



House of Commons  
Public Accounts Committee

---

**Delivering carrier strike**

---

**Twenty-Third Report of  
Session 2019–21**

*Report, together with formal minutes relating  
to the report*

*Ordered by the House of Commons  
to be printed 2 November 2020*

**HC 684**

Published on 13 November 2020  
by authority of the House of Commons

## The Committee of Public Accounts

The Committee of Public Accounts is appointed by the House of Commons to examine “the accounts showing the appropriation of the sums granted by Parliament to meet the public expenditure, and of such other accounts laid before Parliament as the committee may think fit” (Standing Order No. 148).

### Current membership

[Meg Hillier MP](#) (*Labour (Co-op), Hackney South and Shoreditch*) (Chair)

[Mr Gareth Bacon MP](#) (*Conservative, Orpington*)

[Kemi Badenoch MP](#) (*Conservative, Saffron Walden*)

[Olivia Blake MP](#) (*Labour, Sheffield, Hallam*)

[Sir Geoffrey Clifton-Brown MP](#) (*Conservative, The Cotswolds*)

[Barry Gardiner MP](#) (*Labour, Brent North*)

[Dame Cheryl Gillan MP](#) (*Conservative, Chesham and Amersham*)

[Peter Grant MP](#) (*Scottish National Party, Glenrothes*)

[Mr Richard Holden MP](#) (*Conservative, North West Durham*)

[Sir Bernard Jenkin MP](#) (*Conservative, Harwich and North Essex*)

[Craig Mackinlay MP](#) (*Conservative, Thanet*)

[Shabana Mahmood MP](#) (*Labour, Birmingham, Ladywood*)

[Gagan Mohindra MP](#) (*Conservative, South West Hertfordshire*)

[Sarah Olney MP](#) (*Liberal Democrat, Richmond Park*)

[Nick Smith MP](#) (*Labour, Blaenau Gwent*)

[James Wild MP](#) (*Conservative, North West Norfolk*)

### Powers

Powers of the Committee of Public Accounts are set out in House of Commons Standing Orders, principally in SO No. 148. These are available on the Internet via [www.parliament.uk](http://www.parliament.uk).

### Publication

© Parliamentary Copyright House of Commons 2020. This publication may be reproduced under the terms of the Open Parliament Licence, which is published at <https://www.parliament.uk/site-information/copyright-parliament/>.

Committee reports are published on the [Committee’s website](#) and in print by Order of the House.

### Committee staff

The current staff of the Committee are Bradley Albrow (Second Clerk), Jessica Bridges-Palmer (Media Officer), Ameet Chudasama (Committee Operations Manager), Richard Cooke (Clerk), Ben Shave (Chair Liaison), Rose Leach (Committee Operations Assistant) and Wafia Zia (Assistant Clerk).

### Contacts

All correspondence should be addressed to the Clerk of the Committee of Public Accounts, House of Commons, London SW1A 0AA. The telephone number for general enquiries is 020 7219 5776; the Committee’s email address is [pubacom@parliament.uk](mailto:pubacom@parliament.uk).

You can follow the Committee on Twitter using [@CommonsPAC](#).

# Contents

---

<b>Summary</b>	<b>3</b>
<b>Introduction</b>	<b>4</b>
<b>Conclusions and recommendations</b>	<b>5</b>
<b>1 Progress to-date</b>	<b>8</b>
Building the Queen Elizabeth class carriers	8
Defining the ambition for Carrier Strike	9
Developing an understanding of future costs	10
<b>2 Providing essential supporting capabilities</b>	<b>12</b>
Buying enough planes	12
Delays to the Crowsnest radar system	13
Other key supporting capabilities	14
<b>Formal minutes</b>	<b>16</b>
<b>Witnesses</b>	<b>17</b>
<b>Published written evidence</b>	<b>17</b>
<b>List of Reports from the Committee during the current Parliament</b>	<b>18</b>



## Summary

Since 2017, the Ministry of Defence (the Department) has made significant progress in developing its core Carrier Strike capabilities, having successfully brought two aircraft carriers into service, formed the first squadron of Lightning II jets and built most of the UK infrastructure needed to support a carrier strike group. The Department did well to build the two carriers in line with its timetable and keep within 3% of the revised budget of £6.2bn set in 2013. However, its progress in developing the supporting capabilities that are essential for the carriers to operate has been much slower. In particular, the new Crowsnest radar system has been delayed by 18 months because of poor contractor performance and inadequate departmental oversight. The Department also lacks the support ships it needs to supply the carriers and has not yet developed a long-term solution to move people and goods to and from a carrier group. These issues remain unresolved after many years and there has been little discernible progress since our 2018 report.

There remains a disturbing lack of clarity about the costs associated with purchasing and supporting the Lightning II jets, as well as about how many more the Department will need or can afford in the future. Furthermore, the Department has still not developed an adequate understanding of the support and operating costs of a carrier strike group. As Carrier Strike remains a vital component of the UK's military power, the lack of clarity is concerning, especially at a time when there is already enormous pressure on the defence budget. 2021 will be a crucial year for the Department as it examines its ambition for Carrier Strike in the light of the forthcoming Integrated Review of Security, Defence Development and Foreign Policy, learns from its first operational deployment, and integrates the different parts of a carrier strike group.

The Department must translate its ambitions into a clear, funded plan. Otherwise, there is a real risk that it will fail to capitalise on the huge investment that the UK has already made in this capability.

As it stands the UK has two world-class aircraft carriers with limited capability because the wider debate about what the UK's strategic capability needs has been repeatedly delayed. This debilitating lack of clarity is not likely to be resolved when the strategic defence review and the comprehensive spending review look likely to be out of step with each other once again. The link between funding and delivering the major projects necessary for future capability is clear. Decisions are needed to deliver our defence capability and to avoid additional costs because of delays and uncertainty.

## Introduction

---

Carrier Strike provides the ability to undertake a range of military tasks and is central to the government's ambition to be able to respond at short notice to conflicts and humanitarian relief efforts anywhere in the world. It is based around two Queen Elizabeth Class aircraft carriers, Lightning II jets and a new radar system. The deployment of a carrier strike group will involve a significant proportion of the Navy's fleet, including destroyers and frigates, and is dependent on auxiliary ships to support and resupply the carriers. As at October 2020, the Ministry of Defence (the Department) had built two new aircraft carriers, brought 18 Lightning II jets into service and completed the infrastructure works to berth the carriers in Portsmouth and operate the jets from RAF Marham. It expects to declare initial operating capability for Carrier Strike in December 2020 and will undertake its first operational deployment in 2021 with the US Marine Corps. The Department will then work towards full operating capability by 2023—at which point it will be able to support two UK Lightning squadrons (up to 24 jets) from one of the carriers. The Department's longer-term aim is that, by 2026, the carriers can undertake a wide range of air operations and support amphibious operations worldwide.

## Conclusions and recommendations

1. **Building two aircraft carriers is a significant achievement and it is vital the Department applies the lessons learned from this project across its wider defence programme.** This was a large, complex project, with a forecast cost of £6.4 billion. The Department did well to build the two carriers in line with its timetable and keep within 3% of the revised budget of £6.2 billion set in 2013. It created the Aircraft Carrier Alliance—a partnering relationship with its contractors—which was a shift away from the ‘open market’ contractor model that it previously employed. This enabled the Department to ensure accountabilities were clear, focus on programme risks, and better align incentives for completing the work. It also introduced a ‘pain-share’ agreement on cost increases above the target price and rigorously reviewed the contract specification and expenditure. The Department has established a similar partnering agreement on its Dreadnought submarine programme. There is scope for it to consider the benefits of such arrangements on new contracts as it seeks to achieve value for money on projects while contributing to the UK’s industrial strategy and providing greater certainty for its contractors.

**Recommendation:** *The Department should review fully the lessons learned on the Carriers project and assess whether other future contracts would benefit from similar contractual models. The Department should also write to the Committee within one month of publication of this report setting out how it is working to improve its relationships with contractors.*

2. **There remains considerable uncertainty over the Department’s future ambitions for Carrier Strike.** The government is re-assessing its defence priorities in the Integrated Review of Security, Defence, Development and Foreign Policy (the Review), which it is due to publish in November 2020. We are extremely frustrated that the government has failed on several occasions to hold a strategic spending review to address the defence budget’s unaffordability, which has resulted in a debilitating lack of clarity for the Department and its suppliers. The 2020 Review will consider the government’s ambitions for Carrier Strike, including its future role and the level of engagement with allies. The Department has confirmed that Carrier Strike remains a vital component of the UK’s military power, and that it aims to operate the carriers as a sovereign capability by 2023. It assures us that it will prioritise funding to develop Carrier Strike, but the lack of clarity on its role, level of operational readiness and flexibility affects the type of supporting capabilities that it needs, and the level of funding required.

**Recommendation:** *The Department must ensure that its ambitions for Carrier Strike are clearly articulated and understood across government as part of the Integrated Review. Once this Review is published, the Department should quickly publish its policy ambitions for the carriers and translate them into affordable plans for future investment and operation.*

3. **The Department still does not fully understand Carrier Strike’s support and operating requirements or costs.** In 2018, we highlighted that the Department must develop detailed estimates of the costs of supporting and operating Carrier Strike. This is even more important now as the defence budget is likely to come under increasing strain in future years. The Department based its initial assessment

of support and operating costs—such as fuel and spare parts—on estimates and has started to update these using information from its sea trials. However, it says that it needs more time to develop better estimates, with the deployment in 2021 providing a crucial opportunity to improve its understanding of what it takes to run a carrier strike group. The Department acknowledges that it has scaled back investment on support activities on affordability grounds, such as postponing buying a second Lightning II spares pack, and tells us that the situation is tight. As a result, it cannot assure us that it has enough funding to meet future support and operating costs.

**Recommendation:** *The Department should collect full information on the costs of operating a carrier strike group during its 2021 deployment. This is a crucial opportunity to develop its understanding of consumption issues and the level of spares it needs. The Department should be prepared to set out its findings at a future evidence session with the Committee and be able to demonstrate that it has a better grip of future support and operating costs.*

4. **The value for money of the investment in the carriers will be significantly reduced if the UK cannot afford enough aircraft to sustain operations over the carriers' service life.** The Department acknowledges that it will need more than the 48 Lightning II jets it has ordered so far to sustain Carrier Strike operations through to the 2050s and beyond. It originally intended to buy 138 aircraft, but its assumptions for using the carriers have changed since 2015 and it failed to give us a clear answer on how many more jets it now needs. The Department is considering the number and type of combat aircraft it will require in the future—across all operations—as part of its wider Air Combat Strategy. However, it could only provide us with a broad breakdown of the estimated costs of the Lightning II programme. The Department has forecast that the programme's whole life costs are £18.4 billion but, as at June 2020, it had an approved budget of only £10.5 billion. It has told us that each plane currently costs approximately \$100m and that this price is falling. Nevertheless, this basic purchase price is just one element, and other costs must be taken into account, including the UK's original investment to be a Tier 1 partner with the US, and the costs of weapons integration, sustainment and the supporting infrastructure. We are concerned with the Department's lack of clarity on these costs as it will need to find additional funding to purchase all the jets it will require.

**Recommendation:** *Within one month of this report, the Department should provide the Committee with a full and detailed breakdown of Lightning II related expenditure to date, the approved budget and the forecast whole life costs of the Programme. It should also set out the additional whole life cost of buying more than 48 jets.*

5. **The Department's failure to ensure the timely delivery of the Crowsnest radar system leaves the carriers with less protection than planned in its early years.** The Department has regarded the Crowsnest project—which will provide a new airborne radar system to protect Carrier Strike—as a very high-risk project from the start. There were problems with it between 2016 and 2018, including slippage against milestones. Then, in January 2019, the Department realised that Crowsnest's initial contracted capability would not be delivered until September 2021, 18 months later than planned. It has told us that the problems were because the sub-contractor did not understand the technical risks and had been overly optimistic when

reporting progress. The Department assures us that there will be a “credible baseline capability” when Carrier Strike deploys in 2021 and it will be able to respond to potential threats. Although it plans to improve incrementally the radar capability by 2023, it could not assure us that it would achieve this.

**Recommendation:** *The Department should write to the Committee to advise how it has addressed the challenge of not initially having a fully operational Crowsnest system, and on the timetable for enhancements. More broadly, it should advise the Committee how it has improved the oversight of sub-contractors in the light of this case.*

6. **The Department’s failure to fund several key supporting capabilities will restrict how it can use the carriers for many years.** The operational freedom of a carrier group relies on support ships providing munitions and stores where and when they are needed, and the Department has long understood that it will need three new support ships to provide this. However, in 2019 it cancelled a competition to build the new ships and it has not yet started a new one. In the meantime, the Department must rely on one elderly ship, RFA Fort Victoria, which has limited cargo capacity and is due to go out of service in 2028, to perform this role. Furthermore, it will need to make alternative arrangements to restock the carriers, such as using allies’ international bases, both when this ship undergoes maintenance in 2022 and when it retires. We are also concerned that the Department has not found a solution for other unfunded supporting capabilities since our 2018 report, such as a long-term solution to move people and goods to, from and within a carrier group. In addition, the Department will face other funding pressures as it replaces the ships needed to sustain carrier operations over the next 50 years, such as anti-submarine frigates.

**Recommendation:** *The Department should develop a plan setting out the investment required to develop essential supporting capabilities for a carrier strike group. This should include cost-benefit assessments of potential capability enhancements and how to maximise the value of investment to date. It should write to the Committee by June 2021 setting out its planned investment over the next 10 years.*

# 1 Progress to-date

---

1. On the basis of a report by the Comptroller and Auditor General, we took evidence from the Ministry of Defence (the Department) on its progress in developing Carrier Strike and the steps it still needs to take to achieve its full operating capabilities and deliver value for money from its investment to date.<sup>1</sup>

2. The Department told us that Carrier Strike provides an immensely flexible capability able to undertake a range of military tasks and is central to the government's ambition to be able to respond at short notice to conflicts and humanitarian relief efforts anywhere in the world. It is based around two Queen Elizabeth Class aircraft carriers, Lightning II jets and a new radar system called Crowsnest. The deployment of a carrier strike group will involve a significant proportion of the Navy's fleet, including destroyers and frigates, and is dependent on auxiliary ships to support and resupply the carriers.<sup>2</sup>

3. As at October 2020, the Department had built two new aircraft carriers, brought 18 Lightning II jets into service and completed the infrastructure works to berth the carriers in Portsmouth and operate the jets from RAF Marham. It said it is very likely to declare initial operating capability for Carrier Strike in December 2020 and will undertake its first operational deployment in 2021 with the US Marine Corps. The Department will then work towards full operating capability by 2023, at which point it will be able to support two UK Lightning squadrons (up to 24 jets) from one of the carriers. Its longer-term aim is that by 2026 the carriers can undertake a wide range of air operations and support amphibious operations worldwide, which it calls Carrier Enabled Power Projection.<sup>3</sup>

## Building the Queen Elizabeth class carriers

4. The aircraft carriers are the largest warships ever built in the UK and have been in development since 2007.<sup>4</sup> The Department accepted *HMS Queen Elizabeth* into service in February 2018 and *HMS Prince of Wales* in March 2020.<sup>5</sup> As at April 2020, it forecast a final construction cost of £6.4 billion for the carriers, an increase of £0.2 billion (3%) from the revised budget of £6.2 billion agreed in 2013. The level of outstanding works was in line with the Department's expectations.<sup>6</sup>

5. The Department attributed its success in delivering such a complex project on this timeline and for this amount to a change of approach in 2013.<sup>7</sup> It told us that the traditional contractual model of relying on a competitive market to deliver value for money had not been working. In response, it created the Aircraft Carrier Alliance, which was a partnership with its main contractors—BAE, Babcock and Rolls Royce.<sup>8</sup> The Department explained that this had enabled it to align its interests with those of its contractors, establish a closer, more constructive working relationship, and focus resources more directly on addressing the project risks. The Department said it had also set clearer expectations and

---

1 Report by the Comptroller and Auditor General, *Carrier Strike – Preparing for deployment*, Session 2019–2021, HC 374, 26 June 2020

2 Q 19; C&AG's Report, paras 1–2

3 Q 59; C&AG's Report, para 3

4 Q 15; C&AG's Report, para 1.2

5 C&AG's Report, para 1.9

6 C&AG's Report, para 1.9 and 1.11

7 Qq 13,15

8 Qq 13–14

accountabilities, shared information on progress towards the programme's milestones and implemented pain-share and gain-share mechanisms.<sup>9</sup> For example, it had included a 50:50 pain-share agreement on cost increases above a target price and reviewed contract expenditure regularly.<sup>10</sup>

6. The Department told us it had already applied the lessons from the carriers' project to other defence contracts and had replicated this approach when it created the Dreadnought Alliance. It said that, despite it being considerably more complicated to build a nuclear submarine than an aircraft carrier, it had already seen the benefits of a more mature working relationship.<sup>11</sup> The Department suggested that the reality of the defence sector—in which there are monopoly suppliers—meant that instead of always trying to replicate the functioning of a competitive market, different contractual models were sometimes needed to get best value.<sup>12</sup>

## Defining the ambition for Carrier Strike

7. The government is re-assessing its defence priorities in the Integrated Review of Security, Defence, Development and Foreign Policy (the Review), which, when we took evidence at the end of September, the Department expected would be published in November 2020.<sup>13</sup> As part of the Review, government will re-assess its ambition for Carrier Strike. The Department acknowledged that any changes to this ambition, including how the carriers will be used and their deployment patterns, will affect the extent and type of supporting capabilities required, and the level of future investment needed.<sup>14</sup> For example, the 2015 Strategic Defence and Security Review changed the policy ambition from deploying both carriers at the same time to having only one out at a time, with the other in dock. This reduced the number of operational squadrons required.<sup>15</sup> The Department emphasised, however, that even without a full complement of planes or ships to support it, Carrier Strike would still be able to undertake a variety of tasks, from war fighting to humanitarian assistance, and that this would project Britain's power in the world.<sup>16</sup>

8. The Department told us that a key factor in its thinking going into the Review had been to ensure Carrier Strike has appropriate support to operate on a global scale.<sup>17</sup> It said that the Prime Minister has given it a clear instruction that he expects defence to be actively deployed in a greater number of situations around the world to promote British values, and that Carrier Strike would be an important part of that.<sup>18</sup> However, we remain very frustrated that the Department has been left with an overall budget that is under significant pressure and an equipment programme that is unaffordable because of the government's continued delays in conducting a strategic review of funding.<sup>19</sup>

9. The Department assured us that Carrier Strike remains a vital component of the

9 Qq 13, 15

10 C&AG's Report para 1.12

11 Qq 13–14

12 Q 14

13 Q 6

14 Q 49

15 Q 49

16 Qq 50–51

17 Q 76

18 Q 77

19 Qq 6, 58, 75

UK's military capability and power, and that it is working hard to ensure that its plans are fully understood in No10, the Cabinet Office and HM Treasury.<sup>20</sup> However, it explained that any changes to the role and use of Carrier Strike, including the extent of co-operation with allies, will affect the supporting capabilities that it needs and the future size of the Royal Navy's fleet.<sup>21</sup> Carrier Strike's first operational deployment in 2021 is with the US Marine Corps, when it will endeavour to learn from their longer experience of deploying this type of aircraft on carriers.<sup>22</sup> The Department told us that developing the ability to work with allies was vital in deterring aggression around the world. However, it assured us it was committed to building Carrier Strike's capabilities so that it could operate as a sovereign capability able to deploy up to 24 UK Lightning II jets by December 2023, and that it would maintain and develop those capabilities well into the 2050s.<sup>23</sup>

### Developing an understanding of future costs

10. In 2018, this Committee recommended that the Department develop more detailed estimates of the costs of supporting and operating Carrier Strike.<sup>24</sup> This is even more important now given the pressure on the defence budget, as illustrated by funding shortfalls of up to £13 billion on the Department's Equipment Plan.<sup>25</sup> The Department expressed its hope that the Review will result in a more balanced, affordable equipment programme.<sup>26</sup>

11. Support costs include the cost of maintaining, repairing and upgrading equipment. Operating costs include items like fuel, port fees and stock.<sup>27</sup> The Department is developing its understanding of the requirements of a carrier strike group when on deployment, and believes that its cost estimates are beginning to mature.<sup>28</sup> It has used the sea trials to improve its understanding of what it takes to operate Carrier Strike, and collect more information on the associated costs. However, the Department told us that these trials are not representative of routine operations and that it would not develop a fuller understanding of future support and operating costs until 2022.<sup>29</sup> The first operational deployment in 2021 will therefore provide the Department with a crucial opportunity to understand what operating a carrier strike group costs.<sup>30</sup>

12. The Department assured us that it did not have major concerns over its budget for sustaining a carrier strike group and that it could place the support contracts it needs.<sup>31</sup> However, it admitted that it does not yet fully understand the maintenance requirements and told us that the budget for spare parts is tight.<sup>32</sup> The Department acknowledged that it has not prioritised investment in support activities—including spares and weapons stockpiles—in the way that it should have done. This has meant that maintenance periods

---

20 Qq 6, 17, 72

21 Q 17

22 Q 20

23 Qq 19–21

24 HC Committee of Public Accounts, *Delivering Carrier Strike*, Fourteenth Report of Session 2017–2019, HC 394, January 2018

25 Q 75; Comptroller and Auditor General: Ministry of Defence: *The Equipment Plan 2019 to 2029*, Session 2019–20, HC 111, National Audit Office, February 2020

26 Q 75

27 C&AG's Report, paras 3.15 and 3.16

28 C&AG's Report, para 15

29 Letter from Stephen Lovegrove, 20 August 2020

30 Qq 69, 70

31 Q 74

32 Qq 69, 76

for the carriers have occasionally been delayed.<sup>33</sup> The Comptroller and Auditor General identified examples where the Department had scaled back investment on support activities on affordability grounds, such as postponing the purchase of a second Lightning II spares pack.<sup>34</sup> As a result, there is a risk that the Department may not have sufficient provision in later years' budgets to reflect the full costs of operating Carrier Strike.<sup>35</sup> The Department acknowledged that it must make sure it had appropriate support to operate Carrier Strike on a global scale and meet the Government's aims.<sup>36</sup>

---

33 Qq 16, 76

34 Q76, C&AG's Report para 3.7

35 C&AG's Report para 16

36 Q 76

## 2 Providing essential supporting capabilities

---

13. The Department depends on the availability of various supporting capabilities if it is to achieve the full operational capabilities of Carrier Strike in 2023, and ultimately Carrier Enabled Power Projection in 2026.<sup>37</sup> For example, the lack of inflight re-fuelling aircraft and ISTAR high range cover, will severely limit the range and operational capabilities of the lightning aircraft. We were very concerned, therefore, that the Department could not assure us when, or indeed if, these necessary capabilities would be in place.

### Buying enough planes

14. The Lightning II is a sophisticated stealth jet that will be used for both land and carrier-based operations. In 2015, the Department announced that it intended to purchase 138 jets. It is purchasing the jets in tranches under a memorandum of understanding with the US Government. It has ordered 48 jets, the last of which is due to be delivered in 2025–26, and currently has 18 jets.<sup>38</sup>

15. The Department told us that its intention to buy 138 aircraft was based on its original plan that there would always be four operational squadrons and both carriers operating. The 2015 Strategic Defence and Security Reviews altered this expectation, and the Department now regards Carrier Strike's full operating capability as being two UK Lightning II squadrons (up to 24 jets) operating from one of the carriers. It aims to achieve this by the end of 2023. The Department assured us that having 48 aircraft by 2025–26 would be adequate to deliver two squadrons in normal circumstances.<sup>39</sup> However, it acknowledged that the attrition rate in a high-intensity war would mean it could not sustain two squadrons, which would very much reduce a carrier's utility.<sup>40</sup>

16. The Department said that if it is to deploy one carrier at a time it would not need all 138 aircraft. It acknowledged, however, that it will need more than 48 Lightning II jets to sustain Carrier Strike operations through to the 2050s and beyond.<sup>41</sup> It told us that the decision about how many more jets it would need had not yet been made.<sup>42</sup> The Department is currently debating its future requirement for Lightning II numbers as part of its wider Air Combat Strategy. This debate revolves around its plans across all future air-to-air and air-to-surface combat operations and the replacement of Typhoon from the 2030s. It told us that un-crewed autonomous aircraft working alongside crewed aircraft will be part of its solution, and that a key part of the future combat air programme was understanding the right mix of planes, bearing in mind evolving technologies.<sup>43</sup> Nevertheless, the Department was certain that the future combat air system, no matter how it is designed, would be a very expensive part of defence spending.<sup>44</sup>

17. As at April 2020, the Department had spent £6.0 billion on the Lightning II project,

---

37 C&AG's Report, para. 2.1 and Figure 6

38 Q 22; C&AG's Report, paras. 1.14 and 1.15

39 Qq 20, 43–45; C&AG's Report, para. 3

40 Q 50

41 Qq 22, 49

42 Q 50

43 Q 23; C&AG's Report, para. 1.19

44 Q 39

out of an approved budget of £10.5 billion. The approved budget had increased by £1.4 billion (15%) since 2017. However, the Department has forecast that the programme's whole life costs for 48 jets to 2048 would be £18.4 billion, which broadly breaks down as £5 billion for development, £5 billion for production and £8 billion for sustainment and support. This is £7.9 billion more than the current approved budget, and does not include operating costs, such as manpower, fuel and weapons expenditure.<sup>45</sup>

18. The Department told us that each plane currently costs approximately \$100 million and that it expected this price to fall by 13% over the next three tranches.<sup>46</sup> Nevertheless, this basic purchase price is just one cost element, and other costs must be taken into the reckoning, including the UK's original investment to be a Tier 1 partner with the US, and the costs of weapons integration, sustainment and the supporting infrastructure. The Department could only provide us with a broad breakdown of the estimated whole life cost of the Lightning II programme and asserted that it would be misleading to provide a specific per-aircraft cost. We remain concerned with the Department's lack of clarity on these costs because it must find additional funding both to bridge the £7.9 billion funding-gap for the 48 aircraft it is committed to buying, and to purchase the additional jets it acknowledges it will require.<sup>47</sup>

### Delays to the Crowsnest radar system

19. Crowsnest provides critical radar protection for Carrier Strike. It is fitted to the Royal Navy's Merlin helicopters and provides long-range air, sea and land surveillance, detection and tracking to identify threats beyond the horizon. Crowsnest is designed to work alongside air defences provided by the Navy's Type 45 destroyers, and the Department told us that it was an essential component of the Carrier Strike capability.<sup>48</sup>

20. The Department agreed a fixed-price contract for Crowsnest in November 2016 with Lockheed Martin, which sub-contracted delivery of the project to Thales and Leonardo Helicopters. From the very start the Department regarded the project as a very high risk, having assessed that industry might not be able to deliver the initial capability. Between 2016 and 2018 there were numerous problems with the project, which led to the Department raising its concerns with its industry partners and introducing measures to manage the risk. The Department told us that in October 2018 it had become aware that the milestones were not being met as they should be and that some were missed. Nevertheless, it assessed that the project was deliverable through to December 2018.<sup>49</sup>

21. The Department told us that an internal audit at Thales in January 2019 declared that it would be very late delivering the programme. As a result, the Department does not expect Crowsnest to achieve initial operating capability until September 2021. The Department told us that the problems arose because the industry consortium had underestimated the technical risk from the outset and had under-resourced the programme. These problems had been compounded by a "can-do" attitude within industry and a misplaced belief that it could catch up. As a result, Crowsnest will be delivered some 18 months later than planned.<sup>50</sup>

45 Q 26; Ministry of Defence letter to the Chair, 8 October 2020; C&AG's Report, para. 1.16

46 Qq 24–25

47 Qq 26–28; Ministry of Defence letter to the Chair, 8 October 2020; C&AG's Report, para. 8

48 Q 15; C&AG's Report, para. 2.2

49 Q 32; C&AG's Report, para. 2.3

50 Qq 29–32; C&AG's Report, paras. 2.4 and 2.7

22. The Department acknowledged that *Crowsnest* will not provide the capability it had originally expected when it deploys Carrier Strike operationally in 2021, but it assured us that there will be a credible baseline radar capability. It also said that some capabilities would not be available, such as the weather mode. However, the ability to understand, survey and search all the area, identify potential threats, and pass that information onto the carrier and other parts of the carrier group, would be in place. The Department plans to improve the radar capability incrementally between 2021 and 2023 through a series of upgrades. However, it acknowledged that the capability might not be delivered as quickly as it would wish, and it could not assure us that *Crowsnest* will achieve full operating capability in 2023.<sup>51</sup>

### Other key supporting capabilities

23. The carriers cannot be used on their own and need a range of support vessels to provide supplies and protection. The Department told us that in a conflict situation, for example, it would need anti-submarine warfare frigates, anti-aircraft destroyers, and hunter-killer submarines. Deploying Carrier Strike will therefore require a significant proportion of the Royal Navy's fleet. However, the Department faces financial pressures and funding shortfalls over the next 10 years which could restrict investment in capabilities and upgrades. For example, it needs to upgrade the propulsion systems of all six Type 45 destroyers by the mid-2020s and is replacing the outdated Type 23 anti-submarine frigates with specialist Type 26 frigates from 2027. The Department told us that it has made a case to HM Treasury for increasing the size of the surface fleet, but no outcome was yet forthcoming. Furthermore, the ships need to be crewed to operate. The Department said it was not aware of any problems regarding the surface fleet but admitted that crewing submarines was more of a struggle.<sup>52</sup>

24. The operational freedom of a carrier group relies on tankers supplying it with oil and water, and solid support ships providing food, ammunition and general stores, where and when they are required. The Department identified that it needed new solid support ships in 2005, and by 2017 it had decided that a fleet of three new support ships was necessary, entering service from 2026. Indeed, the Department told us that the fleet solid support ship programme was one of the four key components of its ambition to develop Carrier Enabled Power Projection. It began the procurement of the three ships in May 2018 but stopped the competition in November 2019 because it did not have a compliant bidder. The Department told us it was now reconsidering its requirement and had not yet launched a further competition. It has not confirmed when the first new ship will now enter service but estimates it will be October 2027 at the earliest, and possibly as late as April 2029.<sup>53</sup>

25. In the meantime, the Department must rely on *RFA Fort Victoria*, which has limited cargo capacity, to provide the carriers with stores and munitions. *RFA Fort Victoria* entered service in 1994 and is due to retire in April 2028, having already been extended beyond its 25-year service life. Furthermore, this ship will be unavailable for much of 2022 as it undergoes major maintenance work.<sup>54</sup>

26. The Department told us that, consequentially, it would have to think through how

51 Qq 30–31, 35–37

52 Qq 17–18, 50, 78–79; C&AG's Report, paras. 1.6–1.7

53 Qq 56–57; C&AG's Report, para. 2.16

54 Q 56; C&AG's Report, para. 2.17

much spares and stores it must preload onto the carriers before they are deployed. It would also need to manage the consumption rates of stock and spares, depending on the environment the ship was operating in. Where necessary, it might also need to seek support from allies. The Department admitted that having only *RFA Fort Victoria* would inevitably constrain carrier operations, and that it had known about this issue since 2011, when the delivery of the new fleet solid support ships had first been delayed.

27. We were also concerned that the Department had not found a solution for other unfunded supporting capabilities since our 2018 report. For example, a Maritime Intra-Theatre Lift capability is crucial for moving spares (including Lightning II parts), people and, potentially, high-value assets around the fleet and to shore. The Department's plans to develop a dedicated long-term capability have been limited by funding constraints and lack of data on what support a carrier group will need. The Department admitted it requires a long-term solution and anticipates that this will be an un-crewed autonomous system of some form. However, it is unlikely to provide this in the next 10 to 15 years. The Department told us that for the foreseeable future, therefore, it must rely on its interim solution, using Merlin Mark 4 helicopters. It assured us that this provides an adequate capability to operate the carriers. However, this solution relies on competing for spare capacity on helicopters which have other roles and restricts Carrier Strike's ability to operate where required because of the helicopters' limited range.<sup>55</sup>

# Formal minutes

---

**Monday 2 November 2020**

Virtual meeting

Members present:

Meg Hillier, in the Chair

Sir Geoffrey Clifton-Brown	Richard Holden
Barry Gardiner	Sir Bernard Jenkin
Dame Cheryl Gillan	Sarah Olney
Peter Grant	James Wild

Draft Report (*Delivering carrier strike*), proposed by the Chair, brought up and read.

*Ordered*, That the draft Report be read a second time, paragraph by paragraph.

Paragraphs 1 to 27 read and agreed to.

Summary agreed to.

Introduction agreed to.

Conclusions and recommendations agreed to.

*Resolved*, That the Report be the Twenty third of the Committee to the House.

*Ordered*, That the Chair make the Report to the House.

*Ordered*, That embargoed copies of the Report be made available, in accordance with the provisions of Standing Order No. 134.

[Adjourned till Thursday 5 November at 9:15am

## Witnesses

---

The following witnesses gave evidence. Transcripts can be viewed on the [inquiry publications page](#) of the Committee's website.

### Monday 28 September 2020

**Sir Stephen Lovegrove**, Permanent Secretary, Ministry of Defence; **Air Marshal Richard Knighton CB**, SRO Carrier Enabled Power Projection, Ministry of Defence; **Charlie Pate**, Director General Finance, Ministry of Defence; **Sir Simon Bollom**, Chief Executive Officer, Defence Equipment Services, Ministry of Defence

[Q1-91](#)

## Published written evidence

---

The following written evidence was received and can be viewed on the [inquiry publications page](#) of the Committee's website.

CRS numbers are generated by the evidence processing system and so may not be complete.

- 1 Defence Synergia ([CRS0002](#))
- 2 Patel, Jag ([CRS0001](#))

## List of Reports from the Committee during the current Parliament

---

All publications from the Committee are available on the [publications page](#) of the Committee's website. The reference number of the Government's response to each Report is printed in brackets after the HC printing number.

### Session 2019–21

First Report	Support for children with special educational needs and disabilities	HC 85
Second Report	Defence Nuclear Infrastructure	HC 86
Third Report	High Speed 2: Spring 2020 Update	HC 84
Fourth Report	EU Exit: Get ready for Brexit Campaign	HC 131
Fifth Report	University Technical Colleges	HC 87
Sixth Report	Excess votes 2018–19	HC 243
Seventh Report	Gambling regulation: problem gambling and protecting vulnerable people	HC 134
Eighth Report	NHS expenditure and financial management	HC 344
Ninth Report	Water supply and demand	HC 378
Tenth Report	Defence Capability and the Equipment Plan	HC 247
Eleventh Report	Local authority investment in commercial property	HC 312
Twelfth Report	Management of tax reliefs	HC 379
Thirteenth Report	Whole of Government Response to Covid-19	HC 404
Fourteenth Report	Readying the NHS and social care for the COVID-19 peak	HC 405
Fifteenth Report	Improving the prison estate	HC 244
Sixteenth Report	Progress in remediating dangerous cladding	HC 506
Seventeenth Report	Immigration enforcement	HC 407
Eighteenth Report	NHS nursing workforce	HC 408
Nineteenth Report	Restoration and renewal of the Palace of Westminster	HC 549

Twentieth Report	Tackling the tax gap	HC 650
Twenty-First Report	Government support for UK exporters	HC 679
Twenty-Second Report	Digital transformation of the NHS	HC 680
Twenty-Fourth Report	Selecting towns for the Town Fund	HC 651