

Supplementary Written Evidence Submitted by Lockheed Martin UK on Crowsnest Programme

Introduction

1. During an oral evidence session on 29 June 2021, as part of its inquiry '*The Navy: purpose and procurement*', a member of the House of Commons Defence Committee (HCDC) asked Thales for a written submission explaining the delays experienced on the Crowsnest Programme. As prime contractor for the Programme, Lockheed Martin UK has drafted this submission.
2. This submission is publicly-releasable. Further information can be provided on a 'commercial in confidence' basis to HCDC, in writing or via a briefing.

Background

3. Lockheed Martin UK was awarded a fixed-price Demonstration & Manufacture (D&M) contract for the Crowsnest Programme on 30 November 2016. Crowsnest replaces and enhances the capability originally provided by the Sea King Mk7 Airborne Surveillance & Control platform (now retired).
4. As prime contractor, Lockheed Martin UK is responsible for the overall design and development of the Crowsnest system, incorporating a radar and mission system from Thales, and working with Leonardo Helicopters UK to design and make modifications to the Merlin Mk2 helicopter airframes. 10 role kits are being developed for the Crowsnest system, with associated spares. All 30 Merlin Mk2 helicopters will be equipped to receive the role kits.
5. The contracted date for the Crowsnest system's Initial Operating Capability (IOC) was March 2020. Full Operating Capability (FOC) was due in June 2022. The National Audit Office (NAO) has independently assessed the performance of Crowsnest Programme, as part of its investigations into Carrier Strike.¹ Lockheed Martin agrees with the findings of the NAO.

Timelines

6. The NAO has published a timeline for the Crowsnest Programme for the period May 2013 to April 2020, and a forecast for future milestones up to June 2023. These show the delays experienced on the Programme (see Figures 1 and 2). The NAO's reports also identify the reasons for delays. Paragraphs 7 to 11 provide some further context.

¹ See National Audit Office, *Carrier Strike – Preparing for deployment*, HC 374, Session 2019-2021, 26 June 2020, and *Improving the performance of major equipment contracts*, HC 298, Session 2021-22, 24 June 2021.

Figure 7
Timeline of events on the Crowsnest project, 2013 to 2020

The Ministry of Defence thought the project was on schedule until January 2019

Description of events	
2013	<p>May The National Audit Office report <i>Carrier Strike: The 2012 reversion decision</i> highlighted the delayed investment of Crowsnest had impacted the delivery of Carrier Strike by two years.</p>
2016	<p>November Design and manufacture contract signed with Lockheed Martin as the prime contractor and Thales and Leonardo as sub-contractors.</p>
2017	<p>March The National Audit Office report <i>Delivering Carrier Strike</i> highlighted the project was at a critical point with no allowance for delays, leaving limited time for integrated training and work-up, and warning there may not be enough radar-fitted helicopters and trained crew ready for deployment.</p> <p>December Commercial letter of dissatisfaction issued to industry.</p>
2018	<p>March Deep-dive conducted by Defence Equipment & Support due to Thales underperformance resulting in re-planning proposals and contract amendment discussions.</p> <p>August Major contract amendment signed and initial operating capability (IOC) date agreed – March 2020.</p> <p>Lockheed Martin embedded 17 personnel into Thales, Crawley, setting up a programme charter and several senior-level programme reviews.</p> <p>December Project reporting stated delivery of IOC was achievable.</p>
2019	<p>January The Department was informed of the Thales Corporate internal audit report stating that there were significant risks and others emerging that could not be mitigated by the current plan, and a re-plan exercise was needed.</p> <p>May Recovery plan agreed 14 weeks after declaring the project undeliverable.</p> <p>July Capability milestones were redrafted and ‘inch-pebble’ tasks were developed.</p> <p>December The first radar flight trial was postponed.</p>
2020	<p>February First radar flight trial was conducted.</p> <p>April Current schedule to IOC is delayed by 18 months.</p>

Notes

- 1 Shading indicates the Department's assessment of delivery confidence: Green – successful delivery of the project is highly likely; Amber – successful delivery appears feasible but significant issues exist and require management action; Red – successful delivery of the project is unachievable.
- 2 Comptroller and Auditor General, Ministry of Defence, *Delivering Carrier Strike*, Session 2016-17, HC 1057-I, National Audit Office, March 2017.
- 3 Comptroller and Auditor General, Ministry of Defence, *Carrier Strike: The 2012 reversion decision*, Session 2013-14, HC 63, National Audit Office, May 2013.

Source: National Audit Office analysis of Ministry of Defence data

Figure 1: Timeline of events on the Crowsnest project, 2013 to 2020 (NAO)²

² Extracted from National Audit Office, *Carrier Strike – Preparing for deployment*, p. 26.

Figure 8

Future milestones remaining in the Crowsnest project, March 2020

The Ministry of Defence will not meet future capability milestones

Project milestone	Original delivery date	Revised delivery date	Forecast delay to delivery (months)
System training milestone	October 2015	May 2020	55
In-service date data cut-off	February 2019	May 2020	15
Logistic support date	April 2019	July 2020	15
Ready for Training number 6	September 2019	October 2020	13
Initial operating capability data cut-off	November 2019	June 2021	19
Crowsnest initial operating capability	March 2020	September 2021	18
Ready for Training number 7	July 2021	June 2022	11
Interim full operating capability data cut-off	July 2021	June 2022	11
Interim full operating capability	November 2021	September 2022	10
Crowsnest full operating capability	June 2022	May 2023	11
Project closure	September 2022	June 2023	9

Notes

- 1 Milestones are not always consecutive and cannot be totalled.
- 2 Forecast position as at 30 March 2020.
- 3 Crowsnest is a radar system that also provides target identification, an autonomous artificial intelligence tracking system and a mission recording and replay system.

Source: National Audit Office analysis of Ministry of Defence data

Figure 2: Future milestones remaining in the Crowsnest project, March 2020 (NAO)³

7. An Integrated Master Schedule (IMS) was developed by Lockheed Martin to achieve IOC and FOC dates. The IMS was supported by two System-level Critical Design Review (CDR) events. System CDRs baseline a system design, to ensure it has a reasonable expectation of meeting requirements, for production and manufacturing. They are undertaken in the Demonstration phase, prior to the transition to the Manufacturing phase.
8. Following the first System CDR, the IMS was revised to address delays arising from Thales' performance, and maintain an IOC date of March 2020. The revised IMS was endorsed by the MoD in May 2018. A contract amendment was issued by the MoD to Lockheed Martin in August 2018. Lockheed Martin embedded 17 experienced staff in Thales' team.
9. In early January 2019, following a corporate internal audit, Thales informed Lockheed Martin and the MoD that it could not meet the revised IMS, including maintaining the IOC date of March 2020. As a result, a replan of work began. The replan aimed to achieve an IOC that, despite being delayed, still supported the Carrier Strike Group 21 (CSG21) deployment from May 2021. The replan was completed in May 2019. As part of the replan, the MoD implemented closer monitoring of industry performance, and required new project information. Lockheed Martin increased its personnel on the Programme by one-quarter, and Thales doubled its staffing.

³ *Ibid.*, p. 28.

10. The performance of subcontractors continued to cause delays, including to the first radar flight trial. In February 2020, when the first radar flight trial took place, Lockheed Martin UK reported delays for 19 per cent of the tasks in the replan.⁴
11. The Crowsnest Programme remains delayed against its original IOC and FOC dates. A credible baseline capability in support of CSG21 was therefore determined by the MoD,⁵ based on threat assessments. Three Crowsnest-configured Merlin Mk2 helicopters were deployed in support of CSG21 from March 2021, in line with this baseline requirement. As noted by the MoD, *'The Crowsnest capability will be expanded incrementally through subsequent software releases. Operational feedback during CSG21 will shape these upgrades...Crowsnest is due to reach Full Operating Capability in 2023'*.⁶

Cause of delays

12. Lockheed Martin, Thales, and Leonardo Helicopters UK have supported an internal lessons learned exercise by the MoD, and the NAO's independent investigations into Carrier Strike, which included assessments of the Crowsnest Programme. Lockheed Martin agrees with the findings of the MoD's internal lessons learned review, and the NAO's investigations.
13. The most recent NAO report summarised the findings of the MoD's lessons learned review:-

'An internal 'lessons learned' review concluded that neither the Department nor industry understood the complexities of delivering the capability. Changes to funding, scope and timetable, together with a fixed price contract, contributed to subcontractor under-performance, which the prime contractor and the Department did not detect until it was too late to meet the target delivery date'.⁷

14. In addition, a previous NAO report identified the following issues:-

- a. *Software development maturity.* Thales' software maturity metrics failed to represent an accurate picture of work completed at that point, the work that was still needed, and the associated risks.⁸ This also reflected the lack of suitably qualified software engineers for the radar and mission system;
- b. *Availability and maturity of certification documentation.* Thales did not develop and maintain the necessary certification documentation,⁹ to the required timelines or the required standards and regulations. This documentation was necessary to allow airworthiness to be assessed and qualified by the MoD, but was incomplete or immature; and
- c. *Helicopter care.* The helicopter needed for trials, which was the responsibility of Leonardo Helicopters UK, had received insufficient care during outdoor storage, leaving it unsuitable for flying. It needed substantial maintenance to make it airworthy for flight trials and, instead, was used for testing.¹⁰

⁴ *Ibid.*, para 2.6.

⁵ *Ibid.*, para. 2.7.

⁶ MoD written evidence to House of Commons Defence Committee inquiry, *The Navy: Purpose and Procurement*, NAV0030, 4 June 2021 (published 8 June 2021).

⁷ National Audit Office, *Improving the performance of major equipment contracts*, para. 3.7.

⁸ National Audit Office, *Carrier Strike – Preparing for deployment*, para. 2.4.

⁹ *Ibid.*

¹⁰ *Ibid.*, para. 2.6.

15. Overall, the MoD has concluded that Thales *'failed to meet its contractual commitments to develop the equipment'*,¹¹ and that Thales *'had not provided sufficient information on the project's progress to Lockheed Martin. Consequently, neither the Department nor Lockheed Martin identified the lack of progress until it was too late to meet its initial operating capability milestone'*.¹²
16. Finally, as expected during programmes, issues are identified during qualification and trial activities. These issues had to be addressed, including through some redesign, which impacted schedule.

Conclusion

17. Lockheed Martin, Thales, and Leonardo Helicopters UK acknowledge the unacceptable delays to the Crowsnest Programme. A credible baseline capability has been delivered to support the CSG21 deployment, in collaboration with the MoD. Feedback on this pre-IOC Crowsnest system is positive, and insights from the operational deployment are shaping spiral upgrades.
18. Lockheed Martin agrees with the findings of the MoD's internal lessons learned review, and the NAO's investigations. As confirmed by the NAO, the MoD *'has held Lockheed Martin to delivering the project against the agreed contract price of £339 million'*.¹³
19. Lessons have been learnt. They continue to be applied to the Crowsnest Programme, and to other programmes being delivered by Lockheed Martin UK, Thales, and Leonardo Helicopters UK.

8 July 2021

¹¹ *Ibid.*, para. 7 (Summary).

¹² *Ibid.*, para. 2.4.

¹³ *Ibid.*, para. 2.8.