

CHAPTER EIGHT

INVESTMENT

8.1 If funding pressures facing Defence were limited to the area of personnel costs, there would be scope to re-allocate Defence outlays from other areas to alleviate those problems. However, significant pressures exist elsewhere within the Defence budget, which preclude the viability of that reappportionment. In the following section, the Committee examines equipment issues relating to the investment program.

Technological Edge

As economies in the region grow, we clearly face an historic challenge in maintaining Australia's relative strategic standing.¹

8.2 Australia has traditionally relied on maintaining a qualitative superiority in its defence equipment (and a superiority in the level of training of its personnel) to compensate for the necessarily smaller size of its defence forces. Qualitative superiority has until recently been maintained in many areas, having been enabled by an Australian defence expenditure greatly superior to that of its regional neighbours. Examples of this can be found in the purchase of the F-111, the *Oberon* class submarine, and later, in the acquisition of a comparatively large fleet of F/A-18 fighter aircraft. However, with the economies of most South East Asian nations until recently growing at a faster rate than Australia's, that capacity for significantly superior defence spending by Australia has diminished. Other nations within the region are now acquiring capabilities of equivalent levels of technology to our own, and Australia's technological edge in military capabilities has to a significant degree already eroded.

8.3 While Australia has long been the major operator of submarines within South-east Asia, and is currently upgrading to the *Collins* class, submarines are growing more numerous within the region. Singapore will soon have a fleet of four submarines, and South Korea is seeking replacement of its current fleet.² Indonesia has recently announced the purchase of an additional five secondhand submarines, although this purchase has been postponed at present, awaiting resolution of Indonesia's recent economic problems.

8.4 The erosion of Australia's technological edge in vital areas, in combination with the small and decreasing size of the ADF, reduces Australia's military influence within the region. The Committee held particular concerns for the loss of clear military advantage, which is revealed by deficiencies in a number of areas. Australia still has no airborne early warning capability, and only a modest training capability in air-to-air refuelling. Military advantage has also been lost in the areas of air superiority weapons, radars and aircraft. These are key areas where a level of technological superiority is essential. The rationale of this approach is based on Australia's strategic geography. The strategic review assesses that

1 *Australia's Strategic Policy*, op. cit., p. 5.

2 Grazebrook, A W, 'Regional submarine forces expand' in *Asia Pacific Defence Reporter*, 1998 Annual Reference Edition, Volume XXIV, No 1, pp. 28-29

this geography mandates a maritime concept of defensive operations - that is, the need to defeat the forces of an aggressor while still in Australia's maritime approaches.³

8.5 In any scenario involving the defence of Australia, real-time intelligence from surveillance capabilities such as over-the-horizon radars and AEW&C aircraft will be crucial in initiating the defence response. Once that response is initiated, the need to deny an aggressor the use of Australia's maritime approaches will be primarily an air-related task, because of the superior speed at which air assets are able to react. While naval forces will offer valuable support capabilities, most surveillance and denial tasks will fall to air assets, such as maritime patrol aircraft, AEW aircraft, and maritime strike aircraft to operate against surface forces. These operations in turn will require that Australia maintains air superiority, which allows these surveillance and strike aircraft to operate with a degree of protection, and defends against attacks by an aggressor's strike aircraft. Thus air superiority is the foundation on which Australia's defensive capability is built.

8.6 However, in regional air forces, recent technology aircraft such as the Mig-29 *Fulcrum*, Su-27 and Su-30 *Flanker* and F-18C/D are now replacing earlier-generation aircraft. The military exercise CHURINGA 96 (in which the RAAF's F/A-18s flew against the Royal Malaysian Air Force's Mig-29s) reminded that these aircraft are potent platforms, readily comparable in capability to Australia's F/A-18A. In addition, the presence and imminent introduction into the region of medium-to-long-range air-to-air missiles such as the R-27 (AA-10 'Alamo') and R-77 (AA-12 'Adder'), the shorter-range R-73 (AA-11 'Archer') and advanced look-down/shoot-down aircraft radars has highlighted the loss of comparative advantage of the ADF's air superiority systems.

8.7 The advantage might be regained with an extensive and relatively expensive upgrade of Australia's F/A-18s with improved radar and missiles, but that route could at best be regarded as a short-term fix, with superiority likely to be lost again with the implementation of incremental upgrades to other aircraft systems within the region. Such an upgrade would not address the underlying problem: that the F/A-18A/B no longer holds a technological edge over other platforms in the region which could ensure Australia was able to achieve the air superiority necessary for defence of Australia operations. The Committee believes that a solution to this deficiency is to acquire a current generation aircraft. It may well prove that an aircraft incorporating extensive stealth features is the best solution to this problem. Acquisition of a new-generation air superiority fighter with a true stealth capability and a range of capable, long-range air-to-air weapons would guarantee Australia a standard of technological superiority in the area of air superiority which would be unlikely to be overtaken by other capabilities within the region for the foreseeable future. An important question remaining is the timing of that acquisition.

8.8 Technological superiority considerations also affect the other two Services. Army's planned restructuring initiative to restore some level of technological advancement, is a further example of the cost of maintaining high-technology forces. This will include additional reconnaissance vehicles, new troop-carrying vehicles, aerial reconnaissance and fire support helicopters and a command support system. Army's increased reliance on reserves will also require better training and equipping of those reserve forces, with advanced technology items such as night-fighting equipment, to improve their ability to supplement regular forces.

3 *Australia's Strategic Policy*, op. cit., pp. 44-45.

8.9 Navy has received a relatively higher proportion of equipment funding over the last decade or so, with the result that Navy's equipment is relatively more modern than that of the other Services. The completion of the *Anzac* frigate, *Collins* class submarine and *Huon* class minehunter projects will ensure the Navy's capital equipment is in advance of much of the equipment in the region. The impending Warfighting Improvement Program for the *Anzacs* and the Progressive Upgrade Program for the *Adelaide* class frigates will provide for naval technological superiority into the medium term.

8.10 The imperative to maintain a technological edge involves more than equipment acquisition and upgrades. There is also a need to train and exercise personnel in operating at the higher-technology edge of warfighting. This is a reason why bilateral training with the United States is vitally important to the ADF. Maintaining and exercising interoperability with the US provides the opportunity for training 'at the far end of the spectrum in complexity, with the use of modern systems, which ... we will always need to remain in touch with'.⁴

8.11 Defence's views on technological edge was that Australia currently possesses a better capacity than other countries in the region to apply the equipment it has, in order to achieve actual strategic outcomes. This is a product of the quality of the people in the ADF, the way that current systems work, and the way ADF capabilities interact.⁵ Because Australia could no longer allocate the resources required for general superiority in capabilities, there was now a need to be more selective in the areas where the ADF seeks to maintain a capability edge. Particularly, there is recognition that:

... we have to be more selective in the way we go about maintaining our capability edge. That is, we have to find those areas of capability and, within those capabilities, those areas of technology where we can most effectively put our resources to maintain the capability edge we need... That is one of the things which drives the size and shape of both the investment budget and these personnel and operating cost budgets.⁶

8.12 The Committee agreed that maintenance of a technological military edge required careful judgements. However, while Defence in the past was renowned for its application of high technologies, the continuing inertia in the Australian Defence acquisition system has relegated Defence to a position where it now trails the capacity of civilian industries in the application of emerging technology. A cumbersome and bureaucratic acquisition process inhibits the ADF's ability to quickly respond to advances. Several nations within the region have shown themselves more adept at embracing and applying or adapting new technologies, particularly in the electronics field. The Committee was concerned that any technological lead currently held by Defence was a fragile advantage, and without continual efforts toward preserving and maintaining that lead, it might quickly be lost.

8.13 Defence's judgement of the shape of the investment budget, given current circumstances, was that a capital share of below 27 per cent of Defence budget would put

4 Oxenbould, Dept. of Defence, Transcript, p. 177.

5 White, Dept. of Defence, Transcript, p. 44.

6 *ibid.*, p. 245.

Australia 'in grave danger of underinvesting in future capability'.⁷ Given that the Defence budget is currently around \$10 billion, this represents a substantial amount available for new investment. Around \$2,340 million was allocated for expenditure on major capital equipment in 1997-98.⁸

8.14 However, acquisition of new technology equipment is rarely an inexpensive undertaking. Estimates of the likely cost of stealthy aircraft such as the General Dynamics F-22 Raptor is over US\$100 million (around \$147 million) per aircraft. Even the per-unit cost of the advanced (but not stealthy) EF-2000 Eurofighter is estimated at around \$87 million. The options currently being examined for replacement of the Air Force's air superiority capability are estimated to cost between \$5 and \$12 billion.⁹ The likely price of the soon-to-be-acquired AEW&C capability is around \$5 billion. Army estimates that the investment required for its restructuring will require about \$9.5 billion over a 17 year time span.¹⁰ The progressive upgrading of the FFGs will cost roughly \$1 billion. The Warfighting Improvement Program for the *Anzac* class frigates is proposed to cost \$1.5 to \$1.6 billion. Added to these major prospective projects is the need to fund projects which have already been approved, such as the purchase of the *Anzacs*, of the *Collins* class submarines, the C-130J aircraft, coastal minehunters, light armoured vehicles (ASLAVs), the upgrade of the P-3C aircraft and the Jindalee Operational Radar Network. Collectively, the demand on funds outstrips the amount likely to be available, even without considering the many smaller projects currently awaiting funding within the ADF capital equipment program. This pressure on investment funds will be discussed later, under 'block obsolescence'.

8.15 As a final comment on technological edge, the Committee accepted that:

[T]he pace of investment that we will be able to afford over the next few years will give us some improvement, but will certainly not allow us to take advantage of all that technology could offer us and will provide inhibitions to our capabilities and our capacity to interact with allies; and the strategic risk of those deficiencies is ... expanding as capabilities in the region increase.¹¹

7 *ibid.*, p. 25

8 Dept. of Finance, Submission, p. S315.

9 McCormack, Dept. of Defence, Transcript, p. 56.

10 Hartley, Dept. of Defence, Transcript, pp. 33-34.

11 White, Dept. of Defence, Transcript, p. 253.

Revolution in Military Affairs

*Australia's forces will always be comparatively small. But it is their ability to exploit technological advantages ... that separates them from most of their regional counterparts. And these days, the 'sharp end' of a defence force doesn't reflect simple superiority in weapons platforms, but rather a superiority in information handling and data processing.*¹²

8.16 Related to the concept of technological edge is the phenomenon known as the Revolution in Military Affairs (RMA). In simple terms, this is a revolution wrought essentially by the pace of technological advance. Under the RMA, the integration of command and control, communications, computers, intelligence, surveillance, reconnaissance, precision weapons and mobility capabilities have vastly increased the effectiveness of conventional military systems, and in turn has influenced the ways in which future wars will be fought.

8.17 The United States is leading the way in development and utilisation of these technologies, and for Australia to retain a position of comparative military advantage into the future, a raft of new technologies along this line will be required. Many of these capabilities will be new, rather than replacements of current capabilities, and the ADF is now thinking about doing things with information technology (IT) which were not contemplated 10 years ago.¹³

8.18 Examples currently identified for imminent introduction include AEW&C aircraft, and advanced communications, and command and control systems. Future capabilities would include computer warfare capabilities and more advanced surveillance systems. There is also an acceptance within current Defence planning that some capabilities currently performed by manned platforms may be able to be performed in a further 10 years' time in a totally different way. Unfortunately, the rate of change of technology is currently so rapid that planners are unable to predict which currently-emerging technologies will be the ones which will provide the most valuable returns in 10 years' time.¹⁴

8.19 The RMA also brings with it some significant problems for Defence capability and financial planners. The emergence of new capabilities implies the simultaneous emergence of new vulnerabilities for those nations which cannot afford to stay abreast of those capabilities. Even if Australia were able to provide adequately for its own physical defence, it would be rendered suddenly vulnerable should a hostile nation or group obtain the capability to attack our military surveillance systems or the computers controlling our industries, financial systems or communications networks. To defend against the possible emergence of such a vulnerability, the ADF must be ready and equipped to combat new-technology threats, while still maintaining adequate capabilities in necessary areas to counter more conventional threats such as physical attack. ADF deployments to Somalia, Rwanda, Cambodia, and the Persian Gulf have shown that the need for more conventional military capabilities has not disappeared. It is also worth noting that most countries in South East

12 Medley Consulting, Submission, p. S156.

13 White, Dept. of Defence, Transcript, p. 233.

14 *ibid.*, p. 241.

Asia continue to meet their defence needs by investing in present-day capabilities, rather than the requirements of future means of warfare.

8.20 Defence is not currently neglecting the area of computer warfare, but it points out that this form of capability does not require large investments in equipment, along the lines of new aircraft or ships.¹⁵ To date, the Department's efforts have focused on acquiring personnel with the necessary talents to further Defence capabilities in this area.

8.21 The Committee agreed that the logarithmically-expanding capabilities of information technology would be one of the chief determinants of future ADF capability, and hence would have an impact on Defence funding over the next 10 years. One area where IT already has had some effect on funding has been in the enabling of some significant rationalisations within Defence over the last 10 years as previously manpower-intensive processes have been automated. However, most of the processes capable of automation have now been identified and improved, and on completion of the DRP, the capacity for personnel efficiencies able to be achieved through automation will diminish. At the same time, new military capabilities will continue to emerge, potentially more quickly than older capabilities are retired, and there will be an increasing training burden to keep personnel abreast of IT developments. On balance, the Committee believed that IT capabilities would further increase the demand on Defence outlays.

8.22 Defence sees both benefits and drawbacks in the ongoing change in the nature of warfare. Primary among these benefits are those that arise from Australia's unique geography and strategic circumstances.¹⁶ Because the northern part of Australia, and the continent's northern approaches, are such large spaces, enhanced surveillance capabilities will work to the ADF's comparative advantage. Unfortunately, this opportunity also carries with it the probability of a significant cost,¹⁷ and the volume of funding diverted to new technologies is going to squeeze the proportion available for other areas of military capability.¹⁸

Block Obsolescence

*The withdrawal from service of a number of major equipments due to obsolescence and the associated replacement costs will make it difficult to manage the Defence organisation through the 2010-2020 period.*¹⁹

8.23 Possibly the greatest single challenge confronting Defence financial planners is the need to replace, over the next fifteen years or so, a number of capabilities which are currently provided by ageing platforms. Although many of these platforms can be, and have been, upgraded to extend their operational lives, all will reach a stage at which further upgrade ceases to be economically feasible.

8.24 In the short term, the investment portion of the Defence budget is fully committed by a number of already-approved projects. Included in these is the C-130J acquisition, the remainder of the *Anzac* class frigate construction and an upgrade of the P-3C. Shortly

15 Barrie, Dept. of Defence, Transcript, p. 240.

16 White, Dept. of Defence, Transcript, p. 233.

17 *ibid.*

18 *ibid.*, p. 250.

19 Dept. of Defence, Submission, p. S317.

beyond that, the need to fund the AEW&C and Caribou replacement projects, replace the *Fremantle* class patrol boat, acquire an operational air-to-air refuelling capability, upgrade the *Anzac* frigates, acquire a satellite communications capability and purchase helicopters for the Army will become expensive priority demands on capital equipment funding. Defence is optimistic of the prospects of programming these projects, and a host of smaller ones, within the current capital equipment budget. However, these equipment bids will require funding to be spread into the latter part of the next decade, creating a 'bow-wave effect' which reduces the funding available for future requirements. Unfortunately, beyond the medium term there is a looming requirement to replace a small number of high-cost major projects which may then not be affordable within Defence's capital acquisition allocation.

8.25 The critical emerging projects are the replacements for the F/A-18 and the *Adelaide* class frigates, and the possible need to replace the F-111 within the few years immediately following those projects. A number of options are currently being considered for replacement of the F/A-18 or extension of its life-of-type, including early partial replacement, and supplementing the fleet with some new-purchase aircraft, but inevitably there will be a requirement for major expenditure. Depending on the option chosen, the timing and size of this expenditure will vary, with Air Force currently considering time frames between 2005 and 2015. The cost is similarly variable, depending on the capability chosen, and will range between \$5 billion and \$12 billion.²⁰ While this is a substantial cost, the Committee noted that it was not disproportionate when considered in light of the project to acquire the F/A-18. When the F/A-18 acquisition was commenced almost 20 years ago, the project cost was valued at around \$3 billion, even given a better Australian-US exchange rate than currently exists. For a project to acquire a similar degree of advancement in capability, the Committee believes that the price range estimated was within the expected range, and was a cost which necessarily had to be borne.

8.26 In addition to the challenges of affording the F/A-18 replacement, there exists a need also to acquire a follow-on destroyer to replace the capability currently represented by the *Perth* class destroyers and the *Adelaide* class frigates. The new platform will be required for delivery in time to replace the frigates which begin to go out of service in 2010. A rough estimate of the cost of this project is around \$7 billion.²¹ The analysis to be performed in acquisition of this capability will be of particular interest, in view of the size and cost of the project and the current strictures on Defence funding. While not disputing the need to replace the current capability, the Committee believes this project provides an opportunity to step away from the traditional hull-for-hull replacement policy historically practiced by the RAN. Currently emerging technologies may allow the capability requirement to be met with a reduced number of hulls, or with smaller or more economical vessels. However, the project will remain a substantial one, requiring a considerable level of investment.

8.27 The need to plan for replacement of the F-111 has been forestalled by a decision for a major upgrade program, which will extend the life-of-type for the aircraft to at least 2015.²² Because currently-emerging technologies may offer completely different ways of achieving the capability of the F-111 by this time, no planning has yet commenced on that project, and no estimate of costs are available. However, a strike capability remains imperative for ADF force structure planning. A credible strike capability allows attacks to be

20 McCormack, Dept. of Defence, Transcript, p. 48.

21 Oxenbould, Dept. of Defence, Transcript, p. 183.

22 Dept. of Defence Submission, p. S333.

launched against an adversary's forces while they are within Australia's maritime approaches. By maintaining a strike capability, the ADF possesses the capability to inflict disproportionate damage, or to escalate a conflict beyond the ability of an adversary to tolerate. For these reasons, strike remains one of the most cost-effective ways of deterring or prosecuting a major conflict. Given Australia's geostrategic circumstances, and the need to seek maximum efficiencies in obtaining military capabilities, a credible strike capability will remain essential to ADF capabilities well into the foreseeable future.

8.28 The problem of block obsolescence can be distilled to the requirement for expenditure of between \$12 billion and \$19 billion around 2010, in addition to the need to fund a continuing cavalcade of lesser, though still expensive, Defence major equipment projects. Given the current annual capital equipment allocation of around \$2.4 billion, Defence planners doubt the affordability of these requirements.

8.29 Compounding the already substantial problems of the major replacement projects, Defence estimates that the cost of new capital equipment is also growing at around four per cent in real terms.²³ Given a force structure similar to that currently held by the ADF, and assuming that average equipment life remains unchanged, Defence estimates that this real growth could represent an 'increased funding requirement of about \$18 billion over the period 2002 - 2017'.²⁴

8.30 Although optimistic that capabilities would be able to be significantly augmented over the next 10 years within current levels of spending,²⁵ Defence summarised the longer-term consequences of the current equipment affordability problems:

We will not buy a single new major surface combatant. We will not buy a single new front-line combat aircraft. We will not be able to expand our land forces. We will continue to have what is very nearly the smallest army in the region and our capacity to increase our readiness, our preparedness, will be very constrained.²⁶

8.31 Based on the evidence presented, the Committee concluded that the pressures on funding in Defence's investment program were at least of a similar magnitude to the problems faced in funding for personnel.

23 *ibid.*, p. S287.

24 *ibid.*, p. S332.

25 White, Dept. of Defence, Transcript, p. 218.

26 *ibid.*