Submission No 5

Review of the Defence Annual Report 2010 - 2011

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Joint Standing Committee on Foreign Affairs, Defence and Trade

Robert,

This email provides the requested additional information on F-35 JSF Air Combat capabilities against current and future threat aircraft.

Loss-Exchange-Ratios (LER): the ONLY Air Combat Metric that Matters

I expect the Committee Members to be thoroughly confused by all the claims and counter claims made for this aircraft or that.

The only metric that matters is the 'Loss-Exchange-Ratio' which is the result of losses arising from one or more air combat engagements. This ratio is calculated by determining the losses on each side and 'normalizing' by dividing the lowest number of losses into the total losses. For example, if the losses were 200 Spitfires versus 600 Messerschmitts then the Spitfire vs Messerschmitt LER is 1:3.

These estimates are rarely disclosed. A notable exception was the article 'Raptor's Edge' (copy attached) which states:

> The operational arguments focus on
> combat effectiveness against top foreign
> fighter aircraft such as the Russian Su-27
> and MiG-29. Lockheed Martin and USAF
> analysts put the loss-exchange ratio at
> 30-1 for the F-22, 3-1 for the F-35 and 1-1
> or less for the F-15, F/A-18 and F-16.

'The Operational arguments focus on combat effectiveness against top foreign fighter aircraft such as the Su-27 and Mig-29. Lockheed Martin and USAF analysts put the loss-exchange ration at 30-1 for the F-22, 3-1 for the F-35 and 1-1 or less for the F-15, F/A-18 and F-16.'

REPSIM reproduced the F-30A vs Su-27SK engagement using the Australia Defence sponsored H3MilSim simulation program. The Loss-Exchange-Ratio over many engagements was F-35A vs Su-27SK LER 1:2.7. That is 2.7 Sukhois killed for each JSF destroyed. So pretty much the same as in the Raptor's Edge article, thereby calibrating our REPSIM H3MilSim with the Lockheed Martin an USAF simulations.

So, Committee Members might say that is a good result. Well, it is actually a disastrous result. Why?

The Su-27Sk is a 1985 model aircraft. After that, in the mid-990's came the Su-30MK series - there are many in our Region such as the Su-30MKI in India, the Su-30MK2 and Su-30MKK in China, the Su-30MKM in Malaysia and the Su-30MKV in Vietnam. The next Sukhoi Advance is the 2008 Su-35S, now entering service with the Russian Air Force. And now the Sukhoi 2010 PAK-FA we showed at the hearing.

The 'top foreign fighter aircraft' quoted in the Raptor's Edge article is now four models out of date.

So, how does the F-35A JSF fare against the later aircraft. We posted the simulations recorded for the RAND Corporation's Pacific Vision 2008 presentation onto YouTube to support our USA partner's I/ITSEC presentations in 2010. I/ITSEC is the world's largest war-gaming and military simulation trade fair, and I apologise to the Members for the 'Commercial' flavour of the material. Nonetheless, it does show the F-35A JSF being convincingly defeated and the F/A-18F Super Hornet being annihilated.

Summary of Results and Links

Now, to the results requested. I have attached the Excel spreadsheet of the results. We ran each scenario 10 times - 5 from Red and 5 from Blue perspective. The scenarios are identical except for the Blue Force Aircraft: F-22A, F-35A and F/A-18F.

F-22A vs Su35S:

http://www.youtube.com/watch?v=NZoF7hu0wAI

Results: of 240 aircraft on each side - F-22A Killed: 101; Su-35S Killed 217

Loss-Exchange-Ratio F-22A : Su-35S 1 : 2.15

Average of 2 of 2 AWACs Killed; 3.6 of 6 AAR Tankers Killed; 1 of 1 Chinese HALE aircraft killed.

This is a 'win' for the F-22A, but not Air Dominance

F-35A vs Su-35S:

http://www.youtube.com/watch?v=WwXA-EPi53c

Results: of 240 aircraft on each side - F-35A Killed: 205; Su-35S Killed 87

Loss-Exchange-Ratio F-35A : Su-35S 2.36 : 1

Average of 2 of 2 AWACs Killed; 4.2 of 6 AAR Tankers Killed; 0.3 of 1 Chinese HALE aircraft killed.

This is a SAVAGE DEFEAT for the F-35A, with the probability of surviving one mission being only 15%.

F/A-18F vs Su-35S:

http://www.youtube.com/watch?v=X7Jv88g31W0

Results: of 240 aircraft on each side - F/A-18F Killed: 240; Su-35S Killed 30

Loss-Exchange-Ratio F/A-18F : Su-35S 8.0 : 1

Average of 2 of 2 AWACs Killed;6 of 6 AAR Tankers Killed; 0.1 of 1 Chinese HALE aircraft killed.

This is a TOTAL ANNIHILATION of the US air combat forces, with NONE of the aircraft returning. The Sukhois, having blinded the operation with an early defeat of the AWACs with R-172 missiles, kill all of the Super Hornets, and the Sukhois then have the range to hunt down the tankers and kill them all.

Concluding Comments:

None of these results were 'biased' in any way. The models of the entities were constructed in fine detail, and they were sent out to fight in the H3MilSim simulation. The results are what they are.

The gradation of results gives veracity to the outcomes: F-22A Best, F-35 Joint Strike Fighter in the middle, and the F/A-18F Fighter-Attack aircraft a distant last.

H3MilSim creates a detailed database of every event, which can be forensically examined for veracity.

Air Power Australia F-35A vs Su-35S Air Combat Analysis

While I appeared before the Commmittee as a Director of REPSIM Pty Ltd, I am a regular contributor to Air Power Australia - one activity informs the other.

One for of analysis is 'Notices to Airmen' (NOTAMS):

http://www.ausairpower.net/notams.html#NOTAMS

Members will see my name on many. This NOTAM has been especially well read, with well over 100,000 'hits'. So far, nobody has made a credible refutation of the reasons of our assessment that F-35A JSF is NOT an effective air combat aircraft. Here is the link:

How: The Deadly Question for the F-35 JSF

REPSIM has not as yet simulated F-35A vs Sukhoi PAK-FA, as the sensor, countermeasures and weapons fit has not been announced. However, Members can expect from the simple logic that the more advanced capabilities of the PAK-FA will result in more disastrous LERS for the F-35A JSF. Expect numbers close to annihilation.

We can expect to see the PAK-FA in our Region as India has contracted to develop and fund 250 with Russia, and a dual seat version is planned.

The same may be said of the Chinese Chendu J-20, and we will simulate F-35A vs J-20 engagements when the J-20 equipment is more advanced.

Belated apologies for the length of this email, but the simplification is that Loss-Exchange-Ratio (LERs) is the only fighter air combat metric that matters, and REPSIM would be pleased to provide a more in-depth discussion on this matter should the Chairman and members request it.

In conclusion, my personal thanks for the Chairman's and Member's support and additional time. We thought the meeting was very productive, with the members asking relevant and pertinent questions, which we were pleased to answer comprehensively.

Yours sincerely,

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Harpoon 3 Professional Results Summary - Air Combat						
Scenario: 24 vs 24 High Altitude above Pacific Ocean, Average of 10 Runs						
Type				LOSS-EXCHANGE-RATIO		
Aircraft	Ps	Aircraft	Ps			
F-22A	58%	Su-35S	10%	1.0	:	2.1
F-35A	15%	Su-35S	64%	2.4	:	1.0
F/A-18F	0%	Su-35S	88%	8.0	:	1.0
Gripen NG	54%	Su-35S	25%	1.0	:	1.6
Gripen NG IR	52%	Su-35S	6%	1.0	:	2.0