JONES, Vice Admiral Peter, Chief, Capability Development Group, Department of Defence

OSLEY, Air Vice Marshal Kym, Program Manager, New Air Combat Capability, Defence Materiel Organisation, Department of Defence

[11:44]

SUBCOMMITTEE CHAIR: Welcome. Although the subcommittee does not require you to give evidence on oath, I should advise you that this hearing is a legal proceeding of the parliament and therefore has the same standing as proceedings of the respective houses. The giving of false or misleading evidence is a serious matter and may be regarded as contempt of parliament. The evidence given today will be recorded in *Hansard* and will attract parliamentary privilege. I invite you to make opening statements.

Vice Adm. Jones: Thank you for the opportunity to provide some opening remarks. It is now less than two years before the first two Australian F-35A aircraft are delivered, and seven years before the Initial Operating Capability, or IOC, of the F-35A in the Royal Australian Air Force. I would like to update the subcommittee on the New Air Combat Capability and some of the key issues we will deal with on the way to IOC.

The recently released 2013 Defence white paper confirms the government's commitment to the JSF and reflects the improved confidence the government and Defence has in the management of the JSF Program. The announcement at the release of the Defence white paper to acquire the 12 new-build Growler aircraft does not alter the commitment or schedule for the planned JSF acquisition. The Growler and the F-35A have different, complementing functions, with the Growler being optimised for providing broad electronic warfare support across the joint battle space. In operational service, the Growlers, with their theatre-level electronic warfare capabilities, will complement the self-protection electronic warfare capabilities of the F-35A.

The F-18F Super Hornet fleet will still provide the Bridging Air Combat Capability as the RAAF transitions to the F-35A. The decision not to modify Super Hornets to the Growler configuration but acquire new Growlers will maintain aircraft availability and so further mitigate risks in the air combat transition.

The F-35A, as a 5th generation strike fighter, will provide Australia the capability to succeed in the air across the spectrum of conflict. It will bring to the fight a degree of networking that is a force multiplier for airborne forces, as well as for land and maritime forces. The F-35A will be able to operate and win in very high threat environments where most other fighters will struggle. Very importantly, it is at the start of its operational life and will be able to evolve and improve over decades as the threat evolves.

Following the re-baselining of the program by the US Joint Program Office, in 2010-11, the program has stabilised and the manufacturer is meeting its key milestones. Technical problems with systems such as the helmet mounted display system are being addressed. We now have a greater level of confidence that the program will deliver the required capability by 2020. We have reached this view based on three independent reviews conducted by Defence. These consist of two software focussed reviews using the schedule compliance risk assessment methodology, or SCRAM, and also a further DMO-led review that was independent of the Project Team, in March/April 2013. These reviews have confirmed the assessment made by the new Program Executive Officer, Lieutenant General Bogdan, to the Defence subcommittee during his briefing at Avalon, and in his April 2013 testimony to the US congress, that the program is likely to deliver the threshold capability needed for an Australian IOC in 2020, based on block 3i of the aircraft software. Defence assesses a medium risk for the delivery of the software capabilities needed to meet the Australian IOC requirements in 2020.

Of course, with only 35 per cent of flight testing of the F-35A complete, and ground fatigue testing of the F-35A just entering the second life of testing, there is still the potential for issues to emerge. The Block 2B/3i configuration of the F-35A aircraft is assessed to be at least as capable as the Classic Hornet in the priority IOC roles and will meet the threshold requirements for IOC. At this time, all planned capability is expected to be fielded in the Block 2B/31 configuration, but there are several 'drops' of Block 2B software to be delivered in the next few months. Some capability features of the block 3F software may potentially be deferred because of the limited budget and schedule available to the F-35A System Development and Demonstration program. The recent DMO-led review, conducted independently of the project office, found that the F-35A, in a block 3F configuration, together with its weapons and support systems, is likely to be ready to meet an Australian IOC schedule.

Maritime strike capability is a high-capability priority for Australia, and also is a very high US Department of Defense priority for block 4A, planned for release to service in the 2020-21 timeframe. Defence assess a medium risk that the implementation of the Joint Stand-Off Weapon, or JSOW C-1 maritime strike weapon, could be delayed to beyond the planned F-35A final operating capability date of 2023. This risk will be reassessed once the

final block 4A content and priorities are confirmed in around September 2013 and advised as a part of the AIR 6000 phase 2A/2B second-pass consideration to government.

A high risk remains in the area of generating a suitable mission data load for the F-35A at IOC. The mission data load contains threat parameters, weapons information and other mission data. Ways of mitigating this risk are being investigated, including the sourcing of an initial mission data load from the United States.

From a schedule perspective, software remains a key risk; however, the risk appears to be reducing. The block 2B release is expected to be delivered to the fleet in mid-2015, and block 3I in 2016, representing about a four-year schedule buffer to the planned Australian IOC of 2020.

The independent DMO SCRAM review assessed about 11 months of schedule risk in the block 3F software. This assessment appears valid with about three months slip now forecast by the US JSF Program Office. The block 3F fleet release is planned for the third quarter of 2017, but could be as late as mid-2018 if the risk is realised. Defence will have better idea of fleet release date for block 3F after the block 3 critical design review in mid-2013.

The first two Australian F-35A aircraft are on track for delivery in the United States in late 2014 and will be used for training the first Australian pilots at Luke Air Force Base from 2015. Production ramp up from 35 to 100-plus F-35A aircraft and engines per annum presents a challenge, but the F-35A Joint Program Office and the recent DMO-led review assess that it is achievable. Lockheed Martin and Pratt and Whitney appear to have the resources and expertise to deliver the system development and demonstration program and hence achieve an Australian IOC of 2020.

From a cost perspective, the approved AIR 6000 phase 2A/B stage 1—that is, the 'first 14 aircraft'—remains within budget. The unapproved AIR 6000 2A and 2B stage 2—that is, the 'next 58 aircraft'—remains within its Defence Capability Plan provision.

There is now strong alignment between the aircraft acquisition cost estimates from the independent US Cost Assessment and Program Evaluation Office, the US F-35A Joint Program Office, and the Australian New Air Combat Capability Project Office. However, the aircraft costs are sensitive to US and partner nation purchase profiles. The actual costs for each successive low-rate initial production lot continue to be below the US congressional estimates. Our first two aircraft are expected to be around, or less than, the $130 million estimate that Defence has had since before 2011. Overall, in 2012 dollars and exchange rate at A$1.03 to US dollars, 72 F35As are expected to cost an average of A$83.0 million—unit recurring flyaway cost—if ordered in the 2018-19 to 2023-24 time frame.

The latest official US congressional F-35A cost estimates, sourced from the publicly available Selected Acquisition Report of 2011, are consistent with the Australian estimates and indicate the cost of the F-35A—unit recurring flyaway cost—reducing from a price of about $130 million in US then dollars for aircraft delivered in 2014 reducing over time down to about $82 million in US then dollars for aircraft delivered in the 2020 time frame.

The sustainment costs are high but reducing, and we should see further refinement of these costs now that the F-35A has been fielded at several units in the US. This area is a particular focus of the US JSF Program Office at present, who have been implementing initiatives such as improving the supportability of high-value and high-usage aircraft components; opening up greater competition for sustainment work; and further developing programs to reduce the cost of ownership of F-35A support equipment.

From an industry perspective, Australian companies have won contracts worth about $300m to date. About 30 Australian companies are directly involved in doing business with the F-35A primes, with many more Australian companies as subcontractors. About $1.5 billion in work for Australian companies is anticipated during the acquisition phase. There will be additional opportunities for Australian industry to gain sustainment-related work as the F-35A enters service, and also about $1.2 billion in F-35A-related facilities to be built in Australia.

Since the last time Defence briefed the subcommittee on the JSF project, Australian industry has achieved several important milestones. Quickstep Technologies has received qualification to manufacture all types of composite panels and doors for the F-35A centre fuselage, while Marand Precision is making progress towards commencing vertical tail production in July this year.

In conclusion, the New Air Combat Capability Program is progressing within the cost and schedule buffer available and Defence plans to bring forward a submission in 2014 for government consideration of the second pass approval for the next 58 F-35A aircraft.

SUBCOMMITTEE CHAIR: Thanks so much for that update on the JSF. I found it quite interesting, since we last were briefed at Avalon. I was interested in the cost. There appears to be a significant reduction in terms of

what was projected. Did that have any bearing in terms of Japan coming on board with a JSF and anything to do with the decision by the US government to start winding back on defence? Can you elaborate on whether that had any bearing on the prices that you have indicated at today's hearing?

Air Vice Marshal Olsey: The costs that were just covered that indicate the way the price is trending down are from, as you heard, the Selected Acquisition Report 2011. The inputs to that include things such as the latest expected orders that have come in from the partner nations and any adjustments that are made—including any adjustments made because of the Japanese announcement. So the SAR 11 figures did include the adjustments for the FMS customers that were known at the time that the SAR estimate came out.

The next SAR estimate that comes out in a short time, in the next few months, will take into account any developments in the 12 months since that last estimate came out. So, if any further FMS customers or any adjustments to partner numbers occur, they will be reflected in the latest annual estimate. Those annual estimates are valid as at this point in time.

Mr King: I think that your question went to whether the pricing influence the Japanese decision. Is that correct?

SUBCOMMITTEE CHAIR: No, I was interested in whether the Japanese inclusion in the program had a bearing on it overall.

Air Vice Marshal Osley: The short answer is any FMS customer including the Japanese does reduce the price for the other partners. That is a downward trend on the cost. Of course there are upward trends on the cost—that is, should the expected ramp down in labour time on certain parts not be achieved then that would be an upward trend on the dollar figures.

Senator MARK BISHOP: Are we doing the annual report or the JSF?

SUBCOMMITTEE CHAIR: It is basically the JSF.

Senator MARK BISHOP: Right. Have we concluded the annual report?

SUBCOMMITTEE CHAIR: Yes we have.

Senator MARK BISHOP: I want to ask a question about the agreement with the Swedes on the technology re the submarines. Is that appropriate here or not?

Mr King: I did not come prepared for it but I can talk to it to some extent. I am happy to talk about it.

Senator MARK BISHOP: The minister put out a statement today. When we were overseas last year the Germans made it quite clear—it is in the notes in our report—that they had taken over the Swedish company. They own the technology that is in dispute. For us to have access to it sometime in the future was dependent upon their agreement and finally the agreement of the government of Germany. I see in the minister's press release today he has outlined an agreement with the Swedish company and presumably the Swedish government. How does that bear relationship to the assertion of title ownership by the Germans?

Mr King: It is very complex to deal with here.

Senator MARK BISHOP: Would it be better done at another time?

Mr King: It could well be because it is longer than a simple answer. There are two competing positions from both industry and from the Swedish and German governments, although the German government plays no real role in the Swedish IP. I think it would be to better dealt with at another time.

Senator MARK BISHOP: Would it be better if I raised that at estimates in due course?

Mr King: Yes, we could do that. Basically, we have done the agreement with the Swedish government and we are now working it through with the Swedish based arm of the TKMS company, which is called Kockums.

Senator MARK BISHOP: So we have to have further negotiations with the Germans?

Mr King: Yes, that is correct.

Senator MARK BISHOP: To sign off the total package?

Mr King: Yes.

Senator MARK BISHOP: I will do it at estimates.

Senator FAWCETT: You mentioned in your opening comments that the helmet mounted display was being 'addressed'. Given the history of various 'addressing' that has occurred without resolution, could you give us some more detail on why you now have confidence that that 'addressing' is going to reach an outcome.

Air Vice Marshal Osley: When I was over in the US back in March I went to Edwards Air Force Base and spoke with the officer running the test program over there and to his deputy. One of the issues we discussed was

the helmet mounted display. They have been conducting a series of flight tests purely devoted to exploring the issues with the helmet mount display system and also some of the fixes that they have been putting into the helmet mounted display to improve its performance. That testing has just been completed and they are now finalising the analysis of it. I will give you an initial readout on what the analysis is indicating there.

As you are well aware there is a dual path on the helmet. We currently have the VSI Gen II helmet. The VSI Gen III helmet, which will have an improved low-light night vision capability will be coming in about 2015 and that will then take over. We will know longer have the VSI Gen II. We will go to an all VSI Gen III helmet. You are well aware that the other path is a BAE helmet that has a night vision goggle arrangement attached to it as an interim helmet and as an alternate helmet to the VSI helmet. At the moment both paths are being progressed but of course the flight testing was all about the VSI Gen II helmet.

I think you are across the issues but I will briefly cover them. Alignment is a key one. You hop into the aircraft and on occasion the helmet display may not be aligned with the earth. That requires you to get out of the aircraft and have it realigned on the ground. They are working on a proposal to have that, whereby you in fact fine-tune that prior to getting in the aeroplane; the pilot can do it as part of his normal checkout procedures. At the moment you have to return the helmut and basically go back and have it adjusted in the workshop. They are making it so that it is pilot-adjustable.

The next one is green glow, and that is a factor of the design of the helmut, using LCDs. It implies that there is a whole lot of extraneous light that is coming in at night around the display. Even though it is noted by a few of the test pilots it is not considered an operationally significant issue for them and they can overcome that one.

The third one is jitter. There were in excess of 35 flight tests; I believe there were 38 by the time I had been to Edwards, and there were more being planned. The initial results were that they were seeing positive improvements from the modifications that had been made. So, they had adjustments to the software to counteract the jitter, and in the pre-jitter software the pilot considered that it was acceptable but that it would require some workarounds and some compensation operationally. The post-modification ones for the anti-jitter in the software were showing significant improvement. That is all I could get out of them at the time, from the commander there.

The fourth issue is DAS latency—that is, the display has a lag in it. That lag has proven in the test flights to not be significant, so it is no major concern. It is expected to meet USAF operational requirements. They have tested it and measured it and the USAF is now considering that data, but it is looking good.

The final one is the night vision camera. The Generation II helmut is not compliant in its night vision capability, and that is an issue not so much for the USAF—it can achieve their operational requirements—but for the US Marine Corps, in particular for fine motor skills of landing on the deck of an LHD and the fine motor skills involved in air refuelling off KC-130s at night doing the probe refuelling. It is a problem both with the amount of resolution you have and with the location of the camera, as you are aware. That will be fixed in the Generation III helmut by using a better system, and they are working on that. And in the interim of course the US Marine Corps are assessing whether it is operationally acceptable to go to IOC in 2015 with it, noting that they also have the alternate helmut as the backup at this time.

So, that is a readout of where we are up to at this point in time. It is an ongoing issue, and we do expect more clarity on it later in the year. But the indication from a Royal Australian Air Force point of view is that the only issue that is basically a red at the moment is the night vision camera, and from our perspective we can achieve our IOC missions with the system as it is. It is not necessarily a red for us, from an operational perspective. I will finish by saying that the helmut mounted display will not meet the specification that was planned. That is a given; it cannot meet the specification. It is a very tight specification and the Generation II will not do that. But it is looking like being operationally acceptable.

Senator FAWCETT: Perhaps you could talk to me about the weapons road map for the Joint Strike Fighter and your current thinking around short-range and medium-range air-to-air, and also your plans for the collaboration with Norway in the Joint Strike Missile.

Air Vice Marshal Osley: The road map is that we will go to initial operating capability with a minimum of the Block 3I capabilities, and those weapons, from an air-to-air point of view, are limited to the AMRAAM.

Senator FAWCETT: So, no short-range?

Air Vice Marshal Osley: That is with Block 3F, and we are expecting that that will be implemented either for IOC or soon after IOC, but the minimum requirement for IOC is the AMRAAM as part of the Block 3I. The AIM-9X software will be in the load but it will not be certified and tested until Block 3F.

Just to make it clear: at this point in time we are of course progressing on the assumption that we are aiming to get block 3F in there, with block 3I as our fallback. The weapons road map for block 3F is to have the air-to-air mode—obviously, the gun, the AIM-9X and the advanced AMRAAMs.

Then, after that, we are looking at other projects. We have projects in the DCP to look at the next range of air-to-air weapons to take over in the longer term.

Senator FAWCETT: We will come back to AIM-9X in a moment, but with the Norwegian proposal, can you talk through the scope of the collaboration and Australia's involvement you are envisaging in that?

Air Vice Marshal Osley: Australia and Norway have had long discussions about the Joint Strike Missile over many years. We have obviously been very supportive of Norway not in a financial sense but certainly in supporting their aim at getting a very capable maritime strike missile onto the F35.

The Joint Strike Missile, as you and others are perhaps aware, is internally mounted so it retains the stealth capability of the aeroplane. It is a high-capability missile that has very useful modes in the maritime strike regime. We have been working with the Norwegians in sharing information, sharing our requirements. Certainly, the missile shows a lot of promise. The Norwegian government itself has made the decision that it will not rely on engagement with other partners and funding support from other partners to get it into service. It has taken the decision to fully fund the implementation of the Joint Strike Missile into the F35 as part of block 4. That has been announced in the press and Norway has also committed to its plans for its F35 fleet and that was announced last year as well.

So with respect to the Joint Strike Missile at this point in time, in block 4, so in the early 2020s, the planning is underway to include the Joint Strike Missile in that block of software and to have that capability on the F35A should any other nations decide to (*indistinct*) it as the maritime strike weapon.

From our own perspective, as the admiral pointed out there, our plans revolve around the Joint Stand-Off Weapon C1. We are planning to have that as our maritime strike weapon initially. The US navy and the US Air Force are very supportive of having that capability on the F35 and, of course, we are getting that same capability on the F18F.

We are intending to go to our FOC and have a maritime strike capability based on the JSOW C1.We have a joint project 3023 in the longer term that will consider options for maritime strike capability on the F35 and other platforms. I believe that that would consider the Joint Strike Missile at that time as a very serious contender in that competition.

Senator FAWCETT: So you are saying USAF and the US navy are supportive of our current intention. Does that imply that they are going to fund and conduct the integration and stores clearance work for that?

Air Vice Marshal Osley: What it means is that they are very keen to have the JSOW C1 as a weapons capability on the F35 Charlie and the F35 Alpha for the United States Air Force and the USN. Of course, we are keen to see that as well. They regard it as a high priority to have a maritime strike weapon on the F35 in the early 2020s. So, as a result, we are anticipating that JSOW C1 will be a part of the block 4 upgrade and the block 4 upgrade, following on from the block 3 upgrade that is block 3F which we are expecting at IOC or soon after, is planned to be completed in 2020, with a release to fleet in 2021. That is the current time frame for it. So that allows a buffer to 2023 for our FOC and, because USAF and USN regard it as a high priority, they obviously have considerable influence in the F35 program as to the weapons getting on the aircraft.

Senator FAWCETT: My question was that they would end up doing the work to—

Air Vice Marshal Osley: It is part of the common suit. For instance, the joint strike missile will be funded by Norway. The JSOW C1 as part of the common suit, so it is available to all the partners and all the partners make a contribution. Of course, our contributions are based on the ratio of aircraft. Our aircraft numbers are two or three per cent of the—

Senator FAWCETT: I come back to the short-range weapon. You would obviously be aware of the Classic Hornet that the AIM-9 was competed against, the ASRAAM. We ended up choosing the ASRAAM. Has there been any push from the UK to have ASRAAM or its derivatives offered as one of the common weapons? Have we given any consideration to developing the relationship and work that we have done with the UK over that weapon for the Joint Strike Fighter?

Air Vice Marshal Osley: I am not that familiar with the history. I do know that we have discussed the potential to have ASRAAM in the past. The decision was made before I turned up that we would remain common with the United States Air Force, with the AIM-9X at this point in time. I have not seen ASRAAM as a common

weapon in any of the blocks. If it is being progressed, it is being progressed as a unique one with the UK at this point in time.

Senator FAWCETT: In our agreements with the Americans and the Joint Strike Fighter project, what options do we have to do subcomponent and whole of system tests on the AIM-9X here in Australia in understanding its performance, particularly its sensor capabilities?

Air Vice Marshal Osley: I will have to take that question on notice. I could only answer in the broader sense. I know that with your test pilot background, that probably would not be adequate. It will take that on notice.

Senator FAWCETT: What I am more concerned about is that, at the moment, we are on track with both the Super Hornet and the Joint Strike Fighter to see the residual capability that we have within DSTO and Defence around sensor evaluation, sensor development, which has been proven to an extent, particularly with ASRAAM, where a number of the tools that were developed around IR missiles have now been adopted by the Americans, because they have been so successful and effective. Through our procurement decision, we are on a trajectory where we will lose all of that capability to test, develop and certify or integrate onto platforms weapon systems, when in the past we have demonstrated time and again that just taking what the Americans have offered may not be the best solution—hence our choice of ASRAAM—and we can actually add value to our international partners, in this case the UK for the sensor but also for the US in terms of testing concepts and systems. Even with things like the Classic Hornet we have seen that when they have delivered software loads for a new store—you would be familiar with the ACO flutter incident—the level of testing that we have traditionally conducted here has benefited them, because we have approached it in a different manner, to a different level of thoroughness, and yet we are on a trajectory to lose all of that, from what I am hearing of your procurement decisions. Can you talk to me about what plans you have to either retain DSTO and Defence's capability here or, indeed, leverage us into activities in the States such that we maintain a sovereign level of capability into the future?

Air Vice Marshal Osley: What I can point out is that we are engaging with the US military test community—obviously at Eglin and other places, including China Lake. We are progressing agreements with those people to have our people involved in the conduct of tests and to do it in a collaborative way where the Australian test organisation does not duplicate or is rendered irrelevant, where they work in conjunction. I am wondering whether the word 'pace' is familiar to you. We are working in agreements with the United States Air Force to collaborate on weapons testing, certifications and clearances, to have an Australian involvement in that. That is an ongoing thing. What it draws on is the fact that you are correct, that in the past we have value-added in those areas that you have pointed out. The reality is that the weapons testing and the testing of not just weapons but the aircraft and software against threats and so on, a lot of that is going to be US-based in the future, or if it does come to Australia it comes as a package. Therefore we do not want to necessarily duplicate everything out here in Australia; we want to work as one team to do that. So I think what we are moving from is very much an embedded and coordinated way of doing that weapons testing.

I can assure you that we have no intention of losing the edge that we have in DSTO and in Defence in dealing with those test issues and looking at weapons and making judgements about them and improvements. In the F35 program with regard to the radar and weapons, we have already been heavily involved in providing advice back from DSTO and other areas. AOSG of course has been involved in that as well. That is ongoing. As I said, I can research a better response to your answer with more specific examples of how we are doing it, what is involved in the program that we are looking at with the United States Air Force and so on. I think from a professional point of view you would be quite interested in that and I think you would be impressed.

Mr King: I would like to talk about the strategic engagement with the US for a minute. I think your proposition is that on this program certain things are being done in the US that we might otherwise have played a greater role of in Australia. At the highest level I co-chaired recently the ADAC, which is an acquisition and science group that meets under the auspices of AUSMIN. The Chief Defence Scientist and I had two days of discussions in Australia with our US opposite numbers. I think what is happening is quite the contrary to the point you are making about JSF. I have never seen such a high level of cooperation going on in the science and test and evaluation area that we have now got going. Admiral Jones attended the meetings with me. I think what is happening is that the US budget situation is forcing them to be much more embracing of what other countries can do. We saw very high levels of cooperation and future plans developing where I think we will play a greater role and an independently greater role. What I mean by that is doing whole pieces of work in the science and technology area, test and evaluation area and engineering areas and that the US will rely on that work to be inputted to their thinking. In fact, we spent half a day, I think, of the two days at DSTO going through a whole program of initiatives across all of the spectrum of Defence activities for where we will cooperate in a very much peer-to-peer relationship.

CHAIR: In the remaining minutes I will hand over to Dr Jensen.

Dr JENSEN: Air Vice Marshal Osley, in a previous hearing you responded to APA's criticism of the F35's aerodynamic performance and you said that it is inconsistent with years of detailed analysis undertaken by Defence, the JSF program office, Lockheed Martin and eight other partner nations. Given that the Director of Operational Test and Evaluation has indicated that the JSF program office, the JPO, has asked JROC to reduce the sustained turn and the acceleration performance essentially to exactly the numbers that APA was predicting years ago, what does that say about the detailed analysis by Defence, the JSF program office, Lockheed Martin and the eight partner nations?

Air Vice Marshal Osley: The points that the Director of Operational Test and Evaluation made there about the manoeuvrability, as you point out it was the sustained turn and the transonic acceleration. He pointed out that the targets that have been set for those parameters were not going to be met by the F35. The figure of I think it was 55 seconds for transonic acceleration, the F35 was going to take 63.9 seconds to do that. That is obviously at a certain altitude, I think it was 30,000 feet, and a range of mach 0.8 up to mach 1.2.

The point to make about those is that that acceleration by the F35 is in a combat configuration. If you look at the legacy aircraft and we talk about comparable performance, a legacy aeroplane would require weapons and, obviously, external fuel tanks to be in combat configuration.

Dr JENSEN: Air Vice Marshal, sorry to interrupt you, the basis of my question—

Air Vice Marshal Osley: Chair, can I finish that one off?

CHAIR: Let the Air Vice Marshal finish his answer, then proceed.

Air Vice Marshal Osley: If we compare those two, the legacy aeroplane with fuel tanks and weapons on it, if we take a fourth generation fighter, typically an F16 or an F18, in that configuration it would take substantially longer than 63.9 seconds. If you took a 4½ generation aircraft it actually could not accelerate to supersonic in any time over that 0.8 to 1.2 range with a combat configuration of external tanks and weapons. The point I made originally was that we need to talk apples and apples between legacy fighters and the F35 on manoeuvrability and performance capabilities.

Dr JENSEN: I guess my concern is that the numbers that we were talking about, the numbers that the JPO has asked the JROC to reduce them from, are actually threshold numbers. They are not the desired numbers; they were the bare minimum threshold specifications. They did not reach it, but more to the point you had this group APA which actually accurately predicted what those numbers were going to be, in stark contrast to what Defence, Lockheed Martin and all those other organisations were saying. My question is: what does that say about the fidelity of the modelling and the analysis that is undertaken by all those organisations when you can get a small organisation getting the numbers right but all of those that are involved with the JSF have got them so wrong?

Air Vice Marshal Osley: The way that the requirements for the F35 were set up is to talk about mission performance. Mission performance specification is the high level. There is no doubt at this time about the F35 meeting that mission performance—that is, the ability to counter certain threats that might be encountered at IOC and into the future. That level of the specification remains as valid; we are not questioning that; it is actually achieving that. Below that you have your key performance parameters. The aeroplane at this point in time is achieving those, as far as the F35A is concerned.

The figures that you are talking about, the specifications down the bottom with the sustained turn and the transonic acceleration, are derived values in order to meet the overall mission performance specification. We have always been focused on the ability of the aeroplane to meet the overall mission performance specification—the ability to do its air-to-air mission and to do its air-to-ground mission. If you take a particular parameter, such as the transonic acceleration, the difference between—in fact, the F35 can reach mach 1.16 in 55 seconds, so it is 0.04 mach short of that target, and in a slight descent it will exceed the limit. The point to make is that we do not necessarily get too focused on those individual derived parameters. We are focused on the overall ability of the platform, trading off everything—all the different capabilities—it has there: the situational awareness, the performance of the radar, the performance of the electronic warfare capability, the performance of stealth, the balance of range mission payload and the weapons.

The situational awareness is really the key—taking that and seeing how it performs against the overall mission specification. For instance, the trade-off that might have been made—the delay in the transonic acceleration—might have been due to giving it increased stealth as they were going through the design of the aeroplane. So you really need to see not the individual parameters but the overall specification. At the highest level, as I said, it is all about mission performance. That is what we do focus on.

Dr JENSEN: Okay. I will just make the point once again that a small group actually got those numbers right when Lockheed Martin and others got it wrong. Speaking about things like situational awareness and so on, the DOTE did an operational utility evaluation when, obviously, you now have now line pilots flying as opposed to people who you might say have a vested interest in saying good things about the JSF. In terms of what the line pilots say, their view of the JSF has not been particularly favourable, particularly with regard to those issues of situational awareness and the canopy bow. There were four pilots. Basically all of them were negatively disposed towards that. Three of the pilots predicted severe impact in combat or in training and one of them said 'aft visibility will get the pilot gunned every time'.

My concern is that you are getting all the idealised statements that come out of Lockheed Martin and the JSF project office and so on. But then you get line pilots who are highly critical of it. The report by the Director of Operational Tests and Evaluation also made the point that the simulator was not correct, particularly with engine performance: the spool up and spool down time. The director also made very negative comments in another report with regard to the aircraft's vulnerability. The point was made that the removal of all sorts of systems had resulted in the aircraft not meeting its requirement to have vulnerability better than legacy aircraft.

Air Marshal Brown: I will answer that question and try to deal with it in a couple of parts. I think you are kind of mixing situational awareness and rearward visibility.

Dr JENSEN: No, no.

Air Marshal Brown: Let me go through what 'situational awareness' is because it is actually the key advantage of fifth-generation fighters. It has been the key advantage in combat for quite a deal of time, even as far back as World War II. Air crew with the most situational awareness will normally win the day. But rarely since World War II has close-in combat been the actual determining factor because situational awareness is really that combination of things—of understanding what has happened, what is happening and the ability to say what will happen into the future. This is where fifth-generation aeroplanes have an unprecedented advantage over fourth-generation types. The rearward visibility—when you look at those pilots—it depends on which aeroplane you fly.

Dr JENSEN: F16s and 18s?

Air Marshal Brown: Yes. The A10. I think most of them were A10 drivers.

Dr JENSEN: No, three were F16. One was 18.

Air Marshal Brown: I think if you have a look around on an F16 sometimes that is not wonderful either. But getting back to the situational awareness, the ability to actually have that data fusion that the aeroplane has makes an incredible difference to how you perform in combat. I saw it first hand on a Red Flag mission in an F15D against a series of fifth-generation F22s. We were actually in the red air. In five engagements we never knew who had hit us and we never even saw the other aeroplane at any one particular time. That is a current fourth-generation aeroplane.

The data fusion in the stealth makes such a difference to your overall situational awareness it is quite incredible. After that particular mission I went back and had a look at the tapes on the F22, and the difference in the situational awareness in our two cockpits was just so fundamentally different. That is the key to fifth-generation. That is where I have trouble with the APA analysis. They tend to go down particular paths in the aeroplane, whether it is turn rate performance or acceleration. These are all important factors, but it is a combination of what you have actually got in the jet and the situational awareness that is resident in the cockpit of a fifth-generation aeroplane that makes the fundamental difference.

Dr JENSEN: With the F22s there are four KPIs that relate to aerodynamic performance: range, supercruise, manoeuvrability and transonic acceleration. With the JSF there is only one, and it relates to range. Clearly with the F22 they regard those performance parameters as critical in performing its air-to-air role, whereas the parameters around the JSF are clearly designed around the strike role. Indeed, even the carriage of just two AMRAAM missiles—I know there is talk of it being four and perhaps six—

Air Marshal Brown: It actually carries four at the moment.

Dr JENSEN: The point is that the requirement was only for two, which indicates in effect a self-defence capability rather than an air combat capability, whereas the F22 has got eight in its internal configuration.

Air Marshal Brown: Let me get back to my example again. In all those cases, neither turning performance nor speed were the factors that caused us to die in those five simulated engagements. In any practice engagement I have had in the last 20 years where I have turned with another aeroplane in a bigger picture environment—rather than the static one by ones, two by twos or four by fours—every time I have tried to do that I have ended up being shot by somebody else who actually is not in the fight. As soon as you enter a turning fight, your situational

awareness actually shrinks down because the only thing you can be operating with is the aeroplane you are turning with. The person who has the advantage is the person who can stand off, watch the engagement and just pick you off at the time. So you got to be really careful about how you use those KPIs.

Dr JENSEN: Sure, but in some of these engagements, where you have and can maintain a high energy state, even in terms of BVR you have the advantage. I mean, if you have got your JSF at a relatively low level, 40,000 feet, and your enemy up at about 55,000 feet, they can supercruise but you cannot, they can set the terms of the engagement. The problem is that, in terms of the stealth issue, we now no longer have a situation where we are the only game in town and they are not going to have it. You have got the J20, the J31 and the T50 PAK-FA—clearly stealth is becoming ubiquitous—so what about them?

Air Marshal Brown: They are going down that road, but let me tell you I do not think they have the level of stealth that is available in US fifth-generation aeroplanes—and it is by a significant factor that they are still not there. So I still think there are significant advantages with an F35. You have got to remember that PAK-FA, J20 and J31 are possibly where we were in excess of 10 to 12 years ago in their development time frames at the moment—so all those aeroplanes have still got a long way to go. I am not sure they will have the degree of sensor fusion that is available with the JSF. To me that is key: it is not only stealth; it is the combination of the EOS and the radar to be able to build a comprehensive picture. In that engagement I talked about at Nellis, in Red Flag, the ability to be in a cockpit with a God's-eye view of what is going on in the world was such an advantage over a fourth-generation fighter—and arguably one of the best fourth-generation fighters in existence, the F15. But even with a DRFM jamming pipe, we still had no chance in those particular engagements. And at no time did any of the performance characteristics that you are talking about have any relevance to those five engagements.

ACTING CHAIR: There has been a lot of discussion about the fact that some of the critics do not have access to classified data. General Bogdan made a statement relatively recently that early on in this program, for whatever reason, much of the technical data was stamped 'US only'. Now we have a backlog of technical data that is marked 'US only' but that is not 'US only'. It is not a pretty situation to be in because there are reams and reams of data through which we have to go back and look over, but it has to be done. My concern is that there was never any discussion by Defence about lack of access to certain classified data that you think you would have been aware of. What happened with it?

Air Vice Marshal Olsey: His reference there is to airworthiness. If you take it in context, you are talking about gathering enough information to do our airworthiness requirements. What occurred there is that the contract for the data to support airworthiness was not written in such a way—and it was a mistake and is being corrected--that it did not specify that the information had to be released to all the partners.

The reason it has come to light only recently that a lot of that data was for 'US eyes only' is we have only just had partner aircraft—the Dutch and the UK—going through the airworthiness process. In particular, the UK were the first to realise that they required a lot more information—or different information—than the US require for airworthiness. They needed to see that information and the supporting documents, and they found that some of those documents were 'US eyes only', and had been classified that way for no particular reason but because that was the normal way of doing the documents. That has been corrected.

The last time we got together as partners we agreed we would have a suite of documents that cover all the partner airworthiness requirements and that they would be cleared for everyone to see.

CHAIR: I thank you for your attendance here today. If you have been asked to provide any additional material, would you forward that onto the Secretariat? You will be sent a copy of the transcript, to which you may wish to make corrections of grammar or fact.

Resolved (on motion by Dr Jensen):

That this committee authorises publication of the transcript of the evidence given before it at public hearing this day.

Subcommittee adjourned 12:42.

http://parlinfo.aph.gov.au/parlInfo/download/committees/commjnt/fb49a6a2-5080-4c72-a379-e4fd10cc710a/toc_pdf/Parliamentary%20Joint%20Committee%20on%20Foreign%20Affairs,%20Defence%20and%20Trade_2013_05_16_1947.pdf;fileType=application%2Fpdf#search=%22Air%20Marshal%20Brown%22