



Submission No 21

Inquiry into Australian Defence Force Regional Air Superiority

Name: Dr Dennis Jensen, MP

Address: PO Box 329
Willetton, WA 6955

**A SUBMISSION TO THE
JOINT STANDING COMMITTEE ON FOREIGN AFFAIRS,
DEFENSE AND TRADE**

**DR DENNIS JENSEN MP
MEMBER FOR TANGNEY**

**P O Box 329
WILLETTON 6955
WESTERN AUSTRALIA**

23 FEBRUARY 2006

INTRODUCTION

My submission addresses the following Terms of Reference to Joint Standing Committee on Foreign Affairs, Defence and Trade for inquiry and report:

- a. the ability of the Australian Defence Force to Maintain air Superiority in our region to 2020, given current planning; and
- b. any measures required to ensure air superiority in our region to 2020.

THE ABILITY OF THE AUSTRALIAN DEFENSE FORCE TO MAINTAIN AIR SUPERIORITY IN OUR REGION TO 2020, GIVEN CURRENT PLANNING

The current proposal to retire the F-111 fleet from 2010 and replace them with the F-35 Joint Strike Fighter (JSF) is of great concern to me.

As the JSF is not currently due to be delivered until 2012 I have serious concerns about the interim capability following retirement of the F-111's. Additionally, I have concerns that the JSF will not be able to provide Australia with a deep strike capability, and I do not believe that the JSF will be able to adequately fulfill the air superiority role.

The main roles of the Air Combat Fleet are

- Strategic Strike
- Air Superiority
- Maritime Strike in defence of air/sea gap
- Battlefield Strike (Interdiction)

The F/A-18 followed by the JSF, may adequately fulfill maritime and battlefield strike roles, however, in my view, they are inadequate to address the roles of air superiority and strategic strike.

STRATEGIC STRIKE

The F-111 fleet currently provides around 50% of the RAAF's total strike firepower, therefore any gap filler must double the firepower available once the F-111 fleet is removed from service. Not only that, but the F-111 is a unique asset in the region, and is the capability that clearly distinguishes the capability of the RAAF from other air forces in the region. With the loss of this capability, our competitive edge will be lost.

I have concerns with the view that the AP-3C should have even been considered as a strike asset. Simply putting a standoff weapons capability on an aircraft does not make it a strike asset. In many cases, the "strike asset" will simply become a target.

The current plans to bridge the gap left by retirement of the F-111 by filling it with F/A-18 are not desirable. Granted, F/A-18's are highly manoeuvrable,

have a good payload, and are a genuine multi-role aircraft; unfortunately they have a short range and require significant tanking assets to attempt to fulfill the strategic strike role. The F/A-18 Hornet will require significant funding to remain in service.

The Hornet is limited by its small size; long range operations will require the aircraft to carry at least two 480 gallon drop tanks to provide a safe fuel margin for diversions, which impacts on the bomb load capacity. In weapons deliverable the whole fleet of 71 equates in carriage capacity to 36 F-111s, whilst F-111's have no difficulty carrying four large weapons. The capacity to support the F/A -18 fleet simply cannot double its strike sortie rate.

AIR SUPERIORITY

It is already quite clear that several nations in our region have already committed to the Russian Sukhoi's Su-27/30. These combat aircraft are highly manoeuvrable and are only outclassed in this area by the F-22. The Sukhoi Flanker is also highly aerodynamic, it is multi role, has a very large payload capacity, a very long range, late models are air refuellable, and currently readily available. Future versions will be available with the ability to supercruise - a fifth generation capability that the JSF does not possess.

These fighters are also cheap and are currently in service, they are designed to be flown with minimum training – in fact suitably selected and trained conscripts can fly them.

The known problems that these combat aircraft have are; engine durability, availability and durability of spare parts, and support issues generally.

The Su-30MK (Flankers) currently form a significant part of the air strike capabilities of countries such as China, Indonesia, Malaysia, Vietnam, India, Peru, Ethiopia and Eritrea. Currently Thailand is in negotiations to purchase these fighters.

With these facts in mind it is from this point only that we can move forward in planning for the Australian Defence Force to maintain air superiority. The Defence Department has indicated that they want the JSF as their primary air combat aircraft. Unfortunately, they are not a match for the Flankers, particularly within visual range combat.

The Department of Defence appears to be putting all of their eggs in the networking and stealth baskets. Considering that networking is an ever evolving game, all networking does for us is put us a step ahead of the game. Jamming of the network datalinks by an enemy would essentially reduce the networked fleet to the capabilities of those individual platforms.

The JSF is not a true all-aspect stealthy aircraft - it is optimised in the X-band radar frequency from the frontal aspect. The quoted stealthiness of the aircraft has since been reduced from very low observable in 2002 to low observable in 2005. The table of weapons to be qualified for release has also been reduced significantly. In addition the redesign of the external fuel tanks indicates drag, airflow and/or centre of gravity problems with the aircraft.

The Department of Defence is being naïve if it believes that all air combat in the future will take place in the beyond visual range arena, with combat never getting to the merge. This attitude is reminiscent of the 1957 British Defence White Paper, which declared the manned aircraft obsolete. It also reminds me of the United States decision in the late 1950's to remove the gun, as air combat would be undertaken using missiles alone. Vietnam soon put paid to that theory, with even the F-22 and JSF still carrying a gun.

If the Defence Department held true to their view that there would not be a merge, then they would remove the heavy gun and its ammunition, and add additional fuel.

Another question is - what happens when the threat aircraft are stealthy as well? In that case, detection and engagement ranges would be low, within visual range. Do we really want our pilots to be caught in a knife fight in a telephone booth with an aircraft that, aerodynamically, is incapable of mixing it with the threat? The objective with air combat is to be able to engage and disengage at will. With JSF, this will not be the case, and the initiative would lie with the threat aircraft.

Any engagement in this period will require fast stealthy combat fighters capable of long ranges with a versatile payload. The fighters would need to be highly agile to outclass the Flankers.

It is clear that the F-22 Raptor is the only option to adequately enhance capabilities across the Defence Portfolio. They are available in a time period that would mean savings due to the ability to have them in service before deep maintenance and centre barrel replacement of the F/A-18 is required.

These aircraft would be available at less than the "average unit flyaway cost" (AUFC) of \$121 million due to purchasing them later in the production run. The JSF, on the other hand, would cost us more than the \$90 million AUFC, because of Australia's early adoption of the type. It is quite possible that we would be looking at the same AUFC per aircraft, however with the F-22, we get so much more capability, and significantly less risk (a production JSF has yet to fly).

The timeline of the JSF has had a propensity to slip to the right, and it is doubtful that we would receive aircraft in the 2012 time period envisaged. Any slippage in the schedule simply exacerbates gaps in our capability - particularly strategic strike. It is instructive to realise that a reasonably sized strike package, with associated support aircraft, would have inadequate aerial refuelling available to reach 1000 nautical miles, even with all five A-330 tankers deployed!

MEASURES REQUIRED TO ENSURE AIR SUPERIORITY IN OUR REGION TO 2020.

The JSF should be seen as a jack of all trades but master of none. They are not in production or in service and they will serve as a second tier supplement to the F-22's.

Today, the capability of air combat aircraft should be assessed in terms of stealth, range (persistence), speed, payload and energy manoeuvrability.

The F-22's are genuine stealth aircraft, they have very good range, have a versatile payload capacity, are highly agile and have true supercruise enabling transit at twice the speed of other aircraft, including the JSF, without using afterburner. In fact, the F-22 will comfortably outperform the JSF in all aerodynamic performance aspects without recourse to using afterburners.

They are currently in production and in service; they have the ability to be upgraded over the course of their full service life. These air combat fighters are the only rivals for the Flanker once the aircraft are within visual range. An important aspect to consider is that the JSF lacks the size required for comprehensive upgrades over a long time period. This is somewhat similar to the situation with the F-15 versus F/A-18 today.

The JSF is being marketed as Fifth Generation Technology, in my opinion this is not the case. It is not highly stealthy from the rear aspect, and has been optimised to defeat X-band radar from the frontal aspect. It does not have the ability to cruise supersonically without using afterburners (supercruise). It is essentially a Second Tier Bomb Truck, it lacks the necessary aerodynamics to defeat the Flanker, never mind future aircraft that may well proliferate. It definitely lacks the range required for our geography.

As stated earlier, the problem is that using tankers adds other problems into the mix. A strike package will need to be escorted by air superiority fighters and SEAD (suppression of enemy air defences) fighters, as well as escort jammers. These will all need aerial refuelling (tanking).

Additionally, the tankers will then be in range of potential threat fighters, particularly given that the Russians are now selling air - to - air missiles with ranges of 300 - 400km designed specifically to kill tankers and AEW&C aircraft. This will necessitate a combat air patrol (CAP) to defend the tankers, which will also require tanking. An AEW&C aircraft will be required to give the CAP a tactical picture of the situation, and warn of impending attacks.

Range is a critical issue. A shorter range fighter requires that the tankers get closer to the target. This puts them into a more vulnerable position, requiring a larger CAP, which necessitates the need for more tankers. The logistics of supporting a relatively short range aircraft in the strategic strike role are problematic, to say the least.

The only combat aircraft capable of taking on the developing Sukhoi's with their rapidly changing technologies is the F-22 Raptor.

Sukhoi have a range of fighters including the Su-30 (Flanker). It is an excellent multi-role fighter, the Russian equivalent to the American F-15E Strike Eagle. It can carry an array of TV, IR, and radar guided missiles, as well as anti radiation missiles for <http://en.wikipedia.org/wiki/SEAD> and air-to-air missions, and unguided bombs and rockets.

The maximum speed of any variant of the plane is around Mach 2.3. It, like all other Flankers, has a large fuel capacity, giving it a very long range and high combat endurance. Its design incorporates a straked delta wing, with strake and body blending, this allows the airplane to fly at extreme angles of

attack without stalling.

Two other models intended to serve as; a tactical bombers and attack fighters are the Su - 34 (Fullback), and the Su - 24 (Fencer). Both are supersonic aircraft. The Fencer shares its basic design concept with the American F-111 fighter-bomber in that it is a viable geometry, supersonic, side by side seat tactical bomber.

SU-30 VARIANTS

Improvements include 3D vectoring thrust engines, with similar abilities to the 2D vectoring engines of the F-22, and the N-011 radar, which has detection range of 150-160 km range for targets with RCS (Radar Cross Section) of 3 to 5 m². The improvements made push the Sukhoi Su-30MKI variant into fifth generation fighter class. The Sukhoi Su-30MKK variant is a dual-seat, long-range strike fighter, and the Su-30MKI variant is a dual-seater with full multi-role capability. The Su-30K variant is a dual-seater, with limited multi-role capability.

The Su-30MKI has a maximum range with one in-flight refuelling, by air refueller tanker plane, of 8000 km. The Su-30MK and Su-30MKK have a maximum range with one in-flight refuelling, a distance of 5200 km. The Su-30MKI has thrust vectoring engines, whereas Su-30MK and Su-30MKK do not. The Su-30MK is considered equivalent to F-15E whilst the Su-30MKI is considered in same class as the F-15K or SG.

The Su-30MKI used by the Indian Air Force has its main central processor system designed and supplied by DRDO. The Su-30MKI variant is considered by many military analysts to be basically a fourth generation fighter (same class as EF2000 and Rafale). The Su-30MKI variant has the capability to carry tactical nuclear weapons payload (for possible nuclear strike missions). Su-30MKI variant has a combat radius of approximately 1600 km the same as F-22 whilst the Eurofighter 900 km.

The Su-30MKI variant has maximum speed of Mach 2+; in comparison the F-22 has maximum speed of over Mach 2 but is restricted due to stealth factors, and Eurofighter over Mach 2+ (roughly same as Su-30MKI). However unlike the Eurofighter and F-22A it does not have the ability to supercruise.

The avionics in the Su-30MKI include the all weather, dual frequency, digital multi mode NIIP N-011M phased array radar, which has a 200 km tracking range and a 350 km search range.

The aircraft's radar can track and actively engage 20 enemy targets and engage the 8 most dangerous simultaneously. This radar can take on and engage any ballistic/cruise missiles and hovering helicopters (very few aircraft in the world have this capability). The radar has a 20-metre detection resolution for large targets at sea, up to distances of 400 km. Small sea targets are detected at sea at distances of up to 120 km.

The current capabilities of these fighters should be concerning enough, that we seriously re-examine the proposed capability of the JSF. With this type of air strike capability on our doorstep it is vital we make the right choice. The

decision to bring the F/A-18 Hornets into full service over the acquisition of the F-22 is a significant decision which should only be taken in the with the full consideration of all the current and future capabilities in our region

I have recently attended a briefing provided by the Department of Defence in respect to the F-35 JSF combat package. This presentation did not deliver on the level of information required to make such a decision.

COSTS

The costings provided by the Department of Defence have now been shown to be incorrect and the difference between the F-22 and the JSF is now much closer than previously thought.

For the Department to claim that the JSF is a \$45 million aircraft by only considering the immediate costs of production itself, i.e. Average Unit Recurring Flyaway Costs (AUFC) is disingenuous.

Even worse is to then use a completely different metric to cost the F-22. As stated, comparing apples with apples AUFC, the F-22 is only (at worst) 1/3 more expensive than JSF, but has capability that is massively greater than JSF.

In this ever evolving world of technology, more so in the area of National Defence, we need to ensure that this major decision will keep us ahead strategically, we cannot afford to be caught out with a Leyland P76. (Kaman Sea Sprite)

CONCLUSION

The current policy of purchasing JSFs requires reconsideration in light of all the points that I have outlined.

We should immediately determine not to proceed with purchasing the JSF. It would however still be advantageous for our Industry if we remained in the SDD phase of the JSF.

The Defence Science and Technology Organisation (DSTO) should conduct an analysis of the number of F-22s that will be required to meet our capability requirements.

The issue of retirement of the F-111 and the early supplementation of F-22s into this strategy needs to be considered in the analysis that DSTO undertakes.