

The Auditor-General
Auditor-General Report No. 14 2018–19
Performance Audit

Joint Strike Fighter — Introduction into Service and Sustainment Planning

Department of Defence

© Commonwealth of Australia 2018

ISSN 1036–7632 (Print)

ISSN 2203–0352 (Online)

ISBN 978-1-76033-400-0 (Print)

ISBN 978-1-76033-401-7 (Online)

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Canberra ACT
5 December 2018

Dear Mr President
Dear Mr Speaker

In accordance with the authority contained in the *Auditor General Act 1997*, I have undertaken an independent performance audit in the Department of Defence. The report is titled *Joint Strike Fighter — Introduction into Service and Sustainment Planning*. I present the report of this audit to the Parliament.

Following its presentation and receipt, the report will be placed on the Australian National Audit Office's website—<http://www.anao.gov.au>.

Yours sincerely



Grant Hehir
Auditor-General

The Honourable the President of the Senate
The Honourable the Speaker of the House of Representatives
Parliament House
Canberra ACT 2600

AUDITING FOR AUSTRALIA

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Summary

Background

1. The Department of Defence (Defence) anticipates the arrival in Australia of the first two of 72 F-35A Joint Strike Fighter (JSF) aircraft in December 2018. The JSF aircraft will replace the Royal Australian Air Force's ageing F/A-18 A/B Classic Hornet aircraft. Defence expects to declare final operational capability of its new JSF aircraft in 2023.
2. Defence has established multiple programs and projects to acquire, further develop, and support Australia's new air combat capability. The principal program is AIR 6000 and the primary phase, Phase 2A/2B, represents the major purchase of the JSF aircraft and associated support systems, and is the focus of this ANAO performance audit. The total acquisition budget for AIR 6000 Phase 2A/2B is some \$15.5 billion with government approving a further \$4.6 billion in 2014 for operating and support costs until 2024–25.¹

Rationale for undertaking the audit

3. The Auditor-General chose to undertake this audit into Defence's preparations for the JSF aircraft's introduction into Australian service and sustainment planning due to: the imminent arrival of the first two JSF aircraft in Australia; the high cost of the program; the JSF's particular acquisition and sustainment arrangements; and the anticipated contribution of the JSF aircraft to Australia's future Defence capability.²

Audit objective and criteria

4. The objective of the audit is to assess the effectiveness of the Department of Defence's preparations for the introduction of the Joint Strike Fighter into Australian service and its subsequent sustainment.
5. The high-level audit criteria are:
 - Defence has established effective strategic planning and project governance arrangements; and
 - Defence has undertaken effective planning, is achieving progress against relevant plans and effective risk management is occurring for selected capabilities.

Conclusion

6. The Department of Defence's preparations to date for the introduction and sustainment of the Joint Strike Fighter (JSF) aircraft into Australian service have been effective with the exception

1 Department of Defence, submission to the Senate Standing Committee on Foreign Affairs, Defence and Trade Inquiry into the Planned Acquisition of the F-35 Lightning II Joint Strike Fighter, 26 February 2016, p. 5, paragraphs 25 and 27.

2 Previously, the Auditor-General has examined the acquisition of JSF aircraft in Auditor-General Report No. 6 2012–13, *Management of Australia's F-35A Joint Strike Fighter Acquisition*. The JSF has also featured in the annual Defence Major Projects Report since 2010–11.

of arrangements for sustainment of JSF aircraft under the Global Support Solution. JSF sustainment cannot be fully costed until the Global Support Solution further matures.

7. Defence has established effective strategic and project governance arrangements to date for the introduction of the JSF into Australian service and its sustainment. These arrangements include:

- plans addressing the transition from the Classic Hornets to the JSF;
- sustainment arrangements;
- infrastructure requirements;
- workforce planning and training;
- project governance arrangements and procedures for regular engagement with the international JSF Program; and
- procedures for regular monitoring and reporting on risk, cost and schedule to governance bodies, senior Defence leaders and Defence Ministers.

Defence has not, however, provided all of the annual updates to Government that Government required in its approval of the project.

8. Defence has undertaken effective planning for its JSF related infrastructure, workforce and training system, and is achieving progress against relevant plans. Defence has identified and managed risks relating to these operational enablers. Necessary works have been undertaken at the JSF's main base (Royal Australian Air Force Base Williamtown), but works at other bases have been deferred or delayed to manage pressures on the infrastructure budget.

9. Defence has planned for and made progress in implementing the arrangements for the ongoing sustainment of the JSF. The effective implementation of Defence's ongoing sustainment arrangements depends largely on the United States Department of Defense delivering the Global Support Solution, which is still maturing. Defence is managing risks associated with the developmental nature of the JSF supporting systems as well as cost pressures related to establishing Australia as a regional maintenance and warehousing hub for JSF aircraft.

Supporting findings

Governance and planning frameworks

10. Defence has developed an appropriate framework of plans, agreements and other documents, which establishes the Chief of Air Force's requirements for the JSF aircraft and the strategy for the introduction of the JSF aircraft into service and its sustainment.

11. The governance arrangements established by Defence for the Australian JSF Program are appropriate and informed by Defence's engagement in the international JSF Program. Defence has made changes to its project governance in response to review findings and changing circumstances. However, the JSF Strategic Advisory Board has not met quarterly as anticipated by its terms of reference.

12. Defence has implemented monitoring and reporting arrangements to inform its governance bodies, senior Defence leaders (civilian and military) and Defence Ministers about risks and

issues, progress against schedule and costs associated with the Australian JSF Program. Defence advised the government that it had not consistently provided annual updates to government on the Australian JSF Program as directed and that it had committed \$266.3 million for materiel associated with JSF aircraft procurement without first informing the Prime Minister and Minister for Finance (as required by the government).

Australian operational enablers – infrastructure, workforce and training

13. Defence has identified and progressed the preparation of infrastructure to support and sustain the JSF aircraft in Australian service. Defence has prioritised work at the JSF aircraft's main operating base at Royal Australian Air Force Base Williamstown, to complete the necessary infrastructure works before the first two JSF aircraft arrive in Australia in December 2018. The infrastructure budget is under pressure, resulting in the deferral of some works and delays to works at other bases.

14. Defence has identified and planned for its JSF workforce and training requirements and is largely on track to deliver the JSF workforce and training system. Defence has allocated responsibilities for workforce generation and training to Defence's Capability Acquisition and Sustainment Group and the Royal Australian Air Force. Defence records indicate that Defence is generating pilot and maintainer workforces at a rate that will support the operation of the initial Australian aircraft.

Sustainment

15. Defence plans to sustain its JSF aircraft largely through the United States Department of Defense's Global Support Solution and is managing risks associated with the still developing Global Support Solution. Defence has signed a bilateral support agreement with the F-35 Joint Program Office.

16. Defence is monitoring and managing risks to effective sustainment of the JSF arising from the Global Support Solution including — the availability of spare parts, the development of the Autonomic Logistics Information System, and access to maintenance facilities. Defence is constrained in its ability to effectively manage some risks, including access to JSF spare parts due to limited global supply. Not all of the costs associated with Australia becoming a regional hub for JSF aircraft maintenance and warehousing were known by Defence when the project was approved in 2014. This is adding cost pressures to the project.

17. Defence does not expect to have a reliable estimate for whole-of-life sustainment costs for its JSF aircraft until after 2020.

The Department of Defence's response to the audit

18. The Department of Defence's response to the audit is included in Appendix 1. Defence has not provided a summary of its response to the audit.

Key messages from this audit for all Australian Government entities

19. Below is a summary of key messages, including instances of good practice, which have been identified in this audit that may be relevant for the operations of other Australian Government entities.

Governance and risk management

- Embedding an Australian presence in long-term, highly complex international joint initiatives can provide Australian decision makers with additional insights, and improve policy and program advice.
- Establishing and maintaining a project team that integrates relevant areas within the entity, and includes personnel with necessary skills and experience, can help mitigate risks involved in the planning and delivery of complex projects.

Policy/program implementation

- Identifying a senior responsible official for complex projects enhances program accountability.
- Early planning, particularly for complex programs, supports decision makers to identify and implement the most effective ways to achieve outcomes.

Audit findings

1. Background

Introduction

1.1 The Department of Defence (Defence) anticipates the arrival in Australia of the first two of 72 F-35A Joint Strike Fighter (JSF) aircraft in December 2018. The JSF aircraft will replace the Royal Australian Air Force's ageing F/A-18 A/B Classic Hornet aircraft, and form part of Australia's new air combat capability.

1.2 Defence has established multiple programs and projects to acquire, further develop, and support Australia's new air combat capability. The principal program is AIR 6000 and the primary phase, Phase 2A/2B, represents the major purchase of the JSF aircraft and associated support systems, and is the focus of this ANAO performance audit. The Australian Government approved AIR 6000 Phase 2A/2B in two stages, approving the purchase of 14 aircraft in 2009, and the remaining 58 in 2014. The total acquisition budget for AIR 6000 Phase 2A/2B is some \$15.5 billion with government approving a further \$4.6 billion in 2014 for operating and support costs until 2024–25.³

1.3 The Joint Strike Fighter Division (JSF Division) within Defence's Capability Acquisition and Sustainment Group is managing the acquisition of Australia's JSF aircraft from the United States of America (the United States). JSF Division liaises with the United States Department of Defense's F-35 Joint Program Office (F-35 JPO) through a number of international governance forums, and has been responsible for coordinating the necessary works within Australia to facilitate the introduction of the JSF aircraft into Australian service.⁴ Key responsibilities of Defence's JSF Division have included: project planning, establishing Defence's governance arrangements and in-service support arrangements, constructing the required facilities, recruiting and training personnel, and preparing for Australia's entry into the Global Support Solution that will sustain the JSF aircraft.

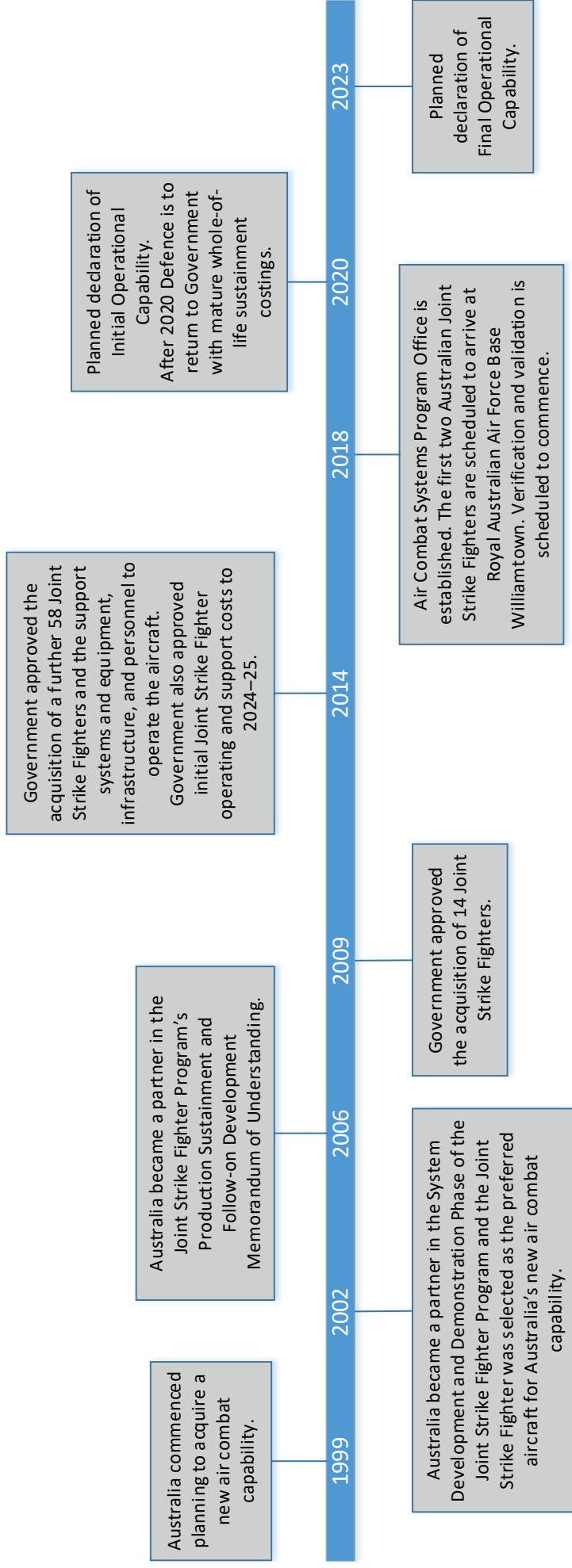
1.4 Following the arrival of the first two Australian JSF aircraft, Defence will commence an initial test and evaluation program that it has scheduled to run through to December 2020, at which time it plans to have approximately 30 aircraft including an operational squadron of at least 12 JSF aircraft available. Figure 1.1 outlines the significant events for the Australian Joint Strike Fighter Program including planned dates for the declaration of initial operational capability and final operational capability (key acquisition milestones).⁵

3 Department of Defence, submission to the Senate Standing Committee on Foreign Affairs, Defence and Trade Inquiry into the Planned Acquisition of the F-35 Lightning II Joint Strike Fighter, 26 February 2016, p. 5, paragraphs 25 and 27.

4 The F-35 JPO is responsible for managing the JSF aircraft acquisition and sustainment program on behalf of the United States armed services and other JSF Program participant nations, including Australia. The international JSF Program is discussed further in paragraphs 1.5 to 1.9.

5 Initial operational capability and final operational capability are when the first and final subset of a capability that can be operationally employed is realised. These milestones are endorsed at project approval, and assessed by the Capability Manager (this is usually the Chief of Navy, Army or Air Force).

Figure 1.1: Timeline of significant Australian Joint Strike Fighter Program events



Source: ANAO

The Joint Strike Fighter Program

1.5 The United States Department of Defense's international JSF Program is expected to deliver over 3,000 aircraft to the nine participating partner nations, with the United States expected to acquire approximately 75 per cent of that total.⁶ The international JSF Program is the first large scale international collaborative development program for a United States-built military aircraft and includes initial design, production, follow-on development and through life support of the JSF global fleet.⁷ Defence has described the JSF Program as 'one of the most technologically advanced and complex development programs ever undertaken in the defence aviation environment'.⁸

1.6 Defence's acquisition of JSF aircraft and support system is under the auspices of the multilateral JSF Production, Sustainment and Follow-on Development Memorandum of Understanding (PSFD MoU).⁹

1.7 The JSF PSFD MoU has supported the international JSF Program through the development stage of the aircraft and support system. Further to the MoU, Defence advised the F-35 JPO on 5 July 2018 of Australia's requirements and performance metrics for JSF aircraft availability, mission effectiveness, supply and maintenance.

1.8 The developmental nature of the international JSF Program and the acquisition strategy means that Defence does not yet know the final purchase price of future Australian aircraft, or the aircraft's whole-of-life operating and support costs. The United States Government negotiates with Lockheed Martin and Pratt & Whitney on the price of the JSF as part of an annual 'lot buy'. In 2018, Defence estimated that Australia will pay an average of \$115.7 million (US\$90 million) for each of its aircraft.

1.9 Australia, along with the other participants in the international JSF Program, will utilise the United States Department of Defense's Global Support Solution to sustain its JSF aircraft. The Global Support Solution involves all participants in the international JSF Program sharing, through F-35 JPO-managed sustainment agreements, critical aspects of sustainment support including maintenance, training, engineering, and spare parts.¹⁰

6 The Joint Strike Fighter Program partner nations are the United States of America, Australia, Canada, Denmark, Italy, the Netherlands, Norway, Turkey and the United Kingdom.

7 The global fleet will include three variants of the aircraft: conventional take-off and landing (which Australia is buying); short take-off and vertical landing; and an aircraft carrier variant. All jets have an airframe made by Lockheed Martin, similar software, and engines made by Pratt & Whitney.

8 Department of Defence, submission to the Senate Standing Committee on Foreign Affairs, Defence and Trade Inquiry into the Planned Acquisition of the F-35 Lightning II Joint Strike Fighter, 26 February 2016, p. 2.

9 Signatories to the JSF PSFD MoU are referred to in the agreement as 'participants'. Israel, Japan and the Republic of Korea (South Korea) are also purchasing the JSF aircraft outside of the PSFD MoU arrangements.

10 Australia's sustainment strategy for the JSF is to utilise the Global Support Solution as much as possible except where there is the need to protect 'sovereign sustainment requirements', in which case Defence may choose to make separate arrangements. Where this is the case, there will be additional costs to Defence as the Global Support Solution operates under a 'pay to be different' principle. The Global Support Solution is discussed further in Chapter 4.

Rationale for undertaking the audit

1.10 The Auditor-General chose to undertake this audit into Defence's preparations for the JSF aircraft's introduction into Australian service and sustainment planning due to: the imminent arrival of the first two JSF aircraft in Australia, the high cost of the program, the JSF's particular acquisition and sustainment arrangements, and the anticipated contribution of the JSF aircraft to Australia's future Defence capability.¹¹

Audit approach

Audit objective, criteria and scope

1.11 The objective of the audit is to assess the effectiveness of the Department of Defence's preparations for the introduction of the Joint Strike Fighter into Australian service and its subsequent sustainment.

1.12 The high-level audit criteria are:

- Defence has established effective strategic planning and project governance arrangements; and
- Defence has undertaken effective planning, is achieving progress against relevant plans and effective risk management is occurring for selected capabilities.

1.13 The audit does not consider the detailed management and progress of all activities necessary to support the introduction of the JSF aircraft into Australian service, the development of JSF aircraft or how the aircraft performs as a capability. The United States JSF Program and the capability of the JSF as a combat aircraft have been extensively considered by the United States Government Accountability Office and the United States Directorate of Test and Evaluation.¹² Further, the audit does not examine JSF aircraft weapons systems, Australia's acquisition strategy for JSF aircraft and weapons, Australian industry involvement, or Australian industry support programs.

Audit methodology

1.14 The audit method included a review of records and data held by Defence. The ANAO also interviewed key Defence personnel and examined progress at Royal Australian Air Force Base Williamtown during July 2018.

1.15 The audit was conducted in accordance with the ANAO auditing standards at a cost to the ANAO of approximately \$661,774. The team members for this audit were Tony Steele, Dr Jordan Bastoni, Kim Murray, Nathaniel Loorham and Sally Ramsey.

11 Previously, the Auditor-General has examined the acquisition of JSF aircraft in Auditor-General Report No. 6 2012–13, *Management of Australia's F-35A Joint Strike Fighter Acquisition*. The Auditor-General has also considered the JSF in each annual Defence Major Projects Report since 2010–11.

12 Information on the United States Joint Strike Fighter Program is available from annual reports prepared by the United States Directorate of Test and Evaluation (DOTE), available from www.dote.osd.mil. Additionally, the United States Government Accountability Office (GAO) regularly publishes examinations of the United States led Joint Strike Fighter Program. Its reports are available from www.gao.gov.

2. Governance and planning frameworks

Areas examined

This chapter examines Defence's strategic planning and project governance arrangements for the introduction of the Joint Strike Fighter (JSF) into Australian service and its subsequent sustainment. In particular, the ANAO examined Defence's planning framework, governance arrangements, and monitoring and reporting arrangements.

Conclusion

Defence has established effective strategic and project governance arrangements to date for the introduction of the JSF into Australian service and its sustainment. These arrangements include:

- plans addressing the transition from the Classic Hornets to the JSF;
- sustainment arrangements;
- infrastructure requirements;
- workforce planning and training;
- project governance arrangements and procedures for regular engagement with the international JSF Program; and
- procedures for regular monitoring and reporting on risk, cost and schedule to governance bodies, senior Defence leaders and Defence Ministers.

Defence has not, however, provided all of the annual updates to Government that Government required in its approval of the project.

Has Defence developed an appropriate strategic planning framework?

Defence has developed an appropriate framework of plans, agreements and other documents, which establishes the Chief of Air Force's requirements for the JSF aircraft and the strategy for the introduction of the JSF aircraft into service and its sustainment.

2.1 Defence has developed a number of plans, agreements and other documents to support the introduction of JSF aircraft into service and their sustainment. The key plan is the Capability Realisation Plan, which sets out the inputs and milestones to be delivered in order to generate a capability that will meet the Chief of Air Force's (the Capability Manager) requirements.

2.2 Underpinning the Capability Realisation Plan are the:

- Materiel Acquisition Agreement — which sets out the materiel and acquisition services that the Capability Acquisition and Sustainment Group is to deliver to the Capability Manager; and
- Materiel Sustainment Agreement — which defines the sustainment requirements and applicable key performance indicators needed to maintain the JSF once it is in Australian service.

2.3 The AIR6000 Program Management Plan (October 2014) sets out the strategic management framework, reporting and control mechanisms and governance arrangements for the Australian JSF Program as well as national and global governance arrangements for the JSF aircraft. The

AIR6000 Program Management Plan documents how Defence intends to deliver the capability across a multi-phased contiguous series of projects. Underpinning these plans are arrangements to monitor and report on risk, cost and schedule. The monitoring and reporting arrangements are discussed further in paragraphs 2.16 to 2.27.

2.4 Defence has also developed plans addressing, for example, infrastructure, workforce planning and training requirements, and sustainment. These plans are discussed further in chapters 3 and 4.

2.5 At the time of the audit, Defence was developing plans to support the test and evaluation of Australia's JSF aircraft, which is the next major activity to occur following the arrival into Australia of the first two JSF aircraft in December 2018. The test and evaluation program is intended to help prepare the Australian JSF aircraft, and their associated support systems, for operations.

Has Defence established appropriate governance arrangements?

The governance arrangements established by Defence for the Australian JSF Program are appropriate and informed by Defence's engagement in the international JSF Program. Defence has made changes to its project governance in response to review findings and changing circumstances. However, the JSF Strategic Advisory Board has not met quarterly as anticipated by its terms of reference.

Australia's involvement with the international Joint Strike Fighter Program

2.6 The international Joint Strike Fighter Program is managed within the United States Department of Defense's acquisition process. This audit has not examined the United States Department of Defense's governance processes, although key bilateral and multilateral governance documents have been considered to the extent that they affect Defence's introduction into service of the JSF aircraft.

2.7 Coordination at the international level occurs through F-35 JPO forums, including through the JSF Executive Steering Board. The JSF Executive Steering Board is the central decision-making and oversight body for the international JSF Program, consisting of senior representatives from participant countries. Australia is a voting member on the Board. In addition, Australia has embedded Defence personnel in the United States Department of Defense's F-35 Joint Program Office (F-35 JPO).

2.8 The key multilateral agreement under which international engagement is conducted is the JSF Production, Sustainment and Follow-on Development Memorandum of Understanding (PSFD MoU), which sets out a broad range of governance and coordination matters that provide the basis for international JSF engagement.

Defence's organisational arrangements for the management and oversight of the Australian JSF Program

2.9 At a departmental level, Defence has three senior committees that provide approvals and strategic direction for Defence capabilities. The Defence Committee, which is chaired by the

Secretary of Defence, is the primary decision-making committee of Defence. It is supported by two subsidiary committees—the Investment Committee and the Enterprise Business Committee.

2.10 Defence’s management structure for the Australian JSF Program consists of the JSF Division, Air Combat Transition Office, Air Combat Systems Program Office, the Defence Science and Technology Group, the Chief Information Officer Group (for the information technology aspects of the Program), and the Estate and Infrastructure Group (to manage construction of facilities and related works).

2.11 The JSF Division, within Defence’s Capability Acquisition and Sustainment Group (CASG), is managing the acquisition of Australia’s JSF aircraft from the United States of America as well as the initial in-service support arrangements. A Royal Australian Air Force (RAAF) officer at the two-star level leads the JSF Division and is the senior responsible officer for the project.¹³

2.12 The RAAF has established the Air Combat Transition Office to manage the RAAF’s transition from the Classic Hornet aircraft to the JSF aircraft, and to represent the interests of the Capability Manager at Australian JSF Program forums. The Air Combat Transition Office is responsible for ensuring that the RAAF has the necessary knowledge and personnel in place in order to operate and sustain the JSF aircraft.

2.13 In preparation for the sustainment of the JSF capability, Defence established the Air Combat Systems Program Office (ACSPO) at RAAF Base Williamstown in January 2018.¹⁴ Over the next five years, activity is to shift from JSF Division to the ACSPO, with the ACSPO eventually having complete responsibility for JSF sustainment.

2.14 Defence has also established several stakeholder groups and boards to facilitate information sharing and coordination within the Australian JSF Program. One of these is the JSF Strategic Advisory Board which was established in 2017 and is responsible for providing regular executive oversight of the Australian JSF Program. The Board’s terms of reference anticipate quarterly Board meetings. As at September 2018, the Board had not met since August 2017.

2.15 Defence reviewed its JSF Program governance arrangements in 2016 and found that the extant governance arrangements were adequate, but could be improved. A follow-up review in June 2017 concluded that ‘great progress has been achieved during Phase 1 on the governance realignment, with new arrangements in place and other initiatives contributing to greater executive capacity and a refocus on the strategy.’ The review also identified that additional work was required to embed the changes into, and mature, the governance arrangements. In July 2018, Defence informed the ANAO that its JSF Program governance arrangements were now closely aligned to those suggested by the review.

13 A ‘two star’ rank is represented by the following equivalent ranks within the Australian Defence Force: Air Vice-Marshal (Air Force), Major General (Army), and Rear Admiral (Navy).

14 The role and stand-up of the ACSPO is described in detail from paragraph 3.14 onwards.

Has Defence implemented monitoring and reporting arrangements?

Defence has implemented monitoring and reporting arrangements to inform its governance bodies, senior Defence leaders (civilian and military) and Defence Ministers about risks and issues, progress against schedule and costs associated with the Australian JSF Program. Defence advised the government that it had not consistently provided annual updates to government on the Australian JSF Program as directed and that it had committed \$266.3 million for materiel associated with JSF aircraft procurement without first informing the Prime Minister and Minister for Finance (as required by the government).

Monitoring the Australian JSF Program

2.16 Defence has defined capability milestones for the Australian JSF Program (see Appendix 2). Defence uses the milestones to track progress against the Australian JSF Program schedule. Defence's forecast of its achievements against these milestones suggests that it considers the Australian JSF Program is predominantly on track to achieve initial operational capability in 2020.

2.17 The combined approved budget, in 2014, for the cost of 72 JSF aircraft, support systems (including information systems), training, weapons, infrastructure and contingency funding was \$15.5 billion.¹⁵ The Government also approved \$4.6 billion in 2014 (approximately \$3 billion of which Defence was to offset against existing funding) for operating and support costs to 2024–25.

2.18 JSF Division has identified cost pressures, and has consulted Defence's Investment Committee to develop cost reduction and deferral options and presented these to Government

2.19 To support the monitoring of risks to the Australian JSF Program, Defence has developed a web-browser based risk management database. For each risk, the database records: the risk owner; a description of the risk; the cause of the risk and the expected consequence(s); the risk treatment(s); a rating (extreme, high, medium or low); and the current status and activities to manage the risk.

Reporting and Oversight

Internal reporting of Australian JSF Program information

2.20 Australian JSF Program information is reported to internal stakeholders in the following ways:

- Quarterly Performance Report: This describes the performance of key major capability acquisition projects and the 'Top 30' sustainment products. It is provided by the Deputy Secretary, Capability Acquisition and Sustainment Group to senior stakeholders within Defence to inform them about emerging risks and issues to cost, capability and schedule targets.
- Senior Defence Committees: In August 2018, Defence advised the ANAO that the Defence Committee, the Investment Committee and the Enterprise Business Committee monitor the Australian JSF Program through their regular meetings.

¹⁵ Defence routinely adjusts the total approved acquisition budget for its JSF aircraft for foreign exchange rate variations. In October 2018, Defence advised the ANAO that, as at 30 September 2018, the acquisition budget was \$17.28 billion, and the approved sustainment budget up to 2024–25 was \$4.9 billion.

- Deputy Secretary Capability Acquisition and Sustainment Group Reports: Bimonthly status updates are provided to the Deputy Secretary, Capability Acquisition and Sustainment Group that include advice about Australian JSF Program performance, issues and achievements.¹⁶

2.21 Up until May 2018, JSF Division held three monthly meetings at which the JSF executive leadership reviewed aspects of Australian JSF Program performance, the:

- JSF Program Management Review — an information-sharing and decision-making forum that reviewed the performance of the Australian JSF Program.
- Risk Management Board — responsible for oversight of the effectiveness and health of Australian JSF Program risk management practices and sharing risk-related information.
- Baseline Change Board — considered any proposed changes to the Australian JSF Program’s scope, cost and schedule.

2.22 In May 2018, Defence consolidated the three meetings outlined above into a single meeting — the ‘Governance Meeting’.

2.23 Defence also convenes Independent Assurance Reviews to provide its Senior Executive with assurance that all identified risks for a project are manageable, and that costs and schedule are likely to be under control. In the October 2018 Independent Assurance Review (the most recent), the Independent Assurance Review Board raised concerns regarding affordability and challenges faced due to the immaturity of the Global Support Solution. The review board noted that:

On the support side, the Global Support Solution is quite immature and, as recognised by the project team, faces a number of challenges. In the short term at least, the availability of spare parts is proving a challenge. The project team advised of a range of measures being undertaken by the US JPO to resolve the issue, but in my view the situation will not be fully resolved for a number of years. Another support challenge facing JSF is that Australia will need to operate a number of different aircraft configurations concurrently for many years. That situation could require multiple configurations of the key supporting elements, including ALIS [the Autonomic Logistics Information System] and ACURL [the Australia, Canada, United Kingdom Reprogramming Laboratory]. I am not comfortable that planning is well advanced to meet that challenge. Finally, I am concerned about the level of funding for operation and support of our JSF. The funds required for sustainment, even for the next few years, have yet to be quantified or allocated. Sourcing the operating and sustainment funds for FOC [Final Operational Capability] and beyond could be a major challenge, particularly if those costs are not contained through the global support arrangements.

Reporting to the Government

2.24 In November 2009 and again in April 2014, Government directed Defence to update it annually on the Australian JSF Program. Defence provided annual updates to Government each year with the exception of 2011, 2015 and 2016.¹⁷ In the 2017 update, Defence advised Government that it had not met the annual reporting requirement, and committed to providing the report annually.¹⁸

16 Another system that Defence relies on is its Monthly Reporting System, through which project data is collected and reported.

17 Defence did not provide a comprehensive update to Government in 2011, but did provide a cost update.

18 In October 2018, Defence advised the ANAO that ‘improved internal governance arrangements are now in place to ensure future updates are provided on time, with quarterly oversight from the Defence Investment Committee.’

2.25 In 2014, Government directed Defence to inform the Prime Minister and the Minister for Finance prior to committing to procurements of JSF aircraft. In 2017, Defence advised Government that it had committed \$266.3 million for materiel associated with JSF aircraft procurement without first informing the Prime Minister and Minister for Finance, as was required by Government. Defence further advised that the overall risk of the Australian JSF Program remained at Medium-High.¹⁹

2.26 Defence provides the CASG Quarterly Performance Report (discussed in paragraph 2.20) to the Minister for Defence and Minister for Defence Industry. The Quarterly Performance Report includes an overview of the project, risks to capability, cost and schedule information including a traffic-light risk rating, and outline of the intended remediation strategy. The Australian JSF Program is reported in the Quarterly Performance Report as a ‘Project of Interest’.²⁰ Defence first identified the JSF acquisition as a Project of Interest in its June 2017 Quarterly Performance Report.²¹ The JSF acquisition remains a Project of Interest in Defence’s June 2018 Quarterly Performance Report (the most recent available as of 19 November 2018).

2.27 Defence also provides reports and briefings to its Ministers about the Australian JSF Program as necessary.

19 This was the risk level advised to Government in 2014.

20 Projects of Interest are identified by Defence as those underperforming at any point in the capability lifecycle that require management action to avoid becoming a Project of Concern. A Project of Concern is a project that Defence regards as seriously underperforming.

21 Before July 2015, known as the ‘Defence Materiel Organisation Quarterly Program Performance Report’.

3. Australian operational enablers – infrastructure, workforce and training

Areas examined

This chapter examines whether Defence has undertaken effective planning, is achieving progress against relevant plans and effective risk management is occurring for operational enablers – infrastructure, workforce and training. In particular, the ANAO has examined whether Defence has: identified, planned for and prepared the infrastructure required to support and sustain JSF aircraft in Australian service; and identified and planned for its JSF workforce and training needs, and is on track to deliver these.

Conclusion

Defence has undertaken effective planning for its JSF related infrastructure, workforce and training system, and is achieving progress against relevant plans. Defence has identified and managed risks relating to these operational enablers. Necessary works have been undertaken at the JSF's main base (Royal Australian Air Force Base Williamtown), but works at other bases have been deferred or delayed to manage pressures on the infrastructure budget.

Has Defence identified and prepared the required infrastructure?

Defence has identified and progressed the preparation of infrastructure to support and sustain the JSF aircraft in Australian service. Defence has prioritised work at the JSF aircraft's main operating base at Royal Australian Air Force Base Williamtown, to complete the necessary infrastructure works before the first two JSF aircraft arrive in Australia in December 2018. The infrastructure budget is under pressure, resulting in the deferral of some works and delays to works at other bases.

Infrastructure requirements and approvals

3.1 The approval of the Parliamentary Standing Committee on Public Works (the Committee) was required to commence the infrastructure upgrades Defence identified as necessary to support the JSF aircraft.²² Parliamentary approval was sought for planned JSF facilities works in July 2014, and approval was given in October 2014.²³

3.2 The report noted that the majority of the works would occur at Royal Australian Air Force (RAAF) Bases Williamtown²⁴ (New South Wales) and Tindal (Northern Territory). The report also

22 Under the provisions of the *Public Works Committee Act 1969*, all public works that have an estimated cost exceeding \$15 million must be referred to the Parliamentary Standing Committee on Public Works. Public works cannot commence until the Public Works Committee has made its report to Parliament and the House of Representatives resolves that it is expedient to carry out the work.

23 The Public Works Committee made three recommendations in its report, focussing on noise mitigation, management of water quality and management of traffic, all at RAAF Base Williamtown. As at January 2018, Defence had conducted community consultations regarding noise mitigation, engaged with Hunter Water about water quality options, and completed traffic studies.

24 The main operating base for the JSF aircraft.

noted that Defence proposed a more limited set of works for RAAF Bases Townsville, Darwin, Curtin, Scherger, Learmonth, Pearce and Edinburgh and Defence Establishment Myambat.²⁵

3.3 In March 2017, Defence advised the Committee of changes to the scope and budget of the proposed JSF facilities works. Defence noted (in its March 2017 advice) that when the Committee considered the facilities project in 2014, the capability requirements were not mature and that these requirements have since been refined.

3.4 In order to fund enhanced facilities at RAAF Bases Darwin, Townsville and Learmonth Defence requested the removal of all previously approved works for the forward operating bases (at RAAF Bases Edinburgh, Pearce, Curtin and Scherger). Defence assessed these changes as cost neutral. Defence has also modified the scope of work at RAAF Bases Williamstown and Tindal. As at June 2018, Defence had halted its design work for the forward operating bases, pending resolution of some design issues with the chosen sites. Due to budget constraints, Defence has also delayed construction work at RAAF Base Learmonth until all the works at RAAF Base Williamstown, and the majority of works at RAAF Base Tindal, are completed.

Progress against the approved works

Performance against approved budget

3.5 The overall approved budget for the facilities works was \$1.477 billion (2014–15 out-turned). As at October 2018, the forecast cost for works at RAAF Bases Williamstown and Tindal is \$43.568 million over the approved budget, however \$44.525 million remains in the deferred works unallocated budget. Defence has \$15.358 million left in its contingency budget for facilities works and is considering options to reduce the risk of the project exceeding its facilities budget.

RAAF Base Williamstown

3.6 Defence records indicate that the construction work elements required to support the basing of JSF aircraft at RAAF Base Williamstown are nearing completion, though 21 of the 29 work elements are to be, or have been, completed later than initially planned. In October 2018, Defence advised the ANAO that the later than planned completion of construction will not affect the arrival of the first JSF aircraft into Australia, training, or Initial Operational Capability.

3.7 Two work elements have a forecast completion date later than December 2018, when the first two aircraft will arrive on base. Those work elements relate to the aircraft shelters for 77 Squadron, which have a forecast completion date of 31 January 2019. As at October 2018, 98 per cent of the facilities budget for RAAF Base Williamstown had been committed.

RAAF Base Williamstown Runway Approach (to be completed by 2020)

3.8 Defence is managing a significant issue involving the approach to the runway at RAAF Base Williamstown. Defence needs to acquire land at the North Western end of the runway to install approach lighting, and to clear vegetation that could present obstacles to JSF aircraft, and this work needs to be completed to improve the utility of the runway in certain conditions and enable the training of new pilots by October 2020.

25 Defence Establishment Myambat is a munitions storage facility in New South Wales.

3.9 In October 2017, Defence determined, and advised the Minister for Defence, that the land acquisition could not be completed by the required deadline. Defence proposed an interim option of declaring the land a Defence Area, and advised the Minister that it would request the Minister to declare a Defence Area in May 2018. In August 2018, Defence advised the ANAO that it is continuing to negotiate with NSW National Parks and Hunter Water, who currently own the land that will be affected. These entities have raised concerns that will require Defence to seek further Ministerial direction. Defence further advised that it is continuing to closely monitor the risks associated with not having the runway approach ready as planned.

RAAF Base Tindal

3.10 Australia's JSF aircraft will also be based at RAAF Base Tindal from 2022. As at October 2018, internal project reporting showed works as being largely on track. As at October 2018, 98 per cent of the facilities budget for RAAF Base Tindal had been committed.

3.11 As at July 2018, the key issues identified and being managed for the RAAF Base Tindal facilities build included: changes to handover requirements due to the resolution of data issues; working around the termination of a subcontractor; and the completion of a review of the remaining works to be completed, which has resulted in the need for a \$10.3 million delivery phase risk allocation.

Has Defence identified and prepared the required workforce and training system?

Defence has identified and planned for its JSF workforce and training requirements and is largely on track to deliver the JSF workforce and training system. Defence has allocated responsibilities for workforce generation and training to Defence's Capability Acquisition and Sustainment Group and the Royal Australian Air Force. Defence records indicate that Defence is generating pilot and maintainer workforces at a rate that will support the operation of the initial Australian aircraft.

3.12 Defence considers that the transition from its fleet of Classic Hornets to the JSF aircraft represents a generational change in aircraft capability, and consequently represents a generational change in the way in which Defence is required to plan and skill its workforce to support the JSF aircraft. In early 2018, Defence's Air Commander Australia explained Defence's perspective of the change from present technology aircraft to a fifth generation capability:

It's not just buildings and infrastructure, but it's also the operational mindset, tasking, IT systems, even the workforce itself. You need a different shaped workforce to support and maintain a 5th generation capability than you did for an older P-3 or F-111 type workforce.²⁶

26 AVM S. Robertson, quoted in A McLaughlin, 'Generational Change', *Australian Defence Business Review*, January/February 2018, p. 20.

Workforce definition and management

3.13 Defence prepared a workforce definition document to support second pass approval in 2009. The document detailed assumptions and projections for the workforce required to support the acquisition and sustainment of the JSF aircraft. Subsequently, Defence is managing the JSF workforce through two parallel streams within the:

- Capability Acquisition and Sustainment Group — responsible for acquisition and establishment of the support and sustainment arrangements, and is now managing the establishment of the Air Combat Systems Program Office (ACSPO)²⁷; and
- Air Force — responsible for managing the transition and generation of the squadron-based pilot, maintainer and operational support workforces through its Air Combat Transition Office.

The Air Combat Systems Program Office

3.14 Defence established the ACSPO at RAAF Base Williamtown on 15 January 2018. Defence intends that the ACSPO ‘will be the [in service support] agency responsible for the sustainment of the Australian [JSF aircraft].’ Figure 3.1 outlines the roles and responsibilities within the ACSPO.

3.15 Defence planned to transition several functions to the ACSPO in the third quarter of 2018, including:

- management of the Materiel Sustainment Agreement and the F-35 JPO Performance Based Agreement;
- in-year budget management;
- sustainment International Traffic in Arms Regulations and export controls;
- management of sustainment and training contracts;
- supply sustainment services;
- in service delegate of the safety authority functions; and
- training system sustainment services.

3.16 Defence advised in October 2018 that these functions had transitioned in August 2018. Defence plans to transition the remaining functions prior to declaring final operational capability in 2023.

27 Defence provides sustainment support services through Systems Program Offices.

Figure 3.1: Air Combat Systems Program Office Roles and Responsibilities

<p>Australian F-35 Governance – Enterprise accountability and performance, asset governance and management</p>				
<p>Strategy and Implementation – Product management, strategic risks and requirements, capability growth and integration, affordability and improvement</p>				
<p>Partnering – JPO advisory and engagement, participant interface management and sovereign obligation service delivery</p>				
<p>Resourcing – Resource forecasting, customer and supplier alignment and budgeting</p>				
<p>Program Executive Management</p>				
<p>Life Cycle Capacity Management</p> <ul style="list-style-type: none"> • JSF fleet management • Sustainment and upgrade requirements management • Fundamental inputs to capability integration • Liaison with the operational wing • Sustainment verification and validation • Industry support • Life cycle cost modelling and analysis • Capability, cost and risk trade off analysis 	<p>Performance Management</p> <ul style="list-style-type: none"> • Materiel Sustainment Agreement management • Customer, supplier, contract and agreement management • Performance monitoring and reporting • Sustainment cost management • Business risk management and benefit realisation 	<p>Program Operations Management</p> <ul style="list-style-type: none"> • Program coordination and controls • Battle rhythm management • Sovereign obligation management • Document and data management and information assurance • Security • Stakeholder management • Shared services management • Quality management • Work health and safety 	<p>Airworthiness and Sustaining Engineering Management</p> <ul style="list-style-type: none"> • Military type certificate holder delegate functions • Engineering support network due diligence • System safety • Sovereign technical risk management 	<p>F-35 Off-Board Mission Systems Management</p> <ul style="list-style-type: none"> • Training systems management • Australian ACURL governance • ALIS administration • Information systems configuration management • Software release management • Deployable ICT facility management • Enterprise architecture modelling • Test lab support

Source: Department of Defence, Air Combat Systems Program Office Organisation Design Submission Version 1.0.

The Air Combat Transition Office

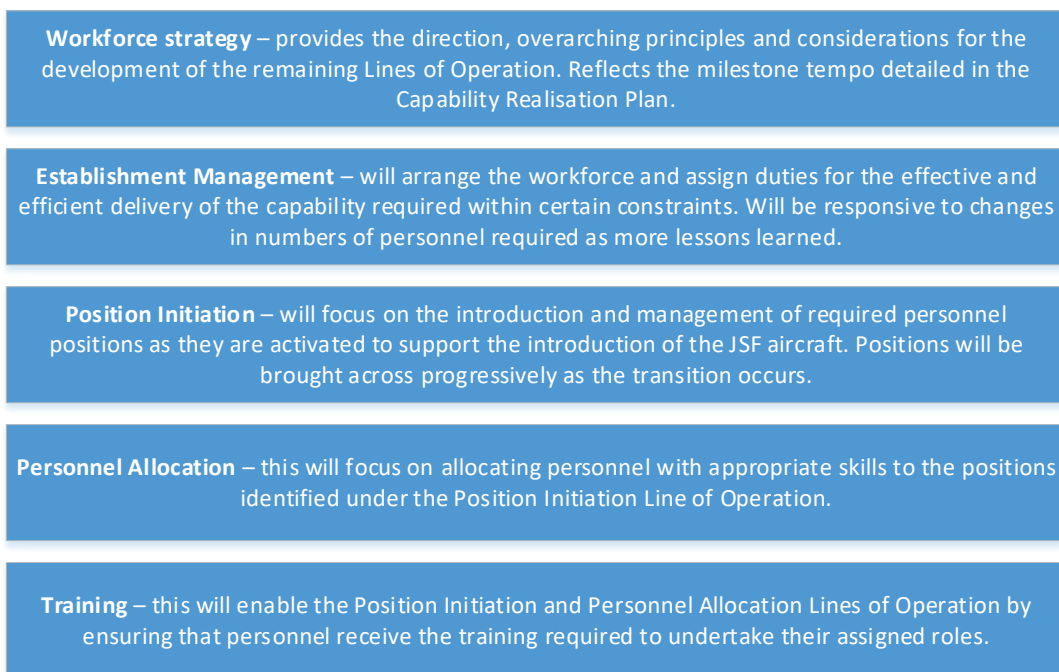
3.17 Based on targets identified in the Capability Realisation Plan, the Air Combat Transition Office has developed a Workforce Transition Strategy to assist Air Force in enabling and sustaining the workforce required to operate and support the JSF. The strategy is to inform the development of a subordinate Workforce Transition Plan.

3.18 The Workforce Transition Strategy describes the environment and constraints within which the JSF workforce will be recruited. The Strategy aligns with guidance on Air Force workforce issued by the Deputy Chief of Air Force in April 2016. This guidance noted that:

[t]he technical workforce is expected to be in modest surplus over the coming years...The depth of the surplus will fluctuate in response to normal workforce planning factors, and should not necessarily be relied upon as a means of de-risking transition.

3.19 The Workforce Transition Strategy also details several considerations around workforce development progress, focusing on the timing and developmental nature of the transition, the need to generate and staff new workforce capabilities within existing workforce allocations and the use of contracted support. The Workforce Transition Strategy states that the Air Combat Transition Office is developing its workforce across five key ‘Lines of Operation’ (see Figure 3.2), consisting of workforce strategy, establishment management, position initiation, personnel allocation and training. The Air Combat Transition Office is responsible for managing each of these Lines of Operation and will move them into the sustainment system as they become mature.

Figure 3.2: Air Combat Transition Office – workforce lines of operation



Source: Department of Defence, *F-35A Workforce Strategic Plan version 2.1*.

3.20 The Air Combat Transition Office is also responsible for establishing the Maintenance Training System. Air Force plans that the Maintenance Training System will rely upon a contracted workforce through the Integrated Training Centre.

Planning and design of the training system

3.21 The JSF Division is responsible for delivering the Australian Training System for the JSF aircraft. The JSF Division:

Is acquiring a JSF Training System via the JSF Program Partnership arrangements that includes all subsystems required to provide training (devices, courseware, training delivery system and network infrastructure) as well as the systems and staff required to operate and sustain the Training System.

3.22 Defence has commenced conducting training system verification and validation activities for the maintenance and support training system. Verification and validation activities for the pilot training system are planned to commence in mid-2020.

Defence's progress against its workforce targets

3.23 For initial operational release²⁸ in December 2018, the Capability Realisation Plan includes targets for pilots, maintainers, specialist and support personnel, and training capabilities. Defence's Director Air Combat Transition Office is responsible for delivery against most of these targets, with JSF Division also holding some responsibility.

3.24 Defence projections indicate that pilot training is on target to support initial operational capability in 2020, with the number of trained pilots projected to meet the number desired to support initial operational capability.

3.25 Defence plans that 80 per cent of the JSF maintenance workforce will come from the existing Classic Hornet maintenance workforce, with the remaining 20 per cent from other aircraft workforces. Defence has developed JSF maintainer selection principles so that it can develop the workforce for the JSF aircraft without degrading Classic Hornet operations.

3.26 Defence has negotiated with the United States Department of Defense for Australian maintenance personnel to be based at Luke Air Force Base (Arizona) to receive on-the-job training in JSF aircraft. Defence projects that sufficient maintainers will have undergone on-the-job training by the time JSF begins operating in Australia in January 2019 to satisfy the requirement in the Capability Realisation Plan for qualified maintenance technicians.

3.27 Defence has determined the number of military and APS personnel needed to initially staff the Off-Board Information Systems Centre (OBISC) and to support the Autonomic Logistics Information System (ALIS) at RAAF Base Williamtown.²⁹ However, a delay in recruiting foreign contractors (discussed further in paragraphs 3.30 and 3.31) will put pressure on the staffing of both the ALIS and OBISC facilities, as Defence has identified that existing personnel from the OBISC facility will need to assist in operating ALIS until additional foreign contractor staff can be hired and cleared to work in Australia. Defence advised the ANAO in November 2018 that the foreign contractor staff will be on-site in February 2019, and that the main reason for the delay is that these personnel are being used to support the ferry of the aircraft to Australia.

28 Initial operational release is the initial capability state as specified at Government Second Pass approval, and signifies that the Capability Manager is satisfied that the initial operational and materiel state of the equipment — including any deficiencies in other Fundamental Inputs to Capability — is such that it is sufficiently safe, fit for service and environmentally compliant to proceed into Australian-based use.

29 The OBISC is an information technology facility that will integrate, test and operate the range of information systems that are required to operate the Joint Strike Fighter aircraft, including ALIS.

3.28 Defence has taken delivery of the major maintenance training devices. In October 2018, Defence advised the ANAO that the assessment of the maintenance training devices had commenced.

Workforce and training risks being managed by Defence

3.29 A key workforce challenge faced by Defence is the timely provision of security clearances for Commonwealth and contractor personnel. Defence records indicate that it has taken a range of actions to mitigate the risks presented by delays in security vetting.

3.30 Defence is also managing an issue around a delay in recruiting foreign contractor personnel. Defence advised that this could affect the commencement of testing activities for the training system, and could affect Australian-based full-rate pilot training (which is intended to commence in January 2019). Defence advised that it is holding weekly 'coordination conferences to manage contractor performance and acquisition of personnel by function and position ... Defence can also consider extending United States based training [of Australian Defence Force personnel] to mitigate the risk.'

3.31 Defence records indicate that contracted support personnel who will be acting as ALIS administrators will not be on-site at RAAF Base Williamtown in time to support the ferry of the first two Australian JSF aircraft from the United States. Defence advised the ANAO in November 2018 that the contracted support personnel will instead be based at Luke Air Force Base in the United States to support Air Force administrative personnel with the ferry of Australia's first two JSF aircraft. Defence further advises that this is being done to de-risk the ferry process. In May 2018, Defence had identified a risk in using only Air Force personnel who have limited experience with the relevant systems.

3.32 In July 2018, Defence records indicated that there was a high risk that delays to the delivery of training devices and equipment or their release into service could delay the achievement of initial Australian-based training requirements. Defence advised the ANAO in November 2018 that:

All training devices are expected to be provisionally accepted in time for all small group try out training remaining in 2018. The Weapons Load Trainer is in the final acceptance phase for training later in November 2018, and the simulator evaluation period has begun ahead of schedule as of 6 November 2018. Air Force assesses LOW risk of training delays related to training device acceptance.

The risk register will be updated in the near term to reflect the change in risk rating.

3.33 Defence is managing an issue with the full mission simulators that it will use to train pilots and aircrew. Defence assessed in July 2018 that certain limitations in the relevant software package required remediation. In November 2018, Defence advised the ANAO that the full mission simulator was configured for use on 30 October 2018.

4. Sustainment

Areas examined

This chapter examines whether Defence has undertaken effective planning, is achieving progress against relevant plans and effective risk management is occurring for the ongoing sustainment of the Joint Strike Fighter (JSF). In particular, the ANAO considered Defence's planning for, and implementation of, arrangements to sustain the JSF and whether Defence has determined the whole-of-life sustainment costs for the JSF aircraft.

Conclusion

Defence has planned for and made progress in implementing the arrangements for the ongoing sustainment of the JSF. The effective implementation of Defence's ongoing sustainment arrangements depends largely on the United States Department of Defense delivering the Global Support Solution, which is still maturing. Defence is managing risks associated with the developmental nature of the JSF supporting systems as well as cost pressures related to establishing Australia as a regional maintenance and warehousing hub for JSF aircraft.

Is Defence effectively planning for its JSF sustainment arrangements?

Defence plans to sustain its JSF aircraft largely through the United States Department of Defense's Global Support Solution and is managing risks associated with the still developing Global Support Solution. Defence has signed a bilateral support agreement with the F-35 Joint Program Office.

Australia's participation in the Joint Strike Fighter Global Support Solution

4.1 Australia, along with the other participants in the international JSF Program, plans to utilise the United States Department of Defense's Global Support Solution (GSS) to sustain its JSF aircraft.³⁰ The GSS entails participant nations in the international JSF Program sharing, through the United States Department of Defense's F-35 Joint Program Office's (F-35 JPO) managed commercial arrangements with United States-based prime contractors, critical aspects of sustainment support including spare parts, maintenance, supply chain support, training systems, and engineering.

4.2 The primary rationale for this approach to sustainment is cost efficiency. The F-35 JPO's view is that a shared sustainment model presents the opportunity for lower costs overall by exploiting certain scale benefits, and so will contribute to reducing the cost of JSF sustainment to

30 Defence's sustainment strategy for Australia's JSF aircraft is to utilise the JSF Global Support Solution as much as possible except where there is the need to protect 'sovereign sustainment requirements', in which case Defence may choose to make separate arrangements. Where this is the case, there will be additional costs to Defence as the Global Support Solution operates under a 'pay to be different' principle. In August 2018, Defence informed the ANAO that initially the Global Support Solution will provide approximately 95 per cent of Defence's sustainment requirements for its JSF aircraft, and approximately 75 per cent once the capability is mature.

JSF operators.³¹ To achieve the efficiencies expected, the GSS is intended to be a performance-based contractual framework where sustainment costs will be driven by the delivery of an agreed standard of service or performance.

4.3 The United States Government has contracted Lockheed Martin to deliver sustainment of the global JSF aircraft fleet through its subcontractors and suppliers, and Pratt & Whitney to deliver sustainment of JSF engines. In August 2018, Defence informed the ANAO that, to date, the value of the sustainment contracts between the F-35 JPO and its two prime sustainment contractors (Lockheed Martin and Pratt & Whitney) for the Australian JSF aircraft fleet total US\$120.3 million. The F-35 JPO managed sustainment contracts were not included in the scope of this ANAO performance audit. However, a 2017 United States Government Accountability Office (GAO) report and Defence documents indicate that there is some doubt as to whether the current United States-based contracting arrangements for sustaining JSF aircraft are performance based.³²

4.4 In July 2018, Defence advised the F-35 JPO of its initial sustainment requirements for Australia's JSF aircraft through a bilateral support agreement.³³ The agreement includes performance metrics for aircraft availability, mission effectiveness, supply and maintenance for the period May 2018 to April 2019.³⁴ Defence informed the ANAO that the bilateral support agreement between Defence and the F-35 JPO will inform the development of the commercial contracts between the F-35 JPO and the prime contractors, however, it is the commercial contracts that define the services required to enable the desired level of aircraft readiness, logistics requirements, and sustainment services including:

- access to a globally dispersed pool of spares;
- global supply chain and repair networks;
- common information systems, engineering, fleet management, configuration management services; and
- training systems.

31 The United States F-35 Joint Program Office has concluded that the total projected sustainment cost for the JSF aircraft is too high and that this will adversely affect the international JSF Program participants' ability to successfully operate the aircraft. In 2014, the F-35 JPO mandated a 30 per cent cost reduction in United States Government through-life sustainment costs. In 2016, Defence informed the Australian Government that estimated support costs for the JSF aircraft 'remain high and the economies of scale were not yet evident'. In August 2018, Defence informed the ANAO that, while it expects that benefits will flow to international JSF Program participants, it does not anticipate a 30 per cent cost reduction to the cost of the Australian capability.

32 In October 2017, the United States Government Accountability Office (GAO) reported that the F-35 JPO was contracting for sustainment support with Lockheed Martin largely through annual cost reimbursable sustainment contracts. According to advice from F-35 JPO officials to the United States GAO, the F-35 JPO 'plans to transition to 5-year, fixed-price, performance-based sustainment contracts in 2020'. See: United States Government Accountability Office, *GAO-18-75 F-35 Aircraft Sustainment-DoD Needs to Address Challenges Affecting Readiness and Cost Transparency*, October 2017.

33 The agreement comprises a multilateral core agreement (the F-35 JPO Performance Based Arrangement), reflecting the strategic intent of the agreement, and bilateral annexes for each international JSF Program participant. The formal title of Australia's bilateral annex is 'F-35 Lightning II Performance Based Arrangement Bilateral Annex between the F-35 Joint Program Office and Department of Defence of Australia'.

34 The agreement documents Defence's requirements for the 'Period of Performance' May 2018 to April 2019 and, according to Defence, provides the basis for developing the performance requirements for financial years 2020 to 2024.

4.5 In July 2018, at the time of signing the bilateral support agreement with the F-35 JPO, Defence was of the view that some of the targets in the agreement were unlikely to be achieved. Defence informed the ANAO that the F-35 JPO performance based framework for sustaining the global fleet of JSF aircraft was in its pilot phase, and Defence expects it will remain so until 2020. Defence also informed the ANAO that the current agreement identifies two levels of performance requirements — those that are expected to be met under the current GSS, and those that are expected from a more mature GSS. Defence informed the ANAO in October 2018 that where contracted performance requirements are not met, the F-35 JPO has the option of withholding payment from the contractor. Defence further advised that Australia does not have the option of withholding payment from the F-35 JPO.

4.6 Defence informed the ANAO in July 2018 that the F-35 JPO is in a ‘cost definition or cost clarification phase’, which means that sustainment costs in agreements between the F-35 JPO and Australia are currently based on estimates. Defence expects that as ‘the GSS reaches a steady state, the JSF enterprise will be able to capture actual costs, rather than using predicted or forecasted costs that should reduce the likelihood of unexpected cost increases’.³⁵

4.7 Figure 4.1 shows the main elements of the sustainment arrangements under the GSS from Australia’s perspective.

Defence’s planning for the Joint Strike Fighter Global Support Solution

4.8 Defence’s sustainment strategy for its JSF aircraft is set out in the following Defence planning documents³⁶:

- AIR6000 Phase 2A/B F-35A Capability Realisation Plan – initially approved in December 2014 and last updated formally in April 2016.³⁷
- New Air Combat Capability Integrated Logistics Support Plan (April 2013).
- New Air Combat Capability Logistics Support Concept (April 2013).³⁸
- Australian JSF Strategic Program Asset Management Plan (July 2016).
- JSF Project Execution Strategy (December 2016).

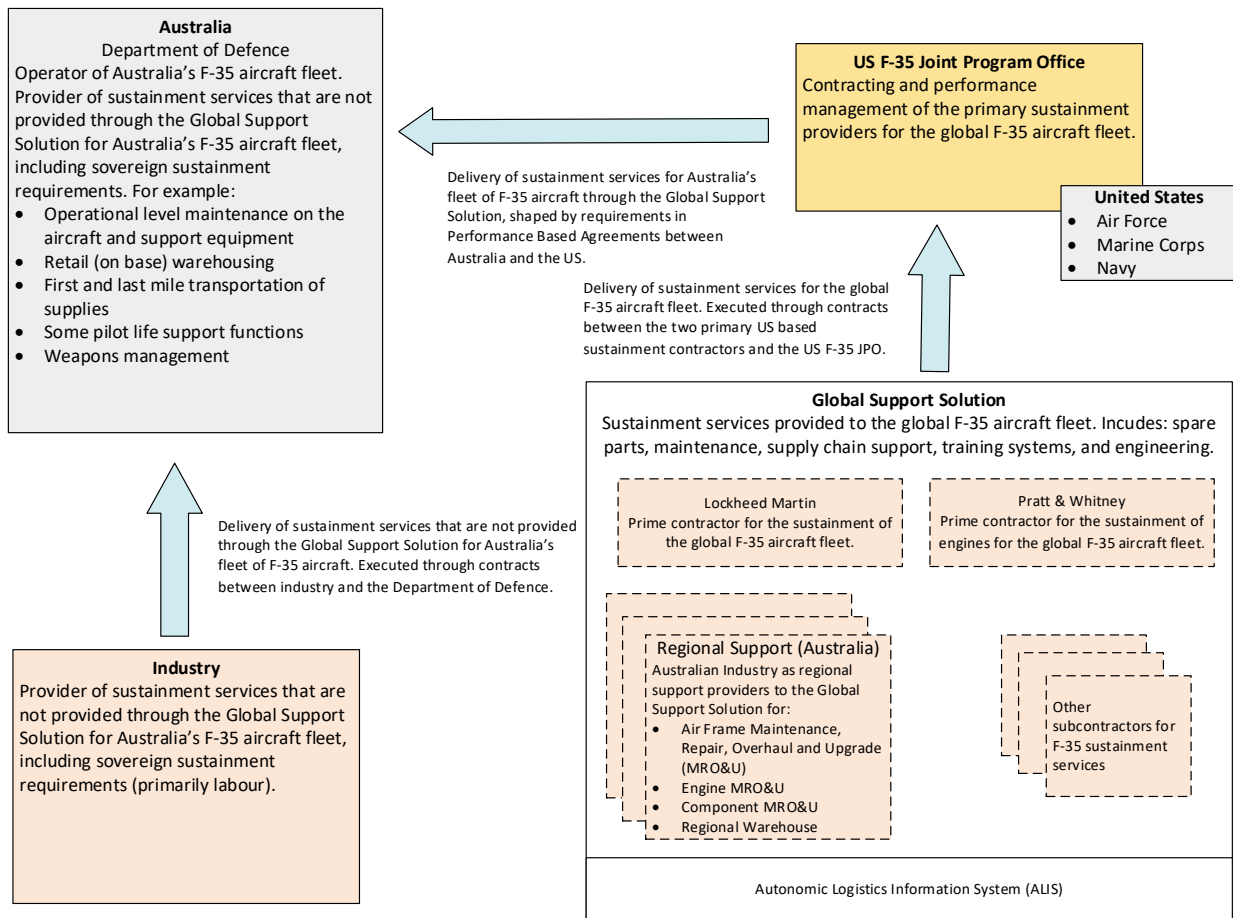
35 Defence advice to the ANAO, 31 July 2018.

36 These are the primary strategic level plans for the sustainment of the JSF aircraft through the GSS. The ANAO has not examined the more detailed operational level planning documents that flow from these, or other related planning documents.

37 In July 2018, Defence informed the ANAO that Defence had recently determined that this plan was not contemporary and that Defence’s Air Combat Advisory Board had decided against making further revisions. For the purposes of this discussion on high-level sustainment strategy, the contents of the plan remain current.

38 In February 2018, Defence amended the *New Air Combat Capability Logistics Support Concept*, Version 3.1, April 2013 via ‘Minute, NACC LSC - Update on F-35 Warehousing Approach’. The update changed Defence’s assumptions about the operation of the regional warehousing facility.

Figure 4.1: Main elements of the Global Support Solution – Australian perspective



Source: ANAO adapted from Department of Defence information and advice.

4.9 Defence's sustainment strategy, as set out in the planning documents listed above, is to utilise the GSS as much as possible except where there is the need to protect 'sovereign sustainment requirements', in which case Defence may choose to make separate arrangements. Defence informed the ANAO that this may involve establishing tailored or unique requirements delivered through the GSS, or delivery through arrangements outside of the GSS.³⁹ In either case, Defence expects that this will result in Defence incurring additional costs. Defence has identified ten sovereign sustainment requirements for its JSF aircraft, including: the Australian Integrated Training Centre at RAAF Base Williamtown; the Off-Board Information Systems Centre at RAAF Base Williamtown; a warehouse for JSF spares at RAAF Base Williamtown; and JSF airframe and engine depot level maintenance capability. Defence informed the ANAO that it has not yet identified the additional cost of the sovereign sustainment requirements over the cost of delivery through the GSS. Defence further informed the ANAO that the funding for sovereign sustainment requirements will be sourced from current and future sustainment funding.⁴⁰

39 Defence informed the ANAO that as of August 2018, it was developing commercial strategies to contract directly with a small number of other Australian companies to support sovereign requirements for information systems, training, maintenance and supply.

40 Noting that in 2014, the Government approved \$4.6 billion (approximately \$3 billion of which Defence was to offset against existing funding) for initial sustainment costs to 2024–25, with the expectation that Defence would return to Government after 2020 for additional sustainment funding.

4.10 Defence (as well as other participants) is planning to rely on the GSS for: access to a global spares pool and supply chain; global repair networks; common information systems; engineering; fleet management; configuration management services; and training systems. Consequently, Defence's planning for the implementation of JSF sustainment is dependent on the planning and implementation of the GSS by the F-35 JPO, and the effectiveness of Defence's provision of sustainment is dependent on the effectiveness of the GSS as a whole.

4.11 Defence has noted that the JSF sustainment arrangements differ from past Defence practice in many ways, such as:

- GSS management by an overseas government program office where the Commonwealth will not have direct contracts/relationships with all service providers.
- Participation in a GSS that includes global spares pooling, [United States Government] ownership of spares, distributed maintenance support and centralised supply chain management and engineering support.
- Autonomic Logistics Information System (ALIS) possesses functionality primacy, therefore superseding the use of many [Australian Defence Organisation] systems in support of the F-35A capability.
- Off-Board Information System Centre (OBISC), which provides an integrated support function for the F-35A capability.
- The Australian, Canadian, United Kingdom Reprogramming Laboratory (ACURL), which requires working in partnership with other selected key Participant nations in an overseas facility [to generate mission data files].
- The need to maintain participant nation contributions to the [F-35] JPO such as the provision of Cooperative Partner Personnel (CPP).
- The level of security associated with the asset and capability.
- The need to integrate complex information management and support systems into the Defence Information Communication Technology (ICT) environment.
- The complexity of integration and interoperability requirements.
- Australia acting as a supplier to the [F-35] JPO in delivering Australian sovereign obligations.

4.12 In July 2017, Defence's Independent Assurance Review of its JSF project concluded that the performance of the GSS was one of the primary risks to initial JSF aircraft operations in Australia.

4.13 An internal review, completed in mid-2018, of Defence's management controls for transitioning the JSF aircraft into Australian service, identified a lack of confidence within Defence about the global support arrangements in the short term for JSF aircraft based outside of the United States of America. Defence expects that the testing and on-going assessment of the system within the Australian context, through Australia's operational testing and evaluation program commencing in December 2018, will ascertain whether the JSF support arrangements provided through the GSS are fit-for-purpose.

4.14 In a June 2018 report to its Air Worthiness Board, Defence identified that the GSS was immature and that the GSS 'had not reached full operational capability and is not optimised at this stage of the program'. Defence identified the immaturity of the GSS as the primary risk to JSF

sustainment. Further, Defence noted that the immaturity of the GSS is a JSF Program-wide risk that is being managed by the F-35 JPO. In October 2017, the United States GAO reported on five key sustainment challenges for the United States Department of Defense's JSF aircraft.⁴¹ Defence's concerns about the immaturity of the GSS are consistent with the findings of this 2017 United States GAO report.

Is Defence monitoring and managing risks associated with the still developing Global Support Solution?

Defence is monitoring and managing risks to effective sustainment of the JSF arising from the GSS including — the availability of spare parts, the development of the Autonomic Logistics Information System (ALIS), and access to maintenance facilities. Defence is constrained in its ability to effectively manage some risks, including access to JSF spare parts due to limited global supply. Not all of the costs associated with Australia becoming a regional hub for JSF aircraft maintenance and warehousing were known by Defence when the project was approved in 2014. This is adding cost pressures to the project.

4.15 The ANAO reviewed Defence's arrangements to manage risks associated with the still developing GSS across four key elements:

- (a) JSF spares;
- (b) the Autonomic Logistics Information System (ALIS);
- (c) the JSF regional maintenance solution; and
- (d) the JSF regional warehousing solution.

JSF Spares

4.16 One of the core elements of the approach to sustaining the JSF aircraft is the global pooling of spares. JSF Program participant nations will contribute financially, and share access, to a globally dispersed pool of JSF aircraft spares. The United States Government owns, and controls the management of, the global pool of spares through its contractors. The international JSF Program participants expect that this approach will result in lower costs than if the JSF Program participant nations individually purchased and managed their own stocks of JSF spares.⁴² Defence informed the ANAO that its contribution to the global spares pool, commencing in 2013–14 up to the end of 2017–18, was US\$45.4 million, and that this funding was allocated from the approved acquisition budget for the project. Defence further informed the ANAO that it has allocated a further US\$256.1 million from the approved acquisition budget over the next five years for further contributions to initial spares in the global spares pool.

41 United States Government Accountability Office, *GAO-18-75 F-35 Aircraft Sustainment-DoD Needs to Address Challenges Affecting Readiness and Cost Transparency*, October 2017.

42 In October 2018, Defence advised the ANAO that 'the F-35 JPO has completed business case analysis cost modelling of spares pooling vs individual participants owning and managing their own stocks of JSF spares.' In November 2018, Defence informed the ANAO that it had requested a copy of this business case modelling from the F-35 JPO.

4.17 Defence's plans anticipate that by late 2018, the JSF spares global supply chain will be sufficiently mature to support initial Australian operations.⁴³ In July 2017, the independent assurance reviewer of Defence's JSF aircraft acquisition project expressed concern about spares availability given the importance of spares support during transition of the JSF aircraft into Australian service, and the relative immaturity of the GSS and its capacity to provide adequate parts for the introduction of the aircraft into Australian service:

I am uncomfortable with considerations related to the JSF Global Support Solution's (GSS) ability to maintain parts delivery against a rapidly increasing global fleet, the significant increase in aircraft deliveries to Australia in the twelve months prior to [initial operational capability], and the reality that the GSS is not planned to be fully mature until 2022. I consider GSS performance to be one of the primary risks to the transition of capability.⁴⁴

4.18 As discussed in paragraph 4.14, in October 2017, the United States GAO reported on some early JSF sustainment challenges for the United States Defense Services. The United States GAO attributed these challenges to poor planning. One of the challenges was a shortage in the supply of JSF spare parts, which has reduced the number of United States Department of Defense owned JSF aircraft that are available to fly. The United States GAO attributed the shortage of spare parts primarily to the United States Department of Defense's capacity to repair JSF parts at military depots being six years behind schedule. In consequence, the United States Department of Defense was relying on the original equipment manufacturers to repair parts. The same suppliers were also producing parts needed for the JSF aircraft production line. At the time of the United States GAO audit, the average spare part repair time was twice what the F-35 JPO had planned.

4.19 In May 2018 Defence informed the Australian Parliament's Foreign Affairs, Defence and Trade Legislation Committee, that the F-35 JPO was 'implementing reforms, and the forecast from the F-35 enterprise at this stage is that those remediations should be in place and delivering effects by 2019'.⁴⁵ Defence informed the ANAO that the remediation activities put in place by the F-35 JPO include efforts to increase spares delivery, decrease cannibalisations, improve reliability, optimise unit level support, and accelerate the establishment of depot level repair capabilities (depot level repair capabilities are discussed later in this chapter at paragraphs 4.30 to 4.39). Defence further informed the ANAO that increasing spares delivery has required earlier than planned procurement of spares with long lead times. In June 2018, Defence informed its Air Worthiness Board that global spares shortages might result in Defence having insufficient spares available to meet operational requirements or to meet the required contracted rate of effort.⁴⁶ In October 2018, Defence advised the ANAO that:

43 Defence's strategic plans for F-35 spares are set out in AIR6000 Phase 2A/B F-35A Capability Realisation Plan (2016); New Air Combat Capability Integrated Logistics Support Plan (2013); New Air Combat Capability Logistics Support Concept (2013); Australian JSF Strategic Program Asset Management Plan (July 2016); and JSF Project Execution Strategy (December 2016).

44 Outcomes from the JSF Independent Assurance Review, 13 July 2017, p. 2. As discussed in paragraph 2.24, concerns were also raised about the availability of spares in the 2018 Independent Assurance Review.

45 Committee Hansard, Senate Foreign Affairs, Defence and Trade Legislation Committee Estimates (Public), Wednesday, 30 May 2018, Canberra, p. 14.

46 The Defence Air Worthiness Board is an important element of the JSF technical regulation process that is designed to provide appropriate evidence to decision makers in order to fulfil Defence's requirements under its Defence Aviation Safety Program. The primary focus of the Air Worthiness Board's considerations is the technical safety of aircraft operations.

This is because the repair lay down is not yet mature. As the repair network reaches maturity it will support the GSS and meet the operational requirements of the rate of effort. Until this time Australia has sustainment contracts in place to support the air vehicle availability rate and as the Non Mission Capable Supply rate decreases due to health improvement plans for spares within the GSS, the air vehicle availability rate will increase reducing the overall risk.

4.20 To sustain its JSF aircraft, Defence is dependent on a spare parts supply system that is not fully developed, and is currently experiencing shortages due to competition for parts as the global JSF aircraft fleet increases. Defence expects that these shortages will continue beyond the transition of JSF Aircraft into Australian service. Defence has recognised that supply shortages are a risk to the JSF aircraft's introduction into Australian service, and is largely dependent on the solutions the F-35 JPO is putting in place to increase the availability of spare parts for the global JSF aircraft fleet.

4.21 To support the introduction of JSF aircraft into Australian service in late 2018, Defence's plans also anticipate that it will have a Base Spares Pack with 'target spares stock levels in place by the third quarter of 2018'.⁴⁷ In July 2018, Defence informed the ANAO that the Base Spares Pack would be in place, as planned. In November 2018, Defence advised the ANAO that:

The propulsion elements of the Base Spares Package have arrived in Australia and been inducted into the F-35 Retail Warehouse at RAAF Base Williamtown.

The Autonomic Logistics Information System

4.22 The Autonomic Logistics Information System (ALIS) is a complex, bespoke and developmental system of systems that supports operations, mission planning, supply-chain management, maintenance, and other processes. ALIS is the primary logistics tool for the JSF aircraft and one of the most significant technical and schedule risks to the international JSF Program.

4.23 Defence's Capability Realisation Plan anticipated the delivery of ALIS hardware and software (version 3.0) during 2018.⁴⁸ Further, Defence anticipated that prior to the arrival of the first two aircraft in Australia in December 2018, ALIS would be capable of supporting and sustaining the initial operational capability rate of effort and test and evaluation in Australia. In October 2018, Defence informed the ANAO that it is currently operating ALIS 2.0.2 but Defence had assessed that there are no safety or major capability implications of using ALIS 2.0.2 to support the flight to, and arrival of, the first aircraft in Australia.

4.24 Defence expects that the testing and on-going assessment of ALIS within the Australian context through Australia's operational test and evaluation program will ascertain whether ALIS is fit-for-purpose in the Australian context.

4.25 Defence has some concerns about the security of Australian data within ALIS and has been working with the F-35 JPO to develop a solution. In August 2018, Defence informed the ANAO that an interim solution is now in place to support the ferry of the first two JSF aircraft to Australia in

47 Defence, AIR6000 Phase 2A/B F-35A Capability Realisation Plan, Version 2.1, January 2016, p. 38.

48 In January 2018, the United States Director of Operational Test and Evaluation reported that many of the capabilities planned for ALIS 3.0 have been deferred to ALIS 4.0. See <http://www.dote.osd.mil/pub/reports/FY2017/pdf/dod/2017f35jsf.pdf>. In October 2018, Defence informed the ANAO that ALIS 3.0.1 should be available to Australia in December 2018/January 2019, and that this version of ALIS introduces Training Management System 2.0, which is the minimum desired standard for Air Force.

December 2018. In October 2018, Defence further advised the ANAO that ‘this interim solution will remain in place until an acceptable solution can be introduced, prior to Initial Operational Capability’.⁴⁹

Australia’s contribution to the JSF regional maintenance solution

4.26 Under the GSS, JSF aircraft maintenance is conducted at two levels:

- Unit level maintenance (also known as operational maintenance) — day-to-day maintenance, generally performed by the uniformed Services.⁵⁰
- Depot level maintenance (also known as Maintenance, Repair, Overhaul and Upgrade (MRO&U) activities, or deeper maintenance) — which is maintenance activity that requires facilities, tools, support equipment, technical skills, or processes that are beyond operational unit level capability.

4.27 Depot level maintenance for JSF aircraft under the GSS comprises airframe, engine, and component maintenance. The GSS places the depot level maintenance capacity for JSF aircraft in three global regions (Asia-Pacific, Europe and the United States of America). Under the GSS, Australia is expected to become a regional JSF maintenance hub, having now received regional assignments from the United States Government for depot level maintenance for JSF airframes, engines and components.⁵¹ The regional maintenance facilities are intended to provide depot level maintenance services for Australia’s JSF aircraft, as well as other nations’ JSF aircraft operating in the Asia-Pacific region.

4.28 In December 2014, the United States Government assigned responsibility for depot level maintenance for the Asia-Pacific region to Australia for JSF aircraft engines (TAE Aerospace) and JSF airframes (BAE Systems Australia).⁵² In November 2016, the United States Government

49 In August 2018, the United States Department of Defense announced that it was awarding a contract to Lockheed Martin for changes to ALIS that will provide international JSF Program participants the ability to review and block messages to prevent sovereign data loss. The work also includes studies and recommendations to improve the security architecture of ALIS. The United States Department of Defense expects Lockheed Martin to complete this work by June 2020. See: United States Department of Defense, Contracts for Aug. 17 2018, Release No.: CR-159-18, available from <https://dod.defense.gov/News/Contracts/Contract-View/Article/1605935/> [accessed 28 August 2018].

50 Defence’s plans require an authorised operational (unit level) maintenance capability at RAAF Base Williamstown to support initial JSF aircraft operations in Australia from December 2018. Specifically, Defence’s plans state that an operational maintenance capability will need to be in place in Australia six months prior to the arrival of the first JSF aircraft. In August 2018, Defence informed the ANAO that this capability was in place.

51 Australia has also received an assignment for regional warehousing from the United States Government (August 2017), as discussed later in this chapter.

52 The United States Government announcement stated that Australia would provide initial heavy engine maintenance capability by early 2018, and Japan would provide additional capability three to five years later. The United States Government announcement also stated that airframe maintenance, repair, overhaul and upgrade capabilities will be provided by Japan in the northern Pacific, and Australia in the southern Pacific.

assigned responsibility for depot level maintenance for the Asia-Pacific region to Australia for 64 JSF components.⁵³

4.29 As at November 2018, Defence estimates indicate that the initial direct Commonwealth contributions required to assist with establishing these three regional maintenance capabilities is likely to be over \$300 million, noting Defence advice that it has yet to develop reliable estimates for some of these capabilities. In 2014, when Defence presented cost estimates to the Government for AIR 6000 Phase 2A/2B, Defence anticipated that some, but not all, of these costs would be part of this phase of the project.

Regional depot level maintenance facilities in Australia for JSF aircraft engines

4.30 The JSF depot level engine maintenance capability comprises two main elements:

- an engine maintenance facility where engine modules are disassembled, repaired and reassembled — the construction of this facility is to be privately funded by TAE Aerospace; and
- an engine test cell, at RAAF Base Amberley, where an engine is tested through its full operating range before it can be installed in an aircraft — to be funded by the Australian Government.

4.31 The estimated cost to the Australian Government of establishing the regional maintenance facility for JSF engines in Australia did not form part of the Government's April 2014 approval of AIR 6000 Phase 2A/2B. At the time, Defence had anticipated that this capability would form part of a later phase of the project (Phase 2C). Subsequently (in December 2014), the United States Government assigned the regional depot level engine maintenance to Australia with the expectation that Australia would provide initial heavy engine maintenance capability by early 2018.

4.32 In August 2017, some two and a half years following the United States Government assigning Australia regional depot level JSF engine maintenance, Defence sought Australian Government approval to amend the scope of AIR 6000 Phase 2A/2B to incorporate an upgrade to the engine test cell at RAAF Base Amberley.⁵⁴ The Australian Parliament approved Defence's proposal to upgrade the engine testing facilities at RAAF Base Amberley on 28 March 2018.⁵⁵

4.33 Defence has subsequently decided that the existing fuel farm at RAAF Base Amberley is not able to support the proposed JSF engine test cell facility.⁵⁶ Defence has decided to construct a new

53 The United States Government is managing assignments for depot level maintenance for JSF components in tranches. Defence informed the ANAO that the United States Government assigned regional depot level maintenance for 64 out of 65 JSF components included in the first tranche of assignments in November 2016. In total, Defence expects that the United States Government will make assignments for regional depot level maintenance for a total of 774 JSF components. Defence informed the ANAO that the preferred suppliers for (tranche 1) depot level JSF component maintenance in Australia are RUAG Australia, Northrop Grumman Australia, GE Aviation, and BAE Systems Australia.

54 Defence informed the Minister that it had already spent \$1.6 million, and committed a further \$13.5 million for preliminary design and site studies for the JSF engine facility.

55 The Minister for Small Business referred Defence's proposal to upgrade to the engine testing facilities at RAAF Base Amberley to the Public Works Committee in December 2017. In its March 2018 report, the Committee recommended that the House of Representatives agree to the proposed works. The House of Representatives agreed to the proposed works on 28 March 2018.

56 The fuel farm solely provides fuel to the engine test cell facility.

fuel farm facility at RAAF Base Amberley. In coming to this decision, Defence considered a number of reviews and reports from 2015 onwards that concluded the fuel farm facilities, which were constructed in the 1960s, are not compliant with Australian Standards and not fit-for-purpose.

4.34 Defence informed the ANAO that, while the Australian Parliament's March 2018 approval of the upgrade to the engine test cell included a limited upgrade to the fuel farm facility to improve the flow of fuel to the engine test cell facility, it did not include a proposal to construct a new fuel farm facility. Defence considers the construction of the new fuel farm to be a dependant, but separate, project to the approved engine test cell upgrade project. Defence further informed the ANAO that the replacement of the fuel farm will be performed concurrently to the engine test cell upgrade thereby ensuring that there is no additional downtime for engine test cell capability. Defence documents show that Defence has been aware of the poor state of the fuel farm since at least 2015. The construction of the new fuel farm was not part of Defence's plans to upgrade the engine test cell, when it sought Government approval in 2017.

4.35 In June 2018, Defence informed the Minister that it now anticipates that the regional depot level engine maintenance facilities will be established in time to support regional JSF engine maintenance work from early 2019, and engine testing by December 2019. In August 2018, Defence informed the ANAO that, in the interim, Defence will rely on the United States-based engine maintenance facilities. Defence further informed the ANAO that each of the other regional depot level engine maintenance facilities, that are also expected to support the global JSF fleet, are also experiencing delays in establishing their capabilities. Defence expects that Australia's test and evaluation program, commencing in December 2018, which aims to validate the suitability and effectiveness of the JSF system, will validate depot level engine maintenance arrangements.

Regional depot-level maintenance facilities in Australia – JSF airframes and components

4.36 Defence's sustainment plans identify an Australian national JSF depot-level airframe maintenance facility as an Australian sovereign requirement.

4.37 In August 2018, Defence informed the ANAO that, while the dedicated JSF airframe maintenance facility (assigned to BAE Systems Australia) will not be in place by December 2018, there is currently no planned JSF depot-level maintenance or modifications scheduled by the F-35 JPO for the Australian facility until January 2021. Defence further informed the ANAO that the capability to carry out any unplanned JSF airframe maintenance will exist by December 2018 through the use of contractor field teams supported by existing RAAF JSF facilities.

4.38 The United States Government expects that Australian companies will establish depot-level maintenance capabilities by 2021 for three of the JSF components, and by 2025 for 61 of the JSF components. In October 2018, Defence informed the ANAO that it does not yet know the full scope of the assignment of regional depot-level maintenance for components to Australia. Defence further informed the ANAO that the regional depot-level maintenance capability for JSF components did not form part of the Australian Government's approval for the project in 2014, and remains unfunded as at October 2018.

Regional warehouse for JSF spares in Australia

4.39 The regional warehousing facility for JSF spares (assigned to BAE Systems Australia) is to be based at Williamstown, New South Wales, and is intended to support the global JSF enterprise

with the supply of aircraft parts from the global spares pool to Australia's JSF aircraft and other nations operating in the Asia-Pacific region. Defence expects the Asia-Pacific Regional Warehouse to be operational from late 2020. In August 2018, Defence informed the ANAO that it has not established a firm estimate for the Australian Government's contribution to the cost of this facility, and confirmed that cost estimates were not included in the 2014 advice to Government supporting second pass approval of the project.⁵⁷

Has Defence determined the cost of sustaining its JSF aircraft?

Defence does not expect to have a reliable estimate for whole-of-life sustainment costs for its JSF aircraft until after 2020.

4.40 The developmental nature of the international JSF Program means that Defence does not yet know the final purchase price of future Australian JSF aircraft, or their whole-of-life operating and support costs. In April 2014, Defence provided rough-order-of-magnitude sustainment cost estimates to the Government at second pass approval for acquisition of the JSF aircraft. At the time, Defence advised the Government that it did not have a sustainment plan of sufficient fidelity to seek approval for whole-of-life sustainment costs, as the design of the GSS was still evolving. Consequently, the Government's 2014 decision to purchase the JSF aircraft was not based on reliable whole-of-life cost estimates as mature cost data was not available.

4.41 Defence undertook to return to the Government after 2020 to present proposed sustainment costs for approval.⁵⁸ The progress of the Australian JSF Program through second pass approval on the basis of rough-order-of-magnitude sustainment costs is contrary to Defence's guidance for the planning and approval of major capital equipment projects⁵⁹, the findings and recommendations of numerous external reviews⁶⁰, and audits undertaken in Defence over the past two decades.⁶¹ The history of Defence acquisitions in Australia demonstrates that inadequate sustainment cost estimates at project approval have led to cost implications once the platform is in service. In 2016, the United States GAO described sustainment as the most significant cost driver for the program. In 2016, Defence informed the Australian Government that estimated support

57 In October 2018, Defence advised the ANAO that the timing and capacity requirements for the regional warehouse are still being developed.

58 Defence considers that after 2020 the cost and support data will be more mature.

59 In 2014, Defence's policy for presenting major capital equipment projects to Government for approval (second pass) required Defence to provide Government with a well-defined project budget, schedule and risk profile, and the future provision for through-life support costs for the capability, including the workforce allocation.

60 See *Defence Procurement Review 2003* (also known as the *Kinnaird Review*), p. 26; *Going to the Next Level, the report of the Defence Procurement and Sustainment Review* (2008) (also known as the *Mortimer Review*) p. 50; *Plan to Reform Support Ship Repair and Management Practices* (2011) (also known as the *Rizzo Review*) p. 35; and The Senate Foreign Affairs, Defence and Trade References Committee, Senate Committee Report, *Procurement procedures for Defence capital projects* (2012), p. 67.

61 The ANAO has undertaken a number of audits identifying the consequences of approving major projects with inadequate sustainment cost estimates. An overarching examination of the issue of sustainment cost estimates for Defence acquisitions is provided in Auditor-General Report No. 6 2013–14, *Capability Development Reform*, Chapter 7. Most recently, Defence provided rough order of magnitude sustainment cost estimates to the Government, at second gate, for its Offshore Patrol Vessel Program. This approach was contrary to Defence policy. See Auditor-General Report No.39 2017-18, *Naval Construction Programs – Mobilisation*, pp. 42-43.

costs for the JSF aircraft 'remain high and the economies of scale were not yet evident', and in November 2018, Defence informed the ANAO that this advice remains current.

4.42 In 2017, Defence informed the Minister that it does not expect greater certainty about sustainment costs until the support arrangements underpinning the GSS are defined and agreed, and the commercial arrangements necessary to support the GSS are established. Defence does not expect the GSS to achieve full maturity until after 2023, which is around the time Defence expects its JSF aircraft to achieve final operational capability. Defence informed the ANAO that it is developing its knowledge of JSF sustainment costs to underpin its financial modelling work. Defence has advised that this, and future work, will provide the basis for its advice to Government on sustainment costs after 2020.



Grant Hehir
Auditor-General

Canberra ACT
5 December 2018

Appendices

Appendix 1 Entity response



Australian Government
Department of Defence

Mr Greg Moriarty
Secretary

General Angus J Campbell, AO, DSC
Chief of the Defence Force

SEC/OUT/2018/351
CDF/OUT/2018/783

Mr Grant Hehir
Auditor-General
PO Box 707
Canberra ACT 2601

**AUSTRALIAN NATIONAL AUDIT OFFICE (ANAO) SECTION 19 PROPOSED REPORT –
JOINT STRIKE FIGHTER (JSF) – INTRODUCTION INTO SERVICE AND
SUSTAINMENT PLANNING**

Dear Mr Hehir,

Thank you for your correspondence of 2 October 2018, which contained the Section 19 Proposed Report for the ANAO performance audit – *Joint Strike Fighter – Introduction into Service and Sustainment Planning*.

Defence acknowledges the findings contained in the audit report and concurs with the conclusion that Defence's preparations to date for the introduction and sustainment of the JSF aircraft into Australian service has been effective.

Defence further acknowledges that the program cost estimates, particularly those associated with the Global Support Solution (GSS) are still continuing to mature. Greater certainty of operating and support costs will be available when all F-35 global and regional maintenance support assignments have been made and commercial arrangements have been established for those assignments and separate Australian sovereign contract requirements. Defence will return to Government after 2020 for operating and support budget through to the planned F-35 withdrawal date.

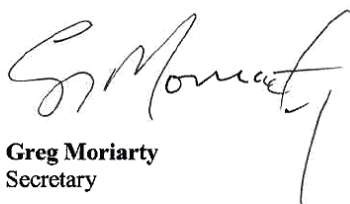
Defence acknowledges that that an annual update to Cabinet was not provided in 2015 and 2016, however improved internal governance is now in place to ensure future updates are provided on time, with quarterly oversight from the Defence Investment Committee. In parallel, Defence has increased the level of Ministerial engagement through other mechanisms.

Defending Australia and its National Interests

Australia's Initial Operating Capability in December 2020 will have delivered 30-33 JSF aircraft, established a sovereign training capability and completed verification and validation of the Australian F-35A capability. One operational squadron (minimum of 12 aircraft) will be proficient in air combat, strike and offensive air support, and ready to deploy in support of Australia's national interests.

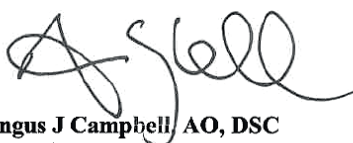
Attached to this letter are Defence's Proposed Amendments, Editorials and Comments (**Annex A**), and Responses to Requests for Information (**Annex B**). These constitute Defence's formal response to the Section 19 Proposed Report. Defence remains committed to assisting you with the successful completion of this audit. We look forward to the upcoming tabling of the Report.

Yours sincerely,



Greg Moriarty
Secretary

26 October 2018



Angus J Campbell AO, DSC
General
Chief of the Defence Force

25 October 2018

Annexes:

- A. Defence's Proposed Amendments, Editorials and Comments
- B. Defence's Responses to Requests for Information

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Appendix 2 JSF Program Capability Milestones

Milestone	Current schedule	Expected delivery
Materiel Release 1 – Complete delivery of materiel and services supporting the start of pilot training in the United States	April 2015	Completed
Materiel Release 2 – Complete delivery of materiel and services supporting the start of maintenance training in the United States	February 2017	Completed
Materiel Release 3 – Complete delivery of materiel and services supporting the start of Off Board Information Systems Centre operations	December 2017	Completed
Materiel Release 4 – Complete delivery of materiel and services supporting Australian, Canadian, United Kingdom Reprogramming Laboratory initial operational capability	December 2018	September 2019
Materiel Release 5 – Complete delivery of materiel and services supporting workup and ferry of the first aircraft to Australia	December 2018	November 2018
Materiel Release 6 – Complete delivery of materiel and services supporting initial verification and validation, and the start of maintenance training in Australia	December 2018	March 2019
Materiel Release 6-A – Complete establishment of the engine depot-level maintenance capability fulfilling Australia’s role as a regional depot for JSF engine depot-level maintenance in the Asia-Pacific region	December 2019	November 2019
Materiel Release 7 – Complete delivery of materiel and services supporting verification and validation Phase 2	December 2019	December 2019
Materiel Release 8 – Complete delivery of materiel and services supporting the start of pilot training in Australia	August 2020	September 2020
Initial Materiel Release – Complete delivery of materiel and services supporting transition to Initial Operational Capability	December 2020	December 2020
Initial Operational Capability – Involving the stand-up of the first JSF squadron	December 2020	December 2020
Materiel Release 9 – Materiel to support the operational capability 2 state – involving the stand-up of the second JSF squadron	December 2021	December 2021
Materiel Release 10 – Materiel to support the operational capability 3 state – involving the stand-up of the third JSF squadron	December 2022	December 2022
Final Materiel Release – Complete delivery of materiel and services supporting transition to final operational capability	December 2023	September 2023
Final Operational Capability – Involving the acceptance of the final JSF aircraft	December 2023	November 2023

Source: Defence documentation and systems