

Chapter 4

Acquisition timeline and potential alternatives

Introduction

4.1 This chapter considers the F-35A acquisition schedule, the risk of the creation of a capability gap should there be further delays to the acquisition timeline, and potential alternatives to the F-35A.

Acquisition schedule

4.2 Defence advised the committee that the 'F-35 Program schedule is structured to address the resources required to deliver a highly technical and complex program' and that, as a result, the System Development and Demonstration phase is 'characterised by a concurrent design and production model'. Defence explained that 'this level of concurrency has introduced some risk' to the Program, demonstrated by the Program re-baselining and issues that have become evident during test and evaluation.¹ Defence noted that software development is 'effectively complete' and is now the 'main focus of the ongoing test and evaluation program'. Defence advised that, as at January 2016, the final software build had completed 50 per cent of baseline test points, but that 'significant test points are yet to be undertaken and issues found will need to be rectified'.²

4.3 Defence advised that the F-35 Program schedule has 'stabilised' since the re-baselining in 2012, with 'any movements being managed through schedule margins built into the Program'. However, 'completion of the test and evaluation program and ensuring the required warfighting capability at the completion of the System Development and Demonstration phase carries schedule risk that will need to be carefully managed by the Joint Program Office'. Defence assured the committee that it is 'closely monitoring test point achievement and software maturity' and has 'built in additional schedule margin to manage this risk' to ensure that Australian initial operating capacity is met in 2020.³

4.4 Defence acknowledged that the re-baselining of the F-35 Program has deferred the procurement of the Australian F-35A by two years, resulting in initial operational capacity moving from 2018 to 2020.⁴ Australia plans to ferry the first two F-35 aircraft to Australia in late 2018, with initial operational capability planned for 2020 with the establishment of 3 Squadron (3SQN) to be followed by 2 Operational Conversion Unit (2OCU) and supporting systems and infrastructure at RAAF Base Williamtown. Final operational capability is planned for 2023 with the establishment

1 Department of Defence, *Submission 55*, p. 13.

2 Department of Defence, *Submission 55*, p. 13.

3 Department of Defence, *Submission 55*, p. 13.

4 Department of Defence, *Submission 55*, p. 13.

of 77SQN at RAAF Base Williamtown and 75SQN at RAAF Base Tindal.⁵ Australia's F-35A delivery profile of a total of 72 aircraft is as follows:

- 2 aircraft in 2014;
- 8 aircraft in 2018;
- 8 aircraft in 2019;
- 15 aircraft in 2020;
- 15 aircraft in 2021;
- 15 aircraft in 2022; and
- 9 aircraft in 2023.⁶

4.5 The first two aircraft delivered in 2014 are currently operating as part of the pool of aircraft at the F-35 International Pilot Centre at Luke Air Force Base, Arizona. The next eight Australian aircraft will be delivered in 2018. Six of these aircraft will be based at Luke Air Force Base to facilitate ongoing F-35 pilot training and two aircraft will be ferried to Australia and based at RAAF Base Williamtown. There is a detailed plan to phase the transition of aircraft to Australia from 2019-23. All aircraft will be based in Australia from 2023.⁷

4.6 Defence told the committee that the arrival of the first two aircraft at the end of 2018 is 'a key milestone prior to Australia's initial operating capability' but that 'the schedule for establishing the required support to meet this timeframe is challenging'. Nonetheless, Defence assured the committee that its 'confidence in achieving initial operational capacity is reinforced by the achievement of key milestones'. Of note is the initial operational capacity (IOC) for the first squadron of F-35B (STOVL variant), which was achieved by the US Marine Corps in July 2015.⁸

4.7 On 2 August 2016, General Herbert 'Hawk' Carlisle, the commander of the United States Air Force Air Combat Command, announced that the F-35A has achieved initial operational capacity (IOC) and that the first squadron of F-35As is 'combat ready'. This means the United States Air Force can now send its first operational F-35A squadron (the 34th Fighter Squadron, located at Hill Air Base in Utah) into combat operations.⁹ The Chief of Staff of the United States Airforce, General David L. Goldfein, stated that:

5 Department of Defence, *Submission 55*, p. 5.

6 Department of Defence, *Submission 55*, p. 14.

7 Department of Defence, email responding to request for clarification from Secretariat, (received 21 March 2016).

8 Department of Defence, *Submission 55*, p. 13.

9 United States Air Force, 'AF declares the F-35A 'combat ready'', *Media release*, 2 August 2016, <http://www.af.mil/News/ArticleDisplay/tabid/223/Article/885496/af-declares-the-f-35a-combat-ready.aspx>, accessed 22 August 2016.

The combat ready F-35A is the latest fifth-generation fighter aircraft in the Air Force's inventory and provides our nation air dominance in any environment. The F-35A brings an unprecedented combination of lethality, survivability, and adaptability to joint and combined operations, and is ready to deploy and strike well-defended targets anywhere on Earth...Today's declaration of IOC is an important milestone on the road to achieving full warfighting capability for the F-35A.¹⁰

Capability gap

4.8 The Sir Richard Williams Foundation (SRWF) noted that the Royal Australian Air Force (RAAF) fleet of F/A-18A/B aircraft were delivered in 1985, with a notional life of 6,000 flying hours. The SRWF advised that some of the fleet have already passed this milestone, through careful management of fatigue accrual and a series of upgrades to the airframe. However, as the airframes continue to age, the additional work and costs required to maintain air-worthiness beyond the planned life of the aircraft will increase exponentially, whilst the capability will decrease as more modern threats represent higher risks to the aircraft:

To give some idea of the magnitude of the additional work required to maintain air-worthiness beyond its planned life, the annual cost of supporting the fleet has doubled in the last five years. Costs would be expected to continue to increase at an accelerating rate as the airframes age further. The airframe/engine maintenance program is designed to have an airworthy fleet of F/A-18 A/B Hornets until 2021/22. By the end of 2022, the majority of F/A-18 A/B Hornets will have reached the end of their useful fatigue life.

Defence has also conducted a mid-life upgrade to most of the avionics on the F/A-18 A/B aircraft. The upgrade closed the capability gap somewhat between Hornet and Super Hornet aircraft. However, by about 2025, the fleet – both Hornets and Super Hornets - would be able to operate in relatively benign airspace only. Operations in airspace contested with either modern air-to-air or ground-to-air threats would represent a high risk.¹¹

4.9 The Australian Strategic Policy Institute (ASPI) asserted that Defence should prepare a hedging strategy that provides for the possibility of further delays to the F-35 delivery. ASPI explained that a failure to do so could 'drastically limit the range of possible responses in the early 2020s, and a capability gap could become a possibility'.¹² ASPI noted the wisdom of past hedging strategies:

It seems to us that it would be prudent to at least devote some staff work to developing an alternative. The RAAF can be expected to resist that notion, as was the case back in 2007 before the Howard government took the

10 United States Air Force, 'AF declares the F-35A 'combat ready'', *Media release*, 2 August 2016, <http://www.af.mil/News/ArticleDisplay/tabid/223/Article/885496/af-declares-the-f-35a-combat-ready.aspx>, accessed 22 August 2016.

11 Sir Richard Williams Foundation, *Submission 17*, pp 4–5.

12 Australian Strategic Policy Institute, *Submission 47*, p. 1.

decision to acquire 24 Super Hornets. The then Chief of Air Force told Parliament that Air Force's view was that purchase of a bridging fighter would only be a last resort. Time has shown that assessment to be wrong, and the Super Hornets now represent a successful hedge against the realised delays in delivery of the F-35.¹³

4.10 ASPI acknowledged that life extension work on the classic Hornet fleet has extended its retirement date from 2015 to 2022 and beyond, but noted that by 2023 the classic Hornets will be well into their fourth decade of service (see table 4.1). ASPI stated that 'there must be some uncertainty in the actual end of life', and that 'given the increasing challenge of keeping a 1980s platform at contemporary standards of capability, scope for further extension would be limited'.¹⁴

Table 4.1—Current and projected ages of Australia's F/A-18A/B fleet

Year	Number (2016)	Age (2016)	Age (2023)
1985	6 (1xA; 5xB)	31	38
1986	12 (12xA)	30	37
1987	14 (7xA; 7xB)	29	36
1988	24 (20xA; 4xB)	28	35
1989	11 (11xA)	27	34
1990	4 (4xA)	26	33

Source: Australian Strategic Policy Institute, *Submission 47*, p. 4.

4.11 ASPI advised that the 'most sensible hedge' would be to order another tranche of F/A-18F Super Hornets. ASPI explained that this would be the best option as no other fifth-generation aircraft is available on the world market; most, if not all, of the fixed costs of acquiring the Super Hornet have already been borne; and any other type of aircraft would bring with it new supply chains and flight and ground crew training requirements, putting strain on the RAAF's capacity to absorb the several other new types of aircraft in the pipeline. ASPI noted that, taking into consideration a three or more year lead time for the delivery of a new-build Super Hornet, a decision would need to be made by 2019 at the latest.¹⁵

4.12 The Chief of the Air Force, Air Marshal Leo Davies, assured the committee that he is confident that delays in the development of the F-35 would not result in a capability gap:

13 Australian Strategic Policy Institute, *Submission 47*, p. 4.

14 Australian Strategic Policy Institute, *Submission 47*, p. 4.

15 Australian Strategic Policy Institute, *Submission 47*, pp 4–5.

CHAIR: Is there a risk that delays in the development of the F-35 could leave Australia with a capability gap? Is there a risk of that at all given the time lines you have mentioned?

Air Marshal Davies: Not in my view. We have two pilots and we have two more under training at Luke Air Force Base. Their appreciation of an aircraft that is immature given the context of the aeroplane we will receive at initial operating capability time line gives me considerable confidence that the aeroplane, right now, has significant advantages in its operations over the F-18. As we build over the next four years, my level of confidence remains high.¹⁶

Alternative aircraft

4.13 A number of submitters expressed concerns that the F-35A would not adequately meet Australia's air defence needs. These concerns primarily focused on the F-35A's flight performance qualities, air combat capabilities, and ability to maintain regional air superiority.¹⁷ In light of these alleged deficiencies, a number of alternative aircraft were raised in evidence.

F-22 Raptor

4.14 The majority of submissions which argued against the procurement of the F-35A asserted that Australia should acquire the F-22 Raptor.¹⁸ Air Power Australia (APA) was highly critical of the F-35A, which it described as 'structurally obsolete'.¹⁹ APA asserted that the F-35A is not capable of meeting Australia's air combat capability needs, warning that 'advances in both Russian and Chinese aircraft, air-to-air missiles, cruise missiles, and smart bombs now challenge the primacy of Western

16 *Committee Hansard*, 22 March 2016, p. 66.

17 For example: Mr Chris Mills, *Submission 1*, pp 1–3, *Supplementary Submission 1.1*, pp 1–2, *Supplementary Submission 1.3*, pp 1–2; *Supplementary Submission 1.4*, pp 1–3; Mr Michael Price, *Submission 2*, pp 12–16; Mr Anthony Wilkinson, *Submission 4*, pp 1–2; Mr Daniel Nowlan, *Submission 6*, pp 1–6; Air Power Australia, *Submission 9*, pp 1–3; *Supplementary Submission 9.1*, pp 1–2; Mr Steve Weathers, *Submission 10*, pp 1–2; Mr Marcus Kollakides, *Supplementary Submission 12.3*, pp 1–7; Name withheld, *Submission 14*, pp 4–6; Mr Eric Palmer, *Submission 19*, p. 6; AIRCDRE Ray Perry (Retd), *Submission 22*, pp 1–5; Mr Peter Larard, *Submission 25*, p. 1; AIRCDRE Ted Bushell AM (Retd) and AVM B J Graf AO (Retd), *Submission 27*, pp 1–3; Mr Scott Perdue, *Submission 33*, p. 2; Mr Robert Gottliebsen, *Submission 34*, Attachment 1, pp 1–8; Mr Peter Goon, *Submission 36*, pp 2–5; Mr Geoffrey de Looze, *Submission 38*, p. 2; Mr John Donahoo, *Submission 51*, pp 1–3; Mr Roger Jennings, *Submission 53*, pp 1–4; Mr Erik Peacock, *Submission 54*, p. 2.

18 For example: Mr Chris Mills, *Submission 1*, pp 1–3, *Supplementary Submission 1.1*, pp 1–2, *Supplementary Submission 1.3*, pp 1–2; *Supplementary Submission 1.4*, pp 1–3; Mr Michael Price, *Submission 2*, pp 12–16; Mr Anthony Wilkinson, *Submission 4*, pp 1–2; Mr Daniel Nowlan, *Submission 6*, pp 1–6; Air Power Australia, *Supplementary Submission 9.2*, pp. 1–3; Mr Steve Weathers, *Submission 10*, pp 1–2; Mr Marcus Kollakides, *Supplementary Submission 12.3*, pp 1–7; Name withheld, *Submission 14*, pp 4–6; Mr Eric Palmer, *Submission 19*, p. 6; AIRCDRE Ray Perry (Retd), *Submission 22*, pp 4–5; Mr Robert Gottliebsen, *Submission 34*, Attachment 1, pp 1–8; Mr Peter Goon, *Submission 36*, pp 1–17.

19 Air Power Australia, *Supplementary Submission 9.2*, p. 3.

air power, believed unbeatable since the Cold War'.²⁰ APA adamantly asserted that the F-22 Raptor is the 'only alternative' and called for the United States to abandon the F-35 program in favour of restarting production of the F-22.²¹ Mr Chris Mills, a member of APA, advised the committee that:

Without the F-22, the JSF fleet is irrelevant and will be defeated by lethal purpose designed air combat fighters now entering our region. Looking beyond air combat, the joint strike fighter cannot do close air support as well as the purpose-designed battle-proven A10 Warthog is currently doing in the Middle East. You cannot fly safely in contested airspace as the purpose-designed F-22 is doing today over Syria. Other countries will not commit their aircraft in Syria unless they have the protection of the F-22. I can provide proof it cannot survive a destruction of enemy air defence attack against modern SAMs. The JSF cannot control airspace contested with lethal, purpose-designed air combats like the Su-35, now being deployed in our region, and against the coming advanced design like the Sukhoi T-50 and the coming Chengdu J-20.²²

ZOCT Table

4.15 APA summarised its analysis of the F-35A in its Zero-One Comparative Technique table (ZOCT Table), listed at Appendix 4, comparing the F-35A to the F-22 Raptor, T-50 PAK-FA, Chengdu J-20, Su-35S, and F/A-18F Super Hornet. APA's analysis concluded that:

In terms of Fifth (5th) Generation Air Combat Fighter Capability Metrics, the F-35A JSF scores poorly, rating only slightly ahead of the F/A-18F Super Hornet—a Gen 4.5 design—yet well behind the Su-35S—the Russian Gen 4+++ design.²³

4.16 The committee questioned APA regarding its confidence in the accuracy of its data and conclusions, noting that the information necessary to accurately assess the capability of the F-35A is highly classified, as is information regarding current generation Russian and Chinese developmental aircraft. APA, however, assured the committee that it is confident in its ability to accurately analyse the capability of aircraft without access to classified information about aircraft capabilities:

CHAIR: I am a bit unclear here. Are you saying you can assess Russian and Chinese aircraft despite the fact that they were trying to keep all of those things secret? Are you saying that you have the wherewithal to just go in there and tell us with definitive facts what a Chinese or Russian stealth fighter can do?

20 Air Power Australia, *Submission 9*, p. 2.

21 Air Power Australia, *Supplementary Submission 9.2*, pp 1–3.

22 Mr Chris Mills, Member, Air Power Australia, *Committee Hansard*, 22 March 2016, p. 1.

23 Air Power Australia, *Supplementary Submission 9.2*, p. 8.

Mr Goon: Within the limits of the analysis, yes. That is what you are supposed to do when you do the net assessments and start the capability development process.²⁴

4.17 The committee sought comment from a range of other witnesses regarding APA's ZOCT Table analysis. Dr Andrew Davies, the Director of the Defence and Strategy program at the Australian Strategic Policy Institute, advised the committee that APA's ZOCT Table is 'not a useful contribution to a discussion of the efficacy of the F-35 aircraft'. Dr Davies highlighted a number of flaws in the analysis and methodology of the ZOCT table, noting that:

The list of characteristics (APA incorrectly calls these 'metrics') of what constitutes a 5th generation aircraft (a term that is not well-defined in any case) is selective and omits or grossly simplifies several of the characteristics that are the strong points of the F-35. Some of the characteristics that *are* included are of debatable value. In particular, the table has several entries that score for high levels of aerodynamic performance—which was never a design goal of the F-35 and is of questionable value in a beyond-visual-range encounter—a key design concept for the F-35.²⁵

4.18 SRWF was similarly critical of APA's information, analysis and conclusions, noting that 'to the layman the arguments presented by APA are very persuasive...However, the vast majority of APA's arguments are based on bogus analysis and conclusions'. SRWF advised the committee that APA's ZOCT Table 'is not recognised by anyone else as a basis for assessing 5th generation capabilities' and is 'fundamentally flawed and its conclusion is completely wrong':

The table focuses excessively on flight performance qualities of 4th and 5th generation fighters. Over half the table relates to the relative flying qualities of the assessed aircraft. Even using these characteristics, a true comparison is only possible with access to classified data. For example, the table is factually incorrect with the data on flight characteristics presented on the F-35 and Super Hornet. The performance of the Russian and Chinese aircraft is also misrepresented. However, even without access to classified data, open source reporting by the Indian Air Force on the deficiencies of the PAK50 give a good indication on the level of misrepresentation inherent in the table. There are videos available on the internet that point to the inadequate performance of both the J20 and J31. Chinese engine technology is many years behind their western equivalents.

The ZOCT Table places significantly less emphasis on the 5th generation characteristics of Very Low Observability (VLO), sensor fusion and network interoperability, which are fundamental to the successful attainment of air superiority in a hostile contested environment. The table significantly underestimates the VLO of the F-35 and significantly

24 *Committee Hansard*, 22 March 2016, p. 6.

25 Australian Strategic Policy Institute, answer to question on notice, 22 March 2016, (received 22 March 2016).

overstates the Low Observability (LO) capabilities of the PAK50 and J20. Even open source reporting from Russia does not claim the same level of LO that APA states in the ZOCT Table. Another area where APA has significantly understated the F-35 and Super Hornet is in the performance of Active Electronically Scanned Array radars of each aircraft. The underlying data used by APA in their analysis of the competing radars is in error by a very significant margin and that leads to erroneous conclusions about the performance of the respective radars.²⁶

4.19 Lockheed Martin advised the committee that APA's ZOCT Table is 'not a relevant assessment' of fifth-generation fighters. It identified three key flaws, noting that the ZOCT Table does not accurately focus on the key discriminators that distinguish the differences between 4th and 5th generation fighters; the ZOCT Table's scoring method incorrectly applies equal weighting to all metrics; and APA's analysis is based on arbitrary and subjective parameters which are reliant on opinion and open source information.²⁷

4.20 Defence described APA's ZOCT Table as 'simplistic' advising the committee it 'has not been informed by a comprehensive analysis program and is unsuited to conveying an assessment of capability' and 'contains assumptions and inaccuracies that further detract from its utility':

The ZOCT is a simplistic aircraft attribute scoring table that is unsuited to convey how individual platform characteristics interact in an operational context to deliver capability outcomes. Further, the ZOCT is unsuited for identifying whether those aircraft, as part of a larger force structure, can meet Australia's strategic requirements. Resolving this question requires useful capability assessments.²⁸

Impracticality of acquiring the F-22

4.21 A number of submissions emphasised the impracticality of APA's calls for Australia to acquire the F-22,²⁹ given that the sale of the F-22 aircraft 'to any foreign government' is prohibited by the United States Congress.³⁰ ASPI observed that 'there is essentially no chance of the F-22 Raptor being reinstated to production, especially for export'.³¹ Defence advised that, even if it was possible for Australia to acquire the

26 Sir Richard Williams Foundation, answer to question on notice, 22 March 2016, (received 14 April 2016), p. 1.

27 Lockheed Martin, answer to question on notice, 22 March 2016, (received 18 April 2016), p. 132.

28 Department of Defence, answer to question on notice, 22 March 2016, (received 26 April 2016), p. 2.

29 For example: Sir Richard Williams Foundation, *Submission 17*, p. 5; Mr James Hicks, *Submission 42*, p. 8; Australia Strategic Policy Institute, *Submission 47*, p. 4; Department of Defence, *Submission 55*, p. 8; Mr Errol Coultis, *Submission 57*, p. 2.

30 United States Congress, Amendment to the *Department of Defense Appropriations Act 1998*, H.Amdt. 295, 105th Congress (1997-1998).

31 Australia Strategic Policy Institute, *Submission 47*, p. 4.

F-22, its capabilities do not meet Australia's multi-role requirements, due to its limited air-to-surface capability.³² The SRWF outlined the major impediments to acquiring the F-22, noting that, even if production was reinstated and the ban on exports was lifted, the delivery schedule and costs would be prohibitive:

Some commentators have proposed reopening the F-22 production line as an alternative to the F-35. There are three key impediments to this presenting a feasible alternative to the F-35. Firstly, the US manufactured the F-22 under Congressional rules that the aircraft would never be exported. Secondly, even if export was feasible, the delivery schedule and costs would be prohibitive for a small production run noting the capability gaps that would emerge through both the planned withdrawal date of the F/A-18 A/B Hornet fleet and broader 5th generation integrated capability systems demands of the future force. Thirdly, and most significantly, the US has proposed developing a replacement for the F-22 in the 2030 timeframe. As such, Australia would run the risk of introducing a capability just as the parent Air Force was ramping down operations and sustainment.³³

4.22 Mr Errol Coultis noted that the 'F-22A is effectively beyond our reach, regardless of how worthy a contender it might be', explaining that 'we are legislatively prohibited from attempting to purchase the F-22A and we are physically prohibited from attempting to purchase the F-22A by the fact that it is not and is unlikely to ever again be in production'. Mr Coultis warned the committee that, considering these circumstances, calls to acquire the F-22 are 'at best fanciful' and 'at worst deliberately disingenuous and misleading':

Any support for the acquisition of the F-22A as circumstances stand therefore, in my humble opinion, is not a serious consideration of a solution that will acceptably meet our needs and I respectfully submit that these calls therefore should be treated by the inquiry accordingly.³⁴

JAS-39E Gripen, Eurofighter Typhoon and Dassault Rafale

4.23 Some submissions asserted that Australia should purchase the JAS-39E Gripen manufactured by SAAB in Sweden instead of the F-35.³⁵ One submitter argued that the Gripen would be more cost effective, whilst still providing the necessary multi-role capability. The submitter acknowledged that the Gripen may not have the stealth capabilities of fifth-generation aircraft, but asserted that it nonetheless 'out-performs the F-35A in almost every arena':

...the JAS-39E Gripen manufactured by SAAB in Sweden provides not only incredible capabilities as a multirole fighter, but even when

32 Department of Defence, *Submission 55*, p. 8.

33 Sir Richard Williams Foundation, *Submission 17*, p. 5.

34 Mr Errol Coultis, *Submission 57*, p. 3.

35 For example: Mr David Archibald, *Submission 8*, pp 3–4; Mr Marcus Kollakides, *Submission 12*, pp 13–15; Name withheld, *Submission 13*, pp 1–2; Mr Geoffrey de Looze, *Submission 38*, p. 2.

considering its through-life support and maintenance, becomes obvious as a far more cost-effective solution which would provide the RAAF with the means to maintain air superiority as well as supporting other ADF combat elements during armed conflict both in our region and abroad in support of our global interests or as part of a coalition force.

While it may not have the stealth capabilities of 5th generation aircraft such as the F-35, the Gripen has many other attributes such as higher speed (up to Mach 2 I understand, as opposed to 1.6 for the F-35A), better manoeuvrability due to its canard-delta wing configuration, the ability to carry a greater weapons payload for sustained fighting, and perhaps most importantly, a better range and combat radius, able to be extended even further through aerial refuelling with our fleet of KC-30A MRTT aircraft. As a complete package, it out-performs the F-35A in almost every arena, and would give our forces one of the best platforms with which to fight and win against the newest generations of Sukhoi, Mikoyan and various Chinese-built fighters which have been talked about already.³⁶

4.24 Mr David Archibald advised the committee that the Gripen would be even more effective than the F-22, asserting that it is the next most capable fighter aircraft and considerably cheaper. Mr Archibald noted that its low operating cost allows for the training of highly proficient pilots, which further increases its effectiveness in combat:

While the Gripen E is almost as capable as the F-22, its build cost is one quarter that of the F-22 and its operating cost is one tenth that of the F-22. The latter attribute means that countries operating the Gripen E can train their pilots to a much higher level of proficiency than F-22 pilots. In combat, that would result in the Gripen E being more effective than the F-22.³⁷

4.25 Some submissions mentioned the Eurofighter Typhoon and Dassault Rafale as potential alternatives to the F-35.³⁸ Mr Marcus Kollakides noted that 'the Eurofighter Typhoon is probably the world leading dogfighter and air superiority fighter, possibly just inferior to the F-22 Raptor'. Mr Kollakides described the Dassault Rafale as 'a brilliant dogfighter, so close to the Typhoon in ability it is difficult to call'. Mr Kollakides also noted the Dassault Rafale's multi-role capabilities: 'it has exceptional strength and design features which lend themselves to multi role capabilities above and beyond the Gripen or Typhoon' and 'would meet or exceed all the requirements for Australia'.³⁹

36 Name withheld, *Submission 13*, pp 1–2.

37 Mr David Archibald, *Submission 8*, pp 3–4.

38 For example: Mr Marcus Kollakides, *Submission 12*, pp 13–14; Mr Errol Coultis, *Submission 57*, p. 3; and Name withheld, *Submission 7*, p. 1.

39 Mr Marcus Kollakides, *Submission 12*, p. 14.

4.26 However, other submissions asserted that the JAS-39E Gripen, Eurofighter Typhoon and Dassault Rafale are not able to meet Australia's requirements.⁴⁰ ASPI advised the committee that 'there are few realistic alternatives to the F-35 at the moment—other potential choices are less stealthy, have poorer electronic warfare capability and are likely to be well overmatched by the F-35'.⁴¹ SRWF asserted that the Super Hornet, F-16 Block 60, F-15, Eurofighter Typhoon, Rafael and Gripen had all been analysed and considered by Australia as options but that 'none of them were able to meet all of Australia's requirements'. SRWF advised that 'all were vulnerable to advanced threats' and 'did not provide the same opportunity to be continually upgraded to meet these evolving threats'.⁴² APA asserted that the alternatives, whilst better than the F-35, were not viable:

...claims that upgraded variants of the Boeing F-15 and F/A-18, LM F-16, Eurofighter Typhoon, Dassault Rafale or SAAB Gripen will be viable do not stand up to scrutiny. While all outperform the F-35 aerodynamically and aero/propulsively, and some have limited (~Mach 1.2) super-cruise, they lack the stealth capabilities of the PAK-FA, J-20 and J-31⁴³.

4.27 Defence assured the committee that alternative aircraft, including the Super Hornet, Eurofighter, Rafale and Gripen, were all considered and analysed extensively by Defence before its decision to acquire the F-35 was made:

The ability of the F-35A to satisfy the Government's expectations of the air combat force was subject to a comprehensive analysis involving the full scope of available tools and techniques conducted over many years, including thousands of simulation runs and a series of human-in-the-loop mission simulator experiments. The best available performance data for both the F-35A and advanced threat systems were employed for these efforts. The combined results of this analysis indicated that the F-35A would be able to meet the Government's air combat requirements over the period of its service life.

Aircraft considered to be alternatives to the F-35 were also analysed extensively by Defence. Alternatives considered included the Super Hornet, Eurofighter, Rafale and Gripen. The capabilities of the F-22 were assessed but it did not meet Australia's multi-role requirements due to its limited air to surface capability, noting also that US policy would not allow the F-22 to be sold to other nations. This extensive analysis identified where alternative platforms would be unable to meet all of Australia's requirements and highlighted the vulnerabilities of some of these platforms to advanced threats that F-35 capabilities overcome. In addition, the available

40 For example: Air Power Australia, *Supplementary Submission 9.2*, p. 2; Mr James Hicks, *Submission 42*, pp 7–9; Australian Strategic Policy Institute, *Submission 47*, p. 3; Department of Defence, *Submission 55*, p. 8.

41 Australian Strategic Policy Institute, *Submission 47*, p. 3.

42 Sir Richard Williams Foundation, *Submission 17*, p. 5.

43 Air Power Australia, *Supplementary Submission 9.2*, p. 2.

alternatives were shown to have limitations in the ability to be modernised over their service life to defeat more complex threats beyond 2030.⁴⁴

Unmanned

4.28 Dr Jai Galliot urged the committee to consider 'whether we have the right balance between piloted, optionally piloted, remotely piloted and even automatically piloted (autonomous) systems planned for the future ADF force structure'. Dr Galliot questioned whether Australia actually required the capabilities outlined in the Defence White Paper as well as questioning whether the F-35 represented a good return on investment when compared with an unmanned aerial vehicle (UAV):

With this in mind, and the fact that Australia already has air superiority over its more immediate regional neighbours, the question for the committee ought to be whether Australia needs the capability to fight with the US against a major power in such an integrated but traditional fashion, especially when it comes at such great expense. My suggestion is that it does not. Indeed, it is not even obvious that we need a human in the loop (that is, a pilot in the cockpit). ..it is not at all obvious whether the margin of improvement offered by an aircraft like the F-35 (over a General Atomics MQ-9 Reaper or a purpose built combat drone, for example) represents a good return on investment or the sort of 'value for money' that the Australian people expect in times of relative austerity.⁴⁵

4.29 Mr Roger Jennings noted that the RAAF 'has no unmanned multi-role attack-ISTAR [information, surveillance, target acquisition, and reconnaissance] aircraft'. He recommended that the RAAF purchase only 36 F-35A aircraft and acquire three types of unmanned aircraft:

RAAF requires three types of unmanned aircraft to greatly strengthen its war fighting-ISTAR capabilities at minimum cost. Purchase 36 Improved Gray Eagle attack-ISTAR unmanned aircraft; 12 Predator B Guardian for maritime patrol and maritime attack; and 36 Predator C stealthy jet powered attack-ISTAR unmanned aircraft.⁴⁶

4.30 SRWF noted that sixth-generation unmanned combat aircraft systems are currently under development, but that few if any of these will be available in operationally significant numbers before 2030:

There are potential 6th generation unmanned combat aircraft systems under development such as the joint French-Swedish nEUROn, the UK's BAE Taranis, Northrop Grumman's X-47B and the US Navy's follow-on UCLASS program, and similar unmanned combat aircraft projects underway in Russia and China. But it is generally accepted that few if any of these will be available in operationally significant numbers before 2030.⁴⁷

44 Department of Defence, *Submission 55*, p. 8.

45 Dr Jai Galliot, *Submission 3*, pp 1–2.

46 Mr Roger Jennings, *Submission 53*, p. 2.

47 Sir Richard Williams Foundation, *Submission 17*, p. 15.

Other

4.31 The Medical Association for the Prevention of War (MAPW) asserted that 'Australia's security needs would be better and far more affordably addressed by using at least some of this expenditure to greatly increase our foreign aid and our diplomatic efforts towards the resolution of conflicts'. MAPW argued that Australia's foreign policy should be independent from the United States and focused on supporting mediation and other forms of conflict resolution and creating goodwill between Australia and other nations:

Australia's diplomatic activity via the Department of Foreign Affairs and Trade (DFAT) is underfunded. Professor John Langmore, Assistant Director Research (Security and Political Engagement) in the Melbourne School of Government at Melbourne University (and former federal parliamentarian) states that the Australian diplomatic service has been starved of funds for 20 years and that we have fewer diplomatic posts overseas than any other of the G20 countries. DFAT does not have an integrated, focussed approach to supporting mediation or other forms of conflict resolution; we tend to instinctively respond to conflict by planning military action. In the 2014 budget, the Defence Department received 21 times as much as diplomacy and aid administration.

Australia's overseas aid program, which could be a powerful means of creating goodwill between Australia and other nations, has also reached shamefully low levels. In 2014, in an astonishing act, Australia ceased its humanitarian aid to Iraq, the nation we had invaded and helped destabilise 11 years earlier; only a small amount of that aid has been restored. Such extraordinary foolishness undermines the building of positive relationships with other countries and peoples, in this case in a part of the world where Australia has already acquired many dangerous enemies. To send in the military, withdraw humanitarian aid, and expect to win "hearts and minds" defies credibility. We place far too much faith in the role of weapons and the capacity to kill in making us "secure".⁴⁸

48 Medical Association for the Prevention of War, *Submission 50*, p. 6.

