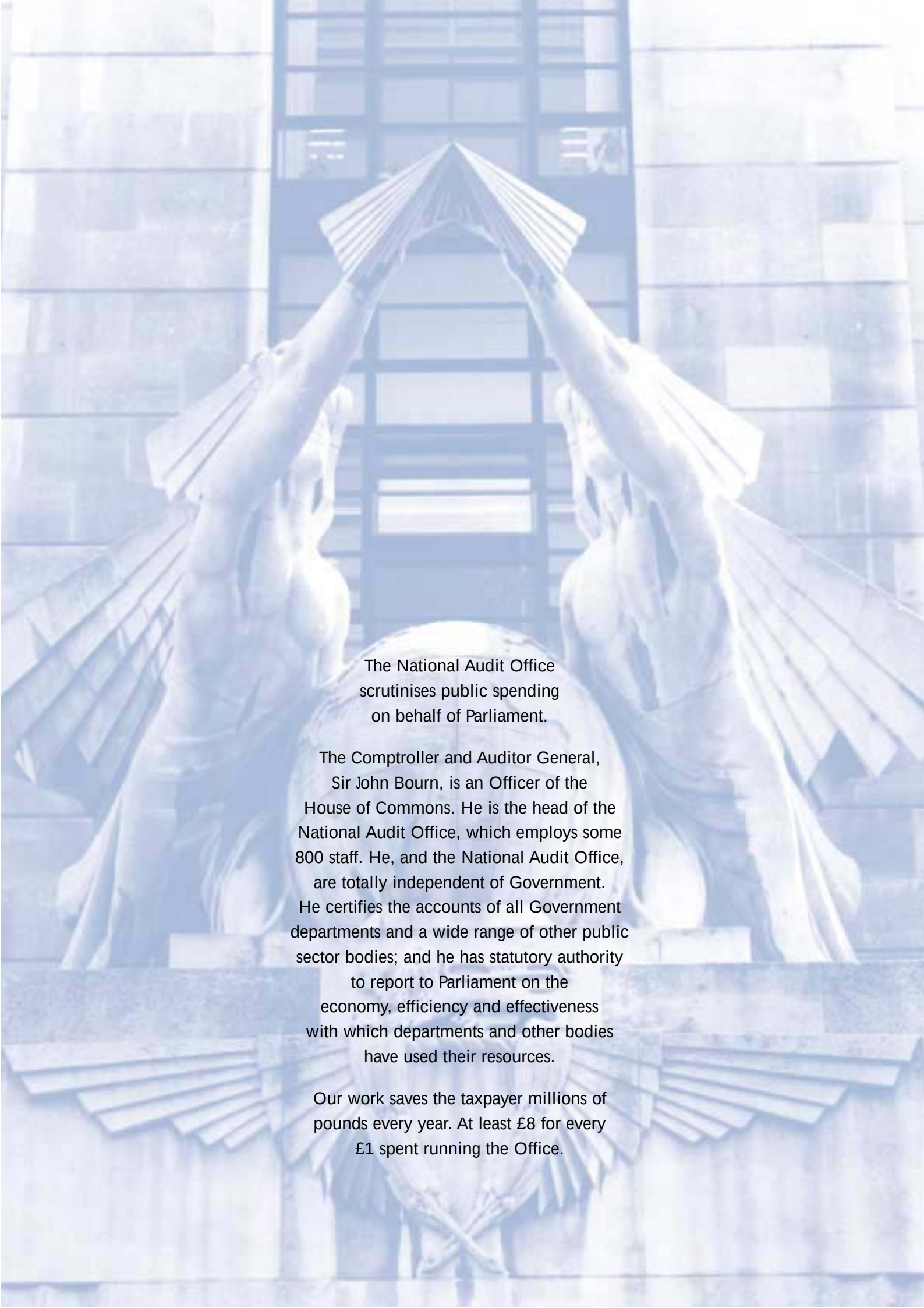
NATIONAL AUDIT OFFICE

Ministry of Defence

Major Projects Report 2003

REPORT BY THE COMPTROLLER AND AUDITOR GENERAL
HC 195 Session 2003-2004: 23 January 2004



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John Bourn
Comptroller and Auditor General

National Audit Office
13 January 2004

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Attack helicopter – WAH 64 Apache

executive summary

1 Each year since 1984 the Ministry of Defence (the Department) has reported to Parliament on its progress in procuring major defence equipments. Prior to 1991, the Department classified much of the data submitted to Parliament and our analyses of the key themes and trends emerging were therefore not published. The Major Projects Report 2003 is the twelfth that we have published since the level of classification was reduced.

2 The Major Projects Report 2003 covers the period to 31 March 2003 and provides cost, time and technical performance data for 30 projects split, in accordance with Smart Acquisition principles, between the 20 largest projects on which the main investment decision (Main Gate) has been taken and the 10 largest projects yet to reach that point. Three of the 20 post-Main Gate projects - Bowman, Skynet 5 and Support Vehicle (Cargo and Recovery) - are new to the population this year.

3 As our recent report on Through-Life Management[1] highlighted, in addition to procurement cost data the Department has begun to produce more data on the whole-life costs of equipments. We have been exploring with the Department how best to reflect this important new information in the Major Projects Report. Appendix 7 provides an update on progress and gives details of the way Through-Life decisions are likely to be reflected in the Major Projects Report 2004.

4 For the Major Projects Report 2003, our overall conclusion is that while 173 out of 174 Key User Requirements (99.4 per cent) are forecast to be achieved, difficulties on four projects that predate the introduction of Smart Acquisition have been the primary cause of cost and time overruns in the last year. The well publicised difficulties of Astute Submarines and Nimrod aircraft have cost the Department £1541 million[2] in cost overruns and the Prime Contractor, BAE Systems, £1050 million[2]. Cost increases totalling £1163 million[2] have also arisen on Typhoon (formerly Eurofighter) and the Advanced Air-Launched Anti-Armour Weapon largely reflecting, under Resource Accounting and Budgeting, the financial impact of the time delays on these projects.

5 The 13 Smart Acquisition projects have performed better than the Legacy projects **(see Figure 1)**, although in some cases it has taken longer than anticipated to negotiate contracts and contract prices have exceeded estimates. Optimism continues to govern the initial appraisal of projects and there are signs that risks are not always sufficiently understood when committing to the main investment at Main Gate. The costs and in-service dates for more than two thirds of projects have drifted away from those planned (50 per cent estimates) towards, and in a very few cases beyond, the highest acceptable approved limits (90 per cent estimates)[3].

1 *The Comptroller & Auditor General's Report, Ministry of Defence: Through-Life Management, HC 671 Session 2001-2002.*

2 *These figures reflect the position as at 31 March 2003. The BAE Systems contribution is stated in cash terms.*

3 *Forecast estimates (50 per cent) are the basis on which the Department plans its equipment programme, while highest acceptable (90 per cent) estimates are not to be exceeded values for the cost and in service date of equipment and represent the manifestation of all identified risks.*

1 **Average in-year cost and time performance split for Smart and Legacy projects**

Projects	Average in-year cost variation		Average in-year time variation (months)
	(£ million)	(%)	
Smart	33	2.1	3
Legacy	389	10.9	16

NOTES

The average in-year Sterling cost variation is calculated across 11 Smart projects and seven Legacy projects, against a baseline of forecast costs at 31 March 2002.

The average in-year percentage variation is an average of individual percentage in-year variations on Smart and Legacy projects, against a baseline of forecast costs at 31 March 2002.

The average in-year time variation is calculated across nine Smart projects, and seven Legacy projects.

Source: National Audit Office

6 Successive Major Projects Reports since 2000 have highlighted the need for the Department to get the best out of the crucial early Assessment Phase of projects in terms of understanding and reducing risks[4]. The Public Accounts Committee have made recommendations for the Department to improve how it measures the effectiveness of risk reduction through better estimating and other indicators such as Technology Readiness Levels[5]. Progress has been made but more needs to be done. In the case of one project in this year's Major Projects Report - the Support Vehicle - the Department decided to proceed without a formal Assessment Phase on the basis of work done to examine the suitability of the project for a Private Finance Initiative solution, and in an effort to accelerate the programme to enable earlier delivery of capability. In the event, the Department's and industry's understanding of the requirement was immature and has resulted in programme slippage through an extended competitive phase.

7 The variations on some Smart projects indicate that there are a range of cultural and systemic influences which the Department and its industry partners need to manage to deliver projects successfully. The Department recognises these challenges and many of the initiatives it is now undertaking (and which we highlight in this Report) hold the prospect of placing a renewed focus on the issues. Our specific conclusions are summarised below.

4 The Comptroller & Auditor General's Report, Ministry of Defence: Major Projects Report 2000, HC 970 Session 1999-2000. The Comptroller & Auditor General's Report, Ministry of Defence: Major Projects Report 2001, HC 330 Session 2001-2002. The Comptroller & Auditor General's Report, Ministry of Defence: Major Projects Report 2002, HC 91 Session 2002-2003.

5 41st Report from the Committee of Public Accounts (HC448 (2001-02), paragraph 4.

Airborne Stand-Off Radar

8 On the top 20 projects in the Demonstration and Manufacture phase:

(i) The Department expects Key User Requirements to be achieved. Whilst many projects are at an early stage in their lifecycle, assuming the Department's confidence is borne out, this will be a significant achievement.

(ii) With the exception of two projects, the costs of which have been excluded because of their commercial sensitivity, total current forecast costs are £51.9 billion, an increase of £3.1 billion in the last year and some six per cent over approval. Legacy projects account for £2.7 billion (87 per cent) of the £3.1 billion cost increase.

(iii) Projects have slipped an average of 18 months beyond their expected delivery dates, twice the average delay recorded in the Major Projects Report 2002. Legacy projects account for 114 months (79 per cent) of the 144 months slippage in the last year.

9 On the ten projects in the Assessment Phase:

(i) Performance measures for the success of the Assessment Phase in understanding and reducing risk continue to evolve, notably three-point estimates and Technology Readiness Levels.

(ii) Most projects are expected to complete the Assessment Phase within cost, but over half are staying in the phase for longer than expected. In some cases spending more than planned or taking longer for the Assessment Phase will be sensible to reduce risks before committing substantive funding at Main Gate. However, the emphasis on understanding and reducing risk does not diminish the importance of accurately estimating the cost and duration of the Assessment Phase since delays can have a knock-on effect through development and production and lead to unplanned capability gaps.

(iii) As can be expected, the level of Assessment Phase expenditure varies across projects but the average level of expenditure is well below that suggested for such risk reduction activity under Smart Acquisition.

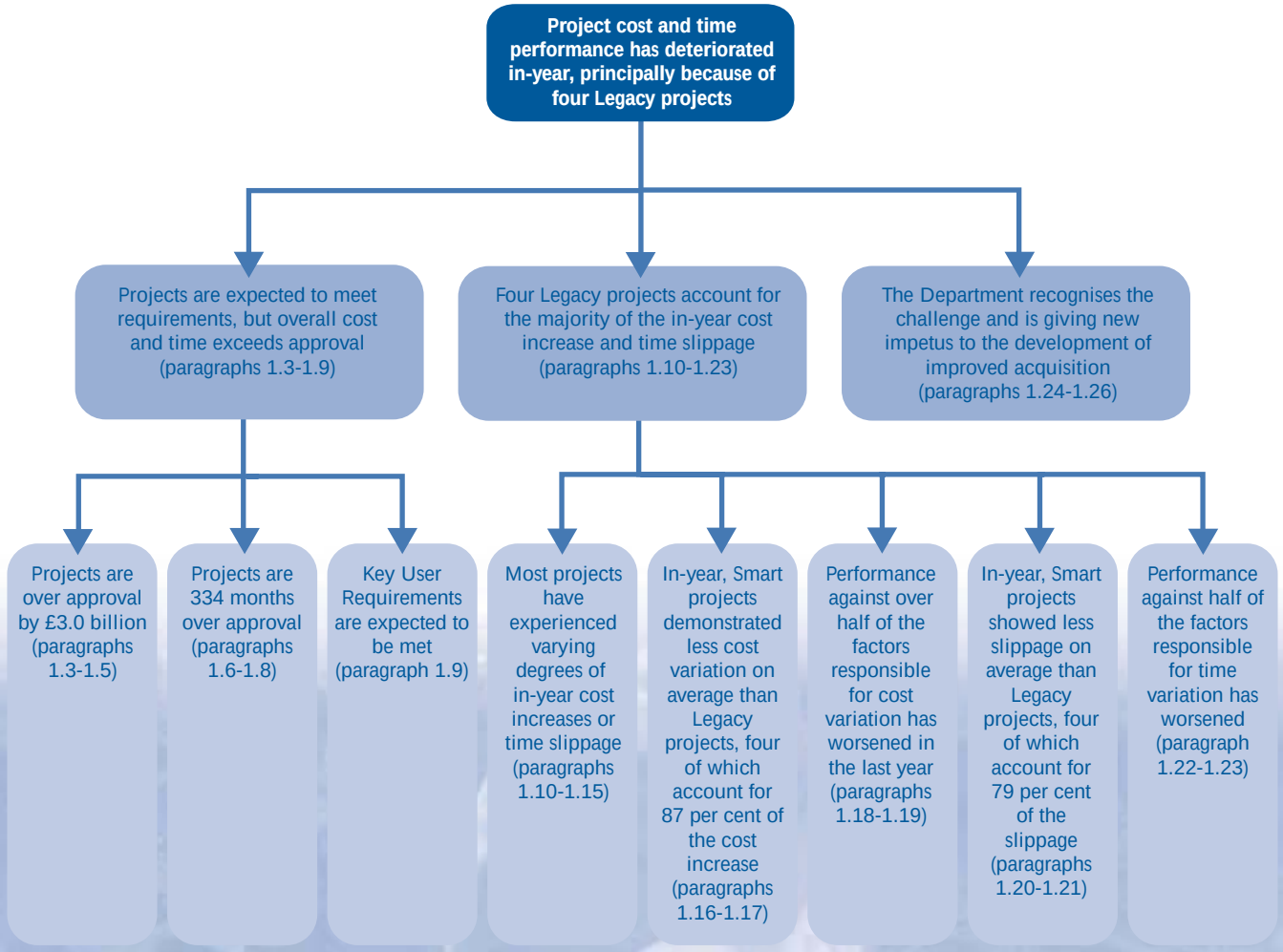
10 Under Smart Acquisition the Department budgets on the basis of estimates which it expects to achieve should 50 per cent of the risks inherent in a programme materialise. However, projects are approved on the basis of 90 per cent confidence figures which represent the most the Department is prepared to spend, or the latest date at which it is prepared to accept the equipment into Service. The difference between the 50 and 90 per cent figures is known as the "risk differential". A high level, in some cases all, of this risk differential has been consumed by a number of projects which have recently passed Main Gate. The early consumption of the risk differential on projects, such as the Support Vehicle (Cargo and Recovery) programme, suggests some risks are still not being fully understood or taken into account when decisions are made to commit substantive funding at Main Gate.

11 We have examined the reasons for the particularly significant time and cost difficulties on four Legacy projects:

(i) The **Astute Class Submarine** and **Nimrod MRA4** programmes have both suffered from technical and project management difficulties which have led to the projects being restructured with the Department and industry sharing the cost increases, and delivery of these capabilities has been delayed.

(ii) Further delays on the **Advanced Air-Launched Anti-Armour Weapon** and the **Eurofighter Typhoon aircraft** have led to increased costs because resources are being tied up on the projects for longer than planned.

12 We have also examined one of the Smart projects new to the Major Projects Report 2003, the **Support Vehicle (Cargo and Recovery)** project, where there have been substantial time slippages.


Project cost and time performance has deteriorated in-year, principally because of four Legacy projects
Projects are expected to meet requirements, but overall cost and time exceeds approval (paragraphs 1.3-1.9)
Four Legacy projects account for the majority of the in-year cost increase and time slippage (paragraphs 1.10-1.23)
The Department recognises the challenge and is giving new impetus to the development of improved acquisition (paragraphs 1.24-1.26)
Projects are over approval by £3.0 billion (paragraphs 1.3-1.5)
Projects are 334 months over approval (paragraphs 1.6-1.8)
Key User Requirements are expected to be met (paragraph 1.9)
Most projects have experienced varying degrees of in-year cost increases or time slippage (paragraphs 1.10-1.15)
In-year, Smart projects demonstrated less cost variation on average than Legacy projects, four of which account for 87 per cent of the cost increase (paragraphs 1.16-1.17)
Performance against over half of the factors responsible for cost variation has worsened in the last year (paragraphs 1.18-1.19)
In-year, Smart projects showed less slippage on average than Legacy projects, four of which account for 79 per cent of the slippage (paragraphs 1.20-1.21)
Performance against half of the factors responsible for time variation has worsened (paragraph 1.22-1.23)

Bowman

Part 1

Project cost and time performance has deteriorated in-year, principally because of four Legacy projects

1.1 In the first part of this Report, we examine progress on the Department's 20 largest post-Main Gate procurement projects against cost, time and the achievement of the Customer's Key User Requirements. We determine how the projects have performed both in-year and since project approval, considering not only the size of variations but their cause. Our analysis shows the Department is forecasting that equipments will meet requirements, but that costs and time will exceed approval, primarily due to four Legacy projects - Astute, Advanced Air-Launched Anti-Armour Weapon, Nimrod and Typhoon (formerly Eurofighter) - hereafter referred to as the four Legacy projects. We examine the reasons for the variances on these projects in more detail in Part 3. The Department recognises the challenge of limiting further cost and time slippage, and is continuing to introduce initiatives to improve performance.

1.2 The Major Projects Report 2003 includes 13 'Smart' projects approved under Smart Acquisition (introduced in 1998) and seven 'Legacy' projects approved prior to the introduction of Smart Acquisition. **Figure 2** summarises the Major Projects Report 2003 project population, showing movements in the population since last year (new projects are shaded) and those projects included in the cost, time and key user requirements analysis presented in this report. Appendix 1 sets out the Smart Acquisition lifecycle, and explains the different bases of approvals under Legacy and Smart Acquisition.

Projects are expected to meet requirements, but overall cost and time exceeds approval

Projects are over approval by £3.0 billion

1.3 **Figure 3** shows that 18 projects in the Major Projects Report 2003 are £3.0 billion (6.1 per cent) over approval in total. In the Major Projects Report 2002, projects were £200 million within approval. The 16 projects common to both reports were £237 million over approval in 2002 and are £3.3 billion over approval in 2003. These figures suggest a reversal of the improvements in cost control indicated over the last few years.

1.4 There has been a total cost increase of £3.1 billion on the 18 projects in the Major Projects Report 2003 in the last year. Of this, £2.7 billion relates to Legacy projects and is virtually all accounted for by the four Legacy projects. Excluding the four Legacy projects from the analysis, the remaining 14 projects in the Major Projects Report 2003 are £839 million within approval and there has been a £382 million increase in cost on these projects in the last year.

1.5 The approval figure for Smart projects includes £1.5 billion of risk differential[6]. Measured against the 90 per cent highest acceptable approved costs, the Smart projects are £1.1 billion under approval. Measured against the 50 per cent most likely costs, which is the basis upon which the Department budgets, the Smart projects are £400 million over costs forecast at Main Gate.

6 *Forecast estimates (50 per cent) are the basis on which the Department plans its equipment programme, while highest acceptable (90 per cent) estimates are not to be exceeded values for the cost and in-service date of equipment and represent the manifestation of all identified risks. Refer to Appendix 1 for further detail on the different bases of approvals for Legacy and Smart projects.*

2 The post-Main Gate projects in the Major Projects Report 2003

Project	Included in analysis: Cost	Time	KURs	Comments
Smart Projects				
A400M	✓	✓	✓	
Beyond Visual Range Air-to-Air Missile (BVRAAM)	✓	✓	✓	
C-17	✓	✓	✓	
Future Joint Combat Aircraft (FJCA)	✓	✗	✓	Excluded from time analysis as it does not yet have an approved in-service date.
Landing Ship Dock (Auxiliary) (LSD(A)) - formerly ALSL	✗	✓	✓	Excluded from costs analysis due to commercial sensitivity.
Sonar 2087	✓	✓	✓	
Sting Ray Torpedo Life Extension (SRLE)	✓	✓	✓	Smart approval for cost, Legacy approval for time.
Successor Identification Friend or Foe (SIFF)	✓	✓	✓	Smart approval for cost, Legacy approval for time.
Type 45 Destroyer	✓	✓	✓	
Typhoon Aircrew Synthetic Training Aids (ASTA) - formerly Eurofighter ASTA	✓	✓	✓	
Bowman	✓	✓	✓	Was pre-Main Gate in the Major Projects Report 2002.
Skynet 5	✓	✓	✓	Was pre-Main Gate in the Major Projects Report 2002.
Support Vehicle (Cargo and Recovery)	✗	✓	✗	New to population. Excluded from costs analysis due to commercial sensitivity. Excluded from KURs analysis as forecast performance not yet known.
Sub-Total 13	11	12	12	
Legacy Projects				
Advanced Air-Launched Anti-Armour Weapon (AAAW)	✓	✓	✓	
Airborne Stand-Off Radar (ASTOR)	✓	✓	✓	
Astute Class Submarine	✓	✓	✓	
Attack Helicopter WAH-64 Apache	✓	✓	✓	
High Velocity Missile (HVM)	✓	✓	✓	
Nimrod MRA4	✓	✓	✓	
Typhoon - formerly Eurofighter	✓	✓	✓	
Sub-Total 7	7	7	7	
Total 20	18	19	19	

Source: National Audit Office

3 Summary of overall cost performance against approval and in-year variation

Overall, projects are over approved cost by £3.0 billion and costs have increased by £3.1 billion in the last year.

	Approval (£ Billion)		2003 Forecast Cost (£ Billion)		Difference from Approval (£ Billion)	In-year variation (£ Billion)
Legacy Projects	28.7	(50%)	32.8	(50%)	4.1	2.7
Smart Acquisition Projects	20.2	(90%)	19.1	(50%)	-1.1	0.4
Total	**48.9**		**51.9**		**3.0**	**3.1**

NOTE

Appendix 1 explains the different bases of approvals for Legacy and Smart projects.

Source: National Audit Office

4 Summary of overall time performance against approval and in-year variation

Overall, projects have slipped 334 months beyond approved timescales, including 144 months slippage in the last year.

	Difference from Approval (months)		In-year variation Net total (months)	In-year variation Outside Approval (months)
Legacy Projects	333	(50%)	114	113
Smart Acquisition Projects	1	(90%)	30	21
Total	**334**		**144**	**134**

NOTE

Appendix 1 explains the different bases of approvals for Legacy and Smart projects.

Source: National Audit Office

Projects are 334 months over approval

1.6 **Figure 4** shows that 19 projects in the Major Projects Report 2003 have slipped 334 months beyond approval. Of the 334 months total delay, Legacy projects are over approval by a total of 333 months, while Smart projects are over approval by a total of 1 month. The total delay equates to an average of 18 months delay per project. This compares to an average of 9 months for projects in the Major Projects Report 2002. Average slippage on the 16 projects common to both reports has increased by 8 months between 2002 and 2003.

1.7 In the last year, there has been 114 months slippage on Legacy projects and 30 months slippage on Smart projects. As with cost, the four legacy projects account for the majority (113 months of the 144 months) of slippage in the last year. Excluding these projects and the three that have already achieved their in-service date, the remaining 12 projects in the Major Projects Report 2003 are a total of 44 months beyond approval (an average of 4 months per project). These 12 projects have slipped by a total of 31 months (an average of 2.6 months per project) in the last year.

1.8 The approval figure for Smart projects includes 60 months of risk differential. Measured against the 90 per cent latest acceptable in-service dates, the Smart projects are 1 month over approval. Measured against the 50 per cent most likely in-service dates, which is the basis upon which the Department forecasts, the Smart projects are 61 months over the original forecast at Main Gate.

Key User Requirements are expected to be met

1.9 The Department is forecasting to achieve 173 out of 174 Key User Requirements (99.4 per cent) on 19 projects. This is an increase from 98 per cent for the projects in the Major Projects Report 2002. The one missed Key User Requirement is historic and relates to Typhoon landing distance. We are exploring with the Department the possibility of including confidence levels against forecasts of Key User Requirements in future Major Projects Reports.

Four Legacy projects account for the majority of the in-year cost increase and time slippage

Most projects have experienced varying degrees of in-year cost increases or time slippage

1.10 **Figure 5** summarises the in-year cost variation and time slippage by project and by value. Fourteen projects (nine Smart and five Legacy) have experienced overall cost increases in the last year, two (one Smart and one Legacy) have experienced no change, and two (one Smart and one Legacy) have experienced overall cost reductions. Cost variations across all projects range from an £11 million decrease to a £1037 million increase. Eight projects (four Smart and four Legacy) have experienced time slippage in the last year, ranging from one to 43 months. Eight projects (seven Smart and one Legacy) have experienced no change and three (two Legacy and one Smart) have achieved their in-service dates and are therefore not subject to further time slippage.

1.11 **Figure 6** summarises the cost and time variations against approval for each project in the Major Projects Report 2003 and, for those that were also in the Major Projects Report 2002, plots what change there has been in the past year. The notes to Figure 6 provide a guide to its interpretation. In essence, vertical upward movement represents cost increase and horizontal left to right movement represents slippage, with diagonal upward left to right movement representing both. The biggest in-year changes are clearly shown as attributable to the four Legacy projects which are all now over approval on cost and time.

5 Cost and time variation in-year by project and value

Project	In-year Cost movement £ millions	In-year Time movement months	In-year KURs expected to be achieved
Smart projects			
A400M	+128	+9	✓
Beyond Visual Range Air-to-Air Missile (BVRAAM)	+20	+2	✓
Bowman	+30	0	✓
C-17	+4	ISD achieved	✓
Future Joint Combat Aircraft (FJCA)	-5	ISD not yet approved	✓
Landing Ship Dock (Auxiliary) (LSD(A)), formerly ALSL	Commercially sensitive	0	✓
Skynet 5	0	0	✓
Sonar 2087	+12	0	✓
Sting Ray Torpedo Life Extension (SRLE)	+31	0	✓
Successor Identification Friend or Foe (SIFF)	+13	+1	✓
Support Vehicle (Cargo & Recovery)	Commercially sensitive	+19	Forecast performance of KURs not yet known
Type 45 Destroyer	+124	0	✓
Typhoon Aircrew Synthetic Training Aids (ASTA), formerly Eurofighter ASTA	+3	0	✓
Sub-totals for Smart projects:			
Favourable or no movement	**2**	**7**	**12**
Adverse movement	**9**	**4**	**0**
Legacy projects			
Advanced Air-Launched Anti-Armour Weapon (AAAW)	+126	+18	✓
Airborne Stand-Off Radar (ASTOR)	-11	0	✓
Astute Class Submarine	+1003	+43	✓
Attack Helicopter WAH-64 Apache	+33	ISD achieved	✓
High Velocity Missile (HVM)	0	ISD achieved	✓
Nimrod MRA4	+538	+40	✓
Typhoon, formerly Eurofighter	+1037	+12	✓
Sub-totals for Legacy projects:			
Favourable or no movement	**2**	**1**	**7**
Adverse movement	**5**	**4**	**0**
Grand Totals for all projects:			
Favourable or no movement	**4**	**8**	**19**
Adverse movement	**14**	**8**	**0**

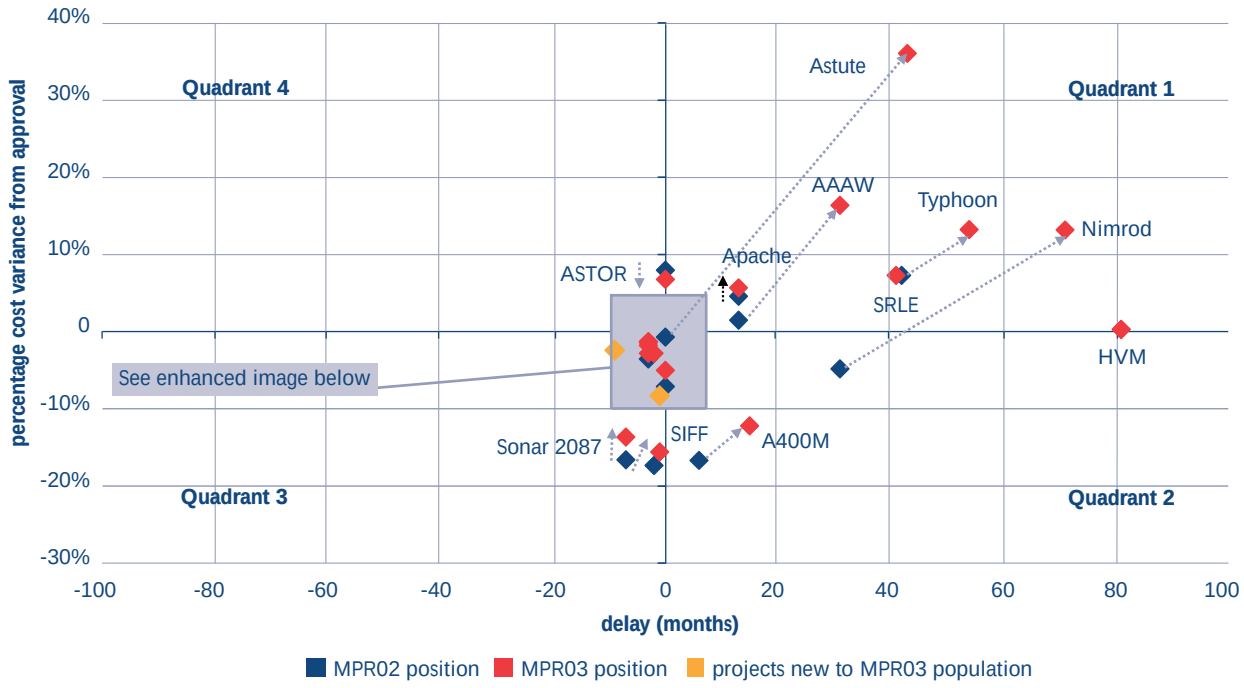
Adverse in-year movement	
Favourable in-year movement or no change	

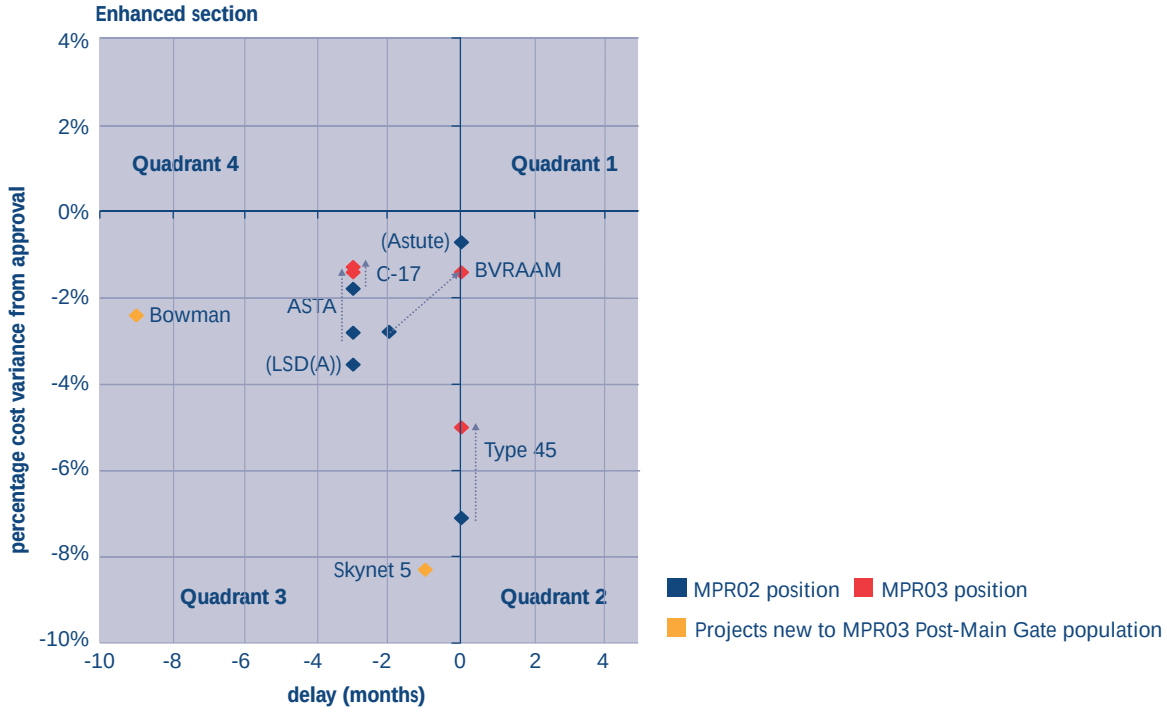
NOTE

See Figure 1 for reasons for exclusions to analysis.

Source: National Audit Office

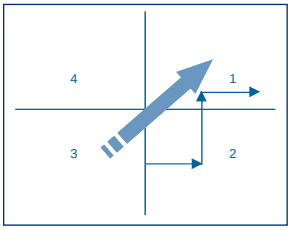
6 Analysis of project cost and time variance and movement since the Major Projects Report 2002



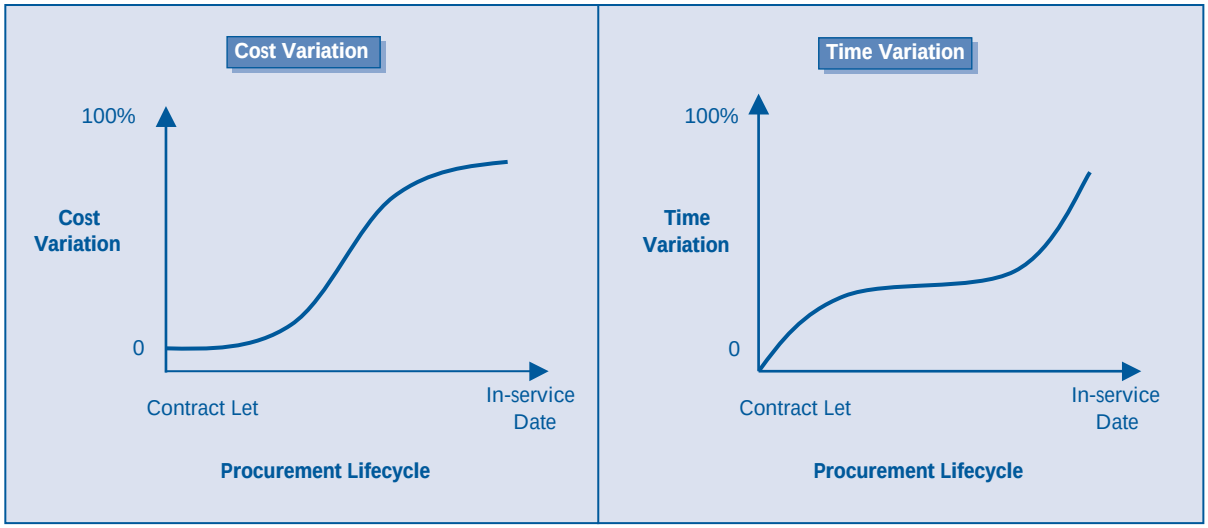


NOTES

1. Quadrant 1 - projects over cost approval and beyond time approval.
   Quadrant 2 - projects within cost approval and beyond time approval.
   Quadrant 3 - projects within cost and time approval.
   Quadrant 4 - projects over cost approval and within time approval.
2. All Smart projects start their lifecycles in Quadrant 3.
3. Vertical upward movement represents cost increase, downward cost reduction.
4. Horizontal left to right movement represents time slippage, right to left recovery of slippage.
5. Diagonal upward left to right movement represents both cost increase and time slippage, diagonal downward right to left cost reduction and recovery of slippage.
6. Historically, as projects have progressed through their procurement lifecycles they have migrated from Quadrant 3 to the other quadrants. Typically, this has been in a pattern characterised by slippage early in the lifecycle, cost increase in the middle, and further slippage towards the end, as illustrated by:



7 Historic reporting of cost and time variation on Major Projects Report projects



NOTE

This analysis is based on historic Major Projects Report data, up to the Major Projects Report 1999. During this period, slippage and cost overrun were independent variables. Now, however, under Resource Accounting, slippage and cost overrun are no longer independent as programme slippage will attract an Interest on Capital charge. Consequentially, if Interest on Capital becomes a significant element of the in-year cost variation total, comparison with the historic cost relationship will no longer be appropriate.

Source: National Audit Office

1.12 Analysis of the project population by quadrant shows that:

i) Projects in **Quadrant 1 (over cost approval and beyond time approval)** are on average 77 per cent mature against their forecast in-service dates (as measured on a timeline from Main Gate approval to forecast in-service date). Since the Major Projects Report 2002, one Legacy project (Nimrod) has moved into this quadrant from Quadrant 2 and one Legacy project (Astute) has moved into this quadrant from Quadrant 3.

ii) Two projects (A400M, and High Velocity Missile) are in **Quadrant 2 (within cost approval and beyond time approval)** and are on average 65 per cent mature against their forecast in-service dates.

iii) Projects in **Quadrant 3 (within cost and time approval)** are on average 57 per cent mature against their forecast in-service dates. Since the Major Projects Report 2002, five Smart projects (Sonar 2087, Successor Identification Friend or Foe, Typhoon Aircrew Synthetic Training Aids, C-17, and Beyond Visual Range Air-to-Air Missile) have migrated within this quadrant towards other quadrants.

iv) One project (Airborne Stand-off Radar) is in **Quadrant 4 (over cost approval and within time approval)**. It is 60 per cent mature against its forecast in-service date.

1.13 Historically, the trend has been for slippage to be reported early in the procurement lifecycle, stabilising in the middle of the lifecycle, with further delays towards the end **(see Figure 7)**. The Smart projects tend to be earlier in their lifecycle than the Legacy projects. The future trend in delays over time compared to the historic trend will be the test and future Major Projects Reports will show this.

1.14 This analysis supports our conclusion in recent Major Projects Reports that newer projects tend to exhibit less adverse time and cost variation against approval. It also gives a warning signal that some projects may be continuing to follow the historic trend of cost increase and delay as they mature through the Procurement Phase, shown by their migration from Quadrant 3 towards the other quadrants. Historically, as we first reported in the Major Projects Report 2002, cost variation tends to be reported towards the middle of the procurement lifecycle and time variation tends to be reported early in the procurement lifecycle and then again towards the end of the Procurement Phase (see Figure 7). Based on one-year's movement, it is not conclusive that those projects that have migrated in the last year are following this trend, but it points towards the continuing challenge faced by Smart Acquisition of limiting further migration.

1.15 The four largest cost increases and time slippages this year highlight one of the objectives of Resource Accounting and Budgeting - that of accurately reflecting the true cost of capital and not simply the amount of cash paid to the contractor. Under Resource Accounting and Budgeting, time slippage on a project will usually involve resources being tied up over a longer period, and will usually therefore have a cost increase consequence. We examine this in more detail in Part 3.

In-year, Smart projects demonstrated less cost variation on average than Legacy projects, four of which account for 87 per cent of the cost increase

1.16 **Figure 8** shows that there has been a total in-year cost increase of £3.1 billion across Legacy and Smart projects in the Major Projects Report 2003. Of this, £2.7 billion (87 per cent) relates to Legacy projects and £400 million (13 per cent) relates to Smart projects. Ninety-nine per cent of the increase on Legacy projects is attributable to the four Legacy projects.

1.17 The in-year cost variations across all projects ranged from a decrease of 1.1 per cent to an increase of 37.1 per cent. The average in-year cost variation was 2.1 per cent for Smart projects and 10.9 per cent for Legacy projects. It is not possible to conclude on whether or not the lower average in-year variation on Smart projects is a result of a firm trend towards better cost control. The Smart projects tend to be earlier in their lifecycle than the Legacy projects when, historically, there has been lower cost growth (see Figure 7). The future trend in cost variations over time compared to the historic trend will be the test and future Major Projects Reports will show this.

Performance against over half of the factors responsible for cost variation has worsened in the last year

1.18 Appendix 2 Figure 27 provides details of the total cost variations on the 18 projects in the Major Projects Report 2003 against their approvals. **Figure 9** summarises the total cost variation by factor, providing a comparison against the Major Projects Report 2002 and showing how these factors split between Smart and Legacy projects. The factors are laid out with those that the Department has most control over on the left, to those where it has limited or no control on the right. Risk Differential is shown separately as it is set at Main Gate. Overall, for seven of the 11 factors the total cost variation has worsened compared with the Major Projects Report 2002, mainly due to variations on Legacy projects.

1.19 **Figure 10** gives a breakdown of the movement in the last year for each of the cost variation factors. It is split between Legacy and Smart projects and summarises the amount of movement, the number of projects affected, and the main variations on individual projects. The biggest variation has been on Technical Factors, which have affected six projects resulting in a £2 billion in-year cost increase, exclusively on Legacy projects. This is followed by Contracting Process, affecting nine projects and resulting in a £471 million in-year cost increase, mostly on Smart projects, and Changed Requirements, which have affected 12 projects resulting in a £431 million in-year cost increase, mostly on Legacy projects.

In-year, Smart projects showed less slippage on average than Legacy projects, four of which account for 79 per cent of the slippage

1.20 **Figure 11** shows that projects in the Major Projects Report 2003 have slipped in-year by a total of 144 months. Excluding the three projects which are already in service and therefore not subject to further change, this equates to an average in-year slippage of nine months per project. Of the total, 114 months (79 per cent) relates to Legacy projects, and 30 months (21 per cent) relates to Smart projects. All bar one month of the slippage on Legacy projects is attributable to the four Legacy projects.

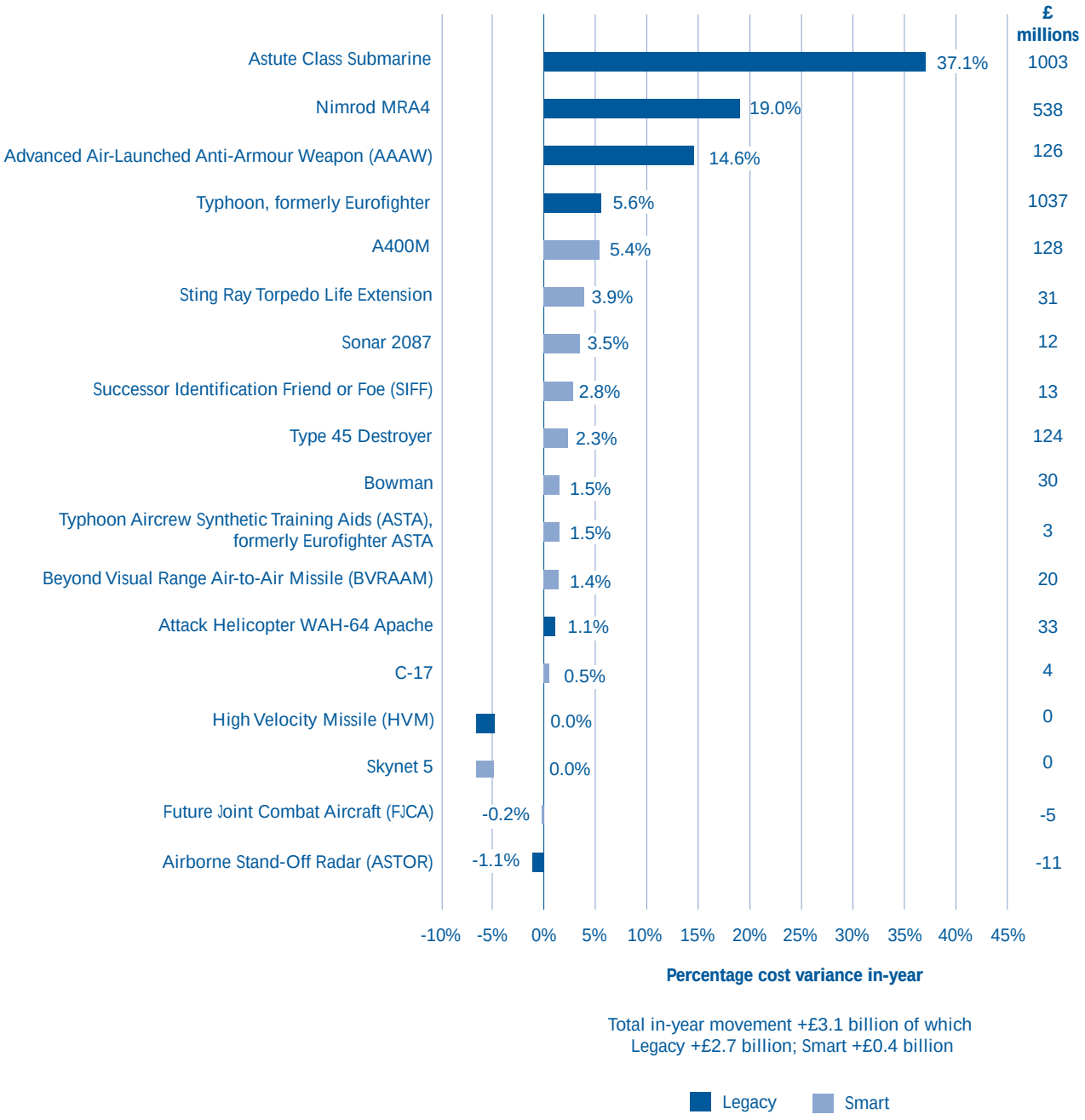
1.21 The in-year variations across all projects ranged from one month to 43 months. Excluding the three projects which are already in-service, the average in-year slippage was 16 months for Legacy projects and three months for Smart projects. As with cost, it is not possible to conclude on whether or not the lower average in-year variation on Smart projects is a result of a firm trend towards better time control.

Performance against half of the factors responsible for time variation has worsened

1.22 Appendix 2 Figure 28 provides details of the total time variations of the 19 projects in the Major Projects Report 2003 against their approvals. **Figure 12** summarises the total time variation by factor, providing a comparison against the Major Projects Report 2002 and showing how these factors split between Smart and Legacy projects. As with cost, the factors are laid out with those that the Department has most control over on the left, to those where it has limited or no control on the right. Risk Differential is again shown separately as it is set at Main Gate. Overall, for four of the eight factors the total time variation has worsened compared to the Major Projects Report 2002, mainly due to variations on Legacy projects.

8 Cost variation in-year by project

There has been adverse in-year movement on 14 projects - of which five are Legacy, nine are Smart. There has been favourable movement on two - of which one is Legacy, one is Smart. There has been no change on two - of which one is Legacy, one is Smart.



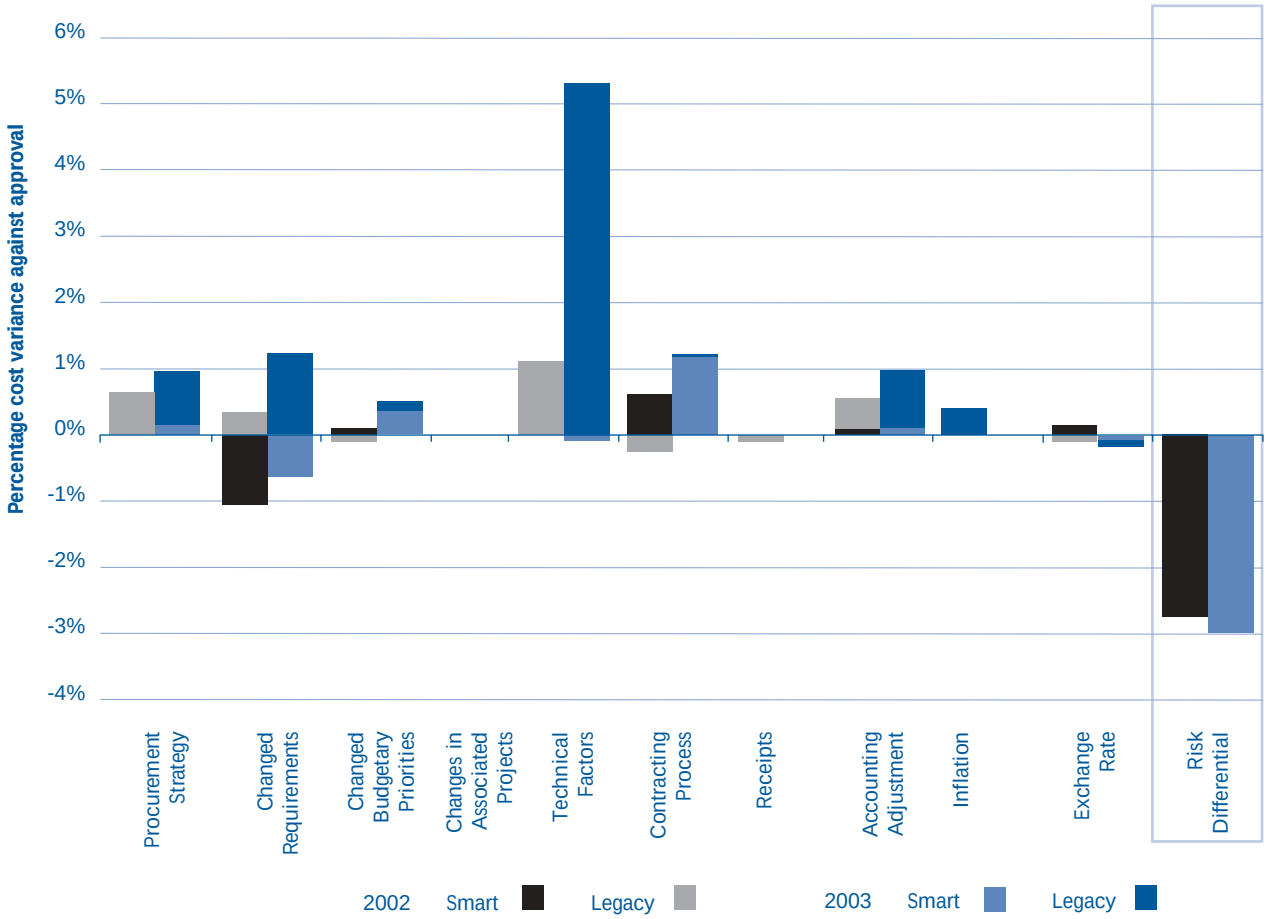
NOTE

Percentage cost variance in-year is calculated against a baseline of forecast costs as at 31 March 2002.
Support Vehicle and Landing Ship Dock (Auxiliary) excluded from analysis. **See Appendix 2 Figure 27 for cost variation against approval.**

Source: National Audit Office

9 Analysis of total cost variation by factor in the Major Projects Reports of 2002 and 2003

Overall, the cost variation has worsened on most factors, mainly due to Legacy projects.



Source: National Audit Office Analysis

Attack Helicopter WAH-64 Apache

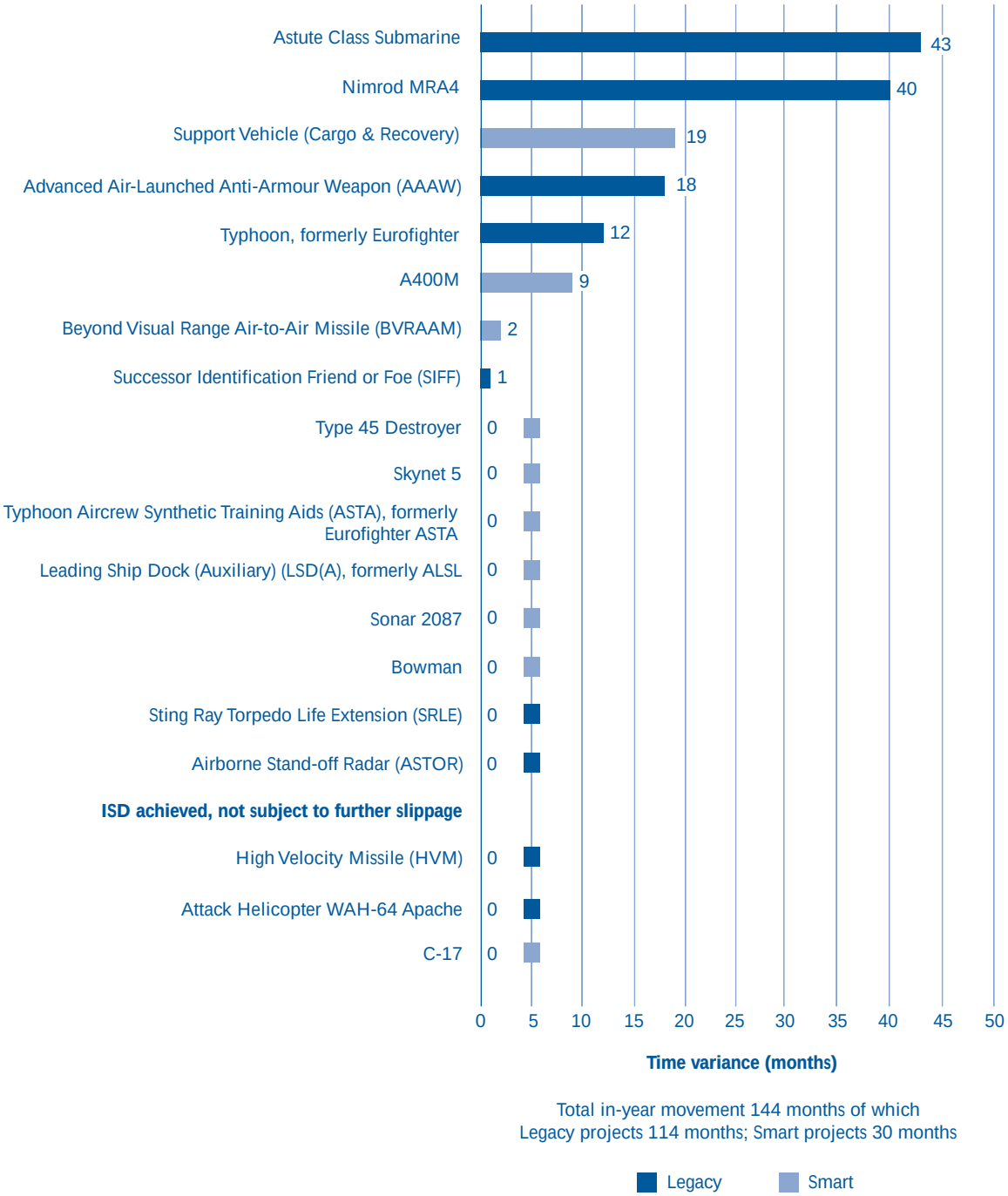
10 Breakdown of in-year cost variation by factor

Factor	Impact on 2003 in-year Cost Variation	of which		No. of projects affected	of which		Main projects affected
		Legacy	Smart		Legacy	Smart	
Technical Factors	Increase of £2049 million	+2089	-40	6	4	2	AAAW - increase of £77 million Astute - increase of £723 million Typhoon - increase of £930 million Nimrod - increase of £359 million A400M - decrease of £46 million
Contracting Process	Increase of £471 million	+186	+285	9	3	6	A400M - net increase of £156 million Astute - increase of £55 million Nimrod - increase of £132 million T45 - increase of £124 million
Changed Requirements	Increase of £431 million	+356	+75	12	5	7	Astute - increase of £225 million Typhoon - net increase of £96 million Nimrod - net increase of £34 million
Accounting Adjustments and Redefinitions	Increase of £190 million	+196	-6	5	2	3	Typhoon - increase of £222 million
Changed Budgetary Priorities	Increase of £136 million	+86	+50	6	2	4	AAAW - increase of £49 million BVRAAM - net increase of £45 million SRLE - increase of £31 million
Procurement Strategy	Increase of £98 million	-7	+105	4	1	3	A400M - increase of £130 million BVRAAM - net decrease of £33 million
Receipts	Increase of £39 million	39	0	1	1	0	Nimrod
Changes in Associated Projects	None	0	0	0	0	0	None
Exchange Rate	Decrease of £139 million	-40	-99	4	2	2	A400M - decrease of £90 million Typhoon - decrease of £32 million
Inflation	Decrease of 189 million	-179	-10	2	1	1	Typhoon - net decrease of £179 million
Risk Differential	Risk Differential is not a cause of in-year variation	-	-	-	-	-	
Total In-Year Variation	Costs have increased in-year by £3.1 billion	+2726	+360				

Source: National Audit Office

11 Time variation in-year by project

In-year, there has been adverse movement on eight projects - of which five are Legacy and three are Smart.



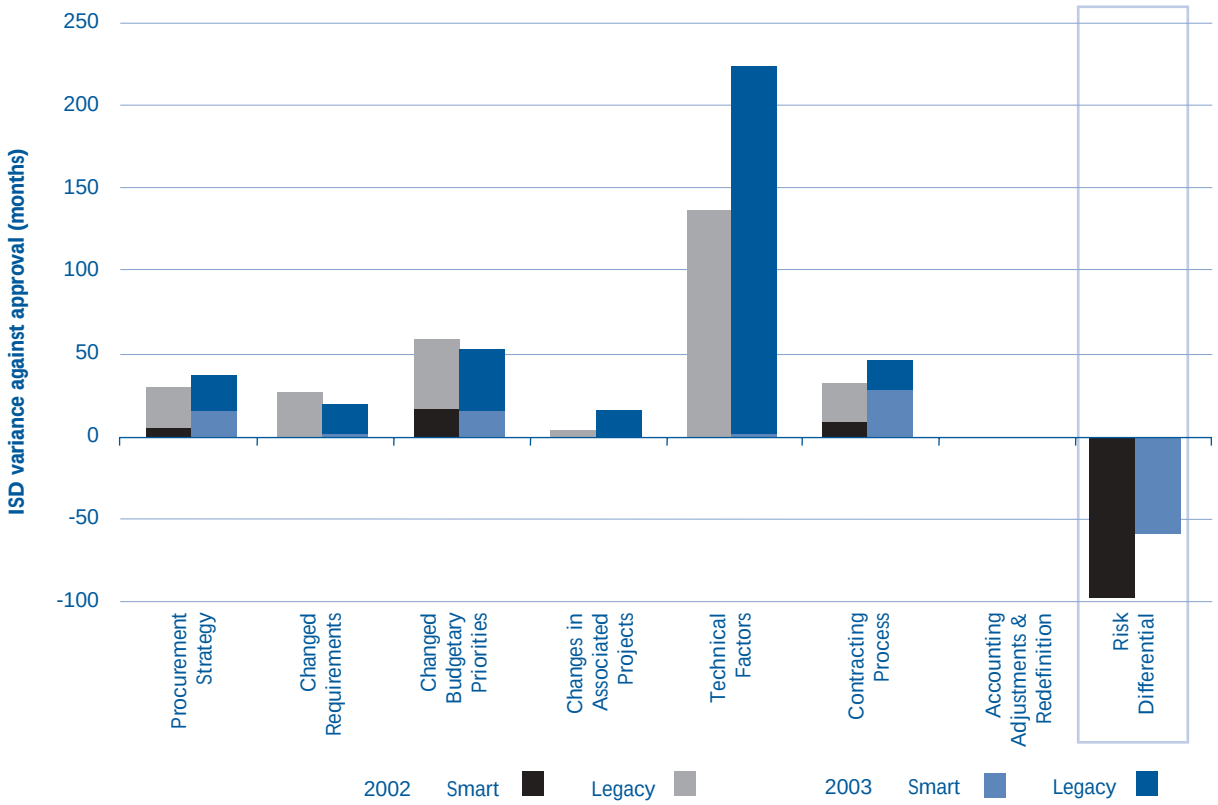
NOTE

SRLE and SIFF are Smart for Cost; Legacy for Time. **See Appendix Figure 28 for time variation against Approval.**

Source: National Audit Office

12 Analysis of total time variation by factor in the Major Projects Reports of 2002 and 2003

Overall, the time variation has worsened on four of eight factors, mainly due to Legacy projects.



Source: National Audit Office

13 Breakdown of in-year time variation by factor

Factor	Impact on 2003 in-year Cost Variation	of which		No. of projects affected	of which		Main projects affected
		Legacy	Smart		Legacy	Smart	
Technical Factors	Slippage of 104 months	102	2	6	5	1	Astute - slippage of 43 months Typhoon - slippage of 12 months Nimrod - slippage of 40 months
Contracting Process	Slippage of 19 months	0	19	2	0	2	Support Vehicle (Cargo and Recovery) - slippage of 17 months
Changes in Associated Projects	Slippage of 12 months	12	0	1	1	0	AAAW
Procurement Strategy	Slippage of 9 months	0	9	1	0	1	A400M
Changed Requirements	None	0	0	0	0	0	
Changed Budgetary Priorities	None	0	0	0	0	0	
Accounting Adjustments and Redefinitions	None	0	0	0	0	0	
Risk Differential	Risk Differential is not a cause of in-year variation	-	-	-	-	-	
Total In-Year Variation	Slippage of 144 months	114	30				

Source: National Audit Office

1.23 **Figure 13** gives a breakdown of the movement in the last year for each of the time variation factors. It is split between Legacy and Smart projects, and summarises the amount of movement, the number of projects affected, and the main variations on individual projects. As with cost, the biggest variation has been on Technical Factors, which have affected 6 projects resulting in 104 months in-year delay, almost exclusively on Legacy projects. This is followed by Contracting Process, affecting two projects (both Smart) resulting in 19 months in-year delay.

The Department recognises the challenge and is giving new impetus to the development of improved acquisition

1.24 During an evidence session with the House of Commons Defence Committee in May 2003, the new Chief of Defence Procurement, Sir Peter Spencer, explained that the Defence Procurement Agency was undertaking an evaluation of the progress of Smart Acquisition since its introduction, and how this might be taken further forward[7]. This work was supported by McKinsey, who had previously been involved in work with the Department to develop the original Smart Acquisition concept. McKinsey undertook an assessment of the views of stakeholders from across the Defence Procurement Agency, the wider Department and industry. There was a high degree of consensus across these stakeholders that the Defence Procurement Agency was now more self aware, more open to change and more receptive to the need for continuous improvement.

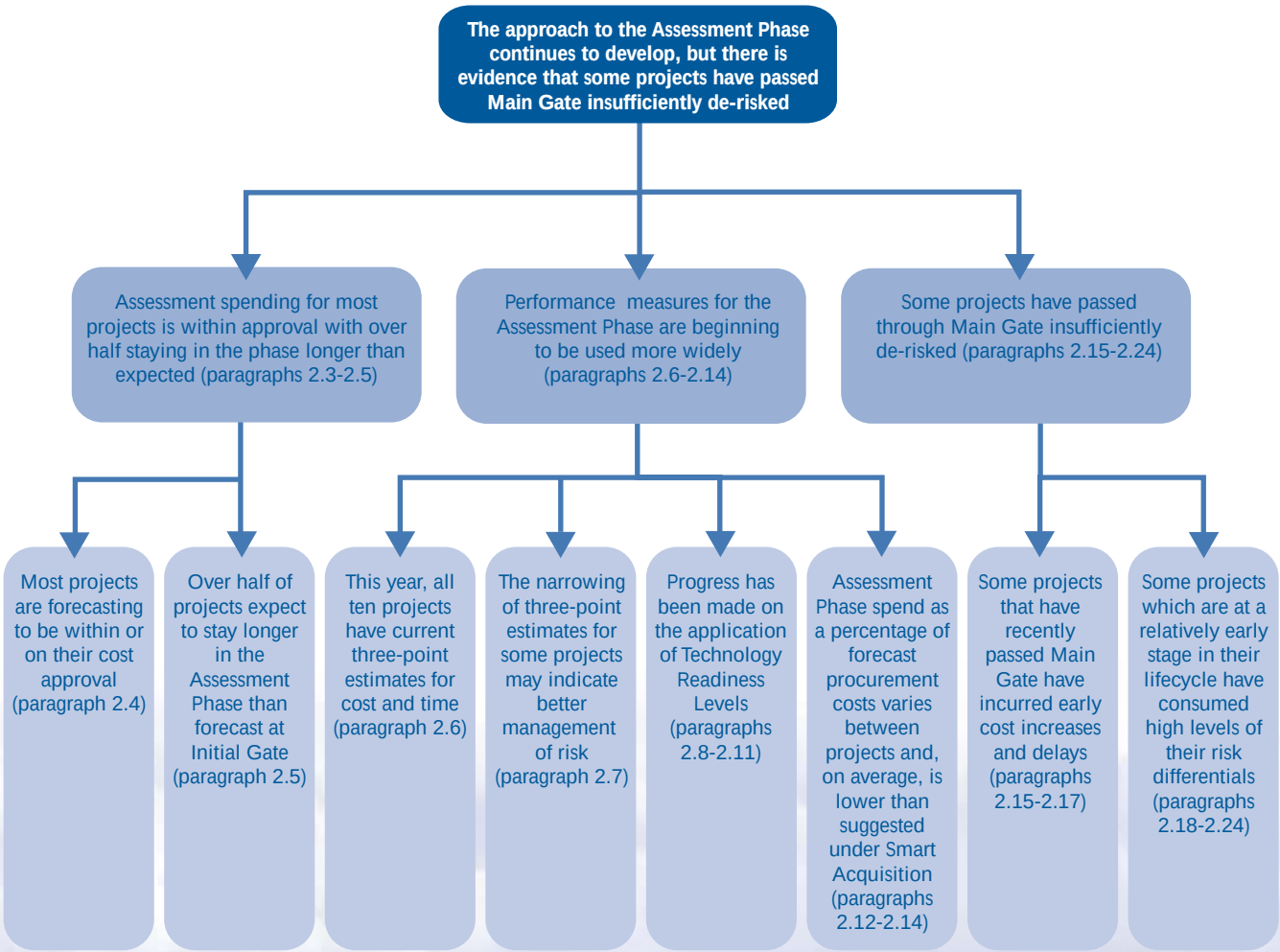
1.25 The initial conclusions of the Chief of Defence Procurement's "stocktake" confirmed that Smart Acquisition had seen the introduction of a number of important improvements. These included the creation of a strong Equipment Capability Customer in the MoD centre and the establishment of Integrated Project Teams to bring together the main stakeholders. The stocktake also confirmed that some of the other key elements of Smart Acquistion would benefit from further development to better meet the latest challenges and deliver greater business benefit. Areas identified where more needed to be done were:

- to improve the ability to manage projects on a whole life basis;
- to facilitate effective trade-offs between capability performance, time and cost;
- to create a better, more open relationship with industry;
- to embed the concept of incremental acquisition;
- to improve the approach to project approvals; and
- to increase early investment to de-risk projects.

1.26 Work on the stocktake is continuing and the Defence Procurement Agency and the wider Department are currently considering options for improvements in areas such as risk management, through-life management and joint working with industry. Parallel improvements are also envisaged to business processes such as corporate governance, financial management and project reviews, together with adjustments to the organisation and the management of the people involved in the acquisition process. Changes within the Defence Procurement Agency are expected to be in place by April 2004.

Battlefield Light Utility Helicopter

7 *House of Commons Defence Committee, Defence Procurement 8th Report HC694 - 23 July 2003.*



Artist's impression of a Future Aircraft Carrier

Part 2

The approach to the Assessment Phase continues to develop, but there is evidence that some projects have passed Main Gate insufficiently de-risked

2.1 In this part of our Report we assess the performance of the 10 largest projects that are in the Assessment Phase. Of these, four projects are new to the population in 2003 (Ground-Based Air Defence, Future Integrated Soldier Technology, Indirect Fire Precision Attack and Battlefield Light Utility Helicopter). A project's Assessment Phase is the phase between Initial Gate and Main Gate (see Appendix 1). This Phase is designed to: assess and down-select possible options for meeting military requirements; to select a procurement route; and to reduce programme risk to an acceptable level before the project commits to the post-Main Gate Demonstration and Manufacture Phase. The Assessment Phase is crucial to the successful delivery of the project to time, cost and performance.

2.2 Our analysis shows that the Department's approach to the Assessment Phase continues to develop, especially in the use of techniques to measure risk. It also shows that in some cases there is rapid consumption of risk differential once past Main Gate, limiting the scope to accommodate future cost increase or delay within approval should further risks materialise. If the early phase of the project has been identified as an area of particular risk, and risk provision has been apportioned to reflect this, then this early consumption may be appropriate. However where early consumption of risk differential was not anticipated it suggests that the Assessment Phase is not taking full account of all risks and some projects are passing through Main Gate insufficiently de-risked.

Future Integrated Soldier Technology

Assessment spending for most projects is within approval with over half staying in the phase longer than expected

2.3 The aim of the Assessment Phase is to spend the right amount of time and money before the main investment decision to reduce project risks to an acceptable level. In some cases, spending more money or time in the Assessment Phase than originally planned may be the correct thing to do if it results in better risk mitigation for the post-Main Gate phase of the project, when most money is spent. To be confident that undertaking more Assessment Phase activity is achieving this desired outcome, three-point cost and time estimates need to be robust enough to give adequate assurance that any narrowing of them reflects risk reduction and is not influenced by optimism. **Figure 14** summarises the performance of the 10 Assessment Phase projects against their time and cost approvals set at Initial Gate.

Most projects are forecasting to be within or on their cost approval

2.4 Overall, the 10 Assessment Phase projects are forecasting to spend £446 million against an approved spend of £434 million (£12 million or 2.8 per cent over approval). Only two projects are forecasting to spend more than originally approved with the other eight forecasting to be within or on their Initial Gate cost approval. The Future Strategic Tanker Aircraft is forecasting to spend £10 million (around 80 per cent) over its Assessment Phase approval with the additional funds being used to reduce risk in what may become the largest defence Private Finance Initiative. The Future Aircraft Carrier is forecasting to spend £25 million (21 per cent) over its approval due to extending design work on two carrier variants to de-risk the decision on the choice of aircraft for the Future Joint Combat Aircraft (FJCA) role; and to enable both companies to undertake a greater level of risk reduction activity. Additional costs to the Assessment Phase were also required to develop a better understanding of the prospects for establishing

14 Summary of Assessment Phase cost and time performance against approval

Assessment spending for most projects is within approval with over half staying in the phase for longer than expected.

Project	Cost variation for approval £ millions	Time variation for approval months
Battlefield Light Utility Helicopter	-2	0
Future Aircraft Carrier	+25	+2
Future Integrated Soldier Technology	0	-1
Future Strategic Tanker Aircraft	+10	+27
Ground-Based Air Defence	-6	0
Guided Multi-Launch Rocket System	0	+7
Indirect Fire Precision Attack	-12	-5
Light Forces Anti-Tank Guided Weapon System[1]	-2	+4
Next Generation Light Anti-Armour Weapon[1]	-1	+25
Terrier[1]	0	+8
TOTALS	+12	+67
Summary:		
Number of projects within approval	**5**	**2**
Number of projects on approval	**3**	**2**
Number of projects exceeding approval	**2**	**6**

Exceeds approval Within approval On approval

NOTE

1. These projects passed Main Gate before the reporting period for 2003 ended on 31 March 2003.

Source: National Audit Office

an effective alliance for the Future Aircraft Carrier programme which could potentially include the Department. The main aims were to:

- pull the best elements of the BAE Systems and Thales UK proposals for the Future Aircraft Carrier into a single package which included a single integrated team, baseline design, programme schedule, cost model and risk register;
- undertake benchmarking activities to benefit from lessons learned on other programmes and pull through best practice (some 16 projects were reviewed including the British Airports Authority project for London Heathrow Terminal Five); and
- engage with independent expert advisers who had real experience of creating and managing alliances and who could advise on best practice to mitigate commercial risks.

Over half of projects expect to stay longer in the Assessment Phase than forecast at Initial Gate

2.5 Of the 10 Assessment Phase projects, six have spent or expect to spend a total of 67 months longer in the Assessment Phase than approved at Initial Gate. Three of these projects (Light Forces Anti-Tank Guided Weapon System, Next Generation Light Anti-Armour Weapon and Terrier) passed Main Gate before the end of the Major Projects Report 2003 reporting date of 31 March 2003; and one project, Guided Multiple-Launch Rocket System, has been approved since the reporting date. The extra time spent or expected to be spent in assessment ranges from two months (Future Aircraft Carrier) to 27 months (Future Strategic Tanker Aircraft). Two projects (Ground-Based Air Defence and Battlefield Light Utility Helicopter) are forecasting to spend the approved time in assessment and two (Future Integrated Soldier Technology and Indirect Fire Precision Attack) are forecasting to finish assessment earlier than approved. These latter four projects are all new to the Major Projects Report in 2003.

Performance measures for the Assessment Phase are beginning to be used more widely

This year, all 10 projects have current three-point estimates for cost and time

2.6 Under Smart Acquisition, all Assessment Phase projects are required to establish three-point risk estimates for cost and time for Demonstration and Manufacture when entering the Assessment Phase and to review the estimates periodically as risks are reduced. The three-points are at different confidence levels (10 per cent, 50 per cent and 90 per cent) and reflect the probability of risks materialising. The difference between the confidence levels is expected to narrow as risks reduce to an acceptable level for the Main Gate decision to commit substantive funds. This year, all ten Assessment Phase projects have provided current three-point estimates for cost and time.

The narrowing of three-point estimates for some projects may indicate better management of risk

2.7 **Figure 15** shows that for the projects where comparable data is available and where three-point estimates have changed since Initial Gate, the band covered by the estimates has narrowed in all but two cases for time (Future Integrated Soldier Technology and Light Forces Anti-Tank Guided Weapon System), where it has widened. Not all projects have comparable data as some did not set full three-point estimates at Initial Gate and some that have recently passed Initial Gate are unchanged. The quality of the underpinning risk management and estimating determines how reliable an indicator of risk reduction the narrowing of three-point estimates is. The Department has established a programme to help Integrated Project Teams improve the maturity of their risk management and estimating, and provide decision makers with assurance on the veracity of three-point estimates.

15 Summary of movements in three-point estimates since Initial Gate

For the projects where comparable data is available, three-point estimates for cost and time have narrowed since Initial Gate in all but one case for time.

Project	Date passed Initial Gate	Has three-point estimate narrowed since Initial Gate (IG) for:	
		Cost	Time
Battlefield Light Utility Helicopter	December 2001	No three-point IG Baseline[2]	No three-point IG Baseline[2]
Future Aircraft Carrier	December 1998	Yes	No three-point IG Baseline[2]
Future Integrated Soldier Technology	August 2001	Yes	No
Future Strategic Tanker Aircraft	December 2000	No three-point IG Baseline[2]	Yes
Ground-Based Air Defence	January 2002	No change	No change
Guided Multi-Launch Rocket System	July 1998	Yes	Yes
Indirect Fire Precision Attack	May 2001	No three-point IG Baseline[2]	No
Light Forces Anti-Tank Guided Weapon System[1]	July 2000	Yes	No change
Next Generation Light Anti-Armour Weapon[1]	September 1997	Yes	Yes
Terrier[1]	August 1998	No three-point IG Baseline[2]	No three-point IG Baseline[2]

NOTE

1. These projects passed Main Gate before the reporting period for 2003 ended on 31 March 2003.
2. These projects did not have full three-point estimates set at Initial Gate to measure against.

Source: National Audit Office

Progress has been made on the application of Technology Readiness Levels

2.8 Technology Readiness Levels are used to assess the level of technical maturity and to target risk reduction activity before the Main Gate decision. The approach uses a quantified scale, from basic concept technologies at Level one to fully mature and proven technology at Level nine. It is usual for projects to have numerous Technology Readiness Levels, representing individual technological requirements involved in the projects as a whole. Technology Readiness Levels are now a mandatory part of the approvals process and have been required to be included in all Main Gate Business Cases submitted since April 2002. The Investment Approvals Board expects projects to reach specific levels of readiness at Initial and Main Gate (normally Levels three and seven respectively), but this is not mandatory.

2.9 Three of the 10 Assessment Phase projects passed Main Gate between April 2002 and March 2003. Two of these (Light Forces Anti-Tank Guided Weapon System, and Next Generation Light Anti-Armour Weapon) passed Main Gate with Technology Readiness Levels included of between seven and eight, and eight respectively. Terrier passed Main Gate in July 2002 when its Technology Readiness Level was six. This was not noted as part of the approvals process. All the remaining seven projects are using Technology Readiness Levels. Other than the Future Aircraft Carrier, these currently range from six to eight. The Future Aircraft Carrier, which is approaching Main Gate approval, is expected to have Technology Readiness Levels of between three and seven for a number of different technologies. The forecast in-service date for the Future Aircraft Carrier is 2012 and the low Technology Readiness Levels of some of the technologies involved are due to the need to allow for incorporation of up to date developments as they mature to avoid obsolescence. Where Technology Readiness Levels are below seven at Main Gate, action plans are instigated to raise them to the required level by the Critical Design Review stage.

2.10 Although not yet mandatory, the Department is currently examining the scope for using System Readiness Levels, to assess the maturity of complete systems including integration of all of the components. System Readiness Levels assess the readiness of the design, development and testing regime of systems or sub-systems to be integrated, and whether candidate systems or sub-systems represent a risk to timely integration. Five of the 10 Assessment Phase projects are currently using these.

2.11 In the United States of America, the Department of Defense uses Technology Readiness Levels to inform a knowledge-based approach to product development. This approach is based on achieving high levels of knowledge in three elements of a new product or weapon - technology, design and production - at key 'knowledge points' in the programme **(see Figure 16)**. If a programme falls short of knowledge in any element, it incurs increased risk of technical problems, accompanied by cost and schedule growth.

Assessment Phase spend as a percentage of forecast procurement costs varies between projects and, on average, is lower than suggested under Smart Acquisition

2.12 The Department aims to spend the right amount of money reducing risks during the Assessment Phase. As a guide, up to 15 per cent of the initial procurement cost of a system might be spent before reaching Main Gate. In practice, the right proportion to be spent will be determined by factors such as the nature of the equipment (such as an upgrade or a completely new capability), the maturity of the technology involved, the scale and length of production, and the likely procurement strategy (collaborative, non-competitive or off-the-shelf, Private Finance Initiative or Public Private Partnership).

16 Use of Technology Readiness Levels in the United States of America Department of Defense

Knowledge Point	Description	Best Practice
1	**Technology maturity** - knowledge that a match exists between technology and requirements	Best practice is to achieve a high level of technology maturity at the start of product development
2	**Design maturity** - knowledge that the design will work as required	Best practice is to achieve design stability midway through development
3	**Production maturity** - knowledge that the design can be produced within cost, schedule and quality targets	Best practice is to achieve production maturity at the start of production

Source: United States General Accounting Office

2.13 Calculating the average Assessment Phase expenditure as a percentage of the total procurement expenditure for the 10 Assessment Phase projects in the Major Projects Report 2003, the average is 4.4 per cent. This is higher than average historic levels since the Major Projects Report 2000 and compares to five per cent for the 10 Assessment Phase projects in the Major Projects Report 2002. The spend ranges from 0.2 per cent (£23 million) on the Future Strategic Tanker Aircraft to 11.9 per cent (£138 million) on Ground-Based Air Defence.

2.14 In total terms, nine of the Assessment Phase projects (excluding Future Strategic Tanker Aircraft for which a Private Finance Initiative solution is being sought) are forecasting to spend £423 million in the Assessment Phase. This represents 4.8 per cent of the total forecast procurement expenditure for the nine projects (£8.8 billion). To achieve the suggested 15 per cent would require an increase of £838 million in Assessment Phase expenditure.

Some projects have passed through Main Gate insufficiently de-risked

Some projects that have recently passed Main Gate have incurred early cost increases and delays

2.15 Our analysis of the Major Projects Report 2002 showed that the five recently approved post-Main Gate projects which were in the Assessment Phase population in 2001 had experienced net cost increases and/or delays in their first year past Main Gate. In their second year as post-Main Gate projects, four of the five projects have again incurred cost increases and the Future Joint Combat Aircraft has reported a cost decrease. Two of the projects (A400M and Beyond Visual Range Air-to-Air Missile) have also incurred further time slippage. In the Major Projects Report 2003, there are two new projects (Bowman and Skynet 5) in the post-Main Gate population which were Assessment Phase projects in 2002, of which Bowman has experienced a net cost increase since Main Gate of £94 million. **Figure 17** shows the cost and time movements on all of these projects since Main Gate. The early adverse movements on projects may indicate that cost and time estimates are optimistic at Main Gate. However, all of these projects remain under their cost approvals and all except one, A400M, are within their time approval.

17 Performance of projects which have recently passed Main Gate

Project	Time elapsed since Main Gate (months)	Maturity of project against forecast in-service date (percentage)	Cost movement against 50 per cent forecast at Main Gate (£ millions)	Time movement against 50 per cent forecast at Main Gate (months)	Net cost variation from approval (£ millions)	Net time variation from approval (months)
Skynet	14	37.8%	0	0	-241	-1
Bowman	19	61.3%	+94	0	-50	-9
FJCA	26	ISD not yet approved	+182	ISD not yet approved	-31	ISD not yet approved
Typhoon ASTA	29	65.9%	+20	0	-3	-3
Type 45	32	36.4%	+215	+6	-291	0
BVRAAM	34	23.1%	+109	+11	-20	0
A400M	34	26.1%	-225	+25	-344	+15

Adverse movement or over approval Favourable movement or within approval

NOTE

The maturity of projects have been measured according to how progressed they are along their timelines of Main Gate to current in-service date. For example, assume a project passed Main Gate in January 2001 and has an in-service date of December 2010. At December 2005, it is 50 per cent into its Procurement Phase.

Source: National Audit Office

2.16 The main factors leading to cost increases across these post-Main Gate Smart Acquisition projects are Contracting Process, accounting for a net increase of £548 million across five projects and Changed Budgetary Priorities, which accounts for a net increase of £117 million across four projects. These costs are partially offset by cost reductions of £340 million in the Changed Requirement category, across four projects. There have also been large movements due to exchange rate variations on some projects (for example, an increase of £189 million on the Future Joint Combat Aircraft and a reduction of £232 million on A400M).

2.17 The main factors leading to delays across these projects are Procurement Strategy, accounting for 15 months slippage across two projects (nine months on A400M and six months on Type 45), Changed Budgetary Priorities, accounting for 15 months slippage on one project (A400M), and Contracting Process, which accounts for 11 months slippage on one project (Beyond Visual Range Air-to-Air Missile). The movement soon after Main Gate in these categories suggests that the Department should consider these areas more fully in the Assessment Phase.

Some projects which are at a relatively early stage in their lifecycle have consumed high levels of their risk differentials

2.18 The Major Projects Report 2003 is the third year to have used Risk Differential as a cost and time variation category. It represents the difference between the forecast (50 per cent) and highest acceptable (90 per cent) cost or time estimates approved at Main Gate. Forecast estimates (50 per cent) are the basis on which the Department plans its equipment programme, while highest acceptable (90 per cent) estimates are not to be exceeded values for the cost and in-service date of equipment and represent the manifestation of all identified risks. Projects are required to inform the Investment Approvals Board if an existing approval has been or is likely to be breached.

2.19 The Risk Differential will be consumed if risks materialise post-Main Gate. Consumption of high levels of Risk Differential early in a project's lifecycle after Main Gate limits the scope to accommodate future cost increase or delay within approval should further risks materialise. **Figure 18** shows that some projects that are relatively early in their lifecycle after Main Gate have consumed high levels of their cost and time Risk Differentials. Appendix 2 Figure 29 shows the amount by value of cost and time risk differential consumed by each project since Main Gate approval.

2.20 For both cost and time, the amount of cost and time risk differential for each project in Figure 18 varies significantly. Each project will have a slightly different procurement strategy or level of technological risk and therefore some variation is to be expected. The range for cost is from 2.6 per cent (£18 million for Sting Ray Torpedo Life Extension) to 10.8 per cent (£23 million for Typhoon Aircrew Synthetic Training Aids). For time the range is from one month for Skynet 5 to 11 months for Beyond Visual Range Air-to-Air Missile. The average cost risk differential is eight per cent of the forecast cost at Main Gate and the average time risk differential is six months. This compares to the previous procurement approval system of 'tolerances', where projects could spend up to 20 per cent more than the approved procurement costs or be delayed by 24 months before having to inform the approvals board.

2.21 Figure 18 shows that in the Major Projects Report 2003, there are 11 post-Main Gate projects with a total cost risk differential of £1.5 billion, of which 46 per cent (£0.7 billion) has been consumed. Four projects have consumed at least 80 per cent of their cost risk differential (Beyond Visual Range Air-to-Air Missile, Future Joint Combat Aircraft, Typhoon Aircrew Synthetic Training Aids and Sting Ray Torpedo Life Extension) and one of these, Sting Ray Torpedo Life Extension, has consumed its entire cost risk differential and now exceeds its resource approval[8]. Costs have reduced by £300 million from the forecast (50 per cent) at Main Gate on three projects (A400M, Successor Identification Friend or Foe and Sonar 2087). Costs on these projects may increase before any risk differential is consumed.

2.22 In the last year, some cost risk differential has been consumed on nine of the eleven projects. The most significant consumption has been on the Type 45 Destroyer (£124 million) and the project has now consumed 50 per cent (£215 million) of its cost risk differential in the two years since passing Main Gate. It has four years until its in-service date. One project has had an in-year cost reduction (Future Joint Combat Aircraft, £5 million decrease) and one project has not increased its forecast cost since passing Main Gate (Skynet 5).

2.23 There are 10 projects with a total time risk differential of 60 months in the Major Projects Report 2003[9]. Four projects have consumed a total of 61 months, one month over approval. Five of the projects have experienced no in-service slippage and remain within approval, and one project is in-service. Two of the projects have consumed their entire risk differential (Beyond Visual Range Air-to-Air Missile and Type 45

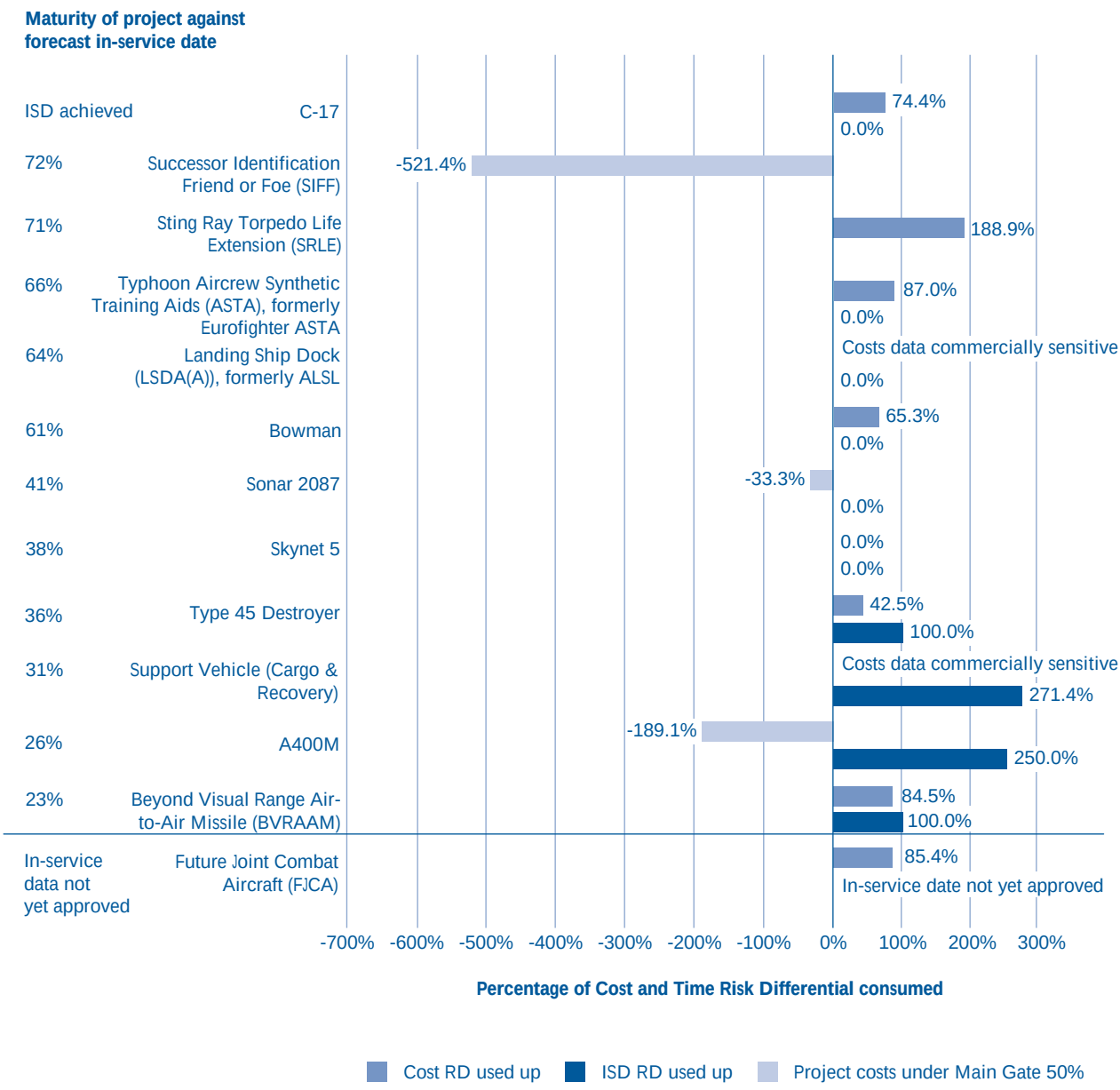
8 The Sting Ray Torpedo Life Extension has a mixed approval. Its demonstration phase was approved under the previous Legacy system, and the manufacture phase has a Smart approval. The consumption of Risk Differential relates to the Smart element only.

9 Three projects are excluded from the time risk differential analysis. Two projects have mixed old and new approvals and so only have risk differential for the new cost approval (Sting Ray Torpedo Life Extension and Successor Identification Friend or Foe). One project, Future Joint Combat Aircraft, does not yet have a time approval.

Destroyer) and two projects have significantly exceeded their approval (A400M and Support Vehicle (Cargo and Recovery)). A400M experienced delays in the contracting process before the the contract was signed in May 2003 and the reasons for slippage on the Support Vehicle (Cargo and Recovery) project are examined in Part 3 of this report.

2.24 Projects such as A400M and Beyond Visual Range Air-to-Air Missile, which are both collaborative projects and have suffered delays, had time risk differentials of only 10 and 11 months respectively. Past experience indicates that aligning national approvals and gaining consensus between the partner nations can cause lengthy delays between Main Gate approval and contract let for collaborative projects. The relatively short time risk differentials in these cases may again reflect optimism in the Main Gate approvals.

18 Percentage of Cost and Time Risk Differential consumed

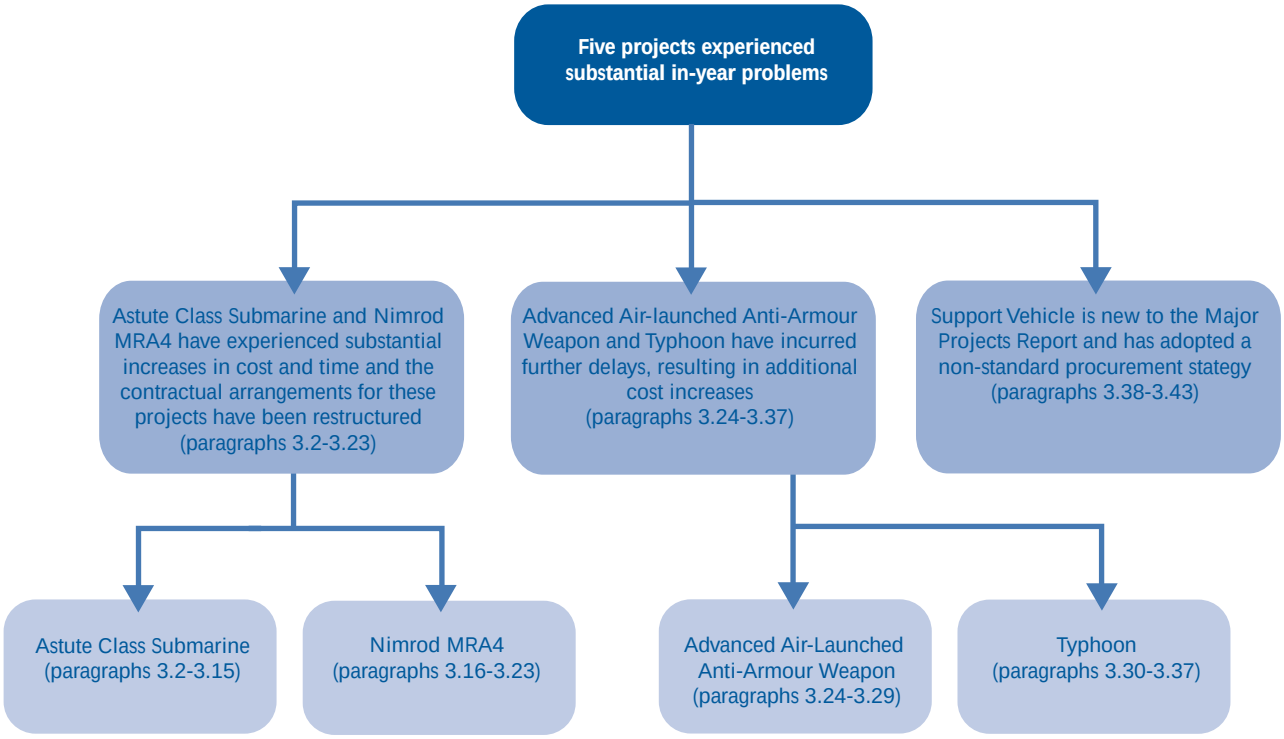


NOTE

Projects have been listed according to how progressed they are on their timelines of Main Gate to current in-service date. For example, assume a project passed Main Gate in January 2001 and has a current in-service date of December 2010. At December 2005, it is 50 per cent mature against its forecast in-service date. This serves as useful approximation of maturity into procurement phase.

See Appendix 2 Figure 29 for details of the actual amount of Cost and Time Risk Differential which has been consumed.

Source: National Audit Office



Artist's impression of an Astute Class Submarine

Part 3

Five projects experienced substantial in-year problems

3.1 Four Legacy projects account for 87 per cent of the in-year cost increase and 79 per cent of the in-year time slippage. Support Vehicles, a Smart project, has incurred 19 months of in-year slippage since passing Main Gate in September 2001. In this section, we examine the reasons for these variations.

Astute Class Submarine and Nimrod MRA4 have experienced substantial increases in cost and time and the contractual arrangements for these projects have been restructured

Astute Class Submarine

Difficulties with the computer aided design tool have led to cost and time increases

3.2 The Astute Class of attack submarine is the replacement for the existing Swiftsure and Trafalgar Classes and will offer enhanced capability in the areas of anti-submarine and anti-surface ship warfare, land attack, intelligence gathering and special forces operations. The prime contract was placed in March 1997 with GEC Marconi (now BAE Systems) following protracted negotiations to arrive at an acceptable contract at an affordable price. The contract included the design, build and initial in-service support of the first three submarines of the Class under a target cost incentive fee contract with a maximum price of £1.9 billion[10].

3.3 The first indications of likely difficulties of up to six months on the programme began to emerge in 1998. The approach, agreed jointly, was to look for opportunities to recover the programme. It was not until the formal Design Chill process in late 2001, and into 2002, that the full seriousness of the difficulties began to be realised. These have so far resulted in a time slippage of 43 months[11] (a 43 per cent increase in the procurement timescale from Main Gate to forecast in-service date) and a cost increase of £886 million[12] over the original estimated cost at Main Gate. The Minister for Defence Procurement announced in February 2003 that BAE Systems would make a contribution of £250 million[13] to the cost of the programme alongside the contribution made by the Department.

3.4 The Treasury is currently reviewing the costs and timing of the programme and an announcement setting out firm time and cost parameters for the programme is expected as soon as possible. At the same time, the Department is expected to contract for long-lead items for the fourth submarine (part of the planned second batch of Astute Class submarines) to address supply chain continuity issues.

3.5 At the heart of the problems on the programme has been the use, to achieve improved quality through efficiency, of computer aided design to manage the complex task of designing the submarine. The technique was new to United Kingdom submarines, had not been trialled before it was applied to the Astute programme and Astute was the first submarine to be designed entirely by the prime contractor. The design of Astute was progressed alongside two other shipbuilding programmes, the Landing Platform Dock (Replacement) and Auxiliary Oiler, and there was a convergence of design activities all of which were being managed using computer aided design tools. In addition to this heavy workload, the workforce at the shipyard in Barrow-in-Furness had been downsized so there were fewer skilled and experienced staff to cope with the complex task of designing a submarine and the use of a computer-based tool to manage the design.

10 Maximum price at 1996 economic conditions.
11 The Department's current assumptions are based on an in-service date of January 2009, which includes full risk contingency. The contract amendment (still under negotiation) is currently predicated on an in-service date of November 2008 and the programme is being driven towards August 2008, both dates acting as stretch targets.
12 Taken from a submission to the Investment Approvals Board, July 2003.
13 BAE Systems' cash contribution at June 2002 economic conditions.

3.6 It is now apparent that neither the Department nor BAE Systems fully understood the risks of introducing computer aided design to a new class of submarine. For example, between 1997 and 2002, the Department did not explicitly monitor the integration of designs via the computer aided design tool and did not include the use of the tool as a separate item on its risk register. Communication between the Prime Contracting Office and the shipyard was not working well, and there were senior personnel changes at BAE Systems. These factors, together with the lack of explicit monitoring of the design tool, contributed to the failure to detect the design difficulties sooner.

The Department has identified ways to move the project forwards

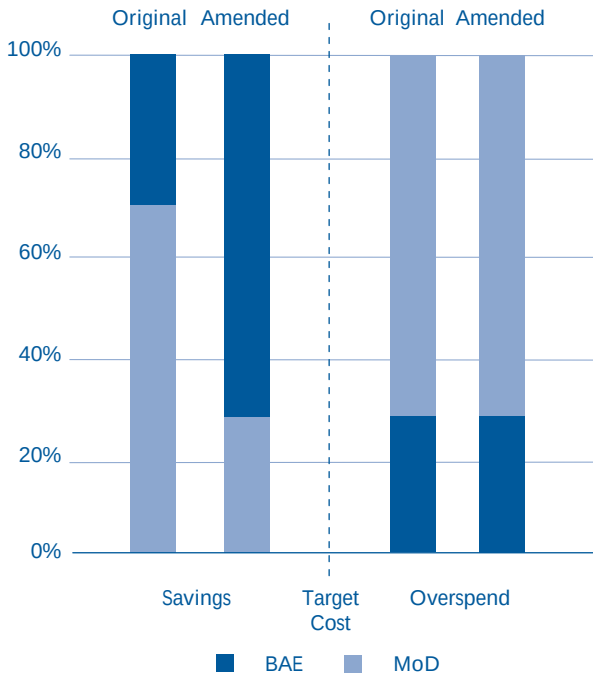
3.7 In February 2003, the Department (after Governmental consultation) and BAE Systems concluded an Agreement on Astute (and a similar one on Nimrod) to provide greater certainty about the delivery of the submarines by restructuring the project to restore confidence that BAE had capped their risk. The Agreement covers two main areas: the principles for restructuring and re-baselining the programme and areas for improved project management.

The programme is being restructured and re-baselined

3.8 Under the February 2003 Agreement, the programme will still be based on a single contract but the contract will be amended to reduce risk by separating the pricing of the design, development and build of the First of Class from the remaining two submarines. The latter two submarines will remain unpriced while risk is reduced on the First of Class to enable it to be used as a benchmark for pricing and build time. BAE Systems will be incentivised to produce early acceptable fixed prices and to reduce build times for the two remaining submarines, for example by reducing the construction man hours by 20 per cent. The incentive available is worth a maximum of £59 million, (1.6 per cent of the forecast cost[14] of the three submarines).

3.9 The way cost under or overruns are shared is also changing. The original contract was based on a target cost, incentive fee arrangement whereby savings or additional costs measured against a target cost would be shared. The arrangement was known as the "share-line" and meant that the Department would receive 70 per cent of any savings and pay 70 per cent of any cost overruns up to an agreed maximum price after which BAE Systems would bear all additional costs. Under the February 2003 Agreement, the terms of the "share-line" were changed and, for the time being, will only apply to the design, development and build of the First of Class. As **Figure 19** shows, the Department will continue to bear 70 per cent of any cost overruns but will now receive 30 per cent of any savings. The new "share-line" does not retain a maximum price but the Agreement provides that any properly incurred costs over and above a cost ceiling will be borne by the Department only after agreement on the scale of the remaining work.

19 Percentage share of over and under-runs measured against target cost



NOTE

The terms of the "share-line" have changed significantly under the February 2003 Agreement.

Source: Ministry of Defence

3.10 Under the February 2003 Agreement, and reflecting the uncertainty on the programme, the Department has agreed to waive liquidated damages of £16 million[15] against the First of Class to which it would have been entitled under the original contract on late delivery. This is with the proviso that late delivery liquidated damages will be reinstated and reset for submarines two and three when they are priced. Other liquidated damages, which in the original contract relate to important aspects of the submarines' performance (speed, radiated noise, radiation dose levels and manning levels) will remain against all three submarines.

14 As at July 2003.
15 Delivery liquidated damages are currently a maximum of £16 million per submarine at 1996/97 prices.

3.11 Under the Agreement, additional capabilities, especially improved navigation and data communications originally intended to be delivered as part of a planned second batch, will also be included in the design of the First of Class. These capabilities are essential to ensure that the submarines are interoperable with other ships and submarines when they enter service after the delay.

Project management improvements are being made

3.12 One of the key issues identified during discussions on the restructuring of the programme was the importance of sharing timely information on progress. Both the Department and BAE Systems have worked hard to address this and other management issues and have made a number of major changes on the programme which are summarised in **Figure 20**. A number of the changes specifically reflect and have quoted Public Accounts Committee[16] recommendations concerning assurance measurement, risk management and the use of earned value analysis.

3.13 The Department and BAE Systems recognised that experienced individuals were needed to provide leadership in using the computer aided design tool on the Astute Class. The Electric Boat shipyard of the General Dynamics Company was identified, having experienced similar problems with computer aided design on the US Seawolf submarine programme and having applied lessons learned to the Virginia Class. Electric Boat is now engaged with BAE Systems under a Foreign Military Sales agreement between the Department and the US Department of Defence.

3.14 Electric Boat are managing the design process with eight design staff on long term secondment to Barrow and fully integrated into functionally responsible positions in the Astute/Barrow engineering effort, of which one is at the most senior management level. An additional five design integration staff have recently supplemented these numbers and a team of 50 staff in the US communicates to the Department and BAE via a secure trans-Atlantic link. There is a highly co-operative relationship between BAE Systems (Submarines) and Electric Boat (G.D.), not only with provision of key resources and technical support, but in programme reviews by submarine design and build experience personnel. A recent joint review conducted by the Department and Electric Boat noted that positive progress is being made.

3.15 Encouraging progress is being made in developing the maturity of the 3-D computer aided design tool model of the submarine equipment and systems arrangement with successful completion to schedule of the first major design review. In addition, the major milestone of design freeze, certifying compliance of the whole submarine baseline functional design with the requirement specification has been achieved to schedule (24 October 2003).

20 Measures to improve project management and monitoring progress on the Astute programme

Co-location	The Department's Integrated Project Team staff (currently 11, around 19 per cent of the total team, and building up to 24 by 2004/05, around 42 per cent of the total team) and BAE System's project office are now co-located at the shipyard in Barrow-in-Furness.
Anchor milestones	Targets that when achieved give assurance that the in-service date will be met. 15 are in place against delivery of the First of Class with a further 20 each for the second and third submarines. An example of an anchor milestone against the First of Class is the forthcoming deadline for agreement of a mature design.
Joint risk register	To identify and mitigate risks to the programme. In addition to managing risk mitigation, BAE Systems has appointed a senior Opportunity Manager to fully explore the potential for positive impact on the project schedule.
Three-point estimates	Jointly calculated to measure confidence levels in the time and cost of different elements of the programme.
Earned Value Management	Used to measure and communicate progress, to evaluate and control project risk and to provide confidence in the quality of anchor milestone estimates.

Source: Ministry of Defence

16 *Committee of Public Accounts 41st Report 'Ministry of Defence: Major Projects Report 2001' (HC448 2001-02); Committee of Public Accounts 29th Report 'Non-Competitive Procurement in the Ministry of Defence' (HC 370 2001-02); Committee of Public Accounts 37th Report 'Ministry of Defence: The Construction of Nuclear Submarine Facilities at Devonport' (HC636 2002-03).*

Nimrod Maritime Reconnaissance and Attack MK 4 (Nimrod MRA4)

Programme management weaknesses have exacerbated technical difficulties and led to further cost and time increases

3.16 Nimrod MRA4 will provide an increase in the multi-role maritime patrol capability to facilitate worldwide deployment of UK forces. This will include a significantly enhanced anti-submarine warfare and anti-surface unit warfare capability through improved aircraft and sensor performance. The prime contract is with BAE Systems and was placed in December 1996. The fixed price contract comprised development and production of the then 21 aircraft (revised to 18 in 2002), and the contracted in-service date was April 2003.

3.17 The Nimrod MRA4 programme has had a history of programme management, technical and commercial difficulty. Two years after the contract award, BAE Systems informed the Department that they were unlikely to meet the contract timescales. This led to the first contract renegotiation, which was completed in May 1999 and provided a revised in-service date of March 2005. A further re-negotiation was concluded in February 2002 that introduced an incremental approach to aircraft delivery to mitigate the risk of further delay, covered a reduction in the number of aircraft from 21 to 18 (reflecting the Department's revised assessment of operational requirements) and a package of measures covering integration facilities and software tools essential for the aircraft and its subsequent long-term support.

3.18 Further slippage and an appreciation of the extent to which technology risks in the programme had been underestimated, together with the consequent cost pressures for BAE Systems were disclosed to the Department in late 2002, making further contract renegotiations necessary. In February 2003, the Department made a formal announcement on the Agreements over both the Nimrod MRA4 and Astute programmes. Both contracts were to be restructured, costs would be borne by both the Department and BAE Systems, and there were to be slippages to the in-service dates of both projects. For Nimrod, the terms of the agreement account for almost all of the in-year cost increase of £538 million, and all of the in-year time slippage of 40 months. It is now £394 million and 71 months over original approval.

3.19 Difficulties on Nimrod stem from "the design challenge [being] hugely underestimated by industry, perhaps as a result of continuing to see the project as if it were the adaptation of an existing aircraft, as it was originally intended to be when in fact some 95 per cent of the aircraft is new"[17]. Against the background of the fixed price contract, the consequent cost pressure and financial losses provided little incentive on BAE Systems to deliver. These difficulties were compounded by a weak programme management culture which lacked transparency, neglected or overrode project control systems and disciplines, and produced forecasts that lacked depth and reality. The Department's oversight and influence was also restricted by the limited access and insight provided under the fixed price contract.

The contract is being restructured and the programme re-organised

3.20 Under the February 2003 Agreement, design and manufacture have been separated as far as possible to ensure that technology is adequately de-risked before fixed commitment to production price and schedule are accepted by customer and supplier. All production beyond the first three development aircraft has been largely curtailed until the maturity of the design and development phase delivers an acceptable level of product maturity to negotiate a production price. It therefore refers - but does not commit - to production of the remaining 15 aircraft. Similarly, the subsequent conversion to production standard of the three development aircraft is an option at the Department's additional expense. Subject to Departmental approval, the restructuring will also allow for an assessment phase for an adaptable aircraft which can perform tasks in addition to those of a MRA4 standard.

3.21 The February 2003 Agreement also requires the contract to be amended from the previous fixed price basis, to a Target Cost Incentive Fee basis for Design and Development. The Department believes this to be the best means of incentivising BAE Systems to deliver the aircraft without further cost and time slippage. Beyond an outer cost boundary of £1,940 million, the Department is liable to bear all of the excess (subject to Departmental approval for work beyond that point). The production price for all aircraft has yet to be negotiated, although a unit cost aim has been set.

17 *Chief of Defence Procurement, House of Commons Defence Committee 'Defence Procurement' Eighth Report of Session 2002-03 (HC694).*

Programme management improvements are being made

3.22 Programme management arrangements were reviewed in the February 2003 agreement. Discussions focussed on three key features: control, assurance of control and senior employee incentives within BAE Systems' project management arrangements - and the visibility of these to the Department. Both the Department and BAE have worked hard to address these management issues and have made significant progress towards reform of the project control systems to remedy past failings. The reforms aim to induce a robust partnering culture that enables delivery, provides refreshed estimates of schedule and cost and enables the quality of project management required by both parties. Examples of the measures being introduced are summarised in **Figure 21**. A number of the changes specifically reflect and have quoted Public Accounts Committee[18] recommendations concerning assurance measurement, risk management and the use of earned value analysis.

3.23 The Agreement has provided a contract framework that has enabled the Department and BAE Systems to work together much more closely and effectively, with regular reviews of risk and progress. Lessons learned are being applied that should provide greater confidence in the prospect of delivery. The Department has co-located key project team staff on BAE Systems' sites. They now have a much deeper involvement in key BAE Systems' teams, with the ability to contribute towards delivery and reform where they are able to so assist. The refreshed programme and associated cost and schedule impacts will not be known for some months, but the first development aircraft is expected to fly by June 2004, the second by autumn 2004, and the third by mid-2005. The revised in-service date of 2009 is still challenging: further risks to this can only be fully assessed when BAE Systems have produced an integrated development and production programme, due later this year.

21 Measures to improve project management and monitoring progress on the Nimrod programme

Reform of Project Control Systems
The Department and BAE Systems have undertaken fundamental and joint independent reviews of project control systems, against best practice criteria, that have confirmed the need for reforms to processes and tools. Reforms are now advancing.
Co-location
The Department's oversight and contribution to programme delivery has been enhanced by fuller access to industry schedule, cost and programme data and by greater staff mobility. Further project team staff have been located alongside BAE Systems at Warton and Woodford.
Anchor milestones
Reform of project control systems has been incentivised and programme control will be underpinned by a set of Anchor Milestones - targets that when achieved provide assurance that the in-service date or other contractual obligation will be met.
Joint risk register
To identify and mitigate risks to the programme.
Three-point estimates
Due by year end these will be jointly calculated to measure confidence levels in the time and cost of different elements of the programme, based on a project network of activities. Financial data on development and production will be reviewed monthly in a joint meeting between BAE Systems and the Department.
Earned Value Management
Used to measure and communicate progress and achievement against costs incurred and provide confidence in the quality of anchor milestone estimates. Focus on measuring outcomes achieved and not effort employed.
Culture
A robust and open partnering approach that raises access, information, communication and behaviours with a greater emphasis upon delivery, cost minimisation and schedule adherence. Associated with refreshed training on Earned Value Management, new project control system tools and risk and other processes.

Source: Ministry of Defence

18 *Committee of Public Accounts 41st Report 'Ministry of Defence: Major Projects Report 2001' (HC448 2001-02); Committee of Public Accounts 29th Report 'Non-Competitive Procurement in the Ministry of Defence' (HC 370 2001-02); Committee of Public Accounts 37th Report 'Ministry of Defence: The Construction of Nuclear Submarine Facilities at Devonport' (HC636 2002-03).*

Advanced Air-Launched Anti-Armour Weapon and Typhoon have incurred further delays, resulting in additional cost increases

Advanced Air-Launched Anti-Armour Weapon

3.24 The Advanced Air-Launched Anti-Armour Weapon, known as Brimstone, is an air-launched missile with a limited stand-off capability to attack armoured vehicles. Designed to reduce the fighting power of enemy armoured forces as early and as far forward as possible, it replaces the BL755 cluster bomb in the anti-armour role, and will be carried by Tornado GR4/4a, Harrier GR9 and Typhoon. Brimstone was approved for Demonstration and Manufacture in 1996, to be delivered in September 2001 at a cost of £849 million. The prime contract is with Matra BAe Dynamics (UK) Ltd. (MBDA) and covers development and production. In the year ended 31 March 2003, total forecast procurement costs increased by £126 million, and the in-service date was delayed by 18 months. Adding these to earlier variations, Brimstone is now expected to cost £988 million (£139 million more than approved) and to be delivered in April 2004 (31 months later than approved).

The Brimstone development programme has been delayed

3.25 Of the 18 months additional time slippage, 12 months relates to a delay in the provision of trials aircraft. Tornado GR4 is the lead platform onto which Brimstone will be fitted and under the terms of the original development programme, the Department was to supply a Tornado GR4 for flight and air-firing trials at China Lake range, USA, in April 2000. Following the earlier slippage of its in-service date to October 2002, the start of the Brimstone China Lake trials was rescheduled for May 2001. This resulted in a conflict between the Brimstone development programme and two other programmes (Reconnaissance Airborne Pod Tornado (RAPTOR) and Conventionally Armed Stand-off Missile (CASOM)) requiring use of the trials aircraft. The Department decided to prioritise CASOM and the trials aircraft only became available for Brimstone trials in December 2001.

3.26 The other six months of the 18 months delay relates to a perceived safety issue encountered during aircraft integration activities. A risk of potential missile collision with the aircraft after launch was identified and flying was halted for six months while this was investigated and resolved by the clearance authorities. Firing trials for a single, non-warhead missile restarted in January 2003.

In-year cost changes are primarily due to an increase in interest on capital and the reinstatement of an earlier reduction in the quantity of missiles being procured

3.27 There has been an in-year increase in interest on capital of £64 million as a consequence of delayed missile deliveries. Interest on capital is a non-cash cost that falls to the Department under Resource Accounting and Budgeting, introduced across Government in 1999. In the context of Brimstone it reflects the opportunity cost to the Government of the capital resources the Department has invested in procuring the missiles, based on the return the Government could have achieved by investing the resources elsewhere. Once the missiles are delivered interest on capital charges reduce as they begin to return the investment in them. Delays to delivery result in the Department incurring higher interest on capital charges for longer. **Figure 22** illustrates the changes in the level of interest on capital charges on Brimstone since 2001.

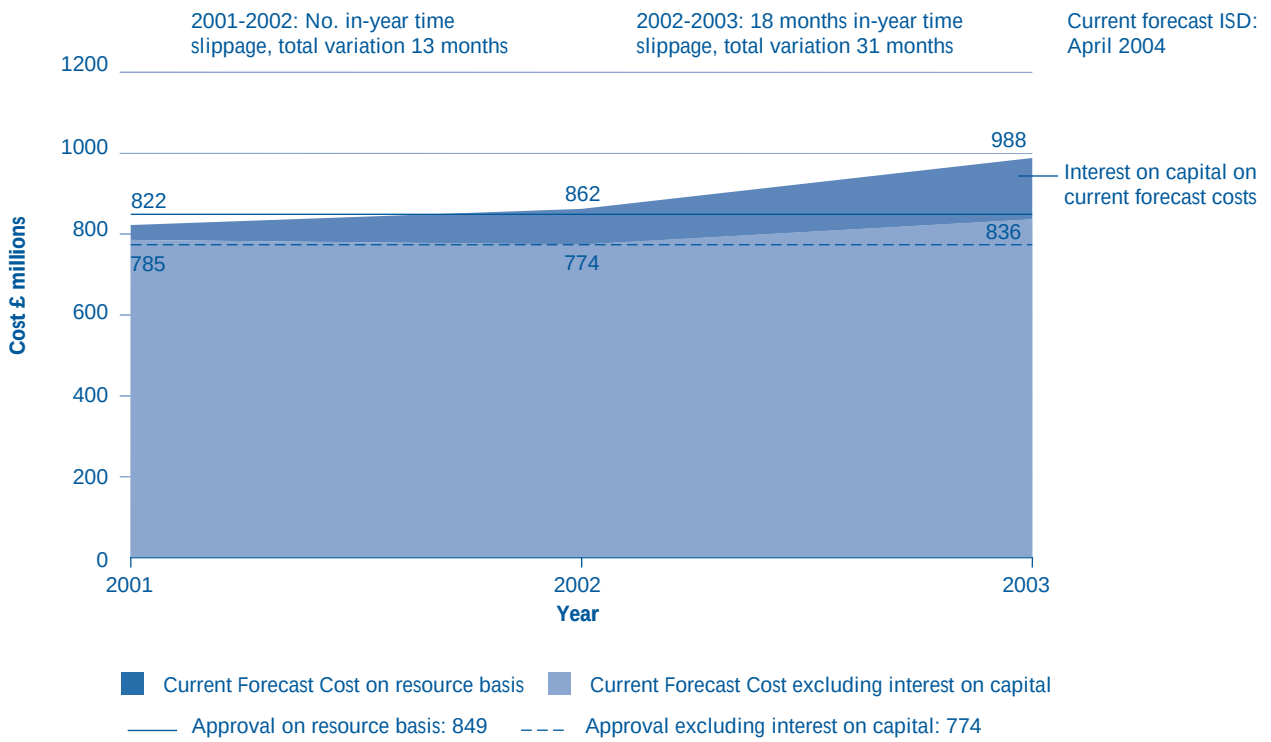
3.28 Most, £49 million, of the remaining £62 million in-year cost increase relates to the re-instatement of a 25 per cent reduction in missile quantities. The Department reduced the number of missiles required in summer 2000 and entered discussions with MBDA over the level of savings that might be released as a result. Brimstone is being procured under a fixed price contract and the Department and MBDA have not been able to reach agreement on an acceptable level of savings. The Department has therefore reinstated the requirement for the original number of missiles at no additional cost to the original price. The Department continues to negotiate with MBDA on other possible options such as allowing MBDA to buy back 25 per cent of the missiles for sale overseas.

3.29 The remaining £13 million in-year cost increase relates to amounts payable to the contractor for non-provision of trials aircraft, and an increase in the costs of integration onto Tornado.

Typhoon

3.30 Typhoon, formerly Eurofighter, will be an agile air superiority fighter aircraft, with a swing-role, air defence and ground attack capability which will replace the RAF Tornado F3 and Jaguar. It was approved for Demonstration and Manufacture in November 1987, to be delivered in 1998 at a cost of £17,364 million. Typhoon is a multi-nation collaborative project comprising two consortia as prime contractors: Eurofighter GmbH Airframe, and Eurojet Turbo GmbH Engine. In the year ended 31 March 2003, total forecast procurement costs increased by £1037 million, and the in-service date was delayed by 12 months. Adding these to earlier variations, Typhoon is now expected to cost £19,670 million (£2306 million more than approved) and was delivered in June 2003 (54 months later than approved).

22 Changes in level of interest on capital on Brimstone since 2001



NOTE

The current forecast costs for 2001 and 2002 differ from the published costs in those years' Major Projects Reports. This reflects the subsequent availability of more accurate information.

Source: National Audit Office

Technical difficulties delayed delivery

3.31 In February 2002, the Department announced that the then forecast in-service date of June 2002 was becoming increasingly difficult to achieve due to delays in bringing the detailed design to maturity. These problems were further compounded by the crash in November 2002 of a development standard aircraft. Typhoon achieved its in-service date on 30 June 2003.

3.32 There were four main factors that underlay the Typhoon in-service date delay. The issues are recognised within the United Kingdom and required attention internationally to improve the process for subsequent delivery standards. The factors are

- The process of gathering and collating flight safety and performance data, which is necessary to accept aircraft into service, took longer than originally planned.
- The large volume of design work to meet appropriate delivery standards, although individually minor, cumulated in a greater volume of work and took industry longer to embody than anticipated.
- Realignment of critical path flight testing activities necessitated by the loss of a development aircraft in November 2002.
- Industry found the acceptance process complex and difficult to forecast and discharge internationally and implement nationally.

In-year cost changes are primarily due to increases in interest on capital, and reassessments of development and production costs

3.33 Of the £1037 million in-year cost increase, £649 million relates to interest on capital. As for Brimstone, the slippage to the programme resulted in an increase in interest on capital charges, amounting to £474 million. Other factors have also affected interest on capital charges for Typhoon. Re-definition of the date at which the aircraft will be of beneficial use to the RAF, moving this date later by 12 months, has increased interest on capital charges by £222 million. This date has been moved to better reflect when the RAF will be deemed to take the full benefit of the aircraft. The original beneficial use date was defined as when the RAF took delivery of the first aircraft and started to fly it. As this was actually the start of Operational Test and Evaluation, and Service

Instructor Pilot Training, it was agreed between the Defence Procurement Agency and the RAF that a more meaningful beneficial use date should be when the aircraft was operationally useful and able to start contributing to Defence output, and thus start to take over from Tornado F3 and Jaguar (i.e. initial operating capability). Realignment with initial operating capability moved the beneficial use date 12 months later and, as a result, higher interest on capital charges related to development costs will be incurred for longer, as in-service benefits yielding reduced interest on capital charges will not be deemed to be received until later.

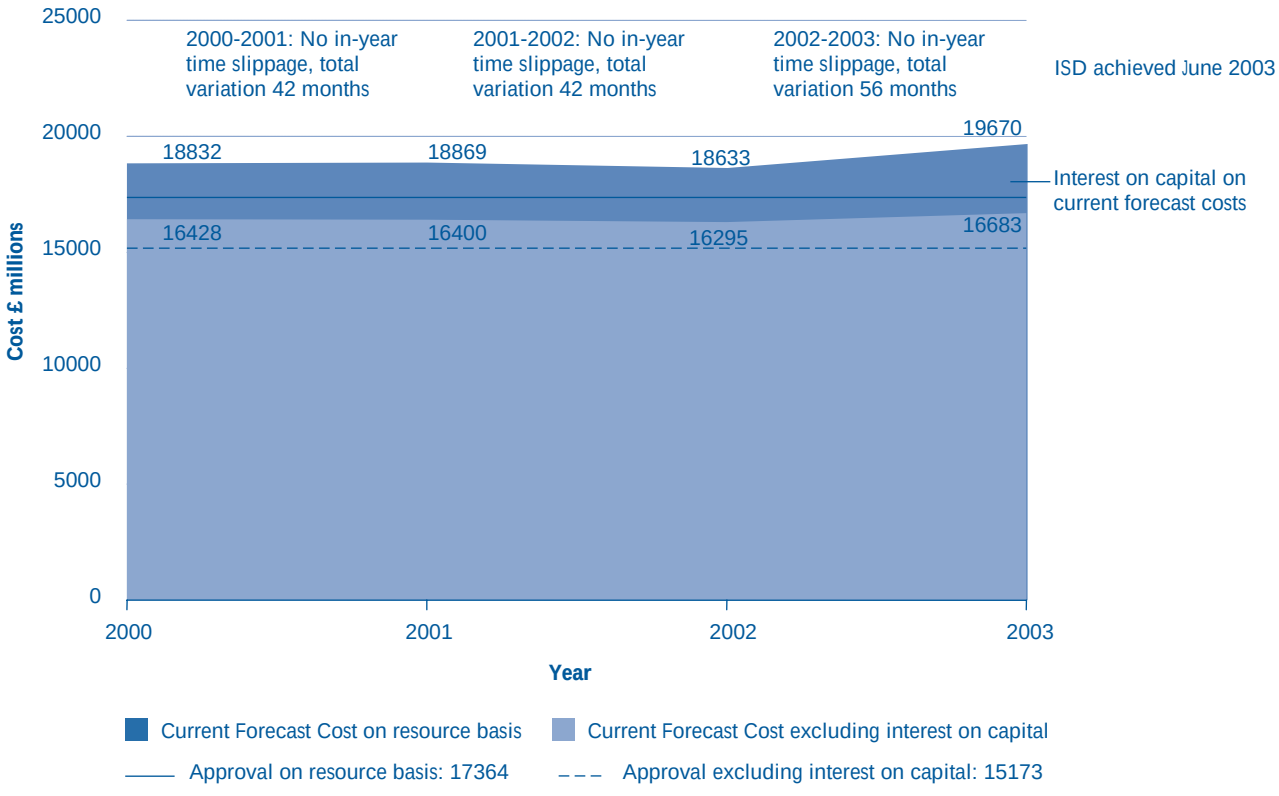
3.34 There have also been reductions in interest on capital charges totalling £47 million driven by variations in inflation, exchange rates, and revised costings. **Figure 23** illustrates the changes in interest on capital on Typhoon since 2000.

3.35 £320 million of the in-year cost variation relates to a reassessment of development and production costs on Tranches 2 and 3. The primary reason this was a thorough reassessment of the maximum prices for Typhoon Airframe, Engine and Equipment as well as revised costing assumptions for the integration of future requirements. Although only Tranche 1 aircraft are on contract, maximum prices were agreed at the outset for all three Tranches. Typhoon contracts are extremely complex with a number of annexes each potentially having a cost impact. The reassessment involved a thorough analysis of all the annexes to both the Eurofighter and Eurojet contracts taking into account latest programme assumptions on aspects such as learning curve efficiencies for Tranches 2 and 3 based on latest Tranche 1 programme experience. Further cost increases followed a major review of all future requirements (Full Operational Capability (FOC) and Enhanced Operational Capability (EOC)). Obsolescence studies were carried out based on latest information from industry. Additional costs were also added for Project Support (mainly Qinetiq costs) and Government Furnished Equipment required to trial the aircraft and integrate FOC and EOC.

3.36 There have been favourable variations on costs due to inflation (decrease of £179 million), and also due to exchange rates (decrease of £32 million). These are factors beyond the Department's control, and represent differences between current assumptions and assumptions at approval.

3.37 The remaining items relate to Changed Requirements. These are an increase of £117 million for the retrofit of Tranche 1 aircraft to Tranche 2 standard, and a reduction of £21 million from the deletion of requirements.

23 Changes in level of interest on capital on Typhoon since 2000



Source: National Audit Office

Support Vehicle is new to the Major Projects Report and has adopted a non-standard procurement strategy

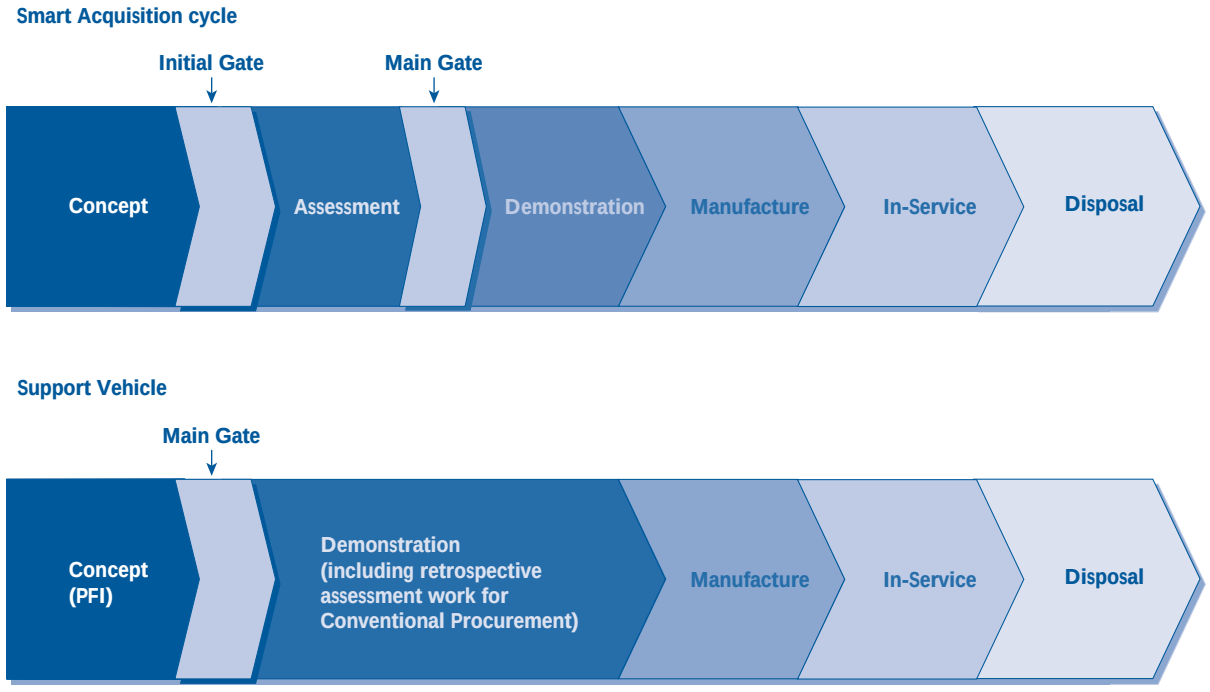
3.38 New to the Major Projects Report population, the Support Vehicle project brings together the related requirements for a recovery vehicle, a cargo vehicle and trailers to support all three Services in a range of environments. The vehicles will replace the ageing four, eight and 14 tonne truck fleet and will have enhanced payload, mobility and survivability. The prime contractor, to build and support the vehicles in-service, will be selected from an international competition which is due to be completed in the autumn 2003. The selection of the prime contractor will be considered by the Investment Approvals Board early in 2004.

3.39 In March 2001, the Department decided that the project should proceed straight to Main Gate for full funding approval as illustrated in **Figure 24**. There were two main reasons for adopting this approach. First, the Department judged that work done during a three-year Concept Phase to assess the suitability of a Private Finance Initiative (PFI) approach demonstrated that the technology was mature. The work concluded that a PFI approach did not add any value over the Public Sector Comparator, and did not offer sufficient scope for industrial innovation or opportunity to generate third party revenue - leading to a decision to opt for a conventional procurement rather than a PFI approach. Second, the Department was faced with an urgent need for the Support Vehicle capability which, at the same time, was perceived to pose low technical risk.

3.40 The Department therefore saw an opportunity to accelerate the project and adopted a non-standard procurement strategy bypassing the Assessment Phase. The work done to assess the PFI approach formed the basis for the time, cost and performance parameters set at Main Gate in September 2001. For example, the vehicle pricing information submitted by industry, Whole-Life Cost estimates, vehicle numbers and the preliminary user requirements setting out the key aspects of the vehicles' performance.

3.41 The procurement strategy was not complete at Main Gate however, as the in-service support solution was not defined (despite the existence of Whole-Life Cost estimates). Industry had indicated during the PFI-stage that there was scope for innovative support solutions, which the Department wished to pursue, but the parameters of these had not been discussed between the Department and the potential bidders before Main Gate. Furthermore, the Systems Requirement Document, the translation of the user requirements into the engineering specification, was not complete and the Key User Requirements required further work after Main Gate approval was given.

24 Timeline for Support Vehicle compared to the Smart Aquisition cycle



Source: National Audit Office

25 The Department has recognised lessons learned and will apply them to future projects

Lessons Learned	The need to address the possibility of a fresh Assessment Phase when there has been a change of procurement strategy
	The importance of identifying risks and appropriate mitigation strategies from the start of a project onwards
	The importance of getting early clarification of industry's understanding of the requirement and ability to meet it
	The need to build flexibility into the budget to respond to unforeseen events
	The need to address the degree to which optimism may be driving key decisions

Source: Ministry of Defence

Bypassing the Assessment Phase has resulted in substantial time slippage

3.42 It is now apparent that industry's understanding of the requirement and potential support solutions was not clear at Main Gate. The nature of the competition also changed as several new companies entered the international competition and those that had previously been involved were part of a consortium to bid on a PFI basis. Two further rounds of tendering became necessary to bottom out the support solution, technical and commercial issues, and to give guidance to overseas companies new to the Department's procedures. The workload surrounding the total three rounds of tendering, which have led to a 12-month delay to the in-service date, has been compounded by the fact that four bidders still remain in the competition and all have the potential to provide a satisfactory bid.

The Department has taken steps to address the timing of Support Vehicle deliveries and has recognised lessons learned

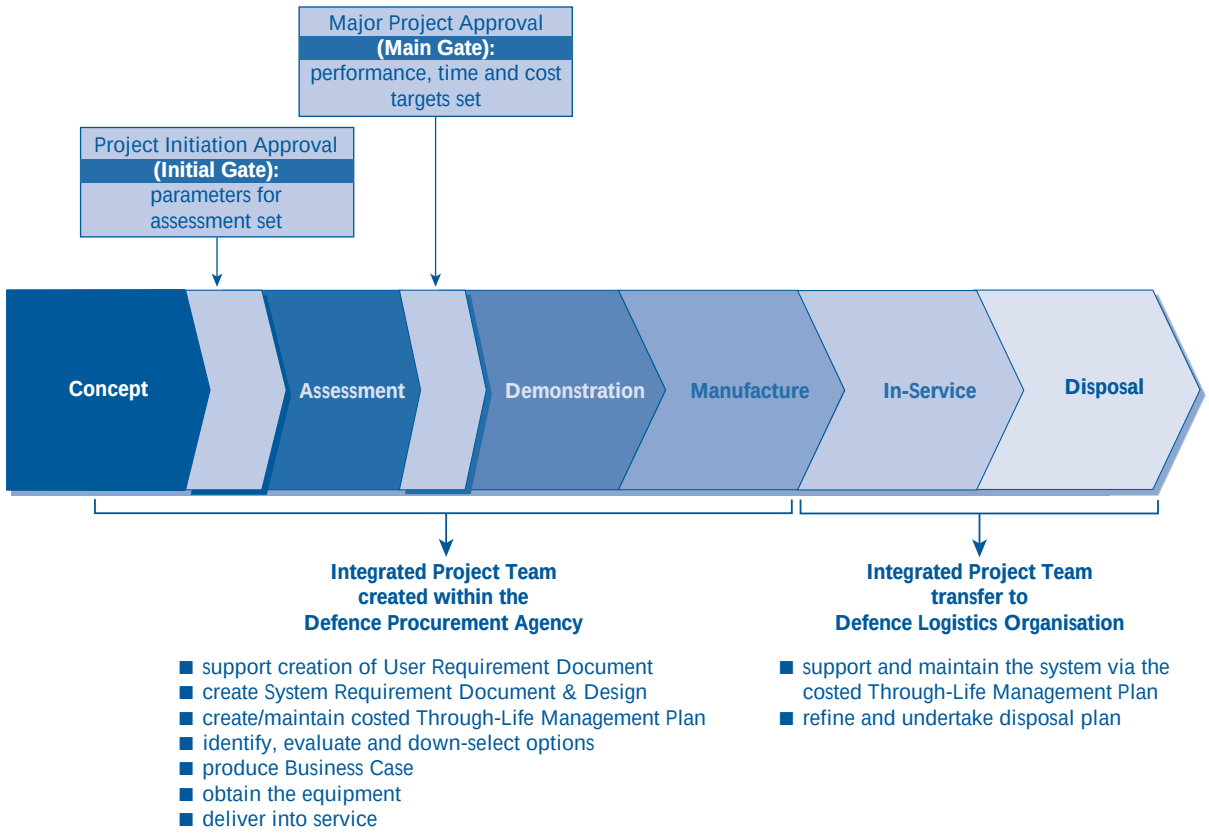
3.43 A budgetary option has been taken to compress the delivery timescale in order to complete deliveries earlier than endorsed at Main Gate. At the same time, the IPT is merging to form a Through-Life IPT - resulting in those in Abbey Wood having to re-locate to Andover. This is causing staffing difficulties at a critical time.

Appendix 1 The Smart Acquisition lifecycle and the different approvals for Legacy and Smart projects

1 Under the Smart Acquisition lifecycle, there are two key approval points, Initial Gate, at which parameters for the Assessment Phase are set, and Main Gate, at which performance, time and cost targets for the Demonstration and Manufacture Phase are set. **Figure 26** outlines the acquisition lifecycle and the responsibilities of Integrated Project Teams at each stage.

2 Legacy projects are measured against a 50 per cent approval; Smart Acquisition projects are measured against a 90 per cent approval. For Smart Acquisition projects, forecast estimates (50 per cent) are the basis on which the Department plans its equipment programme, while highest acceptable (90 per cent) estimates are not to be exceeded values for the cost and in service date of equipment and represent the manifestation of all identified risks. The difference between the forecast (50 per cent) for cost and time and highest acceptable (90 per cent) for cost and time at Main Gate is reported in the Major Projects Report as the Risk Differential.

26 The Smart Procurement acquisition cycle showing the role of Integrated Project Teams



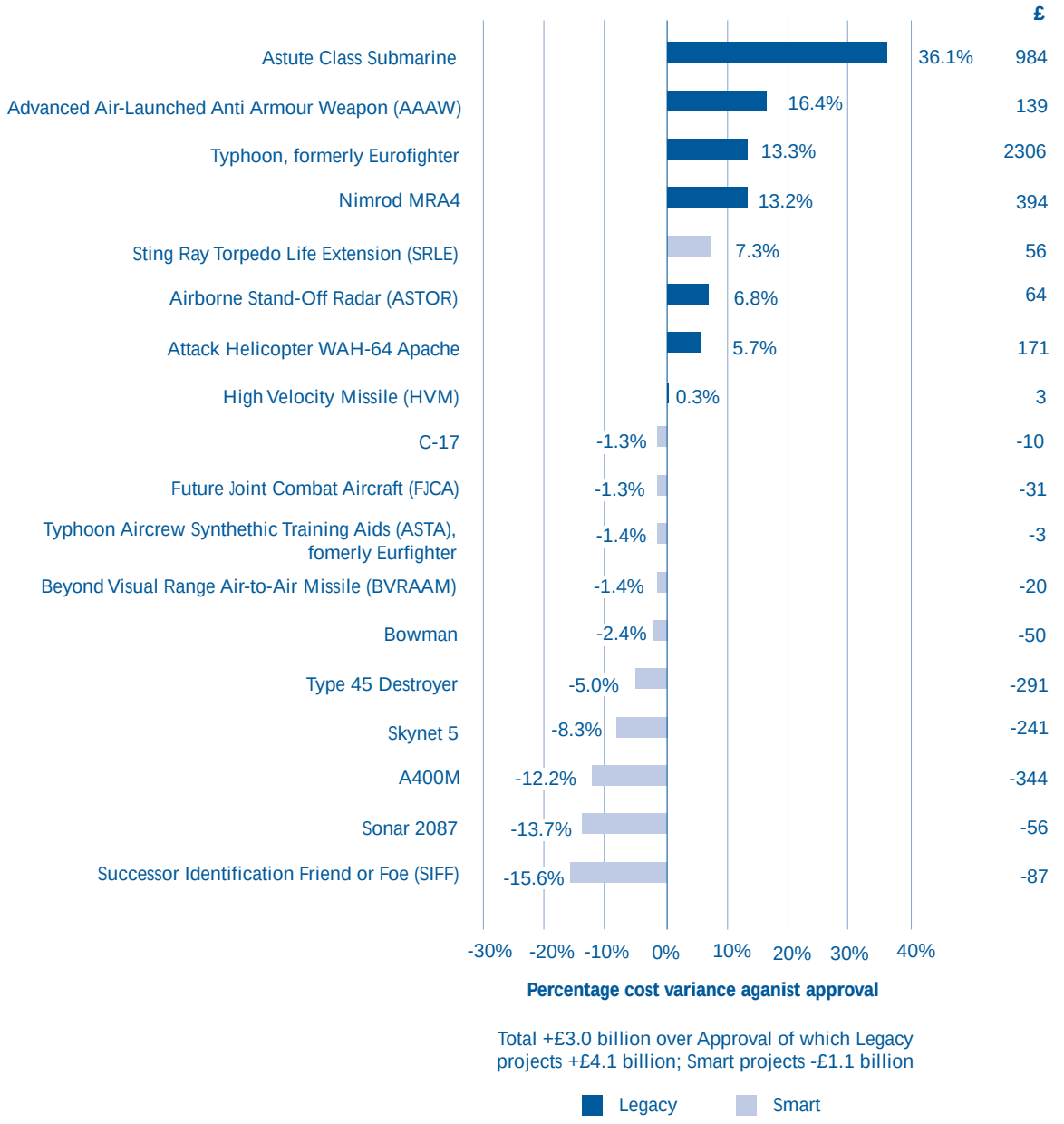
Source: National Audit Office

Appendix 2

Cost and time variation against Approvals for Legacy and Smart projects, and Cost and Time Risk Differential consumed for Smart projects

27 Cost variation against approval by project

Compared against their approvals (stated at 50 per cent for Legacy projects; 90 per cent for Smart projects), eight projects are over approval - of which seven are Legacy, one is Smart.



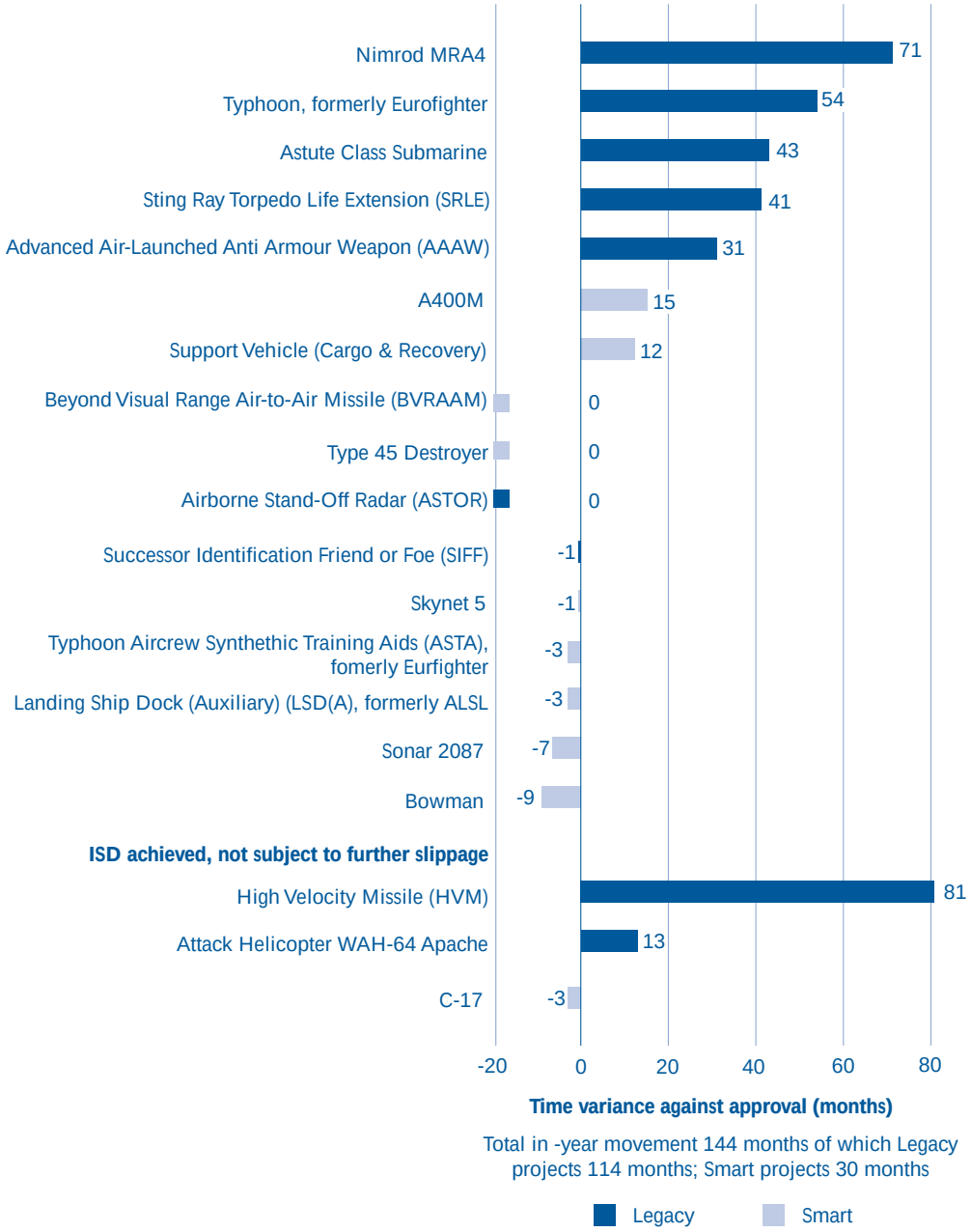
NOTE

Support Vehicle and LSD(A) excluded from analysis.

Source: National Audit Office

28 Time variation against approval by project

Against their approvals (stated at 50 per cent for Legacy projects; 90 per cent for Smart projects), nine projects are over approval - of which seven are Legacy, two are Smart.



NOTE

SRLE and SIFF are Smart for Cost; Legacy for Time. FJCA is excluded from time analysis.

Source: National Audit Office

29 Cost and Time Risk Differential consumed

Project	Maturity of project against forecast in-service date (percentage)	Cost risk differential at Main Gate (£ millions)	Cost risk differential consumed (£ millions)	Time risk differential at Main Gate (months)	Time risk differential consumed (months)
A400M	30.9	119	0	10	25
Beyond Visual Range Air-to-Air Missile (BVRAAM)	23.1	129	109	11	11
Bowman	61.3	144	94	9	0
C-17	In-service date achieved	39	29	3	0
Future Joint Combat Aircraft (FJCA)	In-service date not yet approved	213	182		
Landing Ship Dock (Auxiliary) (LSD(A)). formerly ALSL	64.4			3	0
Skynet 5	37.8	241	0	1	0
Sonar 2087*	59.4	42	0	7	0
Sting Ray Torpedo Life Extension (SRLE)	71.2	18	34		
Successor Identification Friend or Foe (SIFF)*	72.1	14	0		
Support Vehicle (Cargo & Recovery)	26.9			7	19
Type 45 Destroyer	36.4	506	215	6	6
Typhoon ASTA	64.4	23	20	3	0
Total		1488	683	60	61

NOTE

Projects have been listed according to how progressed they are on their timeliness of Main Gate to current in-service date. For example, assume a project passed Main Gate in January 2001 and has a current in-service date of Dec 2010. At December 2005, it is 50 per cent mature against its forecast in-service date. This serves as a useful approximation of maturity.

* Costs on these projects have reduced by a total of £300 milion from the forecast at Main Gate.

Source: National Audit Office

Appendix 3 Ministry of Defence - Project Summary Sheets

This appendix contains the Project Summary Sheets for all 20 post-Main Gate and 10 pre-Main Gate projects included in this year's Report.

MAJOR PROJECTS REPORT 2003

POST-MAIN GATE PROJECTS

PRE-MAIN GATE PROJECTS

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POST-MAIN GATE PROJECT SUMMARY SHEET

A400M

Integrated Project Team Responsible:
A400M

SECTION 1: ABOUT THE PROJECT

1a. Project description, progress and key future events

The Future Transport Aircraft (FTA) requirement seeks to provide tactical and strategic mobility to all three Services. The capabilities required of FTA include: the ability to operate from well established airfields and semi-prepared rough landing areas in extreme climates and all weather by day and night; to carry a variety of vehicles and other equipment, freight, and troops over extended ranges; to be capable of air dropping paratroops and equipment; and to be capable of being unloaded with the minimum of ground handling equipment. Furthermore, the 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 requirement would be met, in the latter part of this decade, by FTA.

The A400M was selected to meet this requirement for an air lift capability to replace the remaining Hercules C-130K fleet. Ministers announced their decision on 16th May 2000 to make a commitment to procure 25 A400M aircraft in the initial production tranche. This is a collaborative programme now involving seven European nations (Germany, France, Turkey, Spain, Belgium, Luxembourg and United Kingdom), following the departure of Portugal in January 2003. Inter-Governmental Arrangements (IGAs) and contract were signed on 18 December 2001 but, in the absence of German Bundestag approval for their commitment, neither of these came into effect. A subsequent reduction in offtake by Germany (73 to 60) necessitated renegotiation and signature of IGAs and contract, which was completed on 27 May 2003. A total of 180 aircraft is now being procured. In March 2003 the approved in-service date was slipped because of the delay in activating the contract.

1b. Associated projects

Critical to Achievement of ISD		Critical to Meet Initial Gate Requirement	
Project Title	Forecast ISD	Project Title	Forecast ISD
-	-	-	-

1c. Procurement strategy

Contractor(s)	Contract Scope	Contract Type	Procurement Route
Airbus Military Sociedad Limitada (AM SL) formerly known as Airbus Military Societe Par Actions Simplifee (AM SAS)	Development, Production and Initial in-service support	Fixed Price subject to Variation of Price	International Competition

SECTION 2: PROJECT COSTS

2a. Performance against approved cost

£m (outturn prices)	Procurement Cost
Current Forecast Cost	2484
Approved Cost at Main Gate	2828
Variation	-344
In-year changes in 2002/2003	+128

2b. Reasons for variation from approved cost

Factor	Increase £m	Decrease £m	Explanation
Technical Factors		46	Reduction in the requirement for government procured items. (-£46m).
Changed Requirement	9	319	Reduction in number of aircraft to be equipped with Defensive Aids Sub-System (DASS) from 25 to 9 (-£238m). Programme option to delete and defer Configuration Items and to slip In Service Date by 12 months (-£81m). Option bringing the DASS forward onto aircraft 1-9 (+£9m).
Changed Budgetary Priorities	7	81	Changed delivery profile from that in the Business Case (-£61m). Minor realism adjustments, includes UK share of OCCAR Programme Division costs (+£5m), QinetiQ Support costs increased (+£1m), unidentified variance (+£1m). Equipment Programme Measure deleting 1 Simulator (-£20m).
Inflation	6	16	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 (-£10m).
Exchange Rate		232	Variation in exchange rate assumptions used in the Business Case, 2000/2001, 2001/2002 and 2002/2003 (-£232m).
Contracting Process	442	59	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 (CED) slipped from November 2001 - October 2002 (+£149m). CED slipped from October 2002 - April 2003 (-£59m). Adjustments in line with increased knowledge of Programme (+£66m).
Procurement Strategy	130	65	Total number of aircraft ordered by participating nations higher than

Factor	Increase £m	Decrease £m	Explanation
			anticipated, and consequent reduction in UPC (-£65m). Subsequent contract renegotiation due to German reduction in offtake (+£130m).
Accounting Adjustments and Re-definitions		1	Transfer from RDEL to CDEL (-£1m).
Risk Differential		119	Difference between the most likely and highest acceptable cost at Main Gate (-£119m)
Total	+594	-938	
Net Variation		-344	

2c. Expenditure to date

Expenditure to 31 March 2003 (£m)	2

2d. Years of peak procurement expenditure

2009/2010	2010/2011

2e. Unit production cost

Unit Production Cost (£m)		**Quantities Required**	
at Main Gate	Current	at Main Gate	Current
***	***	25	25

SECTION 3: PROJECT TIMESCALE

3a. Definition of in-service date

ISD Definition:	Delivery of 7th aircraft with Strategic Military Aircraft Release and support arrangements.

3b. Performance against approved in-service date

	Date
Current forecast ISD	March 2011
Approved ISD at Main Gate	December 2009
Variation (Months)	+15
In-year changes in 2002/2003	+9

3c. Reasons for variation from approved ISD

Factor	**Increase (months)**	**Decrease (months)**	**Explanation**
Changed Budgetary Priorities	16		Change in the customers requirement flowing from changed budgetary priorities (+16 months)
Procurement Strategy	9		Delay in bringing contract into effect as a result of delayed approvals in Germany (+9 months)
Risk Differential		10	Difference between the most likely and highest acceptable dates at Main Gate (-10 months)
Total	+25	-10	
Net Variation	+15		

3d. Cost resulting from ISD variation*

Type of Cost/Saving	**Cost £m**	**Saving £m**	**Explanation**
Support costs of current equipment	-	-	
Other	-	-	-
Total	-	-	

3e. Operational impact of ISD variation

The delay to the ISD by 15 months to March 2011 is likely to aggravate the extant strategic, tactical and special forces airlift capability gap unless remedial action is taken. Director Equipment Capability (Deployment, Sustainability & Recover) is assessing all options necessary to bridge the current and emerging capability gaps.

[1] Last year, there were forecast to be run-on costs for C130K and C-17 due to the ISD variation on A400M. It is not at this stage possible to forecast accurately run-on costs directly attributable to the ISD variation on A400M, as the aim of any extension to the C-17 and C130K programmes is likely to be the introduction of an additional complementary, long-term capability.

SECTION 4: KEY USER REQUIREMENTS

4a. Performance against approved key user requirements

Serial	Key Requirement	Currently forecast to be met (Yes or No)
1	Deployment Capability	Yes
2	Payload	Yes
3	Environmental Operating Envelope	Yes
4	Tactical Operations	Yes
5	Navigation Performance	Yes
6	Communication System	Yes
7	Defensive Aids Suite	Yes
8	Aerial Delivery	Yes
9	Crew Composition	Yes
	Percentage currently forecast to be met	100%
	Change since previous MPR	None

4b. Reasons for variation against approved key requirements

Key Requirement	Factor	Explanation
-	-	-

SECTION 5: HISTORY UP TO MAIN GATE APPROVAL

5a. Description of the Assessment Phase

The Government announced in December 1994 that it would replace its ageing C-130K Hercules fleet, in part by procuring 25 C-130J's from Lockheed Martin and in addition, subject to certain conditions, by rejoining the next phase of the collaborative Future Large Aircraft (FLA) programme (now known as A400M). The FLA '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 FLA. A Request For Proposals (RFP) was issued to Airbus in September 1997 on behalf of the seven FLA nations (UK, France, Germany, Italy, Spain, Belgium, Turkey). Subsequently, in July 1998, four nations (UK, France, Spain, Belgium) issued a "competitive RFP" for a Future Transport Aircraft to Airbus Military Company (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 and industrial dimensions. This work also led to parallel negotiations and clarification with the three bidders. At the direction of the Equipment Approvals Committee (EAC) in December 1999, additional work was undertaken to inform the Main Gate submission. On 16 May 2000 the Government announced their decision to procure 25 A400M aircraft to meet the FTA requirement.

5b. Cost of the Assessment Phase

£m (outturn prices)	Assessment Phase cost	Proportion of total estimated procurement expenditure
Actual cost	1	0.04%
Approved Cost at Initial Gate	2	0.07%
Variation	-1	

5c. Duration of Assessment Phase

	Date
Date of Main Gate Approval	May 2000
Target Date for Main Gate Approval at Initial Gate	June 1999
Variation (Months)	+11

5d. Cost boundaries at Initial Gate and Main Gate Approvals

£m (outturn prices)	Lowest	Most Likely	Highest
Cost of Demonstration and Manufacture Phase forecast at Main Gate	-	2709	2828
Cost of Demonstration and Manufacture Phase forecast at Initial Gate	-	-	-

5e. ISD boundaries at Initial Gate and Main Gate Approvals

	Earliest	Most Likely	Latest Acceptable
Forecast ISD at Main Gate	-	February 2009	December 2009
Forecast ISD at Initial Gate	-	December 2007	-

POST- MAIN GATE PROJECT SUMMARY SHEET

ADVANCED AIR-LAUNCHED ANTI-ARMOUR WEAPON (AAAW)

Integrated Project Team Responsible:
Brimstone

SECTION 1: ABOUT THE PROJECT

1a. Project description, progress and key future events

The Advanced Air-launched Anti-Armour Weapon (AAAW), known as Brimstone, is designed to reduce the fighting power of enemy armoured forces as early and as far forward as possible. It replaces the BL755 cluster bomb in the anti-armour role, and will be carried by Tornado GR4/4a, Harrier GR9 and Typhoon. These fixed-wing aircraft will complement the capability provided by the Apache AH64-D, which is armed with the Hellfire anti-armour weapon. Brimstone operates autonomously after launch, which helps reduce the hazard to the attacking aircraft from enemy fire. The longer reach and speed of deployment of fixed-wing aircraft mean that they can engage armour far beyond the battlefield area, and before it can join the contact battle.

Following an international competition a AAAW development and production contract was let in November 1996 to GEC-Marconi Radar and Defence Systems (later Alenia Marconi Systems, now MBDA) for the Brimstone system. The development phase is almost complete with only the remainder of the air trials firing programme to be finished. Due to delays in the completion of this (now due in January 2004), the in-service date has slipped to April 2004.

1b. Associated projects

Critical to Achievement of ISD		Critical to Meet Initial Gate Requirement	
Project Title	Forecast ISD	Project Title	Forecast ISD
Tornado GR4/4a (Package 2)	2004	-	-

1c. Procurement strategy

Contractor(s)	Contract Scope	Contract Type	Procurement Route
MBDA. Prime Contractor	Development and Production	Firm price until December 1998, fixed price thereafter	International competition
Boeing North American Operations. Sub contractor	-	-	-

SECTION 2: PROJECT COSTS

2a. Performance against approved cost

£m (outturn prices)	Procurement Cost
Current Forecast Cost	988
Approved Cost at Main Gate	849
Variation	+139
In-year changes in 2002/2003[1]	+126

2b. Reasons for variation from approved cost

Factor	Increase £m	Decrease £m	Explanation
Technical Factors	119	10	Reassessment of Development activities (-£4m); reassessment of Tornado Integration Requirements (+£2m); and Harrier Integration Requirements (-£3m); reassessment of level of QinetiQ Support (-£3m). Non provision of GFE (ie (Tornado GR4) to contractor (+£9m). Increase in Tornado integration costs for 2002/03 (+£4m). Increase in Cost of Capital due to slippage in deliveries (MPR02 +£40m; MPR03 +£64m).
Changed Requirement	4	4	Reduction in launcher quantities and Service Weapon Test Sets (-£3m); deletion of Tornado Inboard Pylon (-£1m); additional requirements for Emulators (+£4m).
Changed Budgetary Priorities	53	49	Delay to ISD, milestone payment and Typhoon Integration (+£4m). Reduction of missile quantity by 25% (-£49m). Re-instatement of 25% missile reduction (+£49m).
Inflation	16		Difference between the inflation assumed at contract let and the GDP deflators from the time of approval (+£14m); difference between GDP and inflation on the main contract since placement (+£2m).

[1]The in-year change takes account of an adjustment to the Current Forecast Cost for MPR02, reflecting the availability of more accurate figures relating to deliveries and interest on capital.

Factor	Increase £m	Decrease £m	Explanation
Exchange Rate		6	Change in US Dollar exchange rate quoted in the contract (-£6m).
Accounting Adjustments and Re-definitions	19	3	Changes due to conversion of cash based approvals and contract details to resource basis (-£3m). Increase in Cost of Capital due to the inclusion of Harrier/Tornado costs (+£6m). Change to take account of an adjustment to the current forecast cost for MPR2001, reflecting the availability of more accurate data (+£13m).
Total	+211	-72	
Net Variation	+139		

2c. Expenditure to date

Expenditure to 31 March 2003 (£m)	524

2d. Years of peak procurement expenditure

2003/2004	2004/2005

2e. Unit production cost

Unit Production Cost (£m)[1]		Quantities Required	
at Main Gate	Current	at Main Gate	Current
***	***	***	***

SECTION 3: PROJECT TIMESCALE

3a. Definition of in-service date

ISD Definition:	Delivery of the first *** weapons and associated equipment to a front-line unit, and declaration that the unit is operational.

3b. Performance against approved in-service date

	Date
Current forecast ISD	April 2004
Approved ISD at Main Gate	September 2001
Variation (Months)	+31
In-year changes in 2002/2003	+18

[1] UPC is cost of 1 weapon, i.e. launcher plus 3 missiles.

3c. Reasons for variation from approved ISD

Factor	Increase (months)	Decrease (months)	Explanation
Changed Requirement	12		Equipment Capability Customer request to bring Brimstone ISD into line with that of Tornado GR4/4a (+12 months).
Technical Factors	6		Safety problems resulting from the "2nd Pass" issue (ie the risk of the missile falling back into the aircraft after launch) halted flying during its investigation (+6 months).
Contracting Process	1		Delay in letting contract with Alenia Marconi Systems as pricing negotiations took longer than anticipated (+1 month).
Change in associated Projects	12		Delay in provision of trials aircraft (ie Tornado GR4) (+12 months).
Total	+31		
Net Variation	+31		

3d. Cost resulting from ISD variation

Type of Cost/Saving	Cost £m	Saving £m	Explanation
Support costs of current equipment	-	-	-
Other	19	5	Support cost for Brimstone (-£5m). Additional costs to modify BL755 (+£11m). Urgent Operational Requirement for further modifications to BL755 (+£8m).
Total	+14		

3e. Operational impact of ISD variation

The ISD delay of 31 months results in the lack of a fully effective anti-armour capability and the run-on of RBL755 in the anti-armour role. However, 12 months of the delay were necessary to align Brimstone ISD with the availability of its Tornado GR4/4a platform.

SECTION 4: KEY USER REQUIREMENTS

4a. Performance against approved key user requirements

Serial	Key Requirement	Currently forecast to be met (Yes or No)
1	Carriage, launch and jettison from Tornado GR4/4a, Harrier GR9 and Typhoon.	Yes
2	Autonomous operation after launch.	Yes
3	Detection and attack of Main Battle Tanks, Armoured Personnel Carriers and Self Propelled Guns.	Yes
4	Kill probability as defined in System Requirement Specification (SRS).	Yes
5	Launch from high and low altitude.	Yes
6	Resistance to active and passive countermeasures.	Yes
7	Component lives as defined in SRS.	Yes
8	Compatibility with existing aircraft loads.	Yes
9	Reliability, Maintainability and Testability as SRS.	Yes
10	Minimum Through-life costs.	Yes
	Percentage currently forecast to be met	100%
	Change since previous MPR	None

4b. Reasons for variation against approved key requirements

Key Requirement	Factor	Explanation
-	-	-

SECTION 5: HISTORY UP TO MAIN GATE APPROVAL

5a. Description of the Assessment Phase

Approval was given for feasibility studies to be carried out in 1982. However, during Options for Change, programme funding was withdrawn while alternatives for a future anti-armour capability were considered. The project was reinstated in 1993 and the revised Staff Requirement, for an Advanced Air-launched Anti-armour Weapon (AAAW), was presented to the Equipment Approvals Committee (EAC) early in 1994.

In June 1994, the EAC gave approval for an Invitation to Tender (ITT) to be issued to industry for an AAAW. Following issue of the ITT in December 1994, proposals were received from GEC Marconi, Hunting Engineering, Texas Instruments, Thorn EMI and British Aerospace.

Following full technical and commercial assessment of the proposals a further tender round took place in January 1996. This concentrated on the commercial aspects of the bids in line with revised timescales and production quantity requirements.

The tender assessment was completed in February 1996 with the findings being presented to EAC. Brimstone was found to have superior relative performance by a comfortable margin and also provided the most cost-effective solution. In July 1996 the Secretary of State for Defence announced that GEC Marconi had won the AAAW competition with its Brimstone weapon, and would be awarded the contract to develop and produce the weapon system.

5b. Cost of the Assessment Phase

£m (outturn prices)	Assessment Phase cost	Proportion of total estimated procurement expenditure
Actual Cost	23	2.3%
Approved Cost at Initial Gate	20	2.0%
Variation	+3	

5c. Duration of Assessment Phase

	Date
Date of Main Gate Approval	March 1996
Target Date for Main Gate Approval at Initial Gate	-
Variation (Months)	-

5d. Cost boundaries at Initial Gate and Main Gate Approvals

£m (outturn prices)	Lowest	Most Likely	Highest
Cost of Demonstration and Manufacture Phase forecast at Main Gate	-	849	-
Cost of Demonstration and Manufacture Phase forecast at Initial Gate	-	-	-

5e. ISD boundaries at Initial Gate and Main Gate Approvals

	Earliest	Most Likely	Latest Acceptable
Forecast ISD at Main Gate	-	September 2001	-
Forecast ISD at Initial Gate	-	December 1991	-

POST-MAIN GATE PROJECT SUMMARY SHEET

AIRBORNE STAND-OFF RADAR (ASTOR)

Integrated Project Team Responsible:
Airborne Stand-Off Radar

SECTION 1: ABOUT THE PROJECT

1a. Project description, progress and key future events

ASTOR is a new capability, which will provide a long range all-weather theatre surveillance and target acquisition system, capable of detecting moving, fixed and static targets. It is designed to meet a joint Army and RAF requirement. The system comprises a fleet of air platforms, each with a radar sensor, and a number of ground stations.

Following a competition with Lockheed Martin and Northrop Grumman, Raytheon Systems Limited (RSL) was selected as the preferred bidder for ASTOR in June 1999. Contract award was achieved in December 1999. The Prime Contract with RSL is for the full development and production of 5 aircraft and 8 mobile and transportable ground stations. The contract also covers the provision of 10 years contractor logistic support, the costs of which are not reported below but amount to around £140m. Bombardier is the major sub-contractor providing the 5 Global Express aircraft.

The System Critical Design Review (CDR) took place in early October 2002 after a number of smaller CDRs were held to further decrease risk. System CDR closure was achieved in February 2003, thus completing the design stage for the ASTOR programme. The System CDR process confirmed that the In Service Date of September 2005 was still achievable and that the 10 Key Targets were still on course to be achieved.

The first aircraft and ground stations are due to be delivered in early 2005 with final deliveries being made in 2008.

1b. Associated projects

Critical to Achievement of ISD		Critical to Meet Initial Gate Requirement	
Project Title	Forecast ISD	Project Title	Forecast ISD
-	-	-	-

1c. Procurement strategy

Contractor(s)	Contract Scope	Contract Type	Procurement Route
Raytheon Systems Limited (Prime Contractor)	Full Development and Production	Firm	International Competition
Bombardier Aerospace (Sub-contractor)	Production	Firm	International Competition

SECTION 2: PROJECT COSTS

2a. Performance against approved cost

£m (outturn prices)	Procurement Cost
Current Forecast Cost	1002
Approved Cost at Main Gate	938
Variation	+64
In-year changes in 2002/2003	-11

2b. Reasons for variation from approved cost

Factor	Increase £m	Decrease £m	Explanation
Changed Requirement	12	17	Deletion of requirement to be fitted "for but not with" Air to Air Refuelling (-£12m), reduction in cost for government furnished equipment (-£5m), incorporation of a number of improvements primarily for improved biological chemical protection (+£8m) and Bowman derisk (+£1m) and the addition of UHF Satcom (+£3m).
Exchange Rate	78		Changes in £/$ exchange rates (+£78m).
Contracting Process	11	18	Delay in contract award and reduced costs during Best and Final offers and contract negotiation (-£16m); reassessment of project support costs (-£2m); requirement for additional Technical Documentation (+£9m) and additional costs associated with satellite communication and ground stations (+£2m).
Accounting Adjustments and Re-definitions		2	Derivation of the approved cost on a resource basis (-£2m).
Total	+101	-37	
Net Variation	+64		

2c. Expenditure to date

Expenditure to 31 March 2003 (£m)	527

2d. Years of peak procurement expenditure

2001/2002	2002/2003

2e. Unit production cost

Unit Production Cost (£m)		Quantities Required	
at Main Gate	Current	at Main Gate	Current
-	83.3	5 Aircraft	5 Aircraft
-	15.2	8 Ground Stations	8 Ground Stations

SECTION 3: PROJECT TIMESCALE

3a. Definition of in-service date

ISD Definition:	2 aircraft and 2 ground stations accepted into service and supported by the provision of an adequate logistic and training support.

3b. Performance against approved in-service date

	Date
Current forecast ISD	September 2005
Approved ISD at Main Gate	September 2005
Variation (Months)	0
In-year changes in 2002/2003	0

3c. Reasons for variation from approved ISD

Factor	Increase (months)	Decrease (months)	Explanation
-	-	-	-
Total	-	-	
Net Variation	-	-	

3d. Cost resulting from ISD variation

Type of Cost/Saving	Cost £m	Saving £m	Explanation
Support costs of current equipment	-	-	-
Other	-	-	-
Total	-	-	

3e. Operational impact of ISD variation

-

SECTION 4: KEY USER REQUIREMENTS

4a. Performance against approved key user requirements

Serial	Key Requirement	Currently forecast to be met (Yes or No)
1	Endurance Minimum of ***x hrs***, within which ***x hrs*** at best endurance speed above ***x ft*** above mean sea level. ***x hrs*** at best cruise height and speed.	Yes
2	Altitude and Range : ***x ft*** and ***xkm***[3]	Yes
3	Ground Station Transportability : C130J	Yes
4	Ground Station Responsiveness : Pre-planned tasks within ***x hrs*** of sortie closure	Yes
5	Radar Range : Radar Range bracket ***xkm*** (Min far range - ***xkm*** (Max near radar range)	Yes
6	Air Platform Reaction Time : Turnaround > ***x hrs***	Yes
7	Air Segment Battlefield Mission : ***Moving Target Indicator scan rate x per min***	Yes
8	Air Segment Battlefield Mission (1): ***x Synthetic Aperture Radar Spot xkms***[4]	Yes
9	Air Segment Battlefield Mission (2): ***x Swathe Images*** per mission	Yes
10	Ground Segment Battlefield Mission: ***x days crisis and x days war***	Yes
	Percentage currently forecast to be met	100%
	Change since previous MPR	None

4b. Reasons for variation against approved key requirements

Key Requirement	Factor	Explanation
-	-	-

SECTION 5: HISTORY UP TO MAIN GATE APPROVAL

5a. Description of the Assessment Phase

In 1989 a technology demonstration programme (TDP) worth £12m (at 99/00) prices was agreed with MOD Research Establishments which are now incorporated in QinetiQ (formerly the Defence Evaluation Research Agency). This intramural work ran for two years and demonstrated that the concepts used in ASTOR were practicable. A move into Project definition (PD) was approved in September 1993. This is now deemed to be the equivalent of Initial Gate.

Following open competition, two parallel contracts for an 18 month PD programme were let in February 1995. After assessment of the PD proposals it was considered that the optimum solution would be to invite the two PD consortia to submit Best and Final Offers (BAFOs) for the Development, Production and In-Service Support. This revised Procurement Strategy was approved by the then Minister for Defence Procurement in March 1997.

During the preparation of invitations to the two PD consortia to submit BAFOs in September 1997 programming decisions were taken which delayed the availability of funding, particularly in the early years, and the In Service Date for the ASTOR capability was delayed by 15 months. During the BAFO phase, a decision was taken to consider a third bid based upon the US Joint Surveillance Target Attack radar system (JSTARS) upgrade programme, the Radar Technology Insertion programme (RTIP). As a result various unsolicited revisions to the bids were received during the assessment process, further delaying the In Service Date by 14 months. Approval for the implementation phase was given after down selection in June 1999.

5b. Cost of the Assessment Phase

£m (outturn prices)	**Assessment Phase cost**	**Proportion of total estimated procurement expenditure**
Actual Cost	13	1.3%
Approved Cost at Initial Gate	12	1.2%
Variation	+1	

5c. Duration of Assessment Phase

	Date
Date of Main Gate Approval	June 1999
Target Date for Main Gate Approval at Initial Gate	March 1998
Variation (Months)	+15

5d. Cost boundaries at Initial Gate and Main Gate Approvals

£m (outturn prices)	**Lowest**	**Most Likely**	**Highest**
Cost of Demonstration and Manufacture Phase forecast at Main Gate	-	938	-
Cost of Demonstration and Manufacture Phase forecast at Initial Gate	-	-	-

5e. ISD boundaries at Initial Gate and Main Gate Approvals

	Earliest	**Most Likely**	**Latest Acceptable**
Forecast ISD at Main Gate	-	June 2005	September 2005
Forecast ISD at Initial Gate	-	April 2003	-

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POST-MAIN GATE PROJECT SUMMARY SHEET

ASTUTE CLASS SUBMARINE (ASM)

Integrated Project Team Responsible:
Attack Submarines

SECTION 1: ABOUT THE PROJECT

1a. Project description, progress and key future events

The Astute Class of attack submarines is the replacement for the existing Swiftsure and Trafalgar Classes of nuclear attack submarines. The required capability places greater emphasis on land attack, intelligence gathering and special forces operations. GEC-Marconi (now BAE SYSTEMS Electronics Ltd-Astute Class Project) was identified as MOD's preferred bidder in December 1995. Following protracted negotiations a prime contract was placed on 17 March 1997 for the design, build and in service support of the first 3 of the Class.

Following BAE SYSTEM's disclosure during 2002 of significant delay and projected cost overrun on the Astute programme, the Department entered into discussions with the company about arrangements to address those difficulties. In parallel, the Department also commenced interdepartmental consideration about the extent to which the MoD would contribute to the resolution of the difficulties. An Agreement between the Department and BAE SYSTEMS was reached on 19 February 2003 which reduces risk (for example by separating the design, development, build and acceptance of the First of Class from the production of the second and third submarines), and places new incentives on the company to perform. Subject to final negotiations, the Department has agreed to increase its cash funding for Astute by around £430 million, against an increased contribution by the company of £250 million. The Department's contribution is in recognition of the greater than expected difficulty in applying Computer Aided Design (CAD) techniques to UK submarines.

The Department's risk assessment shows a most likely ISD of January 2009 but this does not reflect opportunities to improve the programme which could bring this date forward by some months; BAE Systems are working towards an ISD of May 2008. The programme is subject to review and re-approval by Ministers later this year.

1b. Associated projects

Critical to Achievement of ISD		Critical to Meet Initial Gate Requirement	
Project Title	Forecast ISD	Project Title	Forecast ISD
S&T Update Final Phase	2004	-	-
Astute Class Training Service (ACTS)	2007*	-	-

* Date subject to re-approval within Attack Submarines submission June 2003

1c. Procurement strategy

Contractor(s)	Contract Scope	Contract Type	Procurement Route
BAE SYSTEMS Electronics Ltd-Astute Class Project formerly BAE SYSTEMS Astute Class Ltd (BACL)	Full development, production and initial support	Fixed price plus incentive fee with a maximum price	UK Competition

SECTION 2: PROJECT COSTS

2a. Performance against approved cost

£m (outturn prices)	Procurement Cost
Current Forecast Cost	3710
Approved Cost at Main Gate	2726
Variation	+984
In-year changes in 2002/2003	+1003

2b. Reasons for variation from approved cost

Factor	Increase £m	Decrease £m	Explanation
Technical Factors	784	16	Reassessment of risk (+£51m). Reduction in risk on Sonar 2076 programme (-£16m) Re-costing of land attack missile interface & integration (+£5m). Re-costing of External communications (+£5m). Increase in overall BAES 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).
Contracting Process	55		Planned Contract Amendments (+£55m).
Changed Requirement	257		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 2nd Buy which has been brought forward into the 1st Buy (+£225m).
Inflation	40		Variation between anticipated rates for GDP and VOP on contract (sunk costs only) (+£14m), Correction of previous VOP calculation – incorrect split between labour and materials (+£26m).

Accounting Adjustments and Re-definitions		136	Decrease reflects difference between anticipated resource profile at approval and current profile (EP2001) (-£74m), removal of ACTS costs that have been incorrectly included in previous MPRs – training not part of original Astute MG Approval (-£62m).
Total	+1136	-152	
Net Variation	+984		

2c. Expenditure to date

Expenditure to 31 March 2003 (£m)	1159

2d. Years of peak procurement expenditure

2001/2002	2003/2004

2e. Unit production cost

Unit Production Cost (£m)		**Quantities Required**	
at Main Gate	Current	At Main Gate	Current
-	-	3	3

SECTION 3: PROJECT TIMESCALE

3a. Definition of in-service date

ISD Definition:	Stage 1 acceptance from the contractor (safe operation and start of operational work up).

3b. Performance against approved in-service date

	Date
Current forecast ISD	January 2009
Approved ISD at Main Gate	June 2005
Variation (Months)	+43
In-year changes in 2002/2003	+43

3c. Reasons for variation from approved ISD

Factor	**Increase**	**Decrease**	**Explanation**
Technical Factors	43		Exceptional difficulties arose with the introduction of a computer aided design (CAD) system, the availability of trained staff and project management (+43 months).
Total	+43	-	
Net Variation	+43	-	

3d. Cost resulting from ISD variation

Type of Cost/Saving	Cost £m	Saving £m	Explanation
Support costs of current equipment	-	-	The effect on existing SSN support costs resulting from the Astute delay is being investigated.
Other	-	-	The effect on existing SSN re-fit costs resulting from the delay is being investigated.
Total	-	-	

3e. Operational impact of ISD variation

The Astute delay will result in delayed introduction of improved capability over current classes; such as improved detection and counter-detection, greater weapon load and increased availability. Also, the Royal Navy is reviewing its plans for meeting the operational requirements of the SSN flotilla in light of the delays to the delivery of the Astute Class.

SECTION 4: KEY USER REQUIREMENTS

4a. Performance against approved key user requirements

Serial	Key Requirement	Currently Forecast to be met (Yes or No)
1	Weapon system effectiveness	Yes
2	Sonar performance	Yes
3	Hull strength (survivability)	Yes
4	Top speed	Yes
5	Endurance	Yes
6	Acoustic signature	Yes
7	Complement	Yes
8	Land attack capability	Yes
9	Special forces capability	Yes
	Percentage currently forecast to be met	100%
	Change since previous MPR	None

4b. Reasons for variation against approved key requirements

Key Requirement	Factor	Explanation
-	-	-

SECTION 5: HISTORY UP TO MAIN GATE APPROVAL

5a. Description of the assessment phase

The Astute Class of submarines is the planned replacement for the Swiftsure & Trafalgar Class SSNs. In June 1991, (equivalent of Initial Gate) approval was given to proceed with a programme of studies at an estimated cost of £6m (91/92 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 SSNs and a further approval of £2m (92/93 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 £23.5m (at 93/94 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 work were awarded to both bidders, GEC Marconi and Vickers Shipbuilding and Engineering Ltd. The successful outcome of these studies led to EAC approval (the equivalent of Main Gate) in March 1997 to place a contract for the design, build and initial support of 3 Astute Class submarines with GEC Marconi, now BAE SYSTEMS.

5b. Cost of the assessment phase

£m	Assessment Phase cost	Proportion of total estimated procurement expenditure
Actual Cost	29	1%
Approved Cost at Initial Gate	33	1%
Variation	-4	

5c. Duration of assessment phase

	Date
Date of Main Gate Approval	March 1997
Target Date for Main Gate Approval	-
Variation (Months)	-

5d. Cost boundaries at Initial Gate and Main Gate Approvals

£m (outturn prices)	Lowest	Most Likely	Highest
Cost of Demonstration and Manufacture Phase forecast at Main Gate	2570	2727	2887
Cost of Demonstration and Manufacture Phase forecast at Initial Gate	-	-	-

5e.ISD boundaries at Initial Gate and Main Gate Approvals

	Earliest	Most Likely	Latest Acceptable
Forecast ISD at Main Gate	-	June 2005	-
Forecast ISD at Initial Gate	-	December 2001	-

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POST-MAIN GATE PROJECT SUMMARY SHEET

ATTACK HELICOPTER WAH 64 APACHE

Integrated Project Team Responsible:
Attack Helicopter

SECTION 1: ABOUT THE PROJECT

1a. **Project description, progress and key future events**

WAH-64 Apache Attack Helicopter (AH), a version of the US Army AH-64D, will replace the ageing Lynx Mk7 system in the anti-armour role. It is equipped with Rolls Royce Turbomeca RTM 322 engines, the Longbow Fire Control Radar, Semi-Active Laser and Radio Frequency versions of the Hellfire missile, CRV-7 (Canadian Rocket Vehicle-7) ground suppression rockets, and 30mm cannon.

The procurement strategy was based on an off-the-shelf buy of the complete weapons systems through a Prime Contractor. Following an international competition, a Prime Contract for the supply of 67 WAH-64s and the integration of its complete weapons systems was placed with GKN-Westland Helicopters Ltd. (now Westland Helicopters Ltd.) of Yeovil in March 1996. The project is in the production phase. Boeing is the major sub-contractor. A separate contract for the procurement of munitions stocks was placed with Hunting Engineering Ltd. (now Insys) in March 1996. Equipments to meet key user requirements were added to the Prime Contract in 1999 (i.e. Health and Usage Monitoring System and Communications upgrade).

The first aircraft was delivered in April 2000. The In Service Date (ISD) was achieved in January 2001, two weeks later than contracted. Delivery of the final aircraft is scheduled for April 2004, some four months later than expected, due to delays in fitting the upgraded Defensive Aids Suite. Training on the Full Mission Simulator began in January 2001 and Field Deployable Simulators were cleared for use in December 2002. All Apache munitions, CRV7 rockets and Hellfire missiles have been delivered.

The Snow Flight Trials were completed in April 2003 and the results are currently being assessed. Ship Operating Limits (SHOL) trials are due to take place on HMS Ocean in March 2004. Military Aircraft Release (MAR) 5 - giving full clearance of the aircraft for training purposes - was achieved in May 2003, MAR6 (giving weapons clearance for operational use) is scheduled for August 2003, and Initial Operating Capability is forecast to be achieved in August 2004 with a Full Operating Capability being provided to the Lead Aviation Task Force in February 2005.

1b. Associated projects

Critical to Achievement of ISD		Critical to Meet Initial Gate Requirement	
Project Title	Forecast ISD	Project Title	Forecast ISD
*	-	-	-

1c. Procurement strategy

Contractor(s)	Contract Scope	Contract Type	Procurement Route
Westland Helicopters Ltd. (formerly GKN Westland Helicopters Ltd).	Prime Contractor for aircraft production and weapon system integration	Fixed price	International competition
Boeing, USA	Sub-contractor	Fixed price	Sub-contractor

SECTION 2: PROJECT COSTS

2a. Performance against approved cost

£m (outturn prices)	Procurement Cost
Current Forecast Cost	3168
Approved Cost at Main Gate	2997
Variation	+171
In-year changes in 2002/2003†	+33

2b. Reasons for variation from approved cost

Factor	Increase £m	Decrease £m	Explanation
Changed Requirement	166	137	Reduction of air-to-air missile quantity (-£4m); deletion of funding for US Helmet solution (-£44m); deletion of M36 training round (-£8m); de-scoping of helmet requirement (-£9m); deletion of funding for generic air-to-air missile (-£72m). Extra funding for Defensive Aids Suite (+£12m); Interest on Capital on revised deliveries (+£62m); incorporation of Health & Usage Monitoring System (+£35m). Introduction of enhancements to Radar Frequency Interferometer (RFI), increased helmet range & scale, and Ground Support System link to Ptarmigan (+£4m). Introduction of Voice and Data Recorders on aircraft 1-29 (+£3m); Inclusion of HIDAS Chaff &

* The 30-year AH PFI Training service was reported in MPR 2000 as being Critical to Achievement of ISD. However, the AH ISD was declared without the PFI Training package ISD being met. This was achieved in April 2003 when the Wide Area Network (WAN) came into use. In parallel with the development of the PFI Training package, a total of some 16 aircrew have been qualified to fly the WAH-64, having been trained to fly the Apache in the USA.

† The In-year change takes account of an adjustment to the current forecast cost in MPR2002. This adjustment reflects the availability of more accurate figures. The actual amount approved to be spent on the project has not changed.

Factor	Increase £m	Decrease £m	Explanation
			Flare (+£3m); additional GFE (+£39m); Munitions Life Surveillance Assessment (+£5m); Hellfire Sensitivity Mitigation Activity (+£3m).
Changed Budgetary Priorities	185	73	Increased estimate to incorporate necessary Communications upgrade (+£31m); inclusion of funding for Low Height Warning System (+£9m), for Ordnance Board approval of munitions (+£10m), for Static Code Analysis of software (+£8m), for Arc radios (+£4m), for configuration changes (+£7m). Reassessment of costs for Foreign Military Sales cases (+£6m), for Bowman integration study (+£1m), for support to missile trials (-£1m) and for Defence Evaluation Research Agency (DERA) and Communications Electronics Security Group (CESG) support (+£26m). Reduction in VAT applicability on Prime Contract (-£60m). Increased costs for the Helicopter Integrated Defensive Aids Suite (HIDAS)(+£22m); for Hellfire missiles (+£1m). Increased cost of Ship Helicopter Operating Limits (SHOL) trial (+£29m). Increased cost for Programme option (+£5m). Additional Testing & Instrumentation (+£4m). Additional miscellaneous equipment costs (+£1m). Additional Aircrew equipment and armaments (+£3m); Re-evaluation of contractor intangible development work (-£9m); Increased costs for Hellfire mitigation programme (+£18m); reduced costs for Low Height Warning System (LHWS) & Voice And Data recorders (VADR) (-£3m).
Inflation	5		Changes in Variation of Price compared with GDP Deflator (+£5m).
Exchange Rate	24	35	Movement in French Franc ER on Prime Contract compared with the rate assumed at contract (+£1m); Movement in US Exchange Rate (ER) for sunk costs on Prime Contract compared with the rate assumed at contract award (-£35m); Movement in US Exchange Rate (ER) Prime contract costs compared with the rate assumed at contract award (+£23m).
Contracting Process	14		Outcome of tendering and contractual negotiations (+£14m).
Procurement Strategy		7	Reduction in Prime Contract Cost due to greater use of firm pricing (-£7m).

Factor	Increase £m	Decrease £m	Explanation
Accounting Adjustments and Re-definitions	29		Inclusion of DERA / CESG costs disaggregated since approval (+£23m). Derivation of the approved cost on a resource basis (+£6m).
Total	+423	-252	
Net Variation	+171		

2c. Expenditure to date

Expenditure to 31 March 2003 (£m)	3000

2d. Years of peak procurement expenditure

2000/2001	2001/2002

2e. Unit production cost

Unit Production Cost (£m)		Quantities Required	
at Main Gate	Current	At Main Gate	Current
27.5	28.2	67	67

SECTION 3: PROJECT TIMESCALE

3a. Definition of in-service date

ISD Definition:	Delivery of the first 9 production standard WAH-64s.

3b. Performance against approved in-service date

	Date
Current forecast ISD	January 2001
Approved ISD at Main Gate	December 1999
Variation (Months)	+13
In-year changes in 2002/2003	0

3c. Reasons for variation from approved ISD

Factor	Increase	Decrease	Explanation
Technical Factors	1		ISD declaration delayed 16 days to establish special procedures relating to the use of Technical Publications (+1 month).
Changed Requirement	6		Reflects the selection of a different engine (RTM322) (+6 months).
Changed Budgetary Priorities	12		Programme slipped by 12 months in order to match the programme to the available Departmental resources (+12 months).
Total	+13*		
Net Variation	+13		

* The 6 month slip acted concurrently with the 12 month slip

3d. Cost resulting from ISD variation

Type of Cost/Saving	Cost £m	Saving £m	Explanation
Support costs of current equipment	47		Costs of running on Lynx Mk7 and TOW missile during the period of AH ISD slippage (+£47m).
Other		45	Apache support costs not expended due to AH ISD slippage (-£45m).
Total	+2		

3e. Operational impact of ISD variation

The slip in WAH-64 ISD results in a requirement to extend the service of current Army aircraft: i.e. the Lynx, with its TOW (Tube-launched, Optically-tracked, Wire Guided) missile, for anti-armour, and Gazelle for reconnaissance and observation. However, whilst ISD is a key milestone for the Defence Procurement Agency (DPA), it is the Army's own Initial Operational Capability Date, currently planned for August 2004, which is on the critical path to achieving the "End State" delivery of the UK Lead Aviation Task Force availability date by February 2005. This remains achievable.

SECTION 4: KEY USER REQUIREMENTS

4a. Performance against approved key user requirements

Serial	Key Requirement	Currently Forecast to be met (Yes or No)
1	Lethality	Yes
2	Survivability	Yes
3	Payload/Range - Anti-Armour Mission	Yes
4	Payload/Range - Ferry Mission (Internal Fuel)	Yes
5	Payload/Range - Ferry Mission (Internal and External Fuel)	Yes
6	Mission Management	Yes
7	Night/Adverse Weather Operations	Yes
8	Supportability (Attributable Fault Rate)	Yes
9	Supportability (Mission Failure Rate)	Yes
10	Supportability (Maintenance Man Hours/Flying Hour)	Yes
11	Supportability (Time to Rectify Faults)	Yes
	Percentage currently forecast to be met	100 %
	Change since previous MPR	None

4b. Reasons for variation against approved key requirements

Key Requirement	Factor	Explanation
-	-	-

SECTION 5: HISTORY UP TO MAIN GATE APPROVAL

5a. Description of the assessment phase

The Attack Helicopter requirement was endorsed as a Cardinal Point Staff Target in June 1991 and called for a competitive Commercial Off-The-Shelf procurement. Six companies submitted bids in 1993 in response to an Invitation To Tender but only three were invited to submit Definitive Bids in 1995. Bids were assessed against four main criteria: operational effectiveness, life cycle costs, risk and industrial participation.

The supportability of each complete helicopter package proposed was evaluated within an Integrated Logistic Support approach to supportability, which included a training needs analysis and full evaluation of the training systems offered. The competition recommended to Ministers the selection of Apache to fulfil our AH requirement.

The variation of £3m between the approved cost at Staff Target (Initial Gate equivalent) and actual cost reflects spend on DERA paid by the project after Initial Gate approval.

5b. Cost of the assessment phase

£m	Assessment Phase cost	Proportion of total estimated procurement expenditure
Actual Cost	6	0.2%
Approved Cost at Initial Gate	3	0.1%
Variation	+3	

5c. Duration of assessment phase

	Date
Date of Main Gate Approval	July 1995
Target Date for Main Gate Approval	-
Variation (Months)	-

5d. Cost boundaries at Initial Gate and Main Gate Approvals

£m (outturn prices)	Lowest	Most Likely	Highest
Cost of Demonstration and Manufacture Phase forecast at Main Gate	-	2997	-
Cost of Demonstration and Manufacture Phase forecast at Initial Gate	-	2751	-

5e. ISD boundaries at Initial Gate and Main Gate Approvals

	Earliest	Most Likely	Latest Acceptable
Forecast ISD at Main Gate	-	December 1999	-
Forecast ISD at Initial Gate	-	December 1997	-

POST-MAIN GATE PROJECT SUMMARY SHEET

BOWMAN

Integrated Project Team Responsible:
Bowman & Land Digitization

SECTION 1: ABOUT THE PROJECT

1a. Project description, progress and key future events

Bowman will provide the Armed Forces with a secure tactical data and voice communications system for all three Services in support of land, littoral (sea to shore) and air manoeuvre operations. It will replace the Clansman combat radio, in service since the mid 1970s and now becoming increasingly obsolete, and the Headquarters infrastructure element of the Ptarmigan trunk system.

In September 2001, following international competition, General Dynamics UK (GD UK) was selected as prime contractor for the Bowman Supply and Support contract and the company has conducted their own competition amongst sub-contractors. Bowman will be fielded in the following capability increments: Initial Operating Capability (IOC) in November 2003, In-Service Date (ISD) capability in March 2004, and Operational Readiness Date (ORD) capability. Land ORD capability is expected in June 2005, with Littoral ORD and Air Manoeuvre ORD planned for late 2005 and mid 2006 respectively.

Chief of Staff (Land) made the decision in December 2002 to commit the Army to convert to Bowman to meet the target ISD. The Initial Programme Review, Acceptance and Release Point 1, was approved by the capability customer on 14 March 2003. Both decisions were based on a review of all 6 Army lines of Development, including the Equipment Line of Development led by the Defence Procurement Agency. Technical trials started in March 2003 and, based on progress to date, Bowman remains on track to meet the target ISD in March 2004.

Acceptance and Release Point 2, which confirms the decision to start conversion of the 1st battalion, 1 Royal Anglian, is scheduled for 11 July 2003 and 1 Royal Anglian will be the exercising unit for the Battalion Operational Field Trial in November 2003. Conversion of 12 Mechanized Brigade, who will be the exercising unit for Brigade Operational Field Trials in March and November 2004, will follow this. The Land, Littoral and Air Manoeuvre ORDs currently remain on track.

1b. Associated projects

Critical to Achievement of ISD		Critical to Meet Initial Gate Requirement	
Project Title	Forecast ISD	Project Title	Forecast ISD
-	-	-	-

1c. Procurement strategy

Contractor(s)	Contract Scope	Contract Type	Procurement Route
General Dynamics (UK) Ltd (formerly Computing Devices Canada (CDC) Ltd)	Demonstration and Manufacture	Firm Price	International Competition

SECTION 2: PROJECT COSTS

2a. Performance against approved cost

£m (outturn prices)	Procurement Cost
Current Forecast Cost	2023
Approved Cost at Main Gate	2073
Variation	-50
In-year changes in 2002/2003	+30

2b. Reasons for variation from approved cost

Factor	Increase £m	Decrease £m	Explanation
Changed Requirement	71		Additional technical requirements not scoped as part of original supply and support contract (+£61m). Technical support requirements not originally included in Main Gate approval (+£10m).
Contracting Process	15		Revised prices for Selective Availability Anti Spoofing Modules (SASSM) (+£3m). Difference between approved D&M cost at Main Gate approval and contract price (+£12m).
Procurement Strategy	8		Contract incentivisation for achieving key events leading to ISD (+£8m).
Risk Differential		144	Difference between the risks allowed for in the most likely (50%) and highest acceptable (90%) estimates at Main Gate (-£144m).
Total	+94	-144	
Net Variation		-50	

2c. Expenditure to date

Expenditure to 31 March 2003 (£m)	384

2d. Years of peak procurement expenditure

2004/2005	2005/2006

2e. Unit production cost

Unit Production Cost (£m)		Quantities Required	
at Main Gate	Current	at Main Gate	Current
-	-	48000 radios of varying types	48000 radios of varying types

SECTION 3: PROJECT TIMESCALE

3a. Definition of in-service date

ISD Definition:	A Brigade Headquarters, two mechanized battalions and support troops capable of engaging in Operations Other Than War.

3b. Performance against approved in-service date

	Date
Current forecast ISD	March 2004
Approved ISD at Main Gate	December 2004
Variation (Months)	-9
In-year changes in 2002/2003	0

3c. Reasons for variation from approved ISD

Factor	Increase (months)	Decrease (months)	Explanation
Risk Differential		9	Difference between the risks allowed for in the most likely (50%) and highest acceptable (90%) estimates at Main Gate (-9 months).
Total		-9	
Net Variation		-9	

3d. Cost resulting from ISD variation

Type of Cost/Saving	Cost £m	Saving £m	Explanation
Support costs of current equipment	-	-	-
Other	-	-	-
Total	-	-	

3e. Operational impact of ISD variation

-

SECTION 4: KEY USER REQUIREMENTS

4a. Performance against approved key user requirements

Serial	Key Requirement	Currently forecast to be met (Yes or No)
1	Secure Voice.	Yes
2	Secure Data.	Yes
3	Automatic Position Location, Navigation and Reporting service (APLNR)	Yes
4	Security.	Yes
5	Ease of Use.	Yes
6	Automated Management. Provide automated system management enabling support to the full spectrum of operations.	Yes
7	Data Communications Infrastructure.	Yes
8	Common Operating Environment. Support the Common Infrastructure for Battlefield Information Systems concept and provide a common operating environment for Digitization Stage 2.	Yes
9	Battlefield Connectivity. Allow the free-flow of data and voice within and between vehicles, groups of stationary vehicles, and other systems.	Yes
10	Tactical Internet. Provide a secure and robust tactical internet service making efficient use of limited bandwidth.	Yes
11	Combat Environment. BOWMAN is to support current operational C2 doctrine, practice, deployment and battle procedure.	Yes
12	Interoperability. BOWMAN is to provide interfaces to other key battlefield communication systems used at the tactical level	Yes
13	Physical Environment. BOWMAN equipment is to meet a level of survivability consistent with its physical environment and mission criticality for 95% of users in 95% of likely climatic conditions.	Yes
14	Electronic Environment. Make effective, robust use of the Electro-Magnetic Spectrum without degrading other systems.	Yes
15	BOWMAN Platforms. BOWMAN is to provide working installations in all platforms designated as containing BOWMAN equipment, except for ships, WAH-64 and Lynx aircraft for which equipment is to be provided but not installed.	Yes
16	Health and Safety.	Yes
17	Supportability.	Yes
18	Training.	Yes
19	Equipment Scaling. BOWMAN is to supply sufficient scales of equipment and services to meet the needs of those forces taking part in or supporting land operations, as structures at EOS.	Yes
	Percentage currently forecast to be met	100%
	Change since previous MPR	None

4b. Reasons for variation against approved key requirements

Key Requirement	Factor	Explanation
-	-	-

SECTION 5: HISTORY UP TO MAIN GATE APPROVAL

5a. Description of the Assessment Phase

Bowman was first approved in 1988, when it was expected to have the equivalent of Main Gate in 1993 and ISD in 1995. After Feasibility Stage 1 in 1993 contracts were placed with two competing consortia for Feasibility Stage 2 (FS2) and Project Definition Stage 1.

FS2 indicated that the risk of procuring and integrating the Local Area Sub-system (LAS) would be best managed by placing the responsibility with the Bowman contractor. This change in procurement strategy was approved in 1997, along with Bowman Core Risk Reduction work.

In November 1996 the previous two consortia formed a joint venture company, Archer Communications Systems Ltd (ACSL) to submit a joint bid for Bowman. The Department approved a single source strategy for Bowman following a review of procurement options. A risk reduction contract was placed with ACSL in August 1997. ACSL received a further package of work in October 1998 worth £182m prior to production commitment at Main Gate, then planned for November 2000.

The Department rejected ACSL's bid in July 2000, removed their preferred supplier status and re-launched the competition, as it was not convinced ACSL could meet an early ISD. TRW Ltd, Computing Devices Canada Ltd (CDC), now General Dynamics UK Ltd, and Thales Defence Ltd competed for the contract, which was won by CDC in July 2001. EAC gave Main Gate approval in August 2001 and the Bowman Supply and Support contract was signed on 13 September 2001.

5b. Cost of the Assessment Phase

£m (outturn prices)	Assessment Phase cost	Proportion of total estimated procurement expenditure
Actual Cost	397	16.4%
Approved Cost at Initial Gate	130	5.9%
Variation	+267	

5c. Duration of Assessment Phase

	Date
Date of Main Gate Approval	August 2001
Target Date for Main Gate Approval (at IG)	December 1993
Variation (Months)	+92

5d. Cost boundaries at Initial Gate and Main Gate Approvals

£m (outturn prices)	Lowest	Most Likely	Highest
Cost of Demonstration and Manufacture Phase forecast at Main Gate	1904	1929	2073
Cost of Demonstration and Manufacture Phase forecast at Initial Gate	-	-	-

5e. ISD boundaries at Initial Gate and Main Gate Approvals

	Earliest	Most Likely	Latest Acceptable
Forecast ISD at Main Gate	February 2004	March 2004	December 2004
Forecast ISD at Initial Gate	-	December 1995	-

POST-MAIN GATE PROJECT SUMMARY SHEET

BEYOND VISUAL RANGE AIR - TO-AIR MISSILE (BVRAAM)

Integrated Project Team Responsible:
Beyond Visual Range Air to Air Missile

SECTION 1: ABOUT THE PROJECT

1a. Project description, progress and key future events

The Beyond Visual Range Air-to-Air Missile (BVRAAM) (also known as Meteor) will provide Typhoon with the capability to combat projected air-to-air threats and sustain air superiority throughout the life of the aircraft. The weapon is required to operate in all weather conditions and will complement Typhoon's Advanced Short Range Air-to-Air Missile (ASRAAM). Until Meteor enters service, Typhoon will be armed with the Advanced Medium Range Air-to-Air Missile (AMRAAM).

The key features of the requirement include stealthy launch, enhanced kinematics (giving increased stand-off and disengagement ranges, and a better ability to chase and destroy highly agile manoeuvring targets) and robust performance in countermeasures.

This is a collaborative programme with 5 other partner nations; Germany, Spain and Italy (for Typhoon), Sweden (for JAS 39 Gripen) and France (for Rafale). The Memorandum of Understanding was finalised by Germany's signature on 19 December 2002. This enabled the UK to place the demonstration, manufacture and support contract on behalf of the six nations with MBDA UK Ltd (formerly MBD(UK) Ltd) on 23 December 2002. The UK is presently the only nation to commit to production; the contract includes production options that can be exercised by partner nations during the demonstration programme.

1b. Associated projects

Critical to Achievement of ISD		Critical to Meet Initial Gate Requirement	
Project Title	Forecast ISD	Project Title	Forecast ISD
Typhoon	2003	-	-

1c. Procurement strategy

Contractor(s)	Contract Scope	Contract Type	Procurement Route
MBDA(UK) Ltd	Demonstration (all 6 nations) and Manufacture (UK only at present)	Firm Price up to June 2007 (Demonstration), Firm Price up to June 2006 (Manufacture), Fixed Price thereafter	International Competition

SECTION 2: PROJECT COSTS

2a. Performance against approved cost

£m (outturn prices)	Procurement Cost
Current Forecast Cost	1417
Approved Cost at Main Gate	1437
Variation	-20
In-year changes in 2002/2003	+20

2b. Reasons for variation from approved cost

Factor	Increase £m	Decrease £m	Explanation
Changed Requirement	10		UK share of additional common requirements (+£2m). Additional requirement for Dual Data Link (+£6m). Additional Containers required for Meteor (+£2m).
Changed Budgetary Priorities	83	16	Increases for Insensitive Munitions (+£9m), Missiles and Ancillary Equipment in Support of Typhoon Integration (+£6m), Surveillance and Life Extension (+£5m), Initial Spares (+£3m), Container Development (+£1m), Container Production (+£1m), Support to Typhoon Integration (+£2m), Revised deliveries of Meteor Missiles (+£12m), Contractor Logistics Support for Meteor (+£7m), Trial Ranges (+£11m), AMRAAM missiles (+£25m), Surveillance Spares for AMRAAM (+£1m). Decreases for Service Evaluation Trials for Meteor (-£7m), Integration of Meteor onto Typhoon (-£9m).
Contracting Process	6		UK's share of MBDA revalidation of prices caused by delay in contract placement (+£6m).
Procurement Strategy	116	95	Additional funding required for integration of AMRAAM AIM 120C onto Typhoon (+£82m), Gripen Trial (+£2m). Realism measure on funding for integration of AMRAAM AIM 120C onto Typhoon (-£65m) Decrease in UK's share of Development as other nations joined/rejoined the programme (-£30m). Increases for UK's share of development through transfer of workshare from Germany (+£31m) and UK share of GFE (+£1m).
Accounting Adjustments and Re-definitions	9	4	Change in assumptions in regard to recovery of VAT (+£9m). Derivation of approved cost on a resource basis (-£4m).
Risk Differential		129	Difference between the risk allowed for in

Factor	Increase £m	Decrease £m	Explanation
			the most likely (50%) and highest acceptance (90%) estimates at Main Gate (-£129m).
Total	+224	-244	
Net Variation		-20	

2c. Expenditure to date

Expenditure to 31 March 2003 (£m)	82.9

2d. Years of peak procurement expenditure

2009/2010	2012/2013

2e. Unit production cost*

Unit Production Cost (£m)		Quantities Required	
at Main Gate	Current	At Main Gate	Current
1.2	1.0	***	***

SECTION 3: PROJECT TIMESCALE

3a. Definition of in-service date

ISD Definition:	Achievement of an operational capability with *** missiles and supporting infrastructure.

3b. Performance against approved in-service date†

	Date
Current forecast ISD	August 2012
Approved ISD at Main Gate	August 2012
Variation (Months)	0
In-year changes in 2002/2003	+2

3c. Reasons for variation from approved ISD

Factor	Increase	Decrease	Explanation
Contracting Process	11		Slippage caused by delays in placing contract (+11 months).
Risk Differential		11	Difference between the risk allowed for in the most likely (50%) and highest acceptance (90%) estimates at Main Gate (-11 months).
Total	+11	-11	

* UPC covers Meteor missile only.

† ISD shown is for Meteor only.

Net Variation		0

3d. Cost resulting from ISD variation

Type of Cost/Saving	Cost £m	Saving £m	Explanation
Support costs of current equipment	-	-	-
Other	-	-	-
Total	-	-	

3e. Operational impact of ISD variation

-

SECTION 4: KEY USER REQUIREMENTS[*]

4a. Performance against approved key user requirements

Serial	Key Requirement	Currently Forecast to be met (Yes or No)
1	Multiple Target Capability	Yes
2	Kill Probability	Yes
3	Enhanced Typhoon Survivability	Yes
4	Typhoon Compatibility	Yes
5	Minimum Air Carriage Life	Yes
6	Reliability	Yes
7	Support	Yes
	Percentage currently forecast to be met	100 %
	Change since previous MPR	None

4b. Reasons for variation against approved key requirements

Key Requirement	Factor	Explanation
-	-	-

[*] KURs are for Meteor only.

SECTION 5: HISTORY UP TO MAIN GATE APPROVAL

5a. Description of the assessment phase

On 2 October 1995, Minister (Defence Procurement) gave approval for the issue of an Invitation to Tender (ITT) for BVRAAM. The ITT was issued on 5 December 1995. Two bids were received; one from a consortium led by Matra BAe Dynamics (MBD) UK Ltd, and one from Raytheon Systems Ltd. After extensive analysis, it was decided that both bids contained areas of risk that needed to be addressed before a development and production contract could be placed. In May 1997, a Project Definition & Risk Reduction (PDRR) phase was approved and contracts were placed on both bidders for a period of one year with the results to be technically and operationally assessed before a final decision was made. Both PDRR contracts were let in August 1997 and revised bids were received in May 1998.

Due to the complexity of the BVRAAM assessment, the need to accommodate the requirements of the Prospective Partner Nations and the need to go for Best And Final Offers (BAFOs) primarily as a result of the French request to join the programme, Main Gate Approval was not achieved until May 2000. In his statement to the House of Commons on 16 May 2000, Secretary of State announced that MBD's Meteor missile had been selected.

5b. Cost of the assessment phase

£m	Assessment Phase cost	Proportion of total estimated procurement expenditure
Actual Cost	20	1%
Approved Cost at Initial Gate	14	1%
Variation	+6	

5c. Duration of assessment phase

	Date
Date of Main Gate Approval	May 2000
Target Date for Main Gate Approval	March 1997
Variation (Months)	+38

5d. Cost boundaries at Initial Gate and Main Gate Approvals

£m (outturn prices)	Lowest	Most Likely	Highest
Cost of Demonstration and Manufacture Phase forecast at Main Gate	1264	1308	1437
Cost of Demonstration and Manufacture Phase forecast at Initial Gate	-	1264	-

5e.ISD boundaries at Initial Gate and Main Gate Approvals

	Earliest	Most Likely	Latest Acceptable
Forecast ISD at Main Gate	June 2010	September 2011	August 2012
Forecast ISD at Initial Gate	-	March 2005	-

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POST-MAIN GATE PROJECT SUMMARY SHEET

C-17 (FORMERLY SHORT TERM STRATEGIC AIRLIFT)

Integrated Project Team Responsible:
C-17

SECTION 1: ABOUT THE PROJECT

1a. Project description, progress and key future events

The 1998 Strategic Defence Review identified an urgent need to improve the RAF's strategic airlift capability and concluded that, in the short term, pending the introduction of Future Transport Aircraft, MOD should acquire a capability equivalent to four Boeing C-17 aircraft.

Following a competitive process, the decision was taken to lease four C-17 aircraft from Boeing to fulfil this capability. The lease signed on 2nd September 2000 is for a period of seven years, with the option of extending for up to a further two years.

Whilst the four C-17 aircraft are leased directly from Boeing, much of the support is being provided under US Government Foreign Military Sales (FMS) arrangements through the United States Air Force (USAF)/Boeing Flexible Sustainment contract.

The in-service date was declared on 30th September 2001, and the aircraft are operated by 99 Squadron at RAF Brize Norton and have flown in support of operations in Afghanistan and Iraq.

1b. Associated projects

Critical to Achievement of ISD		Critical to Meet Initial Gate Requirement	
Project Title	Forecast ISD	Project Title	Forecast ISD
-	-	-	-

1c. Procurement strategy

Contractor(s)	Contract Scope	Contract Type	Procurement Route
McDonnell Douglas Corporation (A wholly owned subsidiary of the Boeing company)	Lease of four C-17 aircraft	Firm price	International competition
United States Department of Defense (US DoD) – United States Air Force (USAF)	Provision of support services for 4 x C-17 aircraft	Foreign Military Sales (FMS)	FMS

SECTION 2: PROJECT COSTS

2a. Performance against approved cost

£m (outturn prices)	Procurement Cost
Current Forecast Cost	775
Approved Cost at Main Gate	785
Variation	-10
In-year changes in 2002/2003	+4

2b. Reasons for variation from approved cost

Factor	Increase £m	Decrease £m	Explanation
Changed Requirement	4		Overfly during operations (+£3m) and Urgent Operational Requirements (UORs) (+£1m) – funded by Conflict Prevention Fund.
Exchange Rate	25		Change in $/£ rate for FMS (+£25m).
Contracting Process	30	2	Formal FMS offer compared with estimate at time of approval (+£17m). Contracted price for Cargo Bay Mock-up compared with estimate (-£2m). Contracted price of lease compared with estimate at time of approval (+£13m).
Procurement Strategy		25	Military Aircraft Release achieved using existing US Release (-£25m).
Accounting Adjustments and Re-definitions		3	Exported costs to Strike Command for Building Work at Operating Base (-£3m).
Risk Differential		39	Difference between the risk allowed for in the most likely (50%) and highest acceptable (90%) estimates at Main Gate (-£39m).
Total	+59	-69	
Net Variation		-10	

2c. Expenditure to date

Expenditure to 31 March 2003 (£m)	192

2d. Years of peak procurement expenditure

2002/2003	2003/2004

2e. Unit production cost

Unit Production Cost (£m)		Quantities Required	
at Main Gate	Current	at Main Gate	Current
-	-	4	4

SECTION 3: PROJECT TIMESCALE

3a. Definition of in-service date

ISD Definition:	The availability of 2 aircraft, which are operated and maintained by appropriately trained and experienced RAF Personnel within Military Aircraft Release.

3b. Performance against approved in-service date

	Date
Current forecast ISD	September 2001
Approved ISD at Main Gate	December 2001
Variation (Months)	-3
In-year changes in 2002/2003	0

3c. Reasons for variation from approved ISD

Factor	**Increase (months)**	**Decrease (months)**	**Explanation**
Risk Differential		3	Difference between the risk allowed for in the most likely (50%) and highest acceptable (90%) estimates at Main Gate (-3 months).
Total		-3	
Net Variation		-3	

3d. Cost resulting from ISD variation

Type of Cost/Saving	**Cost £m**	**Saving £m**	**Explanation**
Support costs of current equipment	-	-	-
Other	-	-	-
Total	-	-	

3e. Operational impact of ISD variation

-

SECTION 4: KEY USER REQUIREMENTS

4a. Performance against approved key user requirements

Serial	Key Requirement	Currently forecast to be met (Yes or No)
1	Deployment Capability: The STSA fleet must be capable of the deployment of 1,400 tonnes of freight over 3,200 nms in a 7 day period.	Yes
2	Payload Requirements: STSA must be capable of carrying a payload of 32,000 kg.	Yes
3	Environmental Conditions: STSA is to be capable of operating in temperatures which equate to sea level figures -40 to +49 deg C	Yes
4	Airfield Operations: STSA is to be capable of landing on airfields with paved surfaces of a minimum length of 4,000 ft.	Yes
5	Navigation: STSA is to be capable of world-wide navigation.	Yes
6	Communications: STSA is to meet current interoperability requirements for communications.	Yes
	Percentage currently forecast to be met	100%
	Change since previous MPR	None

Note: With the aircraft in service, all Key User Requirements have been met.

4b. Reasons for variation against approved key requirements

Key Requirement	Factor	Explanation
-	-	-

SECTION 5: HISTORY UP TO MAIN GATE APPROVAL

5a. Description of the Assessment Phase

An invitation to tender was issued on 30 September 1998 to eight potential bidders for open competition at prime contractor level. The deadline for tenders was the same as that for the four-nation collaborative competition to identify the solution for the FTA requirement (now, A400M). The two competitions were linked and assessed in parallel, both to consider the most cost-effective solution overall and to ensure that the solution chosen for STSA did not prejudice the FTA competition.

In January 1999 five STSA bids were received: from Boeing (C-17), Air Foyle (Antonov An124-210), IBP (Antonov An124-100), Airbus Transport International (Beluga and a mix of A300 freighters), and Rolls Royce offering fleet management service of MOD-acquired assets. The competition was terminated in August 1999, because none of the bids offered an acceptable combination of capability and cost.

The DPA continued to work with industry in a competitive environment to seek an off the shelf solution to meet the requirement. This work culminated in a request for Proposals being issued in October 1999. Three proposals were received: Boeing (C-17), Air Foyle (Antonov AN124-100), and Heavylift (Antonov An124-100). The final main gate submission went to the EAC in February 2000.

These proposals, together with those received in response to the FTA competition, received equally careful consideration against the criteria of operational capability, performance, affordability, international and industrial factors and value for money. The Secretary of State for Defence announced on 16 May 2000 that the UK had determined that the best solution to meet the long-term FTA requirement was the Airbus A400M, with the short-term requirement met by the lease of four C-17 aircraft.

5b. Cost of the Assessment Phase

£m (outturn prices)	Assessment Phase cost	Proportion of total estimated procurement expenditure
Actual Cost	0.6	0.08%
Approved Cost at Initial Gate	-	-
Variation	-	

5c. Duration of Assessment Phase

	Date
Date of Main Gate Approval	May 2000
Target Date for Main Gate Approval at Initial Gate	-
Variation (Months)	-

5d. Cost boundaries at Initial Gate and Main Gate Approvals

£m (outturn prices)	Lowest	Most Likely	Highest
Cost of Demonstration and Manufacture Phase forecast at Main Gate	-	746	785
Cost of Demonstration and Manufacture Phase forecast at Initial Gate	-	-	-

5e. ISD boundaries at Initial Gate and Main Gate Approvals

	Earliest	Most Likely	Latest Acceptable
Forecast ISD at Main Gate	-	September 2001	December 2001
Forecast ISD at Initial Gate	-	-	-

POST-MAIN GATE PROJECT SUMMARY SHEET

FUTURE JOINT COMBAT AIRCRAFT (JCA)

Integrated Project Team Responsible:
Future Joint Combat Aircraft

SECTION 1: ABOUT THE PROJECT

1a. Project description, progress and key future events

The Strategic Defence Review confirmed the requirement to provide the Joint Force 2000 (joint command for all Harrier forces) with a multi-role fighter/attack aircraft to replace the Royal Navy Sea Harrier and the Royal Air Force Harrier GR7. Following participation in the Concept Demonstration Phase of the programme, the US Joint Strike Fighter (JSF) was selected to meet the requirement. The estimated in-service date is 2012 to coincide with the first of the new aircraft carriers (CVF) entering service. A tailored Main Gate Demonstration Approval (to match the US procurement cycle) was obtained in January 2001 for participation in the JSF System Development and Demonstration (SDD) phase, along with £600m for related non-SDD work, leading to signature the same month of the associated Memorandum of Understanding. Of the eight other countries participating with the US in SDD, the UK is the sole Level 1 partner, contributing $2Bn to this phase and obtaining key project roles within the JSF Joint Program Office. The US placed a contract with Lockheed Martin in October 2001, as Prime Contractor for this phase; the UK played a major part in the down selection process. In September 2002 the UK selected the Short Take Off and Vertical Landing (STOVL) JSF variant to meet our requirement, and had a strong role in the JSF Preliminary Design Review process, which concluded at the end of March 2003. The next key steps will be the Air System Critical Design Reviews, which will be held between early 2004 and mid 2005.

1b. Associated projects

Critical to Achievement of ISD		Critical to Meet Initial Gate Requirement	
Project Title	Forecast ISD	Project Title	Forecast ISD
Future Aircraft Carrier (CVF)	2012	-	-

1c. Procurement strategy

Contractor(s)	Contract Scope	Contract Type	Procurement Route
Lockheed Martin	System Development and Demonstration	Cost plus award fee, subject to a maximum price	Competitive, international collaborative procurement. UK participation through MOU agreement.

SECTION 2: PROJECT COSTS

2a. Performance against approved cost

£m (outturn prices)	Procurement Cost
Current Forecast Cost	2327
Approved Cost at Main Gate	2358
Variation	-31
In-year changes in 2002/2003	-5

2b. Reasons for variation from approved cost

Factor	Increase £m	Decrease £m	Explanation
Changed Requirement	20	90	A review of the external missile systems for JCA resulted in the removal of the requirement for integrating an externally mounted Brimstone (-£41m) and ASRAAM (-£49m) capability. Further UK participation in the Joint Integrated Test Force to reflect UK acceptance into service strategy (+£20m).
Changed Budgetary Priorities	43	7	Adjustment for realism in the cost of the UK non SDD work resulting from a deeper review of the estimates originally provided by the US (+£43m). Fewer UK studies than originally planned (MPR02 -£1m; MPR03 -£6m).
Exchange Rate	189	9	Change in dollar/pound exchange rate (MPR02 +£189m; MPR03 -£9m).
Accounting Adjustments and Re-definitions	48	12	Interest on capital correction (MPR02 +£46m; MPR03 -£12m). New DPA requirement to include Price Forecasting Group costs within the equipment plan (+£1m). Additional interest on capital from new DPA IT accrual methodology (+£1m).
Risk Differential		213	Difference between the risk allowed for in the most likely (50%) and the highest acceptable (90%) estimates at Main gate (-£213m).
Total	+300	-331	
Net Variation		-31	

2c. Expenditure to date

Expenditure to 31 March 2003 (£m)	75

2d. Years of peak procurement expenditure

2006/2007	2007/2008

2e. Unit production cost*

Unit Production Cost (£m)		Quantities Required	
at Main Gate	Current	at Main Gate	Current
-	-	-	-

SECTION 3: PROJECT TIMESCALE †

3a. Definition of in-service date

ISD Definition:	8 embarked aircraft at Readiness 2 (2-5 days notice to move).

3b. Performance against approved in-service date

	Date
Current forecast ISD	-
Approved ISD at Main Gate*	-
Variation (Months)	-
In-year changes in 2002/2003	-

3c. Reasons for variation from approved ISD

Factor	Increase (months)	Decrease (months)	Explanation
-	-	-	-
Total	-	-	
Net Variation	-	-	

3d. Cost resulting from ISD variation

Type of Cost/Saving	Cost £m	Saving £m	Explanation
Support costs of current equipment	-	-	-
Other	-	-	-
Total	-	-	

3e. Operational impact of ISD variation

-

* The JCA Main Gate (MG) was tailored for Development only to match the US procurement cycle. Unit Production Cost approval will be sought as part of the MG Production Approval.

† The In Service Date (ISD) approval will be sought as part of the MG Production Approval.

SECTION 4: KEY USER REQUIREMENTS

4a. Performance against approved key user requirements

Serial	Key Requirement	Currently forecast to be met (Yes or No)
1	Survivability	Yes
2	Interoperability	Yes
3	Combat radius	Yes
4	Mission performance	Yes
5	Mission reliability	Yes
6	Logistic footprint: The equipment required to support a number of aircraft for a prescribed period of time.	Yes
7	Sortie generation rates: JCA will be required to contribute to a significant proportion of the total missions required in the early stages of future operations, demonstrating a high level of reliability. This requirement is to enable generation of a predetermined number of sorties without placing an unacceptable burden on the logistics system.	Yes
	Percentage currently forecast to be met	100%
	Change since previous MPR	None

4b. Reasons for variation against approved key requirements

Key Requirement	Factor	Explanation
-	-	-

SECTION 5: HISTORY UP TO MAIN GATE APPROVAL

5a. Description of the Assessment Phase

Approval was obtained in November 1996 to enter the Concept Demonstration Phase (CDP) of the JSF programme under an MOU signed in December 1995. The phase began in November 1996 with two competing US Prime Contractors (Boeing and Lockheed Martin) designing weapons systems 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 JSF to meet the requirement were also conducted but were rejected on cost-effectiveness grounds. The options were US F/A18E, French Rafale M, a "navalised" Eurofighter and an advanced Harrier.

5b. Cost of the Assessment Phase

£m (outturn prices)	Assessment Phase cost	Proportion of total estimated procurement expenditure
Actual Cost	144	6%
Approved Cost at Initial Gate	150	6%
Variation	-6	

5c. Duration of Assessment Phase

	Date
Date of Main Gate Approval	January 2001
Target Date for Main Gate Approval	-
Variation (Months)	-

5d. Cost boundaries at Initial Gate and Main Gate Approvals*

£m (outturn prices)	Lowest	Most Likely	Highest
Cost of Demonstration and Manufacture Phase forecast at Main Gate	2079	2145	2358
Cost of Demonstration and Manufacture Phase forecast at Initial Gate	-	-	-

5e. ISD boundaries at Initial Gate and Main Gate Approvals

	Earliest	Most Likely	Latest Acceptable
Forecast ISD at Main Gate†	-	December 2012	April 2014
Forecast ISD at Initial Gate	-	December 2012	-

* Three point estimates for the production phase have yet to be determined as costs are dependant on the final aircraft numbers.

† For MG Development approval, ISD was noted, not approved.

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POST-MAIN GATE PROJECT SUMMARY SHEET

HIGH VELOCITY MISSILE SYSTEM (HVM)

Integrated Project Team Responsible:
Ground Based Air Defence

SECTION 1: ABOUT THE PROJECT

1a. Project description, progress and key future events

The High Velocity Missile (HVM) System, commercially known as Starstreak, is an Army Very Short Range Air Defence weapon designed to attack armoured helicopters and low-flying aircraft. Deployed in 3 variants; Self Propelled (SP) on a launcher vehicle (STORMER), a Lightweight Multiple Launcher (LML) mounted on a tripod base and Shoulder Launched (SL); it is deployed with the Air Defence Alerting Device (ADAD), a passive 24 hour automatic surveillance device.

Following a competitive project definition phase between Shorts Missile Systems (SMS) (now known as Thales Air Defence Ltd. (TADL)) and British Aerospace, the contract for full development and production was placed with SMS in November 1986. In-Service Dates (ISD) for SP HVM and SL/LML HVM were achieved in September 1997 and September 2000 respectively.

Four follow-on orders for missiles have been placed, the latest in December 1999, with a follow-on order of SL/LML systems and associated equipment in September 2000. The number of SL/LML systems procured was reduced from 72 to 40 although the costs for both quantities remained broadly the same. This was due to the non recurring element of the work required irrespective of quantities and because remaining Tranche 1 equipment was procured as part of this follow-on order which was also unaffected by the reduction in quantities. Approval was given in February 2001 for the Demonstration and Manufacture of Thermal Sighting Systems (TSS) for SP HVM. An order was placed for TSS for SP HVM in February 2001 and the equipment is planned to be brought into service in 2006. A TSS for LML HVM is planned as part of GBAD Phase 1, a pre-Main Gate MPR project.

Further expenditure in clear prospect for Missiles is an estimated £240m.

1b. Associated projects

Critical to Achievement of ISD		Critical to Meet Initial Gate Requirement	
Project Title	Forecast ISD	Project Title	Forecast ISD
Air Defence Alerting Device	1994	-	-

1c. Procurement strategy

Contractor(s)	Contract Scope	Contract Type	Procurement Route
Thales Air Defence Ltd. (formerly Shorts Missile Systems)	Full development and production	Fixed Price	UK Competition

Thales Air Defence Ltd. (formerly Shorts Missile Systems)	Follow on production	Fixed Price	Single Tender. No agreed price, no contract (NAPNOC)

SECTION 2: PROJECT COSTS

2a. Performance against approved cost

£m (outturn prices)	**Procurement Cost**
Current Forecast Cost	904
Approved Cost at Main Gate	901
Variation	+3
In-year changes in 2002/2003	0

2b. Reasons for variation from approved cost

Factor	**Increase £m**	**Decrease £m**	**Explanation**
Technical Factors	7		Missile production problems caused a delay in the placement of latest missile contract (+£7m).
Changed Requirement		10	Reduction in Tranche 1 Practice Missile Kits (-£10m).
Changed Budgetary Priorities	12		SP TSS ISD deferred due to budgetary priorities resulting in increased resource cost (+£6m). Reorganisation of HVM Tranche 3 Ground Equipment future capability (+£6m).
Contracting Process	20	33	Extra contractual payment in settlement of claim regarding provision of Government Furnished Equipment (+£11m). Discount obtained against contract for Tranche 1a/b Missiles (-£5m). Under estimation of funding provision for Tranche 1a/b/c missiles (+£1m). Decrease in forecast expenditure on Tranche 3 based on latest estimates (MPR02 -£11m; MPR03 -£3m). Recalculation of Interest on Capital for Tranche 3 based on revised delivery profile (MPR02 -£8m; MPR03 +£3m). Recalculation of Interest on Capital for SP TSS based on revised delivery profile (+£2m). Decrease due to contract negotiations of Tranche 3 HVM Ground Equipment contract (-£6m). Re-approval of Tranche 3 SL/LML costs (+£3m).
Accounting Adjustments and Re-definitions	8	1	Inclusion of DERA support costs on Tranche 1 (+£8m). Derivation of the approved cost on a resource basis (-£1m).
Total	+47	-44	
Net Variation	+3		

2c. Expenditure to date

Expenditure to 31 March 2003 (£m)	706

2d. Years of peak procurement expenditure

1989/1990	2001/2002

2e. Unit production cost

Unit Production Cost		Quantities Required	
at Main Gate	Current	at Main Gate	Current
-	***	135 SP HVM Systems	135 SP HVM Systems

SECTION 3: PROJECT TIMESCALE

3a. Definition of in-service date

ISD Definition:	One HVM battery, fully equipped, trained and supported.

3b. Performance against approved in-service date

	Date
Current forecast ISD	September 1997
Approved ISD at Main Gate	December 1990
Variation (Months)	+81
In-year changes in 2002/2003	0

3c. Reasons for variation from approved ISD

Factor	Increase (months)	Decrease (months)	Explanation
Technical Factors	69		Problems with the dart and carrier missile, including inconsistent performance in dart guidance and second stage motor ignition of the missile. Problems with the vehicle gearbox (+69 months).
Changed Budgetary Priorities	7		A delay at the outset of the project arising from the need to match the Very Short Range Air Defence Weapons Systems Programme (including HVM) with available resources (+7 months).
Contracting Process	2		Prolonged contractual negotiations on some remaining small contracts, in part because Shorts Missile Systems (now known as Thales Air Defence Ltd.) underwent a major restructuring in 1993 and 1994 (+2 months).
Change in Associated Project	3		Software problems encountered in integrating ADAD into SP HVM caused seven months delay. Four months of this was concurrent with the delays due to technical factors (+3 months).

Total	+81	
Net Variation	+81	

3d. Cost resulting from ISD variation

Type of Cost/Saving	Cost £m	Saving £m	Explanation
Support costs of current equipment	-	-	-
Other	-	-	-
Total	-	-	

3e. Operational impact of ISD variation

SP HVM was intended to support units engaged in mobile operations and in particular counter strike forces. The delay in SP HVM ISD from December 1990 to September 1997 resulted in the 1st (UK) Armoured Division having no specific Very Short Range Air Defence capability. A lesser capability was provided by Tracked Rapier and the manportable Javelin systems.

SECTION 4: KEY USER REQUIREMENTS

4a. Performance against approved key user requirements

Serial	Key Requirement	Currently forecast to be met (Yes or No)
1	SP HVM - essential effective range.	Yes
2	SP HVM - minimum unrestricted launcher traverse.	Yes
3	HVM Missile - overall missile reliability.	Yes
4	SP HVM - minimum probability of completing a battlefield day.	Yes
5	SP HVM - wide angle field of view.	Yes
6	HVM Missile - minimum safe missile drop height in launch canister.	Yes
	Percentage currently forecast to be met	100%
	Change since previous MPR	None

4b. Reasons for variation against approved key requirements

Key Requirement	Factor	Explanation
-	-	-

SECTION 5: HISTORY UP TO MAIN GATE APPROVAL

5a. Description of the Assessment Phase

Approval for the project definition phase (now taken to equate to Initial Gate) for a High Velocity Close Air Defence Weapon System was received in July 1984. The phase lasted 12 months and was conducted on the basis of parallel work by 2 contractors, Shorts Missile Systems (SMS) (now known as Thales Air Defence Ltd. (TADL)) and British Aerospace. The results of the work were accepted as a satisfactory basis for the full development and production phase submission (now taken to equate to Main Gate) that received approval in October 1986. A contract was subsequently placed for the Tranche 1 procurement of the High Velocity Missile (HVM) System with SMS in November 1986. Performance was determined against a variety of measures of effectiveness, surveillance and target acquisition, terrain and meteorological visibility.

5b. Cost of the Assessment Phase

£m (outturn prices)	Assessment Phase cost	Proportion of total estimated procurement expenditure
Actual Cost	8	1%
Approved Cost at Initial Gate	10	1%
Variation	-2	

5c. Duration of Assessment Phase

	Date
Date of Main Gate Approval	October 1986
Target Date for Main Gate Approval at Initial Gate	-
Variation (Months)	-

5d. Cost boundaries at Initial Gate and Main Gate Approvals

£m (outturn prices)	Lowest	Most Likely	Highest
Cost of Demonstration and Manufacture Phase forecast at Main Gate	-	901	-
Cost of Demonstration and Manufacture Phase forecast at Initial Gate	-	-	-

5e. ISD boundaries at Initial Gate and Main Gate Approvals

	Earliest	Most Likely	Latest Acceptable
Forecast ISD at Main Gate	-	December 1990	-
Forecast ISD at Initial Gate	-	December 1989	-

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POST-MAIN GATE PROJECT SUMMARY SHEET

LANDING SHIP DOCK (AUXILIARY) (LSD(A)) (FORMERLY ALSL)

Integrated Project Team Responsible:
Landing Ship Dock (Auxiliary) (Formerly ALSL)

SECTION 1: ABOUT THE PROJECT

1a. Project description, progress and key future events

The Alternative Landing Ship Logistic (ALSL) is a new class of ship designed to deploy troops, vehicles and equipment directly into operational areas. It has been developed as an alternative to the costly life extension programme for the existing Landing Ship Logistic. ALSL is larger and more versatile than its predecessor, enabling troops to be loaded and disembarked with their vehicles and equipment at sea by landing craft and helicopter.

An Invitation to Tender was issued to five UK shipbuilding consortia in April 2000 for the design and build of two ALSLs with an option for up to a further three. A subsequent assessment of the requirement resulted in a decision to procure four ships from two separate shipyards using a parallel build strategy. This parallel build strategy offered better value for money and an earlier In-Service Date. In December 2000 a contract was placed with Swan Hunter (Tyneside) Ltd to design and build two ALSLs. A contract was placed with BAE SYSTEMS Marine in November 2001to build two ships to Swan Hunter's design.

During 2002 additional funding was approved to increase troop accommodation on each vessel and the ALSL nomenclature was changed to Landing Ship Dock (Auxiliary) LSD(A).

The programme is progressing satisfactorily and is on target to meet RFA Largs Bay Programme Acceptance Date (PAD) of March 2004 and its approved In-Service Date (ISD) of October 2004.

1b. Associated projects

Critical to Achievement of ISD		**Critical to Meet Initial Gate Requirement**	
Project Title	Forecast ISD	Project Title	Forecast ISD
-	-	-	-

1c. Procurement strategy

Contractor(s)	**Contract Scope**	**Contract Type**	**Procurement Route**
Swan Hunter (Tyneside) Ltd	Design & build two LSD(A)s, initial spares provisioning and Lead Yard Service support	Firm Price	UK Competition
BAE SYSTEMS Marine	Build of two LSD(A)s	Maximum price to be converted to firm price	No Acceptable Price No Contract (NAPNOC)

SECTION 2: PROJECT COSTS

2a. Performance against approved cost

£m (outturn prices)	Procurement Cost
Current Forecast Cost	***
Approved Cost at Main Gate	***
Variation	***
In-year changes in 2002/2003	***

2b. Reasons for variation from approved cost

Factor	Increase £m	Decrease £m	Explanation
Changed Requirement	***		***
Inflation	***		***
Contracting Process	***		***
Procurement Strategy	***	***	***
Risk Differential		***	***
Total	***	***	
Net Variation		***	

2c. Expenditure to date

Expenditure to 31 March 2003 (£m)	155

2d. Years of peak procurement expenditure

2002/2003	2003/2004

2e. Unit production cost

Unit Production Cost (£m)		Quantities Required	
at Main Gate	Current	at Main Gate	Current
97.8	95.2	4	4

SECTION 3: PROJECT TIMESCALE

3a. Definition of in-service date

ISD Definition:	Availability of First of Class RFA Largs Bay for operational use.

3b. Performance against approved in-service date

	Date
Current forecast ISD	July 2004
Approved ISD at Main Gate	October 2004
Variation (Months)	-3
In-year changes in 2002/2003	0

3c. Reasons for variation from approved ISD

Factor	**Increase**	**Decrease**	**Explanation**
Risk Differential		3	Variation between the 50% confidence level used for budgetary purposes and the 90% level used for approvals (-3 months).
Total		-3	
Net Variation		-3	

3d. Cost resulting from ISD variation

Type of Cost/Saving	**Cost £m**	**Saving £m**	**Explanation**
Support costs of current equipment	-	-	-
Other	-	-	-
Total	-	-	

3e. Operational impact of ISD variation

-

SECTION 4: KEY USER REQUIREMENTS

4a. Performance against approved key user requirements

Serial	Key Requirement	Currently Forecast to be met (Yes or No)
1	Ability to offload/onload troops, equipment and munitions quickly and safely at sea.	Yes
2	Ability to offload/onload to mexeflote (powered raft) in sheltered waters in order to utilise the large lift capacities of these assets.	Yes
3	To be fitted to carry two Landing Craft Vehicle & Personnel and two mexeflotes.	Yes
4	Provision of a single spot flight deck to meet defined operational requirements.	Yes
5	Maximise lift capacity for troops, vehicles and equipment beyond minimum acceptable levels.	Yes
6	Capability to maintain a speed of 18 knots full laden with a minimum range of 8000 nautical miles at 15 knots.	Yes
7	A reliable combat support system and communications package to guarantee the timely and efficient exchange of information with the command platform.	Yes
8	Ability to conduct a passage through a contaminated environment for a specified period and conduct operations on completion.	Yes
9	To provide a self-defence capability as required by current and future threat analysis.	Yes
10	Provide an operational availability of five years peacetime availability of at least 93% and not more than 12 hours mission downtime during a 60-day mission.	Yes
	Percentage currently forecast to be met	100%
	Change since previous MPR	None

4b. Reasons for variation against approved key requirements

Key Requirement	Factor	Explanation
-	-	-

SECTION 5: HISTORY UP TO MAIN GATE APPROVAL

5a. Description of the Assessment Phase

In September 1997 approval was given to proceed with a programme of initial assessment studies to define the ALSL requirement for use in a conventional or PFI procurement. This was followed in April 1999 by further work to develop a Systems Requirement Document to minimise risk and set a baseline for tender assessment under a conventional procurement. PFI was ruled out due to the front line role of the ALSLs in supporting an Amphibious Task Group.

The resultant studies and design solutions offered by industry enabled the Project to move to Initial Gate in October 1999 in order to seek formal costed tenders for the design and build of two ALSLs to inform the Main Gate business case, planned for December 1999. However, the Invitation to Tender was delayed until April 2000, whilst a series of programme options were considered. During the tender process it became clear that a four-vessel procurement through a parallel build strategy offered greater long-term value for money and met the capability required for transporting 3 Commando Brigade into amphibious operations. This strategy also offered earlier In-service Dates compared to a sequential build of all the vessels at one shipyard. Main Gate approval was given in October 2000.

5b. Cost of the Assessment Phase

£m (outturn prices)	Assessment Phase cost	Proportion of total estimated procurement expenditure
Actual Cost	1	0.3%
Approved Cost at Initial Gate	1	0.3%
Variation	0	

5c. Duration of Assessment Phase

	Date
Date of Main Gate Approval	October 2000
Target Date for Main Gate Approval (at IG)	December 1999
Variation (Months)	+10

5d. Cost boundaries at Initial Gate and Main Gate Approvals

£m (outturn prices)	Lowest	Most Likely	Highest
Cost of Demonstration and Manufacture Phase forecast at Main Gate*	-	354	395
Cost of Demonstration and Manufacture Phase forecast at Initial Gate†	-	159	-

5e. ISD boundaries at Initial Gate and Main Gate Approvals

	Earliest	Most Likely	Latest Acceptable
Forecast ISD at Main Gate	-	July 2004	October 2004
Forecast ISD at Initial Gate	January 2003	June 2003	October 2003

* Main Gate approval sought for the procurement of 4 vessels.

† Initial Gate approval sought for the procurement of 2 vessels.

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POST-MAIN GATE PROJECT SUMMARY SHEET

NIMROD MARITIME RECONNAISSANCE & ATTACK Mk4 (NIMROD MRA4)

Integrated Project Team Responsible:
Nimrod MRA4

SECTION 1: ABOUT THE PROJECT

1a. Project description, progress and key future events

The Nimrod Maritime Reconnaissance and Attack MK4 (MRA4) will replace the current Nimrod MR2 as the new maritime patrol aircraft. MRA4 will provide significantly enhanced Anti-Submarine and Anti-Surface Unit Warfare capability through improved aircraft and sensor performance, a greater degree of system integration, better Human Machine Interface design and a substantial improvement in availability and supportability.

The Nimrod MRA4 contract was placed with BAE SYSTEMS (then BAe) in 1996, re-negotiated in mid 1999 and again in early 2002. Continued technical and resource problems led to a further review of the programme in late 2002 and on 19 February 2003 MOD announced that it had reached an agreement with BAE SYSTEMS to change the current fixed price contract to a Target Cost Incentive Fee (TCIF) contract.

This agreement resulted in a 40 month delay to the in-service date (redefined in-year) to 2009 but introduced new performance incentives for BAE SYSTEMS and compelled the company to improve its project management practices. Design, development and production of the first three aircraft (to be used for trials) was separated from production of aircraft 4 to 18, thus reducing cost and programme risk. First flight is likely to occur in mid 2004 and design maturity is scheduled for the end of 2005.

The agreement also covered investigation of the potential of MRA4 as an 'Adaptable Aircraft' to undertake land attack and other roles. The Department will shortly be considering the results of Concept Study work conducted by BAE SYSTEMS and intends to place an Assessment Study contract later this year. Whole life support arrangements will also be explored further to seek optimal arrangements.

Estimated procurement costs have increased by £538M in resource terms since MPR02, of which £225M is additional Cost of Capital (CoC) charges. As a consequence of the Feb 03 agreement, BAE SYSTEMS is making a provision in its accounts of £500M against this contract, in addition to earlier provisions of £300M.

1b. Associated projects

Critical to Achievement of ISD		Critical to Meet Initial Gate Requirement	
Project Title	Forecast ISD	Project Title	Forecast ISD
-	-	-	-

1c. Procurement strategy

Contractor(s)	Contract Scope	Contract Type	Procurement Route
BAE SYSTEMS (formerly British Aerospace Defence Ltd. Military Aircraft Division)	Development and Production package	Fixed Price*	Prime Contractor International Competition
Boeing Defence & Aerospace Group, USA	Tactical Command System and Sensors	Fixed Price	Sub-contractor to BAE SYSTEMS

SECTION 2: PROJECT COSTS

2a. Performance against approved cost

£m (outturn prices)	Procurement Cost
Current Forecast Cost	3376
Approved Cost at Main Gate	2982
Variation	+394
In-year changes in 2002/2003	+538

2b. Reasons for variation from approved cost

Factor	Increase £m	Decrease £m	Explanation
Technical Factors	372	17	Increase in DERA estimate (+£13m): reduction in study requirements (-£6m); slower technical progress than originally envisaged, particularly with wing mass, leading to reduced interest on capital charges (-£9m). Reduced Interest on Capital (IOC) charge linked to reduction in aircraft numbers (-£2m); additional costs relating to the Agreement announced on 19 Feb 2003 (+£359m).
Changed Requirement	155	130	Reduction from 21 to 18 aircraft (MPR02 Saving of £114m less estimated termination costs of £70m; MPR03 further savings identified in 2003 planning process -£16m). Additional commitments as part of the Heads of Agreement (HOA) (+£35m). Additional costs for assessment of enhanced capability as part of the Agreement announced on 19 Feb 2003 (+£10m). As a consequence of the Agreement, QinetiQ requirement extended (+£40m).
Changed Budgetary Priorities		34	Reduction in Risk provision (MPR 00 -£17m; MPR02 -£17m).

* During 2003, the BAES contract will be restructured to Target Cost Incentive Fee arrangements.

Factor	Increase £m	Decrease £m	Explanation
Inflation	41		Variation in Inflation assumptions (+£41m).
Receipts	39	46	Forecast recovery of Liquidated Damages (-£46m) less those to be forgone as part of the Agreement announced on 19 Feb 03) (+£39m).
Contracting Process	148	119	Reduction in Risk provision (-£56m); and reductions following re-negotiation of contract (-£26m); reduction in programme costs between Main Gate approval and original contract placement (-£37m): original contract was let at provisional indices that were below actual indices (+£16m). Additional costs relating to the Agreement announced on 19 Feb 2003 for Design & Development Target Cost Fee (+£132m).
Accounting Adjustments and Re-definitions	30	45	Increase in costs owing to the creation of a trading fund for the Communications Electronic Security Group (CESG) after original approval had been granted (+£1m); derivation of the approved cost on a resource basis (-£19m). Change to take account of an adjustment to the current forecast for MPR01, reflecting the availability of more accurate data (+£29m). Changes caused by conversion of internal accounting system to full resource basis (-£26m).
Total	+785	-391	
Net Variation	+394		

2c. Expenditure to date

Expenditure to 31 March 2003 (£m)	1512

2d. Years of peak procurement expenditure

2003/2004	2004/2005

2e. Unit production cost

Unit Production Cost (£m)		Quantities Required	
at Main Gate	Current	at Main Gate	Current
Development and Production Package	Development and Production Package	21	18

SECTION 3: PROJECT TIMESCALE

3a. Definition of in-service date

ISD Definition:	**Original ISD definition:** Delivery of the seventh production standard aircraft to the Royal Air Force. **Current ISD definition** (part of the 19 February Agreement with the Company): Delivery of the sixth production standard aircraft to the Royal Air Force. **Reason for Change:** To reflect the reduction in the fleet from 21 to 18 agreed in 2002: six aircraft is one third of the fleet and broadly represents one squadron.

3b. Performance against approved in-service date

	Date
Current forecast ISD	March 2009
Approved ISD at Main Gate	April 2003
Variation (Months)	+71
In-year changes in 2002/2003	+40

3c. Reasons for variation from approved ISD

Factor	Increase	Decrease	Explanation
Technical Factors	74	3	Resource and technical problems at BAE SYSTEMS (MPR00 +23 months; MPR02 +11 months; MPR03 +40 months). Difference between forecast date reported in MPR99 based upon the 1999 re-approval at 90% confidence (March 2005) and forecast date reported in MPR 2000 based upon the then current plan at 50% confidence (-3 months).
Total	+74	-3	
Net Variation	+71		

3d. Cost resulting from ISD variation

Type of Cost/Saving	Cost £m	Saving £m	Explanation
Support costs of current equipment	344		Additional cost of running on Nimrod MR2 (+£344m).
Other		150	Reduction in MRA4 support costs over the same period (-£150m).
Total	+194		

3e. Operational impact of ISD variation

The consequence of the Nimrod MRA4 ISD slip is that the Nimrod MR2 will remain in service until mid-2011. This slip will delay introduction of the improved Anti-Submarine and Anti-Surface Unit Warfare capability of the Nimrod MRA4 and will require the ageing Nimrod MR2 fleet to be maintained in service longer than expected. The operational impact of this slippage will be partly mitigated by measures already in hand to introduce upgrades to some Nimrod MR2 systems, notably Replacement Acoustic Processors (RAP), navigation systems, datalinks and other communications to address interoperability issues. The RAP programme has benefited by making use of acoustic processors procured for Nimrod MRA4.

SECTION 4: KEY REQUIREMENTS

4a. Performance against approved key requirements

Serial	Key Requirement	Currently forecast to be met (Yes or No)
1	Anti-Submarine Warfare (ASW) Barrier Search – Probability of Detection (PD)	Yes
2	ASW Area Search - Probability of Detection (PD)	Yes
3	ASW Passive Localisation & Attack - Weapon Splashpoint Error Range (WSER)	Yes
4	ASW Passive Localisation & Attack - Probability of Localisation (PL)	Yes
5	ASW Active Localisation & Attack - Weapon Splashpoint Error Range (WSER)	Yes
6	Anti-Submarine Warfare (ASW) - Time on Station (ToS)	Yes
7	Anti-Surface Warfare (ASuW) - Time on Station (ToS)	Yes
8	ASuW Area Search - Probability of detecting operational targets within a specified area	Yes
9	ASuW Third Party Targeting - Determination of target position, course and speed for third party targeting	Yes
10	Airfield Performance - achieving defined take off performance	Yes
	Percentage currently forecast to be met	100%
	Change since previous MPR	None

4b. Reasons for variation against approved key requirements

Key Requirement	Factor	Explanation
-	-	-

SECTION 5: HISTORY UP TO MAIN GATE APPROVAL

5a. Description of the assessment phase

In November 1992, the Equipment Approvals Committee (EAC) approved a Request for Information exercise whereby 17 companies were invited to provide responses to the draft Replacement Maritime Patrol Aircraft (RMPA) Staff Requirement.

Following analysis of the industry responses, the EAC endorsed the requirement and approved an Invitation to Tender phase whereby four companies (BAe, Lockheed Martin, Loral and Dassault) were invited to provide detailed technical and commercial proposals for an aircraft to meet the endorsed Staff Requirement. Dassault withdrew from the competition in January 1996, and whilst Lockheed Martin and Loral merged in May 1996, they maintained the two separate proposals until the competition concluded.

Following assessment of these responses, selection of BAe's Nimrod 2000 (later to be re-designated Nimrod MRA4) offer was approved by EAC and Ministers in July 1996. This was the equivalent of Main Gate approval.

5b. Cost of the assessment phase

£m (outturn prices)	Assessment Phase cost	Proportion of total estimated procurement expenditure
Actual Cost	5	0.1%
Approved Cost at Initial Gate	4	0.1%
Variation	+1	

5c. Duration of assessment phase

	Date
Date of Main Gate Approval	July 1996
Target Date for Main Gate Approval	-
Variation (Months)	-

5d. Cost boundaries at Initial Gate and Main Gate Approvals

£m (outturn prices)	Lowest	Most Likely	Highest
Cost of Demonstration and Manufacture Phase forecast at Main Gate	-	2982	-
Cost of Demonstration and Manufacture Phase forecast at Initial Gate	-	-	-

5e. ISD boundaries at Initial Gate and Main Gate Approvals

	Earliest	Most Likely	Latest Acceptable
Forecast ISD at Main Gate	-	April 2003	-
Forecast ISD at Initial Gate	-	December 2000	-

POST-MAIN GATE PROJECT SUMMARY SHEET

SUCCESSOR IDENTIFICATION ON FRIEND OR FOE (SIFF)

Integrated Project Team Responsible:
Successor Identification on Friend or Foe

SECTION 1: ABOUT THE PROJECT

1a. **Project description, progress and key future events**

The Successor Identification Friend or Foe (SIFF) programme will replace many of the existing IFF systems currently in use with the UK Armed Forces. SIFF will be fitted to some 40 in-service sea, land and air platform-types to provide a modern, NATO-compatible, secure IFF system, enabling swift and accurate identification of friendly forces.

The Strategic Defence Review endorsed the continuing validity of the SIFF requirement as part of the process of modernisation. It also endorsed the procurement of SIFF for Tornado F3 ahead of the other platform-types, to achieve cost savings and to reduce programme risk through alignment with the aircraft's Capability Sustainment Programme (CSP). An incentivised No Acceptable Price No Contract (NAPNOC) Demonstration and Manufacture (D&M) contract was let in November 1998 with BAE SYSTEMS (formerly British Aerospace (BAe)), the aircraft Design Authority (DA).

In August 2000, Ministers approved the D&M Phase for the SIFF main programme. This phase covers the majority of the platform-types to be fitted with SIFF. Due to the number and diversity of the platform-types, it is not possible to have a single prime contractor to manage the entire programme. Consequently, following competition between BAE SYSTEMS and Raytheon Systems Ltd, a contract was placed with the latter in December 2000 for the supply of the SIFF equipment and its integration into many of the platform-types. For the remaining platform-types, the individual platform DAs would be contracted under NAPNOC arrangements. NAPNOC contracts were let between December 2000 and December 2002 for Rapier, Sea King MKs 4/5, Hercules C130K, Merlin MK 1, Type 23 Frigates Command System, Tornado GR4, Sentry E-3D and also a competitive contract for the UK Air Defence Ground Environment integrated command and control system. Three major contracts (and a number of smaller ones) have still to be let and it is planned that this will have been done by the end of 2004.

Separately, but as part of the overall SIFF project, approval was given for the Demonstration and Manufacture Phase for SIFF for the High Velocity Missile in April 2001. Subsequently a NAPNOC contract was let in June 2001 with Thales Air Defence Ltd as prime contractor, with Thales Communication of France as the main subcontractor following competition.

1b. **Associated projects**

Critical to Achievement of ISD		**Critical to Meet Initial Gate Requirement**	
Project Title	Forecast ISD	Project Title	Forecast ISD
-	-	-	-

1c. Procurement strategy

Contractor(s)	Contract Scope	Contract Type	Procurement Route
Raytheon Systems Ltd	SIFF Main Programme prime contractor and responsible for installation and integration of equipment on some 30 platform-types	Firm Price	Competitive (Value ***
BAE SYSTEMS (formerly British Aerospace)	Prime contractor for SIFF for Tornado F3	Firm Price	NAPNOC Non-competitive, the value of which amounts to some *** of the Main Programme prime contract.
Thales Air Defence Ltd	Prime contractor for SIFF for HVM	Firm Price	NAPNOC Non-competitive, the value of which amounts to some *** of the Main Programme prime contract.
BAE SYSTEMS	Prime contractor for SIFF for Tornado GR4	Firm Price	NAPNOC Non-competitive, the value of which amounts to some of *** the Main Programme prime contract.
MBDA Missile Systems (formerly Matra BAe Dynamics UK (Ltd)	Prime contractor for SIFF for Rapier	Firm Price	NAPNOC Non-competitive, the value of which amounts to some *** of the Main Programme prime contract.

Note: Six other, smaller value SIFF contracts have also been let. Future SIFF contracts will include those for Chinook MKs 2&2a, Lynx MKs 7&9, Harrier GR9 and various simulators.

SECTION 2: PROJECT COSTS

2a. Performance against approved cost

£m (outturn prices)	Procurement Cost
Current Forecast Cost	471
Approved Cost at Main Gate	558
Variation	-87
In-year changes in 2002/2003	+13

2b. Reasons for variation from approved cost

Factor	Increase £m	Decrease £m	Explanation
Technical Factors	7	6	Reassessment of work required on Approach A platforms (MPR02: -£1m; MPR03: +£4m). Reassessment of work required on Approach C platforms (MPR02 -£1m; MPR03 +£1m). Reassessment of risk requirement for Rapier SIFF programme (-£2m). Reassessment of technical content for Tornado F3 (MPR02 -£2m; MPR03 +£2m).
Changed Requirement	23	64	Removal of platforms from SIFF programme: Harrier GR7/T10 (-£22m), Sea Harrier/Harrier T8 (-£21m), Type 92 & Type 93 Radars (-£17m) and Gazelle (RAF) (-£2m). Reduction in quantity of SIFF equipment for HVM Lightweight Multiple Launcher programme (-£2m). Re-introduction of Harrier GR7/T10 requirement as part of the aircraft upgrade to GR9 capability (+£23m).
Contracting Process	3	22	Reduction in costs resulting from the placement of firm price contracts (-£22m). Increase in Approach C (Type 23 DNA) costs as a result of contract negotiations (+£3m).
Procurement Strategy		6	Savings realised by aligning SIFF for HVM and Thermal Sighting System for Self Propelled HVM at prime contract level (-£6m).
Accounting Adjustments and Re-definitions	5	13	Interest on Capital correction (-£1m). Reduction in VAT rate on SIFF Main programme prime contract (-£6m). Approach C VAT rate assumptions (MPR02: -£6m, MPR03: +£5m).
Risk Differential		14	Difference between the risk allowed for in the most likely (50%) and highest acceptable (90%) estimates at Main Gate (-£14m).
Total	+38	-125	
Net Variation		-87	

2c. Expenditure to date

Expenditure to 31 March 2003 (£m)	191

2d. Years of peak procurement expenditure

2002/2003	2004/2005

2e. Unit production cost

Unit Production Cost (£m)		**Quantities Required**	
at Main Gate	Current	at Main Gate	Current
***	***	1369	1308

SECTION 3: PROJECT TIMESCALE

3a. Definition of in-service date

ISD Definition:	36 Sea and Air equipments installed and set to work and supportable.

3b. Performance against approved in-service date

	Date
Current forecast ISD	March 2004
Approved ISD at Main Gate	April 2004
Variation (Months)	-1
In-year changes in 2002/2003	+1

3c. Reasons for variation from approved ISD

Factor	**Increase**	**Decrease**	**Explanation**
Technical Factors	1		Slippage on Main SIFF programme resulting from technical difficulties (+1 month).
Contracting Process		2	Contract negotiations have resulted in timescale savings (-2 months).
Total	+1	-2	
Net Variation		-1	

3d. Cost resulting from ISD variation

Type of Cost/Saving	**Cost £m**	**Saving £m**	**Explanation**
Support costs of current equipment	-	-	-
Other	-	-	-
Total	-	-	

3e. Operational impact of ISD variation

-

SECTION 4: KEY REQUIREMENTS

4a. Performance against approved key requirements

Serial	Key Requirement	Currently forecast to be met (Yes or No)
1	A secure and Electronic Counter Measures-resistant IFF system to succeed (with backwards compatibility) Mk XA. The minimum requirement is MK XII Mode 4, in accordance with STANAG 4193.	Yes
2	Continuous unrestricted access for UK military aircraft to current and future (Mode S) civil-controlled airspace in Europe.	Yes
3	On each platform type the SIFF system performance shall be no less than the current installed performance.	Yes
4	The SIFF system shall provide a growth path for the acquisition of IFF Mode 5 capability.	Yes
5	The installed SIFF must exhibit high levels of continuous, full system availability and reliability over extended mission cycles.	Yes
6	The SIFF equipment support solution must provide the optimum through-life Sustainment of SIFF capability within the project affordability constraints.	Yes
	Percentage currently forecast to be met	100%
	Change since previous MPR	None

4b. Reasons for variation against approved key requirements

Key Requirement	Factor	Explanation
-	-	-

SECTION 5: HISTORY UP TO MAIN GATE APPROVAL

5a. Description of the assessment phase

In May 1997, Ministers endorsed the SIFF requirement with an indicative fitting plan and approved an Assessment Phase known as the Integration Study and Planning Phase (ISPP), the main part of which began in 1998. The approval noted that an ISD would be proposed as part of the SIFF Main Programme Main Gate Submission. The procurement strategy involved placing contracts with BAE SYSTEMS (formerly Marconi Electronic Systems Ltd) and Raytheon Systems Ltd as competing potential SIFF equipment suppliers, covering the majority of platform-types to be fitted with SIFF and from the DAs for the remainder. During ISPP, the Department and Industry worked closely together to refine the SIFF requirement and to produce a low risk solution to the programme, with special emphasis on cost integration, machine-man-interfaces and acceptance into service issues.

5b. Cost of the assessment phase

£m (outturn prices)	Assessment Phase cost	Proportion of total estimated procurement expenditure
Actual Cost	23	5%
Approved Cost at Initial Gate	27	5%
Variation	-4	

5c. Duration of assessment phase

	Date
Date of Main Gate Approval	August 2000
Target Date for Main Gate Approval	April 1999
Variation (Months)	+16

5d. Cost boundaries at Initial Gate and Main Gate Approvals

£m (outturn prices)	Lowest	Most Likely	Highest
Cost of Demonstration and Manufacture Phase forecast at Main Gate	-	544	558
Cost of Demonstration and Manufacture Phase forecast at Initial Gate	-	597	-

5e. ISD boundaries at Initial Gate and Main Gate Approvals

	Earliest	Most Likely	Latest Acceptable
Forecast ISD at Main Gate	-	April 2004	-
Forecast ISD at Initial Gate[1]	-	-	-

[1] An ISD was not included in the Initial Gate approval in which it was noted that an ISD would be proposed as part of the SIFF Main Programme Main Gate Business Case.

POST-MAIN GATE PROJECT SUMMARY SHEET

SKYNET 5

Integrated Project Team Responsible:
Satellite Acquisition

SECTION 1: ABOUT THE PROJECT

1a. Project description, progress and key future events

The Skynet 5 PFI programme will provide the next generation of flexible and survivable satellite communications services for military use and will replace the Skynet 4 constellation at the end of its predicted life.

Robust military satellite communications services are essential to support the inter and intra-theatre information exchange requirements and ensure that the deployed and mobile forces are not constrained by the need to remain within the range of terrestrial communications.

Following Main Gate and Ministerial approval, Paradigm was announced as the preferred service provider in February 2002. As at 31 March contract negotiations were in progress.

Future milestones include:

Transitional Operational Service (TOS) – May 2003
Initial Operational Service (IOS) – February 2005 (50%)
Full Operational Service – August 2007 (50%)

1b. Associated projects

Critical to Achievement of ISD		Critical to Meet Initial Gate Requirement	
Project Title	Forecast ISD	Project Title	Forecast ISD
-	-	-	-

1c. Procurement strategy

Contractor(s)	Contract Scope	Contract Type	Procurement Route
Paradigm Secure Communications Limited	Competitive - International	Firm for 5 years; fixed thereafter.	PFI

SECTION 2: PROJECT COSTS

2a. Performance against approved cost

£m (outturn prices)	Procurement Cost
Current Forecast Cost	2679
Approved Cost at Main Gate	2920
Variation	-241
In-year changes in 2002/2003	0

2b. Reasons for variation from approved cost

Factor	Increase £m	Decrease £m	Explanation
Risk Differential		241	Difference between the risk allowed for in the most likely (50%) and highest acceptable (90%) estimates at Main Gate (-£241m).
Total	-	-241	
Net Variation	-	-241	

2c. Expenditure to date

Expenditure to 31 March 2003 (£m)	7

2d. Years of peak procurement expenditure

2011/2012	2012/2013

2e. Unit production cost

Unit Production Cost (£m)		Quantities Required	
at Main Gate	Current	at Main Gate	Current
-	-	-	-

SECTION 3: PROJECT TIMESCALE

3a. Definition of in-service date

ISD Definition:	Skynet 5 communications services over the Skynet 4 constellation of satellites.

3b. Performance against approved in-service date

	Date
Current forecast ISD	February 2005
Approved ISD at Main Gate	March 2005
Variation (Months)	-1
In-year changes in 2002/2003	0

3c. Reasons for variation from approved ISD

Factor	**Increase (months)**	**Decrease (months)**	**Explanation**
Risk Differential		1	Difference between the risk allowed for in the most likely (50%) and highest acceptable (90%) estimates at Main Gate (-1 month).
Total	-	-1	
Net Variation	-	-1	

3d. Cost resulting from ISD variation

Type of Cost/Saving	**Cost £m**	**Saving £m**	**Explanation**
Support costs of current equipment	-	-	-
Other	-	-	-
Total	-	-	

3e. Operational impact of ISD variation

-

SECTION 4: KEY USER REQUIREMENTS

4a. Performance against approved key user requirements

Serial	Key Requirement	Currently forecast to be met (Yes or No)
1	Users have assured access to Skynet 5 services on Demand.	Yes
2	Users shall benefit from a mix of Skynet 5 services ensuring satisfaction of the Information Exchange (IE).	Yes
3	Users shan't experience reduction in capability when Skynet 4 performance decays below acceptable levels.	Yes
4	Users access to Skynet 5 services scaled to meet the IE Requirement (R).	Yes
5	Key garrisons and deployed forces in areas of strategic interest able to exchange information with other users.	Yes
6	Mobile and covert users on a variety of platforms able to exchange information with other users.	Yes
7	Users benefit from flexible services that accommodate growth in IER.	Yes
8	Users able to exchange information with co-operating forces in a variety of scenarios without disruption to operations.	Yes
9	Critical information exchanged without disruption via hostile or natural means.	Yes
10	Timely, effective up-to-date training available to exploit available resources.	Yes
	Percentage currently forecast to be met	100%
	Change since previous MPR	None

4b. Reasons for variation against approved key requirements

Key Requirement	Factor	Explanation
-	-	-

SECTION 5: HISTORY UP TO MAIN GATE APPROVAL

5a. Description of the Assessment Phase

After Initial Gate in 1993 Assessment Phase work considered 3 options, TRIMILSATCOM, conventional procurement and PFI. Evaluation demonstrated that TRIMILSATCOM would not meet the UK requirements in time and cost. The decision not to proceed with this option was made in August 1998. In March 1999 competitive PFI design study contracts were awarded to Matra-Marconi Space UK (now Astrium) and Lockheed Martin, who considered a range of SATCOM architectures. In July 2000 both companies were issued with an Invitation to Negotiate for the PFI service delivery. The PFI studies culminated in January 2001 with proposals from service delivery entities established by Astrium (Paradigm) and Lockheed Martin, BAE SYSTEMS and British Telecommunications (Rosetta). In July 2001 an extended Revise and Confirm was issued. Best and Final responses were received in November 2001.

5b. Cost of the Assessment Phase

£m (outturn prices)	Assessment Phase cost	Proportion of total estimated procurement expenditure
Actual Cost	123	4.4%
Approved Cost at Initial Gate	113	4.0%
Variation	+10	

5c. Duration of Assessment Phase

	Date
Date of Main Gate Approval	January 2002
Target Date for Main Gate Approval at Initial Gate	-
Variation (Months)	-

5d. Cost boundaries at Initial Gate and Main Gate Approvals

£m (outturn prices)	Lowest	Most Likely	Highest
Cost of Demonstration and Manufacture Phase forecast at Main Gate	2450	2679	2920
Cost of Demonstration and Manufacture Phase forecast at Initial Gate	-	-	-

5e. ISD boundaries at Initial Gate and Main Gate Approvals

	Earliest	Most Likely	Latest Acceptable
Forecast ISD at Main Gate	January 2005	February 2005	March 2005
Forecast ISD at Initial Gate	-	May 2003	-

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POST-MAIN GATE PROJECT SUMMARY SHEET

SONAR 2087

Integrated Project Team Responsible:
S2087

SECTION 1: ABOUT THE PROJECT

1a. Project description, progress and key future events

Submarines remain one of the main threats to maritime forces and Sonar 2087 will significantly enhance the Royal Navy's Anti-Submarine Warfare capability. The new system offers improvements in the ability to detect, classify and track quieter submarines, particularly in littoral waters and at greater ranges.

Sonar 2087 combines active and passive systems and will be stern-mounted on Type 23 Frigates, replacing Sonar 2031 (passive towed array system), where fitted.

Feasibility Studies (FS) were approved in 1994. Two of the three competing companies were then selected to undertake Project Definition (PD) studies, following approval in April 1997. Approval was given in January 2001 for up to 16 sets, the total number of Type 23s. A contract for the Demonstration, Manufacture and Support of the first 6 ship sets was awarded to Thomson Marconi Sonar Ltd (now Thales Underwater Systems Ltd) in April 2001. The planned number of ship sets was reduced to 12 during the 2002 planning round. The contract has an option price for the remaining ship sets.

The programme of sea trials started in summer 2002. The first ship-fit, using pre-production equipment, is expected to begin in January 2004. The In-Service Date (ISD) is May 2006, with Initial Operating Capability in January 2007. All 12 ships are planned to be fitted by 2014.

1b. Associated projects

Critical to Achievement of ISD		Critical to Meet Initial Gate Requirement	
Project Title	Forecast ISD	Project Title	Forecast ISD
-	-	-	-

1c. Procurement strategy

Contractor(s)	Contract Scope	Contract Type	Procurement Route
Thales Underwater Systems Ltd (Formerly Thomson Marconi Sonar Ltd.)	Demonstration, Manufacture and Support	Firm Price	UK Competition

SECTION 2: PROJECT COSTS

2a. Performance against approved cost

£m (outturn prices)	Procurement Cost
Current Forecast Cost	354
Approved Cost at Main Gate	410
Variation	-56
In-year changes in 2002/2003	+12

2b. Reasons for variation from approved cost

Factor	Increase £m	Decrease £m	Explanation
Changed Requirement	12	26	Changes in the timings of asset deliveries in the 2003 equipment planning process have caused a change in the profile substantially increasing the IOC (+£12m). Reduction in planned number of ship sets from 16 to 12 (-£26m).
Risk Differential		42	Difference between the risk allowed for the most likely (50%) and highest acceptable (90%) estimates at Main Gate (-£42m).
Total	+12	-68	
Net Variation		-56	

2c. Expenditure to date

Expenditure to 31 March 2003 (£m)	61

2d. Years of peak procurement expenditure

2003/2004	2005/2006

2e. Unit production cost

Unit Production Cost (£m)		Quantities Required	
at Main Gate	Current	at Main Gate	Current
17.6	11.7	16	12

SECTION 3: PROJECT TIMESCALE

3a. Definition of in-service date

ISD Definition:	Initial acceptance of Sonar 2087 based on achievement of Key User Requirements 1 and 2.

3b. Performance against approved in-service date

	Date
Current forecast ISD	May 2006
Approved ISD at Main Gate	December 2006
Variation (Months)	-7
In-year changes in 2002/2003	0

3c. Reasons for variation from approved ISD

Factor	Increase	Decrease	Explanation
Risk Differential		7	Difference between the risk allowed for the most likely (50%) and highest acceptable (90%) estimates at Main Gate (-7 months).
Total	-	-7	
Net Variation	-	-7	

3d. Cost resulting from ISD variation

Type of Cost/Saving	Cost £m	Saving £m	Explanation
Support costs of current equipment	-	-	-
Other	-	-	-
Total	-	-	

3e. Operational impact of ISD variation

-

SECTION 4: KEY USER REQUIREMENTS

4a. Performance against approved key user requirements

Serial	Key Requirement	Currently forecast to be met (Yes or No)
1	Detection – Active (Deep Water)	Yes
2	Detection – Active (Shallow Water)	Yes
3	Detection – Passive	Yes
4	Variable Depth Capability	Yes
5	Classification – False Alarm Rate	Yes
6	Tracking – Active Capability	Yes
7	Combat System Integration	Yes
8	Unimpaired Speed	Yes
9	Survivability	Yes
10	Availability	Yes
	Percentage currently forecast to be met	100%
	Change since previous MPR	None

4b. Reasons for variation against approved key requirements

Key Requirement	Factor	Explanation
-	-	-

SECTION 5: HISTORY UP TO MAIN GATE APPROVAL

5a. Description of the assessment phase

Feasibility Study (FS) approval was given in April 1994 and Project Definition (PD) in April 1997. The options for meeting the requirement were tested at each stage. Alternatives such as off-the-shelf equipment or collaboration were investigated. The scope for trade-offs was assessed and costed proposals for the next phase produced. Parallel contracts were placed with 3 companies in the FS phase. Two were selected to carry out competitive PD studies. A series of measures reflecting budgetary constraints as well as realism delayed the ISD to December 2005. After risk reduction work at the end of the Assessment phase, Main Gate approval was granted in January 2001. The approval included acceptance of performance trade-offs (shortening of the passive array and removal of the torpedo interceptor) and a realistic plan for achieving the approved ISD of December 2006.

5b. Cost of the assessment phase

£m (outturn prices)	Assessment Phase cost	Proportion of total estimated procurement expenditure
Actual Cost	49	12.2%
Approved Cost at Initial Gate	52	11.3%
Variation	-3	

5c. Duration of assessment phase

	Date
Date of Main Gate Approval	January 2001
Target Date for Main Gate Approval	January 1998
Variation (Months)	36

5d. Cost at Initial Gate and Main Gate Approvals

£m (outturn prices)	Lowest	Most Likely	Highest
Cost of Demonstration and Manufacture Phase forecast at Main Gate	-	368	410
Cost of Demonstration and Manufacture Phase forecast at Initial Gate	-	416	-

5e. ISD boundaries at Initial Gate and Main Gate Approvals

	Earliest	Most Likely	Latest Acceptable
Forecast ISD at Main Gate	-	May 2006	December 2006
Forecast ISD at Initial Gate	-	July 2003	-

POST-MAIN GATE PROJECT SUMMARY SHEET

STING RAY LIGHTWEIGHT TORPEDO LIFE EXTENSION AND CAPABILITY UPGRADE

Integrated Project Team Responsible:
Torpedoes

SECTION 1: ABOUT THE PROJECT

1a. Project description, progress and key future events

The Sting Ray lightweight torpedo is the main anti-submarine weapon for ships and aircraft. It entered operational service in 1983 with a planned service-life of around 20 years. To provide an opportunity for international collaboration on a replacement, Sting Ray will remain in-service until around 2025 when it is envisaged that other nations will require replacement lightweight torpedoes. Accordingly, the Sting Ray torpedo needs to be life-extended and its capability enhanced.

The Sting Ray Life Extension (SRLE) programme was approved in May 1995 and a contract for full development was awarded to GEC-Marconi Underwater Systems Group (now BAE SYSTEMS Electronics Ltd) on 10 July 1996. The design is progressing well with the development in water trials completing in 2002. Contract Acceptance Trials are planned to complete during 2003. Following approval for the SRLE manufacture phase, a contract was awarded to BAE Systems on 30 January 2003.

In February 2001, as a result of a study into a less sensitive warhead for the life-extended Sting Ray, a new Insensitive Munition warhead was included in the SRLE programme at the Department's request. The warhead is required to comply with new Departmental safety policy. Ministerial approval was given for an Assessment Phase for the new warhead in September 2001. Assessment work continues and progress is good. A variety of options including both a new development and a modified commercial off-the-shelf warhead have been studied.

Future milestones: complete warhead assessment and decide way forward by early 2004; SRLE in-service date (ISD) of May 2006.

1b. Associated projects

Critical to Achievement of ISD		Critical to Meet Initial Gate Requirement	
Project Title	Forecast ISD	Project Title	Forecast ISD
-	-	-	-

1c. Procurement strategy

Contractor(s)	Contract Scope	Contract Type	Procurement Route
BAE SYSTEMS Electronics Ltd. (formerly GEC-Marconi Underwater Systems Group)	Full Development & Pre-Production	Fixed Price	Non-competitive contract with design authority of equipment. No sub-contract competition at first tier level.
BAE SYSTEMS Electronics Ltd	Manufacture & In Service Support	Firm Price	Non-competitive, but with competition for manufacturing sub-contracts the value of which amounts to 44% of overall value of the manufacture contract.

SECTION 2: PROJECT COSTS

2a. Performance against approved cost[1]

£m (outturn prices)	Procurement Cost
Current Forecast Cost	825
Approved Cost at Main Gate	769
Variation	+56
In-year changes in 2002/2003	+31

2b. Reasons for variation from approved cost

Factor	Increase £m	Decrease £m	Explanation
Changed Requirement	13	3	Assessment work on a new Insensitive Munition Warhead, resulting from change in Departmental munitions safety policy (+£12m). Removal of warhead life extension funds (-£3m). Addition of safety case to comply with new Health & Safety regulations for warships (+£1m).
Changed Budgetary Priorities	41		Increase to Interest on Capital due to: 12 month ISD delay (+£8m), earlier manufacture payments (+£19m) and rescheduling of test equipment deliveries (+£9m). Revised estimate for Trials activities (+£2m). Re-assessment of manufacture estimate (+£3m).
Inflation		1	Variation due to revised estimate for development contract Variation of Price clauses (-£1m).
Contracting Process	4		Development contract price exceeded estimate at approval (+£4m).

[1] SRLE is being treated as a SMART project for cost. The approved cost at MG comprises two separate approvals; Demonstration (50%) and Manufacture (90%).

Factor	Increase £m	Decrease £m	Explanation
Accounting Adjustments and Re-definitions	20		Inclusion of DERA support previously treated as an intramural charge (+£11m). Re-assessment of DERA support expenditure (+£5m). Derivation of the approved cost on a resource basis (+£4m).
Risk Differential		18	Difference between the risk allowed for in the most likely (50%) and highest acceptable (90%) estimate for the manufacture phase (-£18m).
Total	+78	-22	
Net Variation	+56		

2c. Expenditure to date

Expenditure to 31 March 2003 (£m)	161

2d. Years of peak procurement expenditure

2005/2006	2007/2008

2e. Unit production cost

Unit Production Cost (£m)		Quantities Required	
at Main Gate	Current	at Main Gate	Current
***	***	***	***

SECTION 3: PROJECT TIMESCALE

3a. Definition of in-service date

ISD Definition:	The date when the first 100 production standard weapons have been modified and are ready for issue to an operational unit.

3b. Performance against approved in-service date

	Date
Current forecast ISD	May 2006
Approved ISD at Main Gate	December 2002
Variation (Months)	+41
In-year changes in 2002/2003	0

3c. Reasons for variation from approved ISD

Factor	Increase (months)	Decrease (months)	Explanation
Changed Budgetary Priorities	24		The need to match the MoD programme to available resources in the overall pattern of MoD priorities (+24 months).
Contracting Process	17		Delay due to contract negotiations taking longer than expected (+9 months) and reassessment of programme timescales following negotiations (+8 months).
Total	+41		
Net Variation	+41		

3d. Cost resulting from ISD variation

Type of Cost/Saving	Cost £m	Saving £m	Explanation
Support costs of current equipment	19		Additional In Service Support of present Sting Ray torpedo (+£19m).
Other		14	Reduced In Service Support for updated torpedo (-£14m).
Total	+5		

3e. Operational impact of ISD variation

The ISD delay has enabled additional requirements to be incorporated into the weapon. However, the delay has the potential to cause a capability gap with the older and less effective Sting Ray weapon being retained in service with ongoing consequences for reliability. This capability gap should not be critical.

***

SECTION 4: KEY USER REQUIREMENTS

4a. Performance against approved key user requirements

Serial	Key Requirement	Currently forecast to be met (Yes or No)
1	Overall Torpedo Effectiveness	Yes
2	Hit Probability	Yes
3	Automobile Performance	Yes
4	Torpedo Counter Countermeasure Capability	Yes
5	Operational Environment	Yes
6	Water Depth	Yes
7	Acoustic Environment Capability	Yes
8	Warhead & Firing Chain	Yes
9	Availability, Reliability & Maintainability	Yes
10	Maintenance & Transport Environment	Yes
	Percentage currently forecast to be met	100%
	Change since previous MPR	None

4b. Reasons for variation against approved key requirements

Key Requirement	Factor	Explanation
-	-	-

SECTION 5: HISTORY UP TO MAIN GATE APPROVAL

5a. Description of the Assessment Phase

The equivalent of the Assessment Phase occurred within a number of Definition Studies undertaken between 1993 and 1995 under Sting Ray Post-Design Services at a cost of £2.6m. These studies considered six options which formed part of the dossier submitted to the Equipment Approvals Committee for Full Development and Pre-Production (FDPP) approval. Technical, engineering and environmental specifications together with FDPP, production and in-service support cost plans were also produced.

5b. Cost of the Assessment Phase

£m (outturn prices)	Assessment Phase cost	Proportion of total estimated procurement expenditure
Actual Cost	-	-
Approved Cost at Initial Gate	-	-
Variation	-	

5c. Duration of Assessment Phase

	Date
Date of Main Gate Approval	May 1995
Target Date for Main Gate Approval at Initial Gate	-
Variation (Months)	-

5d. Cost boundaries at Initial Gate and Main Gate Approvals

£m (outturn prices)	Lowest	Most Likely	Highest
Cost of Demonstration and Manufacture Phase forecast at Main Gate	733	751	769
Cost of Demonstration and Manufacture Phase forecast at Initial Gate	-	-	-

5e. ISD boundaries at Initial Gate and Main Gate Approvals

	Lowest	Most Likely	Highest
Forecast ISD at Main Gate	-	December 2002	-
Forecast ISD at Initial Gate	-	-	-

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POST-MAIN GATE PROJECT SUMMARY SHEET

SUPPORT VEHICLE

Picture not available

Integrated Project Team Responsible:
Combat Support Vehicles Heavy

SECTION 1: ABOUT THE PROJECT

1a. Project description, progress and key future events

The Support Vehicle project is a tri-service procurement of cargo and recovery vehicles and recovery trailers which will enhance the carriage and distribution of a variety of military loads and the recovery of both wheeled and tracked vehicle casualties in varying operational environments. The new vehicles will replace the current fleet of 4, 8 and 14 tonne cargo vehicles, three types of recovery vehicle and a recovery trailer. These vehicles are approaching the end of their planned lives and fail to satisfy current and future requirements in terms of agility, mobility and load carrying capability and some aspects of current UK and EU vehicle legislation.

A decision was taken in March 2001 to proceed with a conventional procurement instead of a Private Finance Initiative (PFI), by-pass the Assessment Phase and move directly to the main investment decision. In September 2001, approval was given to undertake an international competition to select a prime contractor for the demonstration and manufacture contract, together with a through-life support package. An Invitation To Tender was issued to industry in January 2002 and bids were received in June 2002. Responses to a second round of bidding were received in January 2003. Progress has been made towards a decision, but a third round of bidding will be required to address issues arising from the previous tendering rounds and a programming adjustment to the required In-Service Date (ISD) and delivery period. Evaluation of the further proposals will take place in the second half of 2003 to inform a decision on preferred bidder(s)

1b. Associated projects

Critical to Achievement of ISD		**Critical to Meet Initial Gate Requirement**	
Project Title	Forecast ISD	Project Title	Forecast ISD
-	-	-	-

1c. Procurement strategy

Contractor(s)	Contract Scope	Contract Type	Procurement Route
Bidders are: MAN Truck and Bus Ltd, Daimler Chrysler UK Ltd, Oshkosh Truck Corporation, Stewart and Stevenson TVS UK Ltd	Demonstration, Manufacture and In-service support for 20 years	Firm price for first five years and then fixed price subject to Variation Of Price	International Competition

SECTION 2: PROJECT COSTS

2a. Performance against approved cost

£m (outturn prices)	Procurement Cost
Current Forecast Cost	***
Approved Cost at Main Gate	***
Variation	***
In-year changes in 2002/2003	***

2b. Reasons for variation from approved cost

Factor	Increase £m	Decrease £m	Explanation
Changed Budgetary Priorities	***	***	***
Accounting Adjustments and Re-definitions		***	***
Risk Differential		***	***
Total	***	***	
Net Variation		***	

2c. Expenditure to date

Expenditure to 31 March 2003 (£m)	1

2d. Years of peak procurement expenditure

2008/2009	2009/2010

2e. Unit production cost

Unit Production Cost (£m)		Quantities Required	
at Main Gate	Current	at Main Gate	Current
***	***	8,231 Cargo	8,231 Cargo
***	***	389 Recovery	389 Recovery
***	***	69 Trailers	69 Trailers

SECTION 3: PROJECT TIMESCALE

3a. Definition of in-service date

ISD Definition:	Achievement of an operational capability with 161 Cargo vehicles and 8 Recovery vehicles and 2 Recovery trailers with the appropriate supporting through-life support package.

3b. Performance against approved in-service date

	Date
Current forecast ISD	April 07
Approved ISD at Main Gate	April 06
Variation (Months)	+12
In-year changes in 2002/2003	+19

3c. Reasons for variation from approved ISD

Factor	Increase (months)	Decrease (months)	Explanation
Technical Factors	2		Increased time given to all bidders to finalise their bespoke technical solution (+1 month). Time added to review the bespoke technical solutions against the requirement to establish possible trade-offs in performance. Included in this review was the need to revise the support strategy so that it is achievable within the approval (+1 month).
Contracting Process	17		A 2nd round of tendering undertaken to address commercial risks, cost, performance and any time efficiencies that could be introduced to maintain the approved boundaries (+2 months). Time added to allow the bidders to prepare their responses for the 2nd round and to evaluate responses (+5 months). A 3rd round of bidding will be necessary to respond to a change in the Fielding Plan (as a result of a planning measure to change ISD and the vehicle production period) (+5 months). Additional time estimated to close contract for split bid options (between Cargo and Recovery) with different bidders (+5 months).
Risk Differential		7	Difference between the risk allowed for in

Factor	Increase (months)	Decrease (months)	Explanation
			the most likely (50%) and the highest acceptable (90%) estimates at Main Gate (-7 months).
Total	+19	-7	
Net Variation	+12		

3d. Cost resulting from ISD variation

Type of Cost/Saving	Cost £m	Saving £m	Explanation
Support costs of current equipment	29		This covers the cost of running the current fleet (+£29m).
Other	-	-	-
Total	+29		

3e. Operational impact of ISD variation

The delayed In-Service Date will require extension to the in-service life of the existing cargo and recovery fleet. The impact will be an increase in planned in-service support costs, an inability to provide the required levels of capability for payload and mobility and affect the deployable operational capability of the Royal Air Force.

SECTION 4: KEY USER REQUIREMENTS

4a. Performance against approved key user requirements[1]

Serial	Key Requirement	Currently forecast to be met (Yes or No)
	Support Vehicles (Cargo & Recovery)	
1	The Support Vehicle Recovery and Support Vehicle Cargo shall be capable of meeting the Defence Planning Assumptions.	-
2	Capable of operating in world-wide climatic conditions.	-
3	Compatible with existing and planned replenishment systems.	-
4	Capable of completing a 48-hour Battlefield Mission without replenishment.	-
5	Able to communicate with other units in their formation.	-
	Support Vehicles (Cargo only)	
6	Capable of completing required Battlefield Mission	-
7	Deployable in its operational state by air	-
8	Capable of strategic deployment by sea	-
9	Capable of operating within the same parameters as other vehicles classified as Medium Mobility.	-
	Support Vehicles (Recovery only)	

[1] The preferred bidder for the Support Vehicle programme has yet to be selected. When a bidder has been selected it will become clear the degree to which each KUR will be satisfied.

Serial	Key Requirement	Currently forecast to be met (Yes or No)
10	The Land, Littoral and Air components shall have the capability to recover bogged, damaged and broken down wheeled and light A vehicles and provide the lift capability to the repair process in order to return them to operational use	-
11	Capable of recovering military vehicles in an operational environment.	-
12	Capable of lifting engines and main assemblies as part of the operational repair process.	-
13	Capable of manoeuvring engines and main assemblies as part of the operational repair process.	-
14	Capable of moving solo over the same terrain, within the same timeframe, as the B vehicles it supports.	-
15	Capable of recovering casualty vehicles from point of failure to a place of repair.	-
	Percentage currently forecast to be met	Not yet declared until a preferred bidder has been selected
	Change since previous MPR	Not Applicable

4b. Reasons for variation against approved key requirements

Key Requirement	Factor	Explanation
-	-	-

SECTION 5: HISTORY UP TO MAIN GATE APPROVAL

5a. Description of the Assessment Phase

The Support Vehicle programme has its origin as the Future Cargo Vehicles (FCV) and the Future Wheeled Recovery Vehicle (FWRV) projects. These were launched as potential Private Finance Initiative (PFI) programmes with advertisements in August 1998 and September 1999 respectively. The FCV project progressed through Pre-Qualification and Outline Proposal stages with 5 bidders short-listed. An Initial Gate Business Case was drafted in December 1999, but was not submitted for approval because it did not demonstrate value for money.

Further work was requested to identify areas for further innovation, and also to develop a 'smart' Public Sector Comparator (PSC). Work continued to produce a more robust case but it became clear that confidence in the PFI approach was unlikely to improve. The decision was taken in March 2001 to replace the PFI procurement strategy with a conventional strategy and hold a fresh competition. Furthermore the FCV with FWRV programmes were merged into a single procurement and proceeded directly to the main investment decision that was secured in September 2001. As the project bypassed the Assessment Phase, the time and cost boundaries were not set until Main Gate.

An advertisement was placed in the MOD Contracts Bulletin in April 2001, seeking expressions of interest in the Support Vehicle Programme. From the responses received a short-list of 6 potential prime contractors was drawn up.

5b. Cost of the Assessment Phase

£m (outturn prices)	Assessment Phase cost	Proportion of total estimated procurement expenditure
Actual Cost	-	-
Approved Cost at Initial Gate	-	-
Variation	-	

5c. Duration of Assessment Phase

	Date
Date of Main Gate Approval	September 2001
Target Date for Main Gate Approval at Initial Gate	-
Variation (Months)	-

5d. Cost boundaries at Initial Gate and Main Gate Approvals

£m (outturn prices)	Lowest	Most Likely	Highest
Cost of Demonstration and Manufacture Phase forecast at Main Gate	***	***	***
Cost of Demonstration and Manufacture Phase forecast at Initial Gate	-	-	-

5e. ISD boundaries at Initial Gate and Main Gate Approvals

	Earliest	Most Likely	Latest Acceptable
Forecast ISD at Main Gate	November 2004	September 2005	April 2006
Forecast ISD at Initial Gate[1]	-	-	-

[1] An ISD was not included in the Initial Gate Approval as it was not sought and thus the ISD was proposed in the Support Vehicle Main Gate Business Case

POST-MAIN GATE PROJECT SUMMARY SHEET

TYPE 45 DESTROYER

Integrated Project Team Responsible:
Type 45 Destroyer

SECTION 1: ABOUT THE PROJECT

1a. Project description, progress and key future events

The Type 45 is a new class of Anti-Air Warfare Destroyer, a planned class of up to twelve ships* to replace the Royal Navy's existing Type 42's. The warship is being procured nationally. The T45 will carry the Principal Anti-Air Missile System (PAAMS) which is capable of protecting the vessels and ships in their company against aircraft and missiles, satisfying the Fleet's need for area air defence capability into the 2030s. PAAMS is being procured collaboratively with France and Italy. The Type 45 Defence Procurement Agency project office is responsible for providing PAAMS to the warship Prime Contractor.

BAE SYSTEMS Electronics was appointed Prime Contractor for the Type 45 in November 1999 and a contract for Demonstration and First of Class Manufacture (DFM) for the first three ships was placed in December 2000. Following approval for a further three Type 45s a contract was placed with the Prime Contractor in February 2002. At that time a commitment was also made by the Prime Contractor to shipbuilders BAE SYSTEMS Marine and Vosper Thornycroft.

Recent achievements include, the issue of a draft tri-national PAAMS Follow-On-Contract to industry which will procure the missile systems for hulls two to six, agreement in principle to procuring PAAMS missiles through OCCAR (Organisation Conjointe de Coopération en Matière d'Armement), and the placing of the contract with MSI Defence for the Small Calibre Gun. Initial Manufacturing began on the First of Class, HMS Daring, at the of end of March 2003.

1b. Associated projects

Critical to Achievement of ISD		Critical to Meet Initial Gate Requirement	
Project Title	Forecast ISD	Project Title	Forecast ISD
-	-	-	-

1c. Procurement strategy

Contractor(s)	Contract Scope	Contract Type	Procurement Route
BAE SYSTEMS Electronics Prime Contractor	Full development and production.	Fixed price incentive fee with a maximum price.	Single Source

* The Type 45 is a planned class of up to 12 ships. Approval has, so far, only been given for 6 ships. It is on the approval of 6 ships that the Major Projects Report is presented.

Contractor(s)	Contract Scope	Contract Type	Procurement Route
EUROPAAMS	Full development and production.	Fixed prices to be agreed for the 5 follow on vessels.	Collaborative with France and Italy. The value for the first 6 ships amounts to approximately 60% of the overall value of the Prime Contract.

SECTION 2: PROJECT COSTS

2a. Performance against approved cost

£m (outturn prices)	Procurement Cost
Current Forecast Cost	5546
Approved Cost at Main Gate	5837
Variation	-291
In-year changes in 2002/2003	+124*

2b. Reasons for variation from approved cost

Factor	Increase £m	Decrease £m	Explanation
Changed Budgetary Priorities	91		Variation of +£91m caused by a combination of Equipment Plan Options plus internal adjustments, and related interest on capital. The Options were: re-profiling of the contract for demonstration and manufacture (approved six-ship programme); re-profiling of the (planned) twelve ship programme; reducing the scope of the PAAMS missile buy; costs of shipbuilders' premium.
Contracting Process	124		Higher than expected costs for PAAMS Production Equipment (+£124m).
Risk Differential		506	Difference between the risk allowed for in the most likely (50%) and highest acceptable (90%) estimates at Main Gate (-£506m).
Total	+215	-506	
Net Variation		-291	

2c. Expenditure to date

Expenditure to 31 March 2003 (£m)	854

* The in-year change takes account of an adjustment to the current forecast cost in MPR2002. This adjustment reflects the availability of more accurate figures. The actual amount approved to be spent on the project has not changed.

2d. Years of peak procurement expenditure

2006/2007	2007/2008

2e. Unit production cost

Unit Production Cost (£m)		Quantities Required	
at Main Gate	Current	at Main Gate	Current
726.0	552.7*	6	6

SECTION 3: PROJECT TIMESCALE

3a. Definition of in-service date

ISD Definition:	The date by which the First of Class will meet the Customer's minimum operational requirement.

3b. Performance against approved in-service date

	Date
Current forecast ISD	November 2007
Approved ISD at Main Gate	November 2007
Variation (Months)	0
In-year changes in 2002/2003	0

3c. Reasons for variation from approved ISD

Factor	Increase (months)	Decrease (months)	Explanation
Procurement Strategy	6		Revised procurement strategy due to delays in establishing arrangements with the Prime Contractor and shipbuilders (+6 months).
Risk Differential		6	Variations arising from the difference between the risk allowed for in the current estimate and the risk allowed for in the approval (-6 months).
Total	+6	-6	
Net Variation	0	0	

3d. Cost resulting from ISD variation

Type of Cost/Saving	Cost £m	Saving £m	Explanation
Support costs of current equipment	-	-	-
Other	-	-	-
Total	-	-	

3e. Operational impact of ISD variation

-

* Current Unit Production Costs has been revised from MPR02 to reflect the availability of better information and includes the PAAMS missiles within the approval.

SECTION 4: KEY USER REQUIREMENTS

4a. Performance against approved key user requirements

Serial	Key Requirement	Currently forecast to be met (Yes or No)
1	PAAMS The T45 shall be able to protect with a Probability of Escaping Hit of {x}*, all units operating within a radius of 6.5km, against up to 8 supersonic sea skimming missiles arriving randomly within {y}† seconds.	Yes
2	Force Anti-Air Warfare Situational Awareness. The T45 shall be able to assess the Air Warfare Tactical Situation of 1000 air real world objects against a total arrival and/or departure rate of 500 air real world objects per hour.	Yes
3	Aircraft Control. The T45 shall be able to provide close tactical control to at least 4 fixed wing aircraft, or 4 groups of aircraft in single speaking units, assigned to the force.	Yes
4	Aircraft Operation. The T45 shall be able to operate both one organic Merlin (Anti-Submarine Warfare and Utility variants) and one organic Lynx Mk8 helicopter, although not simultaneously.	Yes
5	Embarked Military Force. The T45 shall be able to operate an Embarked Military Force of at least 30 deployable troops.	Yes
6	Naval Diplomacy. The T45 shall be able to Coerce potential adversaries into compliance with the wishes of Her Majesty's Government or the wider international community through the presence of a Medium Calibre Gun System of at least 114mm.	Yes
7	Range. The T45 shall be able to transit at least 3000 nautical miles to its assigned mission, operate for 3 days and return to point of origin, unsupported throughout, within 20 days.	Yes
8	Growth Potential. The T45 capability shall be able to be upgraded to incorporate new capabilities or to enhance extant capabilities through displacement Margins of at least 11.5 %.	Yes
9	Availability. The T45 shall have a 70% availability to contribute to Maritime Operations over a period of at least 25 years, of which at least 35% shall be spent at sea.	Yes
	Percentage currently forecast to be met	100%
	Change since previous MPR	None

4b. Reasons for variation against approved key requirements

Key Requirement	Factor	Explanation
-	-	-

* Values are classified

† Values are classified

SECTION 5: HISTORY UP TO MAIN GATE APPROVAL

5a. Description of the Assessment Phase

The Type 45 Destroyer programme builds on the Assessment work carried out in Phase 1 of the collaborative HORIZON project, the warship element of the Common New Generation Frigate programme. Following the decision of the three HORIZON partners (France, Italy and the UK) to proceed with PAAMS, but to pursue national warship programmes, BAE SYSTEMS was appointed Prime Contractor for the Type 45 in November 1999. The contract for PAAMS Full Scale Engineering Development and Initial Production was placed in August 1999. Main Gate approval for the warship was achieved in July 2000 and a contract for Demonstration and First of Class Manufacture was placed in December 2000.

5b. Cost of the Assessment Phase

£m (outturn prices)	Assessment Phase cost	Proportion of total estimated procurement expenditure
Actual Cost	223	3.9%
Approved Cost at Initial Gate	213	3.5%
Variation	+10	

5c. Duration of Assessment Phase

	Date
Date of Main Gate Approval	July 2000
Target Date for Main Gate Approval at Initial Gate	-
Variation (Months)	-

5d. Cost boundaries at Initial Gate and Main Gate Approvals*

£m (outturn prices)	Lowest	Most Likely	Highest
Cost of Demonstration and Manufacture Phase forecast at Main Gate	-	5331	5837
Cost of Demonstration and Manufacture Phase forecast at Initial Gate	-	8198	-

5e. ISD boundaries at Initial Gate and Main Gate Approvals

	Earliest	Most Likely	Latest Acceptable
Forecast ISD at Main Gate	-	May 2007	November 2007
Forecast ISD at Initial Gate	-	December 2002	-

* Cost of Demonstration and Manufacture at Initial Gate was based on twelve ships. Main Gate Approval is for six ships and the difference relates to this.

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POST-MAIN GATE PROJECT SUMMARY SHEET

TYPHOON

Integrated Project Team Responsible:
Typhoon

SECTION 1: ABOUT THE PROJECT

1a. Project description, progress and key future events

Typhoon, formerly Eurofighter, will be an agile fighter aircraft. Air superiority is the primary design driver, but the aircraft will also have an air-to-ground capability. Typhoon will thus have the flexibility to respond to the uncertain demands of the current strategic environment, and will enable the RAF to replace the Tornado F3 and Jaguar aircraft. It is being developed in a collaborative project with Germany, Italy and Spain, and is managed on behalf of the nations by the NATO Eurofighter Tornado Management Agency (NETMA).

The contracts for the first tranche of 148 aircraft, of which 55 valued at some £2.5bn are for the UK, were signed on 18 September 1998. The second tranche comprising 236 aircraft, 89 of which are for the UK, is expected to be ordered around the end of 2003.

The three Instrumented Production Aircraft and each of the four nations first series production aircraft have all successfully completed their maiden flights (albeit later than planned). The programme suffered a setback in November 2002 with the crash of a development standard aircraft. This and other delays to the flight test programme delayed the in service date from June 2002 to June 2003. Estimated procurement costs have increased by some £1Bn since MPR 02 of which some £0.7Bn is due to additional Interest on Capital caused by the slippage to the In Service date and technical redefinition of the "beneficial use" date. This increase is partly offset at a Departmental Level by a decrease in the Interest on Capital paid by the Front Line Command.

A number of potential export customers have been identified and the Department (in conjunction with the partner nations and industry) is pursuing active export campaigns in Europe and the Far East. A contract for 18 aircraft and support was signed with Austria in the summer of 2003.

1b. Associated projects

Critical to Achievement of ISD		**Critical to Meet Initial Gate Requirement**	
Project Title	Forecast ISD	Project Title	Forecast ISD
-	-	-	-

1c. Procurement strategy

Contractor(s)	Contract Scope	Contract Type	Procurement Route
Eurofighter GmbH Airframe consortium comprising: Alenia BAE SYSTEMS EADS(CASA) EADS(Deutschland) Eurojet Turbo GmbH Engine consortium comprising: FIAT ITP MTU Rolls Royce	Development	Fixed Price for Airframe and equipments and Target Cost Incentive Arrangement for Aircraft Equipment Integration. Fixed Price.	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. Non-competitive but with international sub-contract competitive elements, the value of which amounts to some 10% of overall value of the Prime Contract.
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 Aircraft (Fixed prices for production of 1st 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 30% of the overall value of the Prime Contract.
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 aircraft. Fixed prices for Tranche 1 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.

SECTION 2: PROJECT COSTS

2a. Performance against approved cost

£m (outturn prices)	Procurement Cost
Current Forecast Cost	19670
Approved Cost at Main Gate	17364
Variation	+2306
In-year changes in 2002/2003	+1037

2b. Reasons for variation from approved cost

Factor	Increase £m	Decrease £m	Explanation
Technical Factors	1419	45	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). Slippage to the aircraft production programmes and the resultant Interest on Capital (IoC) Charge (+£610m). 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). Slower than expected technical progress reducing asset balances thereby reducing IoC (-£45m).
Changed Requirement	356	71	Provision for integration of new weapons and sensors not contained within original approval (includes Conventionally armed stand-off Missile (CASOM), Advanced Anti-Armour Weapon (AAAW), Low-Level Laser Guided Bomb (LLLGB), Thermal Imaging Airborne Laser Designator (TIALD)) (+£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)
Changed Budgetary Priorities		5	Reprofiling of expenditure, reducing asset balances and thereby reducing IoC (-£5m).
Inflation	205	308	Changes in inflation assumptions since approval: development (+£205m) and production (-£308m).
Exchange Rate		114	Changes in exchange rate assumptions since approval (-£114m).

Factor	Increase £m	Decrease £m	Explanation
Contracting Process	113	165	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).
Procurement Strategy	413		German withdrawal from certain equipments (+£106m). Reorientation Development Assurance Programme (DAP) to bridge gap between Development and Production Investment (+£28m); extension of integrated Logistic Support (ILS) programme (+£45m); Eurofighter/Eurojet GmbH management costs (+£30m); contract price increases (+£87m); risk provision (+£117m).
Accounting Adjustments and Re-definitions	726	218	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). Increases in IoC resulting from changes in accounting treatment of the delivery of assets (+£27m). A redefinition of Beneficial Use of Typhoon has resulted in the DPA incurring additional 1 years IoC on development expenditure (+£222m).
Total	+3232	-926	
Net Variation	+2306		

2c. Expenditure to date

Expenditure to 31 March 2003 (£m)	7690

2d. Years of peak procurement expenditure

2003/2004	2004/2005

2e. Unit production cost*

Unit Production Cost (£m)		Quantities Required	
at Main Gate	Current	at Main Gate	Current
-	56.8	232	232

* Note. Re-definition of some expenditure previously included in the Production costs, on which the Unit Production Cost (UPC) is calculated, as Development has resulted in a small reduction in the UPC.

SECTION 3: PROJECT TIMESCALE

3a. Definition of in-service date

ISD Definition:	Date of delivery of first aircraft to the Royal Air Force.

3b. Performance against approved in-service date

	Date
Current forecast ISD	June 2003
Approved ISD at Main Gate	December 1998
Variation (Months)	+54
In-year changes in 2002/2003	+12

3c. Reasons for variation from approved ISD

Factor	**Increase (months)**	**Decrease (months)**	**Explanation**
Technical Factors	32		Resulting from the application of complex technologies required to enable the equipment to meet the original Staff Requirement (+32 months).
Procurement Strategy	22		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).
Total	+54	-	
Net Variation	+54		

3d. Cost resulting from ISD variation

Type of Cost/Saving	**Cost £m**	**Saving £m**	**Explanation**
Support costs of current equipment	1075		Cost of running on Tornado and Jaguar (+£1075m).
Other		861	Estimated support costs of Eurofighter not incurred (-£861m).
Total	+215		

3e. Operational impact of ISD variation

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 failure.

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 4 years.

SECTION 4: KEY USER REQUIREMENTS

4a. Performance against approved key user requirements

Serial	Key Requirement	Currently forecast to be met (Yes or No)
1	Take off Distance	Yes
2	Landing Distance	No
3	Attributable Failures per 1000 Flying Hours	Yes
4	Life (Flying Hours)	Yes
5	Sustained Minimum Turn Radii at Sea Level, Max Reheat	Yes
6	Maximum speed at sea level	Yes
7	Maximum speed at 36,000 ft	Yes
8	Acceleration Time at Sea level from 200 knots to Mach 0.9	Yes
9	Instantaneous Turn Rate Sea Level, Max Reheat	Yes
10	Sustained Turn Rate at Mach 0.9 at 5000ft, Max Dry	Yes
	Percentage currently forecast to be met	90%
	Change since previous MPR	None

4b. Reasons for variation against approved key requirements

Key Requirement	Factor	Explanation
2. Landing Distance	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.

SECTION 5: HISTORY UP TO MAIN GATE APPROVAL

5a. Description of the Assessment Phase

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 (EAP), 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.

5b. Cost of the Assessment Phase

£m (outturn prices)	Assessment Phase cost	Proportion of total estimated procurement expenditure
Actual Cost	78	0.4%
Approved Cost at Initial Gate	87	0.4%
Variation	-9	

5c. Duration of Assessment Phase

	Date
Date of Main Gate Approval	November 1987
Target Date for Main Gate Approval at Initial Gate	-
Variation (Months)	-

5d. Cost boundaries at Initial Gate and Main Gate Approvals

£m (outturn prices)	Lowest	Most Likely	Highest
Cost of Demonstration and Manufacture Phase forecast at Main Gate	-	17364	-
Cost of Demonstration and Manufacture Phase forecast at Initial Gate	-	-	-

5e. ISD boundaries at Initial Gate and Main Gate Approvals

	Earliest	Most Likely	Latest Acceptable
Forecast ISD at Main Gate	-	December 1998	-
Forecast ISD at Initial Gate	-	-	-

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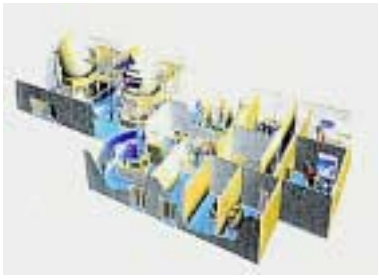
POST-MAIN GATE PROJECT SUMMARY SHEET

TYPHOON AIRCREW SYNTHETIC TRAINING AIDS (ASTA)



Integrated Project Team Responsible:
Typhoon

SECTION 1: ABOUT THE PROJECT

1a. Project description, progress and key future events

Aircrew Synthetic Training Aids (ASTA) will provide a ground-based synthetic aircrew training capability that is essential to supplement aircraft based training for the Typhoon fleet. ASTA comprises two training devices: a Full Mission Simulator (FMS) and a Cockpit Trainer (CT). The FMS will provide immersive pilot training in a high-resolution visual environment and replicate sensor performance against interactive threats. The CT will primarily be used to introduce pilots to the cockpit environment and associated procedures. It will be possible to network CTs to FMSs in order that trainees can be immersed in essential distributed mission training.

ASTA is being procured in collaboration with Germany, Italy and Spain. A single source contract was placed on behalf of the 4 Nations by NATO Eurofighter & Tornado Management Agency (NETMA) with Eurofighter GmbH who have subcontracted a joint venture company, Eurofighter Simulation Systems GmbH, representing the simulation industry from the 4 nations. For the UK, it is planned to procure ASTA in 3 Tranches covering provision for RAF Coningsby, RAF Leeming and RAF Leuchars. Main Gate approval covers the first (Coningsby) Tranche only. RAF Leeming and RAF Leuchars are expected to enter into service during the period 2008 to 2010. The programme is currently on schedule in the Demonstration and Manufacture stage. Construction of the first Typhoon Training Facility (TTF) at RAF Coningsby is expected to complete, on schedule, in mid 2003. This will house the first ASTA training devices together with ground support equipment training systems.

1b. Associated projects

Critical to Achievement of ISD		Critical to Meet Initial Gate Requirement	
Project Title	Forecast ISD	Project Title	Forecast ISD
Typhoon	2003	-	-

1c. Procurement strategy

Contractor(s)	Contract Scope	Contract Type	Procurement Route
EF GMbH	Demonstration & Manufacture	Fixed Price subject to Escalation[1]	Collaborative

1 'Fixed Price' is the UK MoD contract type definition and is identical to the NETMA 'Firm Price' definition reported in MPR 2002.

SECTION 2: PROJECT COSTS

2a. Performance against approved cost

£m (outturn prices)	Procurement Cost
Current Forecast Cost	209
Approved Cost at Main Gate	212
Variation	-3
In-year changes in 2002/2003	+3

2b. Reasons for variation from approved cost

Factor	Increase £m	Decrease £m	Explanation
Contracting Process	25	5	Difference between contract milestones estimated at Main Gate and actual milestones resulting in an increase in development costs (+£25m) and a decrease in production costs (-£5m).
Risk Differential		23	Difference between the risk allowed for in the most likely (50%) and highest acceptance (90%) estimates at Main Gate (-£23m).
Total	+25	-28	
Net Variation		-3	

2c. Expenditure to date

Expenditure to 31 March 2003 (£m)	131

2d. Years of peak procurement expenditure

2002/2003	2003/2004

2e. Unit production cost

Unit Production Cost (£m)		Quantities Required	
at Main Gate	Current	at Main Gate	Current
81.7	76.5	1	1

SECTION 3: PROJECT TIMESCALE

3a. Definition of in-service date

ISD Definition:	A Cockpit Trainer will provide the initial training capability at RAF Coningsby in September 2004.

3b. Performance against approved in-service date

	Date
Current forecast ISD	June 2004
Approved ISD at Main Gate	September 2004
Variation (Months)	-3
In-year changes in 2002/2003	0

3c. Reasons for variation from approved ISD

Factor	**Increase (months)**	**Decrease (months)**	**Explanation**
Risk Differential		3	Difference between the risk allowed for in the most likely (50%) and highest acceptable (90%) estimates at Main Gate (-3 months).
Total	-	-3	
Net Variation	-	-3	

3d. Cost resulting from ISD variation

Type of Cost/Saving	**Cost £m**	**Saving £m**	**Explanation**
Support costs of current equipment	-	-	-
Other	-	-	-
Total	-	-	

3e. Operational impact of ISD variation

-

SECTION 4: KEY USER REQUIREMENTS

4a. Performance against approved key user requirements

Serial	Key Requirement	Currently forecast to be met (Yes or No)
1	ASTA shall be capable of supporting the full range of recognised Typhoon training.	Yes
2	ASTA shall permit efficient training to Typhoon pilots based at UK Main Operating Bases (MOBs)	Yes
3	ASTA shall facilitate Mission Rehearsal/Practice and enable aircrew to maintain currency of their flying skills whilst deployed on operations outside of the UK. This will ensure that aircrew do not have to regularly return to the UK for training.	Yes
4	ASTA is to be available to meet full synthetic training syllabus of each MOB.	Yes
5	ASTA is required to be subject to upgrade concurrent with upgrades to the Weapon System (WS) so that Typhoon and ASTA functionality remains harmonised.	Yes
	Percentage currently forecast to be met	100%
	Change since previous MPR	None

4b. Reasons for variation against approved key requirements

Key Requirement	Factor	Explanation
-	-	-

SECTION 5: HISTORY UP TO MAIN GATE APPROVAL

5a. Description of the Assessment Phase

Initial approval of the ASTA requirement, to fund preparation work and allow Industry to inform an Invitation to Tender (ITT), was obtained in January 1995 as part of the approval for the EF2000 development phase re-orientation. In May 1996, following a Combined Operational Effectiveness and Investment Appraisal (COEIA), the Department obtained Equipment Approvals Committee (EAC) approval to release the ITT to industry.

The Department initially sought to satisfy the full ASTA requirement through a collaborative programme based on a single contract placed by NATO Eurofighter & Tornado Management Agency (NETMA). Due to the complexities of the international collaborative proposal, the Department decided to investigate a national Private Finance Initiative (PFI) solution. After full consideration, a collaborative approach was deemed to represent the lowest risk option to the Typhoon programme as a whole. This approach was endorsed by the EAC in October 2000, when approval was granted for ASTA demonstration and first Tranche manufacture (Main Gate).

5b. Cost of the Assessment Phase

£m (outturn prices)	Assessment Phase cost	Proportion of total estimated procurement expenditure
Actual Cost	3.8	1.8 %
Approved Cost at Initial Gate	2.9	1.4 %
Variation	+0.9	

5c. Duration of Assessment Phase

	Date
Date of Main Gate Approval	October 2000
Target Date for Main Gate Approval at Initial Gate	December 1995
Variation (Months)	+58

5d. Cost boundaries at Initial Gate and Main Gate Approvals

£m (outturn prices)	Lowest	Most Likely	Highest
Cost of Demonstration and Manufacture Phase forecast at Main Gate*	-	189	212
Cost of Demonstration and Manufacture Phase forecast at Initial Gate†	305	314	351

5e. ISD boundaries at Initial Gate and Main Gate Approvals

	Earliest	Most Likely	Latest Acceptable
Forecast ISD at Main Gate	-	June 2004	September 2004
Forecast ISD at Initial Gate	-	September 2001	-

* Costs shown are the approved costs at Main Gate for procuring the first Tranche of the ASTA programme.

† Costs shown are the noted costs at Initial Gate for procuring all three Tranches of the ASTA programme.

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CANCELLED POST-MAIN GATE PROJECT SUMMARY SHEET

MUTI-ROLE ARMOURED VEHICLE (MRAV)

Integrated Project Team Responsible:
MRAV

SECTION 1: ABOUT THE PROJECT

1a. Project description, progress and key future events

The MRAV programme was intended to provide the British Army with a modern and flexible family of armoured utility vehicles to operate in both high intensity conflict, rapid reaction peace support and humanitarian operations world-wide. The vehicle would provide enhanced protection, larger capacity and greater operational and tactical mobility compared with the ageing Fighting Vehicle 430 series, Combat Vehicle Reconnaissance (Tracked) utility variants and Saxon General War Role vehicles it was to replace. A dismountable mission module atop an 8-wheel drive, 4-wheel steer drive module would ensure maximum commonality, whilst allowing the flexibility to design and fit separate mission modules to meet the demands of a multi-role fleet.

The MRAV programme has been a trilateral collaborative programme between Germany, the Netherlands and the UK. On 5 November 1999, Germany and the UK signed a bilateral development contract with ARTEC GmbH. On 5 February 2001 the contract was amended to incorporate the Netherlands. The development contract included an option to manufacture a first batch of 600 vehicles to be split equally between the nations. The international MRAV programme is being managed by the Organisation for Joint Armament Co-operation (OCCAR). The first prototype was delivered in June 2002 for industry commissioning trials somewhat later than expected.

The MRAV project has been reviewed in the light of the Army's evolving requirements for mechanised infantry vehicles. In 2002 consideration of the need for faster, lighter and more deployable vehicles led to the removal of two of the six UK national variants and planning assumptions were adjusted accordingly. The subsequent outcome of New Chapter work has further refined the future combat support vehicle force mix, and Ministers have recently agreed that the revised capability will be better met by the Future Rapid Effect System (FRES) programme. Consequently, on 17th July 2003 Min(AF) announced the UK's withdrawal from the MRAV programme.

1b. Associated projects

Critical to Achievement of ISD		Critical to Meet Initial Gate Requirement	
Project Title	Forecast ISD	Project Title	Forecast ISD
-	-	-	-

1c. Procurement strategy

Contractor(s)	Contract Scope	Contract Type	Procurement Route
ARTEC GmbH (a consortium comprising Alvis Vickers Ltd (AVL), Krauss-Maffei Wegmann (KMW), Rheinmetall Landsysteme (RLS) and STORK PWV (SPWV)	Full Development with an option for Initial Production	Firm Price	International Competition

SECTION 2: PROJECT COSTS

2a. Performance against approved cost

£m (outturn prices)	Procurement Cost
Current Forecast Cost	63*
Approved Cost at Main Gate	428
Variation	-365*
In-year changes in 2002/2003	-255

2b. Reasons for variation from approved cost

Factor	Increase £m	Decrease £m	Explanation
Technical Factors		1	Delay in the development programme milestones resulting from the late delivery of the first prototype has reduced the Interest on Capital Charge (-£1m).
Changed Requirement		271	Reduction in development costs resulting from the Customer decision to equip the mechanised infantry with FRES rather than MRAV which has removed the requirement for an MRAV armoured mortar vehicle and a anti-tank platoon vehicle (-£16m). Customer and Ministerial decision to pursue the capability to be provided by MRAV via an alternative project has removed all production requirements. Some development funds uncommitted at the decision point have also been removed (-£255m).
Changed Budgetary Priorities		4	Reassessment of the cost of the joint project office (-£3m) and development of national variants (-£1m).
Inflation		2	Variation between GDP uplift factor and contract VOP indices (-£2m).
Contracting Process	32		The cost variation has resulted from extensive

* Project Cancelled – see section 5f

Factor	Increase £m	Decrease £m	Explanation
			contract negotiations where a number of UK specific requirements were added to the contract as an option (+£32m).
Procurement Strategy		118	Reduction in development costs associated with the Netherlands joining the programme and the UK share of initial production reducing from 300 to 200 vehicles (-£118m).
Accounting Adjustments and Re-definitions		1	Derivation of the approved cost on a resource basis (-£1m).
Total	+32	-397	
Net Variation		-365	

2c. Expenditure to date

Expenditure to 31 March 2003 (£m)	30

2d. Years of peak procurement expenditure

[1]	*

2e. Unit production cost

Unit Production Cost (£m)		Quantities Required	
at Main Gate	Current	at Main Gate	Current
1.0	*	***	*

SECTION 3: PROJECT TIMESCALE

3a. Definition of in-service date

ISD Definition:	**Original ISD Definition:** Was defined as the operational capability to deploy a Mechanised Brigade HQ and Mechanised Infantry Battalion. **ISD Definition at date of cancellation:** Was defined as an initial Operational Capability comprising 36 Armoured Personnel Carriers and 13 Command Vehicles fully operational in an AS90 Regiment and Brigade Headquarters. **Reason for Change:** The ISD definition was amended to reflect the customer decision not to deploy MRAV vehicles to the Mechanised Infantry following a reduction in overall vehicle numbers required.

3b. Performance against approved in-service date

	Date
Current forecast ISD	*
Approved ISD at Main Gate	March 2011
Variation (Months)	*
In-year changes in 2002/2003	*

[1] Project Cancelled – see section 5f

3c. Reasons for variation from approved ISD

Factor	Increase	Decrease	Explanation
-	-	-	-
Total	-	-	
Net Variation	-	-	

3d. Cost resulting from ISD variation

Type of Cost/Saving	Cost £m	Saving £m	Explanation
Support costs of current equipment	-	-	-
Other	-	-	-
Total	-	-	

3e. Operational impact of ISD variation

-

SECTION 4: KEY REQUIREMENTS

4a. Performance against approved key requirements

Serial	Key Requirement	Currently forecast to be met (Yes or No)
1	Capacity: MRAV will have the minimum useable capacity to carry up to 10 personnel plus adequate supplies to operate over a 48-hour battlefield mission.	[1]
2	Mobility: It is essential that MRAV can be transported by outsize airlift (such as C5, C17 and Future Large Aircraft).	*
3	Survivability: MRAV, without add-on-armour, must be protected against 20mm fragment simulating projectile.	*
4	Survivability: Occupants must be protected against effects of blast mine attack containing up to ***kg of explosive.	*
5	Survivability: MRAV must be fitted with Enhanced Protection overhead protection (top-attack armour).	*
6	Survivability: At night the Commander should be able to identify a NATO standard Target at ***m in poor conditions.	*
7	Reliability: Each design version shall have a basic reliability of 45% against the UK Battlefield Mission.	*
8	Armoured Treatment and Evacuation Vehicle (ATEV): To meet the treatment and evacuation roles, 2 configurations of ATEV are required. MRAV will be able to convert from one configuration to the other at first line.	*
9	Armoured Mortar Vehicle (AMV): AMV must mount the in-service mortar and it must be possible to fire that mortar throughout 6400	*

[1] Project Cancelled – see section 5f

Serial	Key Requirement	Currently forecast to be met (Yes or No)
	mils (360 degrees).	
10	Communications Variants (ComV): Com(V) must be able to mount and fully integrate all future communications equipment standard to role.	*
11	Anti-Tank Platoon Vehicle (ATPV): ATPV must be able to carry 2 Firing Posts, 6 personnel and 16 anti-armour missiles.	*
	Percentage currently forecast to be met	*
	Change since previous MPR	*

***** Project Cancelled - see section 5f

4b. Reasons for variation against approved key requirements

Key Requirement	Factor	Explanation
-	-	-

SECTION 5: HISTORY UP TO MAIN GATE APPROVAL

5a. Description of the assessment phase

There was no approval equivalent to Initial Gate for MRAV as the UK joined a Franco-German programme after France and Germany had conducted national Feasibility Studies. However, the UK did spend approximately £2m in formulating the Staff Requirement, conducting a Combined Operational Effectiveness and Investment Appraisal (COEIA) and tender assessment. The COEIA assessed the cost and operational effectiveness of the collaborative solution against a range of alternative options. This expenditure has been subsumed by the Main Gate approval.

France withdrew from the programme in September 1999 to pursue a national approach to meet its diverging aspirations.

5b. Cost of the assessment phase

£m (outturn prices)	Assessment Phase cost	Proportion of total estimated procurement expenditure
Actual Cost	-	-
Approved Cost at Initial Gate	-	-
Variation	-	

5c. Duration of assessment phase

	Date
Date of Main Gate Approval	March 1998
Target Date for Main Gate Approval	-
Variation (Months)	-

5d. Cost boundaries at Initial Gate and Main Gate Approvals

£m (outturn prices)	Lowest	Most Likely	Highest
Cost of Demonstration and Manufacture Phase forecast at Main Gate	-	428	-
Cost of Demonstration and Manufacture Phase forecast at Initial Gate	-	-	-

5e. ISD boundaries at Initial Gate and Main Gate Approvals

	Earliest	Most Likely	Latest Acceptable
Forecast ISD at Main Gate	April 2008	August 2008	March 2011
Forecast ISD at Initial Gate	-	-	-

Reasons for Cancellation

Section 5f – Post Main Gate

The MRAV requirement has been cancelled as the vehicle is not ideally suited to the type of operations now envisaged under the Strategic Defence Review New Chapter and other developing policy work. This policy, and experience gained in recent military operations around the world, have demonstrated the need for rapid deployability in expeditionary operations, which MRAV cannot meet to the satisfaction of the customer and did not form part of the endorsed MRAV requirement. The capability requirement will now be pursued through an alternative project, the Future Rapid Effect System (FRES).

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PRE-MAIN GATE PROJECT SUMMARY SHEET

BATTLEFIELD LIGHT UTILITY HELICOPTER (BLUH)

Integrated Project Team Responsible:
Lynx

SECTION 1: ABOUT THE REQUIREMENT

The Battlefield Light Utility Helicopter (BLUH) is required to support Air Manoeuvre, Littoral (sea to shore) Manoeuvre, and Special Forces operations within the Joint Task Force. Within Air and Littoral Manoeuvre, BLUH may be required to operate as an integrated system in conjunction with Attack Helicopter (AH). BLUH is also required to provide autonomous capabilities in support of all Ground Manoeuvre forces outside the AH operational ambit. BLUH capability will include Intelligence, Surveillance, Target Acquisition and Reconnaissance (ISTAR), direction of fire, mobility support, assistance in command and control, and casualty evacuation. BLUH seeks to supersede the capability currently provided by 45 Gazelle AH 1 and 124 Lynx Mk 7 and Mk 9. Gazelle will remain in service in some non-battlefield roles. Lynx Mk7, and to a lesser extent Mk9, are coming to the end of their fatigue life and require replacement within the next four years to ensure the continued delivery of this capability. An option was taken in April 2002 to reduce BLUH numbers from 102 to 85.

BLUH is closely linked with the planned Surface Combatant Maritime Rotorcraft (SCMR). SCMR is required to extend the above-water surveillance and attack capability in all required environments from open ocean to littoral in support of maritime, joint or combined operations. 39 Lynx Mk 3 and 36 Lynx Mk 8 currently provide this maritime capability. The Westland Helicopters Ltd Future Lynx (FLynx) proposal is currently being assessed for both BLUH and SCMR.

SECTION 2: THE ASSESSMENT PHASE

2a. Description of the Assessment Phase

Initial Gate (IG) approval for BLUH was given in December 2001, although the Assessment Phase (AP) contract with Westland Helicopters Ltd (WHL) did not become effective until May 2002.

Although subject to separate IG approvals, the BLUH and SCMR AP programmes are running jointly with a single tender solution for WHL to develop and de-risk its FLynx proposal. Analysis undertaken for the BLUH IG business case showed that there was little to discriminate between single tender and competitive strategies for this requirement, but that single tender offered a faster route to provide the capability within the required timescale.

The capability offered by FLynx is being rigorously assessed against the requirement for both BLUH and SCMR with an emphasis on maintaining commonality between the two aircraft where this offers best value. Independent product benchmarking is assessing the value for money of the FLynx compared with the AB139, NH90, UH-60M and EC655 helicopters.

The current forecast date for submission of the joint BLUH and SCMR Main Gate business case is December 2003.

2b. Cost of the Assessment Phase

£m (outturn prices)	Assessment Phase cost
Forecast Cost	42
Approved Cost at Initial Gate	44
Variation	-2

2c. Duration of Assessment Phase

	Date
Current forecast date of Main Gate Approval	December 2003
Target date for Main Gate Approval	December 2003
Variation (Months)	0

2d. Boundaries of future Demonstration and Manufacture phase costs

£m (outturn prices)	Lowest	Most Likely	Maximum	Range
Current forecast cost of Demonstration and Manufacture phase	860	943	1001	141
Forecast cost of Demonstration and Manufacture phase at Initial Gate	-	936	1141	-
% Change	-	-	-	-

2e. Boundaries of future project in-service dates

	Earliest	Most Likely	Latest	Range
Current forecast ISD	May 2007	August 2007	November 2007	6 months
Forecast ISD at Initial Gate	-	-	September 2006	-
% Change	-	-	+42%	-

PRE-MAIN GATE PROJECT SUMMARY SHEET

FUTURE AIRCRAFT CARRIER (CVF)

Integrated Project Team Responsible:
Future Aircraft Carrier (CVF)

SECTION 1: ABOUT THE REQUIREMENT

The requirement for the Future Aircraft Carrier (CVF) was endorsed in the Strategic Defence Review (SDR) which identified a continuing need for rapidly deployable forces with the reach and self-sufficiency to act independently of host-nation support. SDR 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. 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 UK requirements. It was therefore decided to replace the Invincible Class with two larger and more capable aircraft carriers able to operate up to 50 aircraft, both fixed-wing and helicopters. CVF's offensive air power will be provided primarily by the Future Joint Combat Aircraft (JCA). The carrier air group will also operate the Maritime Airborne Surveillance and Control (MASC) system together with helicopters from all three Services in a variety of roles that could include anti-submarine/anti-surface warfare, attack and support.

SECTION 2: THE ASSESSMENT PHASE

2a. Description of the Assessment Phase

CVF received Initial Gate approval in December 1998 and Invitations to Tender were issued in January 1999. Responses were received in May 1999 from industry teams led by British Aerospace (now BAE SYSTEMS) and Thomson-CSF (now Thales). Following tender evaluation, competitive firm price contracts for the Assessment Phase, each potentially worth some £30m, were awarded to both teams in November 1999. The Assessment Phase was originally 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 US Joint Strike Fighter (JSF) as the option with the best potential to meet the JCA requirement. The second stage was originally intended to involve parallel generic design work on carrier options capable of supporting the operation of JSF, followed, after a decision on JSF variant selection, by more detailed work to finalise the design parameters and reduce technological risk for the carrier option to be taken forward.

The first stage of Assessment completed in June 2001, after 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. The result the Assessment Phase strategy was changed. In a revised and shortened Stage 2, which completed in November 2002, the competing consortia concentrated on refining their designs and on taking key trade-off decisions. Based on the results of a Continuous Assessment process that operated during Stage 2, it was concluded that the best way forward for CVF would be through an alliance approach, in which BAE SYSTEMS act as the prime contractor and Thales take on a major role as the Key Supplier.

The Department will also take a formal role in the Alliance to ensure on time delivery of Government decisions and participate in the management of risk. The Department will also be responsible for ensuring the availability of other assets (including people) during the design and build phase.

The innovative Alliance approach seeks to incorporate the best elements of both companies, whilst maintaining an interest on behalf of the Government in how they work together. This revised strategy has increased the cost for the Assessment Phase. The cost baseline for the CVF Demonstration and Manufacture Phase was based on a Short Take Off & Vertical Landing (STOVL) Carrier at Initial Gate. As a result of Secretary of State's announcement on 30th September 2002, the baseline has now changed to a Carrier Variant (CV) based Adaptable Carrier design for the operation of STOVL JSF and rotary wing aircraft for MASC.

2b. Cost of the Assessment Phase

£m (outturn prices)	Assessment Phase cost
Forecast Cost	143
Approved Cost at Initial Gate	118
Variation	+25

2c. Duration of Assessment Phase

	Date
Current forecast date of Main Gate Approval	February 2004
Target date for Main Gate Approval	December 2003
Variation (Months)	+2

2d. Boundaries of future Demonstration and Manufacture phase costs

£m (outturn prices)	Lowest	Most Likely	Maximum	Range
Current forecast cost of Demonstration and Manufacture phase	***	***	***	***
Forecast cost of Demonstration and Manufacture phase at Initial Gate	2654	3047	3363	709
% Change	***	***	***	-

2e. Boundaries of future project in-service dates

	Earliest	Most Likely	Latest	Range
Current forecast ISD	***	***	***	***
Forecast ISD at Initial Gate	-	August 2012	-	-
% Change	-	0	-	-

PRE-MAIN GATE PROJECT SUMMARY SHEET

FUTURE INTEGRATED SOLDIER TECHNOLOGY (FIST)

Integrated Project Team Responsible:
Dismounted Close Combat (DCC)

SECTION 1: ABOUT THE REQUIREMENT

The Future Integrated Solider Technology (FIST) programme will integrate key technologies that British soldiers will need to have access to in order to maintain their place among the world's best. The programme aims to provide the future soldier with equipment that maximises effectiveness, while reducing physical and psychological load, the effects of combat stress and the opportunities for human error.

Historically, soldiers have been equipped in a piecemeal manner. FIST will consider the individual as a system, and the eight-man section as the platform. This system of systems approach, demonstrated successfully during the Concept Phase, will fundamentally improve the capabilities of those committed to dismounted close combat by providing an integrated suite of equipment encompassing the NATO domains of C4I (Command, Control, Communications, Computers and Information), lethality, mobility, survivability and sustainability.

SECTION 2: THE ASSESSMENT PHASE

2a. Description of the Assessment Phase

Initial Gate approval was achieved in August 2001. Four companies submitted tenders for the Assessment Phase (AP) prime contract, and a two-stage selection process was adopted (four to two and two to one). Two companies were de-selected in August 2002, leaving BAE SYSTEMS and Thales to take part in a competitive planning phase between August 2002 and January 2003. Final selection was informed by assessments of the bidders' planning and scheduling proposals, their proposals on technology exploitation during AP, their preparedness to engage in effective partnering arrangements, and their acceptance of contractual terms and conditions. The selection of Thales Optronics UK as the FIST AP prime contractor was announced on 12 March 2003. The AP is expected to take 32 months leading to a main investment decision in 2006 for which competition remains an option.

The FIST programme now incorporates elements of the CRUSADER 21 project, covering the enhancement of head protection, body armour and load carriage. FIST will also now be provided only for those Regular soldiers most likely to be deployed on operations. These changes have resulted in a small increase (lost in the roundings) in the cost of the Assessment Phase but a reduction in the cost of Demonstration and Manufacture.

2b. Cost of the Assessment Phase

£m (outturn prices)	Assessment Phase cost
Forecast Cost	26
Approved Cost at Initial Gate	26
Variation	0

2c. Duration of Assessment Phase

	Date
Current forecast date of Main Gate Approval	August 2006
Target date for Main Gate Approval	September 2006
Variation (Months)	-1

2d. Boundaries of future Demonstration and Manufacture phase costs

£m (outturn prices)	Lowest	Most Likely	Maximum	Range
Current forecast cost of Demonstration and Manufacture phase	388	584	815	427
Forecast cost of Demonstration and Manufacture phase at Initial Gate	433	661	925	492
% Change	-10%	-12%	-12%	-13%

2e. Boundaries of future project in-service dates

	Earliest	Most Likely	Latest	Range
Current forecast ISD	June 2009	August 2009	November 2010	17 months
Forecast ISD at Initial Gate	April 2009	July 2009	September 2009	5 months
% Change	+6%	+3%	+39%	+240%

PRE-MAIN GATE PROJECT SUMMARY SHEET

FUTURE STRATEGIC TANKER AIRCRAFT (FSTA)

Picture not available

Integrated Project Team Responsible:
Future Strategic Tanker Aircraft

SECTION 1: ABOUT THE REQUIREMENT

The Future Strategic Tanker Aircraft (FSTA) is planned to replace the air refuelling (AR) and some elements of air transport (AT) capability currently provided by the RAF's fleet of VC10 and TriStar aircraft. AR is a key military capability that provides force multiplication and operational range enhancement for front line aircraft across a range of defence roles and military tasks.

SECTION 2: THE ASSESSMENT PHASE

2a. Description of the assessment phase

FSTA was nominated as a potential Private Finance Initiative (PFI) project in 1997 when it was judged that the project could offer better value for money scoped as a service rather than an asset procurement, through the transfer of the risks of ownership to the private sector. Early work included a period of market building and Request for Information (RFI) and Invitation to Submit Outline Proposals (ISOP) phases. These activities provided confidence in the potential to secure a PFI solution.

Following Initial Gate approval in December 2000, the project launched a formal Assessment Phase designed to confirm whether PFI would offer best value for money. The Assessment Phase will confirm industry's ability to meet the service requirement, confirm programme timescales and costs, establish the optimum call-off times and readiness levels, determine whether the inclusion of Air Transport capability in the contract will provide value for money and clarify manning requirements and personnel implications.

An Invitation to Negotiate was issued in December 2000 and two consortia submitted initial bids in July 2001. Complex negotiations, aimed at agreeing mature draft PFI contracts with both bidders, have led to delays in completing the Assessment Phase. The Department announced on 17 June 2002 that the planned introduction of the PFI service would be delayed by 12 months (from 2007 to 2008) to allow time for the negotiations to complete. Final proposals are due on 30 April 2003. The consortia are:

- AirTanker Ltd comprising Rolls Royce, EADS, Cobham and Thales
- Tanker Transport Services Company Ltd comprising BAE Systems, Boeing, Serco & Spectrum Capital.

2b. Cost of the assessment phase

£m (outturn prices)	Assessment phase cost
Forecast Cost	23
Approved Cost at Initial Gate	13
Variation	+10

2c. Duration of assessment phase

	Date
Current forecast date of Main Gate Approval	April 2004
Target date for Main Gate Approval	January 2002
Variation (Months)	27

2d. Boundaries of future PFI Programme costs

£m (outturn prices)	Lowest	Most Likely	Maximum	Range
Current forecast cost of Demonstration and Manufacture phase	11300	12300	13100	1800
Forecast cost of Demonstration and Manufacture phase at Initial Gate	-	12400	13900	1500
% Change	-	-1%	-6%	-

2e. Boundaries of future project in-service dates

	Earliest	Most Likely	Latest	Range
Current forecast ISD	June 2009	November 2009	May 2010	11
Forecast ISD at Initial Gate[1]	January 2007	-	January 2009	24
Variation (%)	+48%	-	+19%	-

[1] At Initial Gate, EAC noted that ISD was expected to fall within a window of 2007 to 2009.

PRE-MAIN GATE PROJECT SUMMARY SHEET

GROUND BASED AIR DEFENCE

Picture not Available

Integrated Project Team Responsible:
Ground Based Air Defence (GBAD)

SECTION 1: ABOUT THE REQUIREMENT

This Project Summary Sheet relates to Phase 1 of the Ground Based Air Defence (GBAD) Programme. The aim of the Phase 1 Programme is to integrate the current in-service GBAD Weapons Systems (High Velocity Missile and Rapier Field Standard C) with an overarching Air Defence Command, Control, Communications, Computing and Intelligence (ADC4I) system in the 2005-2010 timeframe and to update the weapon systems to meet the future threat. The potential for wider low-level air battle space management inherent in such a system design will also be considered. The aim of the Phase 2 GBAD Programme is driven by the need to replace the capability provided by existing GBAD platforms as they reach the end of their service life around 2020. GBAD is essential to protect the deployed force and is complementary to Air Defence from the Air; both have individual strengths and weaknesses and provide unique capability against specific threats. GBAD is key to providing continuous protection (24 hours a day – in all weathers and for weeks, or even months at a time) against low-level air threats; particularly Attack Helicopters, Tactical Unmanned Air Vehicles and Cruise Missiles. GBAD is required to support heavy, medium and light forces across the full spectrum of operational scenarios and is particularly important during the deployment phase.

SECTION 2: THE ASSESSMENT PHASE

2a. Description of the Assessment Phase

Phase 1 of the GBAD project received ministerial approval to pass through Initial Gate in January 2002. The Assessment Phase will concentrate on enhancing the Situational Awareness (SA) of our legacy weapon systems by networking their organic sensors and providing connectivity to NATO Link systems. In addition, further Command, Control, Communications, Computing and Intelligence (C4I) improvements such as Electronic Support Measure (ESM) and Non Co-operative Target Recognition (NCTR) techniques combined with additional sensors within the GBAD network will also be considered. Furthermore, limited legacy weapon system improvements will be evaluated. Parallel studies into the wider battle space management implications of the improvements of air related SA at all levels in the command chain will also be undertaken. The Phase principally comprises the incremental acquisition of an ADC4I system through industrial competition, largely based upon a Military Off The Shelf solution. Two Contractors will be contracted to demonstrate their ADC4I solution through hardware demonstrations including limited integration with the current systems. They will also consider how their proposed solutions should be developed to accommodate the additional functionality provided by such capabilities as ESM and NCTR and subsequent migration to Phase 2.

2b. Cost of the Assessment Phase

£m (outturn prices)	Assessment Phase cost
Forecast Cost	138
Approved Cost at Initial Gate	144
Variation	-6

2c. Duration of Assessment Phase

	Date
Current forecast date of Main Gate Approval	March 2006
Target date for Main Gate Approval	March 2006
Variation (Months)	0

2d. Boundaries of future Demonstration and Manufacture phase costs

£m (outturn prices)	Lowest	Most Likely	Maximum	Range
Current forecast cost of Demonstration and Manufacture phase	845	1022	1233	388
Forecast cost of Demonstration and Manufacture phase at Initial Gate	845	1022	1233	388
% Change	0	0	0	0

2e. Boundaries of future project in-service dates

	Earliest	Most Likely	Latest	Range
Current forecast ISD	January 2009	December 2009	December 2010	23 months
Forecast ISD at Initial Gate	January 2009	December 2009	December 2010	23 months
% Change	0	0	0	0

PRE-MAIN GATE PROJECT SUMMARY SHEET

GUIDED MULTIPLE LAUNCH ROCKET SYSTEM (GMLRS)

Integrated Project Team Responsible:
Future Artillery Weapons Systems

SECTION 1: ABOUT THE REQUIREMENT

The Guided Multiple Launch Rocket System (GMLRS) will start to replace unguided MLRS M26 rockets as they reach the end of their shelf life from 2004 onwards. GMLRS rockets will be fired from modified M270 MLRS launchers. The requirement is for a rocket which will increase MLRS's range from 30km to at least 60km, with a reduction in heat and smoke signature. The rocket will use the Global Positioning System and inertial guidance in order to achieve the required accuracy and to significantly increase its effectiveness. The payload is initially planned to consist of bomblets fitted with self-destruct fuzes to address environmental concerns and to comply with extant and anticipated legislation. GMLRS is a modular design, to allow other payloads (such as unitary warhead and smart anti-armour sub-munitions) to be incorporated cost effectively.

The increased effectiveness of GMLRS will reduce the number of rockets required to defeat a target. This will allow stocks of GMLRS to be significantly lower than those for the M26 rocket, thus reducing the logistic burden and eventual disposal costs. At Initial Gate the UK's requirement was for 15,000 GMLRS rockets. However, reviews during the Equipment Planning (EP) process have caused the quantity to fluctuate, due to changing Customer priorities. The UK declared a requirement of 6,500 rockets to our international collaborative partners in 2002. The reduction in the forecast cost of the demonstration and manufacture phase reflects this reduced quantity, partially offset by an increase in the unit price of the rocket.

SECTION 2: THE ASSESSMENT PHASE

2a. Description of the Assessment Phase

An approval equivalent to Initial Gate was obtained in July 1998 for the UK to participate in a collaborative GMLRS assessment phase with the other MLRS Partner Nations (France, Germany, Italy and the US). As part of this phase, and acting on behalf of the Partner Nations, the US Department of Defense (DOD) awarded a prime contract to Lockheed Martin Missiles and Fire Control (LMMFC) in November 1998 to develop a GMLRS carrier rocket. The UK contributed 12.5% of the cost of the Engineering and Manufacturing Development (EMD) contract. The EMD contract was completed in early 2003, having been extended by the DOD from its earlier planned end date of November 2002. This extension, together with protracted negotiations with the US regarding the arrangements for manufacture, caused the deferral of planned Main Gate approval from December 2002 to July 2003. The purpose of the EMD phase was to reduce costs and risk through the use of off-the-shelf components and sub-assemblies, and by maximising sub-contractor competition. All MLRS Partner Nations have equal rights to the design resulting from the EMD contract, and have expressed a wish to enter into a collaborative manufacture phase

. However, whilst UK has declared its intention to procure its rockets from the US assembly line, France, Germany and Italy are evaluating alternative production arrangements that could be employed for the manufacture phase.

2b. Cost of the Assessment Phase

£m (outturn prices)	Assessment Phase cost
Forecast Cost	19
Approved Cost at Initial Gate	19
Variation	0

2c. Duration of Assessment Phase

	Date
Current forecast date of Main Gate Approval	July 2003
Target date for Main Gate Approval	December 2002
Variation (Months)	+7

2d. Boundaries of future Demonstration and Manufacture phase costs

£m (outturn prices)	Lowest	Most Likely	Maximum	Range
Current forecast cost of Demonstration and Manufacture phase	267	294	354	87
Forecast cost of Demonstration and Manufacture phase at Initial Gate	399	419	503	104
% Change	-33%	-30%	-30%	-16%

2e. Boundaries of future project in-service dates

	Earliest	Most Likely	Latest	Range
Current forecast ISD	March 2006	March 2007	January 2008	22 months
Forecast ISD at Initial Gate	December 2007	June 2009	December 2010	36 months
% Change	-35%	-35%	-36%	-39%

PRE-MAIN GATE PROJECT SUMMARY SHEET

INDIRECT FIRE PRECISION ATTACK (IFPA)

Picture not Available

Integrated Project Team Responsible:

Future Artillery Weapons Systems

SECTION 1: ABOUT THE REQUIREMENT

IFPA will provide a suite of munitions for indirect precision attack of static, mobile, and manoeuvring targets, by incremental acquisition, extending to ranges in excess of 100 kilometres by 2010.

The capability required under IFPA will be delivered via a structured programme of assessment, demonstration, and manufacture phases, which will continue after the project's Main Gate, via a series of 'mini-gate' approvals. The mix of munitions procured under the programme will have a range of In Service Dates, commencing in 2008, and extending as far as 2017.

The current Assessment Phase will recommend how the requirement under IFPA can best be met. It seems likely that it will be by a mixture of guided rockets, artillery shells, and other precision munitions, using a variety of different payloads, to engage both 'soft' and 'hard' military targets. The platforms initially using IFPA munitions will be the in service Multiple Launch Rocket System (MLRS) and the AS90 self-propelled howitzer, followed by the Lightweight Mobile Artillery Weapon System (Gun) (LIMAWS (G)), and LIMAWS (Rocket). No new platforms are to be developed under IFPA.

The demonstration and manufacture phases of IFPA were reviewed during Equipment Plan 2003, and longer term funding for these elements was substantially increased, reflecting the customer's growing requirement for a precision munitions capability. This is reflected in the increase in the forecast cost of the demonstration and manufacture phase noted in Section 2d below.

SECTION 2: THE ASSESSMENT PHASE

2a. Description of the Assessment Phase

An Initial Gate Business Case for IFPA was approved in May 2001. Following competition via a Capability Based Questionnaire, the Assessment Phase contract was awarded in May 2002 to a consortium of companies led by BAe Systems. Due to be completed in May 2005, the Assessment Phase is designed to provide a 'Route Map' to achieving the full IFPA capability, with recommendations about both the type and mix of munitions.

The current forecast date for submission of the Main Gate Business case is May 2005.

2b. Cost of the Assessment Phase

£m (outturn prices)	Assessment Phase cost
Forecast Cost	12
Approved Cost at Initial Gate	24
Variation	-12

2c. Duration of Assessment Phase

	Date
Current forecast date of Main Gate Approval	June 2005
Target date for Main Gate Approval	November 2005
Variation (Months)	-5

2d. Boundaries of future Demonstration and Manufacture phase costs

£m (outturn prices)	Lowest	Most Likely	Maximum	Range
Current forecast cost of Demonstration and Manufacture phase	926	1158	1505	579
Forecast cost of Demonstration and Manufacture phase at Initial Gate	-	813	-	-
% Change	-	+42%	-	-

2e. Boundaries of future project in-service dates

	Earliest	Most Likely	Latest	Range
Current forecast ISD	December 2006	December 2008	December 2010	48 months
Forecast ISD at Initial Gate	December 2006	December 2008	December 2010	48 months
% Change	-	-	-	-

PRE-MAIN GATE PROJECT SUMMARY SHEET*

LIGHT FORCES ANTI-TANK GUIDED WEAPON SYSTEM (LFATGWS)

Integrated Project Team Responsible:
Infantry Guided Weapons (IGW)

SECTION 1: ABOUT THE REQUIREMENT

The Strategic Defence Review (SDR) identified shortcomings in Joint Rapid Reaction Force (JRRF) anti-armour firepower, mobility and protection.

JRRF Light Forces are reliant upon their own organic anti-armour system until the deployment of heavier forces. The system needs to deliver a high rate of accurate fire, with minimal exposure for the operator, and must be readily man-portable; to achieve this effectively the capability must be delivered for a minimum weight.

For planning purposes, procurement of the Light Forces Anti-Tank Guided Weapon System (LF ATGWS) solution was assumed for all Infantry types, pending results of a Balance of Investment study run in parallel with the Assessment Phase. The study recommended providing the LF ATGWS for Mechanised Infantry, but an alternative for Armoured Infantry.

The equipment fills the capability gap identified by the SDR while replacing the ageing MILAN system.

SECTION 2: THE ASSESSMENT PHASE

2a. Description of the Assessment Phase

A Military Off The Shelf (MOTS) procurement is being pursued. The Assessment Phase evaluated available MOTS systems, established through competition the best value for money solution to meet the requirement and produced a recommended option.

Initial Gate Approval was secured in July 2000 and in July 2001 a Review Note was approved to incorporate the Mechanised Infantry requirement. Following the issue of a Request for Proposals in September 2000, a contract was placed with Rafael to enable evaluation of the Spike system, and two Foreign Military Sales (FMS) Cases were implemented with the US DoD to acquire the Javelin system and to obtain the services of the Javelin Joint Venture. These were the only weapons systems deemed likely to meet the requirements in the necessary timescale.

The Main Gate approval in January 2003 authorised the procurement of the Javelin system. A contract was placed with the Javelin Joint Venture (Raytheon and Lockheed Martin) in February 2003, supported by an FMS Case, for Demonstration, Manufacture and Support.

* The project population for MPR2003 was defined on 1 April 2002, before LFATGWS achieved Main Gate Approval. Therefore for MPR purposes, LFATGWS is reported as a pre-Main Gate project.

2b. Cost of the Assessment Phase

£m (outturn prices)	Assessment Phase cost
Forecast Cost	9
Approved Cost at Initial Gate	11
Variation	-2

2c. Duration of Assessment Phase

	Date
Current forecast date of Main Gate Approval	January 2003
Target date for Main Gate Approval	September 2002
Variation (Months)	+4

2d. Boundaries of future Demonstration and Manufacture phase costs

£m (outturn prices)	Lowest	Most Likely	Maximum	Range
Current forecast cost of Demonstration and Manufacture phase	309	316	338	29
Forecast cost of Demonstration and Manufacture phase at Initial Gate*	467	522	582	115
% Change	-34%	-39%	-42%	-75%

2e. Boundaries of future project in-service dates

	Earliest	Most Likely	Latest	Range
Current forecast ISD	July 2005	November 2005	August 2006	13 months
Forecast ISD at Initial Gate	December 2004	April 2005	June 2005	6 months
% Change	+26%	+23%	+42%	+117%

* Figures are based on those presented within Annex D to the Initial Gate Business Case, reflecting the assumption of additional delivery of the Light Forces solution to Armoured and Mechanised Infantry. This assumption was changed in 2001/02 when the requirement was reduced to cover the Light Forces and Mechanised Infantry only.

PRE-MAIN GATE PROJECT SUMMARY SHEET*

NEXT GENERATION ANTI-ARMOUR WEAPON (NLAW)

Integrated Project Team Responsible:
Infantry Guided Weapons (IGW)

SECTION 1: ABOUT THE REQUIREMENT

The Strategic Defence Review confirmed the requirement for a short range anti-armour weapon with a range of up to 600 metres as an essential component of the UK's anti-armour capability. The current capability is provided by LAW 80 which is reaching the end of its effective life.

Next Generation Light Anti-Armour Weapon's (NLAW) primary use will be to defeat armour in close battle. Its secondary use will be to attack defended positions such as bunkers. Recognising the potential for warfare in urban areas, it must be capable of being fired from within buildings. NLAW will be used by the infantry in conjunction with medium range weapons (up to 2000-3000m), but will be the only individual anti-armour weapon for other arms and services.
Operational analysis has indicated that, as a fixed point defence weapon, significant numbers of NLAW will be required in order to ensure there is sufficient coverage of the battlefield and rear areas.

SECTION 2: THE ASSESSMENT PHASE

2a. Description of the Assessment Phase

An Enhanced Off-The-Shelf procurement strategy (EOTS) is being followed for NLAW.

Following approval to issue an Invitation To Tender to conduct Project Definition studies in September 1997, competitive firm price contracts were awarded in October 1999 to Matra BAe Dynamics in the UK and Celsius in Sweden. The delay between approval and contract award was caused by uncertainty over the future of the Medium Range TRIGAT anti-armour programme, and resulted in slippage to the forecast ISD. Each contract lasted 22 months and bids for the Demonstration, Manufacture and Support phases were received in January 2001. The contractors were required to confirm the performance of their baseline system, developing weapon enhancements and prototype training systems needed to meet NLAW requirements.

Risk reduction and trade-off studies have been undertaken and detailed management, milestone and trials plans produced. The opportunities for collaboration with other countries have been explored and an MOU with Sweden, facilitating joint development, was signed in June 2002. Main Gate Approval to proceed to the Demonstration, Manufacture and Support phases, together with downselection to Saab Bofors Dynamics (formerly part of Celsius), was achieved in May 2002. Contract placement followed in June 2002.

* The project population for MPR2003 was defined on 1 April 2002, before NLAW achieved Main Gate Approval. Therefore for MPR purposes, NLAW is reported as a pre-Main Gate project

2b. Cost of the Assessment Phase

£m (outturn prices)	Assessment Phase cost
Forecast Cost	17
Approved Cost at Initial Gate	18
Variation	-1

2c. Duration of Assessment Phase

	Date
Current forecast date of Main Gate Approval	May 2002
Target date for Main Gate Approval	April 2000
Variation (Months)	+25

2d. Boundaries of future Demonstration and Manufacture phase costs

£m (outturn prices)	Lowest	Most Likely	Maximum	Range
Current forecast cost of Demonstration and Manufacture phase*	362	380	419	57
Forecast cost of Demonstration and Manufacture phase at Initial Gate	453	468	588	135
% Change	-20%	-19%	-29%	-58%

2e. Boundaries of future project in-service dates

	Earliest	Most Likely	Latest	Range
Current forecast ISD	August 2006	November 2006	July 2007	11 months
Forecast ISD at Initial Gate	May 2004	June 2005	August 2006	27 months
% Change	+55%	+27%	+14%	-59%

* Current forecast is based on lower weapon numbers than was envisaged when the approval was given.

PRE-MAIN GATE PROJECT SUMMARY SHEET*

TERRIER

Integrated Project Team Responsible:
Mobility

SECTION 1: ABOUT THE REQUIREMENT

Terrier is a lightly armoured highly mobile general support engineer vehicle optimised for battlefield preparation in the indirect fire zone. It will replace the existing Combat Engineer Tractor providing mobility support (obstacle and route clearance), counter-mobility (digging of anti tank ditches and other obstacles) and survivability (digging of trenches and Armoured Fighting Vehicle slots). Terrier is being procured by national competition with a planned In Service Date of 2008.

SECTION 2: THE ASSESSMENT PHASE

2a. Description of the Assessment Phase

A funded feasibility study for Terrier concluded that the most cost-effective way of meeting the requirement was to develop a new vehicle integrating, where possible, in-service sub-systems and commercial off-the-shelf equipment. Approval was given for a competitive Project Definition phase in August 1998 and firm price contracts were placed in August 1999 with BAE Systems (with the work undertaken by its subsidiary Royal Ordnance PLC) and Vickers Defence Systems. Both contractors developed detailed designs making extensive use of Computer Aided Design tools, virtual reality modelling, rigs and trials. The capabilities required and constraints imposed by physical limitations, such as rail and air transportability, resulted in very similar technical solutions. Both contractors offered tracked vehicles close in size weight and mobility to Warrior, having a crew of two and providing protection against small arms, high explosive fragments and mines. An Invitation to Tender (ITT) was issued in February 2001 to both companies which sought detailed proposals and prices for all later phases. The ITT also updated the requirement to reflect Smart Acquisition initiatives such as Progressive Acceptance and innovative Contractor Logistic Support proposals. The Main Gate Business Case was approved on 17 July 2002. The contract for Demonstration, Manufacture and Phase 1 Contractor Logistic Support was placed with Royal Ordnance PLC on 19 July 2002.

* The project population for MPR 2003 was defined on 1 April 2002, before the Terrier project achieved Main Gate approval. Therefore, for MPR 2003 purposes, Terrier is reported as a pre-Main Gate project.

2b. Cost of the Assessment Phase

£m (outturn prices)	Assessment Phase cost
Forecast Cost	17
Approved Cost at Initial Gate	17
Variation	0

2c. Duration of Assessment Phase

	Date
Current forecast date of Main Gate Approval	July 2002
Target date for Main Gate Approval	November 2001
Variation (Months)	+8

2d. Boundaries of future Demonstration and Manufacture phase costs

£m (outturn prices)	Lowest	Most Likely	Maximum	Range
Current forecast cost of Demonstration and Manufacture phase	289	300	309	20
Forecast cost of Demonstration and Manufacture phase at Initial Gate	-	291	-	-
% Change	-	+3.1%	-	-

2e. Boundaries of future project in-service dates

	Earliest	Most Likely	Latest	Range
Current forecast ISD	July 2008	September 2008	December 2008	5 months
Forecast ISD at Initial Gate	-	December 2007	December 2008	12 months
% Change	-	+12.3%	0%	-

Appendix 4 Project Glossary

Post-Main Gate Projects

A400M	Transport aircraft providing tactical and strategic mobility to all three Services to replace the remainder of the Hercules C-130K fleet.
Advanced Air-Launched Anti-Armour Weapon (AAAW)	Air-launched missile with a limited stand-off capability to attack armoured vehicles, that will be carried by Harrier GR9, Eurofighter and Tornado GR4 Aircraft.
Airborne Stand-Off Radar (ASTOR)	Long-range theatre-surveillance and target-acquisition system to detect fixed, static and moving targets, in all weathers by day and night.
Astute Class Submarine	Nuclear-powered attack submarines to replace the Swiftsure class.
Attack Helicopter (WAH-64 Apache)	Version of the United States Army's WAH-64 helicopter equipped with Longbow radar, Hellfire missiles, ground suppression rockets and air-to-air missiles and powered by RTM322 engines.
Beyond Visual Range Air-to-Air Missile (BVRAAM)	Air-to-Air missile, to be carried by Eurofighter, for engagement of targets at beyond visual range.
Bowman	A secure tactical data and voice communications systems for all three Services to replace the Clansman combat radio.
C-17 (previously known as Short Term Strategic Airlift)	Heavy airlift capability to satisfy strategic airlift requirement until A400M enters service.
Future Joint Combat Aircraft	The Short Take-Off Vertical Landing variant of the Lockheed Martin Joint Strike Fighter will replace the Royal Navy Sea Harrier and the Royal Air Force Harrier GR7 as a multi-role fighter/attack aircraft.
High Velocity Missile System (HVM)	Very Short-Range Air Defence weapon designed to attack armoured helicopters and low-flying aircraft from the ground.
Landing Ship Dock (Auxiliary), formerly Alternative Landing System Logistic (ALSL)	New class of ship designed to deploy troops, vehicles and equipment directly into operational areas.
Nimrod Maritime Reconnaissance & Attack MK 4 (Nimrod MRA4)	Replacement maritime patrol aircraft for the current fleet of MR2 aircraft, whose primary roles include anti-submarine warfare, anti-surface warfare and search and rescue.
Skynet 5	Private Finance Initiative programme to provide the next generation of flexible and survivable satellite communications services for military use.
Sonar 2087	Significant enhancement of the Royal Navy's Anti-Submarine Warfare capability, combining active and passive sonar systems and to be stern-mounted on Type 23 Frigates.

Successor Identification, Friend or Foe (SIFF)	Modern, NATO-compatible, secure IFF system, enabling swift and accurate identification of friendly forces.
Sting Ray Lightweight Torpedo Life Extension	Life-extension and capability-enhancement programme for the StingRay lightweight torpedo to enable it to remain in-service until around 2025.
Support Vehicles (Cargo and Recovery)	Cargo and recovery vehicles and recovery trailers to carry and distribute military loads and to recover wheeled and tracked vehicles.
Type 45 Destroyer	New Class of Anti-Air Warfare Destroyer to replace the existing Type 42 Destroyer. It will be equipped with the Principal Anti-Air Missile system.
Typhoon (formerly Eurofighter)	Agile air-superiority fighter with a swing-role, air defence/ground attack capability which will replace the RAF Tornado F3 and Jaguar.
Typhoon Aircrew Synthetic Training Aids (Typhoon ASTA) (formerly Eurofighter ASTA)	A ground-based synthetic aircrew training capability to supplement aircraft-based training for the Eurofighter fleet.

Pre-Main Gate projects

Battlefield Light Utility Helicopter	Helicopter to support air manoeuvre, littoral, manoeuvre and Special Forces operations which will replace Lynx Mark 7 and Mark 9.
Future Aircraft Carrier (CVF)	Two larger and more capable aircraft carriers to replace the current Invincible Class. The carriers will operate Future Joint Combat Aircraft (FJCA) and the Maritime Airborne Surveillance and Control (MASC) system together with helicopters from all three Services in a variety of roles.
Future Integrated Soldier Technology	A tri-Service project that aims to provide an integrated fighting system to troops that have to fight on foot at close quarters with the enemy, a role which is termed 'dismounted close combat'.
Future Strategic Tanker Aircraft (FSTA)	Replacement for air-to-air refuelling and some elements of air transport capability currently provided by the Royal Air Force's VC10 and TriStar aircraft.
Ground-Based Air Defence	Two-phase project, the first of which is to integrate current Air Defence weapons with a Command, Control, Communications, Computing and Intelligence system.
Guided Multi-Launch Rocket System (GMLRS)	Replacement for unguided MLRS bomblet rockets, with improvement over current performance, to be fired from MLRS launchers.
Indirect Fire Precision Attack	To provide a suite of munitions for precision attack of static, mobile and manoeuvring targets.
Light Forces Anti-Tank Guided Weapon System (LFATGWS)	System providing high rate of accurate anti-armour firepower to support light and rapid effect forces, to replace MILAN system.
Next Generation Light Anti-Armour Weapon (NLAW)	Short-Range anti-armour weapon to replace LAW 80.
Terrier	Highly mobile support engineer vehicle for battlefield preparation in the indirect fire zone, to replace Combat Engineer Tractor.

Cancelled project

Multi-Role Armoured Vehicle (MRAV)	Armoured utility vehicle that was intended to replace the Fighting Vehicle 430 series, Combat Vehicle Reconnaissance (Tracked) and Saxon General War Role vehicles for use in high-intensity conflict, rapid-reaction peace support and humanitarian operations.

Appendix 5 Glossary of contractual and acquisition terms

Assessment Phase	The second phase in the acquisition cycle beginning after the Concept Phase and Initial Gate Approval. During the Assessment Phase the Integrated Project Team (IPT) produces a System Requirement Document (SRD) and identifies the most cost-effective technological and procurement solution. Risk is reduced to a level consistent with delivering an acceptable level of performance within tightly controlled time and cost limits. By the end of the Assessment Phase a Business Case will have been assembled for Main Gate approval.
Business Case	The documentation submitted to the Approving Authority at Initial Gate or Main Gate, making the case for proposed expenditure on the next phases of the project.
Cost of Ownership	An annualised representation of the resources consumed directly in the procurement, operation, training, support and maintenance of military equipment at all stages of its life. The Cost of Ownership statement is the costed element of the Through-Life Management Plan.
Demonstration and Manufacture Phases	The third and fourth phases in the acquisition cycle, which begin after Main Gate approval, and continue until the equipment enters service. During the Demonstration and Manufacture Phases, development risk is progressively eliminated, the ability to produce integrated capability is demonstrated and the solution to the military requirement is delivered within time and cost limits appropriate to this stage.
Equipment Capability Customer	The Customer with responsibility for developing and managing a balanced and affordable equipment programme; including requirements definition; equipment planning; seeking approvals; and authorising acceptance. The Equipment Capability Customer (ECC) also has through-life responsibility for the equipment capability.
Equipment Programme (EP)	The Department's budgeting plan for expenditure on the equipment programme. It examines costs over the 10-year plan, and creates and considers options to match the required spend profile and Defence priorities.
Firm Price	An agreed price that is not subject to variation for inflation.
Fixed Price	An agreed price that is subject to variation to take account of inflationary and/or exchange rate movements.
Gainsharing	Where the Department and industry work together to derive mutual beneficial advantage from reopening and renegotiating current contracts.
Incremental Acquisition	An approach to acquisition in which successive equipment increments, which are flexible in detail, are planned within a scheme of known overall capability requirement and affordability, with each increment providing quantifiable free-standing military capability.
Initial Gate	The approval point preceding the Assessment Phase. At Initial Gate, a Business Case is put to the Equipment Approvals Committee to confirm that there is a well-constructed plan for the Assessment Phase that gives reasonable confidence that there are flexible solutions within the time, cost and performance envelope the Customer has proposed.

Interest on Capital	The opportunity cost to the Government of employing money in capital expenditure instead of on alternative investment opportunities. For the public sector, Interest on Capital has been charged at 6 per cent of the average capital employed during each year. This changed from 1 April 2003 to 3.5 per cent.
Investment Appraisal	A comparison of alternative investment options on a purely financial basis.
Key User Requirements	Requirements or constraints identified from within the wider set of user requirements, assessed as key to the achievement of the mission.
Liquidated Damages	A contractually pre-agreed sum payable by way of compensation in the event of a specific breach of contract (e.g. late delivery).
Main Gate	The approval point between the Assessment Phase and the Demonstration and Manufacture Phases. At Main Gate, a Business Case is presented, which should recommend a single technical and procurement option. By Main Gate, risk should have been reduced to the extent that the Director of Equipment Capability and IPT Leader can, with a high degree of confidence, undertake to deliver the project to narrowly defined time, cost (procurement and whole-life) and performance parameters.
NAPNOC (No Acceptable Price No Contract)	The Department's policy for non-competitive pricing, which seeks to replicate the pressures of competitive procurement in which a price is secured at the outset through the tendering process. Under the NAPNOC policy, non-competitive contracts should only be placed when a price has been agreed that reflects what it would cost an efficient contractor to carry out the work. NAPNOC contracts should, therefore, be priced before a contract is placed.
OCCAR (Organisation Conjointe de Coopération en Matière d'Armement)	A multilateral agency for the management of European co-operative acquisition programmes. The Member States are Belgium, France, Germany, Italy and the United Kingdom.
Prime Contractor	A contractor having responsibility for co-ordinating and integrating the activities of a number of sub-systems contractors to meet the overall system specification efficiently, economically and to time.
Request for Proposals (RFP)	A request by the Department for the contractor to supply proposals on how it would meet the requirement.
System Readiness Levels	A means of assessing the readiness of the design, development and testing regime of systems or sub-systems to be integrated, and whether candidate systems or sub-systems represent a risk to timely integration.
Technology Demonstrator Programme	A programme designed to demonstrate unproven technology using practical demonstrations, prior to its incorporation into a defence equipment programme.
Technology Readiness Levels (TRL)	A structured means of measuring and communicating the maturity of technologies within acquisition programmes.
Through-Life Management Plan	The Through-Life Management Plan should bring together key themes of Integrated Project Teams, Systems Engineering and improved commercial practices. An outline Through-Life Management Plan should be produced in the concept stage and maintained throughout the procurement cycle. It will show the full resources needed to meet the objectives of the project and is recognised by all stakeholders.
Whole-Life Costs	The aggregation of the annual Cost of Ownership statements covering the total resource required to assemble, equip, sustain operate, and dispose of a specified military capability at agreed levels of readiness, performance and safety.

Appendix 6 Definition of cost, time and performance variance categories

Category	Definition	Used to explain variations in
Technical		
Technical Factors	Variations due to changes in technical ability to deliver project	Time, Cost and Performance
Customer Requirement		
Changed Requirement	Variations due to changes in the customer's requirement for the equipment, flowing from operational reassessment rather than budgetary priority	Time, Cost and Performance
Changed Budgetary Priorities	Variations due to changes in the customer's requirement for equipment, flowing from changed budgetary priorities	Time, Cost and Performance
Economic Conditions		
Inflation	Variations due to changes in inflation assumptions	Cost
Exchange Rate	Variations due to changes in exchange rate assumptions	Cost
Management		
Receipts	Variations due to changes in expectation of receipts, e.g. liquidation damages, commercial exploitation levy	Cost
Contracting Process	Variations due to changes associated with the contractual process, including time taken in contract negotiations and placing contracts, international contract negotiation and effect of contractor bids compared to estimates	Cost and Time
Procurement Strategy	Variations due to changes in overall procurement strategy (e.g. change to collaborative options), or from competitive to single-source	Cost and Time
Reporting Conventions		
Accounting Adjustments and Re-definitions	Variations that do not reflect any substantive change: including imported or exported costs arising from changes in accounting rules and adjustments to reflect changes in the definition of terms	Cost and Time
Risk Differential (only used by projects with Smart approvals)	Difference between the risk allowed for in the most likely (50 per cent) and highest acceptable (90 per cent) estimates at Main Gate	Cost and Time
Associated Projects		
Change in associated project	Variations due to changes in an associated project e.g. availability of equipment from another project for trials	Cost and Time

Appendix 7 Progress in developing Whole-Life Costs

1 Whole-Life Costing is an important concept underpinning Smart Acquisition. One of the key principles of Smart Acquisition is that equipment investment decisions should reflect the whole-life cost implications rather than focussing solely on procurement costs. Whole-Life Costs, as applied to military capability and defence equipment, are the cost to the Department of an equipment throughout its life from concept to disposal. Whole-Life Costing is a continuous process of forecasting, recording and managing costs throughout the life of an equipment, with the specific aim of optimising its Whole-Life Costs and military output. This includes all acquisition and in-service costs such as operation, maintenance, repair, training, modifications and disposal.

2 This Appendix provides background to the introduction of Whole-Life Costs and summarises the Department's progress in developing and utilising robust Whole-Life Cost data. The Major Projects Report 2002 indicated that Whole-Life Cost data would be included in future Major Projects Reports for the 20 post-Main Gate projects. In the Major Projects Report 2003, we have undertaken a detailed scrutiny of the Department's Whole-Life Costs for these projects and have concluded that whilst data has been produced, it will continue to be subject to variation for the next few years as the Department becomes better at forecasting many years ahead. To put absolute Whole-Life Cost data in the Major Projects Report and assess projects against it does not fully represent how the Department is using the maturing Whole-Life Cost data. However, to demonstrate how Whole-Life Costs are being used, future Major Projects Reports will include a new cost and time variation category to show decisions made due to Whole-Life Cost reasons.

The Department has made progress in producing Whole-Life Cost data

The key enablers are in place

3 To progress its work on Whole-Life Costs, the Department established a Whole-Life Costing Team in April 2001 within the Defence Logistics Organisation. This team was tasked with delivering the processes, tools, guidance and training to assist Integrated Project Teams, and their stakeholders including Front Line Commands and Training Commands, across the Department to manage defence equipment capability, taking full account of the Whole-Life Costs.

4 The Department has chosen to use the Cost of Ownership as its preferred Whole-Life Cost metric. Cost of Ownership measures the cost of the resources directly (for example, fuel and spare parts) and indirectly (for example, storage or hangar costs) consumed throughout the life of the equipment. This method was chosen because it allows a comparable annual measure of performance as well as construction of a lifetime cost figure. **Figure 30** is a section of a Cost of Ownership template, illustrating the different cost categories.

5 The Whole-Life Costing Team have conducted an extensive and well-received training programme over the last 18 months. They have trained 2,500 people from the Department and industry, including 148 Integrated Project Teams and their major stakeholders. The result of this has been that, as at the end of May 2003, 90 per cent of 280 Cost of Ownership profiles requested were populated with some cost data. This has also meant that from 1 October 2002 all Main Gate Business Cases should have Cost of Ownership data included in their submission.

30 Example of a Cost of Ownership template, showing the two main data sources, the Operating Cost Statement and the Balance Sheet

Statement	COO Line	31 Mar 2010	31 Mar 2011
Operating Costs			
	Manpower	35.79	59.70
	Stock and Fuel Consumption	6.78	13.16
	General Services Received	54.23	92.26
	Cost of Capital	277.49	315.47
	Depreciation	116.23	148.64
	Other Costs	40.32	42.14
	Total Operating Costs	**530.83**	**671.37**
Balance Sheet			
	Intangible Assets	583.24	601.07
	Assets in the Course of Construction	2,112.44	1,938.63
	Fighting Equipment	865.51	1,530.70
	Other Fixed Assets	17.07	28.40
	Capital Spares	0.00	0.00
	RMC GWMB	1,349.65	1,484.73
	Stock and RMC	0.05	0.09
	Net Current Assets, Liabilities, & Provisions	1.51	2.51
	Total Net Assets	**4,929.48**	**5,586.12**

Source: Ministry of Defence

6 Leading the Whole-Life Cost initiative is a well-represented senior Whole-Life Cost Steering Group. It has representatives from all the relevant stakeholder areas and is responsible for ensuring that all relevant people are bought into Whole-Life Costs.

Cost of Ownership data requires effort and commitment to produce

7 In order for robust Cost of Ownership data to be produced, all stakeholders for each individual project must be bought in to the process of producing data and be aware of the benefit the data holds. It requires Integrated Project Teams to identify all stakeholders, to communicate with them and for all stakeholders to share a common understanding of the key elements of the project. For some large equipment platforms this can mean identifying and communicating with 30 stakeholders. For others, it means four stakeholders.

8 An important part of the stakeholder communication process involves the agreement and use of a consistent set of planning assumptions, with these assumptions being made available to all customers of the Cost of Ownership data. The Cost of Ownership assumptions will include, amongst other things, the boundaries for costing projects as there can be potential for confusion here. For example, the Future Joint Combat Aircraft is costed as a platform and without the missiles, which it will use. The Type 45 Destroyer however is costed with its missile system and missiles. Similarly, assumptions are also needed to establish which stakeholder costs should be included in an equipment Cost of Ownership profile.

9 The year 2002-2003 saw Cost of Ownership data being captured from stakeholders for the first time. The data we reviewed was still immature, especially in the area of stakeholder contributions. Stakeholder costs will continue to evolve as the stakeholders improve their understanding of what is required. The areas of stakeholder buy-in and contribution and of having a common understanding of what is being costed are key and the Department should continue to emphasise this.

The Department intends to use Cost of Ownership data as a strategic planning tool

At an individual project level

10 Cost of Ownership data is the costed element of an Integrated Project Team's Through-Life Management Plan, which holds all the information necessary to plan and maintain the project[19]. Cost of Ownership data will be integral to informing projects' long-term strategic planning. By identifying and communicating with stakeholders, projects should have a better understanding of the key elements of the project, for example, where a project will be based once in-service, what training requirements there will be, and when repairs or upgrades will be carried out.

11 For example, the Type 45 Destroyer Integrated Project Team has planned in advance when its significant maintenance periods will happen. This has enabled a key stakeholder, Naval Base Portsmouth, to start to think about the engineering and support requirements which will be required to complete this and how much this is forecast to cost. The Future Joint Combat Aircraft has also been communicating with stakeholders, especially in the area of training in order to build in time and resources for the high-tech training which will be required to fly the aircraft.

12 Cost of Ownership data gives Integrated Project Teams and their stakeholders significantly more visibility of in-service support costs than before, as these costs are planned on a four-year cost horizon only. The cost information can also show where the majority of the costs fall for any project, as demonstrated by **Figure 31**, a breakdown of Type 45's Whole-Life operating costs by stakeholder area.

At a capability level

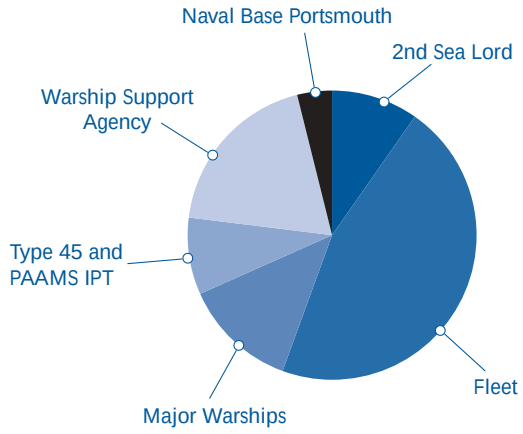
13 Cost of Ownership data is also seen and used by Customer 1, the Directorates of Equipment Capability, which charge Integrated Project Teams with responsibility for the delivery of capability. In order to forward plan on a long-term capability across the Department level, these Directorates produce capability area plans which project Cost of Ownership data feed into. Using Cost of Ownership data, Directorates can see long-term profiles of resource consumption and can identify where sufficient resources may not be available. They can also see the effect of equipment not meeting its in-service date or costing more than forecast and will be able to better plan for these eventualities. The data can be collated across the equipment areas to give an overall view of the Department's equipment programme years into the future. They can also be used to inform balance of investment decisions.

Cost of Ownership data will also provide invaluable cost forecasting data as costs become more refined

Progress has been made in producing data

14 All 20 post-Main Gate projects for the Major Projects Report 2003 reported Cost of Ownership data. We worked with the Whole-Life Costing Project Team to review these and looked at three case studies in more detail to gain a better understanding of the issues. The case study areas were Bowman, the Future Joint Combat Aircraft and Type 45 Destroyer. The data was found to be better than the data generated in previous years, but there is more to do.

31 Operating Cost Statement by Stakeholder



Source: National Audit Office

19 *For further information about Through-Life Management Plans, refer to the Comptroller and Auditor General's report 'Ministry of Defence - Through-Life Management', HC 698. Session 2002-2003. 21 May 2003.*

Refining Cost of Ownership data is the next step

15 The Department has Cost of Ownership data in varying forms of maturity. The next step is to refine the data so that it can be relied upon to support decision-making. This will be an ongoing process. The Whole-Life Costing Team are beginning to run training sessions on how to use the data. The Team are working closely with Integrated Project Teams and their stakeholders to refine data. They are also holding seminars in stakeholder areas to share knowledge. Some stakeholder areas have recognised the importance and usefulness of the data and are organising their own seminars and awareness-raising sessions.

Cost of Ownership data as a decision informer

Cost of Ownership data is being used

16 Cost of Ownership data was presented by the Integrated Project Teams to the Directorates of Equipment Capability in the 2004 equipment planning round. The data is now starting to inform planning and will increasingly be used to inform decisions. The Whole-Life Cost process is also encouraging stakeholders and projects to communicate and to make decisions informed by all relevant parties' planning assumptions, rather than only involve the in-service stakeholder when an equipment enters service. Data is also required to be presented to the Investment Approvals Board within business case submissions.

Analysis of the use of Cost of Ownership data by individual projects will feature in the Major Projects Report

17 As Cost of Ownership data is used to inform strategic planning and decisions, we expect to see variations occurring in the Major Projects Report which are a result of decisions taken on a Whole-Life Cost basis. For example, decisions could result in additional money being spent early in procurement to improve reliability and sustainability long term. These variations will be a key indicator of the Department using Whole-Life Cost data. We will also continue to work closely with the Department regarding the maturing of Whole-Life Cost data to explore ways to reflect Whole-Life Costs in future Major Projects Reports.

Reports by the Comptroller and Auditor General, Session 2003-2004

The Comptroller and Auditor General has to date, in Session 2003-2004, presented to the House of Commons the following reports under Section 9 of the National Audit Act, 1983:

		Publication date
Cross-government		
Managing resources to deliver better public services - Report	HC 61-I	12 December 2003
- Case studies	HC 61-II	12 December 2003
Defence		
Operation TELIC - United Kingdom Military Operations in Iraq	HC 60	11 December 2003
Major Projects Report 2003	HC 195	23 January 2004
Law, Order & Central Institutions		
Youth Offending: The delivery of community and custodial sentences	HC 190	21 January 2004
Public Private Partnership		
Refinancing the Public Private Partnership for National Air Traffic Services	HC 157	7 January 2004
Regulation		
Out of sight - not out of mind: Ofwat and the public sewer network in England and Wales	HC 161	16 January 2004

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A report by the Comptroller and Auditor General

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