



January 31, 2008

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To Whom It May Concern:

I am a former U.S. Air Force officer. During 8 years in the service I gained experience as a tactical aviator and instructor navigator. After leaving the Air Force, I attended Stanford University where I earned a Masters degree in Political Science. I then moved on to the Pardee-RAND Graduate School where I completed my dissertation analyzing the impact of no-fly zone deployments on Air Force fighter crew combat skills. Over the past 13+ years I have worked on a number of RAND projects examining the impact of weapons of mass destruction, military operations other than war, ballistic and cruise missile attacks and the urbanization of conflict on U.S. Air Force strategy and operations. Other research has focused on strategic and operational aspects of Operation Allied Force and methods for enhancing the effectiveness of airpower against elusive ground targets. I spent FY 2001 attached to the US Air Force Headquarters Staff helping to develop a system to better predict Air Force combat readiness. In 2002 - 03 I co-lead the Next Generation Gunship Analysis of Alternatives (AoA). During 2004 - 05 I lead the effectiveness analysis for another AoA focused on KC-135R tanker aircraft re-capitalization. Over the past 18 months I have been engaged in analysis of emerging challenges to USAF operations, forces and bases in the western Pacific.

I have performed a detailed review of *"The F-22A and Evolved F-111 Force Mix Option" discussion paper, Release V*. This review was conducted as a professional courtesy, and the comments offered reflect my personal opinions and evaluations rather than those of the RAND Corporation.

In my opinion *The F-22A and Evolved F-111 Force Mix Option* is a well researched and executed analysis. The analytic methods and logic employed are sound and based on reliable sources and data. In particular, the discussion of the emerging regional strategic environment, technical description of potential adversary aircraft, weapons and air defense systems, and the suite of capabilities the RAAF is likely to need in order to counter and/or defeat current and emerging regional capabilities is both detailed and accurate. The assessment of the capabilities of the current, planned and "F-22A and Evolved F-111" force mixes seems to accurately reflect their relative ability and capacity to provide the combat capabilities the RAAF is likely to be called upon to deliver in the coming decades.

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While my primary expertise is analysis of air operations and training, I have significant experience with cost-effective analysis in the context of formal US Department of Defense (DoD) Major Weapon System AoAs. The main objective of these studies is to determine the relative cost-effectiveness of various alternative means of providing a defined set of military capabilities. The cost figures presented in Figure 27 of *The F-22A and Evolved F-111 Force Mix Option* and accompanying notes lack some of the detailed cost breakdown required of a formal US DoD AoA. However, spot checks against both the cited data sources and other publicly available cost information give very similar estimated cost results (within about 10 percent). In addition, the magnitude of the difference in overall cost between the current plan and the proposed alternative is so large (73 percent) that it is unlikely to be eliminated through the use of alternative data or changes in assumptions within the realm of reason. If one accepts the author's argument that the F-22A and Evolved F-111 Force Mix Option seems to provide a greater breadth, quality and capacity of most relevant capabilities then it seems that even if the costs of the currently planned force mix and the F-22A and Evolved F-111 Force Mix Option were equal, the latter should still be the preferred option. In this sense, the cost analysis results are likely to be quite robust.

In my personal assessment this proposal has considerable merit and is worthy of your most careful consideration.

Yours sincerely and respectfully,

A handwritten signature in dark ink, appearing to read "John Stillion". The signature is fluid and cursive, written over a light-colored background.

Dr. John Stillion  
Senior National Security Policy Researcher  
RAND Corporation

**From : Air Vice Marshal B J Graf AO BSc BE [Aero] [ Retd ]**

**TO WHOM IT MAY CONCERN**

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**REVIEW OF THE PAPER 'THE F-22 AND THE EVOLVED F-111 FORCE MIX OPTION  
VERSION 5**

I write as a retired member of the Royal Australian Air Force with almost 40 years service having retired at the end of 1993 with the rank of Air Vice Marshal. I was an aeronautical engineer, a pilot and a test pilot. As an engineer at one time I filled all of the senior engineer posts in the air force at that time including:

*Assistant Chief of the Defence Force - Material Air Force* - responsible for all major air related capital acquisitions.

*Assistant Chief of the Air Force – Engineering* - the Air Force's senior engineer responsible for all aspects of air force technical equipment including air worthiness policy and the fleet fatigue management.

*Senior Engineering Staff Officer [ Support Command ]* - responsible for the ongoing airworthiness of air force and army aircraft and support of all technical equipment.

In addition as a senior staff officer in Air Force and defence I had exposure to strategic and regional issues relevant to the analysis developed in the above referenced paper. In all I consider I have an appropriate background and experience to make a credible assessment of this paper

A detailed assessment of the discussion paper *The F-22A and Evolved F-111 Force Mix Option - Issue 5* has been made with particular reference to reviewing the reference material to test the information presented. I found the paper well structured and logically set out covering firstly the strategic background and then mapping the current and future distribution of airpower in our region. This section was well researched and gave an excellent overview of the status quo. It then developed the thesis that the current Australian Air Force force-structure and that planned did not meet the threat developing from the Russian sourced fighter aircraft and weapons being deployed into our region. In particular our choice of the Super Hornet and the F-35 Joint Strike Fighter were judged inappropriate and more costly than the alternative proposal - the title of the paper - *The F-22A and Evolved F-111 Force Mix Option*. The conclusion drawn then is that the F-22A and the Evolved F-111 are the only viable options for us to field a superior force against the potential rivals in the region. This option is then discussed in detail and the case made that it is a far better and cheaper choice and that it is both technically sound and practically achievable. I was impressed with the detailed arguments in this section and in particular

the assessment of the superiority of the F-22 and the potential of the Evolved F-111.

With my background in the maintenance of the airworthiness the F-111 I support the conclusion that the evolved F-111 is both technically feasible and highly desirable. In addition the ability of the F-111 to continue in service to allow the full potential of any evolution is fully covered and I support this position. The F-111 airframe properly managed will last well past the 2010 withdrawal date now set by Air Force.

I believe that a compelling case for the *F-22A and Evolved F-111 Force Mix Option* has been made. There are cogent reasons supporting this position and the paper sets these out in a logical way and it is supported by many credible references. The proposal is both technically sound and achievable. It should form the basis of a fundamental review of Australia's air superiority force structure decisions.

I commend this proposal to Defence and Government as the input to the current review of defence aerospace major capital procurement decisions.

A handwritten signature in blue ink, appearing to read 'B. J. Graf'. The signature is fluid and cursive, with the first letters of each word being capitalized and prominent.

B J GRAF

## TO WHOM IT MAY CONCERN

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I am a RAAF Wing Commander serving on the Reserve Staff Group with a Top Secret security clearance. This is my 43<sup>rd</sup> year of service. I have about 2,800 flying hours, over 1,000 of which were flown in fighter aircraft (Mirage). I have flown the Block 2 F/A-18F 'Super Hornet'. My MSc in Systems was awarded by the United States Air Force Institute of Technology and my BSc in Physics by Melbourne University. I have worked in DSTO as an operational analyst, and my work restructuring the RAAF resulted in my appointment to be a Member of the Order of Australia. A Defence Cooperation assignment designing the Indonesian Air Force's (TNI-AU) Engineering and Supply system was highly commended.

For the past five years, I have been representing the 'Red Forces' during capability development war-games based on the Australian Illustrative Planning Scenarios, work which has drawn accolades from all the senior Defence committees. I also participated in the 2003 Defence Capability Review and the recent development of the Defence Planning Guide. This work has been wrongfully terminated by the Chief of the Air Force, after I formally advised the Chief of the Defence Force, the Chief of the Capability Development Executive and the Secretary, Prime Minister and Cabinet (in lieu of the Minister for Defence) that such work indicated that neither the F/A-18F nor the F-35 JSF is likely to meet the Government's imperative to maintain air dominance in our Region.

I have performed a detailed review of 'The F-22A and Evolved F-111 Force Mix Option' discussion paper, Release V. This work parallels much of my work in the Capability Development Executive, and noting its foundation in earlier submissions to Parliament by Air Power Australia, precedes work done by the Department of Defence. Given the same information sources, both studies arrive at the same conclusion: that in the near future Australia will lose air dominance in the Region because of the rapid rise of air power in countries within our arcs of interest.

The Department of Defence's studies are a paradox. On one hand, some segments of the Department conclude that air dominance will be lost to superior Regional combat aircraft, armaments and systems. Other segments claim that inferior aircraft such as the F/A-18F and the unproven F-35 JSF will be able to dominate Regional airspace.

The Air Power Australia air dominance strategy is logically, operationally and financially sound: Australia should purchase the world's acknowledged superior air dominance aircraft, the F-22A Raptor. Using this aircraft to defeat an adversary's air combat aircraft and surface-to-air missiles, confer the required air dominance of the Region.

Once achieved, this dominance of the air allows 'striker' aircraft to operate safely. The paper proposes the F-111 in this role, as it has the combination of range, payload, speed, altitude and endurance that excel at this role. Australia has already upgraded the F-111 to bring it into the 'digital age'. The aircraft's recognised superior performance could be substantially enhanced with relatively low-cost improvements such as a new engine and avionics fit.

The paper notes that if Australia continues to operate the F-111, it could provide invaluable support for cooperation with our allies by bringing the EF-111 Raven back into service. Such an initiative is likely to receive enthusiastic support from the USAF, which has been struggling for several years to meet this requirement.

Self reliance has been a cornerstone of Australia's defence policy to decades. Current maintenance plans for the F/A-18F and the F-35 JSF propose exporting key maintenance activities to the USA – effectively exporting capabilities and work critical to Australia's sovereignty. Should the F-111 continue to be maintained in Australia as at present, these highly skilled maintenance tasks, and the associated work and employment, would be retained by Australia's industry.

The financial cost-estimate is impressive – more air combat capability for far lower cost. Using reasonable cost-estimates, the projected savings compared with the current ADF air combat capability plan is more than \$AUD16 Billion. This factor alone is a reason to accept the discussion paper for detailed, formal examination.

## **Conclusion**

My assessment as a current and qualified capability development officer and analyst indicates that the proposal presented by this paper should be used as 'Benchmark' for the future development of Australia's air combat capabilities.

The proposal meet all of the Government's (past and current) air combat capability imperatives, and does so with low risk and at a much lower cost than the current plans.

I am prepared to provide additional material from my own experience to support and corroborate the arguments of this proposal.

**I commend this paper without reservation.**

Yours faithfully,



**C. L. MILLS, AM, MSc, BSc  
Wing Commander, RSG**

**3 February 2008**

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Date: 02 February 2008

**To Whom it May Concern**

I was a RAAF pilot during the period 1950-1984, initially involved in fighter operations and specialising later in Flight Test, Development and Evaluation. I concluded my service as commander of the RAAF Aircraft Research and Development Unit.

Subsequent to my RAAF involvement, I was Managing Director of Cal Pacific Pty Limited, a Canberra based company dealing with sales, installation and training of indigenous operators of the satellite ground stations required for the COSPAS/ SARSAT satellite aided international search and rescue system. Cal Pacific installed such systems in Korea, Japan, Hon Kong, Singapore, Jakarta, Ambon, Alice Springs and Wellington.

I have examined the discussion paper “The F-22A and Evolved F-111 Force Mix Option (Release V)” in detail. I consider there is no technical issue raised which does not stem from engineering effort already completed and been subjected to peer review.

Where projections have been made, these appear to be conservative and aligned to current thinking.

The cost effectiveness aspects addressed in the paper appear to have been developed more rigorously than many presented to the previous Government.

The promise of cost savings together with enhanced operational capability, in my opinion, suggests this discussion paper has merit and should be further investigated.

Yours faithfully,



*Ronald G. Green*