



Submission No 22

Review of the Defence Annual Report 2010 - 2011

Organisation: Mr Danny Nowlan

Danny Nowlan

Australia
BSc, BE (Aero), Masters (Aero) (USyd)
17th May 2012

Sub Committee of Joint Standing Committee of Foreign Affairs,
Defence and Trade
Review of the Defence Annual Report 2010-11

**RE: Alarm from an Industry Professional over Australia's
involvement/Procurement of the F-35 Lightning – II Joint Strike Fighter.**

Chair and Members of the Joint Standing Committee for FADT,

This Submission has been prepared for your Committee in my capacity as a private citizen and professional Aeronautical Engineer. I have been practicing in the field of vehicle dynamics for over 17 years. Though I now run a software simulation company producing world class simulation products for the motorsport industry, I still maintain a keen interest in both civilian and military aviation.

I am writing to the committee because for the last couple of months I have been in correspondence with my Local MP, the Hon Anthony Albanese and the Minister for Defence, the Hon Stephen Smith, over my concerns about Australia's involvement in the JSF Program. Their replies have been timely and both honourable members have dealt with this matter with the seriousness it deserves.

However what has become very apparent in their replies is they have been drafted by the Department of Defence/RAAF leadership who seem not to want to address the issues I have raised, and have dismissively glossed over my concerns.

I am writing to your Committee as a last resort to air my very grave concerns about the RAAF acquiring the F-35 JSF on the pretext that it will provide Australia with regional Air Superiority.

It is my professional opinion that not only is the F-35 incapable of performing such a role it will also expose the Australian Defence Force to significant operational and financial risk. I am also deeply troubled that the leadership of the RAAF seems to be glossing over and not taking the problems involved with this program seriously.

The correspondence I have had with the Defence Minister indicates that the advocates of this aircraft are playing the classified card and clearly display the attitude that "they know best". For brevity I will not state in full the correspondence I have had with the minister. I have included this as an appendix to this submission. However the running theme

through my correspondence has been what makes this aircraft so special is “classified”. However that’s OK, we have had our specialists and fighter pilots look at it, and they are comfortable with and confident that the stealth and advanced avionics makes this the aircraft the appropriate choice for Australia’s needs. Furthermore even though reports such as the US Department of Defence Concurrency Quick Look Review report have identified significant issues with this aircraft, that’s OK we can still keep building this aircraft and these issues will be resolved.

The problem with the argument put forth by Defence is that all the facts that are on the public record with this aircraft strongly suggest the opposite is true. In my professional opinion I have my severe doubts that the issues with this aircraft will be resolved satisfactorily if at all. These problems include

- Significant buffet that would affect weapons release at manoeuvring speeds.
- A range of structural and thermal issues that will add to the cost and maintenance of the aircraft.
- The shape of the aircraft limits its stealth capability to just forward radar detection.
- Its current performance renders it fundamentally uncompetitive with aircraft such as the Russian Su35S, the T-50 PAK-FA, Chinese J-20 and modern Surface to Air Missile threats, all of which will proliferate globally.

In the appendix you will find a more detailed analysis and explanation of my concerns. However you will see the fixes are far from simple and it would be fool hardy to pretend otherwise.

However what I find most disturbing about the F-35 is that its advocates always invoke the classified tag when it comes to defending this aircraft. The argument goes along the lines of “This is the right aircraft and we have the proof in these documents. There is just one problem we can’t tell you because they are classified”.

To put this in perspective let’s have a look at some of the things the advocates of the JSF have stated on the public record. On March 20, Tom Burbage, the Lockheed Martin executive in charge of the Joint Strike Fighter Program stated the following to this Committee and by direct consequence, the Australian Parliament:

“We manage the weight very tightly on that airplane -- The other two airplanes are not as sensitive to weight. We are actually probably several thousand pounds away from the first compromise of the performance requirements of those two airplanes. We do, however, manage the weight very tightly on all three airplanes. All three airplanes are now in that level-off phase. The best one is the STOVL where you can go back and see that we have not increased any weight at all in a full two years.”

Yet official US Government documents such as the US Department of Defence Concurrency Quick Look Review (QLR), published in November 2011, directly contradict these claims by Lockheed Martin representatives. But what is of even more

concern is the maximum normal load factor or maximum N_z limit empty weight for the version the RAAF intend for Australia to acquire has already been exceeded. This is clearly stated on page 50 of 55 of the QLR Report.

Just so we are clear on this, the maximum N_z limit empty weight is the maximum empty weight at which this aircraft can still fulfil its performance objectives. The fact that this weight has already been exceeded in the design of the F-35A CTOL JSF has massive implications for aircraft performance and longevity.

My point is if the advocates of the F-35 are willing to gloss over important information such as this, you have to seriously question what else they are not willing to tell us about this aircraft. Tom Burbage in his testimony before this committee stated the F-35s the RAAF are to receive are several thousand pounds underweight from their first level of performance compromise. However as we have just discussed this is directly contradicted by documents on the public record. This should give us all significant cause for concern. This raises the question what else are they not telling us about the JSF and is indeed is their information reliable?

In closing I submit to the Committee that now is the time to seriously re-consider Australia's continued involvement with the JSF program. The problems with this program are not just going to be difficult to resolve they also impact on the long term viability of the aircraft. However, what is of even greater concern is the obvious information that the F-35 advocates are willing to gloss over in order to defend this aircraft. This alone has to put very serious questions on the long term viability of the F-35 program. All this indicates that it is time to look at other alternatives.

I commend this submission to the committee along with the attached correspondence between myself and the Office of Defence Minister Stephen Smith.

Best regards,

Danny Nowlan
BSc, BE (Aero), Masters (Aero) (USyd)

Danny Nowlan

Australia
BSc, BE (Aero), Masters (Aero) (USyd)
1st November 2011

The Hon Anthony Albanese MP
Federal Member for Grayndler

**RE: Alarm from an Industry Professional over Australia's
involvement/Procurement of the F-35 Lightning – II Joint Strike Fighter.**

Sir:

My name is Danny Nowlan and I am an Aeronautical Engineer. I have been practicing in the field of vehicle dynamics for over 17 years. While I no longer practice in the aviation industry (I run a software simulation company producing world class simulation products for the motorsport industry), I still maintain a keen interest in both civilian and military aviation.

I am writing to you to convey my alarm of Australia's proposed purchase of the F35 Joint strike fighter to replace our F/A – 18 Hornets. It is my professional opinion that the F-35 will not enable the RAAF to secure air superiority for the Australian Defence force. The F-35 is not capable of competing against its contemporaries (in particular the Russian PAK-FA T-50 and the Chinese Chengdu J-20) and its unit cost (currently estimated in the order of USD \$130 million) make this aircraft a colossal waste of money. It is my intention to explain why I have arrived at this conclusion.

The first reason I have arrived at this conclusion is that a number of respected industry professionals have expressed grave concerns over this aircraft. Bill Sweetman, a much respected Journalist who writes for Aviation Week has authored a number of articles highly critical of the F-35 program. Alan Williams a former assistant minister of defence of Canada has been rather out spoken on his deep reservations about the F-35 program. Closer to home Air Vice Marshall Peter Criss who was the RAAF air commander during the East Timor campaign has gone on the record publicly stating his reservations about the F-35. Also respected aviation professionals Dr Carlo Kopp and Peter Goon, have chronicled a number of papers of why this aircraft has significant deficiencies,

<http://www.ausairpower.net/>

It would be tempting to write this website as the domain of a couple of disenfranchised individuals. However these gentlemen (Peter Goon in particular) are colleagues of the people who taught me how to be an Aeronautical Engineer. Given my company is a world leader in what it does speaks very highly of their competence. I should also add that I have a number of former colleagues at the University of Sydney who are also expressing grave concerns over this aircraft.

However what is off more concern to me is that there are senior defence officials who are supplying highly questionable advice. For example Air Marshall Angus Houston was once quoted as saying to a Senate committee,

“We need to retire the F111 because the F/A-18 isn’t fast enough to escort it.”

I can only hope that Air Marshall Houston is privy to information I don’t know, because this has to be the most astounding quote I’ve ever heard. In combat speed is life because it gives you a multitude of options. This includes options to manoeuvre and or hit the target well before the enemy can do something about it. One of my specialities is evaluating vehicle performance. Statements like this give me considerable cause for concern.

My second reason for my alarm over the Joint strike fighter is the fact this program seems to have no end in sight. After 15 years of development we are still talking about deployment dates of the F-35 of 2015 and beyond. When a project is facing delay after delay, it’s a pretty clear sign that something is very wrong. One thing in particular that amuses me about the F-35 is they intend to build it and develop it at the same time. If the Airbus had attempted to do this with the A-380 they would have been bankrupted. The only organisations I know who can even consider this are F1 teams. However the history of racing has shown that if the car is not fundamentally right, the best thing you can do is damage limitation.

However my biggest concern with the F-35 Joint Strike Fighter is it does not have the airframe performance to compete against the threats it will face. You’ll hear Lockheed Martin say air frame performance is secondary because it’s stealthy and you can’t see it. Lockheed Martin will also claim it’s got such great systems in it, they just push a button and the enemy is destroyed. This might apply for a Su-35 (and this is giving the F-35 an extreme benefit of the doubt), but there is no way this would fly if the F-35 has to come up against the PAK-FA or J-20. Both the J-20 and the PAK-FA both have stealth built into their designs. This means a confrontation between the F-35 and the PAK-FA or J-20 turns into a visual range engagement.

Once we are in a visual range engagement performance becomes paramount. Three simple metrics to evaluate this are top end speed, climb rate and thrust to weight ratio. This is presented in the table below,

Aircraft	Max Speed	Climb Rate	Thrust to Weight
PAK – FA	2000 – 2500 km/h	65000+ ft/min	1.2
F-35	1700 km/h	N/A	0.87 – 1.07

The climb rate and thrust to weight are very revealing figures. In air combat manoeuvring an aircraft trade's air speed for turning performance due the large forces the wing has to generate to manoeuvre the aircraft. This produces drag which slows the aircraft down. Thrust to weight and climb rate are two very good indicators as to how quickly the aircraft can regain and maintain air speed. All of this is paramount for survival in an air combat situation. You can see in terms of thrust to weight the F-35 is very uncompetitive with the PAK-FA. Lockheed Martin has not released the climb rate of the F-35. However given the difference in the top speeds, it would be highly optimistic to claim the climb rate of the F-35 would be competitive against the PAK-FA. Consequently the F-35 would be on the back foot in a confrontation with the PAK-FA.

Let me also add that as much as Australia doesn't have any serious strategic threats, this may not always be the case. If we fast forward the tape 10-15 years from now, our neighbours are very likely to have modern fleets of Su 35 and PAK-FA's which will be more than a match for the RAAF's Super Hornets and F-35's. It only takes one fanatical general to look at an Australian oil rig south of East Timor. If he realises that he has the upper hand in a military engagement then we have a big problem on our hands. Also given the worsening economic conditions in the United States, I think it would be foolish not to plan for the contingency that militarily we have to look after ourselves.

In conclusion then I urge you very strongly to do everything in your power to stop this acquisition. It is now time to look for other alternatives because our current path will leave us defence less. However don't take my word for it. Contact the executives at Lockheed Martin and ask them why don't they pit the F-35 against the F-22. Make no mistake the Su 35, the PAK-FA and the Chengdu J-20 have been designed with the intent of defeating the F-22. I think their answer will be quite revealing.

Best regards,

Danny Nowlan
BSc, BE (Aero), Masters (Aero) (USyd)



Stephen Smith MP
Minister for Defence

Anthony Albanese MP
Federal Member for Grayndler

Received:

12 MAR 2012

Electorate Office

6 MAR 2012

The Hon Anthony Albanese MP
Minister for Infrastructure and Transport
Member for Grayndler
334a Marrickville Road
MARRICKVILLE NSW 2204

Dear Minister

Thank you for your representation on behalf of Mr Danny Nowlan of 9 Harriet Street, Marrickville concerning the acquisition of the F-35 Joint Strike Fighter. The delay in responding is regretted.

Australia's future air combat capability is of immense importance to our national security. In 2008, the then Minister for Defence, the Hon Joel Fitzgibbon MP, commissioned the comprehensive Air Combat Capability Review to determine the future air combat needs of Australia. This review indicated that the stealthy, fifth generation, multi-role F-35 was the preferred solution for Australia's next generation air combat capability.

As a fifth generation developmental aircraft, the F-35 is undergoing a substantial flight test and evaluation program. Detailed modelling, analysis and participation in high fidelity simulator exercise have demonstrated that the F-35 can defeat all realistic current and future threats that Australia is likely to face. The F-35's combination of stealth, advanced sensors, networking and data fusion capabilities, when integrated into the networked Australian Defence Force, will ensure Australia maintains its strategic capability advantage out to 2030.

It is absolutely essential that Australia continues to maintain its regional air combat capability superiority. Since July 2011 I have repeatedly stated that Australia will not tolerate an air combat capability gap.

On 13 February 2012, the United States confirmed its intention to defer production of 179 aircraft for the United States Services over the 2013-2017 period to later years. It will take some time to accurately assess how this may affect the Australian F-35 project.

The deferral stems from both the overall United States Administration budgetary pressure, and the need for more F-35 testing and development. I understand, however, that the United States Government's commitment to acquiring some 2,440 F-35s has not changed.

I have directed Defence to conduct an exhaustive review of the risk of a capability gap and a judgment will be made later this year regarding options to ensure that there will not be a gap in capability.

Australia is currently committed to acquiring 14 F-35 Joint Strike Fighters. The first 2 aircraft are due to be delivered in the US in 2014. A decision on the timing of delivery of the remaining 12 aircraft will be made later in 2012 following the review.

Currently, Australia has 71 classic Hornets, and 24 Super Hornets - 12 of which are wired up to potentially receive the electronic warfare capability, the 'Growler'. While additional Super Hornets is an obvious option so far as addressing the risk of a capability gap is concerned, no decision has been made in relation to additional Super Hornets, although the fact that 12 are wired for 'Growler' is a relevant, material consideration.

I trust this information is of assistance to you and Mr Nowlan.

Yours sincerely

Best Wishes

Stephen Smith

Danny Nowlan

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27th March 2012

The Hon Stephen Smith MP
Minister of Defence
PO Box 6022
House of Representatives
Parliament House
Canberra ACT 2600

RE: Response to Letter of the 6th of March 2012 with regards to concerns on the F-35 Joint Strike Fighter.

Sir:

Thank you so much for your reply to my concerns over the F-35 Joint strike fighter. I am acutely aware of the pressures that the government has been under and I very much appreciate you taking the time to read and consider my concerns over the F-35. I also apologise for this late reply. I've just returned from a business trip in the U.S

I think there is no doubt of our mutual concern that Australia maintains its air superiority in our region. I also am very relieved of the fact that you are considering all options at this point. It is of great relief to me that you are not automatically considering just buying more Super Hornets and leaving it at that.

This all being said my reservations about the F-35 still remain in place.

My biggest concern over the F-35 program is that the people championing it seem to be using classified information to try and gloss over its obvious weaknesses. The prevailing arguments that are being used by Tom Burbage, the vice president of Lockheed Martin in charge of the joint strike fighter program and Air Vice Marshal Kym Osley who is in charge of the RAAF's acquisition of the F-35 seems to run along the lines of the F-35 is totally appropriate for Australia's requirements and we have the evidence in these documents. The only catch is we can't tell you what's in these documents because they are "classified".

The only problem with this argument is the unclassified information of the F-35 exhibits an aircraft that will fundamentally not be able to achieve its objectives. A number of documents in the public domain point to significant unresolvable problems with this aircraft. Some of the more notable points are:

- The aircraft is at its limits of its empty weight. Any more increases and this will eat in to its rather modest performance such, as range, payload and weight.
- Significant buffet that would affect weapons release at manoeuvring speeds.

- A range of structural and thermal issues that will add to the cost and maintenance of the aircraft.
- The shape of the aircraft limits its stealth capability to just forward radar detection.
- Its current performance renders it fundamentally uncompetitive with aircraft such as the PAK-FA and modern Surface to Air Missile threats.

In the evolution of any aircraft program there will be always things that don't go to plan. Usually when things are on track these matters take a few months to resolve without needing to re-define the performance objectives of the aircraft. The F-16 and F/A-18 programs were good cases in point. In contrast the F-35 has taken years to get even the most basic of issues to the point of resolution, but this has needed re-definition of its performance parameters. In the mean time the price of the airframe is now at the point where it exceeds the larger and more capable F-22 Raptor. Forgive me for saying so Minister, but something is very wrong here.

My only hope is there needs to be something truly remarkable in these classified documents that can save the F-35, but unfortunately experience shows otherwise. Most classified information usually pertains to fine details. These either pertain to radar frequencies, special compounds for materials and the like. The catch is these are usually fine tweaks on something that is fundamentally sound.

The problem with the F-35 is that there are so many things so fundamentally unsound with it that minor tweaks can't save this aircraft. A number of these items are,

- As I mentioned before, the shape of this aircraft is fundamentally limited to forward detection only. In reality there are many radars in a combat theatre, and you can never assume an aircraft will always be pointing its nose at an enemy radar. This can be mitigated to some extent by materials but the reality is it's merely damage control, band-aiding at best.
- The weight margins on this aircraft are so slender it would be foolish not to expect significant impacts on range/payload and combat survivability.
- The reliance on a helmet mounted display, combined with the buffet concerns would make operating this aircraft in a combat environment very difficult. To put it simply just imagine trying to operate an iPhone/iPad while driving over corrugated road in the Australian Outback.

This and many more significant concerns were identified in the U.S Department of Defence F-35 Concurrency Quick Look Review released on November 29, 2011. I can tell you as an engineering professional, if you have this many problems with an aircraft program that is over 13 years old it is highly unlikely they will be resolved at all, let alone satisfactorily.

Also it would be very foolish to claim that we in the West will have long term exclusive access to high level systems that are the supposed cutting edge of the F-35. China is now one of the world's largest manufacturer's of specialty electronics (the iPhone and iPad being notable examples) and countries such as India are also well established at being very good at software development. To say that we in the West will have a long term advantage for high technology systems is "rose coloured glasses" optimistic at best.

I would also be very wary of thinking that more Super Hornets are an adequate alternative if/when the F-35 project fails. The Super Hornet is already obsolete. Even in the near term the

Super Hornet is not an answer. In terms of air frame performance the Super Hornet is totally outclassed by existing aircraft such as the Su-35S Flanker, and even older Flankers. Some pertinent performance parameters are shown in Table – 1,

Table – 1: Comparison of F-18 Super Hornet to the Su-35S

Aircraft	Super Hornet	Su -35S
Max speed	1900 km/h	2300 km/h
Climb rate	45000 ft/min	55000 ft/min
Thrust to weight	0.93	1.1
Sustained g	7.5 (at light weights)	9 (at combat weights)

Furthermore the Su 35S is fitted with advanced radar equipment that can track multiple targets simultaneously and at range. What all this translates into is that while the Super Hornet might have the performance to get into a fight with the Su-35S it will have no hope of emerging victorious. What all this says and obviously is it will be impossible for the RAAF to maintain air superiority with aircraft like this in our region.

Minister I realize that right now you are in a very difficult position. I realize there are many elements in the RAAF who are advocating either the F-35 or the Super Hornet. However I think you can see there is overwhelming evidence to the contrary. On a personal level, I find this very sad, because a number of these individuals would have been class mates of mine in the early 90's. The fact they are giving you this advice I find very disturbing and my confidence in the RAAF is at an all time low.

In closing Minister, I realize that in the next couple of months you have some important decisions to make. While you are privy to information that I am not, none the less there is considerable evidence to indicate the F-35 and Super Hornets are far from suitable for our short, medium and long term needs. Both of them lack the required air frame performance and the on going program difficulties with the F-35 exposes the RAAF to significant risk. As I said in my earlier letter now is the time to consider other alternatives because the F-35 and Super Hornet are not appropriate for what we need.

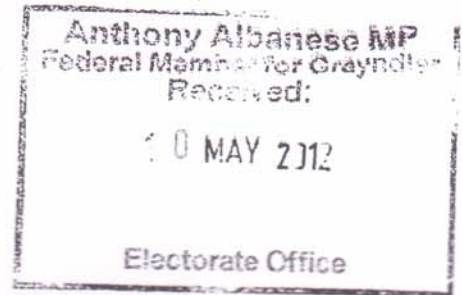
I thank you again for your time.

All the Best

Danny Nowlan\



Stephen Smith MP
Minister for Defence



The Hon Anthony Albanese MP
Member for Grayndler
334a Marrickville Road
MARRICKVILLE NSW 2204

- 1 MAY 2012

Anthony
Dear Minister

Thank you for your representation of 5 April 2012 on behalf of Mr Danny Nowlan, of 9 Harriett Street, Marrickville concerning the acquisition of the F-35 Joint Strike Fighter.

As I stated in my response to Mr Nowlan on 6 March 2012, I will not tolerate an air combat capability gap. In that respect, judgement will be made later this year regarding the options for ensuring no gap in capability occurs. Whilst noting Mr Nowlan's concerns over the capability of the F/A-18F Super Hornet, the Super Hornet remains one of a number of options.

With regard to Mr Nowlan's key concern, as one could expect with a developmental air combat aircraft such as the F-35, a large volume of performance data is classified and cannot be released to the public. Australia's analysis to date of the F-35's capability has been extensive. This analysis has involved the use of sophisticated analysis tools, professional analysts and air combat professionals in the form of our highly skilled fighter pilots. The analysis demonstrates that the F-35, when flown using tactics to exploit its inherent signature and sensor advantages, can defeat the air and ground threats that the aircraft could potentially face in Australian service. Flight testing to date has shown the F-35 is meeting its design goals. The F-35 is also planned to receive regular hardware and software upgrades to ensure it maintains its technological advantage within the region.

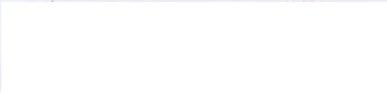
With regard to Mr Nowlan's concerns about the risk areas identified in the United States Department of Defense's F-35 Concurrency Quick Look Review, the Quick Look Review made an overall assessment of the suitability of the F-35 to continue in low-rate initial production. Whilst the report identified 13 key risk areas, which I am informed are being addressed, the report concluded that there was 'no fundamental design risk sufficient to preclude further production'.

Accordingly, the analysis of the large body of work that has been conducted to date indicates the F-35 is the right aircraft for Australia. The F-35 will meet our air combat requirements of the 2020s and with follow-on development will meet our air combat needs into the future.

I trust this information is of assistance to you and Mr Nowlan.

Yours sincerely

Best Wiles



Stephen Smith