

Air combat transition gives birth to Air 5349

■ Trevor J Thomas/CANBERRA

The future combat face of the Royal Australian Air Force (RAAF) is set to dramatically change from end-2009 upon the introduction into service of the first of 24 Boeing F/A-18F Block 2 'Super Hornet' strike fighters.

Announcing the decision at the RAAF's No.34 Squadron facility in Canberra 6 March, the Minister for Defence, Dr Brendan Nelson, described the decision as "significant and historic", and driven by concerns to sustain the potency of Australia's air combat capability, irrespective of any later decision to acquire Lockheed Martin's Joint Strike Fighter (JSF) – see story page 14.

In another first for Australia, the raising of a new military capability acquisition project – Air 5349 – accompanied by a \$6 billion budget to cover the subject aircraft, initial support and upfront training for aircrew and maintenance personnel – is to be fully supplemented as part of the 2007/08 Defence Budget process – all made possible, said the Minister by the Government's delivery of "solid economic management and Budget surpluses over a decade."

In short, this means that work will continue under project Air 5376 to upgrade the current F/A-18A/B 'Hornet' fleet to extend its life out to 2015, whilst work will also continue under project Air 6000, and towards an initial acquisition decision in 2008 (24-48 aircraft) that would yield first aircraft some time after 2013. The casualty of the new Bridging Air Combat Capability (BACC) project is the longevity of the RAAF's F-111 bomber fleet, which Dr Nelson also confirmed will now definitely be retired in 2010.

The first four 'Super Hornet' aircraft are expected to arrive in Australia from St Louis in early-2010, given aircrew will have commenced training in the US in



US NAVY PHOTO

Key Points

- **Australia is to acquire 24 Block 2 'Super Hornet' strike fighters** in a deal brokered by Boeing and the US Navy under a \$6 billion acquisition that will see the first four aircraft in-service with the RAAF's No.1 Squadron from early-2010.
- **A new project – Air 5349 – has been established** to oversee acquisition of the F/A-18F Block 2 bridging air combat capability, and designed specifically to better position the RAAF to transition to new F-35 Joint Strike Fighters from 2013.
- **The introduction into service of the Super Hornets** will see the RAAF's long-serving fleet of F-111 bombers retired from 2010, whilst continuing upgrades to the existing F/A-18A/B 'Hornet' fleet are anticipated to assure their service through to 2015.
- **The Government is also developing an aerospace industries** capabilities retention and support program that will see RAAF technical staff and related commercial maintenance providers transitioned into work for both RAAF and US Navy Super Hornets.

mid-2009 on US Navy aircraft. Final aircraft will have been delivered by the end of 2011. Initial Operational Capability should be achieved by the end of 2010, consisting of 12 aircraft, plus trained crews (and possessing full stand-off weapons capability).

The last aircraft deliveries are set down to be achieved in 2011, with Full Operational Capability being achieved by the end of 2012, and spanning full indigenous training, support, EW support, full deployment capability, and mature crew numbers.

Explaining the rationale for the Government's decision, Dr Nelson cited three major drivers. The first comprised a reaffirmation of the Government's 'very

strong commitment' to the acquisition of the JSF, which "will carry Australia's air combat capability as the principal combat and strike capability for much of the next 30 years."

The second reflected the output of Cabinet deliberations over platform risk factors, and said to be associated with both the longevity of the F-111 and price/availability of the new JSF – and leading to a conclusion that "under no circumstances will Australia accept any kind of risk to the transition to the JSF."

According to Dr Nelson, "air combat capability ... requires more than just the JSF. It requires KC-30B air-to-air refuellers (Air 5402), the 'Wedgetail' airborne

early warning and control aircraft (Air 5077), upgrades to our F/A-18s (Air 5376), ... complex ground-based network centric air warfare systems, and new weapons systems."

Without adding in the detail, the Minister was clearly deferring to the faltering progress of a number of six key RAAF projects originally mandated by the Chief of the Defence Force, Air Chief Marshal Angus Houston (when serving as Chief of Air Force), and firmly stated at the time as being all required to be separately and successfully implemented before there was sufficient confidence the F-111 could be retired pending introduction of the F-35 JSF.

The six key capability projects were: Air 5376 ('Hornet' Upgrade or HUG – see story page 27); Air 5400 (new ASRAAM and AMRAAM air-to-air missiles); Air 5418 (new AGM-142E & JASSM strike weapons), Air 5409 (improved bombs/JDAM); Air 5077 (AEW&C) and Air 5402 (new A330 MRTT air-to-air refuellers).

According to Dr Nelson, and deferring to advice said to have been received from Lockheed Martin that its controversial and highly debated JSF program was "principally on track", the Minister repeated "our air combat capability isn't just about acquiring the JSF, it's about a whole lot of multipliers that go to support it. Under no circumstances is the Government, nor am I as the Minister, prepared to accept any kind of risk to our air combat capability."

Therefore, and on the premise that Australia needed to act in early-2007 to 'maintain its superiority in air-to-air combat and in strike capability in the transition period through to the JSF and beyond', 24 Block 2 Super Hornets (B2Fs) will be acquired from Boeing under a program that is to be progressed, said Dr Nelson, "in full cooperation with the United States Navy."

The Minister went on to describe the 'Super Hornet' as "a highly capable, battle proven, multi-role aircraft that is currently in-service with the US Navy, (and will serve) through to 2030. The next generation Block 2 Super Hornets will provide a more flex-

ible operational capability than currently exists with the F-111.”

The B2Fs will be supplied to the RAAF in essentially the same form as they are currently delivered to US Navy, and will thus come with standard US Navy weapons, such as Raytheon’s ‘Sidewinder’ AIM-9X within visual range air-to-air missile, and the AGM-152 Joint Stand-off Weapon (JSOW) - the latter of which is currently the subject of a substantive range-extension program that has potential to make them competitive with Lockheed Martin’s Joint Air to Surface Strike Missile (JASSM), already on order for the RAAF’s current Hornets under project Air 5418, and following a troubled

and extended integration of the Lockheed Martin/Rafael AGM-142E SOW on the F-111s.

The merits of the F-111 and B2F ‘Super Hornet’ were recently taken up by ADBR in its ‘Entrepreneur’ (ADBR-E) e-Newsletter (*refer www.adbr.com.au*), which observed - when evaluating the ADF’s vital stand-off land attack mission requirements - that while each F-111C would carry two 50km range AGM-142Es, rapidly changing regional threat scenarios would increasingly see a need for the aircraft to be escorted by a current RAAF inventory F/A-18A ‘Hornet’ tactical fighter.

In short, future F-111 operations would therefore be limited to the radius of action of the F/

A-18As in their normal air-to-air combat configuration (ie: 720km), meaning the range of the strike package would only be 770km. Alternatively, F/A-18F B2s flying unescorted, and with four 130km range AGM-152 JSOWs could deliver a total strike range of 1,233km.

This translated into a 60% improvement in range over the F-111Cs, and would require 25% of the rate of effort (in terms of RAAF aircraft sorties) to achieve a similar level of ‘on-target’ effect. Further, ADBR-E observed the on-target effect of the B2Fs (with their US Navy weapons), was also likely to be much better due to the JSOW’s wider range of warhead options, which include a conven-

tional unitary blast/fragmentation package, plus sub-munitions and a hard target penetrator.

In such operations, ADBR-E saw the B2Fs as likely to be far more survivable than the F-111, and a more potent air-to-air platform than current RAAF F/A-18As - by a factor of 3.4 according to US Navy estimates. Further, because the B2Fs stand-off weapon does not require further guidance by the aircraft (as is the case with the AGM-142E), the ‘Super Hornet’ would force an enemy to support a much higher rate of defensive effort in order to attempt to counter its longer stand-off range.

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Pigs go out in flames on Dr Nelson’s orders

Underpinning the 6 March decision to acquire 24 ‘Super Hornet’ strike fighters was a parallel confirmation that after years of controversy and debate, the Government had resolved that after 35 years of “magnificent” service to Australia, it really was time to retire the F-111 force.

DEFENCE PHOTO

■ Canberra Bureau Report

Confirming the Government’s decision that the F-111 would definitely be retired in 2010 (a firm date is yet to be announced), Defence Minister Nelson told media “the risks associated with flying the aircraft beyond 2010 rise on our advice to an unacceptable level.”

According to Nelson, “the operational capability of the aircraft in the 21st Century, and its capacity for situational awareness, is limited compared to other emerging fourth and fifth generation aircraft.”

Driving the claimed accumulating technical, financial and operational risks of persisting with the F-111 in RAAF service, along with doubts about its continued operational relevance, Dr Nelson said “we are determined that under no circumstances will we take

the risk of an aircraft having an engineering failure at Mach 1.5 at a very low level.”

Expanding such views at a media doorstep, the Minister noted, “Australia is the only country in the world that is left flying the F-111. We know from our Chief Scientist that the risk of flying it will start to increase around 2010, and increase at a rate which is unacceptable.”

The Minister added, “if for example, we found we had a wing crack or any sort of significant engineering failing in any one of our F-111s, all of the fleet would be grounded and we wouldn’t have enough upgraded F/A-18s to cover all of Australia’s combat and strike capability.”

In support of the Minister’s assessment, the Chief of Air Force, Air Marshal Geoff Shepherd, added “of course, there’s operational risk. As the aeroplane continues in service beyond 2010, it

becomes less relevant in the modern air space.”

According to Shepherd, “a modern combat air space is getting more and more complex, more and more confusing, and more and more electronically aware. The F-111 is not a networked aeroplane, it won’t fit into our vision of a networked air force, a networked ADF, that’ll have the knowledge dominance in order to achieve the outcomes we require.”

Shepherd further told media, “we upgraded the F-111 in the mid-80s. In today’s terms, that would have been over a billion dollars. It was a massive upgrade, taking it from analog to digital computers. An upgrade to continue beyond about 2012 would be needed to be done again with the F-111. But to do it with a ‘60s architecture - much of the design coming from the late-‘50s - becomes very, very difficult

when you’re the only operator in the world.”

The Air Chief also noted, “in the ‘80s we piggy-backed off an upgrade the Americans were doing. We couldn’t do that in the future. So the aeroplane starts to lose its operational relevance, and it really starts to happen in a big way beyond 2012, 2015.”

Shepherd added, “so it’s that increasing technical risk, increasing financial risk and the increasing operational risk, (and the aircraft’s) operational relevance, that really weighs on our mind.”

In summary, Shepherd assured media “that’s why the ‘Super Hornet’ offers us that network-centric future, it provides that jump to the next generation, it allows us to work the issues of stealth (and) work the issues of network simplicity, so that when we move into the Joint Strike Fighter future, we’re up and running from day one.”

ADBR

More practically, ADBR-E saw the JSOW being less likely to intercept, as it maintains a much lower signature (radar, IR & visible) than the non-stealthy and rocket powered AGM-142E. In other less demanding land-attack and maritime strike missions (facing no enemy air-to-air defences), the F-111C and the F/A-18F can carry similar precision guided munition and 'Harpoon' loads (four each). Yet while the F-111C boasts a 35% range advantage over the Super Hornet (1,475km v 1,095km), it suffers in-flight refuelling throughput capability disadvantages when compared to the B2F.

Contrary to intensive debate leading up to the Government's signing of the JSF Production, Sustainment and Follow-on Development (PSFD) Memorandum of Understanding - in terms of the RAAF receiving assurances it will gain ready access to F-35 technologies to sustain combat operations - Defence Minister Nelson also said of the 'Super Hornet' deal, "we have had nothing but 100% cooperation and support from the US Navy in terms of data and technology access. We have had complete access to everything that we need, including the fifth generation AESA radar system, which is compatible with both the JSF and the F-22."

Dr Nelson's reference to Raytheon's APG-79 Active Electronically Scanned Array (AESA) radar was similarly commented upon by 'ADBR-Entrepreneur', when discussing the new radar's combination onto the B2F 'Super Hornet' and its matching to the aircraft's integrated Electronic Counter Measures (ECM) systems and high-speed fibre optic data bus, along with the adoption of Open Architecture (OA) principles for software/hardware integration and ruggedised commercial-off-the-shelf (COTS) computer hardware. (see story page 28).

In short, ADBR-E concluded that to be an effective replacement for the F-111C, the BACC platform and supporting combat systems must be able to carry out existing missions, including maritime strike and stand-off strikes against well defended land targets. In such cases, the B2F is the only contender that comes already integrated with the ADF's in-service Boeing AGM-84 'Harpoon' anti-ship missile (maritime strike), which itself is subject to a further upgrade program.

Conscious of the economic and political risks to the Coalition of a severe disruption within Australia's military aerospace industry following cancellation of F-111 upgrade and maintenance work, the Government is anticipating that most of the extant workforce (allowing for retirements) will transition to the 'Super Hornet', or be absorbed in other RAAF 'Amberley' defence aerospace support and maintenance programs, and including the project Air 8000 C-17 'Globe-master III' and Air 5402 Multi-Role Tanker Transports (MRTTs).

Acknowledging the 'Super Hornet' will not need the same degree of industry support as the F-111 (as it is a vastly more modern aircraft), Defence Minister Nelson said "the Department of Defence is also to work with Boeing to ensure that the full workforce receives transition support in 2010, and specific to other forms of employment in aerospace and related industries (refer Case Study page 25).

Boeing has reportedly already commenced a review of the workforce impact on the 'Amberley' site to account for F-111 withdrawal, progress with the 'Wedgetail' modification program (including any Australian work sourced from export sales), completion of the last B707 tanker deeper maintenance work, and standing-up of

C-17 support arrangements - latterly to be followed by support infrastructure required for the new 'Super Hornet' fleet.

As lead export customer for the B2F 'Super Hornet', Australia might also expect to benefit from industrial cooperation arrangements with any subsequent export sales, including the over 200 units currently on offer to India and Japan - the latter of which Australia has just concluded agreements to significantly increase defence cooperation.

Dr Nelson confirmed to media there would be "an industry participation program negotiated for Australian industry as a part of the ('Super Hornet') acquisition, for aircraft components and weapons." Early details of the plan suggest it will contain local contractor-owned and operated intermediate maintenance and training for aircrew (including a simulator at RAAF Base 'Amberley') and support personnel. Supply chain infrastructure (ie: warehousing) is also likely to be sized to support both RAAF operations, as well as US Navy Super Hornets operating in the region.

According to the Minister, "the selection of a next generation fighter allows for upskilling of the (Australian) workforce. The 'Super Hornet' brings a significant growth of capability within the support and supply chain, low observable materials (stealth), advanced sensors and IT. This will ensure that Australian industry is trained, qualified and has access to both US Navy, and then JSF markets, as they share common technologies.

Defence officials separately confirmed to ADBR, support options were being developed for "joint future development of the 'Super Hornet' between the US Navy and the RAAF, (given) we intend to use the same software in the combat system."

Contractors identified in a recent Australian National Audit Office (ANAO) report and expected to be most effected by retirement of the F-111 force in 2010 (ie: those supporting 'deeper maintenance') include: Boeing Australia Limited, which was engaged as the 'limited prime contractor' from August 2001 to August 2011, with options to extend at five year intervals to a maximum of 20 years. Total contract expenditure for 2005/06 was \$80.1m.

Raytheon Australia was engaged for the period February 2001 to February 2011, with options to extend at five-year intervals to a maximum of 20 years. Raytheon has logistics responsibility for the F-111 avionics components, associated support and test equipment and avionics training aids. Total contract expenditure for 2005/06 was \$25.9m.

Tasman Aviation Enterprises (TAE) is engaged for the period March 2000 to April 2011, with an option to extend the contract by periods of up to 10 years to a maximum of 20 years. TAE provides metal machining, general engineering and electroplating services to 82 Wing and the other contracted Business Units. Total contract expenditure for 2005/06 was \$8.3m.

In September 2006, TAE's contract scope was extended to include TF30 jet engine Deeper Maintenance, associated support and test equipment, and engine test cells and training aids. The scope extension also requires TAE to maintain the link to the TF30 engines' manufacturer, Pratt & Whitney - and covers the period October 2006 to June 2010, with options to extend to 31 December 2012 or 1 July 2013.

The contract price is \$80.87m (excluding GST), plus provision for survey and quote of \$2.57m (excluding GST). Prior to September 2006, the work included in the scope extension was done by the Defence Materiel Organisation under an in-house arrangement. Total 2005/06 contract expenditure was \$6.9m. Rosebank Engineering also provides maintenance of F-111 hydraulic flight control components. Total 2005/06 contract expenditure was \$1.22m. ADBR

AIR FORCE 2025: Composition of RAAF Air Combat Group

Project Name	Project Phase	Role	Air System	Operational	Training & Conversion	Maintenance, ADBR	
						Attrition & Development	Total
Air 5439	Phase 3	EA	EA-18G	12	4	8	24
Air 6000	Phase 2A/2B	Fighter	F-35A	36	12	24	72
Air 6000	Phase 2C	UCAS	MQ-45C or MQ-47B	48	n/a	16	64