# Submission to the Senate Foreign Affairs, Defence and Trade Committees

## *Reference: Procurement procedures for Defence capital projects*

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*This is a public submission. It is not addressed specifically to and therefore does not address sequentially, sections a. through to e. of this enquiry's terms of reference. Rather, it seeks to identify structural factors that continue to generate recurring problems with the acquisition of major military equipment in Australia.*

*I argue that, because structural factors are difficult to address, the problems that derive from them are unlikely to be overcome solely by modifications to procedure and process. Instead, responses specific to each project may be required as such difficulties emerge. If this is the case, the successful acquisition of military equipment may in many cases require ongoing direct government involvement in monitoring the progress of projects and the maintenance by the Commonwealth of an adequate array of options to rectify potential deficiencies. As such interventions may deviate from the current process of forcing the contractor to accept the time and cost penalties involved in rectifying non-compliant projects, the components of Australian Defence Organisation's (ADO) acquisition cost structure will need to adequately reflect the possibility of requirements for a more active intervention process.*

*The point at which good judgment can influence the future of an acquisition project is during its early developmental phase. In the past, important decisions arising from this phase had set the character of major equipment projects before they were revealed to the Parliament and public. I argue that recent changes in the structure of the ADO now permit the Parliament to play a role in influencing the development of acquisition projects though their early phases.*

*With this structure in mind, the submission is probably most relevant to point c. of the terms of reference. However there are points made throughout that relate to the other four. The submission uses the term "acquisition" to cover the range of activities involved in the purchasing of military equipment, from the conceptual genesis of the project to its acceptance as fit for service by the Australian Defence Force.*

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Australia's acquisition of major military equipment is an area that continues to suffer from significant problems. To those with a long memory, the difficulties currently facing the RAAF's attempts to modernise its combat force with the F-35 joint strike fighter are beginning to look very similar to those of that afflicted the purchase of the F-111 almost 50 years before. This view is strengthened because the root causes of both projects' problems lie in the same areas, – an unnecessarily early commitment to an incomplete design involving immature technology.

Over recent months the Australian Defence Organisation (ADO) has gained attention arising from problems with acquisition projects. Deficiencies in the early construction phase of the Air Warfare Destroyer (AWD) project were symptomatic of undertakings on which the ADO was unable to spend almost $2 billion of its allocations for 2010-11. Subsequently, public policy management concerns were identified by *Report No. 57* of 2010-11, Australian National Audit Office, in the way that the ADO purchases naval equipment.

Such problems grow out of a complex environment. The consequence is to bring into play forces that are often incompatible, frequently not complementary, and of sufficient strength to suggest that the problems of defence equipment acquisition will never be "solved". This in turn suggests that the equipping of the ADF has to be fundamentally rethought.

## Procedures Subjected to Decades of Reform

This is not an area suffering from policy neglect – attempts to overcome significant weaknesses and more tightly manage the processes for acquiring new military equipment go back decades. In the late 1980s then Defence Minister Kim Beazley corporatized, preparatory to their commercial sale, government factories, closed the dockyard at Cockatoo Island and privatized the Williamstown Naval Dockyard.

The privatization and commercialization of defence production facilities did not necessarily generate improved performance in the delivery of individual acquisition projects. A series of reports and structural changes culminated in the creation of the Defence Materiel Organisation, whose responsibilities were later expanded to include the sustainment of in-service military equipment. Efforts to improve the performance of defence acquisition continue, with the Minister for Defence announcing further reforms both in the context of the 2011-12 Budget and over subsequent weeks.[1]

[1] The Hon. Stephen Smith, MP Minister for Defence, "Independent Project Performance Office to oversee major Defence projects established", *Media Release Min.188/11*, 29 June 2011. Viewed 2 July 2011 http://www.defence.gov.au/minister/Smithtpl.cfm?CurrentId=12043 , The Hon. Stephen Smith, MP Minister for Defence, "Reforms to Projects of Concern", *Media Release Min.187/11*, 29 June 2011. Viewed 2 July 2011

## A Decade of Missed Financial Targets

These developments have taken place against a continuing background of criticism over the management of defence acquisition projects. There is now evidence sufficient to suggest that this trend in acquisitions management threatens the achievement of central policy objectives.

For the last decade, successive governments have maintained policies outlined in White Papers in 2000 and 2009 that aim to enhance the military capability of the ADF to perform roles required of it by government. Yet, the acquisition objectives supporting these aims have never been achieved fully. Hence, funding increases for enhanced acquisition (beginning in the 2001-02 Budget) have never been fully expended. Consequently, forward planning for funding acquisitions was scaled back in the 2011-12 Budget. Seemingly, the ADO is limited to processing a capital program with a costing placed somewhere between $5-$6 billion. The implication is that the ADO's long-term capability development plans are subject to constant slippage that creates doubt they can be achieved in the form they are originally announced.

## Difficulties of Risk Management

The central cause of DOA's inability to spend the money allocated to it is technical problems that significantly delaying the projected schedules of major projects. Issues to do with the advanced complex technical nature of military equipment are well known, yet defence acquisition does not differ in principal from civil projects and the latter can perform just as poorly as their complexity increases.

Fundamentally, this is about managing risk. As defence equipment is built by commercial entities DMO project managers are dependent on the supplying companies having the ability to manage risk factors within the budget and schedule of acquisition projects. Contractors are usually required to finance and manage the research and remanufacture necessary to rectify any shortcomings. Hence, increases in project cost are generally not borne by the Commonwealth

Unfortunately, experience and reputation within the defence industry do not necessarily indicate an ability to manage risk in a new project. Signature of a contract does not alter this situation if, despite reputation, contractors are unable to deliver and instead leave the industry (as happened with the Super Sea Sprite

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http://www.defence.gov.au/minister/Smithtpl.cfm?CurrentId=12046 and
The Hon. Stephen Smith, MP Minister for Defence, "Strategic Reform Program", *Media Release Min 116/11*, 6 May 2011. Viewed 6 May 2011 http://www.minister.defence.gov.au/2011/05/06/strategic-reform-program/

project). Nor can risk be directly correlated with complexity; as difficult as is the management of risk, so does it remain difficult to identify areas of risk. The automated ship control system for the *Collins* class submarines was a very complex system that was successfully developed. In contrast, the diesel electricity generating plant seemed a conventional and well-understood component of the design. In operational experience it has proved the chief vulnerability of the submarine. Similarly, the RAAF's Airbus A330 tanker transport aircraft project seemed to involve manageable risk.[2] In reality, problems with its refuelling boom have contributed to a more than two-year delay of the project.

Honing more precise contractual agreements with commercial suppliers is not necessarily a basis for the success of acquisition projects. Commercial entities are subject to business factors that may not continue to align with objectives of the ADO or the government over the (often substantial) life of a project. This was a factor behind problems that developed with the Super Sea Sprite, the Collins submarine combat system and the acquisition of intellectual property on the submarine.

## Implications for the Management of Risk in Defence Acquisition

Three observations are appropriate. Firstly, marketplace commercial factors cannot be assumed to provide adequate risk management across the ADO acquisition function. Contractual agreements might signify a commercial entity's willingness to meet the ADF's requirements for military equipment. History indicates that they do not mean that the signatory is fully aware of the risks affecting its compliance and has appropriate risk reduction strategies in place, even where failure might threaten the viability of the company.

Secondly, while it is comfortable for the DMO to require providers to rectify deficiencies, the approach has drawbacks. Schedule failures degrade ADF capabilities, sometimes seriously. Delays in the acceptance of the Collins class submarines reduced the RAN's capacity for a time to a single boat, created morale and recruitment problems and meant that the Navy's submarine expertise had to be rebuilt. Delays in the delivery of the A330 tanker transport mirror this situation. Larger prime contractors are better placed to finance rectification of underperforming equipment and this may favour them over smaller competitors, both in countenancing risk when seeking tenders and in surviving the costs of reworking.

Given the importance of many acquisition projects to achieving national defence policy objectives, a more interventionist approach in the management of problematic acquisition projects can be justified. This was the approach adopted

[2] The Mortimer Review listed the "air-to-air refuelling aircraft" as a moderate risk category of acquisition, "off-the-shelf with modifications", the report of the Defence Procurement and Sustainment Review, *Going To The Next Level*, Commonwealth of Australia, 2008, p. 18.

to rectify the performance troubles of the Collins class submarines at the end of the 1990s.[3] The introduction of the "projects of concern" approach represents something of an acknowledgement that waiting for contractors to achieve acceptable performance levels may not necessarily be the best way of achieving acquisition objectives. A further step is required, one recognizing that administering a contract is not the same as managing a project.

Thirdly, in order to intervene in the management of projects where required and as a consequence of the inherent difficulty of accurately predicting risk factors, the ADO should have in place independent and robust procedures for assessing project risk and the ability of preferred contractors to meet them. That might require only increased rigour in the evaluation of tender responses but, as the only party with an un-diminishing interest in the successful outcome of a project, the Commonwealth should ensure that it retains the capability to overcome problems that emerge during acquisition. This will include the experience of serving ADF personnel and the technical innovation of DSTO but also such things as access to help from allies, and finance to employ alternative commercial entities.

Careful consideration should be given to the need for preferred technologies as a means of managing risk factors. For instance, in the case of the tanker transport, the RAAF was already accepting considerable risk by being the launch customer for this version of the A330. Whether it should then have increased its exposure by sponsoring the development of the first digitally controlled boom refuelling system is debatable. This is especially so as ADF operational circumstances did not necessitate the acceptance of such risk. The then pending retirement of the F-111 meant that an RAAF boom refuelling capability would not be required until acquisition of the F-35, many years after the originally scheduled arrival of the tankers.

## No Magic Bullets

The factors described above help to explain the continuing problems in defence acquisition. While there is every reason to continue improving the processes in this area, the history of unending and ultimately disappointing process change suggests that chances of finding a "magic bullet" to ensure trouble free acquisition are slight.

Much of the focus of present efforts to secure better outcomes in acquisition falls upon "off-the-shelf" equipment selection and there is some promising experience with this approach. However, off-the-shelf acquisition may not be applicable to complex major defence equipment projects, because these need to enable the ADF to maintain a technological superiority over other regional armed forces. This is an objective that is becoming increasingly difficult and its achievement is

[3] Yule and Woolner, op. cit., p. 287 ff.

likely to be seen as justifying increased risk in some pending acquisition decisions.

The promise of establishing a lengthy period of technological ascendancy lies behind the acquisition of two of the most controversial ADF projects, the F-111 and the joint strike fighter. In both cases there was an impression that the projects had something of an off-the-shelf appearance, a view shared by the Mortimer Report.[4] In fact, neither project was within years of attaining such predictability at the times Australian governments chose to commit. Both projects were troubled and delays forced the RAAF in both instances to acquire an interim fighter force.[5] Australian achieved none of the benefits of off-the-shelf acquisitions.

Yet, if "off-the-shelf" means safe to buy because of the familiarity of widespread usage, the ADF is likely to consider such equipment to be inadequate for crucial combat roles. The Mortimer Report exhibits several misunderstandings about "off-the-shelf" acquisition and it seems likely that few major ADF combat systems will comply with the Report's definition.[6] Significantly, the requirements for ongoing capability sustainment, particularly for naval combatants, usually do not comply with the off-the-shelf rubric that acquisition should be from an established production facility.

With maritime combat capability featuring strongly in Force 2030 and a central air combat element provided by a yet incomplete developmental project, there is probably little scope for off-the-shelf acquisition in meeting the major strategic capability requirements of the ADF over the next two decades.

## A Pathway with a More Active Management Approach

There appear to be no easy solutions for improving the ADO's performance in acquiring new defence equipment. The current DMO policy of selecting a preferred tenderer through market-based competition and taking a narrow interpretation of contractual obligation as the means of overcoming emerging problems, has not worked. The policy is effective in limiting the Commonwealth's financial exposure to additional acquisition costs but has failed to prevent schedule delays, disruption of capability and financial planning and, sometimes, significant opportunity costs for sustaining ADF capacity.

Sensible decisions can and should be made during project development to reduce risk. Early selection of the Aegis combat system for the AWD and a

[4] *The report of the Defence Procurement and Sustainment Review*, p.19.
[5] The RAAF Museum's history of the F-111 in Australian service contains a brief discussion of difficulties during the acquisition stage of the project. RAAF Museum, *A-8 General Dynamics F-111*. Viewed 24 August 2011 http://www.airforce.gov.au/raafmuseum/research/aircraft/series3/A8.htm
[6] *The report of the Defence Procurement and Sustainment Review*, "Glossary of terms", Annex F 4.

decision not to integrate the aircraft avionics and radar electronics of the Wedgetail early warning and control aircraft are examples. However this has not prevented these projects experiencing difficulties in other areas.

With the AWD these manifested in the complex but, nonetheless, predictable task of assembling the warship's keel blocks. Apparently caused by insufficient skilled labour and inadequately interpreted Spanish technical documents, the emergence of problems was more significant for the tensions displayed inside the project's alliance style contract arrangements. Once seen as the answer to better management of acquisition projects, alliance arrangements thereby were shown to be insufficient, by themselves, to achieve successful project outcomes.

Such occurrences are inherently political problems, since they involve entities whose expectations for the project are driven by the different outcomes that each pursues. As was the case in rectifying the deficiencies of the Collins submarines in 1999, redirecting such individually held outcomes back towards the goals of the project usually requires the intervention of a higher-level authority. The Minister's agreement to reallocate construction of AWD keel blocks, the creation of a Minister for Defence Materiel and the introduction of Gate reviews with increased involvement by the latter Minister in rectifying projects of concern[7] is a recognition of the need for higher level intervention in underperforming projects. The minimal usefulness of Ministers discussing monthly situation reports with officials has been apparent for some time.

## Reviewing Policy Settings

However, pursuing more interventionist management practices will require review of other policy settings. Most important are those that involve the ADO's people and their training and employment. This is as much a troubled area for the ADO today as is equipment acquisition. The ADO has for decades been subject to selective deskilling as efficiency programs have sought to reduce running costs. Many of the activities that developed the skills needed to rectify problems in equipment performance have been transferred to the private sector[8] and have often dissipated. This process is now subject to further uncertainty arising from the macro economic settings for Australia's industrial sector.

In any case, the ADO no longer has sufficient skills available to meet its need to verify that the nation's acquisition interests are being met. The Audit Office records that in no area does the RAN have more than 70 percent of the marine

[7] The Hon. Stephen Smith, MP Minister for Defence, "Strategic Reform Program", *Media Release Min 116/11*, 6 May 2011. Viewed 6 May 2011 http://www.minister.defence.gov.au/2011/05/06/strategic-reform-program/

[8] Australian National Audit Office, *Acceptance into Service of Navy Capability*, Performance Audit Report No. 57 of 2010-11, Canberra, June 2011, p. 199.

engineers it needs for current requirements,[9] let alone those should one of the major projects now being developed go awry. Yet the basis of the government's implementation of defence policy is yet another reform program, which is tasked with finding $20 billion in savings over 10 years. Improving administrative efficiency is a valid objective but could involve false economies if it results in the loss of further personnel required for programs needing active project management or to rescue equipment acquisition gone wrong.

An outcome of the complexity of defence equipment is that acquisition programs take a long time. The new submarine project could be delivering vessels into the 2040s. So much will change over this time that the later units in the 12 submarine project could well be obsolete, a risk factor that its acquisition strategy will have to address. This will require a broader involvement by Navy (that is, the Service and not just its representatives in DMO) so that achieving operational status does not become "a voyage of discovery".[10] In other words, ongoing involvement by Navy personnel to ensure that, after a period of 10 years or more, the equipment meets the needs of current circumstances rather than those envisaged a decade earlier when it was designed.

This situation is confined neither to the Navy nor to very long-term projects. Recently, Major General John Caligari, in charge of the Army's modernisation programs, criticised the difficulty of modifying tenders to ensure equipment delivered to soldiers in operational areas (such as Afghanistan) meets the changing nature of the conflict.[11] The ADF will face continuing pressure to train and retain the required personnel. Should relevant skills in the commercial sector decline with the fortunes of the manufacturing sector, the ADO will have to compensate by increasing personnel and training programs. This, in turn may test the limits of the Strategic Reform Program.

## A National Capability Planning Report

Most of the increases in acquisition cost estimates usually occur before conclusion of the tendering process, with the most steep of increases in cost estimates usually occurring in the development phase. The Mortimer Review observed that analysis of projects during their early development needed to be improved.[12] Some three years later, changes to the ADO's management structure (those around the creation of an office of Associate Secretary (Capability)) resulting from the Black Review into defence accountability, have

[9] The RAAF fares better overall but still has only 85 percent of its establishment in DMO. Australian National Audit Office, *Acceptance into Service of Navy Capability*, Table 7.2, p. 201.

[10] Australian National Audit Office, op.cit., p.25.

[11] "Defence hold-ups could kill, says general", *The Australian*, 30 June 2011. Viewed 3 July 2011 http://www.theaustralian.com.au/national-affairs/defence-hold-ups-could-kill/story-fn59niix-1226084470192

[12] The report of the Defence Procurement and Sustainment Review, "Recommendation 1.2", p. 5.

been instituted to “ensure the more effective contestability and integration of advice at the early stages of the (acquisition) process.”[13]

This sensitive stage is generally considered to occupy the first 10 to 15 per cent of the project’s lifespan. Unfortunately, this phase is largely invisible to anyone outside the project or its higher management structure. It took the first five years of the Collins project for it to emerge as a unique developmental acquisition for which the RAN would be the parent navy. At this stage, it was too late to apply any external contestability to influence the nature of the project. At around 20 percent of the project’s lifespan, everything about it was locked in. This point was reached earlier in the history of the joint strike fighter project. Once an acquisition project has reached this degree of definition there is little that can be done to affect its price structure or moderate its risk profile.

Under current practice, the point at which such objectives can be pursued is the first past approval by Cabinet. There have been some criticisms of the effectiveness of this process and the lack of contestability in the options provided to the government. Presumably, the new arrangements under the Associate Secretary (Capability) are meant to stiffen contestability at this stage of the acquisition cycle. Unfortunately, although potentially an improved process, it will still remain invisible to the Parliament and the public.

If members of the Parliament or its bodies such as this committee, wish to influence the effectiveness of the ADO’s acquisition processes they must have input to this stage of project development and the subsequent evolution to second stage approval. Development of a contestability apparatus under AS(Capability) should make this possible. Indeed, a performance requirement of the position could be an annual declassified report to Parliament explaining the evaluation of the various factors considered in defining the nature of significant ADF equipment programs. This could stand as a separate report or become part of a revived annual national security statement.

In the past, bridging the gap between the broad outline of strategic policy, the aspirational objectives of capability development and the specifics of acquisition projects has been a singular weakness of the ADO. An obligation for the new structure to report to Parliament will provide an incentive to address this problem which, if achieved, would provide more potential than most other options to improve the efficiency of defence acquisition and its alignment with government policy objectives.

The implication of the trends identified in this submission is that Net Personnel and Operating Costs are likely to increase as a proportion of total acquisition costs. In addition, options for reducing risk in forthcoming acquisition projects are

[13] Stephen Smith MP, “Improving personal and institutional accountability in Defence”, *Media Release Min 230/11*, 9 August 2011, p.3. Viewed at http://www.minister.defence.gov.au/2011/08/09/improving-personal-and-institutional-accountability-in-defence/

likely to be fewer than might have been expected. In the absence of increased defence funding, achieving all objectives for Force 2030 will become very difficult and aligning acquisition with central objectives of strategic policy increasingly important. A more open and contestable process for making the decisions that such circumstances will demand should contribute to better policy outcomes and provide the Parliament, for the first time, with a meaningful role in the process.

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5 September 2011

## Attachment 1

### A brief outline of acquisition reform since the 1980s

Reform of defence acquisition is not an area suffering from policy neglect – attempts to overcome significant weaknesses and more tightly manage the processes for acquiring new military equipment go back decades. In the late 1980s then Defence Minister Kim Beazley radically overhauled the traditional practice of the government owning and managing facilities for the production of munitions and naval vessels. He corporatized, preparatory to their commercial sale, government factories built under the Department of Supply or its successors, closed the dockyard at Cockatoo Island and privatized the Williamstown Naval Dockyard.

Privatisation and corporate restructure reduced the government's exposure to the costs of maintaining production capabilities. Capital, facilities and, especially, staffing costs were passed to the private sector (if sometimes via an off-budget government authority). These instead became part of the acquisition cost. Williamstown went on to complete an exemplary program building the ANZAC frigate but, under its third commercial owner, has suffered problems in constructing sections of the Air Warfare Destroyer. Some former Supply facilities are performing well, for example the Bendigo factory now owned by the international company Thales where the Bushmaster protected mobility vehicle is produced. Nonetheless, the Bushmaster project was one that was plagued by early difficulties and came close to cancellation.

However, experience suggests that the privatization and commercialization of defence production facilities did not necessarily generate improved performance in the delivery of individual acquisition projects. As detailed by the Australian National Audit Office (*Submission 22*), a series of reports and structural changes culminated in the creation of the Defence Materiel Organisation (and continued to support its subsequent review). The scope of DMO was expanded across the life of the materiel, to include the sustainment of in-service military equipment, an undertaking that impinges on the responsibility of Service Chiefs to maintain the readiness of their forces. Integral to this development was an expectation that the success of the DMO depended on the recruitment of its senior officer from the private sector.

Efforts to improve the performance of defence acquisition continue, with the Minister for Defence announcing further reforms both in the context of the 2011-12 Budget and over subsequent weeks.[14]

[14] The Hon. Stephen Smith, MP Minister for Defence, "Independent Project Performance Office to oversee major Defence projects established", *Media Release Min.188/11*, 29 June 2011. Viewed 2 July 2011 http://www.defence.gov.au/minister/Smithtpl.cfm?CurrentId=12043 , The Hon. Stephen Smith, MP Minister for Defence, "Reforms to Projects of Concern", *Media Release Min.187/11*, 29 June 2011. Viewed 2 July 2011

http://www.defence.gov.au/minister/Smithtpl.cfm?CurrentId=12046 and
The Hon. Stephen Smith, MP Minister for Defence, "Strategic Reform Program", *Media Release Min 116/11*, 6 May 2011. Viewed 6 May 2011 http://www.minister.defence.gov.au/2011/05/06/strategic-reform-program/

## Attachment 2

### Failing to grasp the promise of financial plenty

The 2011-12 defence budget saw a distinct change of policy for the funding of the department's acquisition function, arising from continued under spending on major equipment programs. The accumulation of problems within individual acquisition projects has compounded and has come to be represented by a continuing failure to spend annual appropriations for major military equipment and to achieve the future spending levels projected in the additional estimates. There is now evidence sufficient to suggest that this trend in acquisitions management threatens the achievement of central policy objectives.

For the last decade, successive governments have maintained policies outlined in White Papers in 2000 and 2009 that aim to enhance the military capability of the ADF to perform roles required of it by government. Yet, the acquisition objectives supporting these aims have never been achieved fully. Hence, funding increases for expanded acquisition (beginning in the 2001-02 Budget) have never been fully expended. Only four years into the period, by 2005-06, expenditure on major military equipment had fallen around $3 billion behind schedule. Projects worth $2.2 billion were deferred to 2008 and later years.

To allow the deferred projects to be reabsorbed, planning for the 2008-09 budget projected a 27 percent increase in the allocation for equipment acquisition. Instead, the problem recurred, with the 2007-08 allocation under spent, objectives for 2008-09 slashed and, consequently, projects worth $7.4 billion deferred for two or more years.

Before this reprogramming could be implemented (with $70 million allocated in 2011-12), it was swamped by the consequences for the forward estimates period of the effectively $2 billion capital equipment under spend in 2010-11. The 2010-11 Budget had contained a Major Capital Investment Program allocated an estimated $5.8 billion but this figure had been reduced $530 million by the time of the Additional Estimates. The estimated allocation for 2011-12 is a further $140 million below the reduced outcome expected for 2010-11. The 2012-13 major capital program dips further to $4.2 billion, with projected outlays not rising above the failed 2010-11 estimate until the $6.4 billion projected for 2014-15.[15]

However, the constant of capital acquisition since the 2000 White Paper is that such projected increases in expenditure are never attained. Seemingly, the ADO is limited to processing a capital program with a costing placed somewhere between $5-$6 billion. The implication of this history is that the ADO's long-term capability development plans are subject to constant slippage that creates doubt they can be achieved in the form they are originally announced.

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[15] Department of Defence, *Portfolio Budget Statements 2011-12 Defence Portfolio*, "Table 14:Total Capital Investment Program", Canberra 2011, p.34.

## Attachment 3

### Risk management in defence acquisition

Fundamentally, achieving progress in acquisition is about managing risk, regardless of whether it is in the military of civil spheres. Project performance in comparable areas of civilian technology (as, for instance, civil aviation) appears to be little better than in all but the most difficult of military technological developments. The Airbus A380 suffered delays of around 2 years against projected delivery dates (varying due to a customer's position in a reduced production schedule) while the Boeing 787 is still on the verge of entering service, around three years behind schedule.

Civil capital acquisition can strike trouble where the technology is proven but inadequate allowance is given to risk factors affecting schedule, cost or other critical variables. Australia's largest engineering contractor, Leighton Holdings, was a recent proof of this, having to write down a $480 million profit projection to record a $420 million loss.[16] Much of the reason for this was because of increasing cost in a major road project and schedule delays caused by unusually wet weather effecting construction of a desalination plant.

Defence project managers are as aware as their commercial counterparts of the requirements of risk management. However, Australian defence equipment is built by commercial entities and DMO project managers are in a position little different from airline managers, being dependent on the supplying companies having the ability to manage risk factors within the budget and schedule of acquisition projects. Management disciplines aim to prevent significant changes to the nature of military acquisition projects once contracts are finalized, to prevent situations analogous to an airline management asking for an additional engine after the airliner had been designed.

In one aspect, DMO management of risk has a significant advantage over commercial practice. The consequences of failing to achieve project objectives are borne by the company contracted to deliver equipment to the ADF. Generally, this involves them financing and managing the research and remanufacture necessary to bring the equipment to the level where it is acceptable for service. Hence, contemporary acquisition practice by the ADO does not usually result in increase of cost directly associated with the acquisition.

Unfortunately, experience and reputation within the defence industry do not necessarily indicate an ability to manage risk in a new project. Signature of a contract, which at face value indicates a company's confidence in its ability and

[16] Tracy Lee, "Leighton Holdings sinks into massive loss on writedowns, plans to raise $757m", *The Australian*, 11 April 2011. Viewed 1 September 2011 http://www.theaustralian.com.au/business-old/industry-sectors/leighton-holdings-in-huge-swing-to-427m-loss-plans-to-raise-757m/story-e6frg96x-1226037278119

carries penalties should it fail, does not alter this situation. For example, the well-regarded Litton Systems undertook the now infamous Super Sea Sprite naval helicopter project. The RAN wanted to use a flight crew of two instead of the three utilized in US Navy service, and for which the helicopter's systems had been designed. Hence Litton was required to develop a new avionics system and integrate it with an existing helicopter's airframe and control systems. Despite its reputation and ability Litton was unable to deliver, was forced out of the defence systems industry and left a project that eventually had to be scrapped.

Neither is it possible to quantify risk as directly correlated to complexity. The phrase attributed to former US Secretary of Defence, Donald Rumsfeld, about "unknown unknowns" is now frequently used in reference to the difficulty of identifying areas that might cause problems during the development of an acquisition project. The automated ship control system for the *Collins* class submarines was a vital, innovative and highly complex system that was successfully transferred from its Swedish designer, Saab and developed for the Australian boats. Crucial elements in this process were tight, even at times intrusive, management of this part of the Collins project and the use of a land based test system.[17] In contrast, the diesel electricity generation plant seemed a conventional and well-understood component of the design. The Hedemora-based system was chosen for its enormous power output but in service has proved somewhat fragile and contributed to the restricted availability of the submarines.

More recently, the design and development of the digitally controlled Aerial Refuelling Boom System (ARBS) for the RAAF's Airbus A330 tanker transport aircraft project would seem to involve manageable risk issues, even though it is the first of its type.[18] In fact, problems with the boom have been a major factor in the more than two year delay of the project and, even so, the aircraft will commence RAAF operations without the ARBS, which has sometimes proved dangerous to aircraft involved in trials.[19]

Neither does reaching an ideally structured contractual agreement with your commercial supplier necessarily contribute to the success of an acquisition project. Commercial entities run to their own demands and these may not continue to coincide with those of the DOA or the government over the often long period of an acquisition project. As mentioned above, in the case of the Super

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[17] Peter Yule and Derek Woolner, *The Collins Class Submarine Story: Steele, Spies and Spin*, Cambridge University Press, 2008, pp. 160-165.

[18] Indeed, the Mortimer Review listed the "air-to-air refuelling aircraft" as a moderate risk category of acquisition, "off-the-shelf with modifications", the report of the Defence Procurement and Sustainment Review, *Going To The Next Level*, Commonwealth of Australia, 2008, p. 18.

[19] In January the first of the Australian aircraft and a Portuguese jet fighter were damaged when the boom broke during trials by the manufacturer over the Atlantic Ocean. "Boom or bust! - RAAF KC-30 loses boom", *Australian Aviation*, 13 July 2011. Viewed 5 July 2011 http://australianaviation.com.au/2011/01/boom-or-bust-raaf-kc-30-loses-boom/

Sea Sprite helicopter, if the demands of adhering to contract become unsustainable, a company may prefer to sell out rather than make further efforts to comply.

Even where contractual relationships remain sound, incongruity between the interests of business partners may undermine projects. The combat system of Collins submarine became a notorious failure and had to be replaced. There were several reasons for this but significant among them was the early departure from the consortium contracted to develop the system of the company with the most expertise in the field, because it feared that its commercial interests would be compromised if it remained.

Similarly, the capacity of the Australian Submarine Corporation (ASC) was severely reduced when one of the constituent companies was asset stripped after a hostile takeover. Eventually, when the submarine designer and consortium partner, Kockums, was itself taken over by a rival, the government was forced to acquire ASC. This precipitated a long and costly legal battle for intellectual property rights and greatly complicated relationships at a time when every effort was needed to overcome the problems then affecting the submarines. In the long run, it is only the Commonwealth that can be guaranteed to have retained its interest in the success of a project.

## Attachment 4

### Problems in applying off-the-shelf approaches in defence acquisition

Much of the focus of present efforts to secure better acquisition outcomes falls upon "off-the-shelf" equipment selection. Experience with some projects has been promising, with the acquisition of Super Hornet interim strike fighters and C-17 freighter aircraft having been trouble free. Both types were acquired as standard production models from well-performing factories, having become established in service with the US armed forces.

However, off-the-shelf acquisition may be applicable to few major defence equipment projects, particularly those at a level of complexity where risk factors proliferate. It would not be relevant for this submission to stray far into the realm of strategic guidance but it remains pertinent that acquisition activities are intended to support the goals of strategic policy. Providing equipment that ensures the ADF's effectiveness in prosecuting these goals remains its ultimate objective. Although many factors contribute to achieving military effectiveness, for several decades past Australian policy has held that, in the nation's strategic environment, this is best achieved by the ADF maintaining a technological superiority over other regional armed forces.

Maintaining this objective will become increasingly difficult as growing wealth across Asia supports the purchase (and more importantly, the effective operation) of advanced equipment. This erosion will be further compounded by the growth in much of the region of information and communications technology industries, which have the potential to support the basis of modern military operations – sensors, communications, computers and "smart" weapon systems.

An attempt to establish a lasting advantage in military technology lies behind the acquisition of two of the most controversial ADF projects, the F-111 and the joint strike fighter.[20] Both offered the promise of advanced technologies able to give the ADF a lengthy period of technological ascendancy.

In both cases the government's decision making appeared to be eased by the impression that a projected large American production run gave the projects something of an off-the-shelf character. Both appeared to offer a reduced risk by adopting a multirole, multinational development strategy, implying that lowered costs of acquisition and operation would be achieved by a much wider than normal amortisation of project costs. Indeed, the Mortimer Report considered Australia's participation in the joint strike fighter program an example of using an "international effort to access cutting-edge technology in a cost-effective manner".[21] In fact, neither project was within years of attaining such predictability

[20] Senator the Hon Robert Hill, Minister for Defence, "Transcript of Australia to Join Joint Strike Fighter Program", *Media Release Min 27062002/02*, 27 June 2002, pp. 1-2

[21] *The report of the Defence Procurement and Sustainment Review*, p.19.

at the times Australian governments chose to commit.

Instead, with both aircraft delays and cost increases resulted in fewer aircraft being built than planned and some individual versions being abandoned. In Australia's case, delays in delivery forced the RAAF in both instances to acquire an interim fighter force.[22] Although the US shouldered the project risk in developing the F-111 and F-35, the aircraft incorporated highly advanced technologies and no early purchaser could shield themselves against the cost increases, time delays and performance shortfalls that arose from problems with those technologies. The Australian acquisition decisions achieved none of the benefits of off-the-shelf acquisitions.

This level of risk tends to come with any equipment intended to be central to Australia's future defence capacities. If "off-the-shelf" means safe to buy because of the familiarity of widespread usage, the ADF is likely to consider such equipment to have a performance inadequate for any crucial combat role. The F-111 was selected at a time when the strategic environment was deteriorating in the face of Indonesia's confrontation policy over the creation of Malaysia. In 2002, when many regional countries were introducing capable Russian-built aircraft, the design of the F-35 around stealth technology seemed to offer the RAAF the means to continue as the predominant regional air force.

The Mortimer Report defines "off-the-shelf" as a product already established in-service, sourced from an established production facility and with no more than minor modifications, such as those required by relevant regulations.[23] It notes that the C-17 and Super Hornet acquisitions incorporated minor modifications to ensure interoperability with existing ADF systems,[24] but that setting performance requirements beyond those of a standard product "generates disproportionately large increases to the cost, schedule and risk of projects."[25] To demonstrate this it adopts a figure developed within the DMO that indicates that risk factors begin to increase significantly with the adaption of foreign designs to Australian conditions so that "seemingly minor requirements changes to OTS designs have major impact on cost, schedule and risk."[26]

The dilemma that these observations raise is that few major ADF combat systems will meet the definition of "off-the-shelf". Apart from the question of military effectiveness discussed above, the requirements for ongoing capability sustainment usually do not comply with the off-the-shelf rubric. This is particularly the case with naval combatants. It is nearly four decades since the RAN

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[22] The RAAF Museum's history of the F-111 in Australian service contains a brief discussion of difficulties during the acquisition stage of the project. RAAF Museum, *A-8 General Dynamics F-111*. Viewed 24 August 2011 http://www.airforce.gov.au/raafmuseum/research/aircraft/series3/A8.htm

[23] *The report of the Defence Procurement and Sustainment Review*, "Glossary of terms", Annex F 4.

[24] op. cit., p. 18.

[25] ibid.

[26] op. cit., "Figure 8: Concept diagram-impact on cost, schedule and risk of volume of requirements."

contemplated maintaining such vessels overseas. During that period it has been generally argued that the basis of maintaining combat vessels in Australia was to build them in the country. Since the construction of the last two FFG-7 frigates in Australian yards during the 1980s this has been the case.

Hence it seems unlikely that an Australian major warship will be built in an "established production facility" but instead transferred to an Australian shipyard. The Air Warfare Destroyer project is underway at ASC Shipbuilding in Adelaide and the government is committed to "assembling" the next submarine in the same city. The problem here is that the established Australian shipbuilder is not the same entity as the overseas design company. The difficulty is that this can create has already been witnessed in the AWD project.[27]

Part of this project's problems lie in the structural difficulty of maintaining an adequately skilled workforce between the sporadic demands of a small number of naval shipbuilding programs. The policy solution in this area is somewhat circular – the potential construction workforce is supposed to be sustained between projects by maintenance of earlier vessels, themselves built in Australia to support them throughout their naval service. In practice, correlation between the two arms of policy appears somewhat imprecise; British Aerospace, the latest owner of the Williamstown Dockyard, experiencing difficulties in developing a skilled workforce to undertake its role in the AWD project only a few years after the yard completed one of the most successful acquisition projects of recent decades, that for the ANZAC frigate. Given the current macro-economic settings for Australian secondary industry, recruitment and retention of adequately trained workers for defence acquisition projects appears likely to remain an ongoing difficulty.

With a high proportion of the value of Force 2030 composed of naval craft covering a broad range of maritime operations and a central air combat element provided by a yet incomplete developmental project, there will probably be little scope for off-the-shelf acquisition in meeting the major strategic requirements of the ADF over the next two decades. In this context, the pre-budget announcement extending of-the-shelf evaluation requirements to cover all acquisition proposals[28] might be seen as applying the methodology to an easier sphere rather than any certainty that it will remain relevant for the more prominent acquisition proposals.

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[27] Cameron Stewart, "Overdue and over budget: $8 billion destroyer plan in crisis", *The Australian*, 27 May 2011. Viewed 30 June 2011 http://www.theaustralian.com.au/national-affairs/overdue-and-over-budget-8bn-destroyer-plan-in-crisis/story-fn59niix-1226063739830

[28] The Hon. Stephen Smith, MP Minister for Defence, "Strategic Reform Program", *Media Release Min 116/11*, 6 May 2011. Viewed 6 May 2011 http://www.minister.defence.gov.au/2011/05/06/strategic-reform-program/