme and significant analysis, the US Joint Strike Fighter was selected to meet the Joint Combat Aircraft requirement for Carrier Strike. A Main Gate demonstration approval was obtained in January 2001 for participation in the System Development and Demonstration phase of the Joint Strike Fighter programme, leading to signature that month by UK and United States governments of the System Development and Demonstration Memorandum of Understanding. The selection of Lockheed Martin as the Joint Strike Fighter air system prime contractor included a teaming agreement with Northrop Grumman and BAE Systems to collectively form Team Joint Strike Fighter. Two separate and competitive propulsion contracts were awarded to Pratt and Whitney for the F135 engine and General Electric/Rolls Royce Fighter Engine Team for the F136 engine. In April 2011, the F135 engine was selected as the sole engine variant within the Joint Strike Fighter programme. Whilst other partners joined the programme at Level 2 and 3 entry arrangements, only United States and UK requirements have driven the System Development and Demonstration baseline solution.

In September 2002 the UK selected the Short Take Off and Vertical Landing Joint Strike Fighter variant to meet the Joint Combat Aircraft requirement. A review of the Joint Strike Fighter Programme and the viability of the Short Take Off and Vertical Landing design was completed in January 2005. It concluded that a successful programme of weight reduction initiatives and other performance enhancements had restored confidence that the Short Take Off and Vertical Landing design should remain the UK's planning assumption. A further review by the Investment Approvals Board in July 2006 confirmed this decision.

On 12 December 2006 Minister of State for Defence Equipment and Support signed the Production Sustainment and Follow-on Development Memorandum of Understanding. In March 2009, approval was given for the Joint Combat Aircraft incremental strategy, for participation in joint Initial Operational Test & Evaluation with the United States Services.

In October 2010 the UK Government's Strategic Defence & Security Review announced that the Joint Combat Aircraft programme would switch variant from the Short Take Off and Vertical Landing variant to the Carrier Variant.

## LIGHTNING II

During Financial Year 2011/12 the MOD continued to pursue a Carrier Variant aircraft based programme in line with the variant change decision taken under Strategic Defence & Security Review 2010. In year progress during Financial Year 2011/12 focused on the following:

1. Continuing production of three UK Joint Strike Fighter aircraft. The first two of these jets have entered the final production stages and are in pre flight testing at the Lockheed Martin Fort Worth Texas production line.
2. The Joint Strike Fighter programme System Development and Demonstration phase continues at pace with a total of 2,689 flight test hours achieved through to March 24th 2012, which exceeded test point and flight targets for all variants.
3. The Joint Combat Aircraft project team received approval to accommodate further years of shared programme costs and long lead funding for a fourth Joint Strike Fighter to be procured under Low Rate Initial Production 7.
4. The United States Department Of Defense Selected Acquisition Report 11 announced a slip to the Joint Strike Fighter programme milestone C, which represents the conclusion of System Design and Development, to April 2019. There is no cost increase to the UK contribution due to this slip, since UK contributions are fixed under the System Development and Demonstration Memorandum of Understanding. One of the most significant cost impacts reflected in the report was the US restructuring its production profile, reducing the aircraft quantity inside the US Financial Year 2013-17 timeframe by 179 aircraft, flattening the near term production rate to reflect a balanced development approach between concurrency and unit costs. The US is still committed to a total production buy of 2,443 aircraft. The Selected Acquisition Report 11 cost estimate does not affect the cost of the UK's first three aircraft but the costs of future aircraft will be affected and this impact will be considered in future approvals.

### A.4 In-year Progress

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

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

In the UK the Joint Strike Fighter aircraft is now formally named and referred to as Lightning II. On 19 July 2012 the UK took delivery of its first Joint Strike Fighter aircraft at Lockheed Martin's Fort Worth facility in Texas USA.

In October 2012 the UK took delivery of its second Joint Strike Fighter aircraft. The two UK aircraft are based at Eglin Air Force Base in Florida where UK pilots and UK aircraft engineers are undergoing training to operate on the aircraft.

The project team received Investment Approvals Committee and Her Majesty's Treasury Approval for Main Gate 3 Review Note 2 which covered the order of a fourth aircraft, long-lead items for the Low Rate Initial Production 8 aircraft, and the Financial Year 2013/14 Composite Share Ratio contribution. This is reflected in the increase to the approved cost of Production Sustainment and Follow on Development reported in Section B.2.

### A.5 Capability Risks

The Strategic Defence and Security Review 2010 confirmed the need for Joint Strike Fighter which forms the backbone of Carrier Enabled Power Projection. If the UK did not acquire Joint Strike Fighter it would be unable to meet its Combat Air and Carrier Enabled Power Projection requirements and be unable to support ground forces in multi threat environments at a time and place of the Government's choosing. Joint Strike Fighter brings no significant risks to other projects, but relies heavily on the Queen Elizabeth Class Carrier programme to deliver suitable carriers to introduce a Carrier Strike capability around 2020.

## LIGHTNING II

### A.6 Associated Projects

Title of Associated Project	Forecast In Service Date/ Initial Operating Capability	Approval Status
Queen Elizabeth Class (Future Aircraft Carrier)	Initial Operating Capability: Ship 1 (Queen Elizabeth) - December 2017	Post Main Gate

### A.7 Procurement Strategy

Project / Increment Title	Contractor	Contract Scope	Contract Type	Procurement Route
System Development & Demonstration	Lockheed Martin (Prime)	System Development and Demonstration	Cost plus award fee, subject to a maximum price	Competitive International collaboration procurement. UK participation through Memorandum of Understanding agreement. (Note: the contract is placed by the US Department of Defense who then contract Lockheed Martin on UK MOD behalf)
Production, Sustainment & Follow on Development	Lockheed Martin (Prime)	Initial Operational Test & Evaluation Aircraft	Cost plus award fee, subject to a maximum price.	Competitive International collaboration procurement. UK participation through Memorandum of Understanding agreement. (Note: the contract is placed by the US Department of Defense who then contract Lockheed Martin on UK MOD behalf)

### A.8 Support Strategy

Description				
<p>The long term support strategy for the Joint Strike Fighter programme is currently under development and will not be fully determined until the System Design and Demonstration phase is formally completed. Current proposals assume that Lockheed Martin will provide a contracted for availability solution around performance based logistics</p>				
Support Title	Contractor	Contract Scope	Contract Type	Procurement Route
-	-	-	-	-

## B Section B: Cost

### B.1 Cost of the Assessment Phase

Project/ Increment Title	Approved Cost (£m)	Actual / Forecast Cost (£m)	Variation (£m)	Approved cost as a proportion of total estimated procurement expenditure (%)	Actual Cost as a proportion of total estimated procurement expenditure (%)
Joint Combat Aircraft	150	144	-6	6%	6%
<b>Total (£m)</b>	<b>150</b>	<b>144</b>	<b>-6</b>	<b>6%</b>	<b>6%</b>

### B.2 Actual cost boundaries for Demonstration and Manufacture Phase / PFI

Project/Increment Title	Lowest Approved (£m)	Budgeted For (£m)	Highest Approved (£m)
System Development & Demonstration	-	1874	2060
Production, Sustainment & Follow on Development	-	999	999

### B.3 Cost of the Demonstration and Manufacture Phase

Project/Increment Title	Budgeted For Cost (£m)	Forecast Cost (£m)	Variation (+/- £m)	In-Year Variation (+/- £m)
System Development & Demonstration	1874	1583	-291	+17
Production, Sustainment & Follow on Development	999	905	-94	-36
<b>Total (£m)</b>	<b>2873</b>	<b>2488</b>	<b>-385</b>	<b>-19</b>

#### B.3.1 Cost variation against approved cost of the Demonstration and Manufacture Phase

##### B.3.1.1 System Development & Demonstration

Date	Variation (£m)	Category	Reason for Variation
March 2013	+1	Exchange Rate	MPR13: 12/13 in year variance.
March 2013	-1	Accounting Adjustments and Re-definitions	MPR13: Correction of an accrual related to a UK study into pilot flight equipment.

## LIGHTNING II

March 2013	+20	Technical Factors	MPR13: Development of interim solution to deal with potential gap in re-programming capability (£+5M). Review of risk and issues relating to UK integration work, including aircraft & weapons certification (£+15M) and review integration risks (£+5M). Revised financial profiles received from the Joint Programme Office - MOU Safety Case (£-1.6M) and Operational Test & Evaluation MOU Contribution (£-1M). Technical Support contract cost not realised due to change in contracting scope (£-2.8M).
April 2012	-3	Changed Capability Requirements	MPR13: Tasks no longer relevant to a Carrier Variant programme so removed, Carrier Variant Add Ons (£-39M). Stop work order imposed on Carrier Variant Future (Queen Elizabeth Class) Integration development contract during period of revision resulting in underspend (£-4M). Short Take Off and Vertical Landing specific costs added back in - SHip Borne Rolling Vertical Landing Solution (£+40M).
Historic	+1	Exchange Rate	MPR12: Exchange rate fluctuations through financial year 2011/12
Historic	-20	Technical Factors	MPR12: Reclassification of UK specific work as development focussed rather than production (+£9m). Slower than anticipated progress on ship/air integration work (-£5m). Reduced levels of UK specific risk mitigations being required (-£18m). Qualification of UK weapons for carriage on F-35 (+£14m). Delays to work supporting UK's transition to the Carrier Variant post Strategic Defence & Security Review (-£9m). Reduced levels of engineering support required for UK specific development tasks (-£11m).

## LIGHTNING II

Historic	+13	Technical Factors	Reassessment of risk mitigation activities in relation to Reprogramming (+£5m) and Ship/Air Integration (£8m).
Historic	+8	Accounting Adjustments and Re-definitions	Removal of IRDEL (Foreign Exchange) as per revised Departmental policy.
Historic	-7	Exchange Rate	MPR2011 In year 2010/11 Exchange Rate variance (-£3m). Exchange rate variance 2011/12 to 2013/14 (-£4m).
Historic	+59	Technical Factors	Creation and ongoing funding of an Engineering Authority (£9m). £50m due to the Joint Strike Fighter's Technical Baseline Review impact on: a) the System Development and Demonstration now completing in 2015/16 (+£58m), b) In-year delays and revised short-term plans (-£8m).
Historic	-31	Changed Capability Requirements	Deletion of the Ship-Borne Rolling Vertical Landing Key User Requirement due to the Strategic Defence & Security Review decision to change aircraft variant.
Historic	-16	Accounting Adjustments and Re-definitions	Removal of Cost of Capital due to Clear Line of Sight policy implemented by HM Treasury.
Historic	+37	Exchange Rate	MPR2010 In year 2009/10 Exchange Rate variance (+£12m). Exchange rate variance 2010/11 to 2013/14 (+£25m).
Historic	-21	Budgetary Factors	Cost reductions and re-profiling of UK National requirements (-£15m), correction of effect of System Development & Demonstration Contribution non-financial contributions (+£1m), revision of Operational Test & Evaluation contribution (-£2m), reduced forecast for Ship-Borne Rolling Vertical Landing risk mitigation (-£5m).



## LIGHTNING II

Historic	-100	Exchange Rate	<p>MPR2009 In year 2008/09 Exchange rate variance (+£4m). Exchange rate variance 2009/10 to 2013/14 (+£2m).</p> <p>MPR08: System Development and Demonstration contribution against MPR07 Versus MPR08 Exchange rate: 2007/08 (-£12m), 2008/09 to 13/14 (-£6m).</p> <p>MPR07: Exchange rate against profile until 2013 (-£11m). Change in dollar/pound exchange rate (MPR06 +£9m; MPR05 -£181m; MPR04 -£85m; MPR03 -£9m; MPR02 +£189m).</p>
Historic	-25	Budgetary Factors	<p>MPR09: In year out turn against forecast – Risk mitigation action leading to minimal level of unforeseen activities emerging (-£10m), Ship Borne Rolling Vertical Landing (-£8m) due to overestimate of the work required at this stage of the programme, slippage in the integration of JCA with the Future Aircraft Carriers (-£6m) due to slower than anticipated progress, correction of in year System Development &amp; Demonstration Contribution (+£2m). Re-profiling of future years -comprising of Ship Borne Rolling and Vertical Landing – reassessment of the funding required to return the aircraft with a higher payload (-£1m), updated assessment of the expected implementation work supporting the Autonomic Logistics Information System – a global system for all maintenance and spares for Joint Strike Fighter (-£2m).</p>
Historic	-5	Budgetary Factors	<p>An increase due to Joint Safe Escape – the ability to deploy weapons safely (+£1m) which was not previously explicitly forecast, refinement of Risk mitigation funding for future years (-£4m), Reduction of Safety Case – a requirement to ensure the aircraft is fit to fly (-£2m) due to the cost to the UK being reduced by the contribution of partner nations.</p>

## LIGHTNING II

Historic	-1	Budgetary Factors	MPR08: In year out turn against forecast – including minor changes for 2007/08 (-£14m). UK non System Development and Demonstration National work; Changes to reflect realism: UK Precision Guided Bomb (-£7m), Carrier Variant Future integration (+£1m) and Operational Test and Evaluation (-£7m). Maturation of risk identified since Equipment Plan 07: Autonomic Logistic Information System (+£5m), Conformity European markings (+£6m), Re-assessment of risk (+£6m). Re-assessment of Main programme expenditure: Mission Support (+£2m), Reprogramming (+£10m), Bowman (+£4m). Planning Round 08 Option not included in Equipment Plan07 (-£7m).
Historic	+279	Budgetary Factors	MPR07: Re-assessment of UK National Work - attributable cost which include: UK integration costs: (-£94m), Block 3 weapons adjusted to reflect the latest costing from Prime contractor (+£7m), Safety Case now defined to prepare for contract placement in 2007/08 (+£11m) and re-assessment of risk provision (-£87m). Break out from re-assessment from risk provision above which are: UK basing integration & testing (+£5m), Identification of Operational Test & Evaluation costs (+£26m). Outturn for 2006/07 versus Forecast (-£6m). Adjustment for realism in the cost of the UK non- System Development and Demonstration work resulting from a deeper review of the estimates originally provided by the US (+£43m). Costs benefits gained from use of existing Advance. Short Range Air to Air Missile stocks for Joint Combat Aircraft trials (-£6m). Fewer weapon studies undertaken in year (-£1m). Improved project support strategy (-£3m). Better understanding of the integrated nature and requirements of the aircraft systems (+£384m).

## LIGHTNING II

Historic	-34	Budgetary Factors	MPR06: Re-profile of UK National Work to mitigate increase in Exchange Rate. Main Drivers are Interoperability (-£1m), Capital Studies (-£1m), UK Integrated Helmet Mounted Display System (-£1m) and Carrier Vessel Future Integration (-£3m). Re-profile of later years Follow on Development (-£3m).MPR05: Reassessment of Dstl & QinetiQ tasking (-£10m). Correction of contingency estimates due to weight risks in MPR04 (-£15m).
Historic	-13	Accounting Adjustments and Re-definitions	MPR07: The Integrated Project Team conducted a review of the project work schedule which has given the team sufficient certainty to include more accurate accruals for the duration of the project (-£10m). Accounting Adjustment made in MPR06 now reflected in re-profiling of programme (-£2m). New Defence Procurement Agency requirement to include Price Forecasting Group costs within the equipment plan (+£1m). Accounting reclassification of feasibility studies (-£2m).
Historic	+5	Accounting Adjustments and Re-definitions	MPR06: Change of accounting treatment for System Development and Demonstration contributions. (+£19m) re-profile of 2005/06 accrual into later years. (-£18m) removal of 2005/06 accrual. Reconciliation of accrual (+£1m). MPR05: Re profiling of UK specific tasks (+£3m).
Historic	-71	Changed Capability Requirements	MPR06: Reviews of the external missile systems for Joint Combat Aircraft resulted in the removal of the requirement for integrating internally mounted Brimstone (-£41m), Paveway II and III (-£1m) capabilities and some internal configurations of the Advanced Short Range Air-to-Air Missile (-£49m). Further UK participation in the Joint Integrated Test Force to reflect UK acceptance into service strategy (+£20m).

## LIGHTNING II

Historic	-472	Changed Capability Requirements	MPR05: Provision for Alternate Helmet Mounted Display System removed (-£40m). Reassessment of 2004/05 forecast expenditure (-£12m). Review of miscellaneous requirement including Exchange of Letters Risk Provision (-£40m), design of UK Specific Support (-£3m), Environmental Protection (-£3m) and Autonomic Logistic Information System interoperability (-£6m). Block IV weapons as a result of JSF programme re-alignment (-£368m).
Historic	+55	Technical Factors	MPR07: Re-alignment of programme now included in Development - Ship-Borne Rolling and Vertical Landing (+£55m).
Historic	-29	Technical Factors	MPR05: Reduction of Risk line as a result of programme delays (-£29m).
Historic	-7	Budgetary Factors	Fewer UK studies than originally planned (MPR02 -£1m; MPR03 (-£6m)
Historic	+87	Technical Factors	MPR 04: Re-examination of risk within the overall programme. (+£87m).
<b>Net Variation (£m)</b>	<b>-291</b>		

### B.3.1.2 Production, Sustainment & Follow on Development

Date	Variation (£m)	Category	Reason for Variation
March 2013	-29	Exchange Rate	MPR13: FOREX Risk approval now included for Main Gate 3. Variation to planning rate does not result in consumption of Risk pot (£-32M). 12/13 IY FOREX variation (£+3M).

## LIGHTNING II

March 2013	-10	Technical Factors	<p>MPR13: Increase in cost of Sustainment. MPR 13 based on contracting evidence vice United States Government (USG) estimate at MPR12 (£+24M). Concurrency development cost estimates based on improved USG data, reduced from \$14M to \$8M per aircraft (£-12M). Low Rate Initial Production 3 contract production cost increase due to correction of USG accounting approach (£+9M). The first two jets were grounded for a number of weeks due to technical issues resulting in reduced flying rates (£-9M). Revised estimates received from USG, with improved forecast for Tooling and Follow on Development common costs (£-5M, £-19M). Value of Low Rate Initial production 7 Long Lead production contract higher than estimated at MPR12 (£+2M). Production Overhead &amp; Admin common programme costs increased to reflect latest version of the USG MOU financial management plan (£+3M). Partner Reprogramming Lab common costs detailed in the MOU financial management plan superseded by development of the interim solution - cost now profiled under SDD approval (£-3M).</p>
April 2012	+3	Changed Capability Requirements	<p>MPR13: Flight Test Instrumentation (FTI) equipment ordered under LRIP5 contract to support operational test aircraft purchase under LRIP 7. Delay in buying equipment due to reversion to Carrier Variant and then, back to Short Take Off and Vertical Landing.</p>
Historic	-1	Exchange Rate	<p>MPR12 Exchange rate fluctuations through financial year 2011/12</p>

## LIGHTNING II

Historic	+26	Technical Factors	MPR12 The F35 programme runs concurrent development and production programmes to deliver advanced capability earlier than under legacy programmes. This variance represents the cost against the 3 UK aircraft purchased to date of design changes uncovered during production which require re-design work and implementation of modifications.
Historic	+12	Budgetary Factors	MPR12: Estimates for over target costs on the first two UK production contracts (+£8m). Diminished Manufacturing Supplies (+£2m). Decreased contract preparation costs (-£2M). Correction of levels of shared non-recurring programme costs (+£2M). Increased costs for aircraft and engine spares (+£2M).
Historic	-3	Changed Capability Requirements	MPR12 Due to the decision to change variant under the Strategic Defence & Security Review the requirement for Flight Test Instrumentation was removed from the third aircraft.
Historic	-11	Technical Factors	MPR12 The delayed delivery of the first UK aircraft has delayed commencement of UK flying operations from that per the original approval and therefore reduced the cost of flying in the relevant time period.
Historic	-40	Changed Capability Requirements	No operational conversion unit is now required in the early years and as such support costs in the early years of flying aircraft have been reduced.
Historic	-28	Exchange Rate	MPR2011: Exchange Rate variation (-£28m).
Historic	-11	Budgetary Factors	Improved estimate of production expenditure (-£12m). Delays in Long Lead expenditure (+£1m).
Historic	+31	Exchange Rate	MPR2010: Exchange Rate variation (+£31m).

## LIGHTNING II

Historic	-3	Budgetary Factors	Correction of Composite Share Ratio (UK contribution to shared partner costs) from MPR09 (-£3m).
Historic	-30	Procurement Processes	Improved understanding of production cost data related specifically to Operational Test & Evaluation aircraft (-£30m).
<b>Net Variation (£m)</b>	<b>-94</b>		

### B.3.2 Operational Impact of cost variations of Demonstration and Manufacture Phase

### B.4 Progress against approved Support / PFI Cost -N/A

### B.5 Expenditure to date

Description	Previous expenditure to 31 March 2012 (£m)	In-year expenditure (£m)	Total expenditure to 31 March 2013 (£m)
Assessment Phase	144	0	144
Demonstration and Manufacture Phase	1843	128	1971
Support Phase / PFI Cost	0	0	0
<b>Total Expenditure</b>	<b>1987</b>	<b>128</b>	<b>2115</b>

## C Section C: Timescale

### C.1 Length of the Assessment Phase

Project/Increment Title	Date of Initial Investment Decision Approval	Actual Date of Main Investment Decision Approval	Length of Assessment Phase
Joint Combat Aircraft	-	January 2001	-

### C.2 Actual Boundaries for In Service Date or Initial Operating Capability

### C.3 In-Service Date/Initial Operating Capability

#### C.3.1 Definition

Project/Increment Title	In-Service Date/Initial Operating Capability
Joint Combat Aircraft	Initial Operating Capability - 6 embarked aircraft at Readiness Level 2 (2-5 days notice to move) – to align with the US acquisition framework and definitions.

#### C.3.2 Progress against approved Dates - N/A

#### C.3.3 Timescale variation - N/A

### C.4. Full Operating Capability

#### C.4.1 Definition

Project/Increment Title	Full Operating Capability	Progress to date
Joint Combat Aircraft	Yet to be defined	UK MOD continue to move towards Main Gate 4 approval which will officially set the Initial Operating and Full Operating Capability dates per the approved incremental acquisition strategy.

### C.5. Support / PFI Contract - N/A

Rather than passing an Initial gate, Joint Combat Aircraft has used a tailored Main-Gate strategy. The In-Service Date approval will be sought as part of the incremental Production Approval strategy



## D Section D: Performance

### D.1. Sentinel Score

Project/ Increment Title	Current score	Last years score	Comments
Production Sustainment & Follow-on Development	92% Green	72% Amber	Improvement in Schedule performance based on Lockheed Martin data and Low Rate Initial Production 4 outcome. No formal options against Lightning II programme in ABC13, however draft options will be taken forward in ABC14 to formalise the reversion to Short Take Off and Vertical Landing.
Sustainment Development & Demonstration	92% Green	89% Green	No significant change to SDD which has a forecast completion date of 31 Oct 2017. Joint Strike Fighter PEO SDD will finish on time with no further allocated funding. UK continue to monitor potential for capability reductions at end of SDD.

### D.2.1 Performance against Defence Lines of Development

Line of Development	Description	Met / Forecast to be met (with risks)	Not met / Forecast not to be met
1. Equipment	Initial 10 Force Elements @ Readiness	Yes	
2. Training	Sufficient trained and available personnel	Yes (with risks)	
3. Logistics	Successful integration of Joint Strike Fighter support solution into UK and Joint Supply Chain	Yes (with risks)	
4. Infrastructure	Completion of Main Operating Base	Yes (with risks)	
5. Personnel	Sufficient suitable personnel available for training and support	Yes	
6. Doctrine	Doctrine in place	Yes	
7. Organisation	Suitable command structures in place to support US based Initial Operational Test and Evaluation and Operational Conversion Unit, as well as UK Main Operating Base, Queen Elizabeth Class Carriers and Forward Operating Base operations.	Yes	
8. Information	Integration of Lightning II into UK Ground Information Infrastructure.	Yes (with risks)	
Current forecast (with risks)		8 (4)	0
Last year's forecast (with risks)		8 (4)	0

## LIGHTNING II

### D.2.2 Defence Line of Development variation

Date	Defence Line of Development	Category	Reason for Variation
Historic	Training	Changed Capability Requirements	MPR13: Following the reversion decision there is reliance on US Marine Corps training system for initial throughput and training of early instructor pilots and squadron pilots. Lack of knowledge of 5th Generation Tactics, Training and Procedures, Low Observable aircraft employment and integration with 4th Generation aircraft and other defence assets may limit initial capability. 5th Generation is a new capability for the UK with little/no current suitably qualified personnel. The ability to assessing and maintain the Low Observable characteristics of the aircraft is essential to optimise capability. Lead time to generate suitably qualified personnel is estimated to be in the order of five years.
Historic	Infrastructure	Changed capability Requirements	MPR13: The location of the Lightning Main Operating Base has now been announced allowing the Lightning Basing project to progress to Initial Gate (Dec 13) and the assessment phase. Risk relates to aggressive timeline to meet first aircraft arrival from 1 Apr 2018.. Insufficient Maritime Intra-Theatre Lift to support Joint Combat Aircraft aboard Queen Elizabeth Class Carriers.
Historic	Logistics	Budgetary Factors	Lack of a through-life sustainment solution for Joint Strike Fighter. Insufficient Maritime Intra-Theatre Lift to support Joint Combat Aircraft aboard Queen Elizabeth Class Carriers.
Historic	Information	Technical Factors	UK Ground Information Infrastructure may be unable to support the requirements of Joint Combat Aircraft Information Systems

### D.3. Performance against Key Performance Measures

#### D.3.1 Lightning II

## LIGHTNING II

### D.3.1.1 Performance against Key Performance Measures

Key Performance Measure	Related Defence Lines of Development	Description	Met / Forecast to be met (with risks)	Not met / Forecast not to be met
1	Equipment / Training	Survivability	Yes	
2	Equipment / Information	Interoperability	Yes	
3	Equipment / Doctrine	Combat Radius	Yes	
4	Equipment	Short Take Off and Vertical Landing Recovery	Yes (with risks)	
5	Equipment	Mission Reliability	Yes (with risks)	
6	Logistics	Logistic Footprint	Yes (with risks)	
7	Doctrine	Sortie Generation	Yes	
Current forecast (with risks)			7 (3)	0
Last year's forecast (with risks)			7 (3)	0

### D.3.1.2 Key Performance Measures Variation

Date	Key Performance Measure	Category	Reason for Variation
March 2013	1	Technical Factors	The programme has made significant progress in understanding the technical challenge associated with signature management. Furthermore, Main Gate 4 introduces options for LOVF to be taken forward for approval in 2014.
March 2013	5	Technical Factors	Changed assessment based on current programme progress towards meeting both availability and mission reliability targets.
March 2013	6	Technical Factors	Ongoing absence of a long term Autonomic Logistic Support Solution is a key JSF programme risk
March 2013	2	Changed Capability Requirements	Work carried out over the last 12 months in the BAeS owned Validation Facility / Validation & Acceptance Laboratory have progressed the UK's understanding of Information Exchange Requirements, with links that could also further our knowledge and development of Defence Operational Training Capability (Air).

## LIGHTNING II

May 2012	4	Changed Capability Requirements	Previous Key Performance Measure (KPM) referred to Carrier Variant Recovery Mission performance and was reported in MPR12 as "at risk". Following the May 12 announcement to revert to the Short Take Off and Vertical Landing variant this KPM was switched back to Short Take Off and Vertical Landing recovery and replaced with the US Programme KPM measuring the Vertical Lift performance of the aircraft. (This reverses the historical record of removal of Short Take Off and Vertical Landing KPM post Strategic Defence & Security review10). The previous 'work-stop' on SRVL has been lifted and the development of the manoeuvre is now a core PT activity.
May 2012	3	Changed Capability Requirements	Previous KPM referred to Carrier Variant Combat Radius (590nm). Following the May 12 announcement to revert to the Short Take Off and Vertical Landing variant this KPM has been removed and replaced with the US Programme KPM for Short Take Off and Vertical Landing Combat Radius (450nm). Combat Radius now assessed against USMC F-35B HHH flight profile and is assessed as forecast to be met since the aircraft currently performing to the programme Combat Radius Key Performance Parameter.
Historic	2	Technical Factors	The programme manager assessed that the UK's aspirations for interoperability using the Carrier Variant of the Joint Strike Fighter were more complex than initially thought. This could lead to cost growth on the programme.
Historic	4	Changed Capability Requirements	The carrier landing speed of the Carrier Variant remains at the limit of the Joint Strike Fighter US Key Performance Parameter of 145kts and is a watch item.
Historic	1	Changed Capability Requirements	Concerns over ability for the UK to generate sufficient suitably qualified and equipped personnel in 5th Generation capability

## LIGHTNING II

Historic	3	Changed Capability Requirements	Previous report of "at risk" referred to concerns on the performance of the Short Take Off and Vertical Landing variant. Following the Strategic Defence & Security Review announcement to change procurement strategy and using US indices this is now assessed as "Forecast to be met".
Historic	4	Changed Capability Requirements	Previous KPM referred to Short Take Off and Vertical Landing Mission performance and was reported in MPR10 as "at risk". Following the Strategic Defence & Security Review announcement to change the procurement strategy to procure the Carrier Variant this KPM has been removed and replaced the US Programme KPM for Carrier Variant recovery measuring the landing speed onto the carrier.
Historic	3	Changed Capability Requirements	Previous report of "at risk" referred to concerns on the performance of the Short Take Off and Vertical Landing variant. Following the Strategic Defence & Security Review announcement to change procurement strategy and using US indices this is now assessed as "met forecast".
Historic	3	Technical Factors	Based on modelling and simulation results, the range capability for Joint Strike Fighter Short Take Off and Vertical Landing is approaching the specified target set for UK requirements based on UK Operating scenarios. However, this potential shortfall is based primarily on modelling with very limited experience in actual flight test. Further flight testing is planned to gain an accurate assessment of this potential problem and mitigation actions will be developed accordingly.
Historic	6	Technical Factors	This KUR represents a measure of the amount of support equipment required to allow Joint Combat Aircraft to be deployed on operations. As the Joint Strike Fighter system design has matured, the amount and design of equipment required for deployment in support of Joint Combat Aircraft has reduced to below the contractually specified requirement.

## LIGHTNING II

Historic	4	Technical Factors	The Short Take Off element of KUR 04 (based on Invincible Class Carriers not Future Aircraft Carrier) will be changed in the ongoing KUR review, although current projections indicate robust Short Take Off performance from Future Aircraft Carrier. Weight challenges and propulsion system integration issues place the Vertical Landing Bring Back element of KUR 04 at increased risk; the Integrated Project Team has commenced programme action to amend the System Development and Demonstration contract to satisfy a requirement to undertake Ship-borne Rolling Vertical Landing.
Historic	6	Technical Factors	Subject to intensive programme action by Prime Contractor. Funded design options that significantly reduce risk have been identified and further changes will be considered in due course.
Historic	4	Changed Capability Requirements	Previous Key Performance Measure referred to Short Take Off and Vertical Landing Mission performance and was reported in MPR10 as "at risk". Following the Strategic Defence & Security Review announcement to change the procurement strategy to procure the Carrier Variant this Key Performance Measure has been removed and replaced the US Programme Key Performance Measure for Carrier Variant recovery measuring the landing speed onto the carrier.
Historic	3	Technical Factors	Based on modelling and simulation results, the range capability for Joint Strike Fighter Short Take Off and Vertical Landing is approaching the specified target set for UK requirements based on UK Operating scenarios. However, this potential shortfall is based primarily on modelling with very limited experience in actual flight test. Further flight testing is planned to gain an accurate assessment of this potential problem and mitigation actions will be developed accordingly.

## LIGHTNING II

Historic	6	Technical Factors	This KUR represents a measure of the amount of support equipment required to allow Joint Combat Aircraft to be deployed on operations. As the Joint Strike Fighter system design has matured, the amount and design of equipment required for deployment in support of Joint Combat Aircraft has reduced to below the contractually specified requirement.
Historic	4	Technical Factors	The Short Take Off element of KUR 04 (based on Invincible Class Carriers not Future Aircraft Carrier) will be changed in the ongoing KUR review, although current projections indicate robust Short Take Off performance from Future Aircraft Carrier. Weight challenges and propulsion system integration issues place the Vertical Landing Bring Back element of KUR 04 at increased risk; the Integrated Project Team has commenced programme action to amend the System Development and Demonstration contract to satisfy a requirement to undertake Ship-borne Rolling Vertical Landing.
Historic	6	Technical Factors	Subject to intensive programme action by Prime Contractor. Funded design options that significantly reduce risk have been identified and further changes will be considered in due course.

### D.3.1.3 Operational Impact of variation

Date	Key Performance Measure	Forecast	Operational impact of variation
March 2013	5	At Risk	The inability to achieve mission reliability is a watch item, since it will have an impact on achievement of desired Sortie Generation Rate and Mission Success.
March 2013	2	To be Met	The reversion to Short Take Off and Vertical Landing makes the UK interoperable with USMC / Italian F-35B with potential for joint operations from Queen Elizabeth Class Carriers, subject to further work to address specific weapon clearances and operational limitations and is now regarded as 'To be met'.

## LIGHTNING II

March 2013	3	To be Met	The Short Take Off and Vertical Landing variant currently meets the Joint Strike Fighter programme KPP for Combat Radius so this measure is now regarded as 'To be met'.
May 2012	4	At Risk	The full solution to deliver a Shipborne Rolling Vertical recovery manoeuvre still remains immature. Simulator / Trial work scheduled ahead of First of Class Flying trials on Queen Elizabeth Class Carriers in 2018.
Historic	2	At Risk	Reduced interoperability may limit opportunities for allied aircraft to operate from the decks of Queen Elizabeth Class Carriers.
Historic	1	At Risk	Action taken by Community of Interest 1 community and Air Command to engage with US Air Force to understand support requirements to maintain Low Observable characteristics will address this KPM. US National Disclosure Policy and UK access to required data remain issues to overcome.
Historic	4	At Risk	Joint Strike Fighter programme development action will address this Key Performance Measure
Historic	3	To be Met	As a result of the decision of purchase the Carrier Variant this measure is now regarded as to be met.
Historic	4	To be Met	As a result of the decision of purchase the Carrier Variant this measure is now regarded as to be met.
Historic	6	To be Met	As a result of the 2010 Strategic Defence & Security Review decision to purchase the Carrier Variant, this measure is now assessed as 'To be met'
Historic	3	At Risk	Inability to strike some targets at the extreme range capability of aircraft and weapon system.
Historic	4	At Risk	Severely limits the operational effectiveness of the platform and result in high waste of weapons



<b>Project Title</b>		
Military Afloat Reach Sustainability		
<b>Team Responsible</b>		
Afloat Support		
<b>Senior Responsible Owner</b>	<b>Date Appointed</b>	<b>Planned end date</b>
Brigadier John Brittain	March 2011	November 2012
Commodore William Walworth	November 2012	September 2013
<b>Project/Increment Name</b>		
<b>Current Status of Projects / Increments</b>		
Military Afloat Reach and Sustainability	Pre-Main Investment Decision	
Military Afloat Reach and Sustainability Tanker	Post-Main Investment Decision	
Military Afloat Reach and Sustainability Fleet Solid Support Ships	Pre-Main Investment Decision	

## **A. Section A: The Project**

### **A.1 The Requirement**

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

The Military Afloat Reach and Sustainability capability is designed to support three distinct types of maritime task group: Carrier Strike, Littoral Manoeuvre and Maritime Security. The demands of each differ significantly, but are all composed of three common elements:

Bulk Consumables - fuel and potable water which are transferred by hose.

Non-bulk consumables - Food, ammunition and general stores. Solid cargo which is transferred in unit loads, either ship to ship or ship to shore.

Forward Aviation Support - The provision of helicopter basing and operating facilities to accommodate some of the task group's aircraft or to provide operational flexibility during a campaign.

The Military Afloat Reach and Sustainability capability will be in service into the 2050s and will be designed to accommodate the requirements of current and known future force structures, including Type 45, the Queen Elizabeth Class aircraft carriers, Joint Combat Aircraft and Type 26 Global Combat Ship. Tankers will provide bulk consumables and forward aviation support to the maritime task group. Solid Support Ships, previously referred to as Fleet Solid Support and Amphibious Combat Stores ship, will provide non bulk consumables and forward aviation support to the maritime task group.

The capability to be provided is essential to the evolving logistic support needs of the Royal Navy. The proposed procurement profile of Military Afloat Reach and Sustainability ships has been matched to this need, the initial focus being on the double-hulled Tankers which are required in order to comply with International Maritime environmental standards.

### **A.2 The Assessment Phase**

The Military Afloat Reach and Sustainability programme received formal approval to enter its Assessment Phase in July 2005 based on an Alliance strategy. Following a review of the Procurement Strategy in 2007, the Alliance Strategy was terminated. A new strategy, based on a 'Competitive and Adaptive' approach, was approved and reflected the need to procure the Tanker element of the programme separately in order to comply with International Maritime legislation. In addition approval was granted for the designation and delegation of the Heavy Replenishment at Sea project as a separate Category D project. Solid Support ships will now form a separate strategy. An open international competition was launched for the design and build of up to six Fleet Tankers but was cancelled following the Department's examination of its equipment programme in 2008. A review of the requirements and procurement strategy was undertaken which concluded that a more open procurement strategy to consider a range of possible solutions and which take account of current market conditions is more likely to secure best value for money for the MOD. On this basis a new international competition for up to six Military Afloat Reach and Sustainability Tankers was launched in October 2009 which was conducted using the Competitive Dialogue process. Subsequently the requirement was reduced from six ships to four as a result of the Strategic Defence and Security Review.

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

## MILITARY AFLOAT REACH AND SUSTAINABILITY

The current approved budget for the Military Afloat Reach and Sustainability Assessment Phase is £44m and the current forecast for the Assessment Phase £17m. Following Planning Round 12 the Tanker element of the programme was considered to be part of the Core Equipment Programme. The Fleet Solid Support element of the programme will be considered as a Non Core Equipment Programme which will require further Departmental review before further work is undertaken and therefore no further forecast Assessment Phase expenditure is included.

### A.3 Project History

The Main Gate Business Case for the Military Afloat Reach and Sustainability Tankers was approved by the Investment Approvals Committee in October 2011. The Performance Cost and Time envelope put forward was based on available indicative information the approval of which enabled the Department to proceed to the final bid stage of the competition. Further Departmental and HM Treasury approval to proceed to contract award was received in January 2012 and Daewoo Shipbuilding and Marine Engineering was named as the preferred bidder in February 2012. The contract was placed in March 2012.

### A.4 In-year Progress

In accordance with the Department's approvals process the final Performance Cost and Time was approved in December 2012 providing the project's baseline. In June 2012 Her Majesty the Queen approved the names of the Tankers confirmed to be RFA TIDESPRIING, RFA TIDERACE, RFA TIDESURGE, RFA TIDEFORCE. The Preliminary Design Review was completed in July 2012. Progress has been made towards design transition from BMT Defence Services' basic design phase to Daewoo Shipbuilding and Marine Engineering detailed design phase which is due to complete in Summer 2013.

### A.5 Capability Risks

The Military Afloat Reach and Sustainability programme will deliver future Royal Fleet Auxiliary ships, replacing the current capability, to support the future Royal Navy. Without the support of these ships, the ability of the Royal Navy to carry out global operations will be severely restricted. Double hulled naval tankers are required as soon as is practicable to comply with international maritime legislation; the Royal Fleet Auxiliary currently operates two double hulled tankers and four single hulled tankers under exemption from legislation. The number of ships with single hulled tanks was reduced from six to four in 2011 as a result of the Strategic Defence and Security Review. All Royal Fleet Auxiliary ships are maintained to UK regulatory and classifications standards; should this certification and classification be withdrawn for single hulled tankers, their operation would cease immediately leading to severe operational limitations on the ability of the Royal Navy to operate worldwide and in anything but the most benign environments. Foreign nations have already begun to deny port access for single hulled tankers and this situation will be exacerbated as a consequence of any environmental incident, MOD shipping related or not. Programming for operations takes account of environmental restrictions as well as limitations on ships due to their material state; for example some of the older ships are unable to operate in colder climates due to the steel in their ageing hulls becoming brittle. These ships will be replaced as the double hulled tanker element of the Military Afloat Reach and Sustainability Programme is delivered.

### A.6 Associated Projects - N/A

### A.7 Procurement Strategy

Project / Increment Title	Contractor	Contract Scope	Contract Type	Procurement Route
Military Afloat Reach and Sustainability Tanker	Daewoo Shipbuilding and Marine Engineering	Demonstration and Manufacture	Firm Price	Competitive - International

## MILITARY AFLOAT REACH AND SUSTAINABILITY

### A.8 Support Strategy

Description				
The contract with Daewoo Shipbuilding and Marine Engineering includes two years initial provisioning including spares and training for each of the ships. The in service support support will be subject to competition.				
Support Title	Contractor	Contract Scope	Contract Type	Procurement Route
-	-	-	-	-

## MILITARY AFLOAT REACH AND SUSTAINABILITY

### **B Section B: Cost**

#### **B.1 Cost of the Assessment Phase**

Project/ Increment Title	Approved Cost (£m)	Actual / Forecast Cost (£m)	Variation (£m)	Approved cost as a proportion of total estimated procurement expenditure (%)	Actual Cost as a proportion of total estimated procurement expenditure (%)
Military Afloat Reach and Sustainability	44	17	-27	7%	3%
<b>Total (£m)</b>	<b>44</b>	<b>17</b>	<b>-27</b>	<b>7%</b>	<b>3%</b>

#### **B.2 Actual cost boundaries for Demonstration and Manufacture Phase / PFI**

Project/Increment Title	Lowest Approved (£m)	Budgeted For (£m)	Highest Approved (£m)
Military Afloat Reach and Sustainability Tanker	-	596	-

#### **B.3 Cost of the Demonstration and Manufacture Phase**

Project/Increment Title	Budgeted For Cost (£m)	Forecast Cost (£m)	Variation (+/- £m)	In-Year Variation (+/- £m)
Military Afloat Reach and Sustainability Tanker	596	595	-1	-1
<b>Total (£m)</b>	<b>596</b>	<b>595</b>	<b>-1</b>	<b>-1</b>

#### **B.3.1 Cost variation against approved cost of the Demonstration and Manufacture Phase**

##### **B.3.1.1 Military Afloat Reach and Sustainability Tanker**

Date	Variation (£m)	Category	Reason for Variation
December 2012	-1	Technical Factors	Gradual reduction in elements of risk
<b>Net Variation (£m)</b>	<b>-1</b>		

#### **B.3.2 Operational Impact of cost variations of Demonstration and Manufacture Phase - N/A**

#### **B.4 Progress against approved Support / PFI Cost - N/A**

#### **B.5 Expenditure to date**

Description	Previous expenditure to 31 March 2012 (£m)	In-year expenditure (£m)	Total expenditure to 31 March 2013 (£m)
Assessment Phase	17	0	17
Demonstration and Manufacture Phase	11	52	63
Support Phase / PFI Cost	0	0	0
<b>Total Expenditure</b>	<b>28</b>	<b>52</b>	<b>80</b>

## **MILITARY AFLOAT REACH AND SUSTAINABILITY**

The forecast cost of the Assessment Phase reflects the expenditure up to the Main Investment Decision for Military Afloat Reach & Sustainability Tankers and does not include any further expenditure on the Fleet Solid Support ships which are not currently in the core equipment programme.

## C Section C: Timescale

### C.1 Length of the Assessment Phase

Project/Increment Title	Date of Initial Investment Decision Approval	Actual Date of Main Investment Decision Approval	Length of Assessment Phase
Military Afloat Reach and Sustainability	July 2005	January 2012	78

### C.2 Actual Boundaries for In Service Date or Initial Operating Capability

Project/Increment Title	Earliest Approved	Budgeted For	Latest Approved
Military Afloat Reach and Sustainability Tanker	-	October 2016	-

### C.3 In-Service Date/Initial Operating Capability

#### C.3.1 Definition

Project/Increment Title	In-Service Date/Initial Operating Capability
Military Afloat Reach and Sustainability Tanker	The date when the Sponsor accepts the MARS Tanker as being operationally capable to its fullest extent; OR the date when the Sponsor agrees with the User that the MARS Tanker has achieved operational capability in an agreed minimum effective deployable form.

#### C.3.2 Progress against approved Dates

Project/Increment Title	Approved Date	Actual / Forecast Date	Variation (+/- months)	In-Year Variation (+/- months)
Military Afloat Reach and Sustainability Tanker	October 2016	October 2016	0	0

#### C.3.3 Timescale variation - N/A

#### C.3.4 Other costs / savings resulting from timescale variation - N/A

#### C.3.5 Operational Impact of In-Service Date/Initial Operating Capability variation - N/A

### C.4. Full Operating Capability

#### C.4.1 Definition

Project/Increment Title	Full Operating Capability	Progress to date
Military Afloat Reach and Sustainability Tanker	Declared when all ships of class are accepted into service	On track

### C.5. Support / PFI Contract - N/A

## D Section D: Performance

### D.1. Sentinel Score

Current score	Last years score	Comments
97%	86%	-

### D.2.1 Performance against Defence Lines of Development

Line of Development	Description	Met / Forecast to be met (with risks)	Not met / Forecast not to be met
1. Equipment	Design and Manufacture phases of MARS Tanker to the point of declaring acceptance into service	Yes (with risks)	
2. Training	Establishment of a timely training plan to support MARS Tanker within the directed resources.	Yes (with risks)	
3. Logistics	Through-life support plan and Integrated Logistics Support plan.	Yes (with risks)	
4. Infrastructure	Readiness of UK and overseas port and shoreside infrastructure	Yes	
5. Personnel	Timely establishment of Front Line Command manpower.	Yes (with risks)	
6. Doctrine	Doctrinal direction underpins safe and effective introduction into service	Yes	
7. Organisation	Policy underpins safe and effective introduction into service	Yes	
8. Information	Fully accredited C4I Information Systems	Yes	
Current forecast (with risks)		8 (4)	0
Last year's forecast (with risks)		N/A	N/A

### D.2.2 Defence Line of Development variation

Date	Defence Line of Development	Category	Reason for Variation
March 2013	Equipment	Technical Factors	Design and Manufacture of MARS Tankers. There is risk in the transition from outline design to detailed design work owing to tight timescale and overseas build option. If realised this risk could cause a cost or time overrun.



## MILITARY AFLOAT REACH AND SUSTAINABILITY

March 2013	Training	Technical Factors	Establishment of a timely training plan to support MARS Tanker within the dedicated resources. There is a risk that a sufficiently robust training plan is not developed in time to support acceptance from contract, of the early vessels, due to the delay in completion of Integrated Logistics Support tasks (Training Needs Analysis). The risk could lead to a delay in acceptance of the vessels and potential cost increase.
March 2013	Logistics	Procurement Processes	Through life support plan and Integrated Logistics Support solution. There is a risk that the through life support plan will not be developed, to sufficient maturity, to provide anticipated through life savings thus increasing the cost of the vessels. This is due to contractual confusion over responsibilities and requirements for Integrated Logistics Support.
March 2013	Personnel	Technical Factors	Timely establishment of Front Line Command manpower. There is a risk that insufficient suitably qualified manpower will be available to accept delivery and support manning of the vessels. This is due to a shortfall in general recruitment numbers and unforecast levels of outflow together with uncertainty in the training burden

### D.3. Performance against Key Performance Measures

#### D.3.1 Military Afloat Reach and Sustainability Tanker

##### D.3.1.1 Performance against Key Performance Measures

Key Performance Measure	Related Defence Lines of Development	Description	Met / Forecast to be met (with risks)	Not met / Forecast not to be met
1	Logistics	Cargo Capacity. The platform shall store *** of useable Class II fuel.	Yes	

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2	Logistics	Cargo Embarkation. The Platform shall embark cargo Bulk Logistics Materiel iaw OCIMF Publication Recommendations for Oil Tanker Manifolds and Associated Equipment 4th Edition 1991	Yes	
3	Equipment	Replenishment at Sea Capability. The platform shall deliver Bulk Logistics Materiel whilst underway and making way at *** knots through the water.	Yes	
4	Logistics	Replenishment Tempo. The platform shall deliver bulk logistics material to 3 exchange points concurrently.	Yes	
5	Doctrine	Platform Speed. The platform shall propel itself at an Upper Sustained Speed of *** knots	Yes	
6	Doctrine	Platform Endurance. The platform shall have an endurance of *** nautical miles at a sustained speed of *** knots	Yes	
7	Doctrine	Platform Equipment Performance. The platform shall deliver Core MARS Tanker Platform functions in sea temperatures up to ***°C.	Yes	

### MILITARY AFLOAT REACH AND SUSTAINABILITY

8	Doctrine	Survivability. The platform shall enable AWW self defence.	Yes	
9	Information	CIS Interoperability. The platform shall exchange information iaw MoD CIS policy as recorded in the JSP 600 series of Directions.	Yes	
10	Doctrine	Physical Interoperability. The MARS system shall provide Logistics sustainment to UK/US and NATO Military operations.	Yes	
11	Logistics	Aviation. The platform shall conduct the launch and recovery of rotorcraft (Aircraft Types Merlin Mk1 or Mk2, SCMR & Chinook).	Yes	
Current forecast (with risks)			11 (0)	0
Last year's forecast (with risks)			N/A	N/A

**D.3.1.2 Key Performance Measures Variation - N/A**

**D.3.1.3 Operational Impact of variation - N/A**

**D.4 Support Contract - N/A**

<b>Project Title</b>		
Queen Elizabeth Class Aircraft Carriers		
<b>Team Responsible</b>		
Ship Acquisition		
<b>Senior Responsible Owner</b>	<b>Date Appointed</b>	<b>Planned end date</b>
Cdre Alex Burton	24-Sep-12	31-03-13
RAdm Russ Harding	01-Apr-13	
<b>Project/Increment Name</b>	<b>Current Status of Projects / Increments</b>	
Queen Elizabeth Class Aircraft Carrier Conversion (cancelled May 12)	Post-Main Investment Decision Pre-Main Investment Decision	

## A. Section A: The Project

### A.1 The Requirement

The requirement for the Queen Elizabeth Class was endorsed in the 1998 Strategic Defence Review which identified a continuing need for rapidly deployable forces with the reach and self-sufficiency to act independently of host-nation support. The Strategic Defence Review concluded that the ability to deploy offensive air power would be central to future force projection operations, with carriers able to operate the largest possible range of aircraft in the widest possible range of roles. This analysis was further endorsed by the New Chapter work of 2002 and the Defence White Paper in December 2003. The current Invincible Class of carriers was designed for Cold War Anti-Submarine Warfare operations. With helicopters and a limited air defence capability provided by a relatively small number of embarked Sea Harriers, it was judged that this capability would no longer meet future United Kingdom requirements. It was therefore decided to replace the Invincible Class with two larger and more capable aircraft carriers. The class's offensive air power will be provided primarily by the Joint Combat Aircraft. The Joint Force Air Group is an air group comprising a mix of aircraft, tailored to the mission need; it will typically consist of both fixed and rotary-winged aircraft including joint air assets e.g. Joint Combat Aircraft.

The Strategic Defence & Security Review confirmed the requirement for a Carrier Strike capability as part of MOD's Future Force 2020. In order to deliver overall savings to Defence, it concluded that the Carrier Strike component would be based around the Carrier Variant of the Joint Strike Fighter which would fly from an operational Queen Elizabeth Class carrier converted to a Carrier Variant configuration (fitted with catapults and arrestor gear). The Strategic Defence & Security Review confirmed that both carriers should be built, with one to be operational and the second kept in extended readiness or sold. Following concerns over the escalating cost of the catapults and arrestor gear, in May 2012 the decision was made to revert back to a Short Take Off and Landing solution for both ships in Class. The decision to run one operational carrier and keep one in extended readiness was retained, a decision that is to be reviewed in Strategic Defence & Security Review 2015. The current schedule will see the first in class (HMS QUEEN ELIZABETH) Vessel Acceptance in 2017, First of Class Lightning II Flying Trails in 2018, which if successful will lead to Carrier Strike Initial Operating Capability declaration in 2020.

### A.2 The Assessment Phase

The Class received Initial Gate approval in December 1998 and Invitations to Tender were issued in January 1999. Following tender evaluation, competitive firm price contracts for the Assessment Phase, each potentially worth some £30m, were awarded to BAE Systems and Thales UK in November 1999. Initially, the Assessment Phase was broken down into two stages. The first involved the examination of several carrier designs, and helped inform the decision in January 2001 to select the United States Joint Strike Fighter as the option with best potential to meet the Joint Combat Aircraft requirement. Stage 1 completed in June 2001, following which proposals from the contractors for Stage 2 were considered, together with an assessment of their views on the level of work needed to adequately de-risk the programme. After careful consideration, the conclusion was reached that the original two-stage approach no longer offered value for money and the Assessment Phase strategy was changed.

The competitive second stage was revised and shortened (completing in November 2002) and enabled the competing contractors to concentrate on refining their designs and taking key trade-off decisions. An innovative Continuous Assessment process was used throughout to evaluate the contractors' performance which led to the conclusion that an alliance approach involving BAE Systems, Thales UK and the Department represented the best approach to Future Aircraft Carrier. The innovative Alliance procurement strategy enabled the full exploitation of the resources and strengths of the alliance participants with the shared objective of improving on agreed performance targets and was announced in January 2003. A third stage of assessment was therefore taken forward on this basis to further increase the maturity of the design and determine the alliancing strategy for Future Aircraft Carrier. Stage 3 completed in March 2004.

In July 2004, the Assessment Phase was extended into Stage 4 to further mature the design and carry out risk reduction work, to ensure that the best technical & procurement solution was achieved. Alliancing principles were agreed with BAE Systems and Thales UK and further developed with the selection in February 2005 of Kellogg, Brown & Root UK Ltd as an additional participant in the Alliance. The timescale for completing the design and risk reduction work was further extended in August 2005 (into Stage 5) although this did not result in any additional cost to the programme. The Assessment Phase completed at the end of January 2006 and was finalised in November 2010, on receipt of Final Cost Certificates, at a revised total cost of £288m.

### A.3 Project History

Following direction from the Investment Approvals Board, the project has adopted an incremental approach to Main Gate approval with the Demonstration and Manufacturing Phases being divided into two sequential Main Gate approval points. The first phase (Demonstration), which included expanding the alliance to include Babcock Engineering Services and VT Shipbuilding, was approved by the Investment Approvals Board and Treasury in December 2005. The total cost of the Demonstration Phase (excluding Indirect Resource Departmental Expenditure Limit, but including non recoverable VAT) was approved at £297m (not to exceed).

The Demonstration Phase activity completed in mid 2008 with total expenditure to 31st March 2011 of £266m. The second and final Main Gate approval, to proceed with the Manufacturing Phase of the project was announced by Secretary of State on 25th July 2007 at a not to exceed cost of £3900m including the capitalised Assessment Phase costs and Demonstration Phase costs.

In March 2006, the UK agreed a Memorandum of Understanding that provides for the supply to France of a common baseline design data pack to enable French industry to bid for the design, manufacture and support of one Future Aircraft Carrier (France). France has paid an initial entry fee and contributed to the costs of the UK Demonstration Phase.

At the time of the Main Gate in 2007, the build strategy called for one of the Lower Blocks to be constructed at the BAE Systems Submarines yard in Barrow-In-Furness. BAE Systems needed to build a new facility - the Central Assembly Shop - in order to accommodate the construction of the block. It was envisaged at the time that the facility would also be beneficial to the future submarine programme. MOD authorised BAE Systems to begin site work in June 2007. In July 2008 the Alliance Management Board agreed to the reallocation of Lower Block 3 to the A&P Tyne yard on a 'best for project' basis and in December 2008 the Aircraft Carrier Alliance formally instructed BAE Systems to terminate the contract and fully justify any incurred costs. It was hoped that the work carried out in Barrow would be of use to the future submarine programme, however this did not come to fruition which led to a write-off of £8m in Financial Year 2009-10.

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

On 11 December 2008, Ministers announced the outcome of MOD's Equipment Examination including the intention to re-profile the Queen Elizabeth Class project to meet near term priorities and improve the scope of alignment with the Joint Combat Aircraft programme. The re-profiling measure removed £450M from the next four years and delayed In-Service Dates of the two carriers by 1 and 2 years respectively. The cost estimates of the impact of the Examination on the project were approved by the MOD in February 2010.

The first cut of steel took place in July 2009 at the Govan shipyard in Glasgow, and manufacture subsequently conducted in six UK shipyards: Babcock Rosyth and Appledore, BAE System Surface Ships, Govan, Portsmouth, Cammell Laird Birkenhead and A&P Tyne.

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

At the close of the Financial Year in March 2010 the bow of the Queen Elizabeth departed from Appledore for Rosyth.

The Aircraft Carrier Alliance acknowledged that there was a requirement to reduce costs at the time of contract award on the basis that concerted management action in the early years of the project would allow this to reduce. In the event, the disruption caused by initial recosting activity and then the Equipment Examination prevented successful delivery of the originally planned cost reduction - as this would not be achieved, MoD considered it prudent to formally recognise this in its revised estimate.

During 2010 Diesel Generators were installed in Lower Block 02 (Portsmouth) and in March 2011 in Lower Block 04 (Govan) on HMS Queen Elizabeth. In early 2011, the Goliath Crane, used to assemble the carriers, arrived at Rosyth.

## QUEEN ELIZABETH CLASS AIRCRAFT CARRIERS

The Investment Approvals Board approved the Queen Elizabeth Class Final Target Cost for the pre-Strategic Defence & Security Review programme on 31 January 2011 to £5242m. Long-lead equipments for HMS Prince of Wales have been ordered over the last four years, with many of the major components already in-build or delivered (e.g. Diesel Generators).

In October 2010, the Strategic Defence & Security Review concluded that one carrier would be fitted with Catapults and Arrestor gear to operate the F35C Carrier Variant of the Joint Strike Fighter. The other carrier would not be converted and placed into Extended Readiness. An 18 month investigation into how best to achieve this formally began in Spring 2011 with assistance from the US. As this work proceeded, it became clear the the cost of conversion, and the time needed, was far greater than initially thought. As a result, it was announced in May 2012 that the carriers would revert to their original Short Take Off and Landing configuration and operate the F-35B Joint Strike Fighter. The National Audit Office have separately examined the 2010 and 2012 decisions.

The Goliath Crane was delivered to Rosyth in March 2011. It was assembled and tested over the next two months and was commissioned (ready for use) in June 2011 with steelwork beginning on HMS PRINCE OF WALES's Lower Block 03 at Govan, with a formal steel cut ceremony held on 26 May 2011.

Lower Block 03 for HMS Queen Elizabeth Class arrived at Rosyth No.1 Dock in early September 2011 from Govan, with work to join Centre Block 03 (Tyne) to Lower Block 03 later in the month marking the start of the assembly phase on the project. Over the next few months, Sponsons 03-06 were attached, with the final Sponson (05) join completing in February 2012.

### A.4 In-year Progress

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

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

The ACA formally began rebaselining the QEC programme in July 2012 and provided their initial findings to the MOD-Chaired Alliance Management Board (AMB) in November 2012. Faced with a significant level of cost growth, MOD began detailed discussions with the ACA, with the aim of rebalancing the risk/reward mechanism. These continued throughout the first half of 2013, culminating in a formal proposal from the ACA on 19 July 2013. On receipt of this proposal, the MOD Cost Assurance and Analysis Service (CAAS) were commissioned to undertake further investigations, which once again highlighted a series of challenges, or areas where cost could be reduced. MOD 2\* and 3\* led sessions were convened to ensure appropriate rigour had been applied in reviewing the ACA proposal and to agree resolution. Through this mechanism some £252M of costs were driven out prior to final negotiations. During the negotiations in late October 2013, a further reduction to the target cost of £96m was agreed, resulting in a total cost reduction of £348m compared to the ACA's July 13 proposal position. Subsequently, a Heads of Terms agreement was signed between MOD and the ACA on 6 Nov 13, which set out the commercial principals covering the agreement and work is now underway to obtain programme re-approval from the MOD Approving Authorities. A revised contract will be signed once this has been achieved.

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

## QUEEN ELIZABETH CLASS AIRCRAFT CARRIERS

The Major Projects Report 2013 covers the 2012-2013 financial year for all projects. The report uses financial data from the Equipment Plan 2013-2023 which was formally agreed by Secretary of State in March 2013. Although, the negotiations for the Queen Elizabeth Class aircraft carriers were concluded on 6th November 2013 (outside of the MPR2013 reporting period), the Department had allocated a budget for the additional cost in its Equipment Plan 2013-2023.

Until the carrier deal was agreed, the NAO could not report on the Department's budgeted total forecast cost of the carriers due to the ongoing commercial negotiations. As these negotiations have now been completed, the total forecast cost of the carriers can now be disclosed in the report. The cost disclosed is consistent with the Secretary of State's announcement on 6 November 2013 and is reflected in the Department's financial plans.

Although the Department's budgeted position in March 2013 and the final negotiated position in November 2013 are different, reporting the budgeted position in March 2013 would be out of date. Therefore, the report provides an enhanced position than would otherwise be the case, with the cost variation that has resulted from the deal reported as if it was a 2012-2013 in-year variation. All other project costs remain correct as at 31st March 2013.

### A.5 Capability Risks

The Class is, together with the Lightning II F35B and Merlin Mk2 CROWSNEST and deemed the Carrier Strike Change Programme, an essential element of the Carrier Enabled Power Projection Programme: it exploits the attributes of maritime, air and land forces to deliver or threaten action across three environments. Specifically for Queen Elizabeth Class, the Strategic Defence & Security Review 2010 states 'the Queen Elizabeth Class carrier, operating as part of a Response Force Task Group will be a key basing option for the projection of air and amphibious power in support of national influence and future complex or simple non-enduring intervention operations'.

Lightning II Maritime capability depends on the Queen Elizabeth Class to achieve Carrier Strike.

Strategic Defence & Security Review 2010 further stated that "The current, limited carrier-strike capability will be retired" because "short-range Harriers ... would provide only a very limited coercive capability. We judge it unlikely that this would be sufficiently useful in the latter half of the decade to be a cost-effective use of defence resources". This will create a capability gap until a Queen Elizabeth Class aircraft carrier has completed integration with the first operational squadron of Lightning II aircraft.

Strategic Defence & Security Review 2010 accepted a capability gap in the operation of fixed wing aircraft from 2011 to 2020. This has resulted in a risk to the re-generation of this element of Carrier Enabled Power Projection, which is being addressed by work across multiple Defence Lines of Development, including the analysis of the experience gained from the US and French Navies.

The reduced availability of the Queen Elizabeth Class platform as a result of the Strategic Defence & Security Review 2010 decision to operate a single carrier may (depending on future decisions) reduce the availability of this element of Carrier Enabled Power Projection.

Queen Elizabeth Class is not fully funded to deliver the Helicopter Carrying role in support of Littoral Manoeuvre and the design and safety clearance in its amphibious helicopter support capability is currently limited.

### A.6 Associated Projects

Title of Associated Project	Forecast In Service Date/ Initial Operating Capability	Approval Status
Queen Elizabeth Class Infrastructure Project	2016	Pre-Main Gate
Defence Information	2014	Post Main Gate



### QUEEN ELIZABETH CLASS AIRCRAFT CARRIERS

Medium Range Radar	2012	Post Main Gate
Queen Elizabeth Class In Service Support Solution	2016	Pre-Main Gate

#### A.7 Procurement Strategy

Project / Increment Title	Contractor	Contract Scope	Contract Type	Procurement Route
Queen Elizabeth Class Aircraft Carrier	BAE Systems Insyte / Thales / Kellogg Brown & Root / VT Shipbuilding / Babcock Support Services / BAE System Marine	Demonstration to Manufacture	Target Cost Incentive Fee (subsequently, from July 2007 the Engineering Transition Stage as cost reimbursement)	Non-Competitive - UK
	BAE Surface Ships/ Mission Systems/ Babcock Marine/ Thales/ BAE Barrow	Manufacture to In Service	Target Cost Incentive Fee	Non-Competitive - UK

#### A.8 Support Strategy

Description				
<p>Integrated Logistic Support deliverables are required to enable safe and effective operation and support for the Queen Elizabeth Class. These deliverables are being procured in the main through the manufacturing contract and will be delivered prior to contract acceptance of the first platform.</p> <p>The Carrier In-Service Support Solution project aims to provide affordable, value for money, in-service engineering and spares logistic support from contract acceptance. It is split into 4 key phases; assessment, development, mobilisation and delivery.</p> <p>The Support Assessment Phase is now complete and approval to commence the Support Development Phase will be sought in Feb 14 that will produce a detailed design solution for Stage 1 support. In 2015 Main Gate approval will be sought to mobilise and deliver Stage 1 support to HMS Queen Elizabeth from QEC Logistics Support Date of Dec 2016. Stage 1 support solution is coherent with both the Ships Operating Centre support strategy and the Navy Command Support vision.</p>				
Support Title	Contractor	Contract Scope	Contract Type	Procurement Route
Support Assessment Phase	Aircraft Carrier Alliance - Industrial Participants	Assessment Phase in increments	Cost reimbursment moving to Target Cost	Non-Competitive - UK

## B Section B: Cost

### B.1 Cost of the Assessment Phase

Project/ Increment Title	Approved Cost (£m)	Actual / Forecast Cost (£m)	Variation (£m)	Approved cost as a proportion of total estimated procurement expenditure (%)	Actual Cost as a proportion of total estimated procurement expenditure (%)
Queen Elizabeth Class Aircraft Carrier	120	288	+168	2%	5%
Conversion (cancelled May 12)	56	55	-1	-	-
<b>Total (£m)</b>	<b>176</b>	<b>343</b>	<b>+167</b>	<b>3%</b>	<b>6%</b>

### B.2 Actual cost boundaries for Demonstration and Manufacture Phase / PFI

Project/Increment Title	Lowest Approved (£m)	Budgeted For (£m)	Highest Approved (£m)
Queen Elizabeth Class Aircraft Carrier	3191	3541	3791

### B.3 Cost of the Demonstration and Manufacture Phase

Project/Increment Title	Budgeted For Cost (£m)	Forecast Cost (£m)	Variation (+/- £m)	In-Year Variation (+/- £m)
Queen Elizabeth Class Aircraft Carrier	3541	6102	+2561	+754
<b>Total (£m)</b>	<b>3541</b>	<b>6102</b>	<b>+2561</b>	<b>+754</b>

#### B.3.1 Cost variation against approved cost of the Demonstration and Manufacture Phase

##### B.3.1.1 Queen Elizabeth Class Aircraft Carrier

Date	Variation (£m)	Category	Reason for Variation
November 2013	-96	Procurement Processes	Cost reductions agreed during final Commercial Negotiations between MOD and the Aircraft Carrier Alliance (ACA).
November 2013	-71	Procurement Processes	More efficiently compressed sea trials programme including early transfer of vessel from Rosyth to Portsmouth.
November 2013	-181	Procurement Processes	Cost reductions as a result of the in depth review carried out by MOD (Cost Assurance and Analysis Service) and the ACA. Issues identified include duplication and estimating subjectivity.

**QUEEN ELIZABETH CLASS AIRCRAFT CARRIERS**

November 2013	-19	Procurement Processes	Reduced Target Cost Incentive Fee (TCIF) payable to the ACA as part of the agreement.
July 2013	+144	Procurement Processes	Current Target Cost set at a higher certainty level than at Final Target Cost (FTC) with share arrangements altered to reflect a shift in the balance of risk and reward to make it more favourable for the Department.
July 2013	+35	Budgetary Factors	Better understanding of activity originally considered to be within the scope of support has resulted in its transfer to procurement, together with the associated budget.
July 2013	+28	Technical Factors	Increased cost to reflect revised apportionment of overhead recovery against updated yard hour throughput assumptions.
July 2013	-7	Technical Factors	Reduction in cost estimates for Government Furnished Assets as a result of maturing programme information.
July 2013	-259	Technical Factors	Risk budget consumed by the programme cost growth.
July 2013	+216	Technical Factors	Many opportunities for cost savings recognised at the Final Target Cost stage have not been realised resulting in further cost increase.
July 2013	-23	Technical Factors	Internal ACA reviews identified cost savings through reduction in the management team post Ship 2 flood up; optimising the use of Engineering resources and Project Management reorganisation achievable from the newly implemented and improved Project Controls system.
July 2013	+19	Technical Factors	Review of Vessel Acceptance identified insufficient budget for Defect Rectification in terms of cost and time.
July 2013	+10	Technical Factors	Expenditure on external consultancy support during the rebaseline of the programme schedule and costs including independent Validation and Verification of schedule, costs and risks.

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July 2013	+123	Technical Factors	Revised Bill of Materials (BoM) estimate including labour and material cost as a result of: maturing engineering data, incorrect design quantities and parts specifications at the FTC stage and increased scrappage rates.
July 2013	+150	Technical Factors	Improved design maturity has resulted in 17,000+ Change Requests since the FTC baseline resulting in work being undertaken out of sequence, work needing to be repeated or additional work. Impact of change results in increased carryover from build to integration yard with resulting impact upon time and cost.
July 2013	+65	Technical Factors	Significant increase in budget requirements for paint and access driven by underestimation of scope and scale at FTC PMB, extended schedule, and inadequate provision for change. The contract was placed and managed centrally by the Alliance Management Team (to achieve economies of scale cost savings) resulting in a lack of budget understanding and accountability at the local working level.
July 2013	+33	Technical Factors	Following a review of the Programme Management processes in 2013, the Alliance Management Team agreed to further investment to strengthen programme management to deliver the rebaseline programme (schedule and costs) going forward, building on lessons learned to date. This includes the development of the Mission Control Environment (Management Information), additional Project Management, Controls and Engineering resource.
July 2013	+19	Technical Factors	Cost increase primarily associated with revised estimates for outfit and assembly and transferred scope from Naval Ships and Cammell Laird to Rosyth.

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July 2013	+37	Technical Factors	Elements of cost growth related to: late delivery from HVAC (Heating, Ventilation & Air Conditioning) subcontractor, extra safety management resource and increase in T&S budget to reflect higher level of resource required.
July 2013	+5	Technical Factors	Results from changed rates assumptions (overhead, throughput and direct labour) from those assumed at FTC.
July 2013	+32	Technical Factors	Net cost growth across all Industrial Participants resulting from cost increases/decreases to individual work packages, activities and overspends.
July 2013	+12	Technical Factors	The Ships Deliverable List was immature at the time of FTC, there was a list of items but the scope of each item was not agreed between Industry and MoD. In addition there have been some gaps identified where there has been unclear demarcation between Industrial Participants
July 2013	+261	Technical Factors	The consequential cost impact associated with extension to the schedule durations e.g. maintenance over a longer period, warehousing / storage costs and marching army costs. Elements of schedule at FTC PMB assumed parallel working which has since proved impractical. A revised sequential schedule has resulted in further delay.
July 2013	+101	Inflation	The cost increase has resulted in an increase in inflation.
May 2012	+120	Budgetary Factors	Relates to the reversion decision in May 2012 to a STOVL carrier including Ramp, Flight Deck Coating, Radar and other equipment required to operate STOVL aircraft. Of the £190M total STOVL costs identified some elements (£70M) fall under the approval and budget of other MOD project teams.

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Historic	+217	Technical Factors	Following the agreement of Final Target Cost in 2010, the Aircraft Carrier Alliance are reporting a higher Estimate At Completion cost. This difference is driven by a combination of factors, key of which are: Aircraft Carrier Alliance not able to fully deliver cost reduction opportunities agreed at Final Target Cost (a total of £312m was agreed) the current Aircraft Carrier Alliance view is that some of this will not be delivered (+£88m) (with the remainder to be determined); the latest view of overall risk exposure has increased since Final Target Cost (+£134m); and a reduction against escalation (-£5m). With commercial discussions ongoing, MOD's assessment of the position is being with-held on the basis that it may prejudice those discussions but it has been agreed that the costs of the programme for MPR20102 should reflect the Aircraft Carrier Alliance's Estimate At Completion.
Historic	-13	Budgetary Factors	Completion of Final Target Cost negotiations with the Aircraft Carrier Alliance.
Historic	+190	Budgetary Factors	Refinement of cost estimate connected to the Equipment Examination.
Historic	+35	Budgetary Factors	An £8m reduction on inflation following refinement of estimates against additional costs of £43m for Government Furnished Equipment.
Historic	+337	Budgetary Factors	At the time of contract award in 2008, there was a cost challenge of £337m which was expected to be fully reduced through cost reduction measures. The impact of slowing down the programme prevented these from being delivered
Historic	+117	Technical Factors	Various factors including growth of Bill of Materials and the impact of build strategy changes.

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Historic	+674	Budgetary Factors	Financial Planning Round 2009 resulted in an option that constrained the Queen Elizabeth Class in the first 4 years, this will cause cost growth of £674M over the life of the project.
Historic	+250	Inflation	The Queen Elizabeth Class contracted Initial Target Cost is set at April 2006 economic conditions exposing the MOD to inflation fluctuations. The current procurement contracts were placed during a period of high inflation and, despite the current economic downturn, forecasts covering the whole of the projects life indicated it was prudent to allow for an additional £250m CDEL.
<b>Net Variation (£m)</b>	<b>+2561</b>		

**B.3.2 Operational Impact of cost variations of Demonstration and Manufacture Phase - N/A**

**B.4 Progress against approved Support / PFI Cost**

**B.5 Expenditure to date**

Description	Previous expenditure to 31 March 2012 (£m)	In-year expenditure (£m)	Total expenditure to 31 March 2013 (£m)
Assessment Phase	326	-6	320
Demonstration and Manufacture Phase	2283	718	3001
Support Phase / PFI Cost	0	0	0
<b>Total Expenditure</b>	<b>2609</b>	<b>712</b>	<b>3321</b>

## C Section C: Timescale

### C.1 Length of the Assessment Phase

Project/Increment Title	Date of Initial Investment Decision Approval	Actual Date of Main Investment Decision Approval	Length of Assessment Phase
Queen Elizabeth Class Aircraft Carrier	December 1998	December 2005	84
Conversion (cancelled May 12)	April 2011	Not Applicable	Not Applicable

### C.2 Actual Boundaries for In Service Date or Initial Operating Capability

Project/Increment Title	Earliest Approved	Budgeted For	Latest Approved
Queen Elizabeth Class Aircraft Carrier	April 2015	July 2015	October 2015

### C.3 In-Service Date/Initial Operating Capability

#### C.3.1 Definition

Project/Increment Title	In-Service Date/Initial Operating Capability
Queen Elizabeth Class Aircraft Carrier	<p><b>In Service Date:</b> In Service Date for the QEC is defined as the date that the vessel is ready to proceed to Operational Sea Training. A prerequisite for this is a formal declaration that the vessel has successfully completed Safety and Readiness Check.</p> <p><b>Initial Operating Capability:</b> Initial Operating Capability (IOC) will be declared when the vessel has successfully completed Operational Sea Training and the Operational Readiness Inspection. Operational Sea Training consists of two phases:</p> <p>Tier 1 – Basic sea safety and survival at the platform level. Training as an individual and collectively to be safe to operate the platform in any condition.</p> <p>Tier 2 – More comprehensive training as a unit to include the basic warfighting capabilities and more complex emergencies.</p>

#### C.3.2 Progress against approved Dates

Project/Increment Title	Approved Date	Actual / Forecast Date	Variation (+/- months)	In-Year Variation (+/- months)
Queen Elizabeth Class Aircraft Carriers	July 2015	December 2017	+29	+5



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## C.3.3 Timescale variation

### C.3.3.1 Queen Elizabeth Class Aircraft Carrier

Date	Variation (+/- months)	Category	Reason for Variation
July 2013	+5	Technical Factors	<p>Further maturity of time estimates from the Aircraft Carrier Alliance has identified programme extension of 14 months which includes, and brings refinement to the +9 month reported in MPR12.</p> <p>Major Drivers:</p> <ul style="list-style-type: none"> <li>- Delays relating to change, which includes an element of carry-over work and the impact of changing the carrier configuration from STOV L to CV back to STOV L. This was necessary as a result of blocks being transferred incomplete from the shipbuild yards to the integration yard, and therefore work needing to be completed in Rosyth. It was previously assumed that it would be possible to carry out this work in parallel, but this has now had to be incorporated into the time needed for assembly (+6 Months).</li> <li>- Reduced access as a result of delay (see above) and carry over work has caused disruption to Mission Systems original timeframe, resulting in an extension (+5 months).</li> <li>- An analysis based upon norms from similar programmes identified an underestimation of elements of the Commissioning, Sea Trials and Defect Rectification Periods (+5 months).</li> <li>- A stronger shift pattern in Assembly through increased night shifts has meant a reduction in outfit periods (- 4.5 months).</li> <li>- Resulted from changes to the sequencing of Mission Systems events (-2.5 months).</li> <li>- The bottom-up rebaseline exercise allowed full understanding of the complex iterations between the mission systems and platform programmes for the first time; concerns around the availability of ships services to meet the mission systems demand has led to further delay (+5 months).</li> </ul>

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Historic	+9	Technical Factors	The Project Team, in conjunction with the Aircraft Carrier Alliance, had an improved understanding of the build schedule with the latest Time Risk Analysis identifying a revised 50% estimate for Contract Acceptance Date. This points to a potential for a 9 month slip which the Project Team considers prudent to report.
Historic	+5	Budgetary Factors	The Aircraft Carrier Alliance continues to work to Build Strategy 5, which was first announced in March 2009 following the Equipment Examination. As part of the Final Target Cost analysis, the Aircraft Carrier Alliance have revisited their Monte-Carlo analysis not only in terms of cost but also schedule. Risk and uncertainty assumptions around integration, commissioning and trials have been updated and fully aligned to those used for costing of Final Target Cost. Analysis that both the Project Team and Cost Assurance & Analysis Services support suggests that Contract Acceptance Dates for the two Queen Elizabeth Class vessels should now be June 2016 for Queen Elizabeth and September 2018 for Prince of Wales. Allowing for transition from Contract Acceptance Date to In Service Date gives a revised In Service Dates as October 2016 and December 2018.
Historic	+12	Budgetary Factors	Ministerial announcement that Queen Elizabeth and Prince Of Wales In Service Dates will be delayed as a result of the Financial Planning Round 2009 option
Historic	-2	Budgetary Factors	Industry and Capital Ship current estimates are that the current schedule contains sufficient flexibility to allow for mitigating actions to be taken.
<b>Net Variation (+/- months)</b>	<b>+29</b>		

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### C.3.4 Other costs / savings resulting from timescale variation

Project/Increment Title	Date	£m (+ Cost / - Saving)	Category	Reason for expenditure or saving
Marine Equipment Systems	Historic	+6	Budgetary Factors	Ministerial announcement that Queen Elizabeth Class In Service Dates will be delayed as a result of the Financial Planning Round 2009 option
Communication Situation Awareness	Historic	+3	Budgetary Factors	
Naval Electronic Warfare	Historic	+2	Budgetary Factors	
T45 Overhead	Historic	+63	Budgetary Factors	
CVS Run-on Costs	Historic	+49	Budgetary Factors	
<b>Total</b>		<b>123</b>		

### C.3.5 Operational Impact of In-Service Date/Initial Operating Capability variation

Project/Increment Title	Operational Impact
Queen Elizabeth Class Aircraft Carrier	The Equipment Examination introduced a slip in the In Service Date which would have required the extension in the service of HMS Illustrious in order to maintain carrier-strike capability, the Strategic Defence and Security Review stated that "The current, limited carrier-strike capability will be retired" because "short-range Harriers... would provide only a very limited coercive capability. We judge it unlikely that this would be sufficiently useful in the latter half of the decade to be a cost effective use of defence resources". This will create a capability gap until a Queen Elizabeth Class aircraft carrier has completed integration with the first operational squadron of Joint Combat Aircraft.

## C.4. Full Operating Capability

### C.4.1 Definition

Project/Increment Title	Full Operating Capability	Progress to date
Queen Elizabeth Class Aircraft Carriers	Yet to be defined	The Full Operational Capability will be largely determined by the combination of Joint Force Air Group elements and the Queen Elizabeth Class Incremental Acquisition Plan. Full Operating Capability will therefore be defined once the Joint Combat Aircraft and Maritime Airborne Surveillance & Control delivery programmes and the Initial Approved Plan are agreed. Full Operating Capability will allow Queen Elizabeth Class to have an embarked Joint Force Air Group and a level of capability equivalent to that declared at Main Gate.

## C.5. Support / PFI Contract - N/A

## D Section D: Performance

### D.1. Sentinel Score

Current score	Last years score	Comments
47 Red	54 Red	The QEC SENTINEL Score continues to be driven by the breach in cost and time parameters as both these metrics are heavily weighted. In addition, the lack of three point estimate (this is a time related metric) has caused an additional slip in the score.

### D.2.1 Performance against Defence Lines of Development

Line of Development	Description	Met / Forecast to be met (with risks)	Not met / Forecast not to be met
1. Equipment	Delivery of 2 Queen Elizabeth Class Carriers to the required Performance Specification.	Yes (with risks)	
2. Training	Provision of individual and collective training both ashore and afloat for Queen Elizabeth Class Carriers that delivers the appropriate level of Operational Capability to meet the Readiness Profiles in the Naval Data Book.	Yes (with risks)	
3. Logistics	Provision of Support Solution that enables the operational movement and maintenance of Queen Elizabeth Class Carriers.	Yes	
4. Infrastructure	Provision of support infrastructure and facilities in the MOD estate to support Queen Elizabeth Class Carriers and their associated equipments and personnel.	Yes (with risks)	
5. Personnel	Provision of sufficient, correctly trained and suitably equipped personnel available to participate in commissioning, trials and handover of the ship, then subsequent operation of the ships in service.	Yes (with risks)	
6. Doctrine	Provision of framework of practices and procedures to derive the greatest benefit from using the Queen Elizabeth Class Carriers in a range of operations and scenarios.	Yes	
7. Organisation	Establish a robust and deliverable command structure for Queen Elizabeth Class Carriers with correctly qualified personnel in place in time to support the programme	Yes	

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8. Information	Coherent development of data, information and knowledge requirements for Queen Elizabeth Class Carriers and all processes designed to gather, handle data and exploit information and knowledge.	Yes	
Current forecast (with risks)		8 (4)	0
Last year's forecast (with risks)		8 (4)	0

### D.2.2 Defence Line of Development variation

Date	Defence Line of Development	Category	Reason for Variation
Historic	Equipment	Technical Factors	The Strategic Defence & Security Review confirmed that both carriers should be built. In May 2012, the Department reverted back to the STOVL variant meaning both hulls will operate the Short Take Off and Vertical Landing Variant of the Joint Strike Fighter. However, there are risks associated to the uncertainty around the final Queen Elizabeth Class solution which could result in cost and schedule impact beyond those reported in this year's MPR.
Historic	Infrastructure	Technical Factors	The 2011 Monte Carlo'd simulated estimate for completion of the infrastructure upgrade to Portsmouth identified a risk that base port for Queen Elizabeth could not be ready in time for first entry Portsmouth. This risk has now been mitigated, however the cost and schedule risk of providing two fully serviced berths in the future has yet to be resolved.
Historic	Equipment	Changed Capability Requirements	The Strategic Defence & Security Review confirmed that both carriers should be built, with the current intention to convert one hull to operate the Carrier Variant of the Joint Strike Fighter. The risks connected to the development and integration of Electro Magnetic Launch Systems and Advanced Arrestor Gear technology.
Historic	Training	Changed Capability Requirements	The risks associated with having sufficient trained, suitably qualified and experience personnel to operate the Electro Magnetic Launch Systems.

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Historic	Personnel	Changed Capability Requirements	The risks associated with ensuring suitably qualified and experienced aviation personnel to operate the converted Queen Elizabeth Aircraft Carrier.
Historic	Infrastructure	Technical Factors	Early cost estimates exceed provision, necessitating further investigation of the options to ensure an affordable position
Historic	Information	Technical Factors	The risks associated with the integration of Joint Combat Aircraft and the Queen Elizabeth Class has been addressed by the Equipment Defence Lines Of Development Steering and Integration Group. Analysis of the interface issues between aircraft and the ship has been conducted and significant progress has been made in addressing the issues identified. As a result, the integration risk is now assessed as low.
Historic	Information	Technical Factors	Information Defence Lines of Development remains at risk due to uncertainty over the resolution of Joint Combat Aircraft integration into UK Global Information Infrastructure.

### D.3. Performance against Key Performance Measures

#### D.3.1 Queen Elizabeth Class Aircraft Carrier

##### D.3.1.1 Performance against Key Performance Measures

Key Performance Measure	Related Defence Lines of Development	Description	Met / Forecast to be met (with risks)	Not met / Forecast not to be met
KUR 1	All	Interoperability – Queen Elizabeth class shall be able to operate with joint/combined forces to deliver a medium scale offensive air effort for power projection, focused intervention and peace enforcement operations	Yes	

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KUR 2	All	Integration – Queen Elizabeth class shall be able to integrate with all elements of joint/combined forces necessary to conduct Strike operations and support ‘agile mission groups’	Yes	
KUR 3	All	Availability – Queen Elizabeth class shall provide one platform at High Readiness for its principal role of Carrier Strike at medium scale and at Very High readiness for CS small scale focused intervention, at all times.		Yes
KUR 4	All	Deployability – Queen Elizabeth class shall be able to deploy for the operations in the core regions as defined in Defence Strategic Guidance 05	Yes	
KUR 5	All	Sustainability – Queen Elizabeth class shall be able to conduct deployments away from port facilities for operations lasting 9 months continuously and support air operations for up to 70 days	Yes	
KUR 6	All	Aircraft Ops – Queen Elizabeth class shall be able to deploy the full medium scale offensive air effort	Yes	

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KUR 7	All	Survivability – Queen Elizabeth class shall achieve a high probability of protection, survival and recoverability against both natural incidents and those threats identified in the Defence Intelligence Scale Threat Statement (October 2004)	Yes	
KUR 8	All	Flexibility – The Queen Elizabeth class shall be able to operate and support the full range of defined aircraft and be adaptable such that it could operate air vehicles which require assisted launch/recovery	Yes	
KUR9	All	Versatility – Queen Elizabeth class shall be able to deploy agile Mission groups	Yes	
Current forecast (with risks)			8 (0)	1
Last year's forecast (with risks)			8 (0)	1

#### D.3.1.2 Key Performance Measures Variation

Date	Key Performance Measure	Category	Reason for Variation
Historic	KUR 3	Changed Capability Requirements	The Strategic Defence & Security Review confirmed that both carriers should be built, with one to be operational and the second in extended readiness or sold. With this change of readiness requirement announced and, although the Department has chosen to revert back to the Short Take Off and Vertical Landing aircraft variant, it has still not committed to two ship operation. Therefore one ship will be operational and the other at extended readiness.

#### D.3.1.3 Operational Impact of variation



## QUEEN ELIZABETH CLASS AIRCRAFT CARRIERS

Date	Key Performance Measure	Forecast	Operational impact of variation
Historic	KUR 3	At Risk	The reduced availability of the Queen Elizabeth Class platform as a result of the Strategic Defence & Security Review decision to operate a single carrier may (depending on future decisions) reduce the availability of this element of Carrier Enabled Power Projection , although this could be offset by conversion of the second hull or close cooperation with the French Navy.

**D.4 Support Contract - N/A**

<b>Project Title</b>		
Specialist Vehicles		
<b>Team Responsible</b>		
SCOUT SV		
<b>Senior Responsible Owner</b>	<b>Date Appointed</b>	<b>Planned end date</b>
Maj Gen Bruce Brealey	01 April 2013	30 September 2013
<b>Project/Increment Name</b>	<b>Current Status of Projects / Increments</b>	
Recce Block 1 Demonstration	Post-Main Investment Decision	
Recce Block 2 Demonstration	Pre-Main Investment Decision	
Recce Block 1 & 2 Manufacture	Pre-Main Investment Decision	
Recce Block 3 Demonstration and Manufacture	Pre-Main Investment Decision	

### A. Section A: The Project

#### A.1 The Requirement

Specialist Vehicles will provide a key element to the Army's multi-role brigades. The Scout platform and supporting variants will offer improved fightability, survivability, lethality, and have a greater find capability than the increasingly obsolescent legacy Combat Vehicle Reconnaissance (Tracked) fleet. Specialist Vehicles will provide a mobile, protected ground platform for reconnaissance to fill a capability gap and will contribute to a combined arms capability of modern, medium-weight, strategically deployable, tracked vehicles. The current planning assumption is to deliver a reconnaissance fleet of up to \*\*\* vehicles incrementally.

#### A.2 The Assessment Phase

GENERAL: Future Rapid Effect System Specialist Vehicles entered its assessment phase (Assessment Phase 2) in June 2008. The approval covered the anticipated Specialist Vehicles fleet scope, with high priority afforded to Scout (Recce Block 1), given the pressing need to replace Combat Vehicle Reconnaissance (Tracked). Specialist Vehicles was assumed to consist of three Recce Blocks plus Medium Armour and Manoeuvre Support components, all mounted on a common base platform. In broad terms the Assessment Phase Studies confirmed that the Common Base Platform concept was viable for all platforms and also set the time, cost performance and risk envelope for Recce Block 1.

TRADE-OFFS: Assessment Studies were used to derive the preferred Programme Option and its associated characteristics of performance (requirements), cost, time and risk, ahead of launching a competition to select the Prime contractor. These studies included an analysis of potential solutions ranging from off-the-shelf platforms, modified off-the-shelf, and new design, as well as studies on critical sub-system choices e.g. primary sighting system. Industry was engaged throughout to ensure data used reflected market reality, whilst still keeping competitive choices open. The Military Customer and User were engaged throughout the process.

ACQUISITION STRATEGY: Assessment Phase 2 also determined the most appropriate Acquisition Strategy for the Specialist Vehicles. The product of this strand was subject to a separate Investment Approvals Board Approval. This Approval endorsed the use of open international competition to select a 'prime contractor' to conduct the demonstration phase for Recce Block 1, and subject to further approval included progression to manufacture and initial in-service support, together with a Common Base Platform for all Specialist Vehicles. Major enabling sub-systems e.g. Guided Weapons (missiles) for later Recce Blocks were not included in the scope of Recce Block 1 and Common Base Platform in order to leave competitive choice for later Recce Blocks e.g. missile coherence with Team Complex Weapons.

An update to the Acquisition Strategy was endorsed in Jan 13. In line with the Common Base Platform concept the Protected Mobility Recce Support vehicle can be used with minor sub-system changes for the Ambulance, Command and Engineer Recce roles. Similarly, for the three remaining roles, further studies have been contracted to assess these requirements.

The Recce Block 1 element of Assessment Phase 2 was conducted in four Stages, with the key findings from each stage captured in a stage report. The final stage - the formal competition and Investment Approvals Board approval for Demonstration was conducted under an aggressive timeline with transition through Main Gate 1 achieved seven months ahead of forecast. In 2010, the project was subject to re-approval by the new coalition government which delayed contract award by three months, due to the pre-election period.

Assessment Phase 2 included risk reduction studies and demonstrators on the Specialist Vehicles platforms and on high performance thermal imaging sighting systems which were subsequently down-selected as part of the main competition.

The Recce Block 1 element of the Assessment Phase 2 concluded with a major international competition, which selected General Dynamics UK Ltd as the Prime Contractor.

## SPECIALIST VEHICLES

### A.3 Project History

MAIN GATE 1 - DEMONSTRATION RECCE BLOCK 1 ONLY: The outcome of the Specialist Vehicles Assessment Phase for Recce Block 1 and Common Base Platform was presented as evidence for the Specialist Vehicles Main Gate 1 approval for entry into Demonstration. As part of this Main Gate 1 approval, the Office of Government Commerce conducted a Gateway Review in September 2009, followed by a full Major Projects Review Group examination in December 2009, which confirmed that Specialist Vehicles was in a position to proceed to its planned Demonstration phase with General Dynamics UK Ltd as the Prime contractor. Approval was re-endorsed by the new Coalition Government in June 2010. The contract with General Dynamics UK Ltd commits to the Demonstration Phase for Recce Block 1 only, whilst taking contractual option for manufacture for Recce Block 1 and Common Base Platform options for later Blocks and initial in-service support. This contract includes seven Anchor Milestones.

Main Gate 1 did not set Initial Operating Capability, Full Operating Capability or total fleet requirements, but merely noted the planning assumptions associated with these for service entry at the time. There was also recognition that the then forthcoming Strategic Defence and Security Review could change total fleet requirements and assumptions, and these should not therefore be set at Main Gate 1.

Planning Round 11 and Strategic Defence and Security Review Savings Options removed the Medium Armour element and reset the total vehicle fleet numbers up to \*\*\*, with the delivery profile recast to aspire to the emerging Army restructuring under Strategic Defence and Security Review (Five Multi Role Brigades). Final size and shape of the Specialist Vehicles fleet will not be set until Main Gate 2, in \*\*\*, when the first major production investment decision will be taken. The Recce Block 1 Planning Assumption for Service Entry was also deferred by nine months from \*\*\*\* to \*\*\* due to a Strategic Defence and Security Review savings option. The enduring need for the Specialist Vehicles project was noted in an Information Note to the Investment Approvals Committee in June 2011.

FURTHER APPROVALS: It should be noted that Specialist Vehicles does not have a single Main Gate Approval. The size of the programme, together with previous lessons learned in other programmes, determined that a two stage Main Gate approach should be used; Main Gate 1 for entry into Demonstration for Recce Block 1 and Common Base Platform only, with a second Main Gate (2) for entry into production, the latter being the major investment decision. Later approvals (in effect sub-Main Gates) will approve Demonstration and Manufacture of the remaining Protected Mobility Recce Support roles and any future needs.

DEMONSTRATION PHASE PROGRESS : Continuing to build on progress made in 2011/12, the programme completed its initial milestones reaching the entry review into the Preliminary Design Review.

MAIN WEAPONS SELECTION - SCOUT: Approval for the selection of the 40mm Case Telescope Weapon System was given in 2008 to enable commonality with the Warrior Capability Sustainment Programme, thus taking the benefit of common ammunition and training. Qualification for the 40mm Case Telescoped Weapon System is led by the Scout - Specialist Vehicles team.

### A.4 In-year Progress

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

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

The Mine Blast de-risking trial completed in May 12 providing valuable data on design maturity.

## SPECIALIST VEHICLES

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

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

An Information Note was circulated in January 2013 to provide a general update with an expectation that a further approval update would be submitted later in 2013.

### A.5 Capability Risks

Specialist Vehicles will replace Combat Vehicle Reconnaissance (Tracked) which is increasingly becoming tactically un-deployable. Combat Vehicle Reconnaissance (Tracked) has already been extended beyond its out of service date through a series of modifications and Urgent Operational Requirements. Combat Vehicles Reconnaissance (Tracked) is restricted by its very small design meaning that it has reached its operational capacity. Combat Vehicles Reconnaissance (Tracked) must be replaced (by Specialist Vehicles) to avoid a long term capability gap opening up in essential manned ground reconnaissance.

### A.6 Associated Projects - N/A

### A.7 Procurement Strategy

Pre-Main Investment Decision Projects / Increments only				
Project / Increment Title	Procurement Route			Approval Status
Recce Block 2 Demonstration	Acquisition Programme with full and open competition			Pre-Main Gate
Recce Block 1 & 2 Manufacture	Acquisition Programme with full and open competition			Pre-Main Gate
Recce Block 3 Demonstration and Manufacture	Acquisition Programme with full and open competition			Pre-Main Gate
Post-Main Investment Decision Projects / Increments only				
Project / Increment Title	Contractor	Contract Scope	Contract Type	Procurement Route
Recce Block 1 Demonstration	General Dynamics UK Ltd	Demonstration to Manufacture	The contract is a mixture of Firm, Maximum (to be converted to Firm) and Fixed Prices. The Firm Prices apply until 31 March 2015 and thereafter Fixed Prices will apply, with the exception of the Demonstration Phase activity which is Firm Price regardless.	Competitive - International

## SPECIALIST VEHICLES

### A.8 Support Strategy

Description				
<p>Not yet committed. The current contract for Reconnaissance Block 1 and Common Base Platform includes a Contract Option for an initial In-Service Support Phase; this is for a two year period from the date that the Initial Operating Capability is delivered. It is currently planned to negotiate an incentivised support solution during the Demonstration Phase to come into effect following the Initial In-Service Support Phase.</p>				
Support Title	Contractor	Contract Scope	Contract Type	Procurement Route
First Two Years Support	General Dynamics UK	Support	Fixed Price	Competitive - International

## SPECIALIST VEHICLES

### B Section B: Cost

#### B.1 Cost of the Assessment Phase

Project/ Increment Title	Approved Cost (£m)	Actual / Forecast Cost (£m)	Variation (£m)	Approved cost as a proportion of total estimated procurement expenditure (%)	Actual Cost as a proportion of total estimated procurement expenditure (%)
Specialist Vehicles	109	82	-27	8%	6%
<b>Total (£m)</b>	<b>109</b>	<b>82</b>	<b>-27</b>	<b>8%</b>	<b>6%</b>

#### B.2 Actual cost boundaries for Demonstration and Manufacture Phase / PFI

Project/Increment Title	Lowest Approved (£m)	Budgeted For (£m)	Highest Approved (£m)
Recce Block 1 Demonstration	1377	1394	1433
Recce Block 2 Demonstration	-	-	-
Recce Block 1 & 2 Manufacture	-	-	-
Recce Block 3 Demonstration and Manufacture	-	-	-

#### B.3 Cost of the Demonstration and Manufacture Phase

Project/Increment Title	Budgeted For Cost (£m)	Forecast Cost (£m)	Variation (+/- £m)	In-Year Variation (+/- £m)
Recce Block 1 Demonstration	1394	1394	-0	-0
Recce Block 2 Demonstration	-	-		
Recce Block 1 & 2 Manufacture	-	-		
Recce Block 3 Demonstration and Manufacture	-	-		
<b>Total (£m)</b>	<b>1394</b>	<b>1394</b>	<b>-0</b>	<b>-0</b>

B.3.1 Cost variation against approved cost of the Demonstration and Manufacture Phase - N/A

B.3.2 Operational Impact of cost variations of Demonstration and Manufacture Phase - N/A

B.4 Progress against approved Support / PFI Cost - N/A

#### B.5 Expenditure to date

Description	Previous expenditure to 31 March 2012 (£m)	In-year expenditure (£m)	Total expenditure to 31 March 2013 (£m)
Assessment Phase	72	1	73
Demonstration and Manufacture Phase	288	91	379
Support Phase / PFI Cost	0	0	0
<b>Total Expenditure</b>	<b>360</b>	<b>92</b>	<b>452</b>

## SPECIALIST VEHICLES

### C **Section C: Timescale**

#### C.1 Length of the Assessment Phase

Project/Increment Title	Date of Initial Investment Decision Approval	Actual Date of Main Investment Decision Approval	Length of Assessment Phase
Specialist Vehicles	June 2008	Continuous Assessment Phase	-
Recce Block 1 Demonstration	June 2008	March 2010	21
Recce Block 2 Demonstration	June 2008	***	***
Recce Block 1 & 2 Manufacture	June 2008	***	***
Recce Block 3 demonstration and Manufacture	June 2008	***	***

#### C.2 Actual Boundaries for In Service Date or Initial Operating Capability

Project/Increment Title	Earliest Approved	Budgeted For	Latest Approved
Recce Block 1 Demonstration	-	-	-
Recce Block 2 Demonstration	-	-	-
Recce Block 1 & 2 Manufacture	-	-	-
Recce Block 3 Demonstration and Manufacture	-	-	-

#### C.3 In-Service Date/Initial Operating Capability

##### C.3.1 Definition

Project/Increment Title	In-Service Date/Initial Operating Capability
Recce Block 1 Demonstration	-
Recce Block 2 Demonstration	-
Recce Block 1 & 2 Manufacture	-
Recce Block 3 Demonstration and Manufacture	-

##### C.3.2 Progress against approved Dates - N/A

##### C.3.3 Timescale variation - N/A

##### C.4. Full Operating Capability - N/A

##### C.5. Support / PFI Contract - N/A



## SPECIALIST VEHICLES

### D Section D: Performance

#### D.1. Sentinel Score

Current score	Last years score	Comments
Not reported	85 Green	The project is currently in its Demonstration Phase and is investigating how to best manage the Planning Round 12 outcome within the overall project boundaries.

#### D.2.1 Performance against Defence Lines of Development

Line of Development	Description	Met / Forecast to be met (with risks)	Not met / Forecast not to be met
1. Equipment	System verification (Contract Acceptance against SRD)	Yes	
2. Training	Personnel trained for trials	Yes	
3. Logistics	In Service Support solution verified (contract acceptance in accordance with ITEAP)	Yes	
4. Infrastructure	Infrastructure solution demonstrated in accordance with ITEAP.	Yes	
5. Personnel	Personnel solution demonstrated in accordance with the ITEAP.	Yes	
6. Doctrine	Draft Concept of Use (CONUSE) developed by Concepts & Doctrine (C&D) from Equipment's Initial Baseline Solution (Initial B/L Sol ) and C&D's Concept of Employment (CONEMP), covering all funded platform variants, with gaps between funded CONUSE and CONEMP fed back to Capability's Capability Gap (CG).	Yes	
7. Organisation	Organisation solution demonstrated in accordance with the ITEAP.	Yes	
8. Information	Information solution, including hardware, software and data messages required to satisfy the information exchange requirements, has been successfully verified against the system requirements and design specification through analysis and developmental testing in synthetic and real- world development environments in accordance with the Integrated Test, Evaluation & Acceptance Plan (ITEAP)	Yes	
Current forecast (with risks)		8 (0)	0
Last year's forecast (with risks)		8 (0)	0

#### D.2.2 Defence Line of Development variation - N/A

## SPECIALIST VEHICLES

### D.3. Performance against Key Performance Measures

#### D.3.1 Specialist Vehicles

##### D.3.1.1 Performance against Key Performance Measures

Key Performance Measure	Related Defence Lines of Development	Description	Met / Forecast to be met (with risks)	Not met / Forecast not to be met
KUR 1 Situational Awareness	Equipment	The user shall be able to gather and use information about the operational environment.	Yes	
KUR 2 Interoperability	Equipment	The user shall be able to operate national, and with multinational, C4I Battlespace Systems	Yes	
KUR 3 Deployability	Equipment	The user shall be able to deploy rapidly worldwide by land, sea and air.	Yes	
KUR 4 Operational Mobility	Equipment	The User shall be able to self deploy a total of 530 km (300 km by road, 200 km on tracks and 30 km cross country) on a single load of fuel with the appropriate number of personnel and equipment according to role, ready to complete a Battlefield Mission after re-fuelling.	Yes	
KUR 5 Tactical Mobility	Equipment	The User shall be able to achieve levels of terrain accessibility and agility appropriate to role.	Yes	

### SPECIALIST VEHICLES

KUR 6 Lethality	Equipment	The User shall be able to achieve the defined levels of lethality appropriate to role.	Yes	
KUR 7 Survivability	Equipment	The User shall be provided with the defined levels of survivability appropriate to role.	Yes	
KUR 8 Sustainability	Equipment	The User shall be able to sustain Future Rapid Effect System operational effectiveness for national and coalition operations.	Yes	
KUR 9 Availability	Equipment	The User shall be able to deliver high levels of operational availability, for durations of 14 day high intensity warfighting operation, with minimum maintenance.	Yes	
KUR 10 Environment	Equipment	The User shall be able to store, transport and operate the capability world-wide in all relevant operational environments and terrains.	Yes	
KUR 11 Growth Potential	Equipment	The User shall be able to develop the capability of Future Rapid Effect System through life, through the ready integration of emerging technologies.	Yes	
Current forecast (with risks)			11 (0)	0
Last year's forecast (with risks)			11 (0)	0

**D.3.1.2 Key Performance Measures Variation - N/A**

**D.3.1.3 Operational Impact of variation - N/A**

Project Title		
Typhoon		
Team Responsible		
Typhoon Project Team		
Senior Responsible Owner	Date Appointed	Planned end date
Air Commodore Mark Hopkins (Air Capability)	25 April 2012	
Project/Increment Name	Current Status of Projects / Increments	
Typhoon	Post-Main Investment Decision	
Typhoon Future Capability Programme	Post-Main Investment Decision	
Active Electronic Scanned Array	Pre-Main Investment Decision	

## A. Section A: The Project

### A.1 The Requirement

#### Typhoon

Typhoon, formerly known as Eurofighter, is an agile multi-role combat aircraft. Originally designed primarily, but not exclusively, for air superiority, the aircraft is also capable of delivering a precision ground attack capability. Typhoon has the flexibility to respond to the uncertain demands of the current and evolving strategic environment.

The aircraft is being developed, produced and supported in a collaborative project with Germany, Italy and Spain. The project is managed on behalf of the four partner nations by the NATO Eurofighter and Tornado Management Agency. To date, contracts have been placed for the RAF to receive 160 aircraft in three tranches. Typhoon support is being delivered through the letting of long-term contracts against five areas of support.

#### Typhoon Future Capability Programme

The Typhoon Future Capability Programme will provide enhancements to the Typhoon aircraft, both in the air-to-air and air-to-surface roles, to sustain the RAF's Typhoon fleet's multi-role capabilities.

The first phase of the Future Capability Programme, under a contract signed in March 2007, will integrate Paveway IV and the Litening III Laser Designator Pod onto Tranche 2 aircraft from 2012 onwards as well as interoperability upgrades without which those aircraft will be neither compliant with new civil airspace regulations nor interoperable with key coalition allies. It will also provide the Human Machine Interface for Multi-Role operations, allowing Typhoon to fulfil air-to-air and air-to-surface operations with the current, planned and projected weapons.

The Department will continue to develop the Typhoon capability incrementally in line with the Strategic Defence and Security Review 2010.

### A.2 The Assessment Phase

#### Typhoon

Pre-Development, which commenced with the approval of the feasibility study in 1984, comprised a number of activities. Following early concept studies, and various efforts at establishing a collaborative programme, there were two key Typhoon demonstration activities completed by the UK before development: the Experimental Aircraft Programme, an airframe programme primarily aimed at proving the feasibility of the Typhoon unstable flight control concepts, and the XG40 engine demonstrator programme at Rolls Royce. The results of these demonstrators and their associated studies, together with the results of similar work within the other Nations were harmonised in a Definition, Refinement and Risk Reduction phase that ran from the end of 1985 when four Nations signed the initial Memorandum of Understanding, until 1988 when the development contract was signed.

#### Typhoon Future Capability Programme - Phase 1

The approval process for Typhoon Tranche 2 noted the intention to develop the capability of the aircraft through life and envisaged an incremental route to the acquisition of future capability enhancements. The Assessment Phase found technology and integration were not a major challenge and that risks mostly pertained to the commercial and industrial aspects of the programme. These have been addressed and the MOD approvals process for the project was accelerated to combine Initial Gate, including the cost already incurred during the Assessment Phase, and Main Gate in order to maximise efficiency across the four Partner Nations.

## TYPHOON

### A.3 Project History

Typhoon has been in service with the RAF since 2003 and commenced operational duties for the first time in June 2007 when it assumed Quick Reaction Alert responsibility for defence of UK airspace. Deployable Air Defence operational status was achieved on 1 January 2008, which enables Typhoon to deploy worldwide on air-to-air missions. Typhoon was declared to NATO in the deployable Air Defence – Advanced role on 1 April 2008. Typhoon assumed Quick Reaction Alert responsibility for defence of South Atlantic Islands airspace in September 2009, taking over from Tornado F3.

The existing advanced air-to-air missile capability on Tranche 1 aircraft has been complemented by the integration of an initial precision air-to-surface capability, which was declared combat ready by the RAF in July 2008. This air-to-surface capability enabled declaration of multi-role status and is in advance of more comprehensive air-to-surface capability through the Typhoon Future Capability Programme for Tranche 2 aircraft.

Deliveries of Tranche 2 aircraft commenced in October 2008. The original Typhoon fleet numbers required (232 aircraft) were established in the 1990s. Current fleet planning and assumptions to meet defence requirements have determined the aircraft numbers and capabilities required now (160 aircraft). The contract for the third Tranche, signed in July 2009, represents the best solution for the UK in balancing current military requirement and international obligations against affordability. The UK has retained the option to order further aircraft. Deliveries of Tranche 3 aircraft are scheduled to start in 2013.

The Typhoon Availability Service contract with BAE Systems, signed in March 2009 formally commenced in September 2009. The Engine Availability Service contract with Rolls-Royce was signed in December 2009. These contracts are part of the strategy to transform support arrangements through partnering with UK industry.

Number 6 Squadron, the first Typhoon fighter squadron in Scotland, officially formed at RAF Leuchars on 6 September 2010. The Typhoon Force assumed Quick Reaction Alert (North) air defence responsibility from RAF Leuchars in March 2011.

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

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

Following Typhoon's first overseas contingent operational deployment in March 2011 on Operation ELLAMY, it was used initially in an air defence role and then as a ground attack aircraft against targets varying from tactical to strategic. The aircraft consistently demonstrated exceptional levels of reliability, performance, accuracy and overall cost-effectiveness over and above the MOD's very high expectations. Typhoon aircraft deployed on Operation ELLAMY returned to the UK in September 2011. In June 2011 the ministers of the four core partner nations signed an agreement which signalled their intent to develop an operational requirement for an Electronically Scanned radar for the Eurofighter programme which would aim to introduce a harmonized new radar onto the aircraft, also enhancing the exportability of the aircraft to new overseas customers.

## TYPHOON

### A.4 In-year Progress

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

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

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

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

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

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

The Typhoon front line fleet continues to build with well over half of the contracted deliveries of 160 aircraft in three Tranches now in service with the RAF.

### A.5 Capability Risks

Typhoon is intended to be a cornerstone of UK air defence and the aircraft will be pivotal to the delivery of Standing Home Commitments. Having replaced Jaguar in the ground attack role and with future reductions in other aircraft types occurring, loss of Typhoon would reduce the UK's ground-attack and air superiority capabilities.

### A.6 Associated Projects

### A.7 Procurement Strategy

Project / Increment Title	Contractor	Contract Scope	Contract Type	Procurement Route
Typhoon	Eurojet Turbo GmbH Engine consortium comprising: Avio (formerly FIAT Avio), ITP, MTU, Rolls Royce	Development	Firm Price (Avio, ITP, MTU) Fixed Price (Rolls Royce) for propulsion systems	Non-competitive but with international sub-contract competitive elements, the value of which amounts to some 10% of overall value of the Prime Contract.

## TYPHOON

Typhoon	Eurofighter GmbH Airframe consortium comprising: Alenia, BAE Systems, Cassidian (formerly EADS(CASA) and EADS(Deutschland )	Development	Fixed Price for Airframe and equipments and Target Cost Incentive Arrangement for Aircraft Equipment Integration. Following a breach of the Limit of Contractor Liability provisions the price elements for Airframe and equipments have been converted to a Limit of Liability cost reimbursement without profit.	Non-competitive but with international sub-contract competitive elements, the value of which amounts to some 30% of the overall value of the Prime Contract.
Typhoon	Eurofighter GmbH Airframe consortium (see details under development above).	Production Investment/Production	Overall Maximum prices for Production Investment and Production of Airframes for all 232 UK aircraft. (Fixed Price for production of 1st and 2nd tranche Airframe). Fixed prices for all Production, Investment and Production of Aircraft Equipment.	Non-competitive but with International sub-contract competitive elements, the value of which amounts to some 10% of the overall value of the Prime Contract.
Typhoon	Eurojet Turbo GmbH Engine consortium (see details under development above).	Production Investment/Production	Overall Maximum prices for Production Investment and Production of Engines for all 232 UK aircraft. Firm Price (Avio, ITP, MTU) Fixed Price (Rolls Royce) for Tranche 1, Tranche 2 and Tranche 3 Engine Production Investment and Production.	Non-competitive but with International sub-contract competitive elements, the value of which amounts to some 10% of the overall value of the Prime Contract.



## TYPHOON

Typhoon Future Capability Programme	Eurofighter GmbH Airframe consortium comprising: Alenia, BAE Systems, Cassidian (formerly EADS(CASA) and EADS(Deutschland )	Design, development, demonstration, qualification and production clearance of the first batch of enhancements.	Overall Max Price to be converted to UK Firm Price	Collaborative. Non-competitive but with international competitive sub-contract elements.
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### A.8 Support Strategy

Description				
<p>Typhoon's partnered support strategy was originally approved in 2000. Its principles were reinforced by the results of a 2004 Support Review.</p> <p>The partnered support strategy - referred to as Typhoon Future Support - will be delivered through the letting of long-term contracts against five areas of support: for the Typhoon Availability Service on BAE Systems; for the propulsion availability service on Rolls Royce; for Avionics (Spares Provisioning and Component Repair) via the NATO Eurofighter and Tornado Management Agency; and for international Technical Support Services, also via the NATO Eurofighter and Tornado Management Agency. Valuable experience has already been gained through the letting of incremental contracts to transform Typhoon support, the first of which was the initial phase of the engine availability contract with Rolls Royce in 2005. Work is now well underway to implement changes to the contractual framework for support by replacing eleven legacy contracts with four new more efficient contracts as a part of a wider Transformation programme jointly introduced by Partner Nations and Eurofighter GmbH. Two of the four Contracts were let in 2012 and work is now underway to let the remaining two. The UK has also developed a series of managed workstreams, focussing on the support costs of the Engine, Avionics Engineering sustainment and improved maintenance processes. Progress against these workstreams has continued during the year with efficiencies now starting to be realised in maintenance of the aircraft. All of these workstreams are specifically designed to manage Support expenditure so that it stays within the current Approval limit over the life of the aircraft to its planned out of service date.</p>				
Support Title	Contractor	Contract Scope	Contract Type	Procurement Route
Typhoon Availability Service	BAE Systems	Support	Target Cost plus Incentive Fee	Non-competitive
Engine Availability Service	Rolls Royce	Support	Target Cost plus Incentive Fee	Non-competitive
Spares Provisioning	Eurofighter GmbH and Eurojet GmbH	Support	Fixed Price	International Non-competitive based on commitments under Memoranda of Understanding, with international workshare of sub-contracting also determined by those Memoranda

## TYPHOON

Component Repair	Eurofighter GmbH and Eurojet GmbH	Support	Fixed Price	International Non-competitive based on commitments under Memoranda of Understanding, with international workshare of sub-contracting also determined by those Memoranda
Technical Support Services	Eurofighter GmbH and Eurojet GmbH	Support	Fixed Price	International Non-competitive based on commitments under Memoranda of Understanding, with international workshare of sub-contracting also determined by those Memoranda

## B Section B: Cost

### B.1 Cost of the Assessment Phase

Project/ Increment Title	Approved Cost (£m)	Actual / Forecast Cost (£m)	Variation (£m)	Approved cost as a proportion of total estimated procurement expenditure (%)	Actual Cost as a proportion of total estimated procurement expenditure (%)
Typhoon	87	78	-9	0%	0%
Typhoon Future Capability Programme	39	39	0	9%	9%
Active Electronic Scanned Array	***	***	***	***	***
<b>Total (£m)</b>	***	***	***	***	***

### B.2 Actual cost boundaries for Demonstration and Manufacture Phase / PFI

Project/Increment Title	Lowest Approved (£m)	Budgeted For (£m)	Highest Approved (£m)
Typhoon	-	15173	15348
Typhoon Future Capability Programme	355	402	420
Active Electronic Scanned Array	***	***	***

### B.3 Cost of the Demonstration and Manufacture Phase

Project/Increment Title	Budgeted For Cost (£m)	Forecast Cost (£m)	Variation (+/- £m)	In-Year Variation (+/- £m)
Typhoon	15173	17652	+2479	-19
Typhoon Future Capability Programme	402	430	+28	-11
<b>Total (£m)</b>	<b>15575</b>	<b>18082</b>	<b>+2507</b>	<b>-30</b>

#### B.3.1 Cost variation against approved cost of the Demonstration and Manufacture Phase

##### B.3.1.1 Typhoon

Date	Variation (£m)	Category	Reason for Variation
March 2013	+11	Technical Factors	Cost increases across the Main Development Contract. NAO were unable to validate this due to insufficient evidence being provided.
February 2013	-18	Technical Factors	Risk retirement. Due to the maturity of the programme risk was released in Planning Round 13, FY 12/13 (£12M), FY 13/14 (£6M).

## TYPHOON

August 2012	+1	Change in Associated Project	FY 13/14 £1M - Due to the delay in Voyager refuel clearance safety certification (QRPC1/ABC13).
April 2012	-13	Changed Capability Requirements	Tranche 3 adjustment FY 19/20 due to de-scoping of Electronic Planning Tool in Planning Round 12.
Historic	-4	Budgetary Factors	Reduction in In Year costs of Tranche 3 Production
Historic	+31	Budgetary Factors	Increased profile as a result of Tranche 3 Production Stretch Planning Round 12 Option taken.
Historic	-96	Technical Factors	Reduction in Tranche 3 profile from Planning Round 11 to Planning Round 12 due to reassessment of project costs and risks and reduction in software costs.
Historic	-9	Accounting Adjustments and Re-definitions	Removal of Indirect RDEL (Foreign Exchange) in accordance with a change in Departmental policy.
Historic	+86	Exchange Rate	Changes to Planning Round 2011 assumptions for exchange rates.
Historic	-55	Technical Factors	Reassessment of Development costs (-£29m) and Production costs (-£14m). Reduction in Development costs as a result of In Year savings (-£12m).
Historic	+87	Accounting Adjustments and Re-definitions	Removal of Cost of Capital due to Clear Line of Sight policy implemented by HM Treasury (+87m).
Historic	+71	Exchange Rate	Changes to planning round assumptions for foreign exchange rates
Historic	-74	Technical Factors	Reassessment of Development cost (-£70m). Reassessment of Production cost (-4m)
Historic	+2531	Technical Factors	Inclusion of Tranche 3 Aircraft contract (+£2531m)
Historic	+58	Exchange Rate	Changes to planning round assumptions for exchange rates and weakening of the Pound against the Euro and US Dollar during 2008/09

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Historic	-47	Technical Factors	Reassessment of Development cost (-£83m). Reassessment of Production cost (+£36m).
Historic	-38	Budgetary Factors	Saving measures taken in Planning Round 2009 (-£38m)
Historic	-128	Budgetary Factors	Reduced provision for modifications (-£123m). Reduced quantity of Role Equipment (-£5m).
Historic	+118	Technical Factors	Development revised cost (+£55m) as a result of revised assessment of change proposals and risk. Tranche 1 production revised cost (+£50m) as a result of refined assessment of retrofit programme and interoperability modifications. Tranche 2 production revised cost (-£5m) as a result of revised assessment of change proposals. Revised assessment of UK contribution to Eurofighter, EuroJet and NATO Eurofighter and Tornado Management Agency admin costs (+£18m)
Historic	+53	Inflation	More accurate calculation of inflation based on advice from NATO Eurofighter and Tornado Management Agency (+£53m)
Historic	-18	Exchange Rate	Revised Euro Rate advised for Planning Round 2008 (-£18m).
Historic	-482	Procurement Processes	Transfer to Future Capability Programme.
Historic	+65	Technical Factors	Correction of omission of transferred cost in MPR05 calculation.
Historic	+19	Procurement Processes	Industry restructuring.

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Historic	-36	Technical Factors	Re-assessment of Tranche 2 estimated cost (-£418m), Revised assessment of Tranche 2 aircraft production contract (+£385m), Revised assessment for cost of Tranche 2 engine production contract (-£45m), Revised provision for future changes to production standards(-£35m), Revised estimate for retrofitting early Tranche 1 aircraft to final production standard (+£37m), Revised estimate for the precision air to ground capability (+£42m), Reduction in value of Role equipment required for multi role Squadrons (-£17m), Revised assessment of cost of NATO Eurofighter and Tornado Management Agency and industry management fees (+£25m), Reduction in forecast for cost of release to service support (-£10m).
Historic	-1355	Changed Capability Requirements	Removal of provision for new weapons and Tranche 1 to Tranche 2 retrofit to create separate Typhoon Future Capability project ; subject to approval by Investment Approvals Board (-£377m). Separation of Tranche 3 (-£978m).
Historic	+945	Technical Factors	Higher than expected Development costs, notably for equipments (+£316m). Obsolescence costs resulting from rapid changes in computer hardware technology (+£33m). Increases in the estimated cost of enhancing the weapons system operational capabilities (+£140m). Further price variation due to slippage in the programme (+£136m). Reassessment of the cost of developing aircraft Enhanced Operational Capability and the production of Tranches 2 & 3 aircraft (most notably the reduced scope for savings due to learning curve efficiency gains) (+£320m).

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Historic	+290	Changed Capability Requirements	Provision for integration of new weapons and sensors not contained within original approval (includes Conventionally Armed Stand-Off Missile, Advanced Anti-Armour Weapon, Low-Level Laser Guided Bomb, thermal imaging airborne laser designator) (+£239m) & the retrofit of Tranche 1 aircraft to Tranche 2 standard (+£117m). Deletion of requirements for gun (-£32m), 1500L fuel tank (-£16m), CRV7 Rocket (-£2m) & Air Launched Anti Radiation Missile (-£21m). Conventionally Armed Stand-Off Missile integration assets (+£5m).
Historic	-8	Budgetary Factors	Transfers to other budgets (-£8m).
Historic	-12	Inflation	Changes in inflation assumptions since approval: development (+£208m) and production (-£220m).
Historic	-114	Exchange Rate	Changes in exchange rate assumptions since approval (-£114m).
Historic	-52	Procurement Processes	Reprofiling and adjustment of anticipated Tranches 2 and 3 Airframe, Equipment and Engine prices (+£103m). Introduction of benefits to be assumed from planned implementation of SMART Procurement processes (-£165m). Reassessment of the cost and timing of integrating new weapons (+£5m). Increased estimates for QinetiQ/Dstl test facilities in support of the development trials programme (+£5m).

## TYPHOON

Historic	+413	Procurement Processes	German withdrawal from certain equipments (+£106m). Reorientation Development Assurance Programme to bridge gap between Development and Production Investment (+£28m); extension of Integrated Logistic Support programme (+£45m); Eurofighter/Eurojet GmbH management costs (+£30m); contract price increases (+£87m); risk provision (+£117m).
Historic	+259	Accounting Adjustments and Re-definitions	Changes in accounting rules (inclusion of intramural costs) (+£275m ); transfer costs of industrial consortia management activities from production phase to support phase (-£218m); derivation of approved cost on a resource basis (+£202m).
<b>Net Variation (£m)</b>	<b>+2479</b>		

### B.3.1.2 Typhoon Future Capability Programme

Date	Variation (£m)	Category	Reason for Variation
March 2013	-11	Technical Factors	Risk retirement. Due to the maturity of the programme risk was released in Planning Round 13, FY 13/14 (£2M) & FY 14/15 (£2M). In Year FY 12/13 (£7M) NAO were unable to validate this due to insufficient evidence being provided.
Historic	+22	Technical Factors	Higher than expected development costs due to complexity of requirement specification.
Historic	-1	Accounting Adjustments and Re-definitions	Removal of Indirect RDEL (Foreign Exchange) in accordance with a change in Departmental policy.
Historic	+5	Exchange Rate	Changes to planning round assumptions for exchange rates.
Historic	-8	Technical Factors	Reduction in costs due to reassessment of risk.
Historic	+8	Exchange Rate	Changes to planning round assumptions for foreign exchange rates.



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Historic	+7	Exchange Rate	Changes to planning round assumptions for exchange rates and weakening of the Pound against the Euro and US Dollar during 2008/09
Historic	-2	Technical Factors	Reduction in CDEL achieved at contract negotiation (-£2m).
Historic	+8	Technical Factors	In 2007/8 an attempt to re-baseline the Future Capability Programme Approval (for predominantly technical reasons) was rejected. This change was not reflected in subsequent Major Projects Report submissions and resulted in a higher Approval baseline being carried forward.
<b>Net Variation (£m)</b>	<b>+28</b>		

### B.3.2 Operational Impact of cost variations of Demonstration and Manufacture Phase

Project/ Increment Title	Category	Explanation
Typhoon	Technical Factors	Does not directly impact operations
Typhoon Future Capability Programme	Technical Factors	No impact on operations

### B.4 Progress against approved Support / PFI Cost

Project/Increment Title	Approved Cost (£m)	Forecast cost (£m)	Variation (+/- £m)	In-Year Variation (+/- £m)
Typhoon	13100	13100	0	0
<b>Total (£m)</b>	<b>13100</b>	<b>13100</b>	<b>0</b>	<b>0</b>

#### B.4.1 Cost variation against approved Support / PFI Cost

#### B.4.2 Operational Impact on Support / PFI Cost

### B.5 Expenditure to date

Description	Previous expenditure to 31 March 2012 (£m)	In-year expenditure (£m)	Total expenditure to 31 March 2013 (£m)
Assessment Phase	120	0	120
Demonstration and Manufacture Phase	15149	805	15954
Support Phase / PFI Cost	3781	558	4339
<b>Total Expenditure</b>	<b>19050</b>	<b>1363</b>	<b>20413</b>

## C Section C: Timescale

### C.1 Length of the Assessment Phase

Project/Increment Title	Date of Initial Investment Decision Approval	Actual Date of Main Investment Decision Approval	Length of Assessment Phase
Typhoon	(Legacy Project) pre SMART	November 1987	-
Typhoon Future Capability Programme	Combined Initial and Main Gate approval	January 2007	-
Active Electronic Scanned Array	July 2011	***	***

### C.2 Actual Boundaries for In Service Date or Initial Operating Capability

Project/Increment Title	Earliest Approved	Budgeted For	Latest Approved
Typhoon	-	December 1998	-
Typhoon Future Capability Programme	January 2012	June 2012	June 2012
Active Electronic Scanned Array	-	***	-

### C.3 In-Service Date/Initial Operating Capability

#### C.3.1 Definition

Project/Increment Title	In-Service Date/Initial Operating Capability
Typhoon	In-Service Date - Date of Delivery of first aircraft to the RAF.  Initial Operating Capability - When Squadron Pilots begin training they start to contribute to Defence capability.
Typhoon Future Capability Programme	In-Service Date - Delivery to the RAF of autonomous precision Air-to-Surface military capability in 12 Tranche 2 aircraft.  Initial Operating Capability - The same as In-Service Date.

#### C.3.2 Progress against approved Dates

Project/Increment Title	Approved Date	Actual / Forecast Date	Variation (+/- months)	In-Year Variation (+/- months)
Typhoon	December 1998	June 2003	54	0
Typhoon Future Capability Programme	June 2012	December 2013	18	0

#### C.3.3 Timescale variation

##### C.3.3.1 Typhoon

Date	Variation (+/- months)	Category	Reason for Variation
Historic	+32	Technical Factors	Resulting from the application of complex technologies required to enable the equipment to meet the original Staff Requirement (+32 months).

## TYPHOON

Historic	+22	Procurement Processes - International Collaboration	Reorientation of the Development phase in response to the changed strategic environment and budgetary pressures of the four nations and delays in signature of the Memoranda of Understanding for the Production and Support phases (+22 months).
<b>Net Variation (+/- months)</b>	<b>+54</b>		

### C.3.3.2 Typhoon Future Capability Programme

Date	Variation (+/- months)	Category	Reason for Variation
Historic	+15	Technical Factors	Rebaseline of programme by Industry for Integrated Logistic Support and embodiment factors
Historic	+3	Technical Factors	Re-baselining of Future Capability Programme which affects forecast of ISD.
<b>Net Variation (+/- months)</b>	<b>+18</b>		

### C.3.4 Other costs / savings resulting from timescale variation

Project/Increment Title	Date	£m (+ Cost / - Saving)	Category	Reason for expenditure or saving
Support costs of current equipment	Historic	+1075		Cost of running on Tornado and Jaguar
Other	Historic	-861		Estimated support costs for Typhoon not incurred
<b>Total</b>		<b>+214</b>		

### C.3.5 Operational Impact of In-Service Date/Initial Operating Capability variation

Project/Increment Title	Operational Impact
Typhoon	Key improvements in capability not realised until revised ISD are: i) Agility and all altitude performance; ii) Autonomous detection, identification and multiple engagement of air to air targets; iii) Human computer interface to reduce operator workload; iv) Multi role capability; v) Survivability through superior airframe and equipment performance; vi) Low mean time between failures. The 54 month delay has been mitigated to a small extent by compressing the entry into service period, but the net effect is a delay of four years.
Typhoon Future Capability Programme	Delays to Future Capability Programme 1 does not adversely impact on the Typhoon Force build.

## TYPHOON

### C.4. Full Operating Capability

#### C.4.1 Definition

Project/Increment Title	Full Operating Capability	Progress to date
Typhoon	A declaration by Head of Capability (Theatre Airspace) that the full strength Military Capability has been achieved.	On track
Typhoon Future Capability Programme	A declaration by Head of Capability (Theatre Airspace) that Swing-role military capability has been achieved.	On track

### C.5. Support / PFI Contract

#### C.5.1 Scope of Support / PFI Contract

Project/Increment Title	Scope
Typhoon Availability Service	Aircraft platform availability service integrating on-shore support activities with the outputs of mandated international contracts
Engine Availability Service	National engine spares inclusive availability contract with international support contracts
Spares Provisioning	International spares provisioning contract under the terms established in Memoranda of Understanding.
Component Repair	International component repair contract under the terms established in Memoranda of Understanding.
Technical Support Service	International contract for the provision of technical support services and advice under the terms established in Memoranda of Understanding.

#### C.5.2 Progress against approved Support / PFI Contract Go-Live Date

## D Section D: Performance

### D.1. Sentinel Score

Current score	Last years score	Comments
93%	85 Green	Typhoon
97%	51 Red	Future Capability Programme - Project has been re-baselined and is now progressing well.

### D.2.1 Performance against Defence Lines of Development

Line of Development	Description	Met / Forecast to be met (with risks)	Not met / Forecast not to be met
1. Equipment	Delivery of Typhoon platform, Typhoon Future Capability Programme and associated weapons.	Yes	
2. Training	The timely provision of suitably qualified and experienced personnel to deliver Defence outputs, now and in the future.	Yes (with risks)	
3. Logistics	The provision of maintenance and support to the Typhoon fleet, including the operation of support activities such as supply chain.	Yes (with risks)	
4. Infrastructure	The acquisition, development, management and disposal of all fixed, permanent buildings and structures, land, utilities and facility management services in support of the Typhoon capability.	Yes	
5. Personnel	The timely provision of sufficient, capable and motivated personnel to deliver the Typhoon capability, now and in the future.	Yes (with risks)	
6. Doctrine	Doctrine is an expression of the principles by which military forces guide the use of Typhoon.	Yes	
7. Organisation	Relates to the operational and non-operational organisational relationships of people. It typically includes military force structures, MOD civilian organisational structures and Defence contractors providing support.	Yes	
8. Information	The timely provision of sufficient, capable IT and information systems to deliver Typhoon capability. It includes the production and validation of all mission support data for Operations, Trials and Training.	Yes (with risks)	
Current forecast (with risks)		8 (4)	0
Last year's forecast (with risks)		5 (3)	3

## TYPHOON

### D.2.2 Defence Line of Development variation

Date	Defence Line of Development	Category	Reason for Variation
March 2013	Information	Technical Factors	Generation and validation of mission data for elements of the weapon system is heavily reliant on technical support. With mission data production reliant on interim industry equipment, and personnel additional future investment will be required.
March 2013	Logistics	Technical Factors	National Support arrangements are working well, but there are problems with the timely supply of spares and repair of equipment under the collaborative support contracts which are contributing to the RAF failing to achieve its flying hours.
March 2013	Training	Technical Factors	There is risk that synthetic training will not be provided concurrently with the Future Capability Programme 1 aircraft standard, across the Typhoon Force.
March 2013	Equipment	Technical Factors	It is now assessed that this DLOD will deliver capability to meet the redefined Future Capability Programme 1 In Service Date of December 2013.
Historic	Equipment	Technical Factors	The approved ISD of June 2012 for Future Capability Programme 1 will not be achieved and is likely to be delayed by over 12 months. A combination of technical complexity, Partner Nation disagreement on a synthetic training solution and delays in agreement of an international support arrangement have caused the delay. The situation is summarised in an Information Note released on 2nd April 2012. The ISD for Typhoon surface-attack capability was rebaselined as part of the Strategic Defence and Security Review to 2015. Consequently, the delay to the delivery of Future Capability Programme 1 DLODs does not affect Typhoon's ability to deliver Defence Final Output.

## TYPHOON

Historic	Logistics	Technical Factors	The delivery of the Future Capability Programme 1 Logistics DLOD is dependent on the completion of the Future Capability Programme product which is delayed by over 12 months (Information Note released on 2nd April 2012 refers). The ISD for Typhoon surface-attack capability was rebaselined as part of the Strategic Defence and Security Review to 2015. Consequently, the delay to the delivery of Future Capability Programme 1 DLODs does not affect Typhoon's ability to deliver Defence Final Output.
Historic	Training	Technical Factors	The delivery of the Future Capability Programme 1 Training DLOD is dependent on the completion of the Future Capability Programme product which is delayed by over 12 months (Information Note released on 2nd April 2012 refers). The ISD for Typhoon surface-attack capability was rebaselined as part of the Strategic Defence and Security Review to 2015. Consequently, the delay to the delivery of Future Capability Programme 1 DLODs does not affect Typhoon's ability to deliver Defence Final Output.
Historic	Infrastructure	Technical Factors	Overall performance is good with minor issues mainly relating to the second operating base at Leuchars. Minimum infrastructure was provided because the timescale for delivery was short (approximately two years) and some mitigations are still in place. Furthermore, funding for the building for synthetic simulators has still not been approved.
Historic	Logistics	Technical Factors	National Support arrangements are working well, but there are problems with the timely supply of spares and repair of equipment under the collaborative support contracts which are contributing to the RAF failing to achieve its flying hours.
Historic	Information	Changed Capability Requirements	Generation and validation of mission data for elements of the weapon system continues to lag aircraft development. With mission data production reliant on interim industry equipment, additional future investment will be required.

## TYPHOON

Historic	Training	Budgetary Factors and Technical Factors	A Planning Round 2009 measure restricted the Annual Flying Task resource available to support flying training for Front Line pilots, capping the deliverable capability; pilots are now resourced to ensure minimum safe sustainable flying rate. Eurofighter Aircrew Synthetic Training Aids also failed to deliver software upgrades to programme timescales; synthetic multi-role training capability has been delayed as a result.
Historic	Equipment	Redefinition	The Equipment DLOD is not now considered "At Risk" as the previous assessment was based on an in-year perspective, rather than a forecast of progress towards achieving Full Operating Capability.
Historic	Logistics	Redefinition	The Logistics DLOD is not now considered "At Risk" as the previous assessment was based on an in-year perspective, rather than a forecast of progress towards achieving Full Operating Capability.
Historic	Personnel	Budgetary Factors	Generation of sufficient technical manpower to fulfil the combined requirements of the Typhoon Availability Service and those necessary to man the front line could not be met, largely due to a global shortfall of aircraft engineering technicians.
Historic	Equipment	Budgetary Factors	There are currently insufficient resources available at the right time to integrate weapons systems, such as BVRAAM, onto the Typhoon platform.
Historic	Training	Changed Capability Requirements	The requirement to provide additional training as a result of exports has adversely affected the UK's Typhoon training capacity.
Historic	Logistics	Changed Capability Requirements	The requirement to provide additional spares provisioning as a result of exports has adversely affected the UK's ability to deliver full logistics support.



## TYPHOON

Historic	Logistics	Changed Capability Requirements	The equipment required to generate, verify and validate mission dependent data for elements of the weapons system lags aircraft development by up to 2 years and is currently not fit for purpose. Therefore, mission dependent data production is reliant on interim industry equipment which does not permit validation or verification testing of this data to MOD quality assurance standards until January 2010 at the earliest. Mitigations are in place to manage this risk against Typhoon's tasks over the next 3 years, but this area will require further investment as Typhoon's tasks grow in accordance with extant Planning Assumptions.
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### D.3. Performance against Key Performance Measures

#### D.3.1 Typhoon

##### D.3.1.1 Performance against Key Performance Measures

Key Performance Measure	Related Defence Lines of Development	Description	Met / Forecast to be met (with risks)	Not met / Forecast not to be met
1	Equipment	Take off Distance	Yes	
2	Equipment	Landing Distance		Yes
3	Equipment, Training, Logistics, Personnel	Attributable Failures per 1000 Flying Hours	Yes	
4	Equipment, Logistics	Life (Flying Hours)	Yes	
5	Equipment	Sustained Minimum Turn Radii at Sea Level, Max Reheat	Yes	
6	Equipment	Maximum speed at sea level	Yes	
7	Equipment	Maximum speed at 36,000 ft	Yes (with risks)	
8	Equipment	Acceleration Time at Sea level from 200 knots to Mach 0.9	Yes	
9	Equipment	Instantaneous Turn Rate Sea Level, Max Reheat	Yes	
10	Equipment	Sustained Turn Rate at Mach 0.9 at 5000ft, Max Dry	Yes	

## TYPHOON

Current forecast (with risks)	9 (1)	1
Last year's forecast (with risks)	9 (1)	1

### D.3.1.2 Key Performance Measures Variation

Date	Key Performance Measure	Category	Reason for Variation
Historic	KUR 07	Technical Factors	Industry flight trials to extend the aircraft performance envelope have identified acoustic vibration within the engine intake which is causing the intake to resonate at very high speeds. This has potential long term fatigue implications. It is assessed that it would not be cost effective to conduct trials to expand the existing clearance.
Historic	KUR 02	Technical Factors	Refined modelling carried out to support the 1994 reorientation submission indicated that in the most adverse conditions the specified landing distance would not be achieved - this was accepted by the Equipment Approvals Committee.

### D.3.1.3 Operational Impact of variation

## D.3.2 Typhoon Future Capability Programme

### D.3.2.1 Performance against Key Performance Measures

Key Performance Measure	Related Defence Lines of Development	Description	Met / Forecast to be met (with risks)	Not met / Forecast not to be met
1	All	To engage a defined set of targets.	Yes	
2	All	To complete Air Policing duties.	Yes	
3	All	To maintain Typhoon rates of effort.	Yes	
4	All	To satisfy Communications and Information Systems interoperability requirements.	Yes	

## TYPHOON

5	All	To complete a mission in zero visibility.	Yes	
6	All	To complete the mission from zero to bright sunlight.	Yes	
7	All	To maintain the Typhoon supportability.	Yes	
Current forecast (with risks)			7 (0)	0
Last year's forecast (with risks)			7 (0)	0

### D.3.2.2 Key Performance Measures variation

### D.3.2.3 Operational Impact of variation

## D.4 Support Contract

### D.4.1 Typhoon

#### D.4.1.1 Performance against Key Performance Measures

Key Performance Measure	Related Defence Lines of Development	Description	Met / Forecast to be met (with risks)	Not met / Forecast not to be met
1	Logistics	Forward Available Fleet: Measured as a percentage of the average number of available Forward Available Fleet aircraft against the planned number of Forward Available Fleet aircraft for the accounting period.	Yes	
2	Logistics	Operational Aircraft: Measured as the number of operational aircraft within the appropriate readiness timescale.	Yes (with risks)	

## TYPHOON

3	Training	Pilots: Measured as the percentage of productive pilots available for tasking against the planned number of pilots for the accounting period.	Yes (with risks)	
Current forecast (with risks)			3 (2)	0
Last year's forecast (with risks)			3 (0)	0

### D.4.1.2 Key Performance Measures variation

Date	Key Performance Measure	Category	Reason for Variation
March 2013	2	Technical Factors	There is a risk that the Tranche 2 aircraft will not be available to declare as operational force elements as a result of technical and support issues. Several avionic upgrades and a full deployable support solution must be in place for Tranche 2 aircraft to be declared as operational
March 2013	3	Technical Factors	There is a risk that the synthetic training devices (simulators) will not be upgraded concurrently with the aircraft. This would mean that pilots would be unable to train adequately for employing the new aircraft standard.

### D.4.1.3 Operational Impact of variation

### D.4.1.3 Operational Impact of variation - N/A

<b>Project Title</b>		
Warrior Capability Sustainment Programme		
<b>Team Responsible</b>		
Warrior Project Team		
<b>Senior Responsible Owner</b>	<b>Date Appointed</b>	<b>Planned end date</b>
Major General Bruce Brealey	01-Apr-13	30-Sep-13
<b>Project/Increment Name</b>	<b>Current Status of Projects / Increments</b>	
Warrior Capability Sustainment Programme	Post-Main Investment Decision	
Common Cannon	Post-Main Investment Decision	

## A. Section A: The Project

### A.1 The Requirement

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

The Warrior Capability Sustainment Programme consists of four main elements:

1. Warrior Fightability Lethality Improvement Programme

(A new turret incorporating a fully stabilised automatic 40mm cannon)

The 40 mm Cased Telescopic Cannon and Ammunition System has been mandated as the weapon system for Warrior and procured by a joint Anglo-French project. The project is currently part way through qualification of the ammunition and cannon, concurrently the weapon system is being integrated into Warrior by Lockheed Martin UK, who will qualify the new turret.

2. Enhanced Electronic Architecture

(Power generation and distribution enhancement and the introduction of a modern electronic architecture)

3. Modular Protection System

(Applique Armour fixing points, enabling a 'tailored' armour solution to counter specific threats)

4. Armoured Battlefield Support Vehicle

(A new variant, replacing obsolescent platforms, that has equal protection and mobility to the core fighting platforms). Armoured Battlefield Support Vehicle is currently in the Concept Phase and is subject to future approval.

The current affordable fleet is 565 vehicles including 445 currently planned to be upgraded to Warrior Capability Sustainment Programme which includes the intent to upgrade 65 to Armoured Battlefield Support Vehicle.

### A.2 The Assessment Phase

The Assessment Phase was conducted from the approval of Initial Gate (27th July 2009) to the contract effective date of 31st October 2011. A competition was run, with two bidders (BAE Systems and Lockheed Martin) invited to compete.

After Initial Gate, the programme was given a compressed timeline of six months to gain Main Gate Approval, and a Business Case was submitted to the Investment Approval Board in February 2010. Affordability issues due to an over extended Defence Budget meant Main Gate Approval was not given, with the bidders requested to Revise and Confirm their bids against a range of options. In March 2010 the Investment Approvals Board approved an uplift of up to £12.4m to fund the extended Assessment Phase.

The programme team resubmitted a Main Gate Business Case to the Defence Equipment and Support Investment Board on 11th July 2011, which was approved and submitted for the Investment and Approval Committee meeting on 19th July 2011. Approval was given by Her Majesty's Treasury on 4th October 2011 and then the Investment and Approvals Committee on 10th October 2011.

The Prime Minister visited the Lockheed Martin facility in Ampthill, Bedfordshire on 25th October 2011 and made a public announcement regarding the placement of the contract with Lockheed Martin.

The Contract for the Demonstration Phase was signed on 31st October 2011.

Within the Warrior approval, the 40mm Cannon was the mandated weapon system (March 2008) which would enable commonality with the Specialist Vehicles Programme, thus benefiting from common ammunition and training. A Review Note for the 40mm Cannon went to the Investment Approvals Board in March 2010 and was approved in April 2010.

## WARRIOR CAPABILITY SUSTAINMENT PROGRAMME

### A.3 Project History

26th March 2008 - 40mm Cased Telescopic Cannon and Ammunition mandated.  
27th July 2009 - Warrior Capability Sustainment Programme Initial Gate Business Case Approved  
25th February 2010 - Investment Approval Board Meeting for Warrior Main Gate Business Case (Not Approved due to affordability issues)  
22 March 2010 - Ministerial Letter to both bidders to confirm the Revise and Confirm of bids exercise.  
4th April 2010 - Review Note for Cannon to Investment Approvals Board Meeting for financial approval  
25th August 2010 - Revise and Confirm bids received from bidders  
4th October 2011 - Formal Approval from Her Majesty's Treasury  
10th October 2011 - Formal Approval from Investment Approvals Committee  
25th October 2011 - Ministerial Announcement by Prime Minister  
31st October 2011 - Contract Effective Date with Lockheed Martin UK

MAIN WEAPON SELECTION - SCOUT: Approval for the selection of the 40mm Case Telescope Weapon System was given in 2008 to enable commonality with the Warrior Capability Sustainment Programme, thus taking the benefit of common ammunition and training. Qualification for the 40mm Case Telescoped Weapon System is led by the Scout - Specialist Vehicles team.

### A.4 In-year Progress

The following milestones have been achieved by Lockheed Martin in-year::

April 2012 - Integrated Baseline Review {Performance Measurement Baseline functioning, Programme Planning artefacts established and integrated and Corrective action plans developed and accepted at the completion of the Integrated Baseline Review}

May 2012 - System Design Review (Anchor) {Conduct FV510 & FV511 System Design Review in accordance with and meet the criteria in the Systems Engineering Management Plan, Demonstration and collection of evidence of operation in live fire and trundling environments in accordance with the subject Test Plans, covering: Primary & Secondary Sighting Systems; Fire Control System (FCS) and Develop and agree corrective action plans for this Anchor Milestone's acceptance criteria, as appropriate, at the completion of this Design / Readiness Review.}

September 2012 - Ballistic Solution Algorithm Software Drop 3 {Ballistic Solution Algorithm Interface Control Document for Software Drop 3 approved and Fire Control Algorithms Sub-Systems Requirements Document approved}

November 2012 - System Architecture Design Review 510/511 (SADR) (Anchor) {Conduct FV510 & FV511 System Architecture Design Review in accordance with and meet the criteria in the Systems Engineering Management Plan, Annex A Appendix E01 and develop and agree corrective action plans for this Anchor Milestone's acceptance criteria, as appropriate, at the completion of this Design / Readiness Review.} Noting that this was within the project's approvals it was 2 months late against the contract.

January 2013 - SciSys Electronic Architecture Software Build 2 {Conduct Electronic Architecture Preliminary Design Review in accordance with Systems Engineering Management Plan, Annex A Appendix E01, Corrective action plans developed and accepted at the completion of the Electronic Architecture Preliminary Design Review and Electronic Architecture Software Build 2 Test Report complete and approved}

The next planned milestone, Preliminary Design Review (PDR), is forecast for April 2013 in the contract, and it is anticipated to be delayed.

## WARRIOR CAPABILITY SUSTAINMENT PROGRAMME

### A.5 Capability Risks

Warrior Capability Sustainment Programme will upgrade the current Warrior fleet, some of which have been upgraded through a series of modifications and Urgent Operational Requirements. The current fleet is now restricted in its capability on operations. The Out of Service Date for the non Warrior Capability Sustainment Programme Warrior fleet is 2025, so Warrior must be upgraded to avoid a long-term capability gap opening up.

### A.6 Associated Projects - N/A

### A.7 Procurement Strategy

Project / Increment Title	Contractor	Contract Scope	Contract Type	Procurement Route
Warrior Capability Sustainment Programme	Lockheed Martin UK	Demonstration to Manufacture	Prime Contractor	Competitive - International
Common Cannon	CTA International	Design and Development	Prime Contractor	Single Source

### A.8 Support Strategy

Description				
<p>Repair of equipment and supply of spares for the current Warrior fleet is provided through contracts with industry placed by Civil Servants employed by Defence Equipment and Support and Defence Support Group. A number of significant support contracts exist, with major examples being with Thales Optronics Ltd for the Battle Group Thermal Imager sights and a contract for the Diesel Engines and Transmission with Caterpillar Ltd.</p> <p>The support strategy for the upgraded Warrior will be similar to the current fleet. There will be an initial purchase of Capital Spares through the Manufacture contract to support the upgraded Warrior for a period of two years.</p>				
Support Title	Contractor	Contract Scope	Contract Type	Procurement Route
Warrior Capability Sustainment Programme	Lockheed Martin UK	Manufacture to In Service	Prime Contractor	Competitive - International



## WARRIOR CAPABILITY SUSTAINMENT PROGRAMME

### B Section B: Cost

#### B.1 Cost of the Assessment Phase

Project/ Increment Title	Approved Cost (£m)	Actual / Forecast Cost (£m)	Variation (£m)	Approved cost as a proportion of total estimated procurement expenditure (%)	Actual Cost as a proportion of total estimated procurement expenditure (%)
Warrior Capability Sustainment Programme	24	29	+5	2%	2%
Common Cannon	59	50	-9	-	-
<b>Total (£m)</b>	<b>83</b>	<b>79</b>	<b>-4</b>	<b>-</b>	<b>-</b>

#### B.2 Actual cost boundaries for Demonstration and Manufacture Phase / PFI

Project/Increment Title	Lowest Approved (£m)	Budgeted For (£m)	Highest Approved (£m)
Warrior Capability Sustainment Programme	1234	1319	1424

#### B.3 Cost of the Demonstration and Manufacture Phase

Project/Increment Title	Budgeted For Cost (£m)	Forecast Cost (£m)	Variation (+/- £m)	In-Year Variation (+/- £m)
Warrior Capability Sustainment Programme	1319	1371	+52	+52
<b>Total (£m)</b>	<b>1319</b>	<b>1371</b>	<b>+52</b>	<b>+52</b>

#### B.3.1 Cost variation against approved cost of the Demonstration and Manufacture Phase

##### B.3.1.1 Warrior Capability Sustainment Programme

Date	Variation (£m)	Category	Reason for Variation
November 2012	+56	Inflation	Retail Price Index and other inflation indices forecast update from DASA DESA.
November 2012	+5	Technical Factors	Refined training estimate (-£26.5m), additional technical support requirement for Demonstration Phase Activities (+£11.4m), remodelled equipment support for trials (+11.2m), Cannon Government Furnished Equipment requirement update (+£5.5m), Long Lead Item assumptions update (+£3.2).

## WARRIOR CAPABILITY SUSTAINMENT PROGRAMME

November 2012	-9	Exchange Rate	Foreign exchange forecast update from DASA DESA.
<b>Net Variation (£m)</b>	<b>+52</b>		

### B.3.2 Operational Impact of cost variations of Demonstration and Manufacture Phase

Project/ Increment Title	Category	Explanation
Warrior Capability Sustainment Programme	Inflation	An increase in Retail Price Index (RPIX) forecast from DASA DESA is driving significant cost growth in the Manufacturing years. Manufacture with the Prime is subject to a Fixed Price Contract with a Variation of Price Clause based on Retail Price Index. The Main Gate approval for Warrior Capability Sustainment Programme capped the cost of the project at £1319M. While the project is cost capped a decision is not required until the end of the Demonstration Phase when we commit to manufacture which will be supported by an Information/Review Note

### B.4 Progress against approved Support / PFI Cost

Project/Increment Title	Approved Cost (£m)	Forecast cost (£m)	Variation (+/- £m)	In-Year Variation (+/- £m)
Battle Group Thermal Imaging	61	67	+6	-0
Diesel Engines and Transmissions	25	16	-9	+2
<b>Total (£m)</b>	<b>86</b>	<b>83</b>	<b>-3</b>	<b>+2</b>

#### B.4.1 Cost variation against approved Support / PFI Cost

##### B.4.1.1 Battle Group Thermal Imaging

Date	Variation (£m)	Category	Reason for Variation
March 2013	+1	Changed Capability Requirements	Increased usage due to providing equipment to support operations
March 2013	-1	HM Treasury Reserve	Money claimed back from Treasury Reserve Fund
Historic	+6	Changed Capability Requirements	35 Additional Warrior Battle Group Thermal Imager (BGTI) supported as per formal planning round option.
<b>Net Variation (£m)</b>	<b>+6</b>		

##### B.4.1.2 Diesel Engines and Transmissions

Date	Variation (£m)	Category	Reason for Variation
June 2012	+2	Technical Factors	More expensive type of repairs required in FY12/13, compared to forecast

# **WARRIOR CAPABILITY SUSTAINMENT PROGRAMME**

Historic	-7	Procurement Processes	Decision to reduce existing stock
Historic	-4	Changed Capability Requirements	Reduction in Warrior Joint Business Agreement predicted kilometres.
<b>Net Variation (£m)</b>	<b>-9</b>		

## **B.4.2 Operational Impact on Support / PFI Cost**

## **B.5 Expenditure to date**

Description	Previous expenditure to 31 March 2012 (£m)	In-year expenditure (£m)	Total expenditure to 31 March 2013 (£m)
Assessment Phase	57	3	60
Demonstration and Manufacture Phase	30	42	72
Support Phase / PFI Cost	41	8	49
<b>Total Expenditure</b>	<b>128</b>	<b>53</b>	<b>181</b>

## WARRIOR CAPABILITY SUSTAINMENT PROGRAMME

### C Section C: Timescale

#### C.1 Length of the Assessment Phase

Project/Increment Title	Date of Initial Investment Decision Approval	Actual Date of Main Investment Decision Approval	Length of Assessment Phase
Warrior Capability Sustainment Programme	July 2009	October 2011	27
Common Cannon	July 2009	April 2010	9

#### C.2 Actual Boundaries for In Service Date or Initial Operating Capability

Project/Increment Title	Earliest Approved	Budgeted For	Latest Approved
Warrior Capability Sustainment Programme	March 2018	November 2018	October 2020

#### C.3 In-Service Date/Initial Operating Capability

##### C.3.1 Definition

Project/Increment Title	In-Service Date/Initial Operating Capability
Warrior Capability Sustainment Programme	An Armoured Infantry company (Infantry Section and Command variants) trained to Collective Training Level 2

##### C.3.2 Progress against approved Dates

Project/Increment Title	Approved Date	Actual / Forecast Date	Variation (+/- months)	In-Year Variation (+/- months)
Warrior Capability Sustainment Programme	November 2018	November 2018	0	0

##### C.3.3 Timescale variation

##### C.3.4 Other costs / savings resulting from timescale variation - N/A

##### C.3.5 Operational Impact of In-Service Date/Initial Operating Capability variation - N/A

#### C.4. Full Operating Capability

##### C.4.1 Definition

Project/Increment Title	Full Operating Capability	Progress to date
Warrior Capability Sustainment Programme	445 Warriors upgraded (including 65 Armoured Battlefield Support Vehicles)	

## WARRIOR CAPABILITY SUSTAINMENT PROGRAMME

### C.5. Support / PFI Contract

#### C.5.1 Scope of Support / PFI Contract

Project/Increment Title	Scope
Battle Group Thermal Imaging	Battle Group Thermal Imager is a thermal imaging sighting system incorporating a laser range-finder and tactical navigation system and is used on Warrior. The Battle Group Thermal Imager contract is with Thales Optronics Ltd, selected through competition and covers the procurement of installed systems and provision of a support service for a period of 15 years from 4 Mar 2004 until Mar 2019. Battle Group Thermal Imager is a Contractor Logistic Support project with a 1st to 4th line maintenance and repair policy and includes warehousing, supply, repair, reporting and Post Design Services activities. Spares include both repairables and consumables delivered direct from the supplier's warehouse to the user in Germany / Canada and into Purple Gate for Users in the UK / Operations. Lockheed Martin UK will upgrade the Battle Group Thermal Imager sights on Warrior as part of their Warrior Capability Sustainment Programme solution
Diesel Engines and Transmissions	CV8 Diesel main engines and X300 transmissions are repaired through a single source contract placed with the original equipment manufacturer, Caterpillar, Shrewsbury Ltd. This contract is an enabling arrangement that enables each year's repair load to be varied to meet the User's planned activity demand. Engines and transmissions are repaired using Original Equipment Manufacturer parts through a menu pricing process.

#### C.5.2 Progress against approved Support / PFI Contract Go-Live Date

Project/Increment Title	Approved Date	Actual Date	Variation (+/- months)	In-year Variation (+/- months)
Battle Group Thermal Imaging	March 2004	March 2004	0	0
Diesel Engines and Transmissions	April 2009	April 2009	0	0

##### C.5.2.1 Go-Live Date Variation

#### C.5.3 Progress against approved Support / PFI Contract End Date

Project/Increment Title	Approved Date	Actual / Forecast Date	Variation (+/- months)	In-year Variation (+/- months)
Battle Group Thermal Imaging	March 2019	March 2019	0	0
Diesel Engines and Transmissions	March 2014	March 2014	0	0

##### C.5.3.1 End of Contract Date Variation - N/A

#### C.5.5 Operational Impact of Support / PFI Support Contract variation - N/A

## D Section D: Performance

### D.1. Sentinel Score

Current score	Last years score	Comments
89 Green	98 Green	

### D.2.1 Performance against Defence Lines of Development

Line of Development	Description	Met / Forecast to be met (with risks)	Not met / Forecast not to be met
1. Equipment	Equipment solution validated against current capability audit outputs.	Yes	
2. Training	Training solution validated against current capability audit outputs.	Yes	
3. Logistics	Logistics solution validated against current capability audit outputs.	Yes	
4. Infrastructure	Infrastructure solution validated against current (<2 years) capability audit outputs.	Yes	
5. Personnel	Personnel solution validated against current (<2 years) capability audit outputs.	Yes	
6. Doctrine	Impact of current (<2 years) capability audit upon Doctrine & Concepts assessed.	Yes	
7. Organisation	Organisation solution validated against current (<2 years) capability audit outputs.	Yes	
8. Information	Information solution validated against current (<2 years) capability audit outputs.	Yes	
Current forecast (with risks)		8 (0)	0
Last year's forecast (with risks)		8 (0)	0

### D.2.2 Defence Line of Development variation

### D.3. Performance against Key Performance Measures

#### D.3.1 Warrior Capability Sustainment Programme

#### D.3.1.1 Performance against Key Performance Measures

Key Performance Measure	Related Defence Lines of Development	Description	Met / Forecast to be met (with risks)	Not met / Forecast not to be met
KUR 1	Equipment	The User shall be able to suppress an enemy section in the open, when own vehicle is moving as well as static, by day and by night.	Yes	

# **WARRIOR CAPABILITY SUSTAINMENT PROGRAMME**

KUR 2	Equipment	The User shall be able to destroy (WCSP decode 63) IFVs when own vehicle is moving as well as static, by day and by night.	Yes	
KUR 3	Equipment	The User shall be able to carry personnel and equipment appropriate to the role.	Yes	
KUR 4	Equipment	The User requires that both Commander and Gunner shall be able to maintain all round local Situational Awareness (SA) in all environments, including urban, when closed down and head out, by day or night when own vehicle is moving as well as static.	Yes	
KUR 5	Equipment	The User shall be provided with appropriate levels of operational and tactical mobility commensurate to role.	Yes	
KUR 6	Equipment	The User shall be provided with the ability to quickly add and remove protection appropriate to the operational threat.	Yes	
KUR 7	Equipment	The User shall be able to store, operate and transport the capability in all relevant climates and terrains.	Yes	

### WARRIOR CAPABILITY SUSTAINMENT PROGRAMME

KUR 8	Equipment	The User shall be provided with a capability that is available for the required sustained level for training and operations.	Yes	
KUR 9	Equipment	The User shall be provided with a capability that can interface and is interoperable with current and known future systems.	Yes	
Current forecast (with risks)			9 (0)	0
Last year's forecast (with risks)			9 (0)	0

**D.3.1.2 Key Performance Measures Variation - N/A**

**D.3.1.3 Operational Impact of variation - N/A**

**D.4 Support Contract - N/A**



## **ASSESSMENT PHASE PROJECTS**

<b>Project Title</b>		
Cipher		
<b>Team Responsible</b>		
Networks		
<b>Senior Responsible Owner</b>	<b>Date Appointed</b>	<b>Planned end date</b>
Chief Information Officer - John Taylor	02/04/2013	
<b>Project/Increment Name</b>	<b>Current Status of Projects / Increments</b>	
Cipher	Pre-Main Investment Decision	

## A. Section A: The Project

### A.1 The Requirement

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

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

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

The MOD uses three levels of technology maturity metrics. These are:

1. Technology Readiness Levels to describe the levels of maturity that are embodied in systems.
2. System Readiness Levels for the integrated systems.
3. Information Readiness Levels which provide a meaningful measurement of the maturity of the information design.

Cipher is a large, complex information-centric programme, involving Government Communication Headquarters (GCHQ) and therefore Information Readiness Levels have been selected to report against for this project.

### A.2 Assessment Phase History

Cipher is a combination of two earlier MOD projects, the Future Crypto Programme (Delivering the hardware) and Interoperable Electronic Key Distribution (the complementary system to deliver keying material, and other supporting configuration and management data). The Initial Gate approval, issued in August 2007, for a combined assessment phase for the two programmes authorised an assessment phase funding \*\*\* at 50% confidence with agreement that the funding could be increased to \*\*\* at 75% confidence subject to written confirmation from Head of Capability that the additional funding was available. No delivery phase timescale or funding estimate was provided in the Initial Gate submission beyond the available ten year funding profile. However, an Information Note issued in December 2008 stated 2012 as the date for the Initial Operating Capability.

Following Initial Gate approval, two consortia were down-selected and awarded "Assessment Phase" contracts in November 2008 to evaluate potential options, develop solutions, undertake demonstration programmes and deliver costed delivery phase proposals. The competition was undertaken in accordance with the Initial Gate strategy and the Procurement Strategy and both consortia agreed to at least match MOD funding for their assessment phase programmes of work.

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

## CIPHER

In June 2010, the Defence Equipment and Support Performance Delivery Improvement Team issued a report on Cipher. Head of Capability responded by producing a Project Mandate defining the project vision, scope, outcomes, delivery timelines and Governance arrangements. An Information Note was submitted to the Investment Appraisal Board in January 2011 to notify of the changes necessary, with a review of progress being held in February 2011 at a 2-Star Foundation Milestone Review. A Review Note was submitted to the Investment Approval Board in April 2011 seeking approval for the revised project timescales, the adoption of an incremental acquisition strategy and a revision to the approved budgetary level for the assessment phase \*\*\* to the Initial Gate approval at 50% confidence. The programme includes four key mitigation actions of a) maturing the incremental approach, b) enhancing the delivery team with additional MOD and Government Communications Headquarters staff, c) developing a detailed and resourced plan and d) improving stakeholder and benefits management. Of these, a, c and d have progressed well. This left mitigation action falling short with regard to additional MOD staff.

The Review Note outcome resulted in contract amendments for both companies, increased spend for the extant project team (including Specialist Technical Support and Government Communication Headquarters staff) by virtue of the longer time frame and a proportion for Risk Reduction activities.

The outcome of the February 2011 Foundation Milestone Review was to proceed, but with the direction that all outstanding actions from the Performance Delivery Improvement Treatment Phase would be addressed. The additional funding required for the delivery of the extended Assessment Phase was identified and revised staffing levels agreed. Funding was used to extend the contracts of Logica and Thales.

Cipher proceeded with the successful completion of the tender evaluation process in February 2012. The public announcement of the preferred bidder was delayed (pending resolution of a number of significant commercially sensitive issues). As at March 2012, the intent remained to submit the Main Gate Business Case for Increment 1 to Investment Approvals Committee in September 2012. However in late 2011, Defence Equipment and Support 3 Star lead for Cipher Chief of Material Joint Enablers queried the maturity of the National Level 2 Design and Deliverability. As a result, a detailed review of the Procurement Strategy was required to precede the Main Gate decision. Representation from the preferred bidder joined the Project Team in Corsham. Both MOD and Government Communication Headquarters personnel worked closely and good progress continued to be made.

The next phase of the project is completion of the National Level 2 design (a more detailed design which is needed to complete the Service Requirement Document) which is being managed and delivered using Government Communication Headquarter 'best practice' System Engineering methodology and process. A number of Planning Round 2012 options were raised to re-align finances which would if taken, impact the project and collectively extend the transition period, delay the realisation of benefits and extend the life of the project (but overall affordability would have improved as a result). Both Planning Round Options were taken. As reflected in the completed (March 2012) Office of Government Commerce Level 3 Review (Investment Decision), the availability of sufficient Suitably Qualified Experienced Personnel in project manpower (Crown Servants) was a serious issue (AMBER/RED), and there were well known weaknesses in external governance and senior stakeholder support that that needed to be addressed. A coherent and appropriately resourced joint Crypto Modernisation Programme to coordinate and span MOD, Government Communication Headquarters and Other Government Departments (as applicable) activities in this area was set up. The Office of Government Commerce Gateway Level 3 Review again highlighted the high levels of technical risk inherent in the approach (i.e. to proceed to Main Gate in advance of completion of the Level 2 design).

## CIPHER

### A.3 In-Year Progress

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

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

### A.4 Capability Risks

Capability risks if Cipher is delayed:

Existing Crypto capability lacks the flexibility to deliver Network Enabled Capability. Efficiency savings related to automation of crypto capability are delayed leading to increased demand on service manpower.

### A.5 Associated Projects

Title of Associated Project	Forecast In Service Date/ Initial Operating Capability	Approval Status
Key Production Authority Futures Project	December 2015	Pre-Main Gate

### A.6 Procurement Strategy

Project / Increment Title	Procurement Route	Approval Status
Cipher	Competitive - UK	Pre-Main Gate

### A.7 Support Strategy

Description				
<p>The Cipher Integrated Logistic Support strategy aims to provide a robust and 'fit for purpose' solution and assured adherence to the Support Solution. It will articulate the support framework that will be required for Cipher, bringing together the major elements of support, including the potential Contractor Logistic Support arrangements, the Support Solution Envelope and the role of the crypto System Operating Authority plus Networks Crypto Services for Defence. The Plan will be developed through progressive discussion with the major Integrated Logistic Support stakeholders.</p>				
Support Title	Contractor	Contract Scope	Contract Type	Procurement Route
Increment 1	Awaiting announcement	Demonstration to Manufacture	Fixed Price	Competitive - UK

## B Section B: Cost

### B.1 Cost of the Assessment Phase

Project/ Increment Title	Approved Cost (£m)	Forecast Cost (£m)	Variation (£m)
Cipher	19	66	+47
<b>Total (£m)</b>	<b>19</b>	<b>66</b>	<b>+47</b>

### B.2 Planned Cost Boundaries for Demonstration and Manufacture Phase

Project/Increment Title	Lowest Forecast (£m)	Budgeted For Forecast (£m)	Highest Forecast (£m)
Cipher	***	-	

### B.3 Cost of the Demonstration and Manufacture Phase - Not Applicable

### B.4 Progress against approved Support / PFI Cost - Not Applicable

### B.5 Expenditure to date

Description	Previous expenditure to 31 March 2012 (£m)	In-year expenditure (£m)	Total expenditure to 31 March 2013 (£m)
Assessment Phase	25	14	39
Demonstration and Manufacture Phase	0	0	-
Support Phase / PFI Cost	0	0	-
<b>Total Expenditure</b>	<b>25</b>	<b>14</b>	<b>39</b>

## **C     Section C: Timescale**

### **C.1     Duration of the Assessment Phase**

<b>Project/Increment Title</b>	<b>Date of Initial Investment Decision Approval</b>	<b>Forecast Date of Main Investment Decision Approval</b>	<b>Length of Assessment Phase</b>
Cipher	August 2007	-	-

### **C.2     Planned Boundaries for In Service Date or Initial Operating Capability**

<b>Project/Increment Title</b>	<b>Earliest Forecast</b>	<b>Budgeted For Forecast</b>	<b>Latest Forecast</b>
Cipher	***	-	-

**C.3     In-Service Date/Initial Operating Capability - Not Applicable**

**C.4.     Full Operating Capability - Not Applicable**

**C.5     Support / PFI Contract - Not Applicable**

## **D     Section D: Performance**

### **D.1.     Technology Readiness Level**

<b>Current score</b>	<b>Last years score</b>	<b>Scale</b>	<b>Comments</b>
1	2	1-9	Cipher uses Information Readiness Levels. This is explained under Section A.1. The Requirement.

### **D.2.1     Performance against Defence Lines of Development - Not Applicable**

### **D.3.     Performance against Key Performance Measures - Not Applicable**

### **D.4     Support Contract - Not Applicable**



<b>Project Title</b>		
Successor		
<b>Team Responsible</b>		
Future Submarines		
<b>Senior Responsible Owner</b>	<b>Date Appointed</b>	<b>Planned end date</b>
Vice Admiral Andrew Matthews	11 May 2012	
<b>Project/Increment Name</b>		
<b>Current Status of Projects / Increments</b>		
Future Submarines Concept Phase	Concept Phase	
Next Generation Nuclear Propulsion Plant Concept	Concept Phase	
Nuclear Propulsion Critical Technology	Concept Phase	
Common Missile Compartment Non-Recurring Costs	Concept Phase	
Future Submarines Assessment Phase	Pre-Main Investment Decision	
Next Generation Nuclear Propulsion Plant Assessment Phase	Pre-Main Investment Decision	
Nuclear Propulsion Critical Technology Assessment Phase	Pre-Main Investment Decision	

## A. Section A: The Project

### A.1 The Requirement

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

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

The Successor boats are expected to have a 25 year life with the option of at least a five year extension and suitable low detectability. The current planned service entry date for the first boat is 2028.

A Common Missile Compartment for the submarine is being developed with the United States. This will house the Trident Strategic Weapon System.

Next Generation Nuclear Propulsion Plant: At Initial Gate in April 2011, the decision was taken to power the submarine with a nuclear propulsion system known as Pressurised Water Reactor 3 (PWR3) which incorporates the latest safety technologies and ensures the boats have the performance to deliver the United Kingdom's minimum credible nuclear deterrent out to the 2060s.

The Nuclear Propulsion Critical Technology programme brings focused investment to regenerate the UK nuclear propulsion design and support capability, and ensures we have the design base essential to maintain a strategic sovereign UK nuclear capability.

The Wider Programme: The Strategic Defence and Security Review concluded that it would be possible to defer decisions on the replacement of both the warhead and infrastructure elements of the programme. Over the next few years concept studies will begin to refine potential programmes and costs. No decision as to whether a new warhead design is needed will be taken until the next Parliament. Neither the warhead nor infrastructure is covered in this report.

The Rolls-Royce Core Production Capability facility at Raynesway has passed Main Gate and will provide the fuel cores for Successor. This is covered by a separate Project Summary Sheet.

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

### A.2 Assessment Phase History

The MOD's Future Submarines Project Team was established in 2007 from a small group within the then Nuclear Directorate.

Three companies, BAE Submarine Solutions (Platform), Babcock (support), and Rolls-Royce (power plant) known as the Tier One industrial partners were awarded contracts for the collaborative Concept Phase. This work informed the Options considered at Initial Gate. A Technical Demonstrator programme was also undertaken.

An Integrated Project Management Team has also been established.

Initial Gate was approved on 14th April 2011 and announced in Parliament on 18 May 2011 when a Report to Parliament, "The United Kingdom's Future Nuclear Deterrent: The Submarine Initial Gate Parliamentary Report" was made.

## SUCCESSOR

This followed a Concept phase from 2006/07 to April 2011 during which £905M was approved.

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An Integrated Project Management Team has also been established.

Initial Gate was approved on 14th April 2011 and announced in Parliament on 18 May 2011 when a Report to Parliament, "The United Kingdom's Future Nuclear Deterrent: The Submarine Initial Gate Parliamentary Report" was made.

This followed a Concept phase from 2006/07 to April 2011 during which £905M was approved.

This period saw the preparation and staffing of the Initial Gate Business Case through the MOD and Treasury with Treasury approval received on 29th March 2011.

2010 also saw the SDSR Strategic Defence and Security Review, "Securing Britain in an Age of Uncertainty: Publication of the Strategic Defence and Security Review" chapter three, published on 19th October 2010, and the Trident Value for Money Review ( Fact Sheet ten). These made changes to the White Paper Assumptions. These included: a deferral of the planned delivery of the first submarine from 2024 to 2028, and a deferral of the Main Gate decision point from 2014 to 2016. There was also agreement with the United States on the major parameters of the jointly-developed common missile compartment design that will be capable of carrying the current Trident D5 missiles and any replacement missile once the D5 reaches the end of its expected life in the 2040s.

Initial Gate considered the Submarine design using pull through of Astute technology to reduce cost and design and delivery risk, and provide commonality in training and maintenance. There were also opportunities to take advantage of developments since the Astute design.

One such was the selection of Pressure Water Reactor 3 as the submarine's propulsion system. Pressure Water Reactor 3 provides superior performance and meets the Nuclear Safety Regulator's requirement to continually improve our performance and meet the "As Low As Reasonably Practicable" requirement. However Pressure Water Reactor 3 is more expensive to buy and operate over a 25 year period, but cheaper if the boats are run for longer.

The Coalition's policy on the Successor Deterrent is clear, and it is that it is committed to the United Kingdom's nuclear Deterrent based on a ballistic missile submarine. The Trident Alternatives Study will form part of the information considered to assist the decisions needed at Main Gate.

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

The MOD and Integrated Programme Management teams have been established and teams built up in Barrow and Derby. An Integrated Master Schedule has been agreed with industry across the Programme.

A Review Note on progress in year was submitted to the MOD's Investment Approvals Committee in July 2012.

## SUCCESSOR

### A.3 In-Year Progress

1. The Ship Specification, which decomposes the user requirement into specific requirements for each submarine system and attribute, has been fully developed and placed under configuration control with the exception of Outfitting Requirements. The first phase of the platform detailed design programme, Design Intent Definition which confirms the system architectures, completed to plan in December 2012 with a major design review (System Definition Review, SDR) across all of the major systems areas. The detailed design of the Pressurised Water Reactor 3 (PWR3) plant is now over half-way through the design phase. All significant design decisions have been taken, with the design on track for its Critical Design Review in December 2014; the primary propulsion system exceeded the design maturity requirements for SDR.
2. During December 2012, the Annual Report to Parliament was submitted and in March 2013, the MoD Investment Approvals Committee approved the build strategy for the Common Missile Compartment.
3. The Main Gate Investment decision point has been updated to September 2016. This revised date reflect the point at which the project will transition into the build phase. The forecasted assessment phase costs have also reduced compared to the previous submission, based on updated forecasts from Industry and maturity of estimates for the assessment phase.

### A.4 Capability Risks

Without the design and build of a new class of ballistic missile submarines, the United Kingdom would be unable to maintain its independent nuclear deterrent once the current Vanguard class goes out of service. This decision was agreed by Parliament in 2007 following the 2006 White Paper: "The Future of the United Kingdom's Nuclear Deterrent" Cm 6994. The current Government also supports the maintenance of the United Kingdom's independent Nuclear Deterrent capability.

The Nuclear Deterrent is a current Operation.

### A.5 Associated Projects

Title of Associated Project	Forecast In Service Date/ Initial Operating Capability	Approval Status
Core Production Capability	Full Operating Capability August 2021	Post Main Gate

### A.6 Procurement Strategy

Project / Increment Title	Procurement Route	Approval Status
Future Submarines Concept Phase	Ascertained costs to be three tier 1 contractors	Concept Phase
Next Generation Nuclear Propulsion Plant Concept	Single Source	Concept Phase
Nuclear Propulsion Critical Technology	Non-Competitive - International	Concept Phase
Common Missile Compartment Non-Recurring Costs	Non-Competitive - International	Concept Phase

## SUCCESSOR

Future Submarines Assessment Phase	Ascertained costs to be three tier 1 contractors	Pre-Main Gate
Next Generation Nuclear Propulsion Plant Assessment Phase	Single Source	Pre-Main Gate
Nuclear Propulsion Critical Technology Assessment Phase	Non-Competitive - International	Pre-Main Gate

### A.7 Support Strategy

Description				
<p>The Support Chain Strategy is in preparation, and engagement has started. The aim is for optimised, affordable Through Life Support with established Whole Life Costs and challenging availability targets. The target is to have a Whole Life Cost that does not exceed that of the current Vanguard class and ensure maintenance of the Continuous At Sea Deterrent. Drivers for change include: Long term supply chain incentivisation and reductions in design complexity and component range and scale. Babcock is the Tier 1 company for support, and the strategy will be delivered as a collaborative activity within the Submarine Enterprise Performance Programme.</p>				
Support Title	Contractor	Contract Scope	Contract Type	Procurement Route
-	Babcock	Support	-	Single Source

## SUCCESSOR

### B Section B: Cost

#### B.1 Cost of the Concept Phase (pre Assessment Phase)

Project/ Increment Title	Approved Cost (£m)	Forecast Cost (£m)	Variation (£m)
Future Submarines Concept Phase	209	198	-11
Next Generation Nuclear Propulsion Plant Concept	305	305	0
Nuclear Propulsion Critical Technology	108	80	-28
Common Missile Compartment Non-Recurring Costs	283	264	-19
<b>Total Concept Phase (£m)</b>	<b>905</b>	<b>847</b>	<b>-58</b>

#### Cost of the Assessment Phase

Project/ Increment Title	Approved Cost (£m)	Forecast Cost (£m)	Variation (£m)
Future Submarines Assessment Phase	1832	1764	-68
Next Generation Nuclear Propulsion Plant Assessment Phase	1017	1040	23
Nuclear Propulsion Critical Technology Assessment Phase	166	132	-34
<b>Total Assessment Phase (£m)</b>	<b>3015</b>	<b>2936</b>	<b>-79</b>

<b>Total Cost (£m)</b>	<b>3920</b>	<b>3783</b>	<b>-137</b>
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#### B.2 Planned Cost Boundaries for Demonstration and Manufacture Phase / PFI - Not Applicable

#### B.3 Cost of the Demonstration and Manufacture Phase - Not Applicable

#### B.4 Progress against approved Support / PFI Cost - Not Applicable

#### B.5 Expenditure to date

Description	Total expenditure to 31 March 2012 (£m)	In-year expenditure (£m)	Total expenditure to 31 March 2013 (£m)
Concept Phase / Pre Initial Gate	787	16	803
Assessment Phase	315	415	730
<b>Total Expenditure</b>	<b>1102</b>	<b>431</b>	<b>1533</b>

The Assessment Phase Approved Costs reflect a £47m approvals transfer between Next Generation Nuclear Propulsion Plant and Future Submarines. Though forecast as £60m within the Common Missile Compartment Review Note (dated January 2013), subsequent review has reduced this to £47m. This will be formalised in the annual Review Note to the Investment Approvals Committee

Concept Phase (pre Assessment Phase) costs have been included due to there scale. Usually, Concept Phase costs are relatively small, but given the size of this project they have been included for full disclosure.

Assessment Phase sunk costs in MPR2012 incorrectly included those of the Common Missile Compartment. The above table has correctly attributed those to Concept Phase costs.

## SUCCESSOR

### **C     Section C: Timescale**

#### **C.1     Duration of the Assessment Phase**

Project/Increment Title	Date of Initial Investment Decision Approval	Forecast Date of Main Investment Decision Approval	Length of Assessment Phase
Successor	April 2011	September 2016	65

#### **C.2     Planned Boundaries for In Service Date or Initial Operating Capability**

Project/Increment Title	Earliest Forecast	Budgeted For Forecast	Latest Forecast
Successor	-	***	-

#### **C.3     In-Service Date/Initial Operating Capability - N/A**

#### **C.4.     Full Operating Capability - N/A**

#### **C.5     Support / PFI Contract - N/A**

**D     Section D: Performance****D.1.     Technology Readiness Level**

Current score	Last years score	Scale	Comments
-	-	1-10	Successor Technology Readiness Levels are classified

**D.2.1     Performance against Defence Lines of Development - Not Applicable****D.3.     Performance against Key Performance Measures - Not Applicable****D.4     Support Contract - Not Applicable**



Project Title		
Type 26 Global Combat Ship		
Team Responsible		
Type 26 Global Combat Ship		
Senior Responsible Owner	Date Appointed	Planned end date
Commodore Alex Burton	September 2012	
Project/Increment Name	Current Status of Projects / Increments	
Type 26 Global Combat Ship	Pre-Main Investment Decision	

## A. Section A: The Project

### A.1 The Requirement

There is a need to replace the 13 Type 23 surface combatant 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. The Type 26 Global Combat Ship retains the combat power that had been provisioned for the Type 26 (C1) and C2 originally, whilst enhancing endurance and intelligence gathering attributes in a common, acoustically quiet hull.

Type 23s were designed for an 18 year life but this has been extended to almost twice the original design life \*\*\*. The current planning assumption is to replace the ships under the Type 26 Global Combat Ship programme, currently based on one class of up to 13 ships delivered in two variants; anti submarine warfare and general purpose vessels.

### A.2 Assessment Phase History

The Sustained Surface Combatant Capability pathfinder project recommended a three-class solution for Future Surface Combatant. The first class, Type 26 (C1), a task-group enabled anti-submarine warfare frigate. The second, C2, a general purpose frigate. The third, C3, to provide Mine Countermeasure, Hydrographic and Patrol capabilities. The Sustained Surface Combatant Capability Pathfinder highlighted a need for up to ten Type 26 (C1) and eight C2s. Type 26 (C1) was to be built first at a rate of one per year, followed by C2. This approach also met the needs of industrial sustainability whilst fulfilling the Royal Navy requirement.

It was on this basis that the Concept Phase progressed to form the basis of the Initial Gate approval for Type 26 (C1) on 18 March 2010. It was anticipated that Main Gate approval would be sought by the middle of the decade and estimated that for a ten ship class the procurement cost would be \*\*\* (inclusive of VAT and inflation), with a whole life cost of \*\*\* (inclusive of VAT and inflation), assuming a ship life of 25 years. It was also recognised that there would be a Strategic Defence and Security Review following the General Election. Subsequently as part of the approval, it was planned that there would be a mid-phase review point to assess the impact of any changes in policy driven by that Review.

The Approved budgetary level (VAT inc) for the non-competitive procurement of the assessment work at 50% confidence, consisted of £158.4M total direct resource consumption. The approval from the Investment Approvals Board capped the "not to exceed" value of the Assessment Phase at this 50% level. All non-UK new design and build options were discounted at the Initial Gate, as recorded in the Investment Appraisal, noting the over-arching agreement with BAE Systems Maritime – Naval Ships in the Terms of Business Agreement (dated 21 July 2009).

Subject to approvals and value for money assessments, the Type 26 (C1) is expected to be procured without competition from BAE Systems Maritime - Naval Ships under the Terms of Business Agreement (Dated 21 July 2009). A joint team is in place and working at a number of BAE Systems' sites, primarily in Glasgow and Filton (where the MOD members of the joint team are based). As part of this, it is intended that approval for a commitment to the support solution, including costs from the supply chain, will be sought at the Main Gate 2 approval at the end of the Assessment Phase.

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

## TYPE 26 GLOBAL COMBAT SHIP

The alignment of renamed Type 26 Global Combat Ship against the goals of the Strategic Defence and Security Review was confirmed in an Information Note submitted to the Investment Approvals Board in January 2011. This Information Note stated that:

- a. Approval will be split into two parts. Approval (Main Gate 1) will seek endorsement of the requirements to be delivered by Type 26 Global Combat Ship, with Main Gate 2, the main investment decision following at the end of the Assessment Phase. This will allow detailed costing and design work to proceed against a defined requirement so that the project can present an affordable design proposal for approval at Main Gate 2 and subsequent contract signing;
- b. The remaining programme key milestones remain unchanged, with planned service entry as soon as possible after 2020;
- c. Type 26 Global Combat Ship design is considered to have significant export potential with considerable effort being expended to encourage overseas partner interest.

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

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

### A.3 In-Year Progress

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

\*\*\*

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

### A.4 Capability Risks

The Strategic Defence and Security Review confirmed the need for Future Force 2020 to provide maritime defence of the UK and its South Atlantic Overseas Territories. Capabilities should include a surface fleet of 19 frigates and destroyers providing military flexibility across a variety of operations, including six Type 45 destroyers and the current Type 23 frigates. However there is a need to replace the Type 22 and Type 23 surface combatant capability before the safe operating standard for legacy ships is withdrawn and the platforms become obsolete.

## TYPE 26 GLOBAL COMBAT SHIP

Type 23s were designed for an 18 year life but this has been extended to almost twice the original design life. \*\*\* There is no scope to extend the current platforms further without extensive, currently unaffordable modifications. If further extension was required the hull strength, stability and legislative safety compliance would need to be addressed by work that removes capability, does not reduce the risk to the generation of forces at readiness and costs more than a new build option. The Strategic Defence and Security Review confirmed that as soon as possible after 2020 the Type 23 frigates will be replaced by the Type 26 Global Combat Ship which will be designed to be easily adapted to change roles and capabilities depending on the strategic circumstances.

### A.5 Associated Projects

Title of Associated Project	Forecast In Service Date/ Initial Operating Capability	Approval Status
***	***	Pre-Main Gate
***	***	Concept Phase

### A.6 Procurement Strategy

Project / Increment Title	Procurement Route	Approval Status
Type 26 Global Combat Ship	Single Source	Pre-Main Gate

### A.7 Support Strategy

Description
<p>The project Assessment Phase approval covers funding for Concept and Assessment Phase Support activities. The Assessment Phase contract was placed non-competitively under the BAE Systems Maritime - Naval Ships Terms of Business Agreement. Support Initial Gate which was approved as part of the Main Gate 1 submission to the Investment Approvals Committee outlined the initial commercial arrangement to be placed following Main Gate 2 Approval. The current assumption is that the initial commercial arrangement to be placed following Main Gate 2 Approval, will be:</p> <p>a. a pricing framework agreed with the partners within the Surface Ship Support Alliance / Maritime Support Delivery Framework for support at the platform level covering Class Output Management, fleet time maintenance and upkeep activity. At this stage some aspects of the commercial agreements will be based on pricing formulae relating variations in performance targets, operational and other parameters. During the build of the First of Class, these arrangements will be firmed up so that planned maintenance and in service activities are priced as far as possible for a complete support cycle.</p> <p>b. tailored equipment support contracts appropriate to the different equipment characteristics. The strategic support options of Surface Ship Support Alliance or the Public Sector Comparator will establish the means by which support will be delivered in an integrated way at whole ship level. This level of support is underpinned by support of the constituent equipments and systems, which will be delivered through differing arrangements depending on a range of factors such as whether the equipment is unique to Type 26 Global Combat Ship, whether it is Commercial off the Shelf or its original procurement route. These equipment support arrangements in turn influence the platform level solution. It is the intent to seek contractible offers for long term support arrangements concurrently with contracting for initial procurement to the extent practicable.</p> <p>The aim of the Type 26 Global Combat Ship project at Initial Gate was to provide the Approval Authority with a cost for all support elements at Main Gate 2 as far as possible, based on contractable offers from industry. Work during the Assessment Phase has proven that this will not be achievable in all areas. The project team may therefore seek approval at Main Gate 2 for an integrated Demonstration, Manufacture and Support contract with commitment sought for development, procurement and delivery of in-service support and new to service training. This would comprise a mixture of contractual commitment to BAE, Type 26 Global Combat Ship amendments to existing enterprise support arrangements and development work for later placing of contracts as the design and Fleet wide support arrangements mature.</p>

# TYPE 26 GLOBAL COMBAT SHIP

Support Title	Contractor	Contract Scope	Contract Type	Procurement Route
In-Service Support Contract for Type 26 Global Combat Ship	BAE Systems	Support	Prime Contractor	Single Source

## TYPE 26 GLOBAL COMBAT SHIP

### **B      Section B: Cost**

#### **B.1      Cost of the Assessment Phase**

Project/ Increment Title	Approved Cost (£m)	Forecast Cost (£m)	Variation (£m)
Type 26 Global Combat Ship	158	***	***
<b>Total (£m)</b>	<b>158</b>	<b>***</b>	<b>***</b>

The Type 26 Global Combat Ship is currently in the Assessment Phase with investigations into the cost of delivering the capability being assessed. As such, it would not be appropriate at this time to disclose the immature costs of Type 26.

#### **B.2      Planned Cost Boundaries for Demonstration and Manufacture Phase**

Project/Increment Title	Lowest Forecast (£m)	Budgeted For Forecast (£m)	Highest Forecast (£m)
Type 26 Global Combat Ship	***	***	***

#### **B.3      Cost of the Demonstration and Manufacture Phase - Not Applicable**

#### **B.4      Progress against approved Support / PFI Cost - Not Applicable**

#### **B.5      Expenditure to date**

Description	Previous expenditure to 31 March 2012 (£m)	In-year expenditure (£m)	Total expenditure to 31 March 2013 (£m)
Assessment Phase	45	55	100
Demonstration and Manufacture Phase	-	-	-
Support Phase / PFI Cost	-	-	-
<b>Total Expenditure</b>	<b>45</b>	<b>55</b>	<b>100</b>

## C Section C: Timescale

### C.1 Duration of the Assessment Phase

Project/Increment Title	Date of Initial Investment Decision Approval	Forecast Date of Main Investment Decision Approval	Length of Assessment Phase
Type 26 Global Combat Ship	March 2010	***	***

### C.2 Planned Boundaries for In Service Date or Initial Operating Capability

Project/Increment Title	Earliest Forecast	Budgeted For Forecast	Latest Forecast
Type 26 Global Combat Ship	***	-	***

C.3 In-Service Date/Initial Operating Capability - Not Applicable

C.4. Full Operating Capability - Not Applicable

C.5 Support / PFI Contract - Not Applicable

**D     Section D: Performance****D.1.     Technology Readiness Level**

Current score	Last years score	Scale	Comments
4	4	1-10	-

**D.2.1     Performance against Defence Lines of Development - Not Applicable****D.3.     Performance against Key Performance Measures - Not Applicable****D.4     Support Contract - Not Applicable**



## **CONCEPT PHASE PROJECTS**

## ATTACK HELICOPTER CAPABILITY SUSTAINMENT PROGRAMME

<b>Project Title</b>		
Attack Helicopter Capability Sustainment Programme		
<b>Team Responsible</b>		
Apache Project Team		
<b>Senior Responsible Owner</b>	<b>Date Appointed</b>	<b>Planned end date</b>
Cdre Jonathan Pentreath (Capability Director Joint Helicopter Command)	2 <sup>nd</sup> January 2013	
<b>Project/Increment Name</b>	<b>Current Status of Projects / Increments</b>	
Apache Capability Sustainment Programme	Concept Phase	

## **A. Section A: The Project**

### **A.1. The Requirement**

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

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

### **A.2. The Concept Phase**

The AHCSP Concept Phase strategy is to define and analyse the platform, support and training options to address the Attack Helicopter requirement and to recommend options to be assessed in greater detail in the Assessment Phase to deliver the optimal value for money solution for the ongoing provision of the capability. The Concept Phase will result in:

- Candidate Key User Requirements and the User Requirements Document.
- The recommendation of Platform Options to be analysed in the Assessment Phase. The Platform Options analysed during the Concept Phase fall into three categories:
  - \* Obsolescence management of the Apache AH Mk 1
  - \* Upgrade to Apache AH64E
  - \* New Attack Helicopter platform
- The most appropriate procurement strategy to deliver the Capability Sustainment Programme
- The recommendation of Support Options and also the Training Delivery and Synthetic Training Equipment Options to be analysed in the Assessment Phase, based on the Platform Option(s) recommended at Initial Gate.
- The work package and the funding requirements to conduct the resulting Assessment Phase plan.

### **A.3. In-Year Progress**

The Concept Phase has seen the production, delivery and endorsement of the Key User Requirements. The AHCSP options analysis, based on engineering analyses and cost modelling have largely been completed with the final validation and verification of the Investment Appraisal of the options considered as the main outstanding issue. The options and associated procurement strategy will be taken to the MOD's Investment Approval Committee in Q4 2013 for Initial Gate Approval to launch the Assessment Phase. The time-phased budget of work for the platform, training and Integrated Logistic Support requirements is being developed to support the Initial Gate Business Case.

### **A.4. Capability Risks**

The 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.

### **A.5. Associated Projects – N/A**

### **A.6. Procurement Strategy – N/A**

### **A.7. Support Strategy – N/A**

## UTILITY VEHICLES

<b>Project Title</b>		
Utility Vehicles		
<b>Team Responsible</b>		
Scout Specialist Vehicles		
<b>Senior Responsible Owner</b>	<b>Date Appointed</b>	<b>Planned End Date</b>
Major General Bruce Brealey	01 April 2013	30 September 2013
<b>Project/Increment Name</b>	<b>Current Status of Projects/Increments</b>	
Utility Vehicles	Concept Phase	

## **A. Section A: The Project**

### **A.1. The Requirement**

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

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

- Rapid intervention type operations
- Enduring peace enforcement and peace-keeping type operations
- Enduring support to heavy forces on high-intensity combat operations.

There are 2 critical operational drivers for Utility Vehicles:

- Replace obsolete/obsolescent armoured vehicles throughout Defence
- To deliver and sustain capable armoured platforms more quickly over strategic distances

The Utility Vehicle User Requirement Document (URD 1084) remains extant and defines a fleet of medium weight armoured wheeled vehicles to replace the obsolete Saxon and aging Fighting Vehicle 432 legacy platforms

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

### **A.2. The Concept Phase**

Planning Round 09 savings option (E09GM226S) deferred all Utility Vehicles funding for 3 years until \*\*\*. Planning Round 11 savings option (E11GM114S) further deferred all Utility Vehicles funding until Financial Years \*\*\* whilst maintaining the Planned Assumption for Service Entry of \*\*\*.

### **A.3. In-Year Progress**

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

### **A.4. Capability Risks**

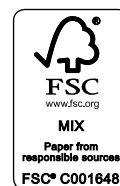
If the UK does not generate Medium Forces capable of Rapid Effect and with demonstrable war-fighting capability, there will be three main impacts:

- a. The majority of the Armoured Fighting Vehicles in the Armoured and Mechanised brigades will be obsolete by \*\*\* (less Challenger 2 and Warrior).
- b. The UK would lack both a viable Medium Weight Capability and Medium Force Capability, \*\*\*. For Rapid Intervention or intervention into land-locked theatres, the UK is already reliant upon either Light Forces \*\*\* or Heavy Forces \*\*\*.
- c. \*\*\*

### **A.5. Associated Projects – N/A**

### **A.6. Procurement Strategy – N/A**

### **A.7. Support Strategy – N/A**



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