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Report
by the Comptroller
and Auditor General

Ministry of Defence

Defence capabilities – delivering what was promised

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National Audit Office

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Report by the Comptroller and Auditor General

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This study examined whether the Ministry of Defence (the Department) gets the capabilities it requires when it needs them to meet its current and future defence objectives.

Contents

Key facts

£196.2bn

the estimated total procurement cost of the 32 most significant defence capabilities that the Ministry of Defence (the Department) is bringing into service

10

number of the Department's 32 most significant defence capabilities that require 'urgent action' to deliver in full, or are already 'undeliverable' to the current timetable

5

number of the Department's 32 most significant defence capabilities where delivery is 'probable' or 'highly likely' to be in line with schedule

12 months	average forecast delay to the delivery of an initial operating capability for the Department's most significant defence capabilities
26 months	average forecast delay to the delivery of a full operating capability for the Department's most significant capabilities
10	number of the Department's 32 most significant defence capabilities which face serious issues with supplier engagement and/or performance
9	number of the Department's 32 most significant defence capabilities which have significant skills shortages that are impacting on deliverability
12	number of additional Senior Responsible Owners that the Department calculated in 2018 it would need if each of the most significant defence programmes was to have its own

Summary

1   The Ministry of Defence (the Department) develops and operates military capabilities in order to meet its strategic requirements and objectives. A military capability is not simply a piece of equipment such as a tank. Rather, it is a tank with a trained crew that: can communicate with others on the battlefield; can meet identified threats; and can be properly maintained and repaired during its lifetime. The Department estimates that around 20,000 civilians and military personnel within the Department are involved in delivering such defence capabilities.

2   The military capabilities are intended to meet the strategic requirements that underpin UK defence policy, as set out in the National Security Strategy and five-yearly Strategic Defence and Security Reviews. Supporting this work are processes for identifying strategic threats and continuously analysing the UK's ability to meet them. Where the Department concludes there are current or future gaps in its ability to counter these threats, it must decide whether to fill the gap or carry the risk. However, once the Department has decided the gap must be filled with a new or replacement capability, it has historically struggled to deliver fully functioning capabilities to schedule.

3   Where the Department decides to fill a capability gap (or prevent one appearing), a Senior Responsible Owner (SRO) in one of the Commands (Air, Army, Navy, Strategic (formerly Joint Forces)), or the Defence Nuclear Organisation (DNO), oversees delivery of the capability.[1] The user requirements are tracked across eight 'defence lines of development', including the equipment itself, the relevant training and the infrastructure necessary to support it. A series of key milestones to delivering the capability underpin the project or programme.

4   As at 30 September 2019, there were 32 programmes defined as capabilities in the Department's Defence Major Projects Portfolio (DMPP) – those programmes the Department considers the most complex and strategically significant, its top priorities. These programmes have an estimated total procurement cost of £196.2 billion. Thirty of these programmes were also in the Government Major Projects Portfolio as at 31 March 2019. The DMPP programmes are overseen by the centre of the Department (known as 'Head Office'). Less significant programmes are monitored at Command level under the Department's delegated organisational model. The Department has a range of initiatives under way that are intended to transform the system to approve and monitor acquisitions.

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1   Where we refer to Commands this also includes DNO.

5   The focus of our study is on the delivery of defence capabilities, from the point at which the Department sets the requirement and starts the acquisition process through to the capability being declared fully operational. The work complements our review of the Department's Equipment Plan, which focuses on the cost of these capabilities.[2] In particular, this report considers whether the Department secures the capabilities it requires when it needs them. To do this, we examined:

● the extent and causes of delays and shortfalls in bringing capabilities into service (Part One);

● the completeness of the Department's system to monitor the delivery of capabilities (Part Two); and

● whether the Department is putting in place appropriate arrangements to transform its capability delivery in the future (Part Three).

6   The study does not examine why and how the Department derived a particular user requirement. We have also not looked in detail at the role of delivery organisations, such as Defence Equipment & Support, which act on behalf of the Commands (the customer). We set out our audit approach and evidence in Appendices One and Two.

7   Our report combines an overview of the Department's system for delivering the capabilities, with a detailed review of a sample of eight programmes from across the Commands (**Figure 1** and Appendix Three). We selected these programmes to enable us to examine the processes in place in more detail. Six of them sit outside the DMPP, thus providing us with insight into the majority of capability acquisitions which are not covered by the Department's central monitoring. They are not intended to be representative of all the Department's programmes. Instead, given the limited number of projects which passed through milestones during the sample period, they do illustrate how the Department's processes are currently being applied.

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2   Comptroller and Auditor General, *The Equipment Plan 2019 to 2029*, Session 2019–2020, HC 111, National Audit Office, February 2020.

Figure 1
Case studies examining passage of capabilities through a major milestone

Case study capabilities passing through Initial Operating Capability (IOC)/In Service Date (ISD)

HMS Forth Batch 2 Offshore Patrol Vessel

Navy Command

IOC milestone declared June 2019
ISD declared November 2019

Materiel Distribution Land equipment transporter upgrades

Army Command

Milestone declared January 2020 for part of the programme

F-35 fighter jet

Air Command

Milestone declared December 2018

Falcon Early Entry Capability battlefield communication system

Strategic Command

Milestone declared January 2018

Case study capabilities passing through Full Operating Capability (FOC)

Commando Training Centre Royal Marines Tactical Engagement System for battlefield training

Navy Command

Milestone declared January 2019

Watchkeeper unmanned reconnaissance vehicle

Army Command

Milestone declared November 2018

High G pilot training and testing facility

Air Command

Milestone declared November 2018

Upgraded Base Inventory Warehouse Management System

Strategic Command

Milestone declared January 2017

Notes
1   Details of the case studies are outlined in Appendix Three. Our case study selection approach is detailed in Appendix Two.
2   IOC is the minimum level at which the capability or service is usefully deployable. ISD is usually declared at the same time.
3   FOC is the military capability which is intended for a particular project.

Source: National Audit Office analysis of Ministry of Defence information

Key findings

Delays to capability delivery

8   The Department currently identifies major risks to the timely delivery of nearly one-third of its most significant capabilities. Delayed delivery can affect the Department's ability to meet external threats to national security, leave gaps in capability and require use of existing capabilities beyond their normal lifetime at increased cost. As part of the background work to its transformation initiatives, the Department carried out research that showed delays to capabilities are now less than they were 10 years ago. However, 10 of the 32 current most significant capabilities are rated by their SROs as either requiring 'urgent action' to address major risks to delivery, or being 'undeliverable' to the approved timescale. In contrast, the Department forecasts successful delivery is 'probable' or 'highly likely' for five of the 32 capabilities. Across the most significant capabilities there is an average delay of 12 months for those projects yet to reach Initial Operating Capability (IOC) and an average delay of 26 months for capabilities which are not yet fully operational. Other countries also experience significant delays in the delivery of capabilities (paragraphs 1.4, 1.5 and 1.8 to 1.10 and Figures 2 and 3).

9   The Department faces specific recurring challenges which affect the delivery of capabilities, of which the most persistent is late or faulty equipment delivery by the supplier. Our case studies and other analysis show that a range of factors affect delivery of each capability. In some cases, poor performance by suppliers has persisted over a number of years and has compromised the operation of capabilities. SROs of 10 of the 32 most significant capabilities currently being delivered report serious concerns about supplier engagement or delivery performance, from poor quality control to lack of transparency about progress. The suppliers involved in delivering these capabilities were predominantly a mix of UK firms and subsidiaries of non-UK companies (paragraphs 1.11 to 1.14 and Figures 4 and 5).

10   Commands and delivery teams lack capacity and skills, which affects delivery of the capability. Under-resourced project and delivery teams contribute to delays in delivery. Six of the 32 DMPP capabilities face shortfalls of more than 20% in their programme teams. Our 2019 report *Reforming the civilian workforce* drew attention to the issue of a lack of suitably qualified and experienced personnel in the Department.[3] There are particular shortages of engineering and commercial staff, and some teams are very reliant on consultancy support. SROs for nine of the 32 DMPP capabilities consider that a lack of team capacity and skills is affecting capability delivery. SROs themselves are crucial, being personally responsible for delivering the capability. A shortfall in the number of SROs has led to some individuals being spread across multiple projects. The Department is trying to address these gaps (paragraphs 1.15 and 1.17).

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3   Comptroller and Auditor General, *Reforming the civilian workforce*, Session 2017–2019, HC 1925, National Audit Office, March 2019.

11   The Department's introduction of capabilities is also hindered by an inability to provide appropriate training when required. The delivery of four of our case studies was affected by a lack of capacity and capability in providing necessary training. Reasons included a lack of appropriate personnel, funding shortages or insufficient equipment. For example, in our Falcon Early Entry Capability case study, reduced capacity within the organisation intended to deliver training led to additional expenditure on a short-term alternative (paragraph 1.18).

12   The Department's funding challenges affect individual capabilities and the whole portfolio. Our case studies included upgrades to existing capabilities which had been delayed to fund other priorities or where implementation was hindered by funding shortages. For example, a shortfall in training funds affected the upgraded Base Inventory Warehouse Management System, and infrastructure funding delays affected the F-35 fighter jet. We have reported for the past three years that the Department's overall equipment portfolio is unaffordable (paragraphs 1.19 and 1.20).[4]

Under-delivery of capability at key milestones

13   The Department declares key project milestones as achieved, without the intended capability always being delivered at that point. Departmental guidance permits the declaration of a milestone even if performance does not meet acceptance criteria, or if testing to confirm criteria have been met is incomplete. The Department allows exceptions for a variety of reasons, but the most frequently used in our case studies was that progress was "good enough", despite criteria not being met. In some cases, this affected the Department's ability to use the capability in the way intended. For example, in the case of the F-35 fighter jet (which accounted for two-thirds of exceptions in our case studies), delays to the provision of synthetic training facilities affected the availability of trained pilots and maintainers. Exceptions should be granted on the basis that there is a timebound plan for their resolution, but this was not the case in most of our sampled case studies. It was apparent that several of the capabilities needed further development work due to the original specification not meeting the user's capability needs (paragraphs 1.21, 1.23 and 1.24 and Figure 7).

14   We identified some examples where the definitions of milestones left the Department unclear what level of capability had actually been achieved against the specified requirements. A lack of clarity about the level of capability generated during acquisition can be caused by the milestone criteria not being sufficiently well defined. For example, in the case of the Type 45 destroyer, the SRO reported that it was unclear what level of capability had been achieved when the ships were declared in service between 2010 and 2013. This was because there was no single statement of the capability required at a particular stage. Even when a capability has technically reached Full Operational Capability (FOC), this does not mean it can do all that is required of it. For example, our case study of Watchkeeper, the Department's unmanned aerial vehicle, illustrates how significant issues remained to be addressed following declaration of FOC (paragraphs 1.21 to 1.23 and Figure 6).

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4   See footnote 2.

Monitoring progress of capability delivery

15   Head Office currently does not have the information it needs to hold Commands fully to account and make strategic decisions. Easy access to consistent information across the entire portfolio is vital for holding Commands to account and for making strategic decisions. Head Office has a strategic role in capability delivery and therefore concentrates on the DMPP. The Department has a central data system for collecting information on this subset of programmes, but it does not have ready access itself to information on all capability projects across the Department and has not ensured that the Commands have it. The DMPP accounts for more than 40% of the Equipment Plan over the next 10 years. It is not always clear why particular capability projects are excluded from the DMPP. There are limitations with the central data collected, which can be out of date when presented to senior decision-makers (paragraphs 2.1, 2.6 to 2.8 and Figure 8).

16   Commands' portfolio management arrangements are at different stages of development, which could affect their ability to hold SROs to account. The portfolio offices within the Commands vary in their maturity and the roles they carry out. Commands are upgrading the capability of their portfolio offices (or in the case of the DNO, developing one for the first time), but all have staffing gaps. Commands do not all have processes for measuring capability acquired against original requirements, although all have a forum for reviewing the progress of the Command portfolio. Nor do they all have information on all the capability projects and programmes within their portfolios, and they use different tools to collect this information, which may duplicate the centrally approved system. Not all Commands centrally manage the relationships and linkages between different projects, systems and activities. In selecting our case study examples, we found errors in Command-level information which, if repeated more widely, could provide a misleading picture of capability delivery (paragraphs 2.11 to 2.14 and Figure 9).

Transforming capability delivery

17   The Department has introduced capability transformation initiatives, but these will not address all the recurring issues with delivery. The Department has a portfolio of transformation projects, including several linked to capability delivery. Some of these initiatives are designed to improve the quality of thinking around milestone setting and monitoring, as well as to speed up the acquisition process. Potentially the initiatives could have prevented problems in our case studies where, for example, significant delays in delivering capabilities threatens their continued relevance. However, the initiatives would not in themselves have prevented some of the problems identified in our analysis, such as inadequate contractor performance or failure to deliver timely training. The Department's transformation initiatives are constantly evolving and run the risk of not being coordinated (paragraphs 3.1, 3.3 to 3.8 and 3.10 and Figure 10).

18   There is a risk that the Department's understandable desire to respond to the challenges of modern capability acquisition, encourages a culture in which capability levels are overstated or opaque. In late 2018, the Department's acquisition system review identified that its organisational culture prioritised the passing of milestones and securing approvals over the delivery of outputs and outcomes. The Department has concluded that the speed of technological change and the evolving nature of the threats it faces mean that its current acquisition processes are no longer fit for purpose. The Department wants to make capability acquisition quicker and more responsive through the introduction of a more rigorous business case process and by providing more flexibility in procurement routes for new technologies. The latter will involve a constant cycle of capability upgrades, which is not compatible with the current milestone-setting process. These objectives are important, but it is essential that it does not create a culture that encourages premature declarations of achievement of capability, or leaves it unclear what level of capability is available (paragraphs 3.4, 3.8 and 3.9).

19   The Department has introduced new processes to identify shortfalls in capability readiness, but their success is dependent on addressing the wider affordability challenge. Head Office has processes in place to assess both current and future capability, and the level of readiness of that capability. The additional mechanisms introduced, such as the Capability Readiness Assessment Framework, are intended to strengthen the ability of Head Office to monitor capability challenges and ensure they are addressed. However, addressing capability readiness issues is contingent upon having funding available. The Department already faces an affordability gap for its existing capability commitments and no new capabilities can be funded currently without reducing existing capability commitments further (paragraphs 3.11 and 3.12 and Figure 11).

Conclusion on value for money

20   The Department delivers complex, long-term capability programmes to meet the threats which it has identified. However, at a time of fast-paced technological and political change, it is essential that it can make swift and full use of these capabilities as planned. Failure to do so is likely to undermine the Department's ability to carry out its key tasks, and lead to existing assets being used for longer and additional costs. To achieve value for money, the Department must deliver capabilities to performance, cost and time consistently within a challenging funding envelope. While the Department may be able to deliver some individual capabilities in ways that deliver value for money, the frequent delays, problems with the quality of what is being delivered and poor monitoring information mean the Department has not achieved it for the portfolio as a whole.

21   In response to the challenges, the Department is currently implementing changes to its acquisitions and approvals systems. For these to be successful, the Department must change the culture around capability delivery in a number of ways, including ensuring that pressure to be seen to deliver capabilities quickly does not distort accurate reporting of progress. The Department also needs to address the affordability gap in the overall defence budget, as this affects its ability to maintain and enhance capabilities.

Recommendations

22 The Department needs to improve its delivery of defence capabilities to ensure it can meet the demands of modern warfare. We recommend:

a Head Office should ensure it has the capacity and capability to hold the Commands to account more effectively for capability delivery through a fully developed central portfolio office function. Management information systems should be aligned with need, provide an overall view of performance which is timely and consistent, and promote transparency at all levels.

b The portfolio office should carry out a root cause analysis to establish the causes of time slippages across the capability acquisition portfolio, and the extent to which particular initiatives will address endemic issues in capability acquisition. The lessons from this work should be considered by the Department's Board.

c The Department should be clear about what good capability delivery will look like following implementation of its current transformation programmes, and set out when benefits will be expected to appear. Guidance, particularly around milestones, should be updated to reflect any transition to a faster, more flexible procurement approach in a way that ensures that the current status of capabilities is clearly understood at all levels of the Department.

d The Department should instil a culture where exceptions are seen as just that – exceptional. The Department should require the communication of any exceptions on the most significant capabilities to the central approving authority prior to declaration of the milestone being achieved, together with an explanation of the implications for the future delivery timetable and budget for the capability. The approving authority would then be able to evaluate whether what has been achieved to date is consistent with what was approved.

e In its guidance and training to SROs and their teams, the Department should emphasise the importance of recognising and avoiding optimism bias in reporting of progress. It should also ensure SROs have enough time to carry out their roles when appointing them and look at how they can balance competing demands.

Part One

Delays bringing capabilities into service

1.1 This report examines how effectively the Ministry of Defence (the Department) is delivering the military capabilities it has decided it needs against the milestones that it sets itself.[5] It is intended to complement our work on the affordability of those capabilities delivered through the Department's 10-year Equipment Plan.[6] Our report on the 2019–2029 Equipment Plan concluded that the Department continues to manage budgets to address urgent in-year affordability pressures, and is introducing new commitments without fully understanding the impact on the affordability of the Plan.[7]

1.2 This report covers:

● current departmental performance in delivering capabilities and acceptance of key milestones (this Part);

● the Department's oversight of the challenges to delivery (Part Two); and

● how the Department is transforming capability delivery (Part Three).

Why this matters

1.3 In order to maintain or deliver future capabilities, the Department has allocated a budget of £181 billion to equipment and support projects alone for the period from 2019 to 2029, 42% of its entire budget for the period. The Department has estimated that around 20,000 civilian and military personnel are involved in delivering defence capabilities. In 2018-19, the Department's accounts stated that it had spent £32.4 billion (85% of the £38.1 billion total defence spend) on all activities linked to the provision of defence capabilities.[8,9] The Department cannot provide a more specific figure for the costs of bringing into service new capabilities.

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5 Capability – this is defined as the combination of equipment, trained personnel and support that gives the armed forces the capacity to achieve the tasks they are given.

6 Comptroller and Auditor General, *The Equipment Plan 2019 to 2029*, Session 2019–2020, HC 111, National Audit Office, February 2020.

7 Affordability challenges are also a feature of some of our case studies – see paragraph 1.20.

8 This estimate includes a proportion of costs which are not directly applicable to capabilities being brought into service, due to the way the costs are recorded within the Department's accounting systems. For example, it includes £10.5 billion of personnel costs under the heading 'provision of defence capability', which will include the costs of operating in-service capabilities.

9 Ministry of Defence, *Annual Report and Accounts 2018-19*, HC 2347, July 2019.

1.4 It is crucial for the security of the UK that the Department can bring capabilities into service as planned, and that they work as intended. The need for effective capability delivery is becoming more urgent due to pressures on resources and rapid developments in technology. Failure to respond to these pressures and deliver on time is likely to lead to capability gaps, overextended use of existing assets and additional costs (for example, the additional cost of the Offshore Patrol Vessels due to delays in the Type 26 programme – see Figure 5). The Department itself has identified issues with delivery to time and is currently undertaking a number of reviews designed to improve capability delivery, including bringing the Department more into line with approaches across government (see Part Three).

1.5 For many years, National Audit Office (NAO) reports have noted long delays in the Department delivering new or upgraded capabilities in line with key milestones. For example, in *The Major Projects Report 2010* we highlighted delays to the delivery of the Queen Elizabeth Class aircraft carriers and reductions in the level of capabilities being delivered.[10] The Committee of Public Accounts has also reported on these issues, and in March 2010 concluded that "Delaying projects once they have started increases costs, postpones the delivery of military capability and puts the Department at a disadvantage as it tries to secure value from its commercial partners."[11] The Department believes that its performance in delivering the capability it needs has improved in the last 10 years, although it is difficult to compare current performance with past eras on a like-for-like basis. In 2009, a report commissioned by the Department reported that programmes were delivered 80% later than initially expected.[12] In 2019, the Department's analysis indicated that the average had reduced to 46%.

Current departmental performance in delivering the most complex and strategically significant capabilities

1.6 The Department monitors those programmes it considers its top priorities – the most complex and strategically significant – through its Defence Major Projects Portfolio (DMPP).[13] As at 30 September 2019, there were 32 programmes in the DMPP which the Department classed as 'capabilities', with a forecast total procurement cost of £196.2 billion.[14] Thirty of these were also in the Government Major Projects Portfolio as at 31 March 2019.[15]

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10 Comptroller and Auditor General, *Ministry of Defence: The Major Projects Report 2010,* Session 2010–11, HC 489-I, National Audit Office, October 2010.

11 HC Committee of Public Accounts, *Ministry of Defence: The Major Projects Report 2009*, Twenty-third Report of Session 2009–10, HC 338, March 2010.

12 Bernard Gray, *Review of Acquisition for the Secretary of State for Defence: An independent report by Bernard Gray*, October 2009.

13 We describe these as the 32 most significant defence capabilities.

14 These costs include amounts already spent, and, for some capabilities, will extend beyond the 10-year period covered by the Department's Equipment Plan. This analysis includes the budgeted costs for one project where no forecast costs were available.

15 The Government Major Projects Portfolio is composed of the largest, most innovative and highest-risk projects and programmes delivered by the government, requiring HM Treasury approval.

1.7 Progress in delivering capabilities is monitored through key milestones. The two most common milestones, which we discuss in this report, are Initial Operating Capability (IOC) and Full Operating Capability (FOC). IOC is the minimum level at which the capability or service is usefully deployable. The Department expects this to be the same as the In Service Date (ISD), although they can be different for certain capabilities, for example, in our *HMS Forth* case study. FOC is the level of military capability which is intended for a particular project. Responsibility lies with the Command to decide what level of military deployable capability this will represent.[16]

1.8 As at 30 September 2019, 10 of the 32 capabilities in the DMPP (31%) were rated in the categories of 'urgent action is needed to address major risks to delivery' or 'delivery appears to be unachievable' (**Figure 2** overleaf).[17] This proportion stayed largely constant during the first nine months of 2019. Five capabilities record successful delivery as 'probable' or 'highly likely', notwithstanding any past slippages. However, two of these have already achieved the FOC milestone.

1.9 Twelve of the 17 most significant capabilities yet to achieve IOC are delayed. The average forecast delay is 12 months against the baseline date reported by the Senior Responsible Owner (SRO). The Department expects 14 of 20 projects to deliver the FOC late, with an average delay of 26 months across all projects delivering FOC (**Figure 3** on page 17). In its Equipment Plans for 2018 and 2019,[18] the Department showed three capabilities as due to enter service in 2019. These are:

• Astute-class submarine *HMS Audacious*. This submarine was due for operational handover into service in August 2019 but this has been delayed;

• the Marshall air traffic control system. This was due to enter service in June 2019, but is also delayed for technical reasons, with a forecast IOC date of May 2020; and

• integration of the Sea Ceptor missile on the Type 26 frigate. This was due in December 2019. This date actually represents the delivery of equipment for integration and this was delivered on schedule.

1.10 These challenges are not unique to the United Kingdom. The Australian National Audit Office reported a schedule slippage of 691 months across 26 major projects as at June 2019.[19] The US Government Accountability Office reported an average delay of more than 27 months in delivering the initial capabilities of the Department of Defense's 2018 portfolio of 82 major programmes.[20]

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16 There are four Commands (Air, Army, Navy, Strategic (formerly Joint Forces)) and the Defence Nuclear Organisation (DNO) who hold the responsibility and the budget for delivery of the portfolio of defence capabilities. Where we refer to Commands this also includes DNO.

17 The Infrastructure and Projects Authority sets the delivery confidence ratings definitions. Infrastructure and Projects Authority, *Annual Report on Major Projects 2018–19*, July 2018, available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/817654/IPA_AR_MajorProjects2018-19_web.pdf

18 Ministry of Defence, *The Defence Equipment Plan 2018*, November 2018, and Ministry of Defence, *The Defence Equipment Plan 2019*, February 2020.

19 Australian National Audit Office, *2018-19 Major Projects Report,* ANAO Report Number 19 2019-20, December 2019, available at: https://www.anao.gov.au/work/major-projects-report/major-projects-report-2018-19

20 United States Government Accountability Office, *Weapons Systems Annual Assessment*, GAO-19-336SP, May 2019, available at: https://www.gao.gov/assets/700/698933.pdf

Figure 2

Assessment of confidence in delivering against key milestones for capabilities in the Defence Major Projects Portfolio (DMPP), 2015-16 to 2019-20

A number of programmes continue to report risks to project delivery as at 30 September 2019

Number of programmes

	Q1 2015-16	Q2 2015-16	Q3 2015-16	Q4 2015-16	Q1 2016-17	Q2 2016-17	Q3 2016-17	Q4 2016-17	Q1 2017-18	Q2 2017-18	Q3 2017-18	Q4 2017-18	Q1 2018-19	Q2 2018-19	Q3 2018-19	Q4 2018-19	Q1 2019-20	Q2 2019-20
Green	2	2	2	1	2											1		1
Amber/green	6	6	5	4	2	2	4	3	3	4	2	3	3	3	3	3	2	4
Amber	9	9	10	15	18	17	16	17	18	10	14	14	18	20	22	18	19	17
Amber/red	4	4	4	5	4	5	5	5	7	12	12	11	6	6	3	6	7	7
Red	1	1	2	2	2	2	2	2	2	6	4	4	5	3	4	4	4	3
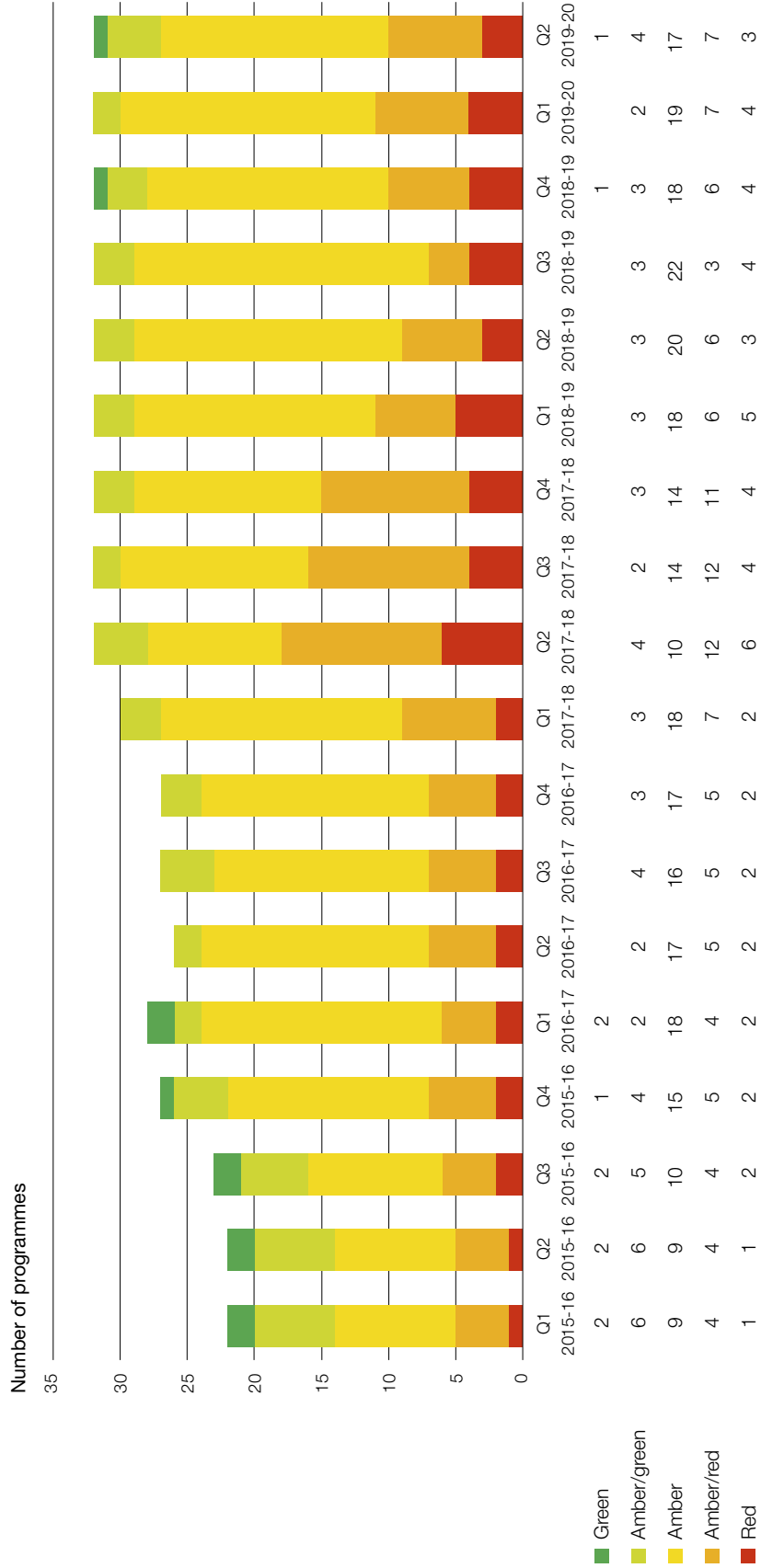
Notes

1 Red denotes where successful delivery of the project appears to be unachievable.

2 Amber/red denotes where successful delivery of the project is in doubt, and urgent action is needed to address whether resolution is feasible.

3 Amber denotes where successful delivery appears feasible but significant issues already exist, which prompt management attention should resolve.

4 Amber/green denotes where successful delivery appears probable.

5 Green denotes where successful delivery of the project appears highly likely.

6 Data cover all capability projects in the DMPP at the given time.

Source: National Audit Office analysis of Ministry of Defence data

Figure 3

Delays against delivery milestones for the most significant defence capabilities as at 30 September 2019

Initial Operating Capability (IOC)	Number of capabilities	Average delay (months)
With forecast delivery date	17 (of which 12 are delayed)	12
IOC already achieved	8	11
Milestone data absent or incomplete	7	–
Full Operating Capability (FOC)		
With forecast delivery date	20 (of which 14 are delayed)	26
FOC already achieved	2	One on time, one 49 months late
Milestone data absent or incomplete	10	–

Note

1   As at 30 September 2019, there were 32 programmes in the Defence Major Projects Portfolio which the Ministry of Defence classed as 'capabilities'.

Source: National Audit Office analysis of Ministry of Defence data

The main causes of delays to capability delivery

1.11 The Department's management information and our case studies show that a range of factors impact upon the delivery of capabilities. The most common problems are set out below.

Late or faulty equipment delivery

1.12 Late or faulty equipment delivery by the supplier is the major contributor to forecast and actual delays in capability delivery. This has been a longstanding concern for the Department, as evidenced in past NAO reports[21] and the Department's Equipment Plan.[22] **Figure 4** overleaf shows that 10 of the 32 capabilities within the DMPP report serious issues with the supplier's engagement or delivery performance as at 30 September 2019. The suppliers involved in delivering these capabilities were predominantly a mix of UK firms and subsidiaries of non-UK companies. SROs refer to a range of factors influencing this rating, both in the management information returns and in communication with the approving authority within the Department's Head Office, although all are linked to the non-delivery or defective nature of the equipment and systems involved. SROs refer variously to a lack of capacity and skills within suppliers, poor internal quality control, a failure of supplier senior management to engage with problems promptly, and a lack of transparency in supplier reporting of progress.

21   Comptroller and Auditor General, *Delivering Carrier Strike,* Session 2016-17, HC 1057-I, National Audit Office, March 2017.
22   Ministry of Defence, *The Defence Equipment Plan 2019*, February 2020.

Figure 4

Assessment of supplier issues for the Defence Major Projects Portfolio (DMPP) over time, 2015-16 to 2019-20

A proportion of capabilities continue to report concerns with supplier performance and relationships as at 30 September 2019

Number of programmes

	Q1 2015-16	Q2 2015-16	Q3 2015-16	Q4 2015-16	Q1 2016-17	Q2 2016-17	Q3 2016-17	Q4 2016-17	Q1 2017-18	Q2 2017-18	Q3 2017-18	Q4 2017-18	Q1 2018-19	Q2 2018-19	Q3 2018-19	Q4 2018-19	Q1 2019-20	Q2 2019-20
N/A				1				1	1	1								
Green	4	4	4	2	3	1	1	1	1				1	1	1	2	4	3
Amber/green	9	8	7	12	11	10	12	13	13	12	11	11	11	12	11	10	8	10
Amber	6	7	7	7	8	9	6	4	7	11	13	12	11	9	10	8	7	9
Amber/red	1	1	2	2	3	3	6	6	6	5	5	6	6	6	8	10	10	7
Red	2	2	3	3	3	3	2	2	3	3	3	3	3	4	2	2	3	3

Notes

1 For projects that are in the post-contract phase, green signifies supplier engagement and/or performance is going well, while red indicates that supplier engagement is poor or non-existent and/or is not delivering in accordance with the contract.

2 Data cover all capability projects in the DMPP at the given time.

Source: National Audit Office analysis of Ministry of Defence data

1.13 Within our case studies, equipment issues featured prominently as the cause of delays in several cases. For example:

- problems with the build quality of *HMS Forth* delayed IOC for more than a year;

- after a re-baselining of the delivery timetable in response to changes to air safety regulations, Watchkeeper's FOC was further delayed by several years due to equipment problems, some of which have led to loss of vehicles due to crashes; and

- emergent technical issues continue to affect the availability of the F-35 fighter jet, and training is affected by technical problems with simulators.

1.14 A supplier issue of a different kind emerged in our Materiel Distribution Land case study, which consisted of two separate vehicle projects. The contractor in this case was the existing provider, who was selected to take the solution forward through a non-competitive tender. However, it refused to be bound by the Single Source Contracting Regulations as it considered the profit rate was too low, halting progress in that aspect of the programme. We reported on resistance to compliance with the Regulations in October 2017,[23] and in March 2018 the Committee of Public Accounts recommended that: "Where suppliers refuse to comply with the regime, the Department should develop and apply appropriate sanctions."[24]

Lack of capacity and skills, and the effect on delivery of the capability and training in its use

Availability of skilled personnel

1.15 Deliverability can also be undermined by a lack of capacity and capability in the departmental teams responsible for delivery. Under-resourced teams in the Commands acting as the customer, as well as in the delivery organisations, contribute to delays in delivery. Skills and capabilities are a serious concern for nine of the 32 DMPP capabilities. Our 2019 report *Reforming the civilian workforce* drew attention to the shortages of suitably qualified and experienced personnel in the Department.[25] There are particular shortages of engineering and commercial staff, and some delivery teams are very reliant on consultancy support. Concerns about this challenge are most common in Strategic Command.[26] Six of the 32 DMPP capabilities face shortfalls of more than 20% in their programme teams. Three have a delivery confidence assessment of amber, and three have an assessment of amber/red or worse. Digital and nuclear programme teams display a particular reliance on external consultants to provide expert input to programme teams.

23 Comptroller and Auditor General, *Improving value for money in non-competitive procurement of defence equipment*, Session 2017–2019, HC 412, National Audit Office, October 2019.

24 HC Committee of Public Accounts, *Ministry of Defence: Acquisition and support of defence equipment*, Twenty-eighth Report of Session 2017–2019, HC 724, March 2018.

25 Comptroller and Auditor General, *Reforming the civilian workforce*, Session 2017–2019, HC 1925, National Audit Office, March 2019.

26 In December 2019, Joint Forces Command was renamed Strategic Command.

1.16 The Department also has to manage skills issues with suppliers. In one of our case studies, *HMS Forth* and the other Offshore Patrol Vessels were ordered with the primary intention of sustaining shipyard skills on the Clyde. However, quality assumptions of both the Department and the supplier proved invalid, causing delays to *HMS Forth* and her sister ships (**Figure 5** and Appendix Three).

1.17 SROs are responsible for ensuring projects deliver their expected objectives and benefits, often alongside other important line management roles. In 2018 the Department examined SRO capacity and nine SROs for capability programmes reported not having enough capacity to carry out their tasks effectively. The Department calculated at this time that 12 extra SROs would be needed if each DMPP programme was to have its own SRO. This figure included transformation as well as capability programmes, but the large majority of these additional SROs would work on capabilities. Separately, the Department sets out how much time SROs should spend on each capability, in the context of the total SRO capacity available. As at 30 September 2019 SROs spend less than the mandated amount of time in six cases.

Training

1.18 Four of our case studies – Falcon Early Entry Capability, F-35 fighter jet, the upgraded Base Inventory Warehouse Management System and Watchkeeper – experienced problems at the time of milestone acceptance because of a limited capacity and capability to deliver training. For the F-35, a lack of operational availability in the run-up to declaration of the milestone hampered the ability to deliver training. Also, the F-35 programme's delivery of training using simulators has been frustrated by technical difficulties and delays in security vetting. For Falcon Early Entry Capability, a lack of previously promised capacity in the training solution delayed IOC while the delivery team funded an alternative solution using the contractor. The Department's Accounting Officer informed the Committee of Public Accounts in November 2019 that training drone operators is the main threat to achievement of the Protector unmanned air vehicle's (UAV's) IOC date.[27]

Impact of affordability issues

1.19 Since 2012 we have reported on the annual Defence Equipment Plan (the Department's 10-year portfolio of equipment and support projects). Our most recent report concluded that for the third successive year, the Equipment Plan remains unaffordable and noted the Department's continuing inability to meet its commitments from the funds available.[28] The consequences of this inevitably feed through into capability delivery. For example, the Department reported to the Committee of Public Accounts in November 2019 that it had delayed the delivery of the Protector UAV by two years due to wider affordability challenges across the Department.[29]

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27 Ministry of Defence, *Protector programme Accounting Officer assessment*, November 2019, available at: https://assets. publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/854362/20191105_-_Meg_ Hillier_Protector_AOA.pdf
28 See footnote 6.
29 See footnote 27.

Figure 5

Case study extract for *HMS Forth* – Offshore Patrol Vessel (OPV)

Issues around programme management and skills monitoring

Three OPVs were ordered in 2014 at a cost of £378 million, with *HMS Forth* the first ship. The primary purpose for procurement of the OPV class was to maintain the skills of dockyard workers, due to delays in approving the start of production of the Type 26 frigate. Work to monitor the quality of the build was intended to inform decisions about the Type 26 programme, but significant quality issues with *HMS Forth* did not become apparent until 2018, more than six months after the start of Type 26 production. The contractor subsequently identified and rectified similar problems with the first Type 26 frigate. The Ministry of Defence told us the quality of work on subsequent ships is greatly improved.

Source: National Audit Office analysis of Ministry of Defence information.

1.20 In our case studies we found several examples where financial pressures had affected the timing and scope of capability delivery. For example:

- the Navy secured funding for the Commando Training Centre Royal Marines (CTCRM) Tactical Engagement System capability at Exmouth from the Education & Skills Funding Agency, as the Navy Command could not fund it;

- the upgraded Base Inventory Warehouse Management System was postponed for funding reasons until a key component of the legacy system was identified as life-expired, and then funding was provided. Even then, funding shortfalls created several problems during delivery of the capability;

- the Falcon Early Entry Capability battlefield communication system struggled to fund a training solution, which delayed progress; and

- there was delayed approval for funding of aspects of air base infrastructure for the F-35 fighter jet.

Underachievement against capability milestones

1.21 It is not only the speed of delivery against capability milestones that is important; it is also the extent to which promised capability is actually delivered. In some cases, this remains uncertain. A milestone should represent a specified level of capability and is declared by the SRO. Departmental guidance permits SROs to use their judgement to declare a milestone with limitations, termed 'exceptions'. These are granted to allow acceptance of the capability where performance does not meet the criteria for that milestone, or if testing to confirm achievement of the milestone criteria is incomplete. Exceptions are granted not only for interim milestones, but also for FOC.

1.22 Departmental guidance suggests a number of acceptable reasons for SROs to report exceptions. Most involve a trade-off for some aspect of capability, user changes to capability requirements, or acknowledgement that the original requirement was unrealistic. In addition, exceptions are acceptable:

● **to avoid the withdrawal from service of the old capability without an operational successor.** The Type 45 destroyer is an example where capability declarations were driven by a need to avoid a capability gap, as the older Type 42 destroyers were increasingly expensive to maintain in service and did not meet modern capability requirements. However, this led to a failure to acknowledge the extent of problems with the Type 45's innovative propulsion system (**Figure 6**); and

● **because the current level of capability offered is considered "good enough".** Departmental guidance does not clarify what this term means.

1.23 There were 102 exceptions granted against milestones for five of our six case studies where the option of granting exceptions was available.[30] Of these, 67 applied to declaration of the F-35 fighter jet IOC (**Figure 7** and Appendix Three). A large majority reflected non-achievement of the required level of performance at the relevant milestone. In these cases, the SRO had deemed performance was "good enough" (although for the F-35 this was based on the assumption that deployability would be demonstrated over the following 12 months). In addition:

● five of the eight exceptions for *HMS Forth* (the Offshore Patrol Vessel) reflected the fact that the ship had yet to be tested against some of the requirements;

● more than half of exceptions for the Falcon Early Entry Capability battlefield communication system involved the need to address shortfalls to the capability as provided, or enhance it beyond the original requirement; and

● limitations on the deployment of the Watchkeeper unmanned reconnaissance vehicle in certain weather conditions and low levels of aircraft availability for the F-35, were not noted as formal exceptions when approving milestones, although they affected performance.

1.24 According to the guidance, granting an exception should be conditional on a plan being in place to resolve the exception by a certain date. Most of the five case studies with exceptions lacked full documentation showing the dates by which they should be cleared

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30 Two of the case studies were not delivered through an approach where exceptions would be applicable, and one is delayed in achieving its milestone.

Figure 6

Type 45 destroyer – example of non-declaration of Full Operating Capability (FOC)

The Type 45 destroyer incurred significant engine problems during and after its entry into service

The Ministry of Defence (the Department) procured six anti-air warfare destroyers to replace the Type 42 destroyer. The Department declared them in service between July 2010 and December 2013, at a cost of £5.8 billion for the original build and £0.2 billion for the current propulsion upgrade. The last Type 42 destroyer was withdrawn from service in June 2013.

Propulsion problems were already apparent when the first ship, *HMS Daring*, entered service in July 2010. Problems increased significantly when the Department deployed ships to the Gulf during 2012 and 2013, with an incident approximately every two days at sea. Despite this, the Department continued to accept ships into service through to *HMS Duncan* in December 2013. High-profile failures prompted renewed efforts by the Department and industry to solve the problem. The Type 45 left the Government Major Projects Portfolio in April 2014. At this time the Senior Responsible Owner reported that the user lacked a clear understanding of the capability performance due to multiple layers of acceptance criteria. The Navy rated delivery confidence of FOC in December 2015 as 'highly likely'. While operating improvements reduced the frequency of defects, they could not mitigate the serious impact of defects when they did occur. Therefore, the Navy did not declare FOC. In March 2016, Navy Command submitted Project Napier for approval by the Department's central approvals committee to upgrade the ships' propulsion system. This was the committee's first involvement with the procurement since 2007, as the ships had entered service in line with the approved timetable. The Department will complete the upgrade by the mid-2020s.

Source: National Audit Office analysis of Ministry of Defence documents.

Figure 7

Case study extract: F-35 fighter jet Initial Operation Capability (IOC) declaration

F-35 IOC was granted with 67 exceptions

The F-35 is a multi-country project to source a 'fifth-generation' multi-purpose fighter plane. The Ministry of Defence (the Department) is buying 48 F-35B Lightning II aircraft to fly from the Queen Elizabeth Class aircraft carriers. This is the first tranche of the 138 Lightning II aircraft the UK has committed to purchase over the life of the programme. The Department will operate F-35s from the carriers and the Royal Air Force base at Marham.

IOC (Land) was declared on 31 December 2018 with 67 exceptions against the intended milestone including: no availability of training simulators, issues with the global support solution and immature infrastructure delivery. As at February 2020, the project team had cleared 47 of the exceptions, although Air Command is clearing them more slowly than planned. The Department currently expects to deliver the promised F-35 Full Operating Capability requirements by 2023.

Source: National Audit Office analysis of Ministry of Defence documents.

Part Two

Oversight of the challenges to capability delivery

2.1 Responsibility for identifying capability requirements and delivering them is split within the Ministry of Defence (the Department). In response to a 2011 report by Lord Levene, the Department undertook a transformation programme which led to a delegated organisational model from April 2014.[31] The centre of the Department, known as 'Head Office', directs activity. Head Office takes a strategic role and has retained the role of approving and monitoring, through its Investments Approvals Committee (IAC), the progress of capabilities with a high value (more than £400 million) as well as others deemed to be novel or contentious. Under this model, the Commands – Air, Army, Navy, Strategic Command (formerly Joint Forces Command) and, more recently, the Defence Nuclear Organisation (DNO) – identify the capabilities they need, and hold the responsibility and the budget for delivery of the portfolio of defence capabilities.[32] Senior Responsible Owners (SROs) make sure individual acquisitions meet their objectives. Delivery organisations manage the equipment and support projects on behalf of the Commands. Further detail on the role of each is provided in **Figure 8** on pages 26 and 27.

2.2 Under the Department's devolved system, Commands should know how programmes are performing and be able to address emerging issues in a timely manner. Head Office should be fully aware of the performance of all significant projects and programmes. At the end of a project, the Department is required to establish whether the capability is delivering what was required.

2.3 In this Part we look at oversight of capability delivery:

- across the Department by Head Office; and

- within the Commands.

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31 Ministry of Defence, *Defence Reform: An independent report into the structure and management of the Ministry of Defence*, June 2011, available at: https://www.gov.uk/government/publications/defence-reform-an-independent-report-into-the-structure-and-management-of-the-ministry-of-defence--2
32 Where we refer to Commands this also includes DNO.

Head Office oversight

2.4   The system set up to deliver capabilities is inevitably complex. Descriptions of the system are embedded within central guidance, but the Department has reduced the amount of resource devoted to maintenance of this guidance in recent years, so parts of it are out of date. The structure of the guidance is not always easy to follow, nor is it clear which parts need to be followed. The acquisition system guidance has become longer and more complex over time; for example, the acronym glossary contains more than 1,900 entries and even then is not exhaustive.

2.5   Under its delegated model for capability delivery, the Department established the Finance and Military Capability (FMC) organisation within Head Office to, among other things, maintain the balance of investment controls over the link between resources and capability. The Department now considers this has not worked as well as intended. It acknowledges that it has further to go in establishing cross-cutting business functions such as commercial, project delivery, finance and capability management and ensuring these work coherently with one another.

2.6   Easy access to consistent information across the entire portfolio is vital for holding Commands to account and for making strategic decisions, but is not currently available. The Department produces and presents senior staff with a variety of different types of information in relation to the Department's capability programmes, for example through the approvals and scrutiny process. In 2013, a review of implementation of the delegated model found there was "a lack of clarity around the future responsibility and resources to deliver the management information [element of the reforms]", and steps to improve it were not expected to be complete until 2017. The Department acknowledges that under the delegated model it has reduced central oversight, and data on all projects and programmes which the Department is undertaking are still not held in a single location within the system.

2.7   As explained in paragraph 1.6, Head Office reviews information on the most significant capabilities – those included in the Defence Major Projects Portfolio (DMPP). The accuracy and completeness of the information provided is the responsibility of the SRO. The DMPP accounts for more than 40% of the Equipment Plan over the next 10 years.[33] It is not always clear why particular capability deliveries are excluded from the DMPP. For example, work for our *HMS Forth* case study showed that the Offshore Patrol Vessel (OPV) programme would have benefited from closer central review. Its initial budget was around £378 million[34] (since increased to five ships costing £683 million), and the programme has important implications for the ship-building skills needed for the Type 26 frigate programme. However, it was not included in the DMPP.

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33   This estimate includes all elements of the capability delivery including non-equipment figures such as infrastructure costs. There are also differences in the reporting period across DMPP projects and the Department's annual Equipment Plan report, which covers equipment procurement and support.
34   Procurement cost of the three Batch 2 OPV ships originally ordered (including *HMS Forth*).

Figure 8

Capability delivery roles and responsibilities within the Ministry of Defence

Capability delivery is split between a number of organisations within defence

Central government

The government's national security priorities were decided using the **National Security Strategy** (NSS) and by the **Strategic Defence and Security Review** (SDSR), both led by the National Security Council. The SDSR identifies the 'means' (resources) and 'ways' (courses of action) across government which are needed to deliver the 'ends' described in the NSS. The defence budget is set by the government's **Spending Review**, led by HM Treasury, which sets firm and fixed spending budgets over several years for each department.

Head Office[1]

Each SDSR generates a **Defence Strategic Direction** document, which translates the outcome into a long-term planning direction. The interpretation of this direction for the next five years, particularly in terms of allocating resources, is set out in the annual **Defence Plan**. **Force development** is the way in which the main parts of the future force structure and capability needs are defined and tested against strategy assumptions, looking out over the next 30 years. The **Annual Budget Cycle** sets targets and budgets over the forthcoming 10 years to deliver the objectives set out in the Defence Plan.

Commands and delivery organisations[3]

The Top-Level-Budget holder's (TLB's)[4] yearly **Command Plan** is the delivery agreement between the Ministry of Defence's (the Department's) Accounting Officer and the TLB holder. Each Command audits capability and conducts analysis to support decision-making; this forms part of the Command Plan. The **Delivery Organisation Plans** form an agreement with the Commands on work to be carried out.

Portfolios, programmes and projects

Each Command manages a 'sub-portfolio' of change and capability programmes. Capability projects and programmes are funded against approved business cases and defined benefits, set out in mandates for each Senior Responsible Owner (SRO).

Notes

1   The centre of the Department is known as 'Head Office'.

2   In 2019 the Defence Plan was combined with the Single Departmental Plan.

3   Delivery organisations include: Defence Equipment and Support (DE&S); Submarine Delivery Agency (SDA); and Information Systems and Services (ISS). In 2019, Defence Digital, within Strategic Command, brought together and replaced a number of organisations, including ISS.

4   There are seven TLBs: Air Command, Army Command, Strategic Command, Navy Command, the Defence Nuclear Organisation, the Defence Infrastructure Organisation, and Head Office and Corporate Services.

5   In February the Government commenced the *Integrated Review of Security, Defence, Development and Foreign Policy*.

Source: National Audit Office analysis of Ministry of Defence information

National Security Strategy

Strategic Defence and Security Review

Spending Review

Defence Strategic Direction

Force development

Defence Plan/Single Departmental Plan (annual)[2]

Annual Budget Cycle

Command Plans (annual)

Delivery Organisation Plans (annual)

Programme and Project Plans
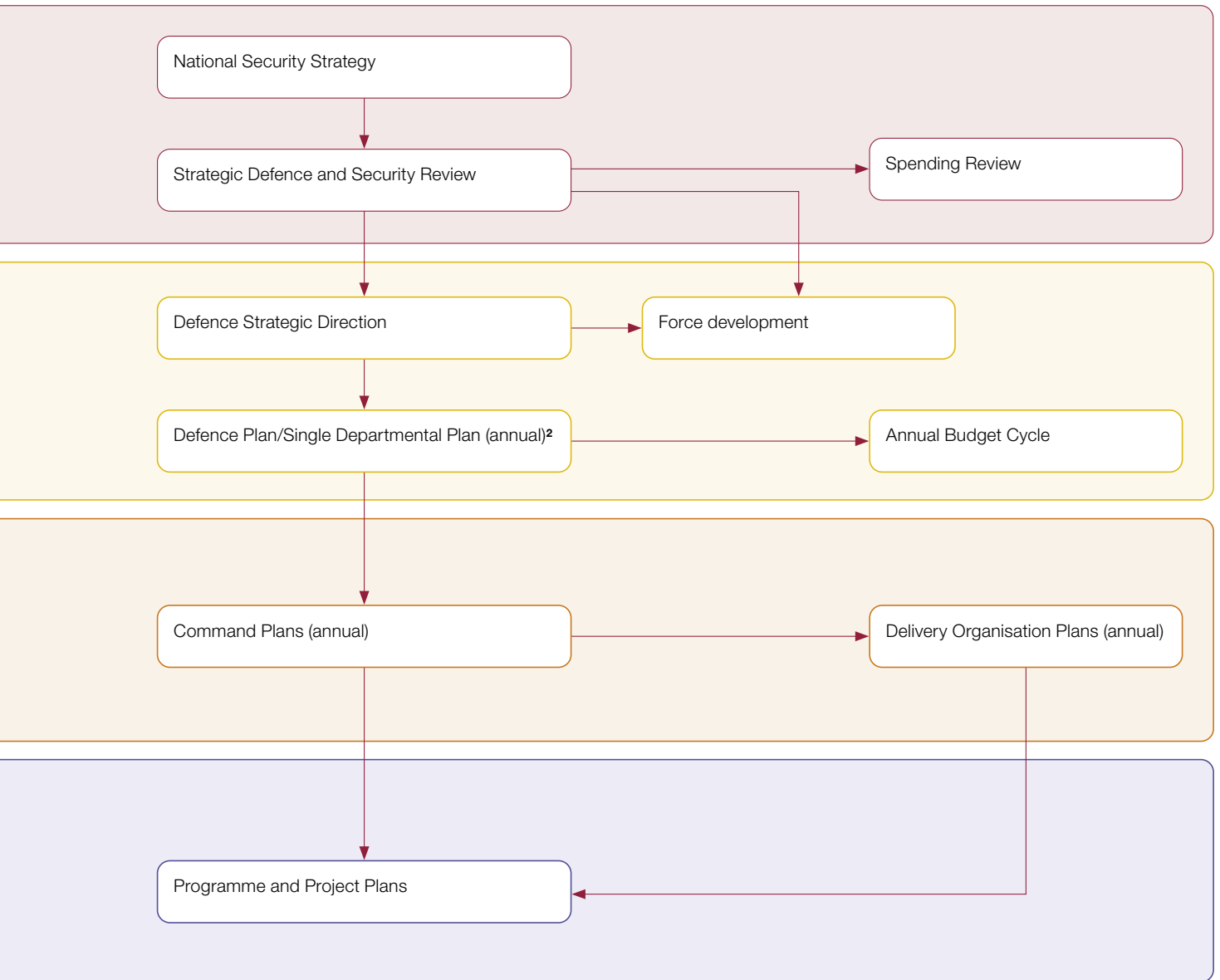
2.8 There are limitations with the DMPP data collected within Head Office, which are presented to senior staff at quarterly DMPP review meetings. Management information can be several months out of date by the time it is presented to senior decision-makers. Senior staff use different financial information (sourced from the central Contract Purchasing and Finance system) to that provided in SRO returns as they consider the former to be more accurate.

Consistency of reporting

2.9 We looked at the progress ratings applied by SROs to capabilities in the DMPP. We were not able to examine these capabilities in as much detail as our case studies, but we looked at consistency between the rating and other information contained in the reports. Most assessments for 30 September 2019 appeared to show a reasonable approach to the assessment of delivery confidence. One anomaly concerns the introduction of the Marshall air traffic control system. The SRO did not declare IOC on schedule in June 2019, and the Department informed us that the project is not expected to reach IOC until May 2020. Despite this, during 2019 the delivery confidence rating did not indicate that successful delivery of the milestone was in doubt or had become unachievable.

2.10 For each capability, the customer's project team tracks user requirements across the eight 'defence lines of development', which together provide a detailed picture of progress across all aspects of the capability. Each line of development addresses a specific aspect of capability, such as equipment, training, infrastructure, and so forth.[35] However, this internal information on performance is not monitored by Head Office. The categories in Head Office management information – the delivery confidence assessment and its associated sub-categories – overlap little with the lines of development. Where there is overlap on equipment delivery, projects often provided different ratings within the same report. Our analysis showed there was only a weak correlation for projects between the Department's rating of supplier confidence and the 'equipment' line of development. It was clear from the commentary in the data returns that, while most personnel considered that the two indicators were measuring the same thing, some did not. Even in the former cases, there were some wide differences in the assessment between the two indicators.

Oversight of capability delivery within the Commands

2.11 As part of the implementation of the delegated model, the Commands monitor delivery of their capabilities through their own portfolio offices, which are designed to meet their capability information needs. The Department has mandated good-practice elements of project, programme and portfolio management, and provided a standard model for capability planning supported by guidance.

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35 Defence Lines of Development (DLODs) are training, equipment, personnel, information, doctrine and concepts, organisation, infrastructure and logistics.

2.12 We found that, five years after being delegated responsibility, the Commands progress in developing their management of their portfolio varied,[36] and that Command portfolio offices vary in the role they carry out (**Figure 9**). There were staffing gaps in all the offices, and for some Commands this was a significant challenge. All Commands told us they have plans to upgrade the capability of their portfolio offices, and in the case of the DNO, to develop one for the first time.

Figure 9

National Audit Office (NAO) assessment of the Ministry of Defence's Command portfolio offices

The level of development of Command portfolio offices varies

	Air Command	Army Command	Strategic Command[3]	Navy Command	Defence Nuclear Organisation
View of the Command portfolio	🟢	🟡	🟡	🟠	🟠
Governance structure	🟢	🟢	🟡	🟢	🟡
Reported progress	🟡	🟡	🟡	🟠	🟡
Management information	🟡	🟡	🟡	🟠	🟡
Guidance	🟡	🟡	🟠	🟡	🟠
Share good practice	🟡	🟡	🔴	🟡	🟠
Management of interdependencies	🟡	🟢	🟠	🟠	🟡
Overall rating[4]	🟡	🟡	🟡	🟡	🟡

🟢 The function is well developed and managed.

🟡 The function is carried out and embedded. There is a defined and consistent process.

🟡 Elements of the function are carried out. Current practices are documented but not used consistently.

🟠 Limited elements of this function are carried out by the Command.

🔴 This function is not carried out by the Command, or performance is inconsistent.

Notes

1   We assessed the portfolio offices against a set of criteria desirable in an efficient and effective portfolio office, which has been informed by departmental guidance.

2   The assessment is based on Command responses to an NAO questionnaire, interviews and a review of documents provided. The questionnaire and interviews were carried out between June and September 2019.

3   In December 2019 following the recommendations of *A Departmental Review of Joint Forces Command*, Joint Forces Command was relaunched as Strategic Command. Our analysis was carried out in the period prior to this.

4   The overall rating is calculated using an average from all the categories.

Source: National Audit Office

36   The Defence Nuclear Organisation has only existed since 1 April 2018.

2.13 Around 100 capability programmes are actively monitored at Command level.[37,38] Currently, Command portfolio offices do not have a complete picture of all the capabilities they are acquiring; only Air Command holds information on all its programmes and projects. While all Commands use the mandated Project Management Reporting System to report delivery performance of those capabilities on the DMPP, some use other systems for their internal monitoring, most notably Army Command. There is variation in the amount of information that is collected for minor capabilities. For example, Navy Command holds little information for those capabilities below its 'top 25' programmes. Some Commands struggled to provide us with a complete or accurate list of all their projects and programmes, and we found errors in some Command-level information when selecting our case study examples. If repeated more widely, this could provide a misleading picture of capability delivery.

2.14 All Commands have a forum for reviewing the progress of the Command portfolio, although these differ in format and name. All perform some form of analysis to identify common challenges to capability delivery but share the insights differently. Air Command, Army Command and DNO centrally manage interdependencies, but in Strategic Command and Navy Command it is up to the SRO or programme directors. Not all Commands have processes for measuring capability against original requirements. Strategic Command does not currently have a process for gathering lessons learned, and Air Command has struggled to implement a process due to staff shortages. All Commands produce their own guidance on portfolio and project management, in addition to that provided by Head Office. However, only limited checks are made to test if guidance has been followed. Strategic Command faces particular challenges because of the responsibilities it holds with regards to capabilities that will be used across defence, and where the SROs are located in other Commands.

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37   Of these, 32 are included in the DMPP.
38   This figure represents capabilities across the Navy, Army, Air and Strategic Commands. As not all Commands monitor small projects this figure may be higher.

Part Three

Transforming capability delivery

3.1   In January 2018, the Ministry of Defence (the Department) set up a dedicated central transformation team reporting to the chief operating officer. Transformation is taking place across four key functional areas of defence business, of which the first is most relevant for the purposes of this report. The areas are:

- Acquisition – creating a more agile, adaptable and streamlined acquisition system to increase the pace of procurement.

- Support of military capabilities.

- Embracing modern technologies.

- Delivering a sustainable workforce with the required skills.

3.2   In this part of the report we explain the steps being taken by the Department to transform capability acquisition, and the extent to which these changes address the issues identified in Parts One and Two.

Transformation projects

3.3   The Department set out in the Levene report its intentions for capability planning and financial management, which included better decision-making, less bureaucracy and simplified processes, with the centre of the Department (known as 'Head Office') having visibility and assurance to ensure financial control.[39] The new initiatives are an acknowledgement that this has not happened as intended. The Department's key objectives for the acquisition system are to:

- create a more agile, adaptable and streamlined acquisition system to increase the pace of procurement; and

- strengthen the role of Head Office in overseeing the system, in line with the original intent of the Levene reforms (see paragraph 2.1). We described the current oversight regime in Part Two.

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39   Ministry of Defence, *Defence Reform: An independent report into the structure and management of the Ministry of Defence*, June 2011, available at: https://www.gov.uk/government/publications/defence-reform-an-independent-report-into-the-structure-and-management-of-the-ministry-of-defence--2

3.4 In 2018, the Department introduced Project MAID (MoD's Approach to Investment Decisions) to improve the quality of investment decisions, based on a more rigorous business case justification in the early stages of the project (akin to that seen elsewhere in government departments). In addition, in September 2019, the Department completed an Acquisition Review. This is intended to increase the speed of delivery by tailoring the acquisition process to suit each programme, and increasing the quality of oversight by Head Office, partly through improvements to management information. In October 2019, Project MAID and the Acquisition Review were brought together under one programme board. The Department told us it was developing a detailed plan for implementation of the Acquisition Review later in 2019-20. More information on both initiatives is shown in **Figure 10**.

3.5 The Department has set itself an ambitious challenge of taking two years out of the average 'time-to-front-line process', and to move from 75% of projects being delayed to 75% being on time, although it is unclear what the baseline is for these metrics. The Department has run a number of pathfinder projects to test its new acquisition approach. One pathfinder project – covering the Interim Surface to Surface Guided Weapon – showed how delivery of the capability could be accelerated by three years. Despite some potential cost avoidance and savings, it could now cost around £200 million over three, rather than six, years – with an annual cost increase of £33 million. However, speeding up delivery and so compressing cost into a shorter time span could increase the Department's difficulties with the near-term unaffordability of its equipment portfolio, as set out in our work on the Department's Equipment Plan.[40]

3.6 In addition to the two reviews mentioned above, other ongoing initiatives will affect how the Department delivers capabilities. In particular:

- the Department has reviewed the operating model it introduced in 2014 with the aim of ensuring all parts of the Department work together effectively. The new model aims to clarify roles, responsibilities, authorities, accountabilities and the Department's processes for taking key decisions. It has been published internally within the Department during 2019-20; and

- the Department has undertaken a specific review of how Joint Forces Command (now called Strategic Command) manages its functions and delivers its outputs, including capabilities. The review recommends that the Command should have an enhanced role in supporting Head Office. The review's recommendations are now being implemented.

3.7 As part of developing the Defence Operating Model, the Department has also introduced a new 'functional leadership' approach to oversee cross-cutting functions such as project delivery, which is a key element of capability delivery. Delivery of the project delivery functional strategy will be facilitated by a centre of excellence, to replace a previous one disbanded in 2012. One of the roles of the centre of excellence is to ensure that lessons are learned.

40 Comptroller and Auditor General, *The Equipment Plan 2019 to 2029*, Session 2019-20, HC 111, National Audit Office, February 2020.

Figure 10

The Ministry of Defence's (the Department's) reviews of the acquisition system and approvals process

The Department has introduced transformation initiatives to speed up capability acquisition

Project MAID (MoD's Approach to Investment Decisions)

Aim: Better programme delivery through better investment decisions. MAID is intended to provide a more robust basis for investment decisions, and hence improve programme delivery. Improved behaviours, culture and processes will make the process more proportionate and risk-based.

Outcome: To make the acquisition system more responsive to current and future challenges. The expected benefits are:

- better quality and faster investment decisions;
- leaner processes;
- increased empowerment of Senior Responsible Owners (SROs); and
- increased credibility with HM Treasury.

The MAID initiative will move the Department into line with the cross-government approval process set out in the HM Treasury *Green Book*.

Implementation: Work is being delivered through two phases.

Key dates:

- Since June 2019 all new programmes of more than £100 million have been required to present a Strategic Outline Case to the approving authority. They will then move on to Outline Business Case and Full Business Case.
- From 1 October 2019 the system has started to roll out across all other programmes more than £20 million, with full coverage from 1 April 2020.

Acquisition Review

Aim: To transform the acquisition system, to deliver the right capabilities to the armed forces effectively and efficiently, and to keep pace with the threat and evolving technology.

Outcome: To design new routes for the supply of capabilities that are more flexible and agile in adopting new technology, and can deliver at pace. The key themes are:

- a more capable Head Office (in line with the original aspirations for the operating model adopted in 2014);
- the introduction of tailored acquisition routes; and
- building capability in people and management information.

Implementation: A set of pathfinder projects has been used to test the benefits of the new approach.

Four elements have been identified to enable improvements. These are:

- empowered SROs with appropriate expertise and resources;
- multi-functional teams;
- clearer expectations from approving authorities coupled with earlier and ongoing engagement of the scrutiny and approvals community; and
- a single source of the truth on acquisition project and portfolio performance for delivery organisations, Commands and Head Office.

Note

1   The *Green Book* is guidance issued by HM Treasury on how to appraise policies, programmes and projects. It also provides guidance on the design and use of monitoring and evaluation before, during and after implementation.

Source: National Audit Office summary of Ministry of Defence information

Addressing the challenges we have identified

3.8 We looked at the extent to which the challenges to capability delivery identified from our analysis and case studies would be addressed by the Department's various initiatives:

- **Milestone declarations**

  We found examples of milestones being declared where there were potentially significant shortcomings against the agreed criteria and which had nothing to do with changes in capability requirements during delivery. The Acquisition Review recommended establishing firm time parameters for capability delivery, monitoring against them, and adhering to them. Updated approvals guidance references aspects of capability delivery and scheduling which should be considered.

- **Flexibility**

  The Department identified that technological change will continue to increase at a pace that outstrips the agility of its current capability planning and acquisition system. Therefore, it set out that it needs a system that supports a more flexible approach to procurement that can respond to the speed of technological change by subjecting core capabilities to a process of continual upgrades. We consider that changes could potentially have mitigated examples in our case studies where individual capabilities were obstructed by a failure to keep pace with technological change. For example, in our Falcon Early Entry Capability battlefield communication system case study the new capability is constrained by obsolete technology in other parts of the system. However, the danger of moving away from the traditional approach whereby a capability is generated against a set of fixed, clearly defined milestones, is that stakeholders across the defence environment will be unclear what level of capability a system has achieved at any given point.

- **Better information**

  As identified in Part Two, there is also a need for greater transparency about performance across the Commands and within Head Office.[41] As part of the implementation of the Acquisition Review, the Department will roll out a system of portfolio and performance management, initially for equipment, then other aspects of capability delivery such as infrastructure, personnel and training, from 2020.

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41 There are four Commands (Air, Army, Navy, Strategic (formerly Joint Forces)) and the Defence Nuclear Organisation (DNO) who hold the responsibility and the budget for delivery of the portfolio of defence capabilities. Where we refer to Commands this also includes DNO.

- **Management of programmes**

  In our work we came across issues with the current lead command model, particularly around prioritisation and flexibility of funding, and the relationships between Strategic Command (formerly Joint Forces Command) and the other Commands. In a new approach, where Strategic Command is leading cross-command work, this Command will seek to transfer programme ownership to another at an early stage, while retaining capability sponsorship responsibilities. This increases the importance of having mature portfolio management in each of the Commands, and Strategic Command has told us that it is working hard to address this, for example through increasing the numbers working on the management of the portfolio and introducing a portfolio Centre of Excellence.

- **Capacity and capability**

  The Department faces challenges around capacity and capability, and in Part One we highlighted issues affecting Senior Responsible Owners (SROs), and more general skills shortages in project and delivery teams. The Acquisition Review recommended more expert support for SROs to understand time, cost and performance trade-offs and tailor their acquisition route. Work is being undertaken on SROs by the Project Delivery function.

3.9 The Department's Acquisition Review also highlighted that there is a culture within the Department which prioritises passing review points and approvals above delivery of outputs and outcomes. One of the key aims of acquisition transformation is to increase the pace of delivery. It is important that reforms do not further encourage declaring milestones in the face of capability shortfalls in order to create the perception of fast progress. Developing the implementation plan to shape the culture will therefore be important.

3.10 The initiatives that are being undertaken by the Department are intended to address challenges identified through our work. Overall, they do address many of them but they would not necessarily prevent the occurrence of some issues identified in our analysis, such as contractor performance or failure to deliver timely training. It is also too early to assess the impact the changes will have as the Department does not yet have an implementation plan. The Department has also still to develop a plan that brings the initiatives together and shows how they are being coordinated, to ensure they do not cut across one another or some become deprioritised.

Force readiness

3.11 The Levene reforms were intended to introduce a system that would enable strategic balance of investment decisions and requirement setting across all defence lines of development. In 2019-20 the Department introduced additional mechanisms to support assessments of both current and future capability, and the level of readiness of that capability (**Figure 11**). The initial work done in these areas is intended to strengthen the ability of Head Office to be aware of capability issues and ensure they are addressed. It is too early to assess the effectiveness of these new processes. These mechanisms sit alongside existing processes, notably the Defence Capability Assessment Register (DCAR). This sets out for decision-makers the risk to delivery of the Defence Tasks over the next 20 years. It provides a baseline from which the requirement, and priority, for further strategic capability investment can be assessed.

3.12 Although these measures will generate a coherent picture of capability readiness against defence objectives, addressing capability challenges is contingent upon having the funding available to implement the results. As part of its submission to HM Treasury for the 2019 Spending Review, the Department carried out a detailed 'balance of investment' analysis using multi-criteria decision analysis. This generated a number of options to prioritise enhancements to existing capabilities, and for savings, based on the best ratio of benefits to costs. None of the enhancements can be funded currently without reducing existing capability commitments. In February 2019, the Committee of Public Accounts concluded: "The Department's Equipment Plan remains unaffordable as government continues to delay decisions on its priorities, and on whether to increase funding or stop, delay or scale back programmes."[42]

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42 HC Committee of Public Accounts, *Defence Equipment Plan 2018–28*, Seventy-seventh Report of Session 2017–2019, HC 1519, February 2019.

Figure 11

New processes within the Ministry of Defence (the Department) to assess both current and future military capability, and the level of readiness of that capability

The Department has introduced new processes to assess the level of capability

Process	Description
Defence Force Development (DFD)	The DFD Board first met in May 2019. The Department recently concluded that its model for strategic force development needed better definitions of roles and responsibilities to make it fit for purpose. The new DFD approach is intended to improve the speed, breadth of inputs and coherence when responding to rapidly evolving threats and taking advantage of emerging technologies.
Capability Readiness Assessment Framework (CRAF)	This new process began in 2019-20 and focuses on the immediate risks to the delivery of defence tasks, ongoing operations and the ability to mount operations in the near future, based on a quarterly dialogue between Head Office and the Commands.
Defence Capability Management Group (DCMG)	This is a new group that has been set up to ensure alignment of the portfolio with the delivery of policy and strategy in order that the balance of investment decisions meet prioritised objectives.

Source: National Audit Office analysis of Ministry of Defence information

Appendix One

Our audit approach

1   This study examined whether the Ministry of Defence (the Department) gets the capabilities it requires when it needs them to meet its current and future defence objectives. We examined the Department's approaches to:

●   identifying and managing the challenges of delivering required capabilities into service;

●   having a complete system in place to monitor the delivery of capabilities; and

●   putting in place appropriate arrangements to transform its capability delivery in the future.

2   We drew on our previous reports on major projects across government to determine good practice when reviewing the Department's approach. We also applied insights on industry standards on portfolio management, for example the Infrastructure and Projects Authority's *Project Delivery Functional Standard*,[43] alongside the National Audit Office's guidance frameworks for project delivery.
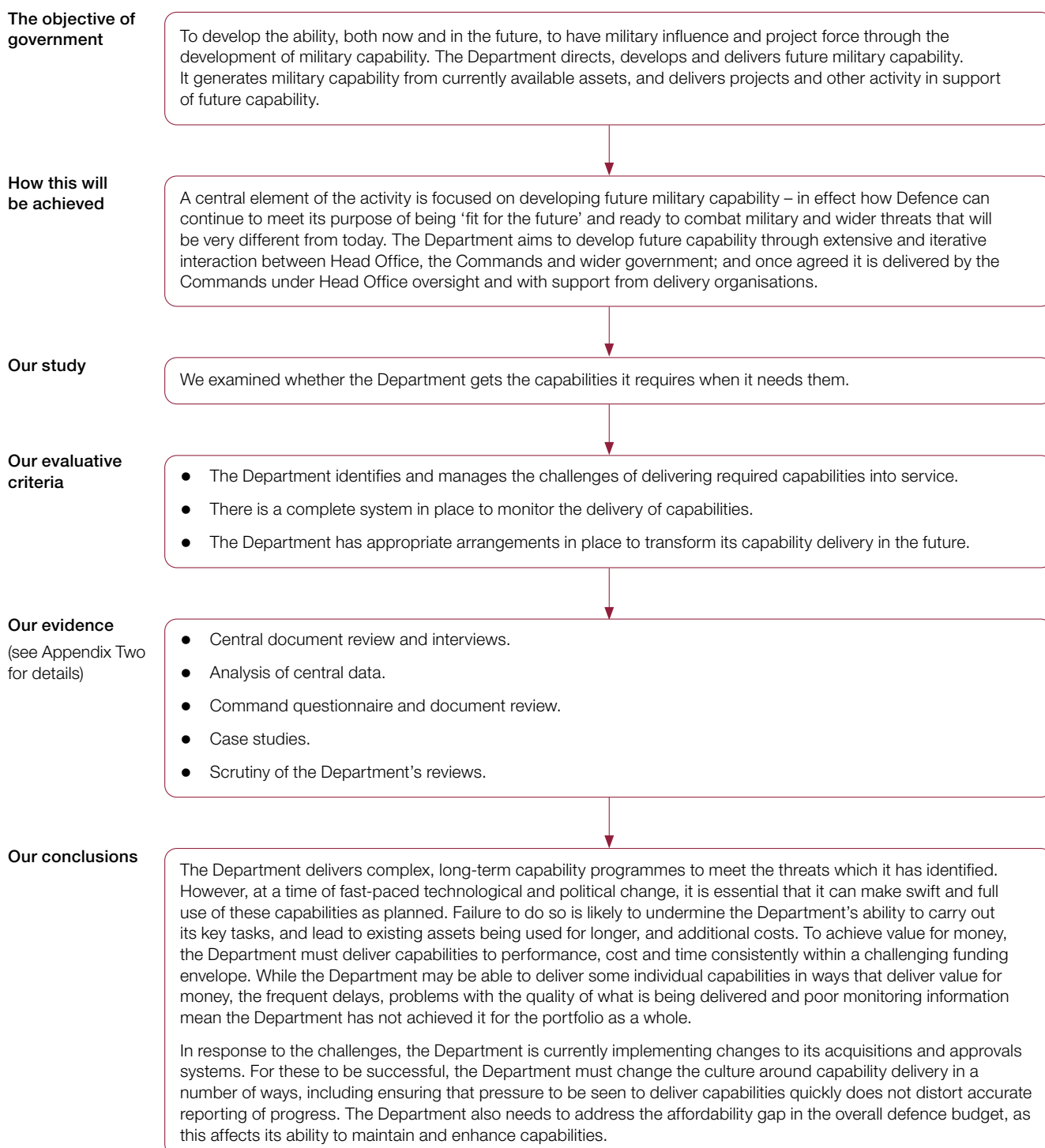
3   Our audit approach is summarised in **Figure 12**. Our evidence base is described in Appendix Two.

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43   Infrastructure and Projects Authority, *Government Functional Standard GovS 002: Project delivery*, August 2018, available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/746400/Project_Delivery_Standard_1.2.pdf

Figure 12
Our audit approach

The objective of government	To develop the ability, both now and in the future, to have military influence and project force through the development of military capability. The Department directs, develops and delivers future military capability. It generates military capability from currently available assets, and delivers projects and other activity in support of future capability.
How this will be achieved	A central element of the activity is focused on developing future military capability – in effect how Defence can continue to meet its purpose of being 'fit for the future' and ready to combat military and wider threats that will be very different from today. The Department aims to develop future capability through extensive and iterative interaction between Head Office, the Commands and wider government; and once agreed it is delivered by the Commands under Head Office oversight and with support from delivery organisations.
Our study	We examined whether the Department gets the capabilities it requires when it needs them.
Our evaluative criteria	• The Department identifies and manages the challenges of delivering required capabilities into service. • There is a complete system in place to monitor the delivery of capabilities. • The Department has appropriate arrangements in place to transform its capability delivery in the future.
Our evidence (see Appendix Two for details)	• Central document review and interviews. • Analysis of central data. • Command questionnaire and document review. • Case studies. • Scrutiny of the Department's reviews.
Our conclusions	The Department delivers complex, long-term capability programmes to meet the threats which it has identified. However, at a time of fast-paced technological and political change, it is essential that it can make swift and full use of these capabilities as planned. Failure to do so is likely to undermine the Department's ability to carry out its key tasks, and lead to existing assets being used for longer, and additional costs. To achieve value for money, the Department must deliver capabilities to performance, cost and time consistently within a challenging funding envelope. While the Department may be able to deliver some individual capabilities in ways that deliver value for money, the frequent delays, problems with the quality of what is being delivered and poor monitoring information mean the Department has not achieved it for the portfolio as a whole. In response to the challenges, the Department is currently implementing changes to its acquisitions and approvals systems. For these to be successful, the Department must change the culture around capability delivery in a number of ways, including ensuring that pressure to be seen to deliver capabilities quickly does not distort accurate reporting of progress. The Department also needs to address the affordability gap in the overall defence budget, as this affects its ability to maintain and enhance capabilities.

Appendix Two

Our evidence base

1   Our independent conclusions on whether the Ministry of Defence (the Department) gets the capabilities it requires when it needs them were reached following our analysis of evidence collected between May and December 2019.

2   We applied an evaluative framework to consider what arrangements would be optimal for capability delivery. Our audit approach is outlined in Appendix One.

3   In examining if the Department identifies and manages the challenges of delivering required capabilities into service we:

●   reviewed central management information on project performance delivery for the 32 capability programmes on the Defence Major Projects Portfolio (DMPP), which the Department considers to be the most complex and strategically significant capabilities, monitored through the Department's Project Management Reporting System (PMRS). These are projects the Department has defined as 'capabilities' rather than 'business change' or 'IT' projects.[44] We analysed data between quarter one 2015-16 and quarter two 2019-20 to identify trends; and

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44   The Department acknowledges that the boundaries between these categories may not be clear-cut. For example, some IT projects are classed as capabilities.

- undertook in-depth analysis of eight case study projects across four military Commands (Navy, Army, Air and Strategic) which had achieved Initial Operating Capability (IOC) or Full Operating Capability (FOC) within the past three years. We selected one IOC and one FOC per Command. We selected one smaller and one larger capability per Command (in cost terms). We selected from project listings supplied by the Commands. Given the limited number of cases passing through some Commands (Air and Army Commands), project choice was limited, especially for the most complex and significant projects. Where more cases were available, choices were narrowed on the basis of secondary criteria, such as balance of project sizes and whether the project's security classification made it too sensitive to report on. In one case, we selected a project where IOC was not yet declared due to inaccuracies in the information supplied to us. We retained this project in the sample as the actual IOC date was due to fall within the study fieldwork period. Delivery teams for the selected capabilities were contacted and asked to supply documentation relevant to the declaration of the milestone. This was then evaluated against a proforma developed from good practice on project delivery. Supplementary information and interviews with the Senior Responsible Owner and project team were used to support our analysis. In the case of two capabilities, a site visit was undertaken to see the final capability (the High G pilot training facility and *HMS Medway* – a sister ship to *HMS Forth*).

4 In considering the system in place to deliver defence capabilities we:

- interviewed departmental staff within central teams involved in capability delivery. This included the Finance and Military Capability group, the Defence Portfolio and Approvals Secretariat and the Project Delivery Function. We reviewed central departmental documentation relating to capability delivery and guidance held on the Department's Knowledge in Defence (KiD) system. In scoping our work we spoke to the government's Infrastructure and Projects Authority (IPA); and

- we prepared a Command questionnaire informed by good practice and the National Audit Office's guidance frameworks for project delivery.[45] The questionnaire was issued to the portfolio offices of all Commands (Air, Army, Navy, Strategic) and the Defence Nuclear Organisation (DNO) to inform our understanding of the maturity of their portfolio function. We also held interviews and reviewed documents supplied by the Commands and DNO to inform our understanding of portfolio processes at the Command level. We used this information to assess Command and DNO portfolio offices against a set of criteria desirable in an efficient and effective portfolio office, which has been informed by departmental guidance. Performance against these criteria has been summarised on a five-point 'traffic light' rating scale to identify the relative progress across the different Commands and DNO. The overall rating is calculated using an average from all the categories. We received feedback from the Project Delivery Centre of Excellence on our assessment. We did not assess the skills and performance of individual staff members.

5 In assessing the Department's arrangements in place to transform capability delivery we:

- reviewed the Department's documents on the transformation of acquisition and approvals, as set out through the Acquisition Review and Project MAID (MoD's Approach to Investment Decisions). These were supported by semi-structured interviews with staff within the transformation teams;

- enquired about wider transformation initiatives and reviewed some documentation in relation to the project delivery function and the new operating model. We also reviewed documents and interviewed staff in relation to the Joint Forces Command review; and

- interviewed departmental staff involved in force readiness work and reviewed documentation associated with this, as well as attending associated board meetings.

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45 National Audit Office, *Framework to review programmes*, April 2019, available at: https://www.nao.org.uk/report/framework-to-review-programmes/, and National Audit Office, *Initiating successful projects*, December 2011, available at: https://www.nao.org.uk/wp-content/uploads/2011/12/NAO_Guide_Initiating_successful_projects.pdf

Appendix Three

Case studies

Case study summary sheets

- *HMS Forth* Batch 2 Offshore Patrol Vessel (OPV) (Initial Operating Capability (IOC))

- Commando Training Centre Royal Marines (CTCRM) Tactical Engagement System (TES) (Full Operating Capability (FOC))

- Materiel Distribution Land (IOC/In Service Date (ISD))

- Watchkeeper unmanned aerial vehicle (FOC)

- F-35 Lightning II Joint Strike Fighter (IOC Land (IOC(L)/ISD))

- High G test and training facility (FOC)

- Falcon Early Entry Capability (FEEC) battlefield communication system (IOC)

- Upgraded Base Inventory Warehouse Management System (BIWMS) – Release 2 (FOC)

HMS Forth Batch 2 Offshore Patrol Vessel (OPV) (IOC)

Capability description:

HMS Forth is the first of three new OPVs that were ordered at a cost of £378 million in 2014. The OPVs were ordered to maintain dockyard skills at the Govan and Scotstoun shipyards between the completion of the aircraft carrier *HMS Queen Elizabeth* and approval for start of production of the Type 26 programme, originally due in 2014, but which slipped to 2017. Initially the vessels were intended to replace three existing Batch 1 vessels commissioned in 2003-04. These plans have since changed and Batch 1 OPVs will remain in service. The ships' capabilities were specified in generic terms as plans for usage have developed organically. Faced with continued delays to the Type 26 programme, the Ministry of Defence (the Department) ordered a further two ships in 2016. *HMS Forth* and *HMS Medway* are now deployed on operations.

Military Command	Navy
Current estimated cost	The procurement cost of the three ships originally ordered (including *HMS Forth*) was £378 million. A firm price contract means delivery problems have not caused cost overruns. Two further ships were subsequently ordered, for a total cost of £683 million.
Level of capability required at IOC	Capability requirements have evolved during the build period. The finalised IOC definition is that the ship would be deployable from UK base ports. In service declaration would allow worldwide deployment.
Documentation of key milestone dates at Main Gate Business Case	The date provided in the business case was for Vessel Acceptance Date rather than IOC and FOC.

HMS Forth milestone declaration against target dates reported to and/or approved by the Department's Investment Approvals Committee (IAC)						
Date of submission to approving authority	November 2013	June 2014 Business Case	November 2016	November 2017	July 2019	Date achieved
Contract/Vessel Acceptance Date	2017	April 2017	July 2017	January 2018	–	January 2018 (prior to major defect identification)
IOC	No date given			May 2018	–	June 2019
ISD	No date given			December 2018	October 2019	November 2019

Main issues with capability delivery	
Management oversight and approvals; and skills	The current five-ship programme has a budget of £683 million and the Department instigated it in order to mitigate manufacturing risks to the Type 26 frigate. Despite this, the programme is not part of the Department's Major Projects Portfolio and associated monitoring. The Department's IAC was not given an IOC date until the ship was at an advanced stage of construction. We found a number of inaccuracies in the management information relating to OPVs reported to the Navy Portfolio Office.
	In approving the OPV programme in August 2014, the IAC tasked the Navy with developing a way of monitoring the quality of the ship build, the results of which would be used to inform the strategy for the procurement of the Type 26 programme. In April 2017 the Navy reported to the IAC that lessons learned from the OPVs meant it was ready to start production of the Type 26 in July 2017.
	After several months' delay, *HMS Forth* was accepted off contract in January 2018. However, it became apparent in April that defects made the ship unsafe to operate, causing a 13-month delay to IOC of *HMS Forth*, and delays of six and seven months to ships two and three. The contractor rectified the issues at its own expense, and in subsequent checks identified similar quality assurance failures on the first Type 26 build. The Department told us the contractor has now overhauled its quality assurance procedures, and that the second ship, *HMS Medway*, has seen a marked increase in quality.
Personnel	At the start of the programme the Department intended that the three Batch 2 OPVs would simply replace the existing Batch 1 ships. These are now to be retained and two additional Batch 2s are being ordered, expanding crewing requirements from three ships to eight. The Navy told us that it has now identified crews for seven of the eight OPVs, and personnel to carry out the acceptance and sea trials for the eight.
Milestone declaration	*HMS Forth's* IOC declaration came with eight exceptions. Several exceptions reflect the fact that testing to confirm achievement of the required standards was not planned until after declaration of the milestone.

Progress in addressing outstanding capability issues
Following the declaration of IOC, *HMS Forth* was deployed on tasks in UK waters. The Navy declared *HMS Forth* in service on 28 November 2019.

Commando Training Centre Royal Marines (CTCRM) Tactical Engagement System (TES) (FOC)

Capability description:

This is a weapons effects simulation system to assist commando training. This capability was unfunded until CTCRM sourced Education & Skills Funding Agency money to upgrade equipment and support in 2017, and again in 2019, as part of a contract extension to the existing training contract. The intention is to incorporate the system into a larger tri-service contract.

Military Command	Navy
Current estimated cost	Contract extension of £922,000 between January 2019 and March 2020.
Delivery of milestone against target date	This is not a regular capability procurement as it relates only to the extension and upgrade of a training contract. Navy Command extended the initial contract in 2019 and this constituted FOC.
Documentation of key milestone dates at Main Gate Business Case	N/A

Main issues with capability delivery	
Affordability	This capability requirement did not meet Navy Command's threshold to qualify for funding. CTCRM identified alternative Navy training funds, which had been sourced from Education & Skills Funding Agency resources, which then allowed an upgrade to the synthetic training environment. This was an innovative approach to sourcing funding and the contract has generated a measurable improvement in the quality of training provided, but the continuing need for specialist technical support has now committed Navy Command to fund the capability in the longer term. This continuing specialist support was not factored into the original business case beyond the time covered by the initial contract covering 2017 to 2020. These support costs represented a significant increase on those included in the original business case.
Management information	The acquisition of capabilities by 'buying in' on a contractual basis does not easily lend itself to the usual pan-'lines of development' approach with staged milestones.

Progress in addressing outstanding capability issues
We were not notified of any exceptions at the point of capability delivery.

Materiel Distribution Land (IOC/ISD)

Capability description:

Materiel Distribution Land (MDL) 2020 is a programme made up of two separate projects which were brought together as a single programme by the Army Portfolio Office. One project, Enhanced Palletised Loading System (EPLS), is a modification of an in-service vehicle for the transport of equipment weighing up to 13.5 tonnes, allowing greater standardisation across the fleet. The other project, Light Equipment Transporter (LET) upgrade, is intended to increase the carrying capacity of existing transporters from 19 tonnes to 44 tonnes.

Military Command	Army
Current estimated cost	£95 million
Delivery of milestone against target date	The MDL programme as a whole had an IOC target of 1 March 2018. A 2018 Mandate updated this to provide separate milestones for the two projects within MDL, with EPLS expected to meet IOC by October 2019 and LET expected to meet IOC by November 2019. However, the stalled progress of the LET acquisition makes a joint IOC unachievable. The Department told us that EPLS achieved IOC in January 2020, with one exception. LET is now expected to reach IOC in June 2021.
Level of capability required at IOC	EPLS: Able to field 135 vehicles with appropriate spares, training solution and support. LET: The carriage of vehicles and equipment up to 44 tonnes with the appropriate strategic and operational mobility and protection.
Documentation of key milestone dates at Main Gate Business Case	There was an IOC and FOC date for EPLS, but not for LET as it did not make it to Main Gate Business Case because the project stalled.[1]

Main issues with capability delivery	
Contractor	The existing provider of the LET refused to be bound by the Single Source Contract Regulations on the grounds that the profit rate on offer was not high enough, leading to abandonment of the preferred contracting approach. A different approach will be developed.
Management oversight and approvals	Two separate projects were brought together to enable the project to be measured by the Army Portfolio Office. Since the two projects' progress has diverged sharply, it is very difficult to give a meaningful measure of the programme's progress. We found that Army management information had inaccurately recorded the IOC as having been achieved on 1 March 2018.

Progress in addressing outstanding capability issues
Options are being considered on how to take forward the LET upgrade. In the meantime, a 'work-around' will be in operation, which will delay realisation of the financial benefits arising from reduced reliance on private sector hauliers. Acceptance of modified EPLS systems is being hampered by asbestos contamination at Ashchurch depot. The project team in Army Command has very limited capacity.

Note

1 The LET element of the programme now has target dates of June 2021 for IOC and January 2022 for FOC. The overall programme FOC is due to be delivered by January 2022.

Watchkeeper unmanned aerial vehicle (FOC)

Capability description:

Provision of 54 unmanned aerial vehicles, 15 ground control stations, data links and other ground equipment to provide a 24-hour, all weather, Intelligence Surveillance Target Acquisition and Reconnaissance capability. Continuing problems with the development of the system led the Department's Permanent Secretary to write to the Committee of Public Accounts in January 2018.[1] The FOC declared in November 2018 was a mixture of two milestones and did not include 'Release to Service' authorisation from the regulator.

Military Command	Army, delegated from Joint Forces Command (now Strategic Command)
Current estimated cost	£927 million
Documentation of key milestone dates at Main Gate Business Case	No IOC date was given and limited information on an FOC date in the 2005 business case. Specific dates were approved when the acquisition was 're-baselined' in 2014.

Watchkeeper's milestone declaration against target dates reported to and approved by the Department's Investment Approvals Committee (IAC)						
Date of submission to approving authority	2005 Business Case	October 2012	2014 Re-baseline	April 2017	October 2017	Date achieved
FOC	2013	September 2015	Milestone split in two.	–	–	
FOC 1	N/A		April 2017	November 2017 (forecast)	No specific date, but November 2017 would not be met.	Not declared separately. 'Release to Service' element given qualified approval by regulator in April 2019.
FOC 2	N/A		April (50th percentile)/ November (90th percentile) 2018[2]	April/ November 2018	No update	30 November 2018

Main issues with capability delivery	
Maintaining relevance of capability	Project delivery has taken 13 years from business case approval to FOC declaration, and 'significant' capability trade-offs were made in 2005 in order to maintain affordability. Stated capability requirements have remained largely unchanged during the 13 years of Watchkeeper delivery. The capability requires a mid-life upgrade due to changes in the wider IT environment and adoption of contemporary capability requirements.
Long-term issues with functionality of equipment, which extend beyond declaration of FOC	The original target date for FOC was 2013. Target dates slipped due to loss of vehicles in crashes and continuing technical problems, as well as unforeseen changes in the regulatory regime and delays related to operational deployment to Afghanistan. FOC was declared in November 2018 with 10 exceptions or capability relaxations, and the regulator provided permission for restricted flights in UK airspace in April 2019.
Personnel/training	A lack of personnel with suitable qualifications and experience has affected the capacity of the project team to deliver all aspects of the project and has required contractor support to provide a sustainable maintenance regime. Recent reviews of Watchkeeper have highlighted a loss of trained personnel due to difficulties sustaining flying and training.
Management oversight and approvals	FOC was unusually split into two milestones, FOC 1 for April 2017 and FOC 2 for April 2018. In the event, only one FOC was declared, as delays in 'Release to Service' removed the rationale for two. Release to Service was then detached from declaration of FOC because it was considered outside the control of the project team (although the purpose of milestones is to indicate achievement or otherwise of capability, irrespective of cause).

Progress in addressing outstanding capability issues
A September 2019 review by the Infrastructure and Projects Authority emphasised the importance of the next few months in demonstrating the value of the capability through increased flying time and operator training. While not noted as a formal exception at FOC, Watchkeeper faces limitations on deployment in certain weather conditions.

Notes

1   Ministry of Defence, *Watchkeeper Accounting Officer assessment*, January 2018, available at: http://data.parliament.uk/DepositedPapers/Files/DEP2018-0133/Meg_Hillier_Watchkeeper_AO_Assessment.pdf

2   It is usual for approval to be given at the point at which the capability is equally likely to take more or less time than the estimate (the 50th percentile). In this case, Watchkeeper was accepted as meeting the terms of its approval so long as it did not exceed the delivery date that would be achieved in 90% of scenarios (the 90th percentile).

F-35 Lightning II Joint Strike Fighter (IOC(L)/ISD)

Capability description:

The F-35 Lightning II system is a combat aircraft that can conduct air-to-air, air-to-surface and electronic warfare, and carry out intelligence gathering. The UK is a partner nation in the United States (US)-led procurement programme. The capability milestone considered in this case study (IOC(L)) covers operations from land bases. The equivalent milestone for maritime operations is set for December 2020.

Military Command	Air
Current estimated cost	£10.4 billion (whole-life cost estimate for 48 aircraft to 2025-26).
Delivery of milestone against target date	When the strategy for acceptance of the aircraft into service was developed in 2003, IOC was set for late 2014, but the programme was then subject to delays and redefinitions. The 2014 business case set a separate IOC date for operations from land bases of December 2018, which was also treated as the In Service Date. IOC(L) was declared on 31 December 2018.
Level of capability required at IOC Land	Air Command set two definitions of IOC(L). One, developed for the US Joint Project Office (JPO) which oversees the procurement, sets out a series of criteria around provision of aircraft and personnel, physical infrastructure at the Royal Air Force base at Marham, maintenance and training facilities, and data management arrangements to allow for independent UK operations. This reflects the aspects of capability delivery for which the JPO is responsible. By comparison, internal departmental approvals were secured against a definition of IOC(L) that specified the requirement as the ability to deploy aircraft on operations, using detailed criteria such as the ability to fly a certain number of sorties.
How capability was measured	Performance was measured against 'lines of development'. The IOC acceptance criteria against which F-35 would be assessed were not finalised until several years after business case approval, in the second half of 2017. In the case of equipment, the milestone acceptance criteria were still being refined at the point that IOC(L) was being considered in November 2018. Air Command expected that the ability of the aircraft to undertake specific operational deployments would be further demonstrated through exercises undertaken during 2019.
Documentation of key milestone dates at Main Gate Business Case	A date was provided for IOC(L). FOC was defined as 2023, with a more specific date set later.

Main issues with capability delivery	
Overall acceptance of the milestone	IOC(L) was accepted with 67 exceptions across 11 'lines of development' (the Senior Responsible Owner (SRO) added three bespoke 'lines of development' to the standard eight). The main areas where capability criteria were not met are set out below. A number of exceptions arose from not being able to demonstrate deployability through a planned exercise, due to low levels of availability among UK-based aircraft and prioritisation of other training tasks. Ongoing reliability issues for the F-35 programme have been examined regularly by the US Government Accountability Office.[1]
Training	There has been a range of training issues affecting the programme: ● lack of access to mission support training facilities in the US; ● delays in establishment of UK training centre (although this was operational in time for IOC); ● reliance on contractors for mission support in the absence of trained RAF personnel; ● poor aircraft availability; and ● low availability of synthetic training facilities, including simulators.
Equipment	IOC(L) was originally due to be assessed following the conclusion of the Operational Testing and Evaluation (OT&E) programme in the US, carried out on behalf of the whole fleet. OT&E is not now expected to be complete until September 2020. A number of exceptions continue to apply awaiting the conclusion of testing. Obtaining clearances for UK weapons will be an ongoing process until FOC.
Infrastructure	Delays to completion of infrastructure at the main operating base at RAF Marham, due to ground contamination and affordability issues.
Logistics	Immaturity of the fleet-wide 'global support solution'.
Security	Delays in appropriate security clearances for personnel in UK and US (the Department told us these issues have now been addressed).
Reprogramming	The Department is committed to having the ability to programme aircraft with its own mission data, independently of the US. Work-arounds are in place due to delays in completion of the dedicated facility.

Progress in addressing outstanding capability issues
As at February 2020, 20 exceptions were outstanding. Air Command has made progress in the areas of training, personnel and logistics. However, when Air Command declared the milestone it planned that less than 10 exceptions would be outstanding at February 2020. Aircraft and pilot resources are now focused on trials with UK aircraft carriers to achieve the IOC (Maritime) milestone in December 2020. The Department currently expects to deliver the promised F-35 FOC requirements by 2023.

Note

1   United States Government Accountability Office, *F-35 Joint Strike Fighter: action needed to improve reliability and prepare for modernization efforts*, GAO-19-341, April 2019. Available at: https://www.gao.gov/assets/700/698748.pdf

High G test and training facility (FOC)

Capability description:

Provision of a facility in which to train aircrew to deal with high g-forces. This was an adaption of a facility in use with the Republic of Singapore Air Force. The project had no IOC milestone but delivered an FOC ahead of schedule.

Military Command	Air
Current estimated cost	£126 million (whole-life cost estimate over 25 years)
Delivery of milestone against target date	High G achieved FOC by November 2018, three months in advance of the February 2019 milestone specified in the Main Gate Business Case, although the business case itself was delayed by six months.
Documentation of key milestone dates at Main Gate Business Case	High G went straight to FOC, and a date was provided for this.
Successful delivery of capability	The delivery team attributed the successful delivery of the capability to the proven technological solution, specialist project delivery support and a well-managed, highly motivated team.

Main issues with capability delivery	
Equipment and infrastructure	Three exceptions related to a need to meet user specifications set in excess of operating requirements, and policy around certification of the building by the Defence Infrastructure Organisation.

Progress in addressing outstanding capability issues
There is a process in place for dealing with exceptions. As at August 2019 not all exceptions had been cleared and it was expected this might not happen until 12 months or longer after FOC.

Falcon Early Entry Capability (FEEC) battlefield communication system (IOC)

Capability description:

The design and provision of a smaller, more portable version of the FEEC battlefield communication system for rapid response forces. Part of a much larger programme – the Land Environment Tactical Communication and Information System – to be implemented in full later in the 2020s and into the 2030s. The system has been deployed since IOC.

Military Command	Joint Forces Command (now Strategic Command) and Army Command
Current estimated cost	£71 million whole-life cost
Level of capability required at IOC	Personnel trained to deliver FEEC to one deployed operating base and two headquarters.
Documentation of key milestone dates at Main Gate Business Case	Dates for both IOC and FOC were given.

FEEC's milestone declaration against target dates approved by departmental approval authorities			
Date of submission to approving authority	November 2015 Business Case	July 2017	February 2018
IOC	July 2017	October 2017	January 2018 (backdated approval after the milestone was missed)

The capability subsequently achieved FOC in November 2018.

Main issues with capability delivery	
Equipment	Premature system acceptance – the Senior Responsible Owner deemed the FEEC system's masts as meeting system requirements as a result of limited Factory Acceptance Tests. In subsequent field trials, the lead user concluded the solution was not acceptable to meet the full range of environmental conditions when judged against user requirements. As a result, the Command paid for more robust masts.
	Competing priorities during demonstration and manufacture phases – during manufacture, the design was frozen. Over this period, a number of critical software patches were released by the manufacturers. As a result, an eight-month backlog of patches had to be applied before IOC could be declared. Patching is also more difficult because FEEC uses a more up-to-date operating system than the rest of Falcon.
Training	Lack of previously promised capacity in the training solution delayed IOC while the delivery team funded an alternative solution using the contractor.
Personnel	FEEC is more personnel-intensive than expected, but its impact is judged to be 'tolerable' by the LE TacCIS Programme Board.

Progress in addressing outstanding capability issues

FEEC faced 11 exceptions at the declaration of the milestone – just under half of the exceptions for the FEEC communication system involved the need, identified during field trials, to improve the performance of the system beyond that specified in the original requirements. All exceptions were resolved within 14 months.

Upgraded Base Inventory Warehouse Management System (BIWMS) – Release 2 (FOC)

Capability description:

BIWMS replaces the RAF's previous inventory management system and other associated systems. In 2010 BIWMS was authorised as a sub-project within the larger Future Logistics Information Service (FLIS) programme.

Military Command	Joint Forces Command (now Strategic Command)
Current estimated cost	£46 million; £41 million of this cost was absorbed within the estimate of the wider FLIS programme.
Delivery of milestone against target date	FOC achieved in January 2017 in line with the target date.
Documentation of key milestone dates at Main Gate Business Case	A date for IOC was omitted from the FLIS Main Gate Business Case. In January 2015 the SRO supplied the Department's approving authorities with an IOC date of December 2016.

Main issues with capability delivery	
Training	Training delivery was not in the initial scope, which led to funding shortfalls for the project. The solution involved use of generic trainers delivering training rather than specialists with subject matter experience.
Personnel	There was a high turnover of personnel in the project management roles.
Governance	This requirement originated as a one-line sub-project within a larger programme to replace the old inventory management system. Project papers record that "due to uncertainty over the requirement, the Project stagnated for almost five years", had no specific funding allocation and suffered from "unclear deliverables, questionable requirement and un-finalised timelines". The appointment of a project team with appropriate skills brought momentum to the project. The presence of limited project documentation meant the team worked flexibly and proactively with the supplier to replace the life-expired system.
Delivery approach	The fact that the capability consisted of new software rather than physical equipment represented a challenge to the traditional milestone approach – the new system was rolled out in 'waves', which were fitted into the IOC/FOC approach.
Management information	The Joint Forces Command (now Strategic Command) Portfolio Office held an incorrect date for the declaration of the milestone (reporting it met FOC in January 2019).

Progress in addressing outstanding capability issues
There were no exceptions at the point of capability delivery.