Is the Joint Strike Fighter the right aircraft for Australia?

April 28 2014, by Steven L. Jones

Australia now plans to have 72 F-35 Joint Strike Fighter from Lockheed Martin. Credit: AAP/Lockheed Martin, Matthew Short

The Australian Government's mission to upgrade the defence force fleet of ageing aircraft with the F-35 Joint Strike Fighter has been controversial since it began more than a decade ago.

Australia formally began looking for options to replace its F/A-18 and F-111 aircraft in May 1999 with the creation of project AIR 6000 – New Air Combat Capability.

Phase 2, a Project Definition Study, was to commence in the 2002/03

financial year with a final decision expected around 2005/06.

But when Australia signed up to the System Development and Demonstration phase of the JSF program in June 2002, then-Defence Minister Robert Hill effectively ended the selection process for Australia's new combat aircraft.

At that stage the primary contenders included the European Eurofighter Typhoon, the French Dassault Rafale and the Swedish Saab Gripen.

The government's decision was a surprise to nearly everyone, including JSF manufacturer Lockheed Martin, rival manufacturers and the Pentagon. While many other nations had joined the JSF program in 2002, Australia was the only one to end their selection process at that time.

Now Prime Minister Tony Abbott's pledged to spend A$12 billion on a further 58 aircraft to bring the total to to 72.

The JSF has an impressive list of capabilities and weapons including:

- low observable stealth
- integrated sensors, information and weapons systems
- powerful and comprehensive integrated sensor package for intelligence, surveillance and reconnaissance missions
- advanced electronic warfare capabilities
- a 25mm GAU-22 internal gun
- four internal and six external weapon stations which can carry a combination of air-to-air, air-to-surface and anti-ship missiles, and precision guided bombs.

But whether the JSF is the right aircraft for Australia has been continuously questioned. The government and Australian Defence Force

maintain it is the right aircraft because it provides Australia with a technological edge in our region. But this only raises further questions.

An edge over whom?

Two defence white papers from 2000 and 2009 recognised that the conventional military threat to Australia is relatively low, with the 2009 white paper stating:

There is a broad consensus that the present strategic environment is relatively benign.

Of the countries in our region, Indonesia has a growing military capability, and has had serious political tensions with Australia over many decades.

Over the past decade Indonesia has acquired advanced Russian Sukhoi Su-27 and Su-30 fighters. Its plans to acquire more have led to concerns regarding Australia's air superiority capabilities.

While these aircraft are superior to Australia's F/A-18 Hornets in many ways they have not been considered a major threat to Australia because of the standards of training and doctrine for Indonesian pilots, and levels of aircraft readiness.

Indonesia is currently in the process of significantly expanding and modernising, but it remains largely ill-equipped and ill-prepared for modern military operations.

Prime Minister Tony Abbott tries out the cockpit of the F-35 fighter plane in Canberra. Credit: AAP/Alan Porritt

Analysts such as Ben Schreer and Alan Stephens have suggested that Indonesia's military modernisation offers opportunities for increasing Australia's security.

A technological edge in what timeframe?

The JSF does offer significant technological advantages at the moment and probably out to at least 2020. But Australia and the US plan on operating the JSF until 2050 and it is here that a capability edge becomes more uncertain.

While the JSF was designed to be upgradeable – and regular software upgrades are a major part of the ongoing sustainment of the aircraft –

future improvements will be limited by the hardware and the physical characteristics of the aircraft.

Although some broad technological developments fundamentally change the nature of warfare (such as with the invention of gunpowder or the aircraft) smaller incremental changes generally only provide short-term advantages with counter-measures developed over time, and developing increasing quickly in the 21st century.

Also, technology itself does not always provide advantages. During the Vietnam War, early US F-4 Phantoms lacked guns as air-to-air missiles were considered the best way of destroying enemy aircraft, limiting their dominance over technologically inferior, but more agile and gun armed North Vietnamese MiG fighters.

The argument here is not that the days of dogfighting are back, but rather to point out that there are historical precedents that illustrate the limitations to technological advantages.

While the JSF is less manoeuvrable than less advanced aircraft, probably making it less capable within visual range, it's argued that this is not relevant as stealth and advanced missiles will allow JSFs to take down enemy aircraft well before they enter visual range.

Australia has paid a large premium for radar stealth in the JSF but it is not a permanent solution. A US F-117 Nighthawk stealth fighter was shot down in 1999 by an innovative Serbian commander who modified his obsolescent anti-aircraft missile battery.

In 2012 the US Chief of Naval Operations, Admiral Jonathon Greenert, explored the limitations of stealth:

The rapid expansion of computing power also ushers in new sensors and

methods that will make stealth and its advantages increasingly difficult to maintain […] It is time to consider shifting our focus from platforms that rely solely on stealth.

Israel's air force also believes any stealth protection of the JSF will be good for only five to 10 years.

For what purpose?

In defending the JSF against Russian and Chinese competitors, Prime Minister Abbott said that in the judgement of the US and the other Western powers it was a "very, very effective aircraft".

One of the F/A-18F Super Hornet at RAAF Amberley in Queensland that will ensure Australia?s air combat capability is maintained until the full introduction of the Joint Strike Fighter. Credit: AAP/Australian Defence Force, LAC Benjamin Evans

How the US plans to use the latest fifth-generation fighters such as the JSF sheds light on Australia's strategic thinking in acquiring them.

A Rand report noted the importance of any fifth-generation aircraft to operate in hostile environments featuring integrated air defence system that include advanced surface to air missile systems, jamming and other electronic attack modes.

Senior US generals have also indicated the importance of allowing the US to strike any target in the world at any time.

To operate successfully in a contemporary hostile environment, older technology strike aircraft would need the support of a range of defensive and offensive electronic warfare aircraft, as well as other aircraft to suppress enemy air defences.

But the JSF can perform all of these roles in the one aircraft.

China's military modernisation and strategic developments are designed to deter a US attack, and the JSF is a key component in overcoming Chinese defences.

Defence company Lockheed Martin has defended its controversial F-35 Joint Strike Fighter declaring it will be better than current combat aircraft, and cheaper. AAP/Lockheed Martin, Matthew Short

What other options are there?

The suitability of other options depends on evaluating and prioritising a range of factors, including price and cost effectiveness, timeframes, the strategic environment, operational needs and capabilities available.

As well as the European aircraft mentioned previously, Australia's current F/A-18F Super Hornets possess many advanced technologies. There is also a range of aircraft that would fit in the fifth-generation category currently being developed in China, Russia, Japan, India and Turkey.

While not all of these will ultimately be produced, the future is likely to

see a range of technologically advanced aircraft made available to customers in Australia's region. The suitability of the JSF for Australia in the long term will, to some degree, be dependent on the capability of these aircraft.

The JSF may well be a safe bet for Australia. It has its problems and does not meet the expectations of a decade ago, but it provides some certainty, at least in the short term.

Predicting Australia's strategic needs for the next 35 years is a daunting exercise, but the financial cost burden of acquiring and sustaining the JSF may reduce Australia's strategic flexibility to change its force structure in the coming decades.

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