Submission No 27

Inquiry into Australian Defence Force Regional Air Superiority

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Hatton Response

Question:
What is the expected total Unit Procurement Cost per unit in current year-dollars for the F-35 JSF? [N.B. not the Unit Flyaway Cost or Unit Recurring Flyaway Costs and in current year-dollars, not base-year dollars]

Answer:
Average Unit Procurement Cost (AUPC) is a defined US cost term.

A diagram showing the full range of US cost terms relevant to a major project is at Attachment 1.

AUPC refers to the average cost of aircraft plus ancillary equipment, logistics support, training equipment and spares. It does not include development or facilities costs.

It is based on the US production schedule and does not include Australian specific project requirements such as weapon costs, contingency allowance etc. Hence this is not an Australian unit project cost but is indicative of the relative cost of the system versus other systems.

The F-35 AUPC is made up as follows:

- The total procurement budget for the F-35 is US$154.3B (2002 prices).
- This is for 2458 aircraft.
- The AUPC for the US program is therefore US$63m per aircraft (2002 prices).
- This is approximately US$67.3m per aircraft in 2005 prices.

Note: This is the average cost for all 3 variants; the Australian preferred CTOL is the least expensive variant.

Question:
How does that figure compare to the total Unit Procurement Cost per unit in current year-dollars for the F-22A Raptor? [N.B. not the Unit Flyaway Cost or Unit Recurring Flyaway Costs and in current year-dollars, not base-year dollars]

Answer:
The total procurement budget for F-22 is based on:

- The total procurement budget is US$31.6B (2005 prices).
- This is for 181 aircraft.
- This results in an Average Unit Procurement Cost (AUPC) of US$175m per aircraft in 2005 prices.

Question:
As a Level 3 Team Member in the JSF program. Australia is behind other partner countries in terms of priority of delivery. What impact is this likely to have on the schedule of delivery to Australia of JSF aircraft? What impact is this likely to have on the cost of JSF aircraft to Australia?

Answer:
Priority for placing Procurement Orders for JSF is based on level of contribution to SDD phase of project. Australia is therefore behind the US, UK. Italy, the Netherlands and Turkey. It is equal with Canada and ahead of Denmark and Norway. Australia is also ahead of Israel and Singapore and any other Third Party sales.

Advice from the JSF Project Office and Lockheed Martin is that expected production capacity will satisfy Australia's preferred delivery profile.

Question:
What analyses have been done to ascertain the potential benefits to Australian industry if Australia was to enter the F-22A Raptor program as the International Launch Partner?

Answer:
The F-22A has not yet been released for export. That said, scope for Australian industry involvement in the F-22A Program is likely to be very low because the initial aircraft development is now complete (i.e., except for future upgrade requirements) and production runs are expected to be too small to support cost effective 'second-sourcing' of components.

Question:
How is the Key Performance Parameter of the Radio Frequency Signature of the F-35 JSF currently rated?

Answer:
The JSF will be a Very Low Observable (VLO) aircraft. The JSF radar signature requirement has not changed since we joined the project and ongoing analysis confirms that the F-35 will meet its requirements. Ongoing analysis by Defence reaffirms our original view that JSF performance in this area will meet ADF requirements.

Question:
What was the re-categorization of the terminology in the United States such that the rating was changed from Very Low Observable to Low Observable?

Answer:
The change in categorization by the US was due to a revision in procedures for discussing stealth platforms in a public document. The previous decision to re-categorize in the public domain has now been reversed. Publicly released material now categorizes JSF as 'Very Low Observable (VLO)'.

Question:
How is this terminology currently defined?

Answer:
There is no universally agreed categorization scheme for stealth terminology.

Question:
The US Government Accountability Office (GAO) confirmed in its report of March 2006 that the aircraft is being procured 'before flight testing proves it will perform as expected'. Air Commodore John Harvey stated that 'we've had scientists involved in analysing it. we've had Australian pilots flying simulated missions. and so we're very confident in the capability of the aircraft'. What analysis and simulated activities have been done to ensure that the aircraft will perform as expected in terms of overall performance and stealth capability?

Answer:
Significant analytical effort and simulation activities are being conducted to ensure that the F-35 will meet its performance targets. The bulk of the analysis is being conducted by Lockheed Martin and its industry partners as part of the System Development and Demonstration (SDD) phase. This analysis effort is being overseen by the JSF Project Office and various national laboratories in the US.

Analysis is being conducted at a number of levels:

- Subcomponent level testing by manufacturers.
- Component-level testing by the manufacturers and Lockheed Martin.
- Sub-system level testing is being conducted by the manufacturers' at various stages of development in company laboratories.
- Sub-system level testing – for example the radar, electronic warfare system, countermeasures systems, flight control actuators – is being conducted on surrogate aircraft to test performance in flight.
- Integration testing of all the sub-systems is being conducted by Lockheed Martin at Fort Worth in the integration laboratories. (Key lessons learnt from the F-22 program are that the facilities are now collocated and approximately five times the size of the F-22 facilities).
- Integration testing will be done on the Cooperative Avionics Test Bed (CAT-B), a modified Boeing 737 aircraft, that will have all F-35 sensors, mission systems and cockpit integrated so that full F-35 functionality can be tested in a dynamic environment while providing access for engineers to resolve any problems.
- The F-35 flight test program includes 14 flying aircraft and 8 ground aircraft. Flight/ground testing will comprise over 7,000 flights over a 7 year period.
- In parallel with the above there is ongoing wind-tunnel testing, and simulation testing of all the aircraft systems and software.
- An extensive simulation facility has been developed at Fort Worth where all Partner countries fly simulated F-35 missions in a secure environment to ensure all the F-35 systems can be evaluated and concepts of operation developed.
- Scientists and other specialists for the Defence Science and Technology Organisation (DSTO) constantly review the results of (and in many cases participate in) the above activities and have developed a detailed (classified technical risk assessment).
- In addition DSTO conducts independent assessment of F-35 performance and its ability satisfy Australian requirements.
- The Australian project office is currently determining requirements for involvement in both development and operational flight test activities.

Question:
The US GAO stated in its report of March 2006 that 'producing aircraft before testing demonstrates the design is mature increases the likelihood of design changes that will lead to cost growth, schedule delays, and performance problems'. What is the likely cost growth and what is the extent of the likely schedule delays and performance problems in respect of Australia's potential acquisition of F-35 JSF aircraft?

Answer:

The US Department of Defense (DoD) does not believe a delay to the Program is needed, and has stated that "The JSF Acquisition Strategy provides the most cost effective balance of technical risk, financial resources, and the Service's operational needs."

The JSF program is the largest single military program in US history with a total program cost of over US$240b. The US Government and Lockheed Martin are fully committed to ensuring that the program is executed successfully. The program currently in place to achieve this outcome, and being managed through the JSF Project Office in the US, has been developed to address the known problems associated with and major lessons learnt from major weapons development programs.

The features of the program include an incremental Block development program to introduce capability in a measured way to meet the initial war fighting requirements of the US.

Further, a comprehensive test program – as described above - including systems integration testing of all the major sensors and electronic systems of the JSF in surrogate and specialist test aircraft is well advanced, reducing many of the risks normally associated with systems integration tasks.

The air system design for the CTOL and STOVL variants has already been through Critical Design Review and is considered sufficiently mature to commence initial low rate production. This first production run of five aircraft will further validate the production process and provide confidence in the cost of building the JSF.

Question:
The US GAO recommended in its report of March 2006 that the United States Department of Defence 'delay investing in production until flight testing shows that the JSF performs as expected'. What impact will such delays have on the cost and delivery schedule of potential JSF acquisitions by Australia?

Answer:

The US DoD continues to provide strong support for the JSF Program and believes the currently approved Program strategies are sound. The US Department of Defense (DoD) has stated that "The JSF Acquisition Strategy provides the most cost effective balance of technical risk, financial resources, and the Service's operational needs."

Any delay to the overall JSF schedule, should that occur, would result in a delay in deliveries to both the US and Australia.

Question:
What guarantees exist that Australia will have access to the necessary JSF data and technology to allow operation and support of the JSF before Australia joins the next phase of the project in December 2006?

Answer:
Australia will not enter the MoU for the Production, Sustainment and Follow-on Development (PSFD) phase unless we are assured of necessary access to technology and data to operate and support the JSF aircraft.

Question:
What is being done to ensure that such sensitive technology is transferred and shared with Australia?

Answer:
Assurance of access to necessary technology and data is being addressed by two primary means:

- Multilateral negotiation of the PSFD MoU.
- Bilateral discussions with the US Government and Lockheed Martin.

ATTACHMENT 1

US Cost Definitions