



Submission No 17

Review of the Defence Annual Report 2010 - 2011

Organisation: Department of Defence

Joint Standing Committee on Foreign Affairs, Defence and Trade

QUESTIONS ON NOTICE - COMMITTEES

Parliamentary Committee

2010-11 Defence Annual Report Hearing – 16 March 2012

Q23: Joint Strike Fighter

Senator Furner asked on 16 March 2012 (Proof Hansard pg 54):

Is there a simulated exercise available to demonstrate to the Committee the success of the F35 versus other air combat capabilities?

Response:

The United States and Partner Nation F-35 multi-aircraft air combat simulation exercises are classified.

Joint Standing Committee on Foreign Affairs, Defence and Trade

QUESTIONS ON NOTICE - COMMITTEES

Parliamentary Committee

2010-11 Defence Annual Report Hearing – 16 March 2012

Q24: Joint Strike Fighter – Simulations

Dr Jensen asked on 16 March 2012 (Proof Hansard pg 54):

- (a) Have you done simulations against the Su-35 with different varieties of mixed missile load-outs against the F-35?
- (b) What simulation software was used and how many simulations were done?

Response:

- (a) The New Air Combat Capability Integrated Project Team has performed simulations against advanced threats equipped with advanced weapons.
- (b) The Defence Science & Technology's (DSTO) Aerospace Operations Division (AOD) adopts an analysis approach that integrates a number of tools from several sources that together aggregate the best available knowledge. The following is a description of the analysis approach adopted:
 - i. Seminar wargames experiments, including Joint Military Appreciation Process (JMAP) are conducted to provide insights into courses of action, likely factors of interest, the tactical employment options and the order of battle possibilities and permutations. These activities set the context and ensure the relevance of subsequent analysis. These wargames are often supported with data from models that address high level metrics to allow informed decision making by participants who will include representatives of all three services and civilian counterparts from other agencies.
 - ii. Constructive simulation at the campaign/mission level is used to examine a large set of potential vignettes resulting from the first step. These simulations address both air-to-air and air-to-surface vignettes from differing scenarios and represent in detail the characteristics of the physical aircraft sub-systems and the tactics that govern their employment. Experts from across Defence provide specific subject matter expertise to develop, verify and validate these models.
 - iii. Human-in-the-loop simulation has been used to provide a realistic tactical environment that allows pilots to experience the aircraft capabilities, to provide feedback on the performance of particular systems and tactics and contribute to the validation and verification of the underlying models. A

regular series of these exercises has been conducted with the support of DSTO since 2003.

- iv. Constructive simulation at a more detailed level is employed to examine the complexities of engagement level tactics and system-on-system interactions. This has included air-to-air and air-to-surface weapons effectiveness, interactions with electronic warfare (EW) systems, aero performance and simulations of individual sensors.
- v. Engineering level simulation has been performed on specific sub-systems allowing for technical assessments and detailed understanding of sub-system design and performance.
- vi. Hardware-in-the-loop and/or mission-system-software-in-the-loop simulation has been conducted to provide the highest levels of fidelity.

It is important to note that there is significant interaction between these levels. For example: constructive engagement level results may be fed input into mission/campaign level modelling and analysis.

Joint Standing Committee on Foreign Affairs, Defence and Trade

QUESTIONS ON NOTICE - COMMITTEES

Parliamentary Committee

2010-11 Defence Annual Report Hearing – 16 March 2012

Q25: JSF – Sensors

Dr Jensen asked on 16 March 2012 (proof Hansard pg 55):

Have you done differential simulations of, once again, Su-35 - 2V2, 4V4, 8V8, 4V2 and 2V4, for instance?

- (a) Have you done that using widely different engagement geometrics and sensor weapon mixes – in other words, not head-to-head co-altitude?
- (b) If so, what sort of runs have you conducted in that regard?
- (c) Have you done simulations of F-35s versus any six aircraft that have HF over-the-horizon radar, working with your threat group in terms of their integrated air defence system?
- (d) Have you done any simulations, using adversary HF over-the-horizon radar equipped naval surface vessels as a component of IADS?
- (e) Have you done any simulations using current generation passive detection systems, incorporated as additional constructive elements of an adversary IADS against the F-35 scenarios?

Response:

(a) – (e)

Yes. Further information is classified and consequently cannot be provided.

Joint Standing Committee on Foreign Affairs, Defence and Trade

QUESTIONS ON NOTICE - COMMITTEES

Parliamentary Committee

2010-11 Defence Annual Report Hearing – 16 March 2012

Q26: JSF – Detection of Stealthy Aircraft

Dr Jensen asked on 16 March 2012 (Proof Hansard pg 55):

Is the JSF adequately protected against passive systems for detecting stealthy aircraft?

Response:

Yes.

Joint Standing Committee on Foreign Affairs, Defence and Trade

QUESTIONS ON NOTICE - COMMITTEES

Parliamentary Committee

2010-11 Defence Annual Report Hearing – 16 March 2012

Q27: JSF and Super Hornets

Dr Jensen asked on 16 March 2012 (Proof Hansard pg 61):

Can you tell me why Super Hornets in the United States are not allowed to operate with radar on in close vicinity to the Joint Strike Fighter?

Response:

The presumption that Super Hornets in the United States are not allowed to operate with radar on in close vicinity to the Joint Strike Fighter is incorrect. This has been confirmed with the US Joint Strike Fighter Program Office who oversight flight testing of the F-35.

The F-18F Super Hornet aircraft is one of the aircraft that has been used at Patuxent River Naval Air Station as a chase aircraft when F-35B and F-35C testing occurs. To conduct this role, the chase aircraft requires a serviceable radar. To ensure test results are unaffected by chase aircraft transmissions, however, chase aircraft are required to turn their radars off during the conduct of test points. In fact, all emitters on chase aircraft are turned off or to standby mode. This occurs irrespective of the type of chase aircraft used. At all other times, chase aircraft may use their radars in the vicinity of the F-35.