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**JOINT STANDING COMMITTEE ON
FOREIGN AFFAIRS, DEFENCE AND TRADE**

Defence Subcommittee

Wednesday, 5 July 2006

Members: Senator Ferguson (*Chair*), Mr Edwards (*Deputy Chair*), Senators Bartlett, Crossin, Eggleston, Hutchins, Johnston, Kirk, Moore, Payne, Scullion, Stott Despoja and Webber and Mr Baird, Mr Barresi, Mr Danby, Mrs Draper, Mrs Gash, Mr Gibbons, Mr Haase, Mr Hatton, Mr Jull, Mrs Moylan, Mr Prosser, Mr Bruce Scott, Mr Sercombe, Mr Snowdon, Dr Southcott, Mr Cameron Thompson, Ms Vamvakinou, Mr Wakelin and Mr Wilkie

Defence Subcommittee members: Mr Scott (*Chair*), Mr Hatton (*Deputy Chair*), Senators Bartlett, Crossin, Ferguson, Hutchins, Johnston, Payne and Scullion and Mrs Draper, Mr Edwards, Mrs Gash, Mr Gibbons, Mr Hasse, Mr Snowdon, Dr Southcott, Mr Thompson, Mr Wakelin and Mr Wilkie

Members in attendance: Senators Bartlett, Ferguson, Johnston and Payne and Mr Edwards, Mr Hatton and Mr Thompson

Terms of reference for the inquiry:

To inquire into and report on:

- a. the ability of the Australian Defence Force to maintain air superiority in our region to 2020, given current planning; and
- b. any measures required to ensure air superiority in our region to 2020.

WITNESSES

**DAVIES, Group Captain Gavin Neil, Officer Commanding, Number 82 Wing, RAAF Base
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**MACKLIN, Mr Daryll William, Site Manager, Amberley Queensland and Senior Maintenance
Manager (Corporate), Rosebank Engineering Pty Ltd 1**

**MORRISON, Group Captain Adrian Scott, Officer Commanding, Strike Reconnaissance
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SANDERSON, Mr Andrew Mark, General Manager, Tasman Aviation Enterprises 1

WEBB, Mr Geoff, F-111 Project Manager, Boeing Australia Ltd 1

Subcommittee met at 10.01 am**WEBB, Mr Geoff, F-111 Project Manager, Boeing Australia Ltd****DUFF, Mr David John, Director, F-111 Engines Business Unit, Defence Materiel Organisation****MORRISON, Group Captain Adrian Scott, Officer Commanding, Strike Reconnaissance Systems Program Office, Defence Materiel Organisation****HARLING, Mr Mark Andrew, Program Manager, Avionics Business Unit, Raytheon Australia****MACKLIN, Mr Daryll William, Site Manager, Amberley Queensland and Senior Maintenance Manager (Corporate), Rosebank Engineering Pty Ltd****DAVIES, Group Captain Gavin Neil, Officer Commanding, Number 82 Wing, RAAF Base Amberley, Royal Australian Air Force****SANDERSON, Mr Andrew Mark, General Manager, Tasman Aviation Enterprises**

ACTING CHAIR (Senator Ferguson)—I declare open the second public hearing of the Defence Subcommittee of the Joint Standing Committee on Foreign Affairs, Defence and Trade on Australian Defence Force regional air superiority. This morning the committee will be reviewing issues relating to the maintenance of Australia's regional air superiority and, in particular, aspects on the withdrawal from service of the F111 fleet. During this hearing at RAAF Base Amberley, the committee will further pursue this issue from the perspective of defence and industry personnel responsible for delivering the day-to-day maintenance support for the aircraft.

I welcome representatives of the Department of Defence and industry contractors who provide the maintenance support for the F111 fleet. Although the subcommittee does not require you to give evidence on oath, I should advise you that these hearings are legal proceedings of the parliament and therefore have the same standing as proceedings in the respective houses of parliament. I invite you to make an opening statement.

Group Capt. Morrison—Welcome to Amberley. The Strike Reconnaissance Systems Program Office is the unit within the Defence Materiel Organisation responsible for delivery of F111 capability to Air Combat Group. At the table with me are the managers from each of the organisations which are responsible for delivering support to the F111 and, in the case of Number 82 Wing, also operating the F111. Collectively, I refer to those present as the F111 Support Management Board, as it is in that forum that we are jointly engaged in the management of F111 support.

At this stage I would like to introduce Group Captain Gavin Davies, who is the Officer Commanding of Number 82 Wing, which is the RAAF unit responsible for operation of the F111. He also has operational maintenance responsibility for the F111. Mr Geoff Webb is the Manager of Boeing Australia Ltd, responsible for the F111 Weapon System Business Unit. The

F111 Weapon System Business Unit is responsible for aeromechanical deeper maintenance of the aircraft and components, engineering and supply.

Mr Mark Harling is the manager responsible in Raytheon Australia for the F111 Avionics Business Unit, which maintains avionics components. Mr Andrew Sanderson is the General Manager of Tasman Aviation Enterprises. They hold the F111 Workshops Business Unit contract, encompassing electroplating, machining, welding and a range of general engineering services. Mr John Duff is a Defence employee and manager of the in-house F111 Engine Business Unit. The Engine Business Unit provides the TF30 engine for the F111. Mr Daryll Macklin is the Amberley Site Manager for Rosebank Engineering. Rosebank provides maintenance of hydraulic components and some specialist mechanical services, both under contract to SRSPO and as a subcontractor to Boeing.

Overall, my unit, SRSPO, meets the majority of its materiel support obligations for the F111 through industry; the majority of which is located here at Amberley. SRSPO performs the role of a business integrator, in that we manage support planning for the F111 weapons system. We manage a number of the major contracts with industry and their in-house engines business units allocate tasks to industry and apply a corporate governance framework across all dimensions of the business. In addition, 82 Wing conducts operational-level maintenance with its own workforce. SRSPO is very proud of the relationship that it has with its customer and industry. I feel we work together very well to produce a focused outcome. We meet regularly to ensure that our plans and intentions are consistent across all levels of the business. The level of support we provide is recorded in a materiel sustainment agreement and a number of materiel acquisition agreements between the Defence Materiel Organisation and the Air Force. The content of these agreements is then reflected in our contracts.

These agreements also identify the relationship between our budget and the outcomes we are required to deliver. Overall, our key deliverables are meeting targets across the board, but that is not suggesting that we are not without our challenges to manage. For an aircraft that at the time of its acquisition was intended to provide strike capability for the RAAF well into the 1980s, we have already demonstrated that the aircraft has already had a life that was not anticipated at the time it was designed.

Today we are dealing with an airframe that, while still capable and probably going as well as it ever has, is 40 years old in its design and is in its 34th year of RAAF service. It is harder today to manage the F111 than when it was new, and the risks to maintenance of capability will only increase over time. Nonetheless, we believe we are well resourced to accomplish our task and are confident that we can achieve what is currently being asked of us to get the aircraft to its planned withdrawal date. In closure, our aim is to ensure that the F111 remains mission capable until it is withdrawn from service at a time when our leaders choose and that it is not withdrawn because of some technical issues that we are unable to manage.

Mr EDWARDS—I have one question which I would like answered. It is simply this: is the F111 capable of maintaining strike capability beyond 2010-11? If so, at what cost and what safety consideration? I would appreciate a response from everyone to that question. It is really the hub of what we are about.

Group Capt. Morrison—Perhaps Group Captain Davies could start with the operational capability aspects and then we can see from there.

Group Capt. Davies—Can the F111 be a viable strike platform beyond 2010-11? My answer to that is yes. But in saying yes, it would be on a diminishing return in its current guise. We have updated the F111 to get us through to a planned withdrawal in 2010 or 2012 if that decision is taken. Beyond that, its ability to be viable in a number of defence scenarios diminishes over time.

Group Capt. Morrison—To deal with that from a maintenance perspective—and my colleagues will no doubt add to this—we are confident that the aircraft can easily get out into the 2012 time frame. At the moment, we see nothing which would prevent us going beyond that time frame. However, we need to acknowledge that, as the aircraft gets older, there is an element of risk. We tend to solve those problems and we get on with doing the business, but there is a risk of having problems that we do need to solve increasing the cost, perhaps reducing some of the capability that we are able to provide as we solve it, but we see nothing that is critical at the moment that would prevent us from going out there if we had to.

Mr Webb—In the last five years at least, the aircraft is more reliable than it has ever been. In fact, the data we have suggests the aircraft has improved in reliability overall by a factor of three in the last five years, safety critical systems by a factor of three, mission critical systems by a factor of four. So right now, it is definitely performing extremely well. The investment that has been made in the support infrastructure across the enterprise is working exceptionally well. From an engineering perspective, this aircraft is certainly capable of performing until 2012 and beyond, but at some point, you will obviously need to make further investment depending on how far you want to take it.

Mr Harling—From an avionics perspective, I echo my colleagues' views. A planned withdrawal date of 2010 out to 2012 has been planned for and is being undertaken. The experience to date has been that the avionics suite is capable of reaching those dates. Beyond those dates, there are no known barriers from an avionics supportability perspective. In terms of avionics, the risk is a question of the reliability of those instruments and avionics boxes. That reliability is being tracked now. To forecast that reliability for those outer years is not an unknown science, it just needs to be done. In terms of supporting avionics to 2012 or beyond, it is a question of analysis not a question of huge risk or barriers.

Mr Duff—From a propulsion perspective, planning out to 2012 has been under way for some time. In fact, planning went further than that. The original planned withdrawal date for the F111 was at 2020. Factors were taken into consideration to get our propulsion systems out for that date. I see no risk of getting out to 2012 and beyond, providing we have time to source spares and additional support. That is already in the contract at the moment. So, from a propulsion perspective, there is no problem.

Mr Sanderson—From the workshops perspective, which supports the other major business units here, our role is sustainability on a daily basis. Our capability is aimed at continuing to support these businesses. We do not see any technological barriers to help us or let us continue to do so for the foreseeable future. We are not creating new technology; we are delivering things

that were designed 20 or 30 years ago. We do not foresee any barriers to that in the near to distant future.

Mr Macklin—I agree with what the other guys have said. From our perspective, we have made plans in conjunction with the other guys, and with the SRSPO, certainly up to 2012. Probably the impediments would be things like support and test equipment that would need to be upgraded, because some of that is old technology. However, good planning can see to that. A lot of effort would need to go into components spares but, having said that, we are doing that along the way now. Where OEM support is no longer available, we are manufacturing our own parts in country through Rosebank or other SMEs. Rosebank has done reverse engineering many times in the past where there is no OEM support, and we could continue to do that for manufacturing spares. Another thing we can certainly look at is the retention of training: making sure those skills are still available even though they are old skills, and having those people able to do that in country. Looking at all of those aspects, I see no reason why it would not go beyond 2012.

Mr EDWARDS—During our public hearing in Canberra some weeks ago, Professor Babbage cited the risk associated with extending the life of the F111, and he made the comments that the F111:

... is rather an old air frame. It is suffering ... from quite a serious fatigue challenges—

and he also said it:

... is not going to be a viable option in intense environments downstream.

Is the F111 suffering these serious fatigue challenges?

Group Capt. Morrison—I will respond first. Back in 2002, in a fatigue test that was run to prove the fatigue life of the wings, the fatigue test article broke. The test was conducted by the DSTO. Since that time, we have put a huge amount of effort into responding to that particular problem and, although it is still a challenge to us, most of the issues from that fatigue test failure are being resolved and we are fairly confident that they will be resolved. However, that does not mean that the aircraft and those wings can go on forever. There will be a finite life where it is reasonable to manage the current wing set, and then we might have to go to other technologies or do some major repairs or modifications in order to be able to go further into the future. It really depends on how far you want to take the aircraft out. Part of our response to the fatigue issues was to acquire additional wing sets from the Americans—that is, from their retired aircraft. In fact, the majority of our fleet at the moment is flying with wings from retired American aircraft. We are refurbishing those wings and putting them into service.

The fatigue tests go to the end of this year and into early next year and, as every day goes by with those cyclical fatigue tests, our confidence increases on the life we can get out of those wings and the techniques we have to use to manage them. So we currently have a fatigue problem that we are managing, but we are confident that it is under control. The bottom line from my perspective is that the aircraft cannot go on forever in the current maintenance form unless we do something else with additional cost, effort and time.

Mr EDWARDS—I have a final question for the time being. Did anyone here at the table have any input into the advice that we have received from Defence that the aircraft is running on a viable option beyond 2010-11? Did anyone here have any input into that decision?

Group Capt. Davies—I will answer that question. From the perspective of my operations of the aircraft, for the stability to do the roles that we have been tasked to be ready to do, we have geared ourselves, bought the equipment and trained our people to meet a 2010-12 time frame. Does that mean that we will not be viable the day after Christmas 2012? That is certainly not the case. Their viability will remain for a period after that, but, as I said earlier, on a diminishing return. The aeroplane that we had 10 years ago was nowhere as good as the aeroplane that we have today, because of the equipment and the training that we have put into the F111 in order to get us to 2010 or 2012, because that was the goalpost set for us.

If the goalpost were to be changed to 2015 or 2020, we would need to acquire equipment, train people and develop the aeroplane significantly beyond what it currently has in order for it to remain viable. Regarding 2013, I do not think there would be too much of a problem. Regarding 2014, that would not be as good as 2012, comparing regional aircraft, our training practices, the level of maintenance on the equipment and the fidelity of the equipment we use. In 2015, the returns, in my view, would not be viable.

ACTING CHAIR (Mr Hatton)—In 2000, the goalposts were 2015 to 2020. So for three years, until the review in 2003, those years were the goalposts. What was the view then? You have now had to look at 2010 to 2012, but what was the view in those three years on whether it would be possible to run the F111 through to 2015 to 2020? At that time, did you have to project forward for technology insertions and a series of other things to be done?

Group Capt. Morrison—Probably the most defining event was in the middle of that period—that is, the fatigue test article failure in 2002. I think that caused a fairly substantial rethink as to the supportability of the F111 and how we could manage it. If you go back to prior that point, a huge amount of confidence was associated with running the aircraft out to the later period. The reason we were doing the fatigue test was to validate those assumptions and ideas. So, although the test article itself failed, the test did not fail in the sense that it actually validated the life of the aeroplane and the management techniques that we would need to use to keep operating it. Beyond that, I believe that the decision processes are not necessarily driven by what we do but by the external influences relating to defence policy, which we are not necessarily privy to.

ACTING CHAIR—The Chief of Air Force was very strong when we took evidence from him. Having flown those for 32 years or so, he had reached the point where he said that as far as he was concerned they were going to finish and that was the end of it. From a pilot's point of view, can you project very far forward? It is better now than it was 10 years ago but, flying this platform, do you still think it is adequate, and could it be extended if we had to do it?

Group Capt. Davies—The answer is yes again. The year 2012 is what we have been aiming for. We were asked to make the aeroplane as viable as it could be to achieve the roles that we have been set to 2012, so the equipment we have acquired and the training that we are doing are geared to reaching that to the 2010-12 period. We have complete and absolute confidence that we can go to 2012. As for 2013, I have confidence but it is not as strong as for 2012. At 2014 my

confidence diminishes, unless there is a significant input of technology, which of course takes dollars and time. A program that would keep us viable beyond 2012 is possible, but in my view it becomes a case of even greater diminishing returns—if that is the right terminology—beyond that 2013-14 time bracket. If you are asking for my opinion from the point of view of a pilot or a navigator or crew about whether the aeroplane is able to do the role in 2020, I believe that the amount of dollars and effort required to get a very small increase in its current capability is not an option that we would want to take up.

ACTING CHAIR—So we might look at that compared with the Hornet a bit later.

Senator JOHNSTON—Until 2003 we had planned and had organisations such as Rosebank and many others around Australia providing a sole operator support for a unique capability. It stands out in terms of our capability, having just done that, that the risk is all with us—with all of you sitting at the table and with us as Australians. That is where the risk has been sitting until 2003 in anticipation of 2020. What has changed since 2003? Is it irredeemable, given that the JSF looks as if it might be late, and indeed we have to anticipate that it will be?

Group Captain Davies, you have just mentioned that after 2012 we are going to have to spend some dollars and do things. I would have thought that 2015 would be the capability gap insurance that we need. What do we need to do to make sure that we can take this aircraft out of service in a seamless way such that the JSF can take over the role—although not exactly the role—to a large extent? We are buying wings and motors, as I understand it, from the boneyard. How is that going? Is it successful? All of our accompanying support is standing up and doing the job. Tell me what has happened since 2003: is it irredeemable? What do we need to do to make sure we can go to 2015?

Group Capt. Davies—The things that I believe we need to do to the F111 to make it viable to 2015 to guarantee that extra three years—if I can use that time frame, Senator—of insurance, is along the lines of the networked development that the F111 needs. At the moment it is not a networked aeroplane, as the F18 and the JSF certainly will be. So developments in communication, the ability to get data and situational awareness into the cockpit, would be one of the necessities to make it a usable platform in the Air Force we are going to have in 2012 to 2015.

Senator JOHNSTON—Is that a major drama?

Group Capt. Davies—In our ability to fly the aeroplane for a crew to train on a day-to-day basis it is perhaps not so dramatic, but I would say it is a necessity for our ability to be a viable force multiplier in a coalition or for any sort of conflict that we are likely to be involved in.

Senator JOHNSTON—Aren't they going to have to do it anyway? We are not just sending our pilots out into the ether.

Group Capt. Davies—That is why the F111 provides, I think, a great learning experience for the Air Force in particular in our development of the AGM142 night-vision goggles. All our electronic warfare development and tactics development is directly transferable to the FA18—and the JSF downstream.

Senator JOHNSTON—So it is a hardware problem not a learning problem? The guys are going to have to learn to do network-centric warfare in any event, aren't they?

Group Capt. Davies—Yes, they are.

Senator JOHNSTON—So, with link-16 and other things going into these aircraft, it is a hardware issue?

Group Capt. Morrison—Yes. To address that from a supportability perspective: the major capability driver, from my perspective, is the ability of industry to support us. One of the key things that drives that ability is the decision time frames associated with when you might decide to change the planned withdrawal date of the aircraft. If, for example, in 2012 we said we wanted to go out to 2015, it would be a very difficult prospect to do that tomorrow because we would already have begun to ramp down some of the industrial capability supporting the aircraft.

Senator JOHNSTON—That is why we might be here today.

Group Capt. Morrison—In my view, the earlier that such a decision can be made, the lesser the risk that will be faced by the whole weapons system—by industry and by the Commonwealth—because it makes sure we keep the required level of capability there. In terms of the hardware on the aircraft and needing to ramp up, the whole cycle time in our maintenance environment can measure up to four years. In other words, in order to achieve a change in direction at the time you want it, you need to start making decisions a number of years before you need to change direction.

Senator JOHNSTON—We are four years out now?

Group Capt. Morrison—That is correct. When it comes down to it, for a 2012 time-frame decision we are at the point where we need to start making decisions in a 2008 time frame so that we do not start drawing down on the industrial capability. The main threat is in engines. We do not need to be overhauling engines beyond 2008 if we are only going out into that 2010-12 time frame.

Senator JOHNSTON—We are buying engines from Arizona?

Group Capt. Morrison—We bought some surplus stock from the US when they retired the aircraft. We have a large proportion of spares. Correct me if I am wrong, John, but I believe about 70 per cent of our life-of-type spares were purchased from surplus US stock—and we still buy a large number of components on an annual basis.

Senator JOHNSTON—But that has been a successful program, hasn't it?

Group Capt. Morrison—That has been an extremely successful program. The cost of engines' support dropped dramatically because we were able to buy that surplus stock at very good prices.

Senator JOHNSTON—Can you tell us what we pay for an engine through that system?

Mr Duff—We procured the ex-USAF P109 engines at 10 per cent of cost. They are normally \$2 million and we got them for \$200,000 each. So that was a very successful program.

Senator JOHNSTON—That was a good deal.

Group Capt. Morrison—That was a really good deal.

Senator FERGUSON—They were not worth anything to the US, were they?

Senator JOHNSTON—And they are worth everything to us.

Group Capt. Morrison—It has been a successful program in terms of what it provides to the aircraft—it is a much more powerful engine—and, on the support side, it is much more reliable and cost-effective at the prices we bought most of that gear.

Senator JOHNSTON—What about these wings? They are slightly shorter and I am told they are performing well.

Group Capt. Morrison—The wings we are getting that operated out of the desert are mainly from old F111 Ds and F111 Fs. They were originally planned by the US Air Force in the short-wing configuration. We bring them back here and put them through Boeing's wing shop—and we should be able to see that later today. They go through a refurbishment program. All the high-lift devices are refurbished, we check out the fuel tanks in the wings for leakage and we also extend the wings—we make them into a long wing configuration. The advantage we get with the D and F wings over the current wings we have is that they are a much later build of wing. There are elements of the build quality of those wings that are a lot better than what we had in our original C-fleet wings.

Senator JOHNSTON—What are we paying for those wings, and is there a comparable cost saving as we had with the engine?

Group Capt. Morrison—It is a very good price out of the US. I cannot recall the specific figure off the top of my head but it is in the hundreds of thousands at the most, landed. We end up paying in the order of \$1 million a wing set—I think that is right, Geoff—

Mr Webb—That is correct.

Group Capt. Morrison—to have a refurbished wing set go through the Boeing shop and sit on an aircraft. That is a very good price.

Senator JOHNSTON—And we could not produce those if we wanted to—that is, at anything like that cost, shall we say?

Group Capt. Morrison—No, that is an extremely good price. I think I only got partially through the answer before. The main issue for us is that development cycle. The same would go if we were looking for any major changes to the aircraft. First up, the design requirements may take some years to produce, depending on the scale of what is required. Then you have to go through the modification program in a way that you do not reduce the aircraft availability too

low. Even running through a modification program can take three to four years as you run a small number of aircraft through at a time. Again it depends on the scale. To give a comparison of cost, the avionics subprogram cost in the order of half a billion dollars at that time. In comparison, if we wanted to do the scale of upgrade that might go into the Hornets these days, it would probably be of the order of about \$1 billion to do that program. That is our rough estimate.

Senator JOHNSTON—But we would not do that, given our knowledge to this point.

Group Capt. Morrison—It would depend on what capability threats we would be wanting to face. That comes back down to the operators saying what they need and how far we needed to go. From my perspective, if the operational capability requirements did not come into play, I would be suggesting that we would just continue to operate the F111 at its current cost, roughly in the order—my budget—of \$130 million to \$140 million a year, running out to whenever you want it to stop. But, if we started introducing new capability requirements, that adds a different cost.

Senator JOHNSTON—Thank you very much for that.

Senator FERGUSON—Group Captain Morrison, I am just a bit confused here. As I understand it, we are actually talking about hypotheticals because there is no plan to take the F111s past 2012 at present, is there?

Group Capt. Morrison—No, not that I am aware of.

Senator FERGUSON—In fact, if there is a gap it is going to be taken up by upgraded Hornets.

Group Capt. Morrison—That is our understanding.

Senator FERGUSON—So I am a bit concerned as to why we are extending ourselves as to whether the life of the F111s is capable of being extended when in fact the current planning is that beyond 2012 it will be upgraded Hornets that have to fill any gap that might exist until the JSF arrives.

Group Capt. Morrison—Basically, I am responding to your questions. But, if you have a look at it under the previous analysis, where we were looking at lives like 2020 and so on, we have a great deal of knowledge from that time. As well as that, just looking at our own risks, we have taken the approach that there might be some variability, should we be asked for it, and it is appropriate that we have a plan B, just in case that were required. Secondly, from my own perspective, I have been wanting us to look beyond that 2012 time frame because, if the assessment of the timing of risks is wrong, we may find ourselves facing a risk that, in that 2012 time frame, we had not anticipated. We look out there just as part of our normal course of business.

Senator FERGUSON—Group Captain Davies, I am trying to imagine this in my mind. You said you felt quite confident in the aircraft to 2012 but by 2014 you did not share the same

confidence in the aircraft. What is the difference between the F111 in 2012 and that same aircraft in 2014?

Group Capt. Davies—It is not so much a question of just the F111; it is the F111's job and ability to conduct the job in a scenario, in a context. I have considerable faith in the aircraft and in the ability of the assembled team here to provide me with safe, reliable airframes, engines and avionics; that is not my concern for 2014. But the systems we have in place on board now—the Pave Tack system, the radar system, the TFRs; all the weapons, diffusers and the bombs we currently have—will be 10, 11, 12, 14, 15 years old by then. That is something we have not factored in; we have factored in a 2012 time frame. It is not so much that at 2012 you might as well shut the hangar doors because the F111 is not viable—I am certainly not saying that—it is that all the options will do a good job in 2012, will do a good job in most of them in 2014-15 but will do a good job in fewer of them in 2015 and beyond.

Senator FERGUSON—If the proposed phase-out of the F111s occurred in 2012, when would you stop training new pilots for F111s?

Group Capt. Davies—Two years prior.

Senator FERGUSON—In other words, you would need at least two years notice, if not more, to be able to maintain your number of pilots.

Group Capt. Davies—Yes.

Senator FERGUSON—I think it was you, Mr Duff, who said that you would need time to source spares. Would you expand on that, please?

Mr Duff—The sourcing of our spares is mostly from the United States. Some of those spares would have to be manufactured, and it takes companies a lead time of anything up to two years—24 months—to go back into production. If we need to produce more overhauls, we need advance notice of at least 24 months so that we can have enough to source spares—enough lead time for the components to be manufactured.

Senator FERGUSON—As the only operator of these aircraft left—the Royal Australian Air Force—does that mean that, if they had to retool or reorder, those spares would become very expensive?

Mr Duff—We would have to assume that the cost of spares would increase, yes.

Senator FERGUSON—In talking about the risks that might eventuate post 2012, one of the things someone from the defence department said—I think it was Dr Lough—which concerned me and made me think again was that one of the problems is that you do not know what you do not know in relation to these aircraft and that the risk of unanticipated problems accelerates with each passing year. Would someone like to comment on that? To me, that was quite a telling statement—that we do not know what we do not know about these aircraft.

Group Capt. Morrison—We do a fairly detailed analysis of the aircraft. Geoff mentioned earlier that, for example, the reliability of the majority of the components is improving and

things like that. We have quite a detailed analysis across all the systems of the aircraft. We are now a sole operator, and we cannot rely on the US Air Force as a lead operator that is out there ahead of us anymore. If there is a problem that nobody has foreseen, or the US Air Force had not seen in their service, we will be the first people to find it. As was indicated, the group of people here and the companies they represent have the capability to respond to that problem should it occur. What you end up with is a situation where, if something does occur, we may not necessarily get a forecast of it. We think we are looking in all the right places but the aircraft has surprised us before. When we are trying to deliver an assured capability to the government, we have to bear in mind that there may be something we just do not know.

Senator FERGUSON—And the longer you keep them, the more there is the risk of something happening that you will not know about.

Group Capt. Morrison—That is correct. For example, if you look at fatigue issues, we do testing, we rely on USAF knowledge and we have done tear-downs of aircraft through the DSTO to have a look at older aircraft and to see what problems are occurring. But as the aircraft gets older, in a fatigue scenario, you get new modes of failure that you have not necessarily seen in all of your testing and in other operations. So you may find the aircraft failing in a different way than what was anticipated and what you are looking for. You can also simply have manufacturing problems come into play. If we are down to a single supplier of parts and that is our pile of parts that we have of that particular component, if we find there has been a manufacturing defect or the life on that component has been halved, then we have to work out how to respond to that. We could not necessarily reasonably anticipate that.

Mr Webb—I will add to that. There can never be a guarantee that there will not be an unknown failure. But it is also important to remember that the sole operator program that was initiated when the Air Force became the sole operator of the F111 has been remarkably successful. We are far better informed about this aircraft than we were five or 10 years ago. And whilst, yes, the wing failure of the DSTO test was unexpected, that is also a good example of how that has been responded to and managed, and the activities have been put in place to ensure that (1) the wings can be returned to a safe life and that (2) until that happens, there is an adequate inspection regime in place to ensure that it is operated safely. We are certainly better informed than we were, but there can never be a rock solid guarantee that there will not be another surprise.

Senator FERGUSON—I am in no way critical of the existing program—I think it has worked exceptionally well—but when you start talking about 2012, we also have to think about the scenarios that are put in front of us by people who give us evidence, such as, ‘We don’t know what we don’t know.’

Mr Webb—As Group Captain Morrison said, the earlier that a decision is made the better, because it allows us the time to be able to put into place the actions that guarantee safe operation. I think that so far the actions that have been put in place to address the known issues, given that there is still some uncertainty around the DSTO wing test, are more than adequate to get you to where you want to go at this stage.

Mr Harling—May I offer a view from the avionics perspective that will answer Senator Ferguson’s and Senator Johnston’s questions. The avionics suite is old, but it is a suite that can

be maintained to the current planned withdrawal date and possibly beyond. We have a lot of confidence in that. Why is that? Because we have avionics boxes inside the jets, which are repaired out of the jets, and they are repaired on a current basis. Therefore, issues that arise about reliability or spare parts or obsolescence can be addressed outside the aircraft itself in a production line perspective.

There are three things we need: we need commitment, we need time and we need budget. That avionics profile is saying that if you tell me what the planned withdrawal date is and you tell me what the profile of the F111 will be out to 2010, 2012 or whatever date you choose, I can undertake an assessment of the gap in the support that I need from my support base—the original equipment manufacturers, most of whom are overseas—and I can engage them and I can understand what their drivers are. Do they want to offload surplus equipment that they have, possibly cheaper? Maybe they need to retool and remanufacture, and, therefore, I can understand when I need to buy and how much it might cost me. If you tell me early, then I can make sure I can engage that supply base early enough to do a life of type buy, for example. I can do that now, I can save dollars now, or if I have to wait until later, then I can assess the cost value later on.

That is not an optimistic view, that is an experienced a view. We have OEM suppliers now who are telling us that they do not want to undertake these activities in the future. They are saying, 'Here's a last opportunity, come and buy.' So we are undertaking life of type buys now. So, to answer your question, Senator Ferguson, it could be too late next year, but it is never too late. I can undertake a buy now or later, but it might cost me if I do it later because I will have to ask that support base to retool and remanufacture.

Mr Webb—I think that Mark's comments on avionics are equally applicable to the structure of the aircraft. There are many times when we find we buy cheaper because it is a life of type buy, but there are times when it is more expensive.

ACTING CHAIR—Just before I go to Senator Payne, I have an associated question on comparison. The Americans have decided to shelve their F111s, but I think they are determined to take their B2 bomber well into the future—a significant period of time, possibly some decades. Is it a comparable situation or decision to say that the frame of it is good enough and it is supportable if you make a determination that you want that kind of capacity and there is nothing else available at that particular time, which runs to the general arguments that we have had over whether or not you can accept it?

Group Capt. Morrison—I think there are a number of things that come into play in determining whether or not that sort of decision is viable or comparable. First up is the type of aircraft. It is very difficult to compare an aircraft like a B2 or a B52 with the F111, because they are very different beasts in the way they have been manufactured and in the access to structure and things like that. In a tactical fighter aircraft like the F111, there is not a lot of space to get in easily and things like that. You also have to look at the era and the technology that was used in building it. The F111 is a very special beast in terms of the type of technology that has been used in the aircraft. If you compare that to, say, a B52, you probably have more airline type technology coming into play. You also need to consider what your overall upgrade program might be. It might look like the same aircraft on the outside, but there might be entirely different repairable items for all your components and systems than what was originally built. That is often very hard to do. It can be easy to do in a big aeroplane; for example, re-engining an aircraft

that has podded engines externally as distinct from doing it in a tactical fighter aircraft where the engine is inside the fuselage. You end up with a whole range of different issues coming into play that decide whether or not that is appropriate to do. Ultimately, you have to simply look at issues such as fatigue life, wear, the nature of the operations of the aircraft and so on, that all come into play. Are you operating in a benign environment or are you, for example, operating an aircraft at 30,000 feet straight and level for five-hour missions or operating at 200 feet in excess of mach I and pulling lots of G all the time. All of those things come into play.

ACTING CHAIR—Thank you. That is very useful, because that argument was put in prior evidence.

Senator PAYNE—In the public hearing held earlier, there was a lot of emphasis on the sole operator program and the ‘going it alone’ concept. The CAF emphasised the difficulties associated with going it alone. Mr Macklin, you touched on that earlier. Do you have any further comments to make and does Mr Sanderson want to comment on that?

Mr Macklin—Yes. What I stated earlier was about the support and test equipment. Are those the sorts of things you are talking about?

Senator PAYNE—Yes.

Mr Macklin—It is not insurmountable but it needs to be looked at. I agree with what has been said before. We have to make a decision so that we can plan ahead to do those things. On support and test equipment, for example, for the automatic hydraulic test facility that we use to test a lot of the flight controls on, we have gone out and identified where we can get a lot of the older technology parts and have purchased a few of those to have them available. If one breaks down, we have another part or piece of equipment to put in.

Alternatively, we can manufacture new equipment. We did it for the servo damper test facility in a 10-month period whereby we completely replaced the old technology support and test equipment with new equipment. We can do it with the latest technology. In fact, doing that improved the reliability of the component. They can quote \$600,000 as the return on their investment over a 12-month period, because servo dampers were just coming back all the time and, whilst we were making money out of it, when they were fitting them to the recently upgraded digital flight controls, they were failing because they did not interface properly. We were able to use the latest technology to be able to simulate testing to what it was on the aircraft. That paid dividends.

Those types of things, as I said, are not insurmountable to do. On other things like component spares, we have manufactured a myriad of internal components for the flight control through reverse engineering. Whilst that does take time, with engineering approvals and things like that, we can do that quite easily, and we have proved that. We can manufacture spares, whether they be housings or anything like that. Capabilities in Australia for manufacturers to do that have been identified. The JSF program has identified that we have capabilities in Australia to do these sorts of things. We have just got to utilise them, plan and give people opportunities to be able to do it. I think sometimes with engineering we rely too much on OEM support and say, ‘We’ll put it out to them because they have all the knowledge and all the background.’ But try to ask them

for a drawing: they do not have it. With reverse engineering, as long as we can have some ability to validate testing or whatever, we can do that.

From another point of view, we need to streamline our engineering in that context. We need to make sure that we have authorised engineering authorities out there. Rosebank is one of them. In our own right, we have been pretty much authorised by Defence as an approved engineering organisation. Yet sometimes the protocol it has to go through after we have gone through that takes so much time. I think we need to streamline that type of thing. Again, training is quite easy—we can get it but we just need to get the people to do it. Does that answer your question?

Senator PAYNE—Training is an interesting question. We talk in other contexts and in Defence related inquiries about skills shortages and the challenges that they currently present. Although that is related to naval shipbuilding, thematically I think it is similar. What sorts of challenges do you face in that regard?

Mr Macklin—Being able to get people, because there is so much in the aerospace industry that is going on in Queensland—and even trying to get them in our other facilities, because they have just been soaked up with whatever has been going on around the place with all the different aerospace industry, particularly in Queensland. I think Boeing will attest that they are having trouble getting people and that they end up importing people from overseas or whatever. I think the way things are going ahead with training people, like with Aviation Australia and those sorts of organisations, is good. You are able to use it. We have apprentices. Even on the machining side of it, Tasman Aviation have hired apprentices. We have really got to look ahead in that way and get those sorts of people on board early so that we can continue that focus, because the average age in our workforce here at Amberley is well over 40. If you can put that into context, the average age in Qantas is probably 50 or something like that. You have not got those people, if they are made redundant from Qantas, coming across, because they are usually too old to employ or they do not want employment—they want to retire. We really need to focus on the training of our younger workforce.

Mr Sanderson—I tend to support Daryll quite strongly in a sole operator sense. I operate a business that has a lot of manufacturing processing capability, much the same as Rosebank, and focus forward on JSF downstream, looking after making new parts. I think we can apply that same logic to sustaining the F111 and making replacement parts. Reverse engineering parts and the technology that we have today makes that so much easier. One of the issues is obtaining the original equipment data that lets us make parts, not in an avionic sense but more in a structured sense.

We can manufacture most of the aeroplane. There are some parts that we are not going to be able to do in Australia, because the technology or the equipment is not here. But, as we contribute as a group toward sustaining the F111, we can come up with ways of solving issues for remanufacturing parts, which is going to be one of the shortages in the future. How we come up with ways of solving unique problems that a sole operator brings is going to come up in the future, and volume is going to be the issue.

When the aeroplane was being built in numbers of 400 or so, coming up with volume was not hard. For us now, supporting a fleet of fewer than 40 aeroplanes, you often do not have to make 40 parts—you are making ones and twos. But our capability is designed around that—reverse

engineering parts to make one or two. Daryll's example around hydraulics is a good one. He made a complete suite of parts for a lot of the servo dampers and other things for the aeroplane. It can be done in Australia. The JSF focuses around manufacturing parts for JSF in Australia. We can do the same for the F111. With some of the larger parts we might be restricted, but a lot of the technology we have today is designed or focused on remanufacturing parts to help us go for the future.

For training, Daryll mentioned we have eight apprentices. We have an average age of a bit under 50, but that is diluted now with eight apprentices who are just over 20. In fact, a couple are under 20. So we can find people to sustain our knowledge base into the future, and they are all keen. They get an excitement from working in aviation—I do not know why at times, but it is good. We can find a good way of attracting people here locally, certainly in Ipswich. A lot of the people here like living in Ipswich and turning right out of their driveway and not driving down into town, into Brisbane.

We attract a lot of people because of that. It is easier to come to Amberley. They get to work in some cases in high technology, but in some cases with technology that has less power than a calculator. But there is a good reason that they come to Amberley and want to work for us, so we can sustain the knowledge we have today and then transitioning for five, 10 or 15 years. We are running a business that supports the F111 but it also supports a lot of other customers here, so we are trying to make sure we can sustain that at a workforce level for the future as well.

Senator PAYNE—In terms of the future, in companies like yours—companies like Rosebank—what happens at the currently delineated 2012 deadline?

Mr Macklin—For Rosebank's sustainability?

Senator PAYNE—To start with, yes.

Mr Macklin—The capability is still going to be there, but will we have the work then with the F111 going down? However, we have absorbed a lot of that with the F18 at the moment—but again, that just puts it out another period. JSF is a little bit different because of the way that is supportable. Our current plans are that we have to look ahead for other avenues to do it, whether it be aviation or whether we support it. But certainly, whatever we do, we will still retain the core skills that we have developed and learned from.

Senator JOHNSTON—They are pretty unique skills though, Mr Macklin, aren't they? I have been to Rosebank and seen the capacity, the dustproof workshops and all of that. Is there much scope for that outside of aviation, defence and other areas?

Mr Macklin—There is, but again the tendering process for shipbuilding and for all of those sorts of things—sometimes. because of the unique capability and the skills that we have. we tend not to be competitive price wise. That usually lets us down, so it goes offshore or whatever. It is unique but, let me tell you, it is not insurmountable. I was the first one that matched to 20 millionths of an inch on a grinder down at Rosebank, so if I can do it we can teach others to do it.

Senator JOHNSTON—I think you were one of the first in Australia to do that?

Mr Macklin—Yes.

Senator JOHNSTON—And the aircraft was not going to fly unless you did do that?

Mr Macklin—We cut our teeth on the horizontal stabiliser, yes—the servo valve. But what we learned from that process went into manufacturing all the close tolerance parts for the flight control servos—yes.

Mr Sanderson—Just to continue on the training side of things, the focus of our business has not just been on F111. We started here with about 40 people six years ago and we now have 90. F111 occupies about 60 per cent of that work, so we are actually diversifying beyond the F111 so we can sustain that workforce into the future as well. The capability we have here on site at Amberley and at our other workshops at Wacol, Brisbane Airport and Newcastle is able to develop or expand our customer base beyond just the F111. We have an overlap with the likes of Qantas and Virgin Blue and others, so you get a way of continuing the skill set into the future, not just relying on F111. There will be a decline as the F111 withdraws, but we are making sure our forward forecasting is looking at where we can take that group of people as well.

Mr Harling—My term is ‘tenure security’. There are two issues. One issue is workforce retention and the other one is forward planning for after the F111. It will happen one day. On the first part—workforce retention—we are already experiencing competition from outside which is looking to take away our experienced engineering logistics and maintenance personnel, with an average age over 40—thanks, Daryll!—and you cannot buy that—

Senator PAYNE—It is really quite young, actually!

Mr Harling—and you cannot grow that quickly. So the workforce retention issue is singularly based on what the planned withdrawal date is today. It is not far away, so therefore there is that commitment to a planned withdrawal date. Is it going to stay or is it going to move? That will help us retain not only our own workforce but our subcontractor workforces as well. They are doing the maintenance on the bench and wondering what they will do with their technology, which is not replicated elsewhere, after the F111. They will start making a move soon.

Beyond the F111, from an avionics perspective, there are only a small number of elements that will be replicated in other platforms—radar, oxygen and EW fleur et cetera. Those people and those skill sets will be retained. It is our job as an industry partner to diversify, as Andrew said, into other platforms as best we can and, from a Raytheon perspective, to try to be an avionics subject matter expert so that we can retain that knowledge, because, at the end of the day, what we are providing to the Commonwealth is knowledge, experience and qualifications.

ACTING CHAIR—So part of the problem is that, the closer you get to the end date, the more likely it is that people will walk, and therefore the situation will become more unstable.

Mr Harling—Absolutely. And it is often against their wishes. They want to stay with something that they have loved for many years. They do not want to drift, so it does not take a lot to keep them. There needs to be some kind of commitment to allow companies, such as those sitting at these tables, to plan for retention, to keep their people. They do not necessarily chase the big dollars. They do not want to change their geographical location. They want to stay with

what they know and love, but they are asking, 'Have I got four years to go, or have I got eight years to go?' Their average age is in the 40s, and many of them are ex-Defence and they are looking to stay with this particular platform.

Mr Webb—The other thing is that there are certainly very high levels of employment within the industry. That means that any growth is always going to be challenging. It is predictability that is important. When 2010 was announced as a planned withdrawal date, that happened to coincide with the end of a major software development program that we had at the time. We lost a lot of experienced software engineers on the back of that announcement. That expertise takes a long time to rebuild, as everyone has said. Certainly, all of us, as industry players, have to commit—and I think all of us are—to comprehensive training programs across a whole range of skills, but it does take time. But it is as valid in the trade areas as it is in some of the specialist engineering areas.

Senator PAYNE—I think the need for predictability is the absolutely consistent and extremely important message that we get, not only on this issue but on a whole range of other defence industry issues. It is good to have it reinforced. Thank you.

Mr CAMERON THOMPSON—I want to ask a range of questions about different things. I want to touch on the cold-proof load test facility. How many aircraft have now gone through that? Have there been any failures of airframes in relation to that? What is the outcome we are gaining? It is only two or three years old.

Group Capt. Morrison—I cannot tell you how many aircraft have gone through that facility, but I can say that it is in continuous use. And it will be in continuous use on the F111 up to perhaps about a couple of years from the end, when we stop the deepest level of servicing. It is essentially a requirement that comes around on the cycle very close to the R5 servicing at around 2,000 hours. So essentially each aircraft has to go through that facility on about a 10-year basis—and correct me if I am wrong there, Geoff. So we will be continuing to use that facility.

We have not had any aircraft failures in this facility. There have been RAAF aircraft and US Air Force aircraft that have suffered structural failure in cold-proof load tests when the tests used to be done at Sacramento in California. From our perspective, it is an essential requirement for approving the structural safety on the aircraft. It will be needed until we stop doing the deeper maintenance.

Mr CAMERON THOMPSON—Apart from the spectacular failures, every time you do that does that give you data on how well a particular airframe is wearing? Does it actually provide that to you or does it not?

Group Capt. Morrison—Not really. The cold-proof load test is a very coarse check of structural integrity. It is seeking to find whether or not there are cracks which we have not detected by non-destructive methods in a specific structure—the steel structure. It is not a very good test for other parts of the structure. Essentially, you are really looking for cracks that you have not picked up by other methods that could still grow to a critical length in that next maintenance cycle. The wing carry-through box, the wing attachment fittings and the stabilator spindles are some of the major examples.

Mr CAMERON THOMPSON—But, when you say it is a coarse test, is it about something either passing or having a spectacular fail?

Group Capt. Morrison—It passes or it has a spectacular failure.

Mr CAMERON THOMPSON—I just wanted to ask the F111 availability and the actual number of flying C and G aircraft that are currently there and how that compares to the way things were five or 10 years ago.

Group Capt. Morrison—We currently have 21 C and reconnaissance aircraft—a full fleet of those. I cannot remember when the last loss of C was. That is stable. We are currently using a fleet of five G-model aircraft, and there are two G-model aircraft that have essentially been retired because they fell due for major maintenance. It was part of our plan to essentially withdraw them from service as they came up for major maintenance. So those two aircraft are sitting aside.

Mr EDWARDS—Are they cannibalised?

Group Capt. Morrison—The two aircraft that have been set aside? Yes. We need the wings to go on to the remainder of the fleet. For example, the wings have been removed. A number of other components have been removed. But we are trying to avoid cannibalising those aircraft at the moment and are essentially putting them in storage. The main component that has been removed is the wings. They have been installed on other fleet aircraft.

Mr CAMERON THOMPSON—So there are 21 Cs, including the reconnaissance aircraft, and five Gs. How many of them are available flying on a day-to-day basis in fully airworthy condition? A while back, I think we had gone up in terms of the numbers that were available. I think that makes it a lot better for training and all those sorts of issues. How does that compare with previously? I am not talking about the total number; I am talking about how many are actually flying at any one time.

Group Capt. Morrison—The agreement that we have between the DMO and Air Force obliges me—and correct me if I am wrong—to put 17 aircraft down to 82 Wing out of that entire fleet. The remainder of them are going through such programs as fuel tank repair, the deeper maintenance in the Boeing hangar and the block upgrade project and modifications. Out of those 17 aircraft, 82 Wing decides how many they need and how many they are capable of producing.

Mr CAMERON THOMPSON—How would that compare with five years ago?

Group Capt. Davies—To the delivery?

Mr CAMERON THOMPSON—Yes, on the flight line—not out the back but ready to fly.

Group Capt. Davies—My assessment is that there are more aeroplanes that we are able to fly on a day-to-day basis than there were five years ago.

Mr CAMERON THOMPSON—Why is that?

Group Capt. Davies—The reliability of the aircraft in their systems is certainly better. Is it twice as good? No. I am thinking it is 20 or 30 per cent better. That is my guesstimate on how many aeroplanes. Of the 17 that I am given by contract, I get somewhere around eight, nine or 10 C models able to be flown at any given hour during the day and three, four or sometimes five G models on any given day. So 10 to 14 of the 17 are flyable. Of course, out of that is the day-to-day maintenance—that is, ‘The engine broke last night because of a problem and that is being fixed, so that one is not available to fly.’ That does ebb and flow—hence the eight, nine or 10 or the three, four or five. That is the day-to-day maintenance function.

Mr CAMERON THOMPSON—While I am on the subject, could I clarify the status of the reconnaissance ones? They are C models, but they do not have the Pavetack. They are of a different category. Do we currently have any of those operating? Are they within that category or are they separate? I did not know precisely how much—

Group Capt. Davies—They are within that category. There are four recce C models and, of those four, three are currently online.

Mr CAMERON THOMPSON—Within the process of the upgrades and things, I think everyone has heard the story about the deficiencies of the F111 as it was seen at the time of Gulf War I, in relation to electronic countermeasures and those sorts of things. That was something that was rapidly addressed. It had to be addressed and has been addressed—we heard that it was addressed. Are there any holes within the capability that are a priority and currently need to be addressed? They may not be current problems but problems that we could expect to see in the 2010-2012 time frame.

Group Capt. Davies—That is probably a two-part question and I might answer in that way. There is the operational area—the ability to drop bombs and break people’s stuff, as I have been heard to say before—and then there is the engineering ability to deliver those air frames down to the flight line. From my side, the current suite of fighting systems, if I can use that term, is about right. The only system that we are working with Mark on, and with Boeing specifically, is the Pavetack system, which over the next period or two of withdrawal will need to be tweaked—that is, we will need to buy some components to improve its reliability. We have noticed a decrease in reliability over the last couple of years. That is still manageable, but we are trying to identify that as one. The other elements of the aircraft systems, as far as dropping bombs is concerned, is all right today and I do not see any problems with that through to 2012.

Mr CAMERON THOMPSON—What about the standard of performance of the Pavetack as a capability, as it compares with other designating type systems? How does it rate?

Group Capt. Davies—Again, there are two parts to that answer, I am sorry. Firstly, the Pavetack brings some unique characteristics—that is, we are able to keep it inside the aircraft, with no drag, to get where we need to go and then deploy it. The field of view and ability to do multiple profiles using the Pavetack pod is second to none. There is still not a pod on the market that I am aware of that provides that sphere of usability. I suppose it is a bit like television sets at home. You have the best tube TV and you think the picture is just fine, and it is not until you go to Harvey Norman and look at a new LCD that you say, ‘Things have improved somewhat.’ I use that analogy because that is what it is like. We can still get the job done, but there is now the

ability, with modern technology, to tweak that a little, which will provide us with not only a little more maintainability but also a slightly better picture in the cockpit.

Mr CAMERON THOMPSON—Group Captain Morrison, I suppose this is a question to you. You said that you are working with a current budget of \$130 million to \$140 million. How does that compare with what it was, say, five years ago?

Group Capt. Morrison—At the moment, we are operating at the highest budget level that we have records for. That sort of budget is certainly placing a significant demand on industry and us at the moment in order to actually deliver the capability.

Mr CAMERON THOMPSON—But how does it compare in actual dollar terms?

Group Capt. Morrison—We are operating at about 20 per cent higher.

Mr CAMERON THOMPSON—Than you were operating with, say, five years ago?

Group Capt. Morrison—Yes.

Mr CAMERON THOMPSON—What is the core reason for that?

Group Capt. Morrison—We have been budgeting for additional requirements and recognising particular problems. For example, fuel tank refurbishment has been put on the backburner while we resolve a number of the safety problems, so we are trying to get into those sorts of things. We are also making sure that we properly do some investment in some of the reliability of components. For example, we are doing a bunch of work with Raytheon to improve the reliability of certain pieces of kit. As well as that, it is a recognition of maintaining the rate of effort and the need for the deeper maintenance programs to go through. Most of the increase though is related to trying to get reliability improvements, making sure that we can achieve the life over time.

Mr CAMERON THOMPSON—Group Captain Davies, one of the virtues originally of the F111 was the terrain-following radar capability. In a combat sense is that a redundant capability now because it emits radar and those sorts of things? I understand that there has been a move to use night vision goggles instead. Is that really a switch that is going to happen and the TFR will not be such a crucial part of its capability?

Group Capt. Davies—No, that is not the case at all. The TFR is still a large part of the way we would plan to go into the majority of conflicts. It also gives us a distinct advantage in a coalition sense—that is, we can do something that is not necessarily unique but can be fitted in. If you have a lot of aeroplanes flying in a particular piece of sky, to own that piece is something that is enjoyed by the mission planners. We saw that quite dramatically earlier this year at Exercise Red Flag where the use of terrain-following radar as a method of getting a coalition force to the place it needed to be was rather effective.

We are going through the process of integrating the night vision goggles into the aircraft now. The addition is not so much a replacement for the TFR but an enhancement of the situation awareness that we have whilst we are TFR flying. The TFR has its inherent limitations in terms

of bank angle and ability to stop TFR flying to conduct a manoeuvre. With NVGs—night vision goggles—we are able to perform that in a greater speed range at a different height range and do it more crisply.

Mr CAMERON THOMPSON—Concerning the ability of Boeing to retain and continue to attract engineers to this project—and, I suppose, the prestige of the project among engineers is an important part of it—does the fact that Boeing is also now engaged here on site on the Wedgetail project provide you with an opportunity to cross-fertilise, create greater critical mass and attract better and more engineers, given that you have now got both things on the one site?

Mr Harling—To start with, we do not compete for resources directly. That is up to the individuals. We have had individuals swap from Boeing to Raytheon and vice versa. To answer your question about whether we would attract engineering resources from those new capabilities like Wedgetail, I think that it is unlikely. The F111 is old engineering and there are far shinier pieces of kit elsewhere that generally attract the young engineer. So our No. 1 focus is to retain the workforce that we have and where, for reasons of individual benefits that look inside Raytheon compared to Boeing, that is the only way we would attract them to us. Avionics engineering and Boeing engineering are different.

Mr CAMERON THOMPSON—Finally, is there any component in an engineering sense of the F111 that you really know that you cannot possibly build?

Mr Sanderson—For the size and scale of some of the parts, we can probably manufacture and repair componentry. Whether we can build the whole wing carry-through box—I would argue that we could do a good job of it, but I do not think we are going to get to that stage. A lot of the way the aeroplane was built was welding steel together in a unique process, certainly around the wings. There will be a new technology that would have to be brought into Australia to do so. We have not explored that ourselves, but no doubt it has been addressed at various points.

Mr EDWARDS—I have one final question. We have already dealt with a scenario that Senator Ferguson raised, and we do not know what we do not know. Given what we do know, I would like to ask both the group captains and Mr Webb: is it possible to quantify the risk of keeping the aircraft at task beyond 2010 to, say, 2015? Would that be a high risk or would it be a low risk, or are you unable to quantify what the risk might be?

Group Capt. Davies—Mr Edwards, the risk is one in a broad band, I suggest. If you are asking about the operational risk to drop a bomb on a bridge or a building as tasked, or to do a maritime strike in the 2010 time frame compared to 2015 in a benign flight environment—

Mr EDWARDS—I am really interested in the risk to the air crew.

Group Capt. Davies—Zero risk to the air crew is my assessment. That is because the team at this table tell me if there is a risk. So I have absolutely no doubt at all. I still fly. In the planning phase, the step to the aircraft, the start, taxi, take-off and flight phases, there is not a single air crew person at 82 Wing who says, ‘I wonder if I should be getting into this jet’ or ‘That jet just came out of a major servicing, therefore I should be more vigilant.’ That is certainly not the case. So I would say the risk between now and 2015 will always be zero, because if the engineering

risk rises above anything other than zero we will be told and we can make an operational assessment after that.

Group Capt. Morrison—From our perspective, I would be very confident of our ability to provide a safe, useful product. I think the risks are probably more associated with something that will affect our ability to deliver the capability. But I think, at the same time, we are actually good at solving problems. We have solved them before. If we did come across a problem, we would solve it, but it might take time. It will certainly take money. I think we would solve it. I think we have a very good team that is able to do that sort of thing. In terms of delivering a product that is safe, I would be very confident that it is actually safe, but there might be small perturbations in the availability and so on.

Mr Webb—You asked: given what we know, is there much difference between 2010 and 2015? Given what we know now and the issues that we are addressing, we do not believe there is any significant difference in risk between 2010, 2012 or 2015.

Senator BARTLETT—I was wanting to explore a little more the issue that has been talked about, to some extent, with regard to expertise in the sector. I guess this is more a question to the industry people. Given that we are the sole operators of F111s, how much of a problem is the loss of expertise that may occur? Obviously, once no-one is using it, it does not really matter if there is no expertise around. There is probably not much expertise around on how to operate spitfires or zeppelins or whatever these days. I am trying to get a sense of the problem, because a number of people identified—and you talked through it—that there is a problem that, as the life gets closer to being phased out, people will get poached by other companies because of shinier equipment, or whatever the phrase was that you used. Or is it that, as part of that, we lose our flexibility if we do want to extend the life of it or that it becomes more expensive to keep it going? Is that basically the core of the problem?

Mr Webb—Predictability is the issue. If we have a predictable target then we can manage to do that. It will take different strategies in the last couple of years to maintain the critical skills from those taken 10 years before. The biggest problem we face is when the target moves, particularly if it moves to the left and then it moves back out to the right, which has happened. That certainly hurts us. It is an issue that we have to address every day but it is one that we manage and it is not adding any more risk into the platform or into the ability to deliver the capability.

Senator BARTLETT—Is the expertise regarding the F111 so unique or specialised that there is extra need to guard that expertise? Is it being poached by other companies or is it that people are just starting to let their skills in that area decline and they are getting skilled up in whatever Chinese stuff is around?

Mr Webb—It is more cost effective to keep the expertise that we have at the moment. But, in a number of cases where we have taken software engineers out of the finance sector, we have found that we can train them into software engineers in this sector. So it is possible to do it. It is more expensive to do it, but it is certainly not impossible. Other forms of engineering are transferable and, again, there is a training impost, but it is not impossible. It is more the issue of timing. We cannot afford to lose significant levels of capability at times when we are doing major project work, for instance. So it is more a timing issue and a total capacity issue,

particularly in the trades area where there is a very high level of employment and other industries are competitive with us. For instance, recently we have lost a number of tradesmen to the mines. We cannot compete with the pay that they will get in the mines.

But, as Mark said earlier, there are a lot of people who love this aircraft and who want to work on it. They are not working solely for the money. It is a total choice that they make, and they want to continue to do it. In some cases, the fact that it is an ageing aircraft makes it more interesting because you get to do more interesting work than you might do on a shiny new aircraft where it may be a simple modification or maintenance-type engineering. There are opportunities to do more interesting work on ageing aircraft.

Group Capt. Morrison—I would like to comment on how I see this issue. I agree with Geoff's comment about the timing of the decision-making. As we get towards the end, we certainly need fewer people than we have now maintaining this aircraft, for example. That we might be losing some people to other programs is not necessarily a bad thing, because we may not actually need them out there. It does come into that planning issue.

We have the advantage also of a substantial industry base—and it is a commercial base—whereas, if you go back 10 years, it was an entirely blue-suit workforce that we were using here. The fact that other programs can support the technology base and that these guys can bring in other work that is non-F111 also gives us an advantage and, from my perspective, reduces some of the risks.

Senator BARTLETT—My understanding is that some commentators have expressed concern that the earlier retirement of the F111 will have a negative impact on the aerospace industry sector more broadly, just because of a loss of expertise. It is not so much that you will lose people from the industry altogether that is the problem but that, if the goalposts keep shifting backwards and forwards, you will lose people with that specific expertise and then it costs you a fortune to build it back again.

Group Capt. Morrison—It costs you money and it costs you time to build it back as well.

Mr Harling—The risk that you face if there is no commitment to a time is the surge. Where there is a shift in a scenario date for a planned withdrawal, the assessment is going to deliver you a gap, and you close the gap by project, as Geoff mentioned. The project may require you to bring that in early or in a defined period of time that is challenging. That ability to respond to a Commonwealth surge is going to be very taxing where engineering resources that have gone away or where there is a need to train up new resources. To train up new resources is very difficult, but to recover them is the only way to meet those kinds of surge challenges.

Senator BARTLETT—What is the time frame there? I appreciate predictability is highly desirable and any shift is a major pain in the neck, but if there was another shift—I appreciate the comments Senator Ferguson made that the plan is in place and there are no alternative plans, so I do not want to get into too much of a hypothetical—and it was extended out again and that decision was made now, is that a cause for a few raised eyebrows and no major drama? When does it become a major problem, or would it be a major problem now?

Mr Webb—If the decision to extend the aircraft was made now, it would not be a problem—we would just manage to that. If the decision were made in two to three years time to extend it beyond the 2012 mark, that is still manageable. If it were attempted in 2010 or 2011 to say that we wanted to go beyond 2012, that would be hard.

Group Capt. Morrison—It does depend on which part of the aircraft you are actually looking at. The industry players in front of us have different demands placed on them. Boeing's work continues doing deeper maintenance on the aircraft until a couple of years from the end. So does Rosebank and Tasman in terms of the fact that they are more directly supporting operations and the work that is coming through Boeing in particular, and the same goes for Raytheon. However, Tasman's work for engines and the Engines Business Unit work will drop off much earlier than the actual aircraft work. Although Geoff's decision date might be further out to the right, for engines we would probably want that decision to be made earlier.

Senator BARTLETT—I am particularly interested in the expertise. Obviously, it is always going to be an issue at any stage and it would always have financial implications but, if you have lost your expertise at all of those stages, I presume it makes it much, much harder.

Mr Webb—It certainly does for us as we have a number of platforms on site. We have about 450 people working on F111, and a total workforce of a bit over 700. So having more work here is certainly a lot easier, and a lot of the people who are working on those other platforms are former F111 employees.

Senator FERGUSON—Mr Webb, I was interested in your comment that people love this aircraft and they love working on an ageing aircraft. I know lots of people who love working on vintage cars, but I would not like to drive one to work every day.

Mr Webb—I certainly was not comparing this aircraft to a vintage car.

Senator FERGUSON—In relation to this whole question of reasonable air superiority, we have received conflicting opinions from so-called experts. The difficulty we have is deciding which of these people is giving us the best information—not necessary being right, because I do not know whether anybody is totally right or totally wrong—and we have to try to sort that out. Group Captain Davies, I was interested in your answer to Cameron Thompson's question when you talked about your TFR, because you said that in any conflict it would be an essential part of your equipment. The question I have been pondering is: when was the last time an F111 was involved in a conflict?

Group Capt. Davies—Timor.

Senator FERGUSON—Just recently, or the first one?

Group Capt. Davies—The first one.

Senator FERGUSON—The one in 1999?

Group Capt. Davies—Yes, that is correct.

Senator FERGUSON—What about prior to that? It is a long time, isn't it?

Group Capt. Davies—Australian F111s, not at all; American F111s, there are several—Vietnam, Libya and Gulf War I.

Senator FERGUSON—But we never used our F111s in either of the Iraq wars?

Group Capt. Davies—No.

Senator FERGUSON—We used Hornets.

Group Capt. Davies—Yes.

Senator FERGUSON—So really, in recent times, the only operational activity—I think that is the best way to describe it—has been over East Timor in 1999.

Group Capt. Davies—That is correct.

Mr CAMERON THOMPSON—Group Captain Morrison, I understand there is some work in progress looking at the way the responsibility for maintaining the engines is handled. Can you update the committee on what is happening with that, and what is the reason behind the consideration of that as an option?

Group Capt. Morrison—We have been looking at commercialising the management of engines. Currently we have an in-house option, which is managed by Mr John Duff. It is an entirely Public Service workforce which is located here at Amberley. It manages the Engines Business Unit. That came out of the market testing of No. 501 Wing, which occurred in the late 1990s, and it just so happened that the in-house team won the competition. As we are getting closer to the planned withdrawal date of the F111, we have identified that one of the risks we foresaw was this workforce risk associated with them going off to other programs before the aircraft had actually been withdrawn. Under the current Commonwealth Procurement Guidelines, the in-house option, the Engines Business Unit, is unable to compete commercially for other work. We felt that one of the best ways of being able to manage that risk of the workforce going off elsewhere was to provide opportunities for other work to come in. That would allow us to maintain the workforce, which is essentially the core of the capability that we own.

Late last year we put out to industry an invitation to register interest to assess what industry might do in coming up with a commercial solution. The result of that invitation to register interest was that we decided that only one company was able to provide the capability we wanted and also continue to work in South-East Queensland, which was necessary to maintain the current workforce capability. That was Tasman Aviation Enterprises, represented by Andrew Sanderson, to my left. Since then, we have gone into negotiations with Tasman. We completed our negotiations last Friday. The recommendation that I have made is currently with my chief so I would not like to actually announce what that recommendation was in here. Andrew may give you his own version of how confident he is, or not, and, depending on whether or not my chief has decided to run with my recommendation, we will decide the next step.

Mr CAMERON THOMPSON—Group Captain Morrison, what are you anticipating to achieve out of that? It is basically workforce management, but has it got a bottom line outcome or is it—

Group Capt. Morrison—How do you mean ‘bottom line’?

Mr CAMERON THOMPSON—Dollars.

Group Capt. Morrison—Basically we do not have any additional dollars to spend. We have been seeking an outcome within the available current cost of doing this business and that has been our goal right from the beginning.

Mr CAMERON THOMPSON—Mr Sanderson, what is it that your company is proposing? Are you offering some advantages, as you see it, to what we currently do in relation to engines?

Mr Sanderson—We are trying to leverage off what we have done here in the last six years and, rather than just run the F111 Engines Business Unit, just run an engines business. As for Adrian’s point about bringing other work into Amberley, which we have proven we can do, we hope to bring additional work into the facility from a number of sources that creates and sustains a gas turbine engine business here in South-East Queensland. Obviously none of those are locked in at the moment but it gives us a chance to run this business, recombining our current workshops with the industrial capability of the engine business to offer something that is reasonably unique in Australia. Leveraging off some relationships we have from OEMs in the states and also as our parent company, Air New Zealand, has two other engine businesses in this region, we anticipate sustaining business so that the F111 services that we would have to offer in the future are not at risk in the future as well. So, if we are successful with DMO decisions, we will be taking on the Engines Business Unit workforce, and we plan on expanding and growing that workforce as we move forward so that we are here not just for F111 but for the future.

Mr CAMERON THOMPSON—Is that going to mean you will seek work on commercial aircraft? Is that going to mean flying commercial aircraft in here to do the work on them, or are you going to have to pull the engines out and bring them here?

Mr Sanderson—Not the aeroplanes themselves. The idea of the business will be to take engines into the business, work on those engines—be it overhaul, repair or test—and send them back to those customers, be they defence customers, industrial customers or potentially commercial customers.

Senator JOHNSTON—It is not every day that a parliamentary committee turns out, as it has today, and some of us have travelled quite a distance to be here to discuss this particular aircraft. It would be remiss of me not to ask you, as the star of the show: what is this capability we are so concerned about? What does this aircraft do that means we need to be so attentive to its retirement? Could you take us through the what you see as the advantage of this aircraft and, to some extent, why we are here?

Group Capt. Davies—The aeroplane has provided a couple of things and will continue to do so to the point where a more modern approach exists to providing those capabilities. By that I mean a networked Air Force, which we have heard mentioned in numerous forums—that is,

AW&C and air-to-air refuelling of the next combat aircraft, whether that is JSF or not, or a superior FA18 force. So we are talking about that 2015 time frame. The F111 has, I think, provided a rather large deterrent—that is, the ability to go a long way and deliver a meaningful payload to whatever environment it needs to be delivered. It has also provided the right aircraft for Australia's operating environment.

The F111 is not a significant asset in a European context. We need to go a darned long way and still be able to do something at the end of it—and the F111 has provided that. In my view, the combination of AW&C air refuelling and, I assume, JSF—or a modern FA18—will be able to provide that role and more. The F111 is getting to the end of its life both as a piece of metal and as a machine that is able to be maintained—although I do not have any problem personally with the other members who have asked whether, if we threw more dollars, more effort and more engineering at it, we could keep it flying. I think we could but, as I said earlier, it is a diminishing return, and around 2015 is where I think that should stop. The F111 is a radar-significant beast. It is not networked. It was designed on a 1960s basis—and I might use the AGM142 integration as an example. It seemed okay to take a wonderful weapon and plug it into an old aeroplane, but it is not that easy—and I think that will continue to be the case for whatever we choose to develop on the aeroplane over the next period.

Senator JOHNSTON—When this aircraft went to East Timor, did it require refuelling?

Group Capt. Davies—No.

Senator JOHNSTON—We do not have a tactical aircraft that can do that?

Group Capt. Davies—That is correct.

Senator FERGUSON—Did you use both reconnaissance and other aircraft, or mainly reconnaissance?

Group Capt. Davies—I was not here in 1999, but my understanding is that it was predominantly reconnaissance. I am not aware of a C-model role in that scenario.

ACTING CHAIR—Given that the F111 is ageing in place, and so are the people who are supporting it—and the Hornet is as well; it is younger but it has a number of problems—the core issue of what we have been looking at in the public hearings is the antagonistic position that has been put by Dr Kopp and Mr Goon, which is that we could do this in other ways and extend its life. I will quote Mr Goon's evidence—and I suppose this is a way to summarise what we have been doing today. He said:

The upgrades proposed for the F111 are principally technology insertion upgrades to upgrade the remaining legacy systems in the aircraft. The nature of the upgrades and the types of technologies that we are talking about are low risk technologies.

On the basis of that assessment, he and Dr Kopp have built the evolved F111 concept, which is that, if you pair the F111 with the Raptor, you can run this right out. Can I get your comments in relation to that core approach?

Group Capt. Davies—In my view, it goes back to what has been a fairly common thread of the F111's development. I would disagree with the analysis that it would be relatively simple and that it is just an extension of what currently exists. That extension would get us perhaps to 2015. But beyond that, to having another generation of combat aircraft that would not need replacement or significant work, I would disagree with, having been around the F111 for some time and seen that level of development. The idea that the F111 would perform a particular role is, I think, a little narrow in view of what the F111's performance expectation is in a number of roles; therefore, we are expecting a networked Air Force to be able to provide that set of roles. From an operator's perspective, I think an F111-F22 mix does not meet all of those.

Group Capt. Morrison—From a supportability perspective, I would agree with Group Captain Davies. To take the aircraft out as far as some of those proposals seem to want to go would require, in my view, a substantial upgrade to not only basic aircraft systems but also avionics and so on, just to give it both maintainability and supportability, as well as providing the operational capability that 82 Wing needs to operate the jet. For example, I would tend to think that you would want to do a complete upgrade of the avionics systems. To head way out into a new life for the aeroplane, we would probably need to remanufacture wings on the aircraft. We can still get wings out of the desert, but I do not think we would want to carry the maintainability, the inspections and all those other things into the future. If we were going to do that for the next 30 or 40 years, I think would we want to try and redesign it. That is a fairly major effort, and I cannot even begin to dream up a cost for such a thing. I am not aware of anybody having done it to the scale that I would envisage. However, you can re-skin wings and things like that. So it is not impossible, but I am beginning to wonder why.

We are a unique operator of this engine now. I understand some of those proposals suggest that other engines might be used. It might indeed be possible, but in a tactical fighter aircraft changing the engines is not a simple thing. A couple of different engines were proposed in some of those options. The one out of the F22, to my understanding, is not directly compatible with the F111 because of the way it mounts things like generators and hydraulic units and so on. That would essentially require a substantial redesign of the air frame-engine combination, and I think that is a very big deal. There are other engines, such as the GEF101, which probably offer some greater compatibility. For example, the GEF101 is the current engine being delivered in the F15 and F16. It was designed as a replacement for the TF30, so it is possible to use it. It was integrated into the American navy's F14, but not without its problems. When you start introducing that sort of technology, particularly with such a small fleet, you end up with all of the integration costs but you are not able to amortise it over a buy of 700, 1,000 or 5,000 aeroplanes, such as you might see with the JSF. So we have to wear all of the qualification testing, the integration and design and so on. It is a very big program we are talking about.

As well as that, the scale of the program is such that I think, as we went through it, we would suffer significant aircraft availability problems, because we would be taking aircraft off line for quite extended periods to do really major modifications. So even if you decided to do this today, it would probably be a decade before you actually came out of it again. You would have spent billions of dollars and you would have managed to increase the capability and sustainability across a range of aircraft systems, but issues such as Group Captain Davies raised about radar observability and things like that would still be out there. You would still have old components in there that you would need to sort. So I would tend to think that the comment of diminishing returns but rather increased cost comes to mind.

ACTING CHAIR—Does anyone else wish to comment?

Mr Webb—In terms of your question about the level of risk, after AGM142 and the work that was done to integrate that weapon, it is a lower risk to integrate further systems into this aircraft than it was prior to AGM142. In terms of Group Captain Morrison's comments about wings, for instance, I agree it is certainly achievable, but it would not be a cheap thing to do and it will certainly have an impact on the number of aircraft available. When you start talking about re-engining, I think your risks are going to increase significantly.

Senator FERGUSON—Of course, this is based on the scenario of the F22 being available for purchase, which we do not know yet, do we?

ACTING CHAIR—That is true, and we do not know whether that is the whole of it or the engines.

Senator FERGUSON—We simply do not know.

ACTING CHAIR—But the argument is that that would give this aircraft supercruise, and that is another reason why you could run it further into the future. But apart from the problem of actually integrating that, if you bring the Hornet and the costs of upgrading the Hornet into play here, there is a problem with engines in terms of replacing engines, the barrel for engines and so on. The evidence we have had so far is that that will be very costly. There is also a question of the extent of that cost, the amount of time it will take and the number of aircraft that will be out of service. We have a comparability situation in terms of the projected Hornet upgrade, which Defence has now committed to, and the problem we have got with the F111.

Group Capt. Davies—Another area takes care of those Hornet issues. The Hornet program has begun. But in recent exercises I have not seen a significant impact on the ability of the Hornet to support its training requirements. Secondly, I think it is a reasonable strategy that we have aimed at 2010 but asked support agencies and the operators to have a hedging strategy to 2012, so if the Hornet program does look like it is having difficulty we can make the decision to go to '12 with little impact, because we have planned for it. The other factor here for me as an operator is that the Hornet provides the better stepping stone to a single place JSF or whatever in terms of our ability to grow the expertise and experience to function in the way we intend to function beyond 2015. The F111—two-place cockpit, strike role, little self-defence, not self-escorting—involves those kinds of concepts. There is a better transition through Hornet to the next aircraft.

ACTING CHAIR—A lot has been made about the capacity to have strike at a great distance. That is one of the key things the F111 has been essential to Australia for. But I think Chief of Air Force put a compelling argument—something that had not occurred to me in everything I had read about it. He said, 'Yes, that's the case.' When the F111 goes and does that, it has F18s with it, so they have to be refuelled. They are there to protect it and to do so for most of the mission. But once it projects into that space, you have to take the whole package. The F18s are there. That is a fundamental reason that the argument about deep strike is not as valid as people would otherwise think. Given it is cheaper, I imagine it will be agreed with generally, but to me it is a telling point in terms of the way in which people perceived the F111 to have that advantage

without thinking that you would normally have protective fighter aircraft with it. So operationally—

Group Capt. Davies—It is not necessarily because he is my chief that I agree with him, but I do.

ACTING CHAIR—It helps—and he is a former F111 fighter.

Group Capt. Davies—If you were to propose that same scenario to the guys and girls in the various crew rooms around Australia, they would agree that the idea of the B52s or Lancasters on a bombing mission being escorted by fighters to look after them is a World War II scenario. In a modern battlefield, that is the case. We train predominantly to have a package of aircraft that best suits the outcome we are after. There will be lone-strike scenarios in which the F111 is able to do that role—that is why we have done our electronic warfare upgrades and purchased AGM142 and the like—but the majority of a modern battlefield scenario will involve a composite package of aircraft to get the best outcome. So I would suggest that the scope for a lone-aircraft role has diminished since we first purchased the F111.

ACTING CHAIR—The F111 has done its job because it has not had to do much actively; it has been there as a fundamental deterrent.

Group Capt. Davies—Yes.

ACTING CHAIR—We will lose that long-range capacity into the region.

Group Capt. Davies—I suggest that we step back one layer and look at what Defence in total is able to do with air warfare destroyers, submarines, stand-off missiles, the ability of coalition partners to assist and satellite imagery. That entire Defence approach is what we need. There may not be a manned aircraft that does that single penetrating role that might have existed 10 years ago.

ACTING CHAIR—That is quite likely in the future. One thing we know we will face—and this is another part of this argument—is Sukhoi 29s or 30s. There are insignificant numbers in the region. We know that they are advanced, that they can be flown and that the pilots who will train on those will become increasingly capable. Defence's argument is that, if we get the F35s, we can run through with that package—if we can afford it. Defence will take some Raptors as well—if they would sell them to us—to add to that package. But we are up for 100 or so JSFs, and that is a networked package. The underlying question that has been put in terms of the capacity of that is that we seem to be relying extremely heavily on the fact that it is network-centric. There are a number of vulnerabilities already there because of refuelling and so on, but an argument has been put that those Sukhois are simply a superior aircraft on their own and could do us great damage. Is our fundamental defence not only the network-centric approach but also the stand-off missiles and others and the capacities of our pilots to operate in that more difficult situation, or do you think we need a bit more in the package to deal with that if we can afford it?

Group Capt. Davies—The answer to that question is largely based on the supposition that the Su-30 or MiG29 is a significantly superior aircraft and that we should be prepared and,

therefore, growing ourselves to another level above that again. My understanding of the MiG29 and Su-30 is that they are good aeroplanes, but they are not fifth generation. JSF, from my reading of the publicly available information, is the only fifth-generation aircraft out there. It has been designed to be fifth generation and, therefore, superior in almost every aspect to an SU-30 type threat. Our forces have smart commanders and smart battle managers in all three environments. We would be going to the battle of our choosing. So we intend, more through a networked ADF than a networked Air Force, to be able to go to battle at the time of our choosing with an outcome that is almost predetermined. I personally as an aviator—and again talking of opinion in the crew room—do not subscribe at all to the opinion, ‘There are four Su-30s and four JSFs out there, so we’re in for a heck of a battle.’

ACTING CHAIR—That is despite the fact that the argument has been put strongly that the 29s and 30s are in fact fifth generation and that the closest equivalent would be the Raptor, which is as well, but the JSF, because it is slower and there is still a question about how visible it would be—because we do not know whether we are going to get the full technology transfer in terms of its radar signature—is really a fourth-generation, not a fifth-generation, plane.

Group Capt. Davies—I cannot answer that on a purely technical basis. My understanding is that it is fifth generation. From the point of view of an aviator at my level, I would suggest that it is actually the Su30, since it is already flying and operating. The Su30 and even the Su35—those variants—are flying now. They are F15 style airframes. They are getting modern technology, modern radars, modern missile systems—that is true—but their genesis was on a third-generation airframe, upgraded perhaps to fourth generation, but they do not have the ground-up development of the JSF.

Senator JOHNSTON—Would you explain what an AGM is? The other question is: can a Hornet carry one?

Group Capt. Davies—There is a family of air-to-ground missiles that provide us with a stand-off capability. There are many guises, certainly in range and capacity. The Hornet can carry a stand-off missile.

Senator JOHNSTON—Of the same dimension and capability of one that we would want to attach to an F111?

Group Capt. Davies—Yes.

Mr CAMERON THOMPSON—You mentioned that in Exercise Red Flag there was a niche in which the F111 was found to have a role. I wonder if in closing you could expand on that a little bit. How did it perform in Exercise Red Flag and what was the nature of that? Was it in any way really relevant to the Australian experience and the missions that we are asking of F111s?

Group Capt. Davies—The answer to that is yes, it is relevant. It was a combined push by F18s and F111s. We did form packages together. We formed packages with the US and UK forces there. The integration—the ability of both the F111 and the Hornet to be part of that package—was seamless. I actually did not want to use that term, but we started on day one integrating and the outcomes of the mission were met using F111s and F18s. The sortie rate

generated by maintenance and the serviceability of aircraft was in the order of 98.4 per cent. I think we dropped three sorties in total for the entire detachment.

Mr CAMERON THOMPSON—You said there was that niche. Would you explain what it was? What type of mission was it? Did it involve terrain-following radar? I am trying to get a picture of what it was.

Group Capt. Davies—It was a day and night scenario against an integrated air defence system, so there was a layered defence put in for surface-to-air missiles through to a primary target. We experimented within the Red Flag environment: was it a heavily defended IAD or a lightly defended one; was it all low level or was it all high level? It is that experimentation that gives us the confidence that, in a number of scenarios that we might be asked to go and operate in, we are capable of managing those scenarios.

Mr CAMERON THOMPSON—Are you rated in that process? Do you come back and stick a star on the wall and say, ‘We got a gold star for that one’? I do not know how this is done.

Group Capt. Davies—Yes, we get a gold star. The reason I say that is that Red Flag was designed to give crews the first 10 days of war, if you like. It was actually not bad to die—simulated, of course—in the first couple of days because you made a tactical blunder or you did not use your systems to their full extent. This Red Flag was no different from the others that I have been to in that there was a significant improvement as a coalition force and, primarily in our context, the Australian Hornets and F111s improved as we went through that two-week period.

ACTING CHAIR—Just before we finish, how reusable are F111 pilots? Are you going off to Hornets or waiting for the JSFs? Will there be a big transition?

Group Capt. Davies—It is a bit of both. The F111 withdrawal plan includes a transition plan for pilots and navigators but I think as important as that, if not more important, is the workforce. The pilots will transition to either Hornet or other aircraft types. We have C17s and transport aircraft that need to be manned and piloted. The navigators are a different issue in that the next aircraft is most likely not to have a second seat. Some of those are already going through plans to transition into a pilots course; three have already done so. There are options for Army helicopter flying and also to man other positions within the new aircraft. The F111 withdrawal plan is in a reasonably mature state and it is movable at least through the 2010 or 2012 decision process.

ACTING CHAIR—I have got the Australian Aviation Museum in Bankstown in my electorate. It is about to be redistributed out, but I am sure they would be interested in one of those when the time comes! On behalf of the committee, I want to thank you very much. Today’s trip was extraordinarily worth while. The depth of information and the breadth of the evidence that you have given us has been really excellent and has helped us to clarify a number of issues we have arising from previous evidence, as has that practical look at your maintenance facility. Thank you for your attendance here today. If you have been asked to provide additional material, please forward it to the secretary.

Resolved (on motion by **Senator Payne**):

That this committee authorises publication, including publication on the parliamentary database, of the proof of transcript of the evidence given before it at public hearing this day.

Committee adjourned at 12.07 pm