4

Defence Industry Visits

Introduction

4.1 This chapter of the delegation report will discuss the outcomes of delegation meetings with three major US defence industry organisations. These visits were designed to observe progress on major Australian defence projects, to discuss Australian industry involvement and to get a sense of the scale of the massive US defence industry.

Raytheon Expeditionary Warfare Centre

Overview

4.2 The first industry site visited by the delegation was the Raytheon Expeditionary Warfare Centre (EWC). The EWC was chosen for inclusion on the delegation itinerary both because the technology being developed at the facility forms part of the Raytheon expertise being utilised on the important Air Warfare Destroyer (AWD) project, and because the facility is an example of the scale of the US Defence Industry. Importantly the specific technology being developed at the EWC will also feature in the impending Government decision on the future amphibious capability for the RAN.

4.3 The delegation were hosted at the EWC by Mr. David E. Gray, Executive Director of the Expeditionary Warfare Centre. Mr. Gray was assisted by Mr. Jerry Fitzmorris, the Raytheon staff member responsible for support to the Australian business unit of the company.

4.4 Raytheon is one of the leading defence and aerospace systems suppliers in the world. In 2004 it had sales of $US 20.2 billion and employed 80 000 people worldwide.[1] This scale of operation, across the defence, government, commercial electronic and space sectors, is well beyond that possible in Australia's relatively small market. The delegation was briefed on the following main business units:

- Missile Systems:
  - ⇒ produces strike systems such as cruise missiles, air to air and land combat missiles; and
  - ⇒ advanced programs such as directed energy weapons and armed unmanned air vehicles.
- Integrated Defence Systems:
  - ⇒ mission systems integration for submarines, including the Collins Class;
  - ⇒ other naval systems such as the future US amphibious class and the next generation destroyer;
  - ⇒ integrated air defence; and
  - ⇒ ballistic missile defence.
- Intelligence and Information Systems – which produces intelligence and information solutions.
- Space and Airborne Systems:
  - ⇒ Tactical aircraft systems such as the targeting pod in competition for the upgrade to Australia's FA18;
  - ⇒ Unmanned and reconnaissance sensors such as those that form the sensor package for the Global Hawk UAV; and
  - ⇒ Electronic warfare and communications systems.
- Network Centric Systems – supporting networked decision making:
  - ⇒ Command and control;
  - ⇒ Network sensors; and
  - ⇒ Communications.

Observations

4.5 In Australia Raytheon is represented by a wholly owned subsidiary company. The company described its Australian subsidiary as a self sufficient indigenous company, optimised for the Australian market and able to leverage particular Australian expertise into the global market. The

1 Unpublished Raytheon Briefing to Australian Parliamentary Delegation, 2 July 2005.

delegation was particularly interested in the process of 'reach-back' in which the Australian subsidiary can bring forward US technology in a cost effective manner.

4.6 The delegation was briefed that reach-back was being used to cost effectively support a range of current ADF projects. This reach back reduced the risk to the Australian Government by drawing on expertise already developed on US projects. The reach-back support includes the following:

- Collins replacement combat system – the use of US engineers seconded to Australia for training of Australian technicians and ongoing through life support;
- Air Warfare Destroyer – bringing to Australia Aegis knowledge and ship systems integration experience; and
- RAN Amphibious Ship project bid – importing to Australia system architects, major program management and supply chain management.

4.7 The delegation exposure to the scale of the Raytheon operation and the philosophy of reach-back support was an important aid to understanding the industry component of the Australia – US Defence relationship. The delegation is grateful to Raytheon Australia for facilitating their access to the parent company and to Raytheon US for the frank and extensive briefing and tour.

The M1 Abrams Tank

Overview

4.8 In 2004 the Defence Sub Committee reviewed the Defence decision to purchase new main battle tanks (MBT). The Committee noted concerns about the purchase but concluded that the "new MBTs will provide a positive addition to the Army and the ADF's broader objectives." However some Australian media speculation that the decision to purchase a refurbished Abrams tank meant Australia would be exposed to the same problems as the projects to procure the refurbished amphibious ships Manoora and Kanimbla and the Sea Sprite helicopters. To determine whether Defence faced a similar risk with the Abrams, the committee included a visit to the US Joint Services Manufacturing Centre (JSMC). The JSMC, formally known as the Lima Tank Plant, is the home of the Abrams tank.

4.9 At Lima the delegation was briefed by the US Government agencies with responsibility for Abrams, the manufacturing plant leadership and the industry contractor, General Dynamics Land Systems. This comprehensive

brief gave the delegation insight into the US military's long term plans for the vehicle, their expectations of the contractor, and the performance of the vehicle on operations. General Dynamics then gave a similarly detailed brief about the tank Australia is purchasing which, importantly, was conducted in the presence of the US project team who have proven to be a discerning customer.

4.10 The delegation then proceeded into the manufacturing plant where they observed the re-manufacturing of tanks for the US Army. While some steel for the Australian tanks has arrived at the plant, Australian manufacture has not yet commenced so the delegation observed the progress of US vehicles. It is important to note than one of the strengths the delegation observed about this Australian defence project is that it piggy-backs on a very successful US program with minimal changes.

Observations

4.11 The Project Manager for US ground combat systems Colonel Larry Hollingsworth briefed the delegation on the US system for managing their Armoured Fighting Vehicle fleet. He described the impact of the high operating tempo faced by US forces in Iraq and Afghanistan and the resulting sustainment and modernisation plans. The delegation was impressed by the detail of the US plan and with the US intention to support the Abrams tank through until 2050.

4.12 The delegation also noted that the M1 Abrams Army Integrated Management – Digital (AIM-D) version of the tank would form the majority of the US tank fleet until 2035. This is a clear strength of the Abrams project from the Australian stand point as we are now linked to an organisation supporting ~ 4000 tanks in service, the majority of which are identical to those purchased by Australia. The delegation did note that the year 2035 becomes an important decision point for Australia. At that time the next generation Abrams will merge with the follow on system, called the Future Combat System, forcing Australia to choose one path or the other.

4.13 The Australian purchase has come at a key juncture in the life of the Abrams. In the last decade, in both the US and Australia, many civilian theorists questioned the utility of heavily protected weapon systems that were difficult to strategically deploy. These theorists were convinced that rapid deployment was more important than protection for soldiers, convinced by a series of peacekeeping deployments where the threat of close combat was minimal. It was during this period that Australia's Leopard tank was neglected. However the 'Blackhawk Down' incident in Somalia showed the increased lethality of the modern battlefield, in which

even the most irregular forces have access to heavy weapons and rocket propelled grenades that can destroy lighter military vehicles. This modern battlefield demands we provide our valuable soldiers the best protection available. As the US military became aware of this need for protection they decided to modernize the Abrams tank and their other key land fighting systems.

4.14 It is this modernised Abrams that was demonstrated to the delegation. The tank includes a new and vastly more capable Forward Looking Infra Red (FLIR) sighting system and fire control computer which will allow Australian ground forces to detect targets and destroy them with precision, critically important when the threat forces may be operating amongst the civilian population. The Australian tank has improved armour that negates the need for depleted uranium and which forms part of a survivability package that includes blast proof compartments and fire suppression systems more advanced than on any other ground combat vehicle in the world. The tank has been modernised to be digitally capable, meaning that it can form part of a networked team with systems such as the Tiger Helicopter, the Airforce Airborne Early Warning and Control Aircraft and in the future the Joint Strike Fighter.

Figure 4.1 The delegation observes the test and evaluation phase of the M1 Abrams re-manufacturing process

4.15 Finally to dispel the idea that the Abrams purchased by Australia was simply a veneer over an old vehicle the delegation was shown the complete upgrade process. In one of the largest enclosed production facilities in the world the vehicle is reduced to its original internal frame before being completely rebuilt. The most modern engineering processes

available are in use at the plant, including computer controlled laser and water jet cutters, which achieve error tolerances previously unheard of in manufacturing on this scale. The delegation observed the fitting of a new more fuel efficient engine, a pulse jet dust filter system and digital electronics to integrate the numerous systems on the vehicle. To complete their understanding of the process the delegation were taken out onto the test facility and driven around the test track in completed vehicles.

4.16 After an extensive inspection the delegation were impressed with the Abrams rebuild process. The 59 M1 Abrams tanks for Australia have been selected from tanks whose usage has been in peace time training and which have not fired depleted uranium ammunition. They will not include any elements of depleted uranium armour but will be the best protected fighting vehicles in the world. Significantly for Australia the tanks will be almost exactly the same as those used by the majority of the US Army and have been procured under a US Foreign Military Sales (FMS) contract linked directly to the price and arrangements in place for the US military, ensuring best value for the Australian tax payer.

Lockheed Martin - Joint Strike Fighter

Overview

4.17 The aim of the visit to the Washington Headquarters of Lockheed Martin was to enable the delegates to understand the range of issues associated with Australia's likely purchase of the F35 Joint Strike Fighter (JSF).

4.18 The Defence Sub-Committee has received a number of submissions during inquiries into the Defence Annual Report 2003-04 and the current inquiry into Australia – US Defence relations concerning progress on the JSF project. Because the project represents the largest single defence procurement in Australian history it will continue to be followed closely by the Parliament and the public until the capability is delivered into service. With so many opinions being expressed about the JSF it was considered important that the delegation seek briefings from the US Government Project Office and the prime contractor, Lockheed Martin, in order to receive the most recent and accurate information.

4.19 To this end the delegation was grateful for the opportunity to speak with Admiral (USN) Steve Enewold, the Project Director and Mr. Rick Kirkland, Vice President Lockheed Martin Corporate and International Business Development. In speaking with these officials the delegation intent was to cut through the 'fog of war' to get to the real state of the project.

Observations

4.20 One of the issues raised in submissions to the Inquiry relate to the actual performance characteristics of the aircraft. The aircraft has been criticised for not having significantly more aeronautic capability than the current generation of Russian built aircraft being procured by countries in the Asia Pacific. At the outset of the briefing the project office made it clear to the delegation that the aim of the project was not to make a quantum leap in aeronautic performance and that criticism in this aspect of the project was misinformed. The aircraft is intended to have similar aero-performance characteristics as the FA18 or the US F16.

4.21 However the aircraft will make a quantum advance in the area of stealth technology, both in reducing signature and in the application of counter-measures. The aircraft will also have advanced avionics, able to network with other JSF and other command and control systems such as the AEWC aircraft. This networked capability, combined with stealth technology, is intended to enable the JSF to defeat threat aircraft before aeronautic advantage is an issue. The conventional take-off aircraft will also have a 50% range advantage over the FA18, placing the JSF range close to mid way between the FA18 and the longer range F111. Finally the aircraft is intended to be significantly easier to support, as a result of greater reliability and lower cost of operation, than current generation aircraft. Therefore the US Project Office argue, JSF as a component of a complete capability, will be significantly more able than the aircraft it replaces and other aircraft being operated in the region.

4.22 Criticism of the choice of aircraft has also included comment that the JSF has not achieved weight or performance targets. The assertion has been taken up by some members of the US Congress who have threatened to cut development funding to the aircraft until the weight problems have been resolved. The delegation put these criticisms to the US Project Office. Admiral Enewold, who has responded to the Congressional criticisms, explained that the majority of the weight over-runs have been in the Short Take-Off and Vertical Landing (STOVL) variant of the JSF. Significant re-engineering of the aircraft was necessary as a result of these weight issues, causing a 12 month delay in the project. However the conventional JSF, sought by Australia, is projected to meet or exceed key performance parameters set by the US Airforce. Weight savings identified in the STOVL aircraft will in turn be passed on the conventional aircraft, potentially further improving performance and allowing increased development potential over the life of the aircraft.

4.23 While redesign work is being undertaken, the test flight program will continue on the original or 'heavy' aircraft. This will ensure minimal delay

occurs in the systems integration work, which is generally regarded as the most complex element of the JSF system. The project office acknowledged that there had been a 12 month delay from the original time-line developed at the outset of the project, but indicated that as long as the development funding agreed by the US Government was not altered, there would be no further slippage over the remainder of the projected development schedule.

4.24 One of the most interesting observations to emerge during discussion of production and scheduling, concerned the state of the art digital design and manufacturing systems used on JSF. The multi-national team building the aircraft, including a number of Australian companies, share a digital design data-base for the aircraft. Collaborative design takes place in this virtual or internet based 'design room', allowing precise input from all agencies as the aircraft takes shape. This is a 24 hour process in which Australian design inputs take place during the Australian working day and then form part of US based considerations the next day.

4.25 A significant outcome of this digital design function has been the increased accuracy of the manufacturing process. Assembly time has more than halved and error rates in fabrication are also less than half of that achieved on legacy aircraft. These results are projected to allow the manufacturers to meet affordability expectations and may accelerate delivery schedules once production of service aircraft commences. Projected production costs are expected to be approximately equal to the current cost of the F16.

Figure 4.2 Hon Bruce Scott MP pilots the F35 Joint Strike Fighter simulator, observed by Mrs Joanna Gash MP, Crystal City Virginia

4.26 Discussions of alternatives to the JSF by Australian air power theorists have suggested the F22 Raptor may be a better capability for the RAAF. Lockheed Martin also produce this highly capable air superiority fighter and were able to provide some comment on this alternative for the delegation. Firstly it is not clear whether the F22 will be sold to any allies because of the sensitivity of technology and the International Traffic in Arms (ITARS) limitations imposed by Congress. If such a sale was possible the cost of the aircraft would be expected to be exponentially greater than the JSF as the development costs of the aircraft will be shared over a far smaller number of aircraft. However, Lockheed Martin briefed the delegation that many of the avionic capabilities of the two aircraft are now common. As an advance is identified on one platform it is added to the other, reducing overall cost and increasing capability. By the time the JSF is produced Lockheed Martin expect many elements of the two aircraft to be common.

4.27 Finally the delegation was briefed on Australian Industry participation in the program by Mr Abhay Paranjape, the JSF International Program Manager for Lockheed Martin. Mr Paranjape briefed the delegation that the allied industry participation program did not include any automatic industry offsets. Each business competing for work on the program must win the work on merit in a competitive process.

4.28 The $AUD 200 million Australian Government contribution to the program meant that Australia was regarded as a Tier 3 partner. The Tier 1 partners are the US and UK, responsible for the majority of the main assemblies that comprise the aircraft. Tier 2 partners include the Italians and Dutch, each able to bid for significant sub-systems. Industries from Tier 3 partner countries are able to bid on contracts for the sub systems that comprise the Tier 1 and 2 assemblies.

4.29 Australian companies have been very successful in winning business in this very competitive environment. Current business, in the prototyping or low rate production phase amounts to $US 210 million. If the Australian firms continue to perform at their current high level these contracts are expected to expand significantly in the full production phase in which up to 4000 aircraft are expected to be made.

4.30 Lockheed Martin have been particularly impressed by the innovation and quality of the Australian companies who have now been granted access to contribute to the digital design of the aircraft. They have also been impressed by the collaborative or team Australia approach used by the Australian Government to group like companies as allies rather than enemies on the project. As a result Australian companies have a very high

take up rate on bids when compared with peer nations. Of the $US 846 million in projects available to Tier 3 partners Australian companies have had the ability to bid against $US 433 million in opportunities. Lockheed Martin briefed the delegation that the $US 210 million achieved against the opportunities available has been the highest amongst contributing countries.

4.31 In summary the visit to the Washington Headquarters of Lockheed Martin allowed the delegation to discuss a number of issues that surround the JSF procurement decision in Australia. The delegation was made aware of the true delays due to weight over-runs in the design of some variants of the JSF. The delegation was made aware of the impact of possible delays in funding the development phase of production by the US Congress. While these restrictions involve relatively small amounts of money they may cause significant delays in the project that will impact on Australia's proposed delivery time line.

4.32 The Congressional decisions are expected in late 2005 and need to be followed closely by the Government and the Joint Standing Committee on Foreign Affairs, Defence and Trade. The Committee will continue its oversight of this issue, including the US project office response to Congressional criticisms, through an inquiry into the ability of the ADF to maintain air superiority in our region to 2020.