

**Submission to Inquiry
Into the Planned Acquisition of the F-35 Lightning II (Joint
Strike Fighter)**

from

AVM B J Graf AO [Retd] and AIRCDRE E J Bushell AM [Retd]

1 We have read with interest the submissions put to the Committee [thirteen at the time of writing] and it seems to us that most of the major issues have been well covered already. This is especially true of the unsuitability of a small bomber aircraft to perform challenging air defence roles, which demand aerodynamic performance competitive against potential opponents developed to compete against the F-22 Raptor.

2 Our submission focuses on the series of the United States Director of Test and Evaluation [DOT&E] Reports which have been published in the US by the Department of Defence covering the progress of the testing, particularly the flight testing of the F-35. These tests are conducted in support of the F-35's development to establish whether the aircraft is fit for purpose before full rate production can be authorised under US law.

3 We believe we have the background to make informed judgments in these areas because we have what we believe are qualifications necessary for this task. Those qualifications are set out in Annex A.

4 The Director of OT&E has been reporting on the progress of the F-35 Project for some 17 years now. There have been 17 sets of reports issued, and close scrutiny of these will show the following:

- a Each year the number of deficiencies to be resolved by further testing has grown. Simply counting the number of deficiencies identified in each report confirms this.
- b In recent years the number has grown dramatically. The number is in fact growing at an increasing rate annually.
- c Many of the deficiencies remain unresolved years after they were first identified. Examples include problems with shedding waste heat from the aircraft's systems, problems with the Vsim simulation tool, problems with the software, the pilots helmet and

the ejection seat system, and shortfalls in aircraft aerodynamic and propulsive performance, as well as structural damage tolerance concerns. Many of the deficiencies are so fundamental to the design, that they cannot be corrected easily, if at all.

d Most of the serious deficiencies identified affect directly the attainment of the declaration of the aircraft's Initial Operational Capability [IOC]. The yardstick for acceptable capability at IOC has been repeatedly lowered, or intended capabilities have been pushed back from IOC into an indeterminate future.

e The planned forward flight test program does not inspire confidence that the task can be completed in a reasonable time if at all.

f The strategy of deferring the integration and test of capabilities in the aircraft to some future date following IOC is contrary to proper practice. This approach delays discovery of problems that might require expensive future modifications thus multiplying the cost of correcting such problems by the number of fleet aircraft that need to be modified. If 500 aircraft need to be modified, the cost of the modification is increased 500 fold. It should be emphasized that many of the problems identified in the DOT&E report cannot be fixed by upgrading the aircraft's software.

This is not a situation which reflects a maturing project but rather the opposite i.e. a project in deep trouble.

5 Historically, projects in this state of difficulty are uncommon, as problems on this scale usually result in project cancellation at a much earlier stage. Case studies of projects with similar intractable design problems, terminated well before they reached the crisis state of the F-35, include the Nimrod AEW.3, the A-12A Avenger II bomber, and the RAH-66 Comanche helicopter. Like the F-35 program, those projects involved unrealistic optimism, unproven and immature technologies, and unrealistically ambitious schedules.

6 The track record of the F-35 program shows no cause for any optimism. Should the highly improbable outcome of the aircraft meeting the low expectations of its performance specification eventually arise, taxpayers of partner nations will be spending on an excessively expensive to procure, and to operate, low performance aircraft suitable only for a

narrow range of roles, excluding air defence and air superiority.

7 Advocates of the F-35 program in Australia need to explain why, despite mounting evidence since 2003, they have persisted in their unquestioning optimism for the program, and continued to irrationally encourage successive Australian governments to waste taxpayers' money on a program with little or no prospect of an operationally capable aircraft as an outcome.

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Annex A: Authors' Qualifications

Annex A

Authors' Qualifications:

1. AVM B J Graf AO (Retd) BSc BE(Aero) CPEng[Retd] CEng FRAeS FIEAust:

- I served a few months short of 40 years in the Royal Australian Air Force [RAAF];
- I retired as an Air Vice Marshal;
- I was a pilot and a fighter pilot;
- I was a qualified Test Pilot - a graduate of the Empire Test Pilot's School in the UK;
- I was a Senior Engineer in the RAAF;
- I have a BSc and BE [Aero] both from Sydney University;
- I am a Fellow of the Royal Aeronautical Society FRAeS;
- I am a Fellow of the Institution of Engineers [Aust] FIE[Aust].

2. AIR CDRE E J BUSHELL AM (Retd):

- I served 35 years in the Royal Australian Air Force;
- I retired as an Air Commodore;
- I was trained and served as an Engineer Aeronautical;
- My final appointment was as the Senior Maintenance Staff Officer, HQ Support Command;
- My service included Unit Commands, Command HQ and Air Force HQ staff positions, and several major capability projects, in Australia and overseas;
- On leaving the Service, I was engaged by BHP (Aerospace and Electronics and Information Technology) on major defence and civil projects.