



## **Supplementary Remarks – Dr D. Jensen MP**

### **F-35 Joint Strike Fighter Program**

As can be seen from the evidence presented in Chapter 6 of this report, Defence's confidence in regard to the cost and schedule of the F-35 Joint Strike Fighter (JSF) project has no basis in fact.

So far, none of the cost and schedule targets stated in Parliament by Defence through the life of the project have been met. To start to understand and determine why this is so, we need to look at what senior Defence officials have said about the F-35A JSF unit price over the past decade:

*"It's about \$37 million for the CTOL aircraft, which is the air force variant."*

*- Colonel Dwyer Dennis, U.S. JSF Program Office and Australian Defence Department Briefing, August 2002-*

*"...about \$40 million dollars per aircraft..."*

*-Senate Estimates/Media Air Commodore John Harvey, AM Angus Houston, Mr Mick Roche, USDM, 2002/2003-*

*"...US\$45 million in 2002 dollars..."*

*JSCFADT/Senate Estimates, Air Commodore John Harvey, Mr Mick Roche, USDM, 2003/2004-*

*"...the JSF Price (for Australia) - US\$55 million average for our aircraft ... in 2006 dollars..."*

*-Senate Estimates, AVM John Harvey ACM Angus Houston, November 2006-*

*"There are 108 different cost figures for the JSF that I am working with and each of them is correct."*

*- Dr Steve Gumley, CEO of the DMO, September/October 2007-*

*"...I would be surprised if the JSF cost us anymore than A\$75 million ... in 2008 dollars at an exchange rate of 0.92."*

*-JSCFADT, Dr Steve Gumley, CEO DMO, July 2008-*

*"...Dr Gumley's evidence on the cost of the JSF was for the average unit recurring flyaway cost for the Australian buy of 100 aircraft..."*

*-JSCFADT/Media, AVM John Harvey, August 2008-*

*"Confirmed previous advice i.e. A\$75 million in 2008 dollars at an exchange rate of 0.92..."*

*-JSCFADT, Dr Steve Gumley, CEO of the DMO, September 2009-*

As the evidence shows, none of these figures come anywhere close to what is likely to be the actual unit price of the aircraft or even what was being reported to the US Congress in official US Government documents at the time.

Some may say such claims are the result of a "*conspiracy of optimism*" and "*the zeal of feeling very confident and extremely comfortable that all is well*". However, such euphemisms risk distracting the attention of all levels of Defence governance from what the evidence shows is patently "*acquisition malpractice*".

Of even greater concern is the way senior Defence officials have seemingly confused the terms 'costs' and 'price'. Though there may be many 'costs' associated with building a product like an aircraft, there is only one 'price'. Failing to state the full price of a consumer product is a practice

known as “deceptive component pricing” and is subject to sanction under consumer laws in many jurisdictions, including Australia.

Today, senior Defence officials claim the NACC/F-35 JSF Project is “*somewhat delayed but still within budget*” but the delays are due to what is happening in the USA, the implication being such things are outside the control or influence of Defence management.

A sorry state of affairs considering each DMO Executive since 2000 has stated schedule to be paramount and their principal focus, along with budget. Such a concerted focus schedule on the part of successive DMO Executives ignores the fact that schedule overruns and blowouts in budgets are consequences, not causes.

Management that focuses on the consequences rather than the causes is akin to closing the proverbial gate after the horses have bolted and displays even greater dysfunction when the aftermath excuse proffered is there wasn’t the wherewithal to close the gate, in the first place.

Evidence provided to this Review shows the professional discipline of Project Management has a simple way of describing the causes that lead to such consequences as budgetary blowouts, schedule delays and other project shortfalls and failings, including the project not meeting requirements. These are known as issues and problems that result from risks materialising which, by definition, are the result of failures on the part of those responsible to manage risk. After all, Project Management is all about managing the project which includes managing any associated risks. Submission No 2 provided this Review with clear evidence of repeated, systemic and ongoing failures on the part of Defence to manage any of the risks associated with and inherent in Australia’s involvement with the JSF Program.<sup>1</sup>

Today, the provision of actual figures for cost estimates let alone anything substantive in relation to JSF costs (or schedule) is diligently avoided in any of the testimony provided by Defence.

On the matter of schedule, according to previous advice received from senior Defence officials, the JSF was also to replace the venerable F-111. From 2002 until around 2008, the advice from Defence was (1) this would happen in the 2010 to 2012 timeframe and (2) no interim air combat aircraft would be needed.

---

<sup>1</sup> See Air Power Australia, *Submission No. 2*, tabled titled ‘Risk Assessment IAW DMO Risk Management Guidelines: JSF Program’, p. 14.

Meantime, in 2001, experts in Industry, Academia and also within Defence itself were advising (1) the JSF Program is extremely high risk; (2) highly unlikely the JSF will be operational before 2018; and, (3) the JSF will almost certainly cost more than US\$100 Million per aircraft and will most likely exceed the unit price of the F-22A Raptor in the 2008-2010 timeframe that senior Defence portfolio officials were claiming would be when the first tranche of JSF aircraft for Australia would be available to buy.

In 2006, independent subject matter experts provided further advice to Defence which has been proven to be correct while the advice from senior Defence officials remains, at best, parlous and unsupportable.

Based on the expert evidence presented to this Review, it is clear that Defence has no differently exaggerated confidence in the capabilities offered by the JSF, particularly in light of the fighter jet technology which will deploy operationally in Russia, China and their export client nations post 2015; that is, over the coming half decade.

The expert evidence shows that capabilities required of the JSF were defined in terms of past Cold War era threats. Such definitions and the resulting requirements are contained in the JSF Operational Requirements Document (ORD). These capabilities may not be sufficient to compete with the Generation 4++ air combat aircraft (e.g. the Sukhoi Su-35S) now available for export into our region, let alone the 5<sup>th</sup> generation fighter technology currently in advanced flight testing, such as the Russian Sukhoi T-50 (PAK-FA) and the Chinese Chengdu J-20, both very capable 5<sup>th</sup> generation fighters designed from the outset to compete with the F-22.

When originally conceived, 5<sup>th</sup> generation fighters were defined as providing up to 14 design elements, of which four were central: sensor fusion, stealth, super-maneuvrability and the ability to cruise at supersonic speed without using afterburners (Supercruise). While all of these features are provided by the F-22, and are stated and evident design features of the PAK-FA and J-20, they will not all be delivered by the JSF. Indeed, the JSF is the only aircraft, claimed by its manufacturer to be a 5<sup>th</sup> generation fighter jet that does not meet all of these four central requirements.

However, Lockheed Martin seems to have changed its definition of the 5<sup>th</sup> generation fighter to be “survivable in contested airspace and integrated with networks”.

This redefinition is based on the assumption that kinematics – speed, acceleration, climb rate, agility, overall aero/propulsive performance - will not be important in future air combat technology due to the combination

of stealth, superior sensor technology and situational awareness via networks. It assumes that future air combat will take place entirely beyond visual range, and that sensors are infallible, missiles always effective, and that our future air combat capability will not require any capabilities that would allow it to outperform foreign 3<sup>rd</sup>, 4<sup>th</sup>, and 5<sup>th</sup> generation fighter aircraft in close range aerial combat. Expert evidence to the committee, and the historical record, show that, kinematic performance remains no less critical at medium and long ranges in terms of the pilot's ability to dictate the terms of the engagement, and evade or deny enemy missile shots

The assumption by Defence that kinematic performance does not matter is a poor assumption to make, and indeed is an assumption that has been made and proven incorrect many times over in the history of air power. Defence assumes a paradigm of future air combat that, if incorrect as it has always been proven to be in the past, will prove disastrous for Australia maintaining air superiority in the region.

For instance, senior Defence officials state the JSF has been designed “to have comparable fighter performance” to that of legacy aircraft with external fuel tanks (or “drop tanks”) attached. The basis for this comparison is both aircraft having ‘comparable’ fuel loads. This is a fraught and misleading benchmark, akin to comparing a fuel tanker truck with a Ferrari towing a fuel trailer so that the fuel loads are ‘comparable’. Burning the fuel in the trailer then unhitching it returns the latter to being a Ferrari. However, even when the fuel load in its bulbous fuel tank is down to the same level as that of the Ferrari, the truck is still a truck. As the name implies, external tanks are designed (and intended) to be quickly jettisoned in the event of close quarters air combat, giving the legacy aircraft a considerable improvement in its aero/propulsive performance. The JSF does not carry external fuel tanks, instead carrying all of its fuel internally, just like a fuel tanker. As such, its aero/propulsive performance cannot be improved the way a legacy aircraft's can on entering an air combat engagement.

In terms of the ability to cruise at supersonic speed (supercruise), the JSF is also inferior to its potential competitors. The JSF is not able to supercruise. This means that the JSF must increase its fuel consumption to fly at supersonic speed, which in turn shortens the amount of time it can stay in combat, several fold. While dogfights do tend to be conducted at transonic speeds, many tactical manoeuvres can occur at supersonic speeds, leaving the JSF at a considerable disadvantage. Both the Russian PAK-FA and Su-35S jets can supercruise, giving them significant advantages in close quarters as well as in beyond visual range combat which, importantly,

requires far greater volumes of air space to be covered and faster, to meet time critical demands

Given that current and emerging Russian fighter jet technology not only has the ability to supercruise, but also fly at higher altitudes than the JSF, this lack of aero/propulsive performance and ability to supercruise will mean that the Russian jets will set the terms of engagement. They can choose where and when to fight, to gain the best possible advantage. The Chinese J-20 is also built to supercruise, and will enjoy the same advantages.

Furthermore, engaging afterburners decreases the stealth of the JSF by making it easier to detect by increasing its infra-red emissions, several fold. Both Defence and Lockheed Martin have been dismissive of this severe degradation in stealth, and neither has adequately explained why they have dismissed it. Most Russian and Chinese built fighters are fitted with infrared sensors capable of detecting afterburners from distances of many tens of miles.

Considering the many limitations of the JSF, it is evident that, Defence's expectations of the JSF have been "adjusted" in order to fit the limited capabilities it offers, rather than allowing Australia's ongoing and evolving regional air superiority needs to determine what capabilities the RAAF should possess.

I also have a range of other concerns regarding the JSF project's performance to date. There are indications that the engineering has not been done properly in a number of important areas. The C-variant (for aircraft carriers) has had issues with inadequate power generation. This required changes to the generator, gearbox and driveshaft. The JSF's cooling system has been widely reported to be inadequate for the heat load of the avionics. Its fire suppression systems have been compromised to save weight. Its crew escape system has had persistent problems. These and more are detailed in the Quick Look Review and Director of Operational Test and Evaluation (DTOE) documents.

There is great potential for serious problems with the software. The JSF is intended to use many times more lines of software code than any previous aircraft, cited in 2009 as 5.9 million, and more recently at 10 million. A lot of the code for the software has not been written yet and, as such, we do not know about the quality of integration or standards compliance between the code components making up the vast amount of software that goes into the JSF. As a result, it is not yet possible to test the software on which most of the cited assumptions about the JSF's combat capabilities rely upon.

Another issue with the project has been the decrease or deferral of early production JSF procurements by both the US and foreign purchasers preceding full rate production, where efficiencies of scale assumed by the manufacturer in their costing models were to have been achieved. This presents a problem for the sellers of the JSF. In order to make low rate initial production profitable, Lockheed Martin needs to lock buyers in now by minimising or dismissing concerns raised about the capabilities offered by the JSF. This in turn, makes it a marketing issue.

When it comes to Australia's purchase of the JSF, Defence has not acted like a rational and sceptical buyer, instead acting more like a salesperson for the JSF. Should the concerns raised by expert witnesses about the capabilities offered by the JSF be borne out, and all the evidence seen to date shows this to be the expected outcome, Australia will greatly regret making this decision.

As such, it is quite clear that Australia should immediately reconsider its decision to be involved in the JSF project, and start looking towards better alternatives to maintain Australia's superiority in regional air combat capabilities.

Additionally, it appears that security classifications have been used by Lockheed Martin to avoid having to answer embarrassing questions during a public hearing held for this Review. When asked about which aircraft type was used as the threat during simulations, and specifically whether this threat was from an older generation of fighter aircraft, Lockheed Martin replied that this detail was classified and could not be discussed.<sup>2</sup>

Prima facie, this constitutes a breach of US Department of Defense classification policy, making it in effect unlawful. The most recent version of this policy states that 'if there is significant doubt about the need to classify information, it shall not be classified', and further that 'Unnecessary or higher than necessary classification is prohibited.'<sup>3</sup>

There is no good case that can be made for classifying what representative threats the JSF has been flown against in simulations. After all, making such information public would release no information about the JSF itself or its capabilities. The only thing such a release would achieve is to inform the public whether a current, near future or emerging threat has been simulated against, or alternatively, whether an older threat has been

---

<sup>2</sup> Mr Liberson, Lockheed Martin, *Transcript*, 20 March 2012, p. 5.

<sup>3</sup> United States Department of Defense Manual, *Information Security Program: Overview, Classification and Declassification*, Number 5200.01, Volume 1, 24 February 2012, p. 33.

misused to inflate the capabilities and effectiveness of the JSF in order to market the jet more effectively. Earlier simulation results publicly disclosed for the JSF involved exactly such, quarter century old, threat aircraft.

Of even greater concern is the use by Defence and others of the term '*classified information*' and statements like "*We can't say anything to that because the answer to that question is 'classified'*" as an omnibus means of avoiding having to answer legitimate questions. The inference that can be drawn is anything that is difficult to answer somehow has a National Security Classification. This is classic denial behaviour on the part of senior Defence officials as seen by the fact it extends to subject matters which are clearly not national security sensitive. Moreover, such behaviour stymies critical thinking and critical debate which are the fundamental tenets of due diligence, 'Red Teaming' and the application of *caveat emptor*. Along with unsupported assertions, false and misleading statements, and confabulation, such behaviour has been one of the hallmarks of the JSF Program since 2001. The adoption of such practices should be seen for what it is and one of the many reasons why the JSF Program poses a serious threat not only to the defence and security of Australia but to that of its cosignatory to the ANZUS Alliance, the United States of America.

Dr Dennis Jensen MP