National Audit Office

Report
by the Comptroller
and Auditor General

Ministry of Defence

Investigation into military flying training

HC 2635 SESSION 2017–2019 4 SEPTEMBER 2019

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Ministry of Defence

Investigation into military flying training

Report by the Comptroller and Auditor General

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Gareth Davies
Comptroller and Auditor General
National Audit Office

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The Ministry of Defence (the Department) is not currently meeting its stated targets for the number of trained aircrew it needs, with students taking longer to complete training than expected. Since 2012, the Department has introduced new core flying training, Phase 2 of the training process, through working with its contractor Ascent Flight Training (Management) Limited. We investigated the performance of this new training system within the context of the Department's full training system and how the Department plans to meet its increasing aircrew requirements.

Investigations

We conduct investigations to establish the underlying facts in circumstances where concerns have been raised with us, or in response to intelligence that we have gathered through our wider work.

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Contents

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Key facts

257

average number of aircrew the Ministry of Defence (the Department) needs to complete Phase 2 training each year in the six years to 2018-19

45%

average annual shortfall between the number of aircrew completing Phase 2 training against the Department's requirement in the six years to 2018-19

94%

percentage of the 965 Phase 3 front-line training places filled by students completing Phase 2, 2015-16 to 2018-19

Meeting the Department's aircrew requirements

7.1 years	average time for Royal Air Force fast-jet pilots to complete the three-phase training process against the Department's 3.9-year optimum, as at July 2019[1]
145	number of Royal Air Force students waiting to start Phase 2 training against a target of 26 students, as at July 2019
April 2021	Department's expected date to meet its target for the number of students waiting to start Phase 2 training
2023	Department's expected date to have all training components in place to meet its increased aircrew requirements

The Military Flying Training System (MFTS)

76	shortfall between the Department's latest requirement for aircrew completing Phase 2 training (342) against the number which Ascent Flight Training (Management) Limited (Ascent) were contracted to deliver (266) for 2018-19
102	the number of new aircraft Ascent and the Department have brought into service, across seven different aircraft types
94%	current percentage readiness of MFTS helicopter and fixed-wing training[2]
£514 million	amount received by Ascent from the Department for the MFTS, as at 31 March 2019

Notes

1 Target time assumes students wait no more than one month between training courses.

2 Other training, advanced jet and rear crew, has been in place since 2012.

What this investigation is about

1 In the next 10 years, the Ministry of Defence (the Department) plans to invest £46 billion purchasing and supporting front-line aircraft, including the helicopters and fast jets used by the Royal Navy, British Army and Royal Air Force (RAF). Every five years, through Strategic Defence and Security Reviews, the government sets the strategic context which informs the Department's assessment of the aircraft and aircrew required. It most recently conducted a review in 2015. This increased current aircrew requirements compared with the previous 2010 review, leading to a 29% (76) rise in students needing to complete training in 2018-19. This increase resulted from, for example, introducing two further Typhoon squadrons; accelerating the purchase of F-35 jets; and committing to buy new maritime patrol aircraft and remotely piloted aircraft.

2 To operate this equipment, the Department must train enough aircrew with the right skills. These aircrew include pilots, observers and weapons specialists to fly the aircraft and operate its systems. For aircrew to be able to serve in front-line squadrons, they must complete a three-phase training process (**Figure 1** overleaf).

3 The Department currently provides Phase 2 – core flying training – through a range of providers. They include Ascent Flight Training (Management) Limited (hereafter Ascent) as the principal partner, with whom it contracted in 2008 to design, introduce and then provide, with the Department, a new Phase 2 training system. This became known as the Military Flying Training System (MFTS).

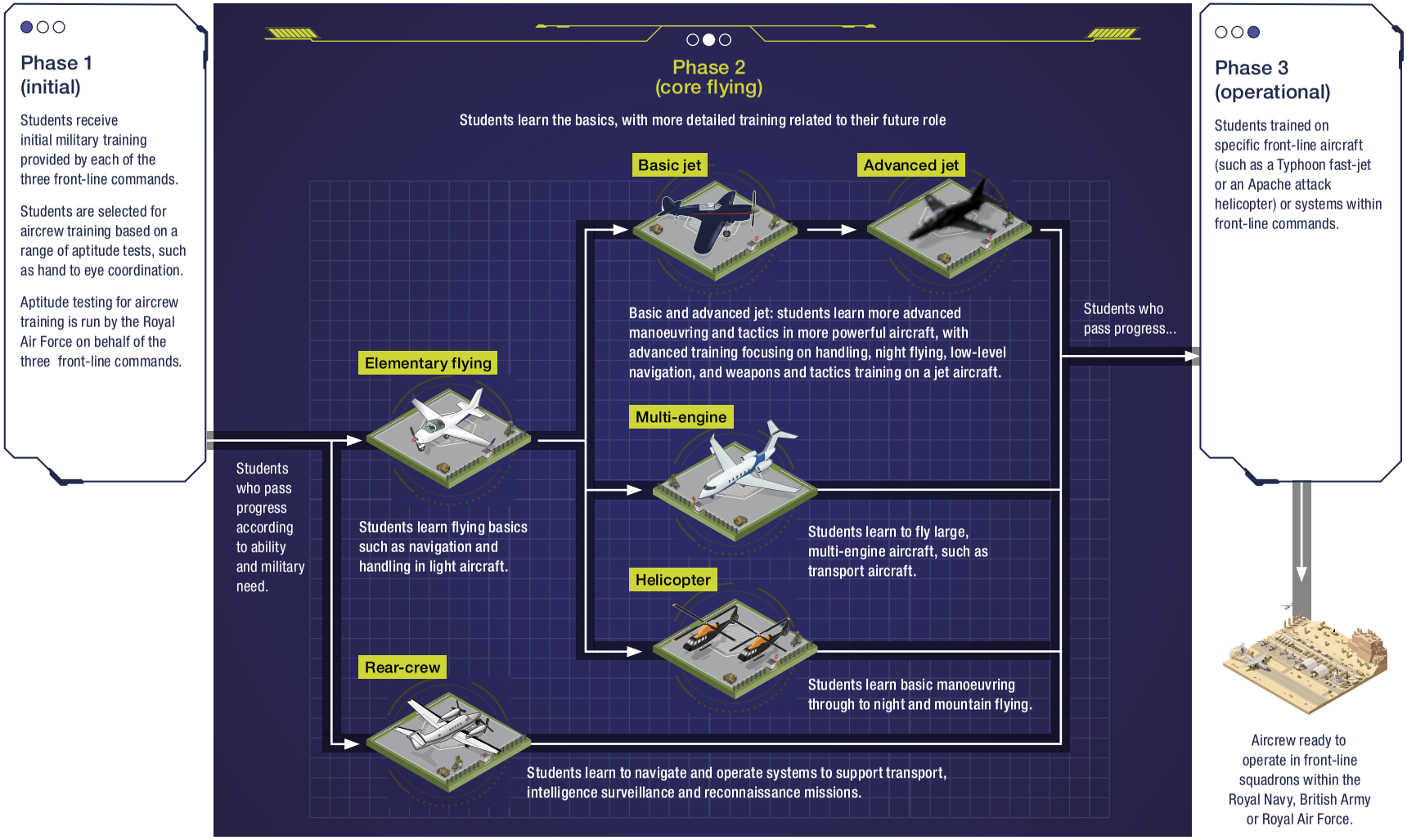
4 Since 2012, the Department and Ascent have been transitioning to MFTS from legacy training. The Department considers the MFTS, alongside changes to front-line aircraft, to represent the largest transformation of UK military flying in more than a generation. Through the MFTS, the Department aims to:

- optimise aircrew training time;
- close the gap between the skills that aircrew have on finishing Phase 2 training and those they need to operate front-line aircraft; and
- reduce the overall cost of flying training.

Figure 1

Military flying training model, as at July 2019

The aircrew training model involves three phases with separate training for different aircraft and aircrew



Source: National Audit Office

5 Ascent has been contracted to provide the Department's earlier 2010 Review aircrew requirements, rather than the higher requirements of the 2015 Review.[1] It is paid for designing and delivering the MFTS, and then for making available training components across a range of training packages, including for helicopters and fast jets. These courses cannot be provided if either the Department or Ascent, or their supply-chains, do not meet their contractual responsibilities. As shown in Figure 7, these responsibilities include providing flight simulators and aircraft, and managing airfield services. As at 2015, the Department had forecast the MFTS would cost £3.2 billion during the 25-year contract, and up to 31 March 2019 Ascent had received £514 million.[2]

6 In 2015, we reported that full introduction of the MFTS had been delayed nearly six years with the expectation that it would operate at full capacity by December 2019.[3] This followed several events which affected the Department's original assumptions and which took time to resolve. They included the Strategic Defence and Security Review 2010 approximately halving the number of student recruits each year, and reductions in funding affecting how the Department would purchase aircraft. In our 2015 report we recommended that the Department better incentivise Ascent to meet the MFTS aims, establish a baseline against which to assess performance, and examine the time and cost implications of increasing training capacity across the system. Subsequently, the Strategic Defence and Security Review 2015 increased the demands for trained personnel.

7 This investigation follows up recent Parliamentary concerns about the MFTS. It builds on our 2015 report by describing what has been delivered, while setting this within the broader context of the Department's current aircrew requirements and its overall training system. It describes:

- the Department's aircrew requirements, the three-phase training process and how this is performing (Part One);
- what has been delivered as part of the MFTS and the system's performance (Part Two); and
- the Department's actions to address flying training shortfalls (Part Three).

8 We conducted our fieldwork in June 2019 by interviewing Department and Ascent staff; reviewing available data on training and aircrew requirements; and examining performance reports. Appendix One describes our approach. We do not consider the value for money of military flying training.

9 As the report highlights, in a number of places we identified significant gaps and inconsistencies in data used centrally by the Department to manage the training process. The central team, which oversees Phase 2 training, also oversees RAF training, with Navy and Army Commands having responsibility for their respective students. Centrally, the Department does not collate data from front-line commands other than the RAF. This includes, for example, on the time students take to complete their three-phase training.

1 The Department has taken time to consider how it will deliver the increased requirements set by the 2015 Review.
2 Figures provided by Ascent. They cover the design and delivery of the MFTS, alongside debt repayments for fast jets and fixed-wing training private finance initiatives. They do not include more than £400 million of Departmental capital repayments direct to sub-contractors for aircraft and other infrastructure to support training.
3 Comptroller and Auditor General, Ministry of Defence: *Military flying training*, Session 2015-16, HC 81, National Audit Office, June 2015.

Summary

Key findings

Meeting the Ministry of Defence's (the Department's) aircrew requirements

10 The Department does not currently have the aircrew it needs. The Department does not have accessible historical data on the students completing the entire three-phase training process. However, using aircrew shortfalls as a proxy shows it has experienced significant personnel gaps for several years. For example, as at April 2019, the Royal Air Force (RAF) – the front-line command requiring the most aircrew – was 331 personnel (18%) below its pilot requirement (paragraph 1.3).

11 In the six years to 2018-19, the Department experienced an average 45% (125 student) shortfall in aircrew completing their Phase 2 training each year. Students must complete Phase 2 training before progressing to the Phase 3 operational training. In its worst year (2018-19), 49 students completed Phase 2, an 86% shortfall against the Department's current aircrew requirements. In its best year (2015-16), 182 students completed Phase 2, a 21% shortfall (paragraph 1.8 and Figure 3).[4]

12 Students completing Phase 2 training filled 94% (910) out of 965 Phase 3 operational training places between 2015-16 and 2018-19. To complete their training and be ready for service, students learn to fly front-line aircraft, such as Typhoon fast jet or Apache helicopter, during their Phase 3 training run by front-line commands. If the Department meets its stated requirement for 424 students completing Phase 2 training in 2022-23, it will need to increase its Phase 3 training capacity so students can complete their flying training (paragraph 1.9).

13 In the past two years, students have taken longer to complete training than expected. Centrally, the Department does not collect data from across front-line commands on the time students take to complete their three-phase training. Data from the RAF show that as at July 2019 training of its fast-jet pilots took an average of 7.1 years, compared with the Department's optimum time of 3.9 years. The Department told us that while waiting to take up courses students fill other roles, such as in air traffic control, where they help deliver services and develop their personal effectiveness. The data also show that 145 RAF students were due to start their Phase 2 training, having waited an estimated average of 90 weeks, compared with an expected position of 26 students waiting 12 weeks.[5] The Department plans to have an appropriate number of students awaiting the next stage of training to ensure that courses do not have gaps.

4 Phase 2 currently consists of aircrew being trained through the Military Flying Training System (the MFTS), but also through other training routes.

5 We were unable to provide full assurance over the data.

It recognises this is not currently the case and is seeking to correct this situation. It recognises that extended waiting times can reduce the amount of time aircrew are available on the front line during their career. In 2018-19, fewer than 10 students left the Armed Forces before completing their flying training (paragraphs 1.10 to 1.13 and Figures 4 and 5).

Performance of the MFTS

14 The Department and Ascent now have in place most of the training components needed for the MFTS to operate fully by April 2020. Ascent and the Department have:

- brought into service 102 aircraft of seven different types;
- provided around 20 flight simulators and other training devices;
- built or refurbished new aircraft hangars and training facilities; and
- designed and certified 36 courses out of a planned total of 67.

Advanced jet and rear crew training has been provided since 2012, with the remaining training – for helicopter and fixed-wing students – now 94% ready and expected to be fully introduced from December 2019.[6] The MFTS will then provide training as designed to meet the Strategic Defence and Security Review 2010 requirement from April 2020. This represents only a further three-month slippage on top of the six-year delay we reported on in 2015. The Department considers this a good outcome considering the past position of the programme. The first students to be trained entirely via the MFTS courses are expected to graduate in September 2019 (paragraphs 1.15, 2.4 and Figures 8 and 9).

15 As at 31 March 2019, Ascent had received £514 million from the Department for introducing the MFTS and starting to deliver courses. As well as some debt repayments, this sum includes £145 million (30%) relating to fixed payments for designing the system, managing training courses and maintaining courseware. It also includes £245 million (52%) for ensuring the training components, such as the aircraft and simulators, were available for courses. Historical delays introducing the MFTS meant Ascent did not initially receive £15 million where training components were not in place. The Department was eventually liable for paying Ascent £10 million of this sum given it had failed to fulfill its responsibilities or remained contractually liable to make payments. As training components have been introduced, Ascent has delivered an increased number of courses (paragraph 1.16 and Figure 6).

6 The fixed-wing package includes elementary flying and multi-engine training, which have been fully introduced, and basic jet training, which the Department and Ascent expect to be ready for training use from November 2019.

16 As at 31 March 2019, 44 out of the 369 planned MFTS courses had been cancelled due to one or other party failing to fulfil its responsibilities. Neither the Department nor Ascent could easily provide a full list of delayed courses with underlying reasons, in part because the different roles and responsibilities make it difficult to determine the causes. Of the 44 cancelled courses, 28 related to the Department not fulfilling responsibilities such as not providing sufficient air traffic controllers or because runways were being refurbished. Other reasons have included:

- **insufficient qualified instructors provided by the Department:** For each training type, the Department has agreed to provide a proportion of the required instructors. This includes 75% of helicopter instructors and all live-flying, fast-jet instructors. However, there are currently military instructor shortfalls which the Department and Ascent are working to resolve; and
- **availability of aircraft provided by Ascent and the Department:** Ascent and its subcontractors provide all aircraft apart from the Hawk T2, which the Department provides through BAE Systems. Apart from helicopters, aircraft availability has been poor across the system. For example, between April and July 2019, Ascent did not provide the elementary flying, rear crew and multi-engine aircraft required. The Department provided an average of 12 advanced jet aircraft per day, against a required 18 per day.

In addition, the Department chose not to provide students for 10 of the planned 369 courses (paragraphs 2.12 to 2.20 and Figures 10 to 12).

Looking ahead

17 The Department does not yet have approved plans for every training package needed to deliver its current Phase 2 aircrew training requirements. Ascent has been contracted to provide, through the MFTS, the Strategic Defence and Security Review 2010 aircrew requirements. These requirements subsequently increased following the 2015 Review. Therefore, the MFTS was designed to provide 76 fewer trained aircrew than the Department's 2018-19 requirement. Since the 2015 Review, the Department has been considering and testing its options, developing business cases and putting additional commercial arrangements in place. For example, in July 2019, it agreed to expand the MFTS helicopter training capacity. The Department expects to make decisions for rear crew and multi-engine training by the end of 2019. As such, the Department expects to start incrementally increasing the number of trained students from 2020, with a fully expanded system from 2023 (paragraphs 1.18 and 3.6).

18 To increase the number of trained aircrew, the Department uses other providers outside the MFTS. In 2019-20, it expects to train 125 aircrew in other ways, such as through civilian training providers, at a cost of £15 million. Students following these routes need to complete additional military training, which the Department recognises may cost more than if those students completed the MFTS training (paragraphs 3.4 and 3.5, and Figure 13).

19 The Department has not yet fully addressed the recommendations in our 2015 report to ensure it maximises the potential benefits of the MFTS. Our 2015 report recommended that the Department should improve both the MFTS commercial arrangements and performance information across the training process. In June 2019, the Department and Ascent formalised joint transformation projects to improve commercial incentives and performance data. In particular:

- **Commercial incentives.** Ascent and the Department are discussing revised commercial terms to incentivise increases in the number of students completing training, reductions in training times and decreases in costs. Ascent continues to be paid primarily for service availability, with a small proportion of payments – £7.4 million (1.4%) as at March 2019 – for completing courses (paragraphs 3.7 to 3.13).
- **Whole-process performance information.** Our 2015 report recommended that the Department establish a baseline to measure, monitor and evaluate performance across all three phases of the training process. Although compromised by a lack of historical information, it has assessed Phase 2 training times. However, the central team does not yet collate data to assess the time taken across the full process. In addition, it does not yet have data to assess the cost to train aircrew or data on how many students complete their full training (paragraphs 3.14 to 3.17).

Part One

Background

1.1 The Ministry of Defence (the Department) must train the aircrew it needs to meet its front-line demands. This part explains the Department's aircrew requirements, the number of aircrew being trained and how the training process works. In 2008, the Department contracted with Ascent Flight Training (Management) Limited (Ascent) to design, introduce and manage a new approach to Phase 2 training, known as the Military Flying Training System (MFTS).

The Department's aircrew requirements

1.2 The Department must train aircrew to fly and operate around 25 types of front-line aircraft currently in use by the three front-line commands – the Royal Navy, British Army and Royal Air Force (RAF). Over the 10 years from 2018-19, it plans to invest £46 billion in procuring and supporting aircraft, which must then have suitably trained aircrew. These include pilots to fly all types of military aircraft from fast jets (including Typhoons and F-35 Lightnings), large aircraft and helicopters, as well as specialist rear crew to undertake a variety of technical roles.

1.3 In April 2019, the RAF, which has a higher demand for pilots than the Navy and Army, was 18% (331) below its requirement for 1,869 pilots. In 2018, we reported that at the current rate of training, the RAF estimated it would be another 20 years before it has enough pilots.[7] Since then the Department has been considering ways to increase the number of trained aircrew, which we describe in Part Three.

1.4 The Department's front-line requirements, set by each command, direct the number and type of aircrew to be trained each year (**Figure 2**). Every five years, through Strategic Defence and Security Reviews, the government sets the strategic context around these requirements. As such these Reviews, last conducted in 2010 and 2015, influence the number of front-line aircraft in service and therefore the aircrew requirements.

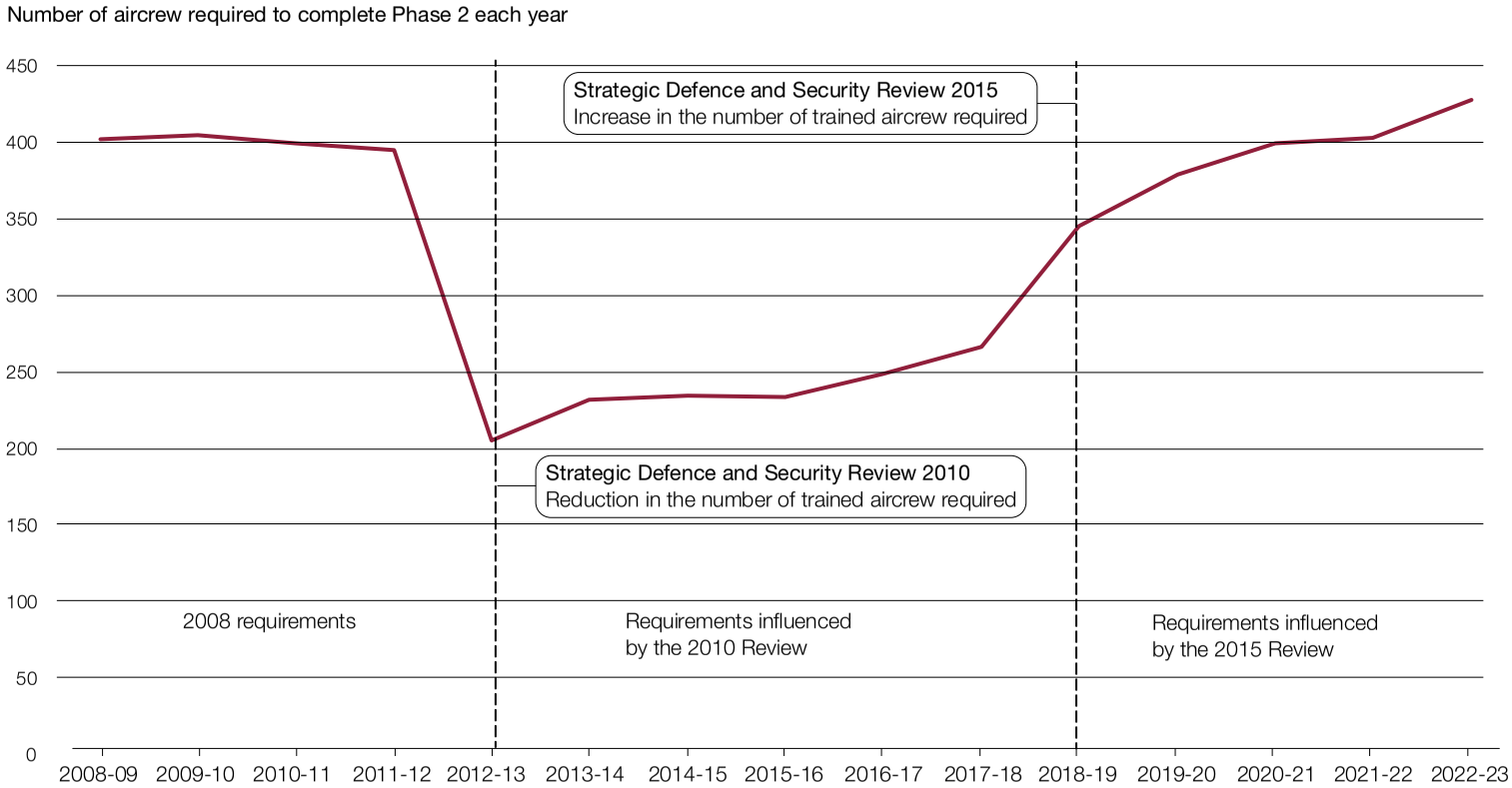
1.5 Changes introduced by the Strategic Defence and Security Review 2010 (2010 Review) decreased the number of aircrew required, resulting in a 48% (189) fall in the aircrew who needed to complete Phase 2 training in 2012-13. This followed certain aircraft being removed from service and the retirement of others earlier than expected.

7 Comptroller and Auditor General, Ministry of Defence, *Ensuring sufficient skilled military personnel*, Session 2017–2019, HC 947, National Audit Office, April 2018.

Figure 2

Ministry of Defence requirement for students completing Phase 2 training, 2008-09 to 2022-23

The Ministry of Defence's aircrew requirements have changed over time



	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22	2022-23
Fast-jet pliots	46	46	46	44	34	32	34	27	29	35	25	40	40	40	40
Helicopter pilots	144	144	144	144	73	83	76	81	87	89	86	104	106	109	109
Multi-engine pilots	46	46	46	46	15	28	26	25	24	28	121	108	109	106	106
Rear crew	162	165	160	157`	80	85	95	97	105	111	110	123	141	144	169
Total	**398**	**401**	**396**	**391**	**202**	**228**	**231**	**230**	**245**	**263**	**342**	**375**	**396**	**399**	**424**

Notes

1 From 2018-19, multi-engine numbers include those training to fly remotely piloted aircraft (drones).

2 The 2010 Review reduced aircrew requirements following certain aircraft being removed from service and the retirement of others earlier than expected. The 2015 review increased requirements with, for example, the Department purchasing more aircraft and extending the lives of others.

Source: National Audit Office analysis of Ministry of Defence data

1.6 Subsequently, the Strategic Defence and Security Review 2015 (2015 Review) increased requirements. This included the Department committing to: two additional Typhoon fast-jet squadrons; accelerating the purchase of F-35 fast jets; purchasing nine new maritime patrol aircraft; acquiring remotely piloted aircraft; and extending the life of some existing surveillance aircraft. Prior to the 2015 Review, the Department's expected Phase 2 training requirement for 2018-19 was 266. After the 2015 Review, this increased by 29% (76) to 342 for 2018-19).

How flying training works

1.7 The aircrew training process involves students being put through increasingly tailored training to operate different aircraft and systems, and undertake specific roles. As Figure 1 shows, it involves the Department selecting students (Phase 1); teaching them the basics of flying in training aircraft and simulators (Phase 2); and then providing operational training on front-line aircraft, such as Typhoon fast jets and Apache helicopters, within around 25 units across the front-line commands (Phase 3). Students then join operational squadrons.

Performance of the flying training system

Aircrew numbers

1.8 The Department does not have accessible historical data on the number of aircrew completing the full three-phase training process. However, using students completing Phase 2 training as a proxy, as at April 2019, students completing training did not match the Department's requirements (**Figure 3**). This shortfall has varied between 48 (21%) in 2015-16 and 293 (86%) in 2018-19. In the six years to 2018-19, the average aircrew requirement was 257, but an average of 132 personnel completed Phase 2 training over this period. This represents an average shortfall of 125 students and an average percentage shortfall of 45% over the six years to 2018-19.

1.9 To be ready for front-line service, students passing their Phase 2 training must then complete Phase 3 within their front-line commands. Between 2015-16 and 2018-19, the Department has filled 94% (910) of the 965 Phase 3 places provided by the three front-line commands, principally from those completing their Phase 2 training. Should more students finish Phase 2, the Department must increase Phase 3 training capacity so students can complete their training.

Figure 3

Number of aircrew completing Phase 2 training, 2011-12 to 2020-21

The Ministry of Defence (the Department) has not trained enough aircrew to meet its requirements

	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21
Requirement	391	202	228	231	230	245	263	342	375	396
Total UK aircrew trained										
Fast jet	n/a	n/a	14	10	19	11	15	17	28	38
Multi-engine	n/a	19	27	22	28	20	26	18	67	48
Helicopter	57	44	67	67	86	77	38	0	55	80
Rear crew	n/a	28	41	40	49	44	42	14	79	92
Total	**n/a**	**n/a**	**149**	**139**	**182**	**152**	**121**	**49**	**229**	**258**
Shortfall	n/a	n/a	79	92	48	93	142	293	146	138
Percentage			35%	40%	21%	38%	54%	86%	39%	35%
International students						2	10	4		
Total trained			**149**	**139**	**182**	**154**	**126**	**53**	**229**	**258**

Notes

1 As the Ministry of Defence (the Department) compiled actual figures from both its systems and discussions with training sites, we have not been able to fully quality-assure these figures. These differ from the student database that the Department uses for internal reporting and to monitor training times.

2 Requirement shows the number of trained UK aircrew the Department needs to complete Phase 2 training. Up to and including 2017-18, this reflects the Strategic Defence and Security Review 2010, after which it reflects the Strategic Defence and Security Review 2015.

3 International students do not count towards the United Kingdom's requirement. The Department has committed to train some international students from 2019-20 onwards.

4 Figures from 2019-20 reflect current forecasts.

5 Percentage figures have been rounded to the nearest whole number.

Source: National Audit Office analysis of Ministry of Defence data

Training times

1.10 The Department does not collect data centrally on how long training takes for students across the front-line commands. Data from the RAF indicate that as at July 2019, the average time taken by RAF students to complete the three-phase training was far longer than expected (**Figure 4** overleaf). The Department told us this reflects that the overall training system does not currently have the capacity to handle the required throughput and that managing students through the three-phase process remains a challenge.

1.11 The Department recognises that the full training process currently takes students longer than anticipated. Students spend longer between individual courses, termed 'being on hold', than the Department expected. It always planned to have students waiting in order that courses were full, with an optimum one-month wait between different courses. In July 2019, 145 RAF students were due to start a Phase 2 course, compared with 151 undertaking training courses (**Figure 5** on page 17). By managing the number of new students entering Phase 1, the Department expects those waiting to decrease by 10% during 2019-20, with the backlog at planned levels by April 2021.

Figure 4

Average actual and optimum Royal Air Force pilot training time in July 2018 and 2019

The time taken to train aircrew has consistently exceeded the Ministry of Defence's expectations

Aircrew type	Ministry of Defence's optimum time (years)	Average time as at July (years)	
		2018	2019
Fast jet	3.9	7.4	7.1
Multi-engine	2.6	4.3	4.5
Helicopter	3.0	5.0	5.2

Notes

1 Training time is measured from the start of Phase 1 to the end of Phase 3 training. Optimum times reflect the average target time once the Military Flying Training Scheme (the MFTS) is fully implemented, assuming no more than a month between courses.

2 Actual times taken from the Ministry of Defence's (the Department's) student database, which it uses for internal reporting. This database does not reconcile with the Department's manual record of students completing training and we have been unable to quality-assure these data.

3 Data do not include Army and Navy students. They include all Royal Air Force students training via both the MFTS and other courses. No earlier information is available, and the Department does not collect data on rear crew as this training is currently conducted through a range of training packages.

Source: National Audit Office analysis of Ministry of Defence data

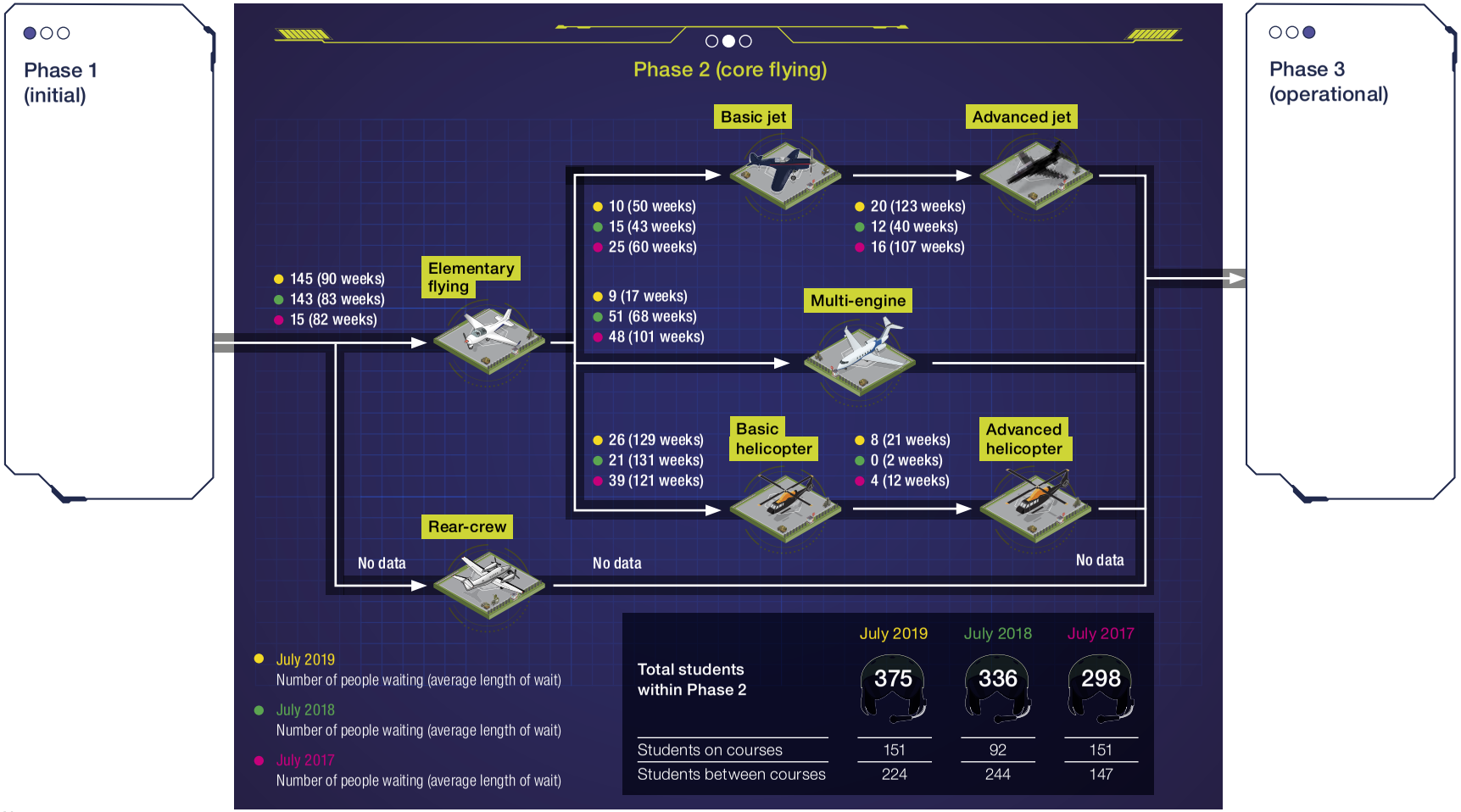
1.12 In April 2019, the RAF was a total of 1,750 personnel below its required strength. Students between courses fill various roles which would otherwise be vacant. In 2018-19, the salaries of student aircrew working in other areas, such as air traffic control, air safety assurance and air worthiness, amounted to £8.5 million. Waiting to undertake training can affect morale but the Department told Parliament that in 2018 fewer than 10 people left the Armed Forces before completing their flying training, which would be less than 3% of 375 students in Phase 2 training as at July 2019. It does not systemically collect data on student aircrew morale or retention.

1.13 The Department selects students and provides the necessary initial training before they join Phase 2 training. In 2016, the Department recognised there were delays introducing new training and that it did not yet have plans to deliver its current aircrew requirements. In 2016-17, the RAF selected 69% (92) more student aircrew than in 2015-16. This decision did not take account of training capacity and contributed to an increase in students waiting to start Phase 2 training. As at July 2019, 145 RAF students had been waiting an average of 90 weeks, compared with 15 students waiting 82 weeks in 2017. The Department prefers to keep students waiting in advance of starting Phase 2 training, rather than after they have developed aircrew skills that would then need to be refreshed. In 2019-20, the RAF aims to recruit 146 aircrew, 73 (33%) fewer than in 2016-17. By the end of 2020-21, the Department expects 26 students to be waiting an average 12 weeks to start Phase 2.

Figure 5

Royal Air Force students across Phase 2 of the military flying training process in July of 2017, 2018 and 2019

The numbers of students waiting to start elementary flying training and the time students are waiting has increased since 2017



Notes

1 Actual times taken from Ministry of Defence's (the Department's) student database, which it uses for internal reporting. This database does not reconcile with the Department's manual record of students completing training and we have been unable to quality-assure these data.

2 Data do not include Navy and Army students. They include all Royal Air Force students training via both the Military Flying Training System and other courses.

3 Total students between courses includes those completing elemtary flying training who have not yet been assigned a specific training route (two as at July 2018; four as at July 2019).

4 The Department does not have robust data to show students waiting for Phase 3 training before 2018 or undertaking rear crew training.

Source: National Audit Office analysis of Ministry of Defence data

The Military Flying Training System

1.14 In 2008, the Department signed a 25-year contract with Ascent, a 50:50 Lockheed Martin and Babcock joint venture, to design, introduce and then manage with the Department new Phase 2 training. It decided to outsource this training following Departmental and National Audit Office work, which highlighted that existing training was fragmented and expensive and that students spent too long in training rather than on the front line.[8] The Department's aims in using an external provider were to:

- optimise training times;
- close the gap between the skills of aircrew finishing training and the skills needed to use front-line aircraft; and
- reduce the overall cost of flying training.

1.15 The Department has been transitioning to the MFTS incrementally, with Ascent introducing training in phases for different aircraft types. Each training package includes individual courses, which students must finish to complete Phase 2. During the transition, the Department continued to operate legacy training and support older aircraft, and has used other training providers outside the MFTS. The Department expects the first students trained entirely through the MFTS to graduate in September 2019. Until then it will be difficult for the Department to start to assess whether MFTS students perform better during Phase 3. If so they may need to undertake less of this operational training, reducing the overall training cost.

1.16 The Department pays Ascent for designing the Phase 2 training, introducing the system and managing availability. In 2015, the Department had forecast the MFTS would cost £3.2 billion over the 25-year contract. From the start of the 2008 contract to 2018-19, Ascent had received £514 million from the Department (**Figure 6**). In 2018-19, it received £107 million for ensuring training courses were available, with the required aircraft, simulators and instructors in place for each course. This is almost three times the £36 million Ascent received in 2017-18, which reflects, in part, that more MFTS courses are being provided.

1.17 To introduce and provide courses, both the Department and Ascent must fulfil their respective responsibilities. These include providing course materials, simulators, aircraft, instructors and airfield services, and managing student numbers. Part Two of this report describes the performance of the Department and Ascent in fulfilling these responsibilities.

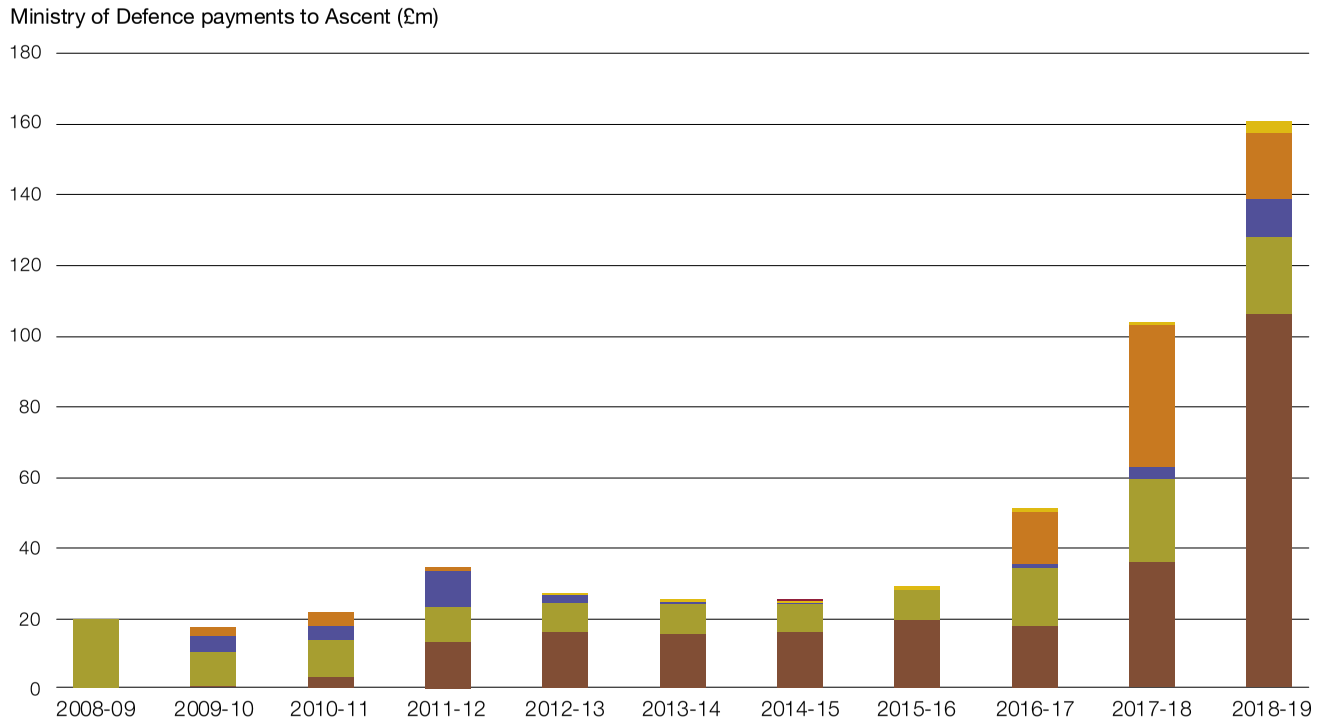
1.18 The Department contracted Ascent to meet the 2010 Review requirements through the MFTS. Subsequent changes made as a result of the 2015 Review mean the MFTS does not meet the Department's current requirements. For example, in 2018-19 it expected to train 76 fewer aircrew within Phase 2 than the current requirement of 342 students. Part Three of this report describes how the Department plans to meet these increased requirements.

8 Comptroller & Auditor General, Ministry of Defence, *Training new pilots*, Session 1999-2000, HC 880, National Audit Office, September 2000.

Figure 6

Payments received by Ascent Flight Training (Management) Limited from the Ministry of Defence (the Department), 2008-09 to 2018-19

Ascent has been paid more as it starts to deliver more courses



	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	Total
Whole system incentive	–	–	–	–	–	–	0	–	–	–	–	**0**
Course completion incentive	–	–	–	–	0	1	1	1	1	1	3	**7**
Other	–	2	4	1	–	–	–	–	15	40	18	**80**
Ministry of Defence changes	–	4	4	10	2	1	0	0	1	4	11	**38**
Training system design	20	10	11	10	8	8	8	9	16	23	22	**145**
Training availability	–	0	3	13	16	16	16	19	18	36	107	**245**
Totals	**20**	**16**	**21**	**34**	**26**	**26**	**25**	**29**	**51**	**104**	**160**	**514**

Notes

1 Figures presented on an accruals basis.

2 Figures include debt repayments for fast-jet and fixed-wing training private finance initiatives. They do not include more than £400 million of Departmental capital repayments direct to sub-contractors for aircraft and other infrastructure to support delivery of training.

3 Figures do not sum due to rounding. A hyphen shows no payment made. A figure of 0 represents less than £0.5 million.

Source: National Audit Office analysis of Ascent data

Part Two

Performance of the Military Flying Training System

2.1 Part One describes how the Ministry of Defence (the Department) is not yet training the aircrew it needs, with shortfalls in students completing their Phase 2 training. To improve flying training, in 2008 the Department contracted Ascent Flight Training (Management) Limited (Ascent) to design, introduce and provide new Phase 2 training – the Military Flying Training System (MFTS). Following a transitional period, the MFTS is now largely operational, with the number of courses increasing. This part sets out progress with the MFTS.

Roles and responsibilities

2.2 The Department retains overall accountability for providing flying training that meets front-line requirements. To operate effectively, the MFTS requires both the Department and Ascent to meet their respective contractual responsibilities (**Figure 7**). Where responsibilities are not met, there have been delays introducing the MFTS and providing courses, with financial consequences for the party at fault. Events beyond the control of both the Department and Ascent, such as the weather and accidents, also have an impact.

Introducing the MFTS

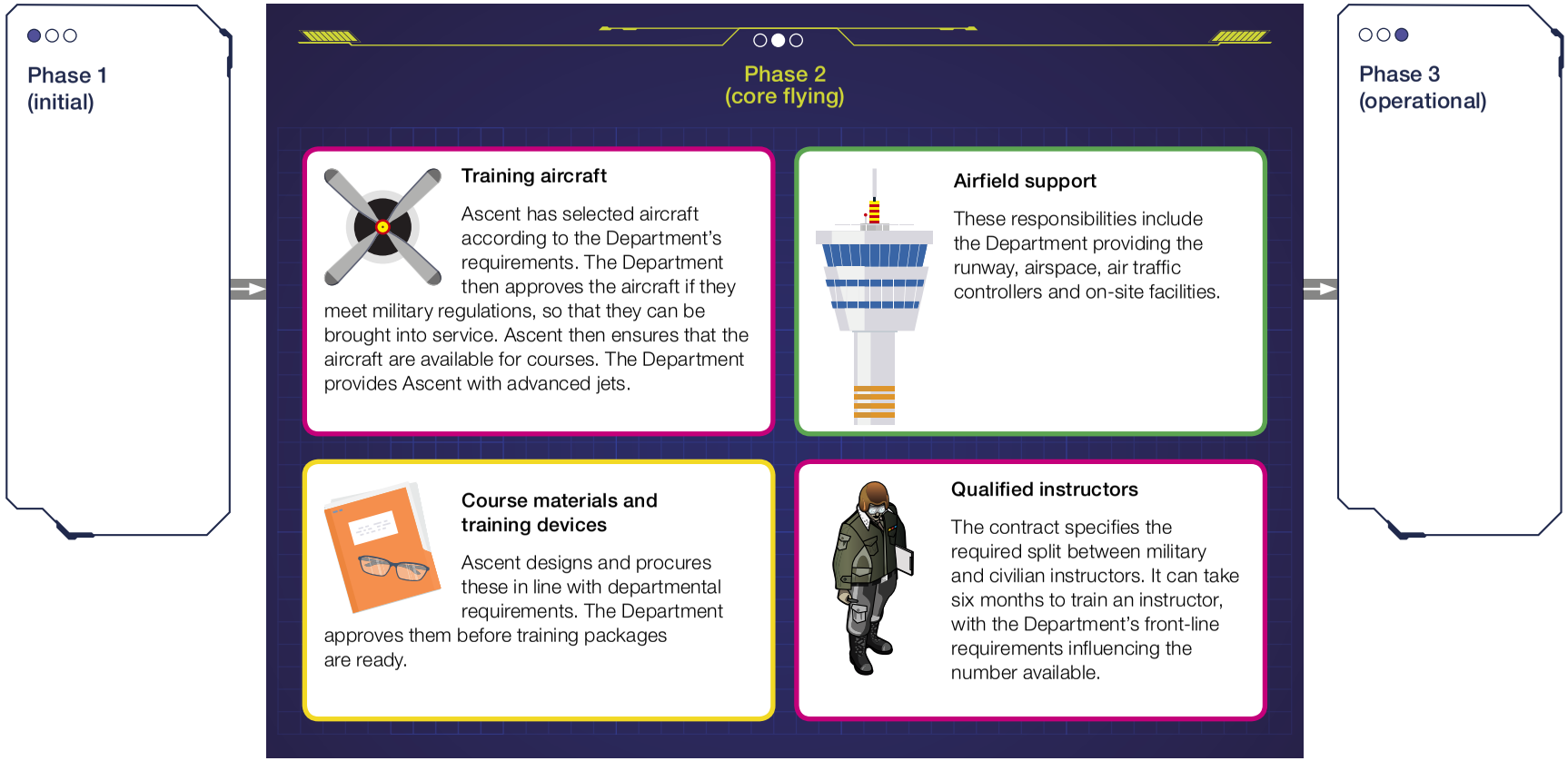
2.3 In 2015, we reported on the challenges the Department and Ascent had experienced introducing the new Phase 2 training, which led to a delay of nearly six years. The Department had originally expected to run the MFTS from 2012 and for it to be at full capacity, providing aircrew requirements set out in the Strategic Defence and Security Review 2010, by 2014. Delays resulted from the Department having to change its original assumptions about the 25-year contract following:

- substantial reductions in the number of aircrew entering training each year, and a decrease in overall funding from £6.8 billion to £3.2 billion, which led to changes to aircraft and training material; and
- changes to private finance initiative (PFI) accounting rules that meant the Department no longer used PFI to obtain aircraft and had to consider what it could afford.

Figure 7

Summary of the roles and responsibilities of the Ministry of Defence (the Department) and Ascent Flight Training (Management) Limited, July 2019

The Department and Ascent need to manage dependencies for the Military Flying Training System (MFTS) to work



Ascent primarily responsible | Department primarily responsible | Department and Ascent share responsibility in different proportions

Notes

1 Figure shows the most significant dependencies. Ascent also depends on the Department for fuel, aircrew equipment assemblies and meteorological information. It is responsible for planning and scheduling training.

2 The respective responsibilities of the Department and Ascent differ depending on the aircraft type and the training site.

Source: National Audit Office analysis of Ministry of Defence information

2.4 The Department and Ascent currently expect the MFTS to operate at full capacity from April 2020. This is only three months later than when we last reported in 2015. The Department considers this is a good outcome considering the past position of the programme. To meet this date, they expect to have the training equipment in place by December 2019 (**Figure 8**). They already have in place most of the required infrastructure, aircraft and simulators (**Figure 9** on page 24). This includes new facilities on five training sites; 102 new aircraft (of seven types); around 20 flight simulators and other training devices; and 36 (out of 67 planned) designed and certified training courses. Ascent starts to receive availability payments once training courses are ready. As at July 2019, these payments had started for rear crew and advanced jet training, with 94% of the milestones for helicopter and fixed-wing training payments also being reached.[9]

2.5 In introducing the MFTS, both the Department and Ascent have experienced challenges fulfilling their respective responsibilities, which we describe below. Up to 2018-19, 25 introduction milestones were missed for helicopter and fixed-wing training. Ascent had initially foregone an estimated £15 million of expected payments due to these delays. However, the Department remained liable to pay £10 million of this where it had failed to fulfil its responsibilities or was contractually obliged to make payments.

Ascent-provided training devices

2.6 The MFTS design assumes that students will undertake a proportion of their training in simulators, rather than in live flying. Ascent is responsible for procuring these devices and for ensuring they are available. It has sub-contracted this responsibility.

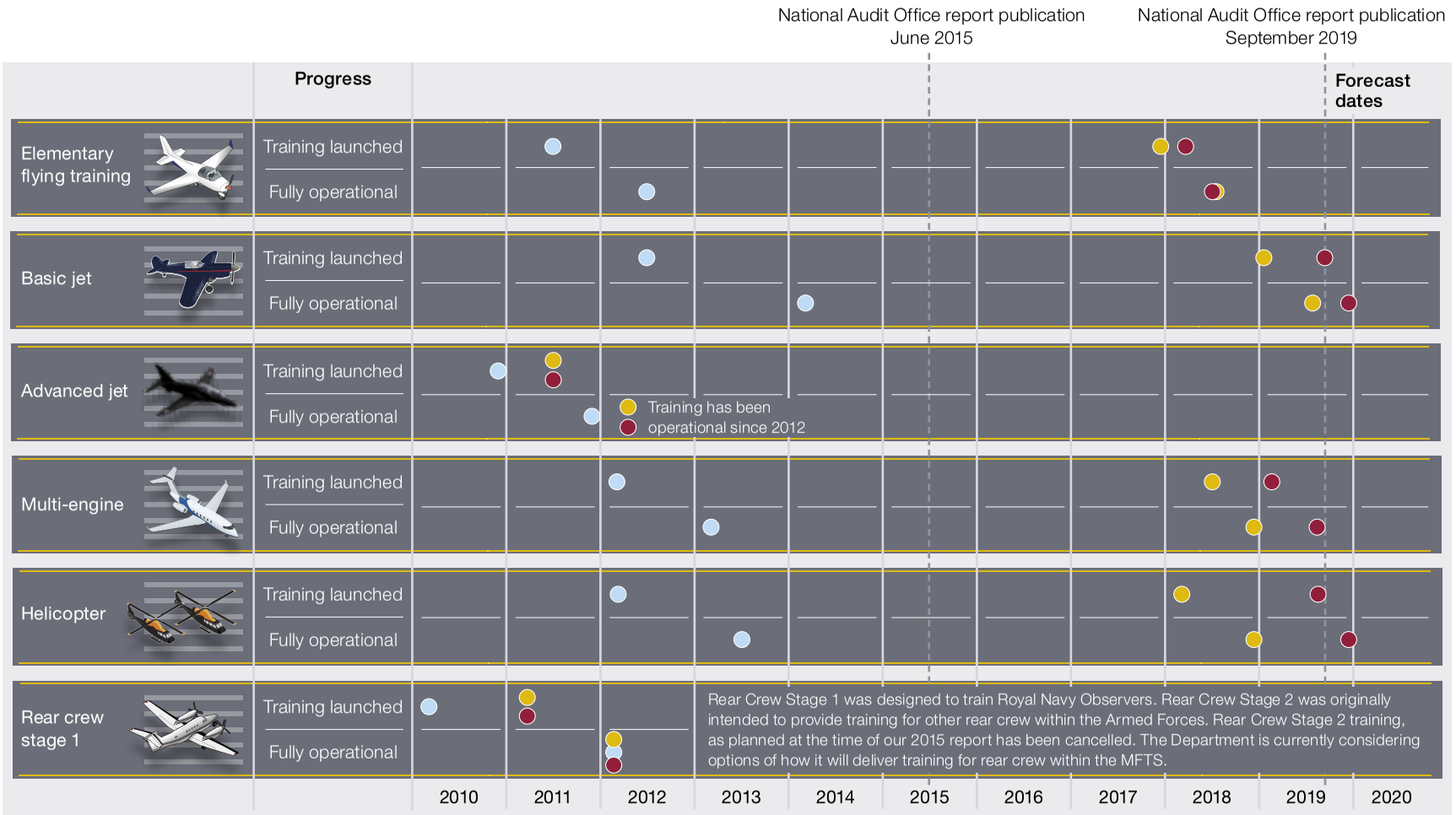
2.7 When fully implemented, the MFTS provides helicopter training with an estimated 50:50 split between live flying and simulators, with one course solely on simulators. In 2018-19, no students completed their helicopter training. Full introduction of this training has been delayed following Ascent's sub-contractor providing a flight simulator 18 months later than expected. As a result, the Department withheld £6 million from Ascent and delayed a further £20 million payment. To continue training, from January 2019 helicopter students have been trained in handling skills entirely through live flying, with 16 students starting between that date and July 2019. Ascent has borne this additional training cost. The Department has estimated that this equates to £160,000 per student. It now expects to receive the simulators in August 2019 and fully operate helicopter training from December 2019.

9 The fixed-wing training package includes elementary flying and multi-engine training, which have been fully introduced, and basic jet training, which the Department and Ascent expect to be ready for training use from November 2019.

Figure 8

Progress introducing the Military Flying Training System (MFTS), July 2019

The Ministry of Defence (the Department) expects all training components to be in place from December 2019



Note

1 The fixed-wing contract with Ascent covers elementary flying, basic jet and multi-engine training. The Department agreed separate contracts for advanced jet, helicopter and rear crew training.

Sources: National Audit Office analysis of Ministry of Defence information; Comptroller and Auditor General, *Military Flying Training*, Session 2015-16, HC 81, National Audit Office, June 2015

Figure 9

Training components introduced as part of the Military Flying Training System, July 2019

Ascent has introduced most of what it needs to provide for the system

What has been established

	Description	Sites	Status of introduction	Aircraft numbers	Simulators include:	Infrastructure	Certified courses
Elementary flying training 	All students currently undertake this before continuing to either multi-engine, helicopter or basic jet training	RAF Cranwell RAF Barkston Heath	Complete	23 Prefect	• 5 flight simulators • Desktop trainers	3 hangars, 2 school houses and training device facilities (shared with multi-engine)	5 (plus 1 outstanding)
Basic jet 	Students expected to fly front-line fast-jet aircraft (Typhoon or F35 Lighting II)	RAF Valley	Expected to be ready for training from November 2019	10 Texan	• 3 flight simulators • Desktop trainers	Hangar and school house	0 (plus 7 outstanding)
Advanced jet 	Students who pass basic jet training move onto advanced jet training	RAF Valley	Complete	28 Hawk T2	• 2 full mission simulators • 6 flight simulators • Desktop trainers	Hangar, school house and training device facility	6
Multi-engine 	Students expected to fly large, multi-engine transport and surveillance aircraft	RAF Cranwell	Complete	5 Phenom	• 1 flight simulator	3 hangars, 2 school houses and training device facilities (shared with elementary flying)	6 (plus 5 outstanding)
Helicopter 	For all students expected to fly front-line helicopters. Course varies depending on the type of helicopters they expect to fly	RAF Shawbury RAF Valley	Courses running. Expect to be fully ready for training from December 2019	29 Juno 3 Jupiter	• flight simulators	3 hangars, 2 school houses and training device facilities	15 (plus 13 outstanding)
Rear crew stage 1 	For all students expected to become Royal Navy Observers	RNAS Culdrose	Full introduction suspended	4 Avenger	• flight simulators	Hangars, school house and training device facility	4

Notes

1 Certified courses include those developed to train both instructors and aircrew.

2 Simulators include flight simulators that allow students to experience flying; full mission simulators allowing students to practice complex training missions; and desktop trainers so students can familiarise themselves with flying.

3 Some rear crew training will take place on the Phenom aircraft at RAF Cranwell.

Source: National Audit Office analysis of Ministry of Defence and Ascent information

Ascent-provided course design and materials

2.8 Ascent is responsible for developing new training course materials. The Department approves these materials before they are used. In 2015, we reported that the Department had rejected some elements of Ascent's advanced jet training course materials as not fit for purpose. It then agreed with Ascent a new approach to developing future training materials, to be tested on the fixed-wing and helicopter training packages.

2.9 Subsequently, the introduction of helicopter and multi-engine training has been delayed following difficulties with the course design, particularly in ensuring the course is up to the required standards. For helicopter training, delays developing course materials also resulted from the late introduction of simulators. Ascent and the Department must work together, with Ascent developing the material and the Department approving it.

Department and Ascent-provided aircraft

2.10 When bringing aircraft into service the Department sets the overarching requirement and approves the aircraft's use against approved aviation standards. Ascent develops the more detailed requirements and has procured all training aircraft, except for the Hawk T2 and Avenger.[10]

2.11 As we reported in 2015, the Department assumed civil aviation regulations would apply to training aircraft but, following changes to military airworthiness regulations, aircraft must now be registered as military aircraft and meet the associated regulations. For aircraft to meet the Department's requirements and military regulations, the Department has requested 38 aircraft modifications, with 11 of these agreed with Ascent, each of which can create delays. They include a modification to the Texan aircraft ejection seats and survival equipment. This reduces the risks associated with pilots ejecting and landing in water, which could limit the training provided. After having gained their military certification in 2019, these aircraft are now being used to train instructors.

Providing MFTS courses

2.12 Each year, the Department and Ascent agree the number and type of courses to be provided. Since 2012, the MFTS has gradually provided more courses as training packages have been introduced. In total, 245 student courses have been run, with 74 in 2018-19 compared with 38 in 2016-17. An additional 70 instructor courses have also been provided over this period.

10 The Avenger aircraft were procured by the Department, but Ascent are responsible for ensuring they are available for training use. The Department is responsible for ensuring the availability of the Hawk T2.

2.13 Should either Ascent or the Department not fulfil their contractual responsibilities, courses may be delayed or cancelled. Reasons, which are examined later in this section, include the availability of aircraft, air traffic controllers or qualified instructors. Neither the Department nor Ascent could easily provide us with a list of delayed courses with underlying reasons. Our analysis showed that 40% (41) of the 103 courses expected to complete in 2018-19 had experienced delays, with a net slippage of 3,044 days, an average of 74 days per course.

2.14 Since 2012, 44 MFTS courses (12% of 369 planned courses) have been cancelled due to the Department or Ascent not fulfilling their responsibilities **(Figure 10)**. Of the planned cases, a further ten were cancelled given changes to the Department's requirements. Course cancellations may have a financial impact for the party at fault. For 2018-19, the Department and Ascent negotiated a settlement covering all completion incentive fees. For this period, Ascent received £2.6 million against potential course completion incentive fees valued at £4.4 million.

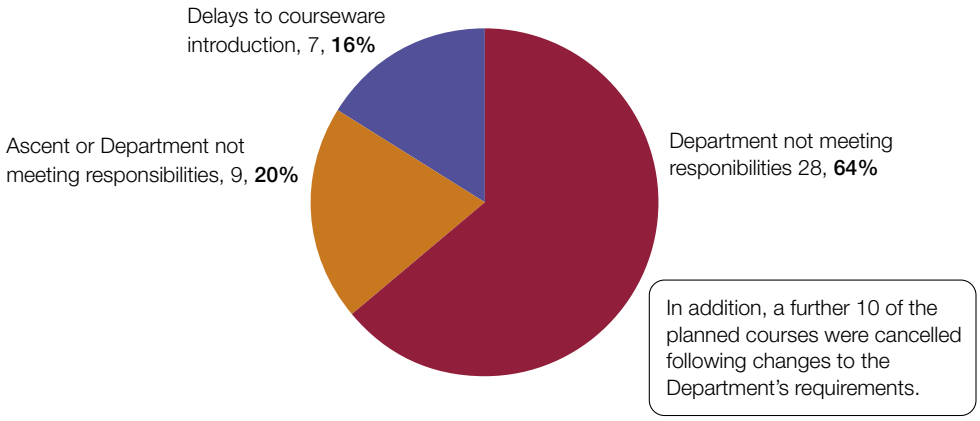
Ascent-provided training devices

2.15 For 2018-19, the MFTS delivered 703 (8%) more simulator training hours than had been planned. That year, simulator availability exceeded 98% for multi-engine, rear crew and elementary flying training.

Figure 10

Summary of reasons for Military Flying Training System cancelled courses, 2012 to 31 March 2019

Of 369 planned courses, 44 have been cancelled for one or other party failing to fulfill its responsibilities



Note

1 Data have not easily reconciled to course information previously provided by the Ministry of Defence (the Department).

Source: National Audit Office analysis of Ascent data

Department and Ascent-provided aircraft

2.16 Ascent must ensure that all aircraft, apart from the Hawk T2, are available for courses. Except for helicopters, both Ascent and the Department have experienced aircraft availability problems, leading to delays and cancellations. In the four months up to July 2019, for training packages fully introduced, availability ranged from 113% (meaning training requirements had been met) to 38% per aircraft type (**Figure 11** overleaf). In particular:

- **Elementary flying training**: In the four months up to July 2019, aircraft have been available for 72% of the required time, with a low of 67% in May 2019. Reduced availability was due to various factors including difficulties obtaining spare parts, a lack of engineering resources and aircraft being modified to meet the required specifications. The Department and Ascent told us they expected to complete these modifications by March 2020.
- **Multi-engine training**: Factors affecting aircraft availability include an in-flight collision between two MFTS aircraft and technical issues with a third.
- **Advanced-jet training**: The Department contracts with BAE Systems to maintain 28 Hawk T2 jets. Given technical problems, the Department averaged 12 available aircraft per day against a required 18. The Department and its industry partners recognise that they need to improve availability and that the training provision is extremely sensitive to the availability of aircraft and instructors. The Department forecasts that for 2019-20, these aircraft will be available for 7,100 of the required 9,200 hours (77%).

Department-provided airfield services

2.17 The Department provides the airfields and associated facilities such as air traffic control and refuelling. It has experienced difficulties providing these on training sites. For example, runway resurfacing at RAF Cranwell meant less elementary flying training between June and November 2018, and Ascent had to amend its training programme. Similar issues were also experienced at RAF Valley, affecting advanced jet training.

2.18 The Department does not have enough air traffic controllers at RAF Cranwell, RAF Shawbury and RAF Valley, where training hours have been reduced as a result. In addition, at RAF Barkston Heath, where 11 of the 23 MFTS elementary flying training aircraft are based, poor air traffic controller availability has meant restricted or no flying hours one day per week. The Department told us it expects improvements during 2019 after recently contracting for a new provider of air traffic control services.

Figure 11

Military Flying Training System (MFTS) aircraft availability, April to June 2019

Aircraft availability has been below expected levels

Training	Aircraft	Number	Required (per day)	Actual (average per day) 2019				Availability over period (%)
				April	May	June	July	
Elementary flying	Prefect	23	18	13	12	13	14	72
Advanced jet	Hawk T2	28	18	11	9	12	14	64
Multi-engine	Phenom	5	4	2	2	1	1	38
Helicopter (basic)	Juno	29	20	22	24	23	21	113
Helicopter (advanced)	Jupiter	3	2	2	2	2	2	100
Rear crew	Avenger	4	3	2	2	2	4	83
Basic jet	Texan	10	3	6	3	5	6	167

Note

1 Basic jet training has not yet been fully introduced. The number of Texan aircraft required per day will increase to eight once training operating fully. Aircraft are currently being used to train instructors.

Source: National Audit Office analysis of Ascent data

Department-provided instructors

2.19 Flying training depends on having both civilian instructors, provided by Ascent, and military instructors, provided by the Department. The balance between military and civilian instructors varies by course and any change in the number of military instructors affects the availability of aircrew for military operations. In 2015, we reported that the Department recognised the risk that it would not be able to provide enough instructors. As a result, it was considering introducing incentive payments to retain pilots, or using more civilian, rather than military, instructors.

2.20 Currently, there are not enough qualified instructors across all types of training (**Figure 12**). For example, for elementary flying training, difficulties increasing the number of military instructors has led to courses taking longer than expected. Against an expected instructor availability rate of 80%, the actual rate in the first three months of 2019 ranged from an estimated 62% to 67%. Shortages resulted from problems with running instructor training courses and runway availability. The Department and Ascent continue to consider whether Ascent could make up the instructor shortfall.

Figure 12

Requirement and availability of Military Flying Training System (MFTS) instructors, July 2019

The Ministry of Defence (the Department) has not provided the military instructors required for MFTS

Training type	Proportion civilian: military	Civilian instructors		Military instructors	
		Required	In place (of which not qualified)	Required	In place (of which not qualified)
Elementary flying training	40:60	24	23 (3)	34	33 (1)
Basic jet	25:75	7	7 (3)	13	9 (4)
Multi-engine	25:75	6	6 (1)	15	14 (4)
Advanced jet	0:100	–	–	42 to 45	37 (7)
Helicopter	25:75	36	37.5 (2)	102	87 (3)
Rear crew (includes Royal Navy observers and multi-engine aircraft	30:70	7	8.5(3)	17	17 (11)

Notes

1 Figures show flying instructors and not ground-based instructors. Military instructor requirements based on the MFTS contract, with civilian requirements based on Ascent's estimation of need.

2 Military Instructors numbers are Full Time Equivalent (FTE) figures and do not directly correlate to individuals.

3 The Department and Ascent continue to introduce basic jet training, part of which includes training instructors. It expects this to operate from November 2019. Figures indicate requirements once training fully introduced.

Source: National Audit Office analysis of Ascent data

Part Three

Addressing flying training shortfalls

3.1 Parts One and Two describe the training process and how the Military Flying Training System (MFTS) contributes to providing the Ministry of Defence's (the Department's) aircrew requirements. As the Department retains the risk of there being insufficient operational aircrew, this part describes what it is doing to better meet its requirements through alternative training and by addressing previous recommendations. Appendix Two describes the Department's response to our 2015 report recommendations.

Increased aircrew requirements

3.2 The Strategic Defence and Security Review 2015 (2015 Review) increased the number of aircrew currently required by the Department, leading to a 29% (76) rise in the number required to complete Phase 2 training in 2018-19. At that time, the Department recognised it could buy more MFTS training if needed as part of the contract change process, but that this would incur a cost if the number increased beyond the capacity of existing equipment and infrastructure. Increasing training capacity takes time as: new aircraft must be bought, modified and certified; flight simulators designed, manufactured and tested; and new infrastructure built.

3.3 The Department has also committed to training aircrew from other countries to help build international relationships, generate income and support United Kingdom aircraft sales abroad. From 2019-20, it has committed to train between seven and 22 international pilots a year. However, it has not yet incorporated this requirement into the MFTS, reducing the number of UK pilots who can be trained.

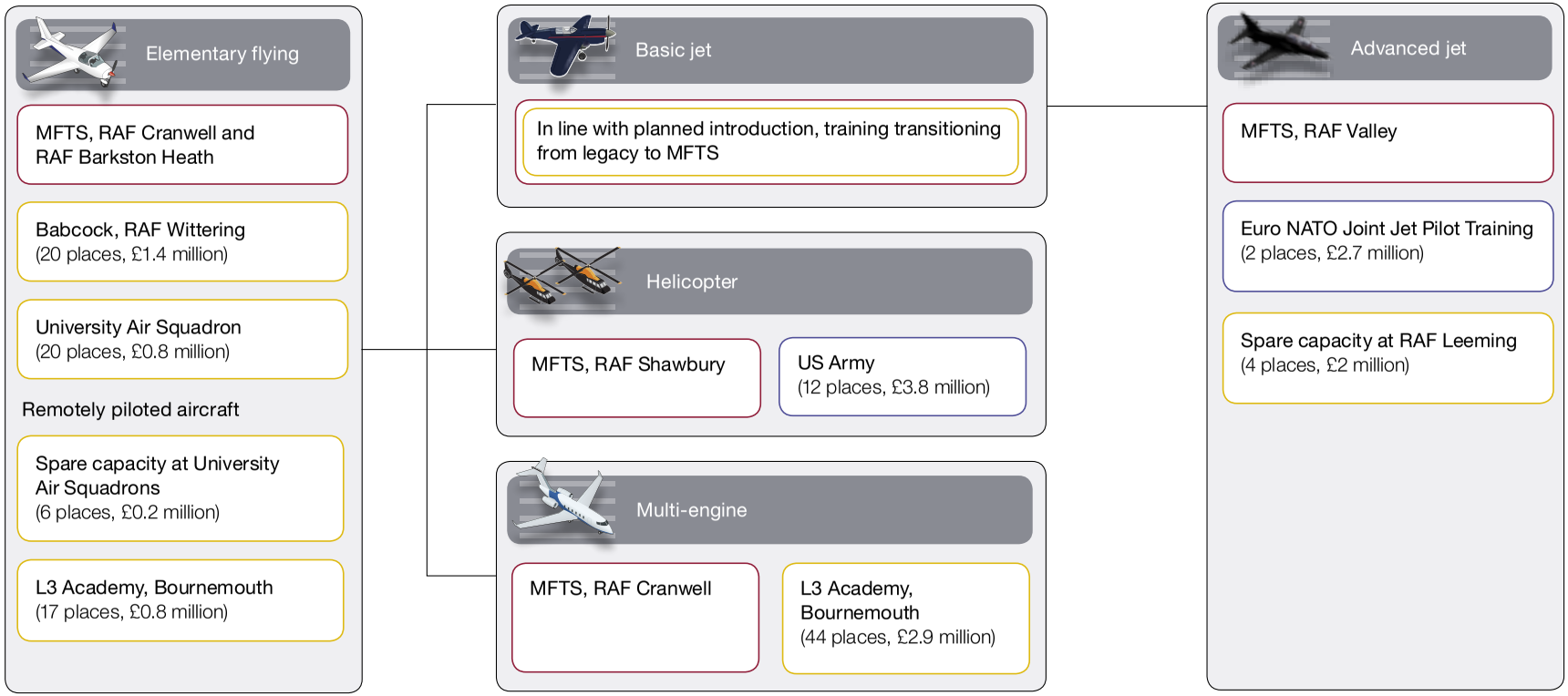
Action to date

3.4 To better meet its aircrew requirements and address shortfalls following MFTS delays, the Department has also conducted training outside of the system. This creates additional complexities, with students undertaking different courses on different aircraft and in different environments. In 2019-20, the Department expects to provide aircrew training for 125 students outside the MFTS at a cost of £15 million (**Figure 13**).

Figure 13

Summary of the Ministry of Defence's (the Department's) plans for Phase 2 training, 2019-20

The Department will rely on other providers and international agreements to train aircrew beyond the Military Flying Training System (MFTS)



Notes

1 Total helicopter, advanced jet and multi-engine student numbers show the Department's overarching requirement for students completing Phase 2 training in 2019-20.

2 Costs reflect the latest estimated costs and include opportunity costs where the Department has made use of spare capacity.

3 Elementary flying: Legacy training extended at RAF Wittering, representing an additional cost.

4 Remotely piloted aircraft: This represents a new requirement not included within MFTS.

5 Basic jet training: From September 2019, the Department and Ascent expect to operate MFTS training, with legacy training ceasing on 31 October and the aircraft currently being used, the Tucano, being withdrawn from service.

Source: National Audit Office analysis of Ministry of Defence data

3.5 Those students completing other courses must undertake additional training because certain aspects, for example low-level and formation flying, need to be conducted in a military environment. The Department does not know how much this additional training costs, but recognises that outsourcing helicopter training, for example, could cost more than under the MFTS. The MFTS has been designed to reduce training costs, with more training conducted during Phase 2, rather than Phase 3.

Future plans

3.6 Since the 2015 Review, the Department has considered various ways to meet its current requirements for trained aircrew. It has been considering and testing options, developing business cases and putting additional commercial arrangements in place. To speed up this decision-making process, in April 2018 it decided to consider training types separately. It now estimates that through incrementally expanding training capacity it will start increasing the number of trained aircrew from 2020 and will have in place a fully expanded system from 2023. The Department's approach includes:

- **Helicopter training:** In July 2019, the Department approved funding to recruit and train more civilian instructors and purchase, support and operate a further four helicopters and one simulator via an amendment to the MFTS contract. This will provide the students with more helicopter training and enable some to move straight to helicopter training instead of first undertaking elementary flying training.
- **Fixed-wing training:** Following course modifications, Navy and Army helicopter students will no longer need to complete elementary flying training, freeing up 2,400 hours to train the additional aircrew required by the 2015 Review. For multi-engine training, the Department is considering options, including a greater use of flight simulators, and continuing to use training providers outside of the MFTS. It plans to decide how to meet this increased requirement by the end of 2019. For basic jet training, in March 2019 the Department agreed with Ascent provisional plans to procure four additional aircraft to incrementally increase the number of aircrew trained.
- **Rear crew:** The 2015 Review introduced nine new Poseidon maritime patrol aircraft. The Department needs to ensure that the increase in trained aircrew is aligned with these aircraft coming into service. The new aircraft contributed to a 52% increase in the rear crew requirement, from 111 in 2017-18 to 169 in 2022-23. The Department continues to consider how it will address this increased demand, and aims to have an approved approach by the end of 2019.

Using contractual arrangements

3.7 Under the current arrangements, Ascent Flight Training (Management) Limited (Ascent) is paid a fixed cost for introducing the MFTS and for ensuring training components are available. Its incentive to introduce the MFTS to agreed timeframes is that availability fees will be paid once training components are ready for training use. Once courses are running, Ascent's availability fees could reduce if training components are not available as expected. Payments include:

- **Training system design fee:** This is a monthly fixed payment, which reduces during the contract, for designing the training, managing the business and maintaining course materials. Deductions are made if Ascent does not deliver documentation, such as training strategies and annual training plans, on time.
- **Training service availability payment:** This is a monthly fixed payment that starts to be paid when training components, such as aircraft and simulators, become available. Service credits accrue where availability does not meet a pre-determined threshold. The Department pays compensation if it is at fault.

3.8 Ascent will receive additional incentives for completing courses and meeting broader departmental aims. Incentive payments cover:

- **Course completion incentive fee:** This is an amount paid from an annually determined pot of money when a scheduled course completes, regardless of student numbers. If a course is cancelled due to the Department not meeting its responsibilities, such as insufficient students or military instructors, then the nominal course fee is redistributed across those courses that have been run. Where Ascent is responsible for a course not completing, then the incentive fee is reduced.
- **Whole-system incentive fee:** A proportion of the £22 million pot is paid each year if Ascent meets specific performance indicators aligned with the Department's aims for Phase 2 training. These include providing the agreed number of trained aircrew or students spending the expected time in training.

3.9 With the MFTS almost fully introduced and providing more courses, up to 2018-19 Ascent has received a growing amount of incentive fees. However, these fees still comprise less than 2% of total payments. As at 31 March 2019, £7.4 million (1.4% of £514 million) related to incentives to complete training courses, compared with £1.7 million (1.2% of £143 million) as at 31 March 2015. With advanced jet and rear crew training operating fully in 2018-19, and 74 courses running, Ascent did not receive a whole-system incentive payment. The Department and Ascent expected incentive fees to increase once courses are available.

3.10 In 2015, we recommended that the Department encourage better performance from Ascent by using contract incentives to encourage partnership working and improve the quality, length and cost of training. At the time, the Department had not based whole-system incentives on achievable, albeit challenging, milestones. Ascent considers some of these metrics as very unlikely to be achieved.

3.11 Since 2015, the Department and Ascent have agreed contracts to introduce helicopter and fixed-wing training. These contracts included annual performance indicators, linked to incentive payments around training time and student output, which would take effect once training packages are fully introduced from 2020-21 onwards. In addition, the Department and Ascent have agreed advanced jet performance incentives relating to training time, cost and student output. For example, an incentive payment would be paid where specified advanced jet training courses take less than 55 weeks. The 12 students we identified as completing these courses in 2018-19 took between 81 and 95 weeks.

3.12 The Department and Ascent continue to consider how to amend other incentive arrangements. In 2017-18, they sought consultancy support to help identify options and in June 2019 formalised a broader joint transformation project. This work includes a commercially focused project considering changes to the incentive mechanisms, as well as how data could be collected and used.

3.13 Commercial arrangements do not include specific mechanisms to encourage innovation. However, the Department expects Ascent to use innovation to deliver the contractually agreed services and meet agreed incentives. Since May 2018, delays in the MFTS and pressure on flying training have driven the need to consider further innovation. Both Ascent and the Department have suggested and supported innovative proposals to date. This has included course innovations, which have reduced the number of live flying hours required.

Understanding performance across the whole training process

3.14 In 2015, we recommended that the Department establish a robust baseline to measure, monitor and evaluate performance across the whole training process. This followed our finding that the Department did not use available information effectively to understand performance and would struggle to measure the impact of changes.

3.15 Since our report, the Department has started to collect more information on Phase 2 training, such as the number of aircrew who are between courses. However, it still does not systematically collect student data across the whole training process, from Phase 1 to Phase 3. Each front-line command collects and manages its own data. Consequently, it remains difficult to easily determine the time taken to train aircrew and for the Department to make decisions on how the system should operate. As part of our work, we identified inconsistencies between data sources and were unable to validate some of the information used by the Department for management purposes.

3.16 Given training costs sit across different areas, the Department does not know how much flying training costs. It does not have data on: the total cost from Phase 1 to Phase 3; how much it costs for it to meet its MFTS responsibilities, such as military instructors; or the full cost of training aircrew outside the MFTS. It told us the financial structures covered by MFTS mean these figures are not easily accessible.

3.17 The Department's current analytical approach relies on manual input of data and an understanding of the training pipeline to interpret data. It does not have bespoke software or a dedicated data analytics team to analyse aircrew in training. In 2018, it recognised the need to change how it held student information to monitor student throughput more efficiently. The Department told us it has commissioned consultants to help it improve its data-tracking. In June 2019, it also formalised a broader transformation project with Ascent aiming to improve end-to-end data, the ability to predict and analyse student throughput, and understanding the root cause of problems.

Appendix One

Our investigative approach

Scope

1 We conducted this investigation following Parliamentary interest in the Ministry of Defence's (the Department) management of its Military Flying Training System (MFTS), which is intended to provide Phase 2 of the three-phase flying training process. Our report describes:

- the Department's aircrew requirements, the three-phase training process and how this is performing;
- what has been delivered as part of the MFTS and the system's performance; and
- the Department's actions to address flying training shortfalls.

Methods

2 In examining these issues, we drew on a variety of evidence sources. In particular, we interviewed key individuals from the Department and Ascent Flight Training (Management) Limited, the industry training provider of the MFTS, in order to understand the performance of military flying training and how shortfalls in aircrew training are being addressed.

3 We also sought to undertake quantitative analysis to understand how well both the Phase 2, and the broader training process, were performing against their objectives. Our analysis was hindered by gaps and inconsistencies in the Department's data. In particular:

- **Data on students in training:** Since 2017, the Department has improved the data it has on students in Phase 2 training, but these data are incomplete and require significant manual manipulation. The Department does not hold data centrally on student training across the entire three-phase training process, with Navy and Army student data held within their respective commands. The Department had difficulty in providing the number of students completing training, the number of students waiting between courses, and how long training has taken. We have reviewed the figures provided, which are used by the Department for internal decision-making, but we cannot provide full assurance over these data.

- **Cost of training:** Given training costs sit across a number of different areas, the Department does not know how much flying training costs. It does not have data on the total cost from Phase 1 to Phase 3; how much it costs for it to meet its MFTS responsibilities, such as military instructors; or the full cost of training aircrew outside the MFTS. It told us the financial structures that the MFTS covers mean these figures are not easily accessible.

Appendix Two

Response to our 2015 recommendations

Figure 14

The Ministry of Defence's (the Department's) response to the National Audit Office's 2015 recommendations, as at July 2019

The Department has implemented some recommendations from the National Audit Office 2015 report

National Audit Office recommendation	Status
The Department should:	
• encourage better performance from Ascent by more effectively incentivising it to work as a partner to achieve the aims of the new core training;	In March 2016, the Department told the Committee of Public Accounts that it was reviewing contract incentives. It has since introduced new incentives for some contracts. In June 2019, it launched a broader transformation project to better align incentives with the Department's desired outcomes.
• assess the cost and time implications of increasing training capacity;	Since the Strategic Defence and Security Review 2015, the Department has considered various ways to train more aircrew, including through an expanded Military Flying Training System (MFTS) or other training. It estimates that it will have the processes in place to fully meet increased requirements from 2023.
• agree formal contingency plans for covering gaps in training during the move to the new core training;	With most MFTS courses now available, the need for contingency plans has reduced. While introducing the MFTS, the Department has continued training on some legacy aircraft to ensure continuity.
• set out and communicate clearly roles and responsibilities across the whole training system;	In 2018, the Department told us it had been working with Ascent to manage interfaces within the MFTS. The Department does not have a senior responsible owner overseeing the complete training process, with the team responsible for Phase 2 training not having authority over the subsequent operational (Phase 3) training.
• the Department should establish a robust baseline to measure, monitor and evaluate performance across the whole training system; and	Since 2017, the Department has improved Phase 2 data, but cannot yet assess historical trends. It does not centrally hold data on the whole training process extending beyond Phase 2. As such, it cannot say how much it costs, or the time taken to train aircrew.
• establish a clear process to get benefits across the whole training system and between services.	An objective of the MFTS is to bring forward Phase 3 training, which has been the most expensive aspect, with the Army estimating in 2011 that it comprises an estimated 90% of the costs. The Department is now conducting more training outside the MFTS than initially planned.

Source: National Audit Office; Comptroller and Auditor General, Ministry of Defence: *Military flying training*, Session 2015-16, HC 81, National Audit Office, June 2015

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