The Cost of Defence
ASPI Defence Budget Brief 2010-11

Seventy-three million, six-hundred & eighty-nine thousand, two-hundred & nineteen dollars & eighteen cents per day.

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With an essay on the *Efficiency in Defence* by:
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Cover graphic courtesy of Department of Defence

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Note on title:

The figure of $73,689,219.18 represents one three-hundred-and-sixty-fifth of reported Total Defence Funding for financial year 2010–11. This does not include funds appropriated to the Defence Housing Authority, those administered by Defence for military superannuation schemes and housing support services, nor the additional funds provided directly to the Defence Materiel Organisation.

CONTENTS

EXECUTIVE DIRECTOR'S INTRODUCTION

This is ASPI's ninth annual Defence Budget Brief. Our aim remains to inform discussion and scrutiny of the Defence budget and the policy choices it entails.

As has been the custom in the past, we explore new areas in this year's brief. A chapter on *Efficiency in Defence* by Henry Ergas has been added, and our usual chapter on *Defence Management* has been given over to track the progress of the *Strategic Reform Program* one year after it was announced. In addition, the old material dealing with Defence Outputs has been revamped and expanded to cover the new Defence Programs schema which provides a revealing insight into the organisational structure of Defence.

The chapter we introduced last year entitled *Selected Major Projects* makes a return with the assistance of our colleagues at the *Australian Defence Magazine*, Gregor Ferguson and Tom Muir. This section has once again been capably edited by ASPI's Andrew Davies.

Finally, the not inconsiderable task of preparing the document for publication has been ably taken care of by Janice Johnson. Many others have helped by providing comments, offering advice, and checking facts. Our thanks go out to them all.

Also, Defence was kind enough to look over a preliminary draft of this brief and provide valuable comments. This helped clarify some important points and resulted in improved accuracy in many areas. Of course this does not in any way imply that Defence endorses this document or even supports its conclusions.

My colleague Dr Mark Thomson, who is the Manager of ASPI's Budget and Management Program, has once again pulled together the brief in the short time available. For this I extend my sincere thanks. As always, responsibility for the judgements contained herein lie with Dr Thomson and me alone.

Lastly we should acknowledge that we at ASPI are not disinterested observers of the Defence budget. Our funding from government is provided through Defence at the rate of seven thousand, five hundred and eighty-three dollars and fifty-six cents ($7,583.56) per day. Details can be found in our 2008-09 Annual Report.

Peter Abigail
Executive Director

EXECUTIVE SUMMARY

Last year brought mixed news for Defence. On one hand, they got an unprecedented 20-year funding commitment from the government in the 2009 Defence White Paper, including a promise of 3% real growth to 2017-18 and 2.2% thereafter until 2030. On the other hand, when it came time for the actual budget, $8.8 billion of promised funding was cut from the forthcoming six years and deferred to undisclosed years beyond. Yet, in the prevailing economic situation, this was hardly surprising.

A lot has changed since then. The past twelve months have seen the Australian economy perform much better than anticipated in last year's budget. Rather than an outright recession, we've experienced a limited slowing of economic growth. As a result, the Australian economy is now projected to grow by 3.25% next financial year as opposed to suffering a 0.5% fall. Instead of unemployment peaking in 2010-11 at 8.5%, we are now told that the zenith was reached in 2009-10 at a mere 5.25% and that in 2011-12 unemployment will fall to 4.75%.

As the prospects for the Australian economy have improved, so too has the government's fiscal outlook. Last year it was estimated that the forthcoming financial year would see the government $57 billion in deficit; the current estimate is for a $41 billion deficit. More importantly, the prospective date of a return to surplus has been brought forward by three years from 2015-16 to 2012-13.

The 2010-11 Defence Budget

Despite the dramatic improvement in the government's economic and fiscal outlook, there was little joy to be found for Defence in this year's budget. Aside from $1.6 billion in routine supplementation to cover the cost of overseas deployments over the next four years, there were no substantive new funding measures in the budget. Moreover, Defence was told to absorb $912 million of the $1.1 billion cost of enhanced force protection measures for Australian forces in Afghanistan.

Once again, there is little to surprise in what the government has done. Any hope that the funds taken from Defence last year might be reinstated was forlorn from the start. The $3.4 billion removed from defence funding in 2012-13 is the difference between surplus and deficit for the Commonwealth from both a fiscal and underlying cash balance perspective.

Nonetheless, despite last year's cuts and this year's stringency, net Defence funding (including funding for the Defence Materiel Organisation) will increase in real terms by 3.6% to reach an historic high of $26.8 billion in 2010-11—equivalent to 1.9% of GDP. Because last year's deferrals cut deepest in the years that follow, the next couple of years are unlikely to be as favourable. In fact, for the first two years of the forward estimates period, underlying defence funding (exclusive of supplementation for operations) will fall in real terms, before recovering in 2013-14. After that, the 'catch up' necessary to deliver the promised average 3% real growth will see Defence funding increase by 29% over a five-year period.

The impost of swallowing $912 million in extra costs over the next three years comes on top of $1.7 billion of additional costs over ten years foisted on Defence last year along with the deferrals (and separate from the $20.8 billion of savings to be found through the Strategic Reform Program). According to the Defence budget papers, the $912 million for enhanced force protection will predominately be funded from within Defence's existing capital investment programs. If that means that some of the equipment and facilities projects envisaged by the 2009 White Paper have to wait, that is how it should be. There can be no questioning that the protection of deployed personnel should take precedence. Nonetheless, the impact of the decision on existing plans needs to be assessed.

Consequences

The impact on the capital facilities program is straightforward—there'll be $162 million less to spend next year and $268 million less the year after compared with previous plans. But because the capital facilities program is presently surging to an unprecedented annual spend well in excess of a billion dollars to accommodate new capabilities and the expansion of the Army, these cuts will only result in a marginal slowing. From an industry perspective, the massive construction sector can easily adapt to changes in Defence demand.

It's less easy to reckon the impact on the capital equipment program, partly because foreign exchange movements make year-to-year comparisons pointless but, more importantly, because the government ceased disclosing deferrals in the 2008-09 budget (at which point the cumulative net deferral amounted to an embarrassingly large $4.4 billion). What we do know, is that the amount of money available to initiate new projects has fallen by 55% for the budget year and 42% and 36% for the first two years of the forward estimates compared with what was available in the budget and forward estimates this time last year. Even making generous provision for the impact of an appreciating Australian dollar, there is clearly a lot less money available to start new projects.

Given that the approval of projects has already slipped behind what was planned in last year's budget papers, there is little doubt that further slippage relative to the 2009 Defence Capability Plan will occur, given the substantially reduced funds available to initiate new projects. It is impossible to say where the impact will be felt. In a marked departure from previous years, the budget papers do not list the projects planned for approval in the coming twelve months. Instead we get an omnibus listing of projects under development which might be approved in the next two to three years. This obfuscation will disappoint defence industry, many of whom rely on Defence as a sole buyer of their highly specialised products.

Add to this the problem introduced last year when the capital investment program was forced to absorb a significant part of the Global Financial Crisis – induced deferrals, and the next few years are looking tight for industry. As things stand, the major capital investment program will fall by 23% in real terms between next year and 2012-13 before recovering as underlying defence funding grows after the return to surplus.

But it is important not to confuse a disappointing outcome for industry with a strategic setback to the government's 2009 Defence White Paper plans for building the

Australian Defence Force (ADF). The diversion of a couple of billion dollars needs to be seen in the context of a twenty-year capital investment program valued well in excess of $100 billion. Provided that asking Defence to absorb substantial costs does not become a perennial event, and assuming that defence spending recovers as planned post 2012-13, it should be possible to get things back on track (to the extent that the original plan was affordable to begin with).

There are two problems, however. First, on the basis of long-term trends in defence costs, it is unlikely that the promised 2.2% real growth post 2017-18 will be adequate to sustain let alone expand the ADF as planned. In other words, the plan was probably not affordable to begin with. Second, past experience shows that it can be surprisingly difficult to rapidly initiate projects and ramp-up industry capacity irrespective of how much money is available. Consequently, there is a risk that the rapid increase in defence spending post 2012-13 will not translate into acquisitions as quickly as hoped.

Personnel

The Budget contained interesting news about defence personnel. The past financial year has seen Defence record its best recruitment and retention figures in more than a decade; the ADF separation rate fell to 7% (from a ten-year average of 11%) at the same time as ADF recruitment met 94% of targets (compared with a ten-year average of 82%). As a result, Defence ended up with around 1,500 more people than originally planned, due in part to a lack of flexibility to adjust recruiting targets in-year. Although Navy will be able to capitalise on this windfall and retain the growth it achieved, Army will have to fall in strength by 581 positions and Air Force by 316 next year to put things back on track. For the record, the cost of employing 1,500 military personnel would have been around $184 million; it is not known where cuts were made to accommodate this unplanned expense, although the Reserves felt pressure as a result.

The Strategic Reform Program

Although the defence budget papers refer to the Strategic Reform Program (SRP) in a number of places, very little useful detail was provided. But, because the SRP and its $20.6 billion worth of savings are an integral part of delivering the capability goals of the 2009 Defence White Paper, it deserves close examination nonetheless. Unfortunately, the information that has been made available about the SRP since its announcement twelve months ago is both fragmentary and continues to change as plans evolve. What follows is our best understanding of what's going on.

The SRP is designed to be more than a savings program. It has been described as a source of both 'deep' and 'fundamental' reform to the way Defence does its business, including through 'improved accountability' and 'improved planning', and 'enhanced productivity'.

How deep and fundamental the changes will be remains to be seen. The recommendation of the 2008 independent Defence Budget Audit to move to an 'outputs-driven budget model' failed to materialise this year—despite last year's plan to have its design complete in 2009-10 and for implementation to begin in financial year 2010-11. According to the Budget Audit, such a model would 'drive reform from the Services back into the support function.' The essential step is to give the Service

Chiefs control of a larger slice of the budget. But that's not what's happening with the SRP savings program.

Instead, under the oversight of no less than two additional deputy-secretaries, cuts have been made to the existing centrally planned budget and the various parts of Defence are being told to live within their means. Any suggestion of savings being found and progressively transferred to the 'sharp end' is erroneous.

Quite apart from the overarching approach employed to deliver the savings, a close examination of the $20.6 billion of planned savings reveals a worrying picture. As best we can tell from the incomplete information available, the situation looks something like this. Around $4.6 billion of the claimed amount is an artefact of accounting, involving the reallocation of funds within Defence's budget that have nothing at all to do with reduced costs or efficiency. For example, Defence claim to save $150 million from cuts to capital facilities investment over the next four years while simultaneously touting $190 million of increased capital facilities investment over the same period. With this sort of accounting, the only limit on the scale of savings is set by the size of the Defence budget itself.

Of the remaining $15.7 billion of savings (of which around $4 billion is yet to be explained in any detail) there are also problems. In a couple of areas, Defence is back-pedalling fast. Over the past twelve months, the number of positions to be cut by the SRP has fallen substantially. With the caveat that there appear to be around 660 extra positions likely to be cut in the future, here's how things look: the number of military positions to be cut outright by the SRP has been revised downwards from 1,713 to 859, while civilian reductions have fallen from 3,125 to 1,708. The situation is little better in the case of the Reserve, where the original bold idea of shifting rarely used Army capabilities to the Reserve has been abandoned in favour of making the Reserve more efficient through initiatives with associated savings that are difficult to reconcile with the explanations given.

The bottom line is that an even greater share of savings—something like $12.6 billion—will now have to be borne by defence's suppliers. In the case of equipment sustainment, good progress has already been made. The Defence Materiel Organisation (DMO) led the way on savings back in 2008 by initiating and delivering a 5% reduction in costs. In other areas, the substance of the planned savings is difficult to assess because of the underlying planned growth in the defence budget. Indeed, the SRP savings are only hypothetical figures relative to a business-as-usual extrapolation—especially given that internal budgets have already been adjusted in anticipation of the savings. For example, the (reduced) 'cuts' to personnel numbers mentioned above are relative to growing numbers of military and civilian personnel, the net result of which will be around an extra 3,800 military and 1,500 civilian personnel on current plans.

The temptation within Defence will be to do a little less, take a little longer, and otherwise make do with reduced budgets by delivering less—especially easy to do with defence funding set to rise in the medium-term and alleviate pressure. Moral hazards abound.

But it does not have to be this way. If the SRP really is 'a major public sector reform initiative' as the Minister has said, why not open it up to public scrutiny? Two things should happen: first, the SRP savings should be rebaselined to remove the fanciful accounting tricks. It discredits both Defence and the government to exaggerate the amount of savings to be delivered.

Second, regular and detailed public reporting of the program should begin immediately, including—and this is critical—disclosure of the baseline extrapolations of historical trends against which savings are claimed. It is a matter of public and parliamentary interest to see whether the savings are being delivered and, perhaps more importantly, what the impact on capability is. Recent public concerns surrounding changes to the Reserve are an example.

If Defence really is actively managing the SRP savings as comprehensively as we are told, the information should already exist. So let's see it. Surely there is nothing to hide.

The future

On the surface, it looks like Defence dodged a bullet in this year's budget. Although they had to absorb a substantial share of the $1.1 billion in force protection costs, there were no further reductions to Defence funding to help bring the budget into surplus in 2012-13. The point is that 2012-13 is a special year; it's the last opportunity that the next government (whoever that might be) will have to demonstrate fiscal rectitude prior to the election after next. It was probably not an accident that last year's cuts to defence funding peaked strongly in that year.

Of course, a return to surplus in 2012-13 has now taken on talisman-like importance after being elevated to the centrepiece of this year's budget. The problem is that the surplus is very finely balanced. If, for example, the budget papers had included funding for continuing Australian deployments to Afghanistan and East Timor out to 2012-13, the cost would have exceeded the projected $1 billion underlying cash balance surplus. If the government has to choose between telling Defence to absorb the costs and delaying a return to surplus, it won't have to deliberate for long.

In reality, projections of economic performance and fiscal outcomes three years hence are highly uncertain. The best we can say is that, on the basis of what we know now, there is a 50% chance the situation will be more favourable and a 50% chance that it will be less favourable. That means there's a 50% chance that Defence might have to tighten its belt yet again in favour of the budget's bottom line.

CHAPTER 1 – BACKGROUND

1.1 Strategic Context

The world of strategic affairs moves in fits and starts. Like the punctuated equilibrium of the fossil record, or the long pauses between battles in a war, there are times when geopolitics jumps from one proverbial quantum state to another, and there are times when there is little more than incremental movement from one year to the next.

The past twelve months don't quite fit into the latter category. There have been some significant changes on many fronts. The policies of the Obama administration are becoming clearer by the day, including the approach to be taken in Afghanistan. The new government in Tokyo is showing signs of adopting a more independent posture—though the gap between rhetorical aspiration and concrete steps is large. We even have an emerging crisis on the Korean Peninsula stemming from either bellicose irresponsibility or a gross failure of command on the part of North Korea. Add to this the bloody instability in Thailand and continued recalcitrance on the nuclear issue by Iran, and its hard to argue that we're experiencing business as usual.

But nor has the world changed for most people in a fundamental way. For those protected by the cushion of distance, such as Australia, the world may be a little more interesting but it isn't any more alarming. Certainly the past twelve months have not brought a shock the size of that wrought by 9/11 or East Timor in 1999. Perhaps things would appear somewhat starker than they do if we had not had our attention focused over the past two years on ructions in the international economy. It may be that we have trouble worrying deeply about more than one thing at a time.

Whatever the reason, defence and national security was hardly an issue in this year's federal budget, notwithstanding that the budget fully lived up to the government's promise of being unexciting. Apart from the bold (but, even then, not unexpected) promise of a return to surplus in three years time, there will be little to remember about this budget in years to come. The budget was, when all is said and done, an exercise in demonstrating fiscal rectitude. So much so, that the single isolated mention of defence came with an assurance to voters that the additional cost of military operations had been safely offset by cuts in other areas.

And there was no debate on the matter either. The opposition's budget response was to offer a double heaped tablespoon of extra strength fiscal discipline. We can either return to surplus quickly, or we can return to surplus very quickly. The option of paying off the debt more slowly to allow higher levels of public consumption or better public goods (like national defence) is simply not on the table.

So what does all this portend for the future of the government's ambitious program to expand and modernise the ADF as set out in its 2009 Defence White Paper? We know already that there will be delays due to the substantial deferral of promised funding in last year's budget. And the imposition of significant costs to absorb in this year's budget will force further deferrals. But in the overall scheme of things, these are bumps in the road in the planned twenty-year program of building what the government calls *Force 2030*. With well in excess of $100 billion of planned investment, there is plenty of time and money to get the program back on track.

Provided, that is, that future government's make good on the commitment to ratchet up defence spending after the promised nirvana of a positive underlying cash balance is achieved in 2012-13.

Despite repeated warnings about the fiscal cost of a greying Australia, the reality is that we are better placed than almost any other developed country to deal with the costs of demographics in the decades ahead. Our position has strengthened with each successive edition of the Treasury's periodic *Intergenerational Report*, the last of which came out early this year and therefore took account of the impact of the Global Financial Crisis (GFC). In fact, Treasury's long term projection of the government's fiscal position after the GFC was more favourable than that made in 2007 before the crisis.

Barring unforeseen developments, on current projections there is no economic or fiscal reason why Australia cannot afford to increase its defence spending in line with the commitments made in the 2009 Defence White Paper—or even somewhat higher—and still remain consistent with international and historical comparators for defence spending. At less than 2% of GDP and less than 8% of government outlays, Australia's defence spending is exceptional.

Of course, given the events of recent years, unforeseen economic developments can hardly be discounted, especially with a sovereign debt crisis simmering in Europe. But that is a risk to be dealt with when and if it arises. The question to be asking now is whether the relegation of defence to a secondary issue in the government's priorities (and presumably in the public's imagination) can be reversed. In three year's time, how much enthusiasm will there be in the electorate to sacrifice tax cuts for tanks, health care for helicopters, or schools for ships?

On the surface, the argument for defence spending looks as good now as it did twelve months ago. The world may be no more alarming, but nor is it any more reassuring. If anything, the worrying long-term trends identified in the 2009 Defence White Paper have accelerated. In particular, the aftermath of the GFC has left the developing world much better off than the developed world of which we are a part, thereby hastening the shift of power from the West to the East. Perhaps the only solace to draw from the past year has been the relative calm in East Timor and Solomon Islands, but it would be a mistake to think that this is guaranteed given the combined effects of rapidly rising populations and poor economic prospects in those and similar countries.

So not only is long-term growth in defence spending more affordable, but the strategic argument for sustained growth has not lessened one iota in the twelve months since the 2009 Defence White Paper was published.

The trouble is that decisions about defence spending are rarely the purely analytic result of reasoned examination. Except in times of clear and imminent danger they cannot be. In general there are too many unknowns and intangibles to permit a formulaic approach. Instead, a judgement is reached based on dimly perceived heuristic models of how the future might mimic the past. With few exceptions, earnest discussions about 'force structure determinants' and 'regional capability benchmarks' can be (and often are) manipulated to produce whatever outcome is desired within a wide range of possibilities.

In the years to come, as in the past, support for sustained growth in defence spending to meet the challenges of the future will hinge on the degree of anxiety that people feel with the present. Arguing that the future is more uncertain than ever before will not be enough (apart from not being true anyway). Something has to happen.

It was no coincidence that the promise of 3% real growth in defence spending came soon after the Australian-led mission to East Timor. Nor was it a coincidence that national security spending accelerated after the events of 9/11—in a budget where the Treasurer devoted four pages to security spending before getting around to talk about the economy. In this regard, the 2009 Defence White Paper is perhaps an exception. Although the ADF was still active in Afghanistan and locally when it was published, it would be a long stretch to argue that 2009 represented a period of strategic angst in Australia. Then again, its promise of two decades of continuous growth in defence spending only lasted 10 days before the reality of the 2009 budget hit home.

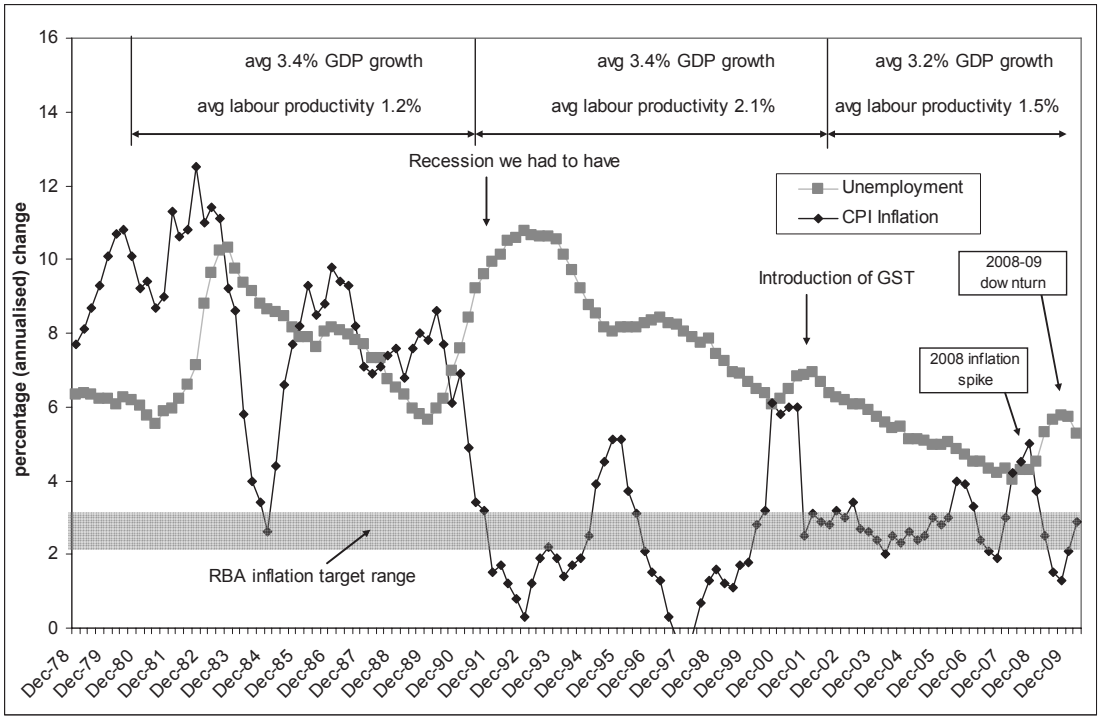
After the Commonwealth returns to surplus in 2012-13 or thereabouts, any return to growth in defence spending will be as much influenced by the events that occur between now and then as it will by promises made last year. Already, the once iconic notion of 3% real growth is beginning to fade from memory. This year's Defence budget papers did not mention the promise of 3% growth, nor did the formal Treasury papers, nor did the Minister's budget night press releases. Perhaps they've forgotten already.

1.2 Economic Context for the Budget

From the early 1990s until last year, Australia enjoyed relatively favourable economic conditions, see Figure 1.2.1. Three things stood out:

- Economic growth was healthy, averaging 3.4% during the 1990s and 3.2% from 2000 to 2007, despite a fall in labour productivity growth.
- Unemployment fell from a peak of 10.8% in late 1992 to a thirty-four year low of 4% in early 2008 (at the same time as workforce participation edged up from 62.7% to 65.2%).
- Following the 'recession we had to have' in 1991-92, the long-term rate of inflation fell to effectively half what it was in the 1970s and 1980s, notwithstanding a short-lived spike in 2008.

Figure 1.2.1: Australian economic performance 1978 to 2008

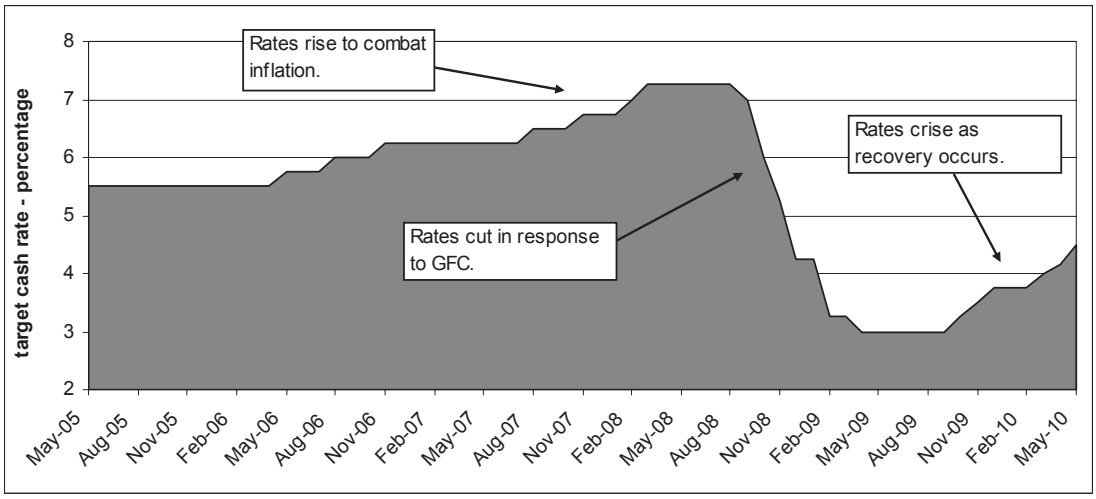


Source: Reserve Bank of Australia (RBA), Australian Bureau of Statistics (ABS) and Treasury statistics

Strong economic growth through much of the 1990s allowed the previous government to simultaneously increase spending and cut taxes. Despite the fact that the GST ensured that total tax revenues continued to rise as a share of GDP, it was a happy time all around. Few areas were happier than Defence, which saw its funding grow more or less in tandem with GDP from 1999 onwards.

But from around 2003, when unemployment fell below 5%, capacity constraints started to be felt in the economy and in 2008 inflation began to rise quickly. Then, in late 2008, the GFC hit and by early 2009 it looked like a substantial recession was on the cards. Twelve months on, and Australia has weathered the economic storm better than expected; rather than an outright recession, we've suffered a limited slowdown. The timing of the recent events is reflected in the changes to the RBA target cash rate set out in Figure 1.2.2.

Figure 1.2.2: RBA target cash rate 2005 to 2010



Source: RBA.

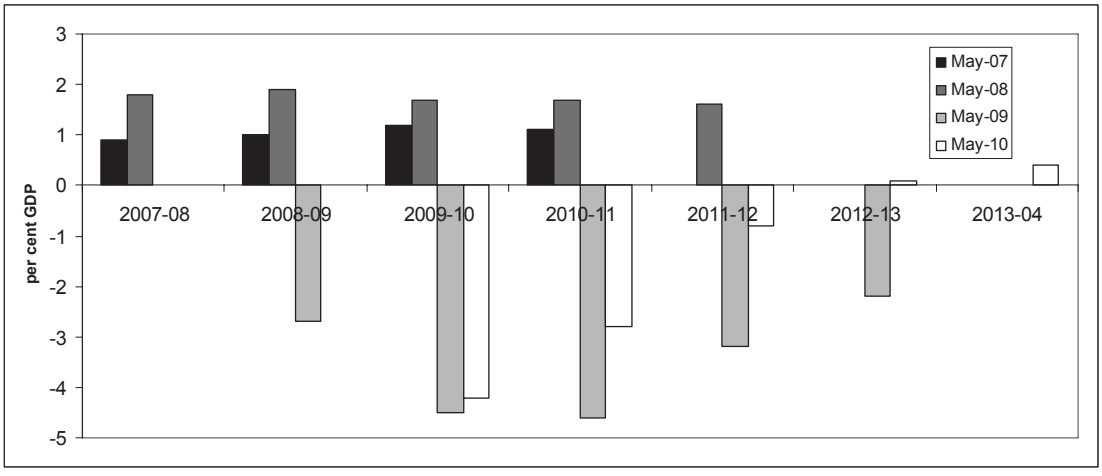
The recent downturn was accompanied by a deterioration of the government's projected fiscal situation which has since recovered. Table 1.2.1 compares the outlook in May 2009 with that of today. Figure 1.2.3 graphs the dramatic changes to the fiscal outlook in successive official estimates in recent years. Note that it's now anticipated that a return to surplus will occur in 2012-13.

Table 1.2.1: Budget aggregates 2009-10 and 2010-11 Budgets (nominal dollars)

		07-08	08-09	09-10	10-11	11-12	12-13	13-14
Budget 2009-10	Underlying cash balance ($b)	**19.7**	**-27.1**	**-57.6**	**-57.1**	**-44.5**	**-28.2**	
	Per cent of GDP	1.7	-2.2	-4.9	-4.7	-3.4	-2.0	
	Fiscal balance ($b)	**21.0**	**-29.7**	**-53.1**	**-56.0**	**-41.8**	**-30.3**	
	Per cent of GDP	1.9	-2.4	-4.5	-4.6	-3.2	-2.2	
Budget 2010-11	Underlying cash balance ($b)	**19.7**	**-27.1**	**-57.1**	**-40.8**	**-13.0**	**1.0**	**5.5**
	Per cent of GDP	1.7	-2.2	-4.4	-2.9	-0.9	0.1	0.3
	Fiscal balance ($b)	**21.0**	**-29.7**	**-54.18**	**-39.6**	**-12.1**	**2.0**	**6.3**
	Per cent of GDP	1.9	-2.4	-4.2	-2.8	-0.8	0.1	0.4

Source: Budget Papers No. 1, 2009–10 and 2010–11

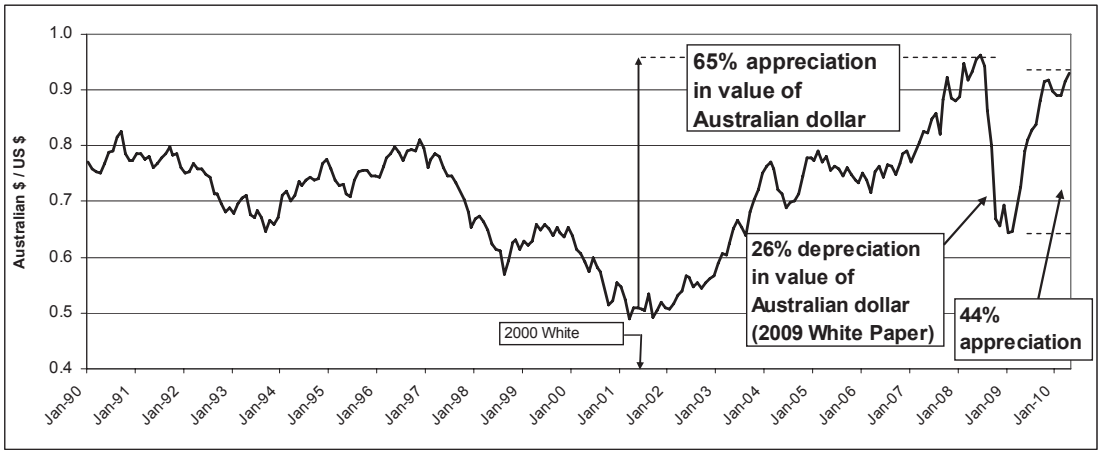
Figure 1.2.3: The changing outlook—fiscal balance per cent GDP



Source: 2007-08 to 2010-11 Budget Papers

Defence spends something like $5 billion a year offshore (no official figure is available) mostly in contracts written in US dollars. And while Defence is insulated from fluctuations on a no-win, no-loss basis with the Department of Finance and Deregulation, the government, and ultimately the taxpayer, feels the pain or gain. In recent years, the USD–AUD exchange rate has fluctuated substantially as Figure 1.2.4 shows. At the time of writing, the exchange rate was again trending down having fallen from a peak of 0.93c in April to 0.81c in late May.

Figure 1.2.4: Foreign exchange



Source: RBA

From 2001-02 to 2008-09 the Defence budget was indexed relative to the awkwardly named *Implicit Non-Farm GDP Deflator* (NFGDPD), but from 2009-10 onwards the budget has received fixed 2.5% annual indexation. (This is separate from and in addition to the adjustments made for foreign exchange.) The relative benefit or cost compared with the CPI is calculated in Table 1.2.2.

Table 1.2.2: Changes to the Implicit Non-Farm GDP Deflator and CPI

	01-02	02-03	03-04	04-05	05-06	06-07	07-08	08-09	09-10	10-11	11-12	12-13	13-14
NFGDPD	2.1	2.6	4.0	3.9	4.8	4.8	4.3	5.5	1	5	1.75		
Fixed 2.5%	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5
CPI	2.9	3.1	2.4	2.4	3.2	2.9	3.4	3.1	3.25	2.5	2.5	2.5	2.5
Difference	-0.2	-0.4	1.6	1.5	1.6	1.9	0.9	2.4	-0.75	0	0	0	0

Source: APH Library, RBA, ABS and Budget Papers

Note that from 2003-04 to 2008-09 Defence received above CPI indexation for six years in a row before losing close to one percent in 2009-10—though the outcome was much better than would have occurred had they still had the NFGDPD.

Finally a caution, although Australia has enjoyed a much better than expected twelve months, significant uncertainties remain over the global economy. At the time of writing the Greek debt crisis was still playing out and US equity markets had just recorded a 'technical correction' amounting to a 12% fall in value in less than a month. It is possible that the economic underpinnings of the projected 2012-13 surplus are eroding.

1.3 Defence Organisation and Management

The Outcomes and Program Framework

From 2009-10, the Defence budget has been set out according to a framework of 'outcomes' and 'programs'. This replaces the 'outcomes' and 'outputs' framework that was established in 1999.

- **Outcomes** are the results or benefits that the Commonwealth aims to deliver to the community through the work of its agencies. They are specified for each agency, and are meant to express the purpose or goal of each agency's activities.
- **Programs** are activities that agencies undertake in pursuit of the outcomes they are expected to deliver.

Under the framework, the performance of agencies is measured. This is done through specific targets (like flying hours for Air Force) and, ultimately, the extent to which their programs actually deliver the outcomes intended. So the aim is to show not only how much an agency is *doing*, but how much it is actually *achieving.*

The Defence Outcomes

Since 2009-10, the Defence Outcomes have been:

Outcome 1: The protection and advancement of Australia's national interests through the provision of military capabilities and the promotion of security and stability.

Outcome 2: The advancement of Australia's strategic interests through the conduct of military operations and other tasks as directed by Government.

Outcome 3: Support for the Australian community and civilian authorities as requested by Government**.**

The programs that contribute to these three outcomes are set out in Figure 1.3.1. Note that the programs are closely aligned with the actual organisational structure of Defence, as can be seen by comparison with the Defence 'wiring diagram' in Figure 1.3.2.

This framework provides greater visibility of resources consumption within the organisation than the output-based approach that was in place up to 2007-08. But this comes at the loss of knowing what it costs to deliver military capability, which is what the old framework attempted to do. Ultimately, what really matters is how much it costs to deliver ships, planes and battalions ready for deployment, not how much money is spent on health services, legal advice or personnel management. Of course, in a perfect world we would be told both.

Curiously, at the same time as Defence's formal budget framework abandoned the concept of outputs in favour of an organisation-based program approach, the 2009 White Paper said that Defence will move to an output-driven internal budgeting model. Twelve months on, and it is still too early to know what this will entail or the extent—if any—to which it will be visible to the public. It would be ironic if Defence finally moved to an internal output-based budget so soon after abandoning output-based external budgeting and reporting.

Figure 1.3.1: The new Defence Outcome-Output framework

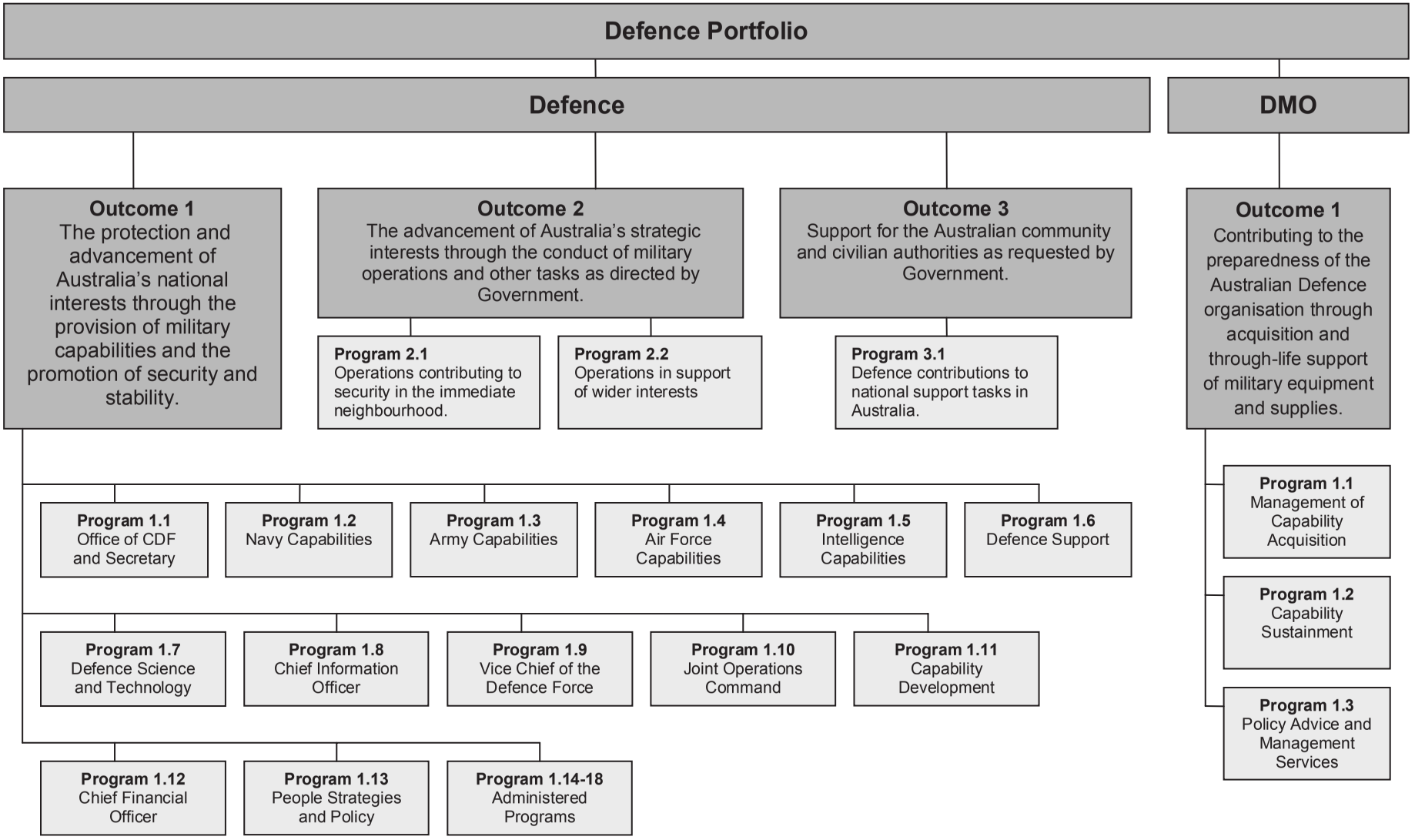
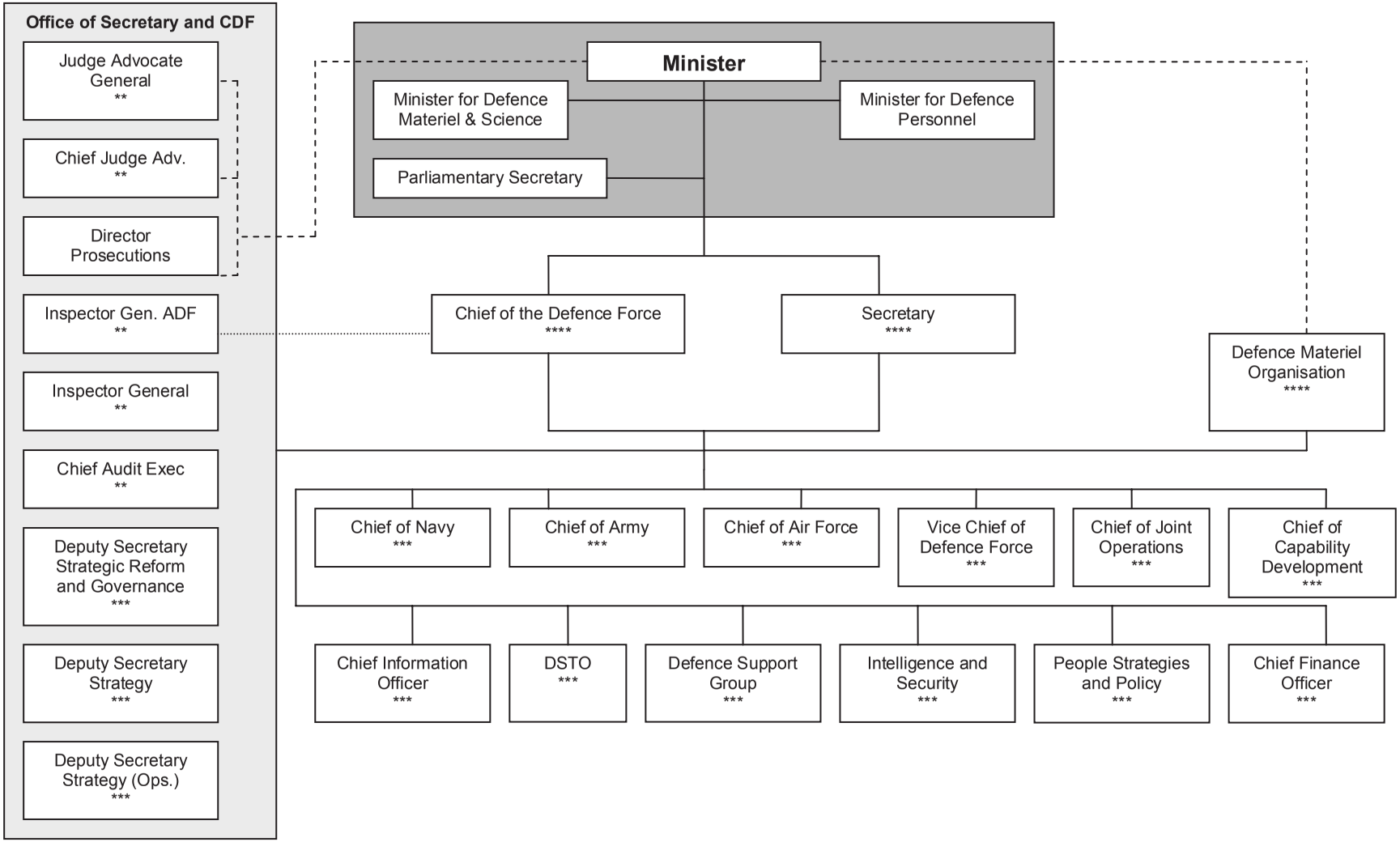


Figure 1.3.2: Defence organisational structure (as at May 2010)



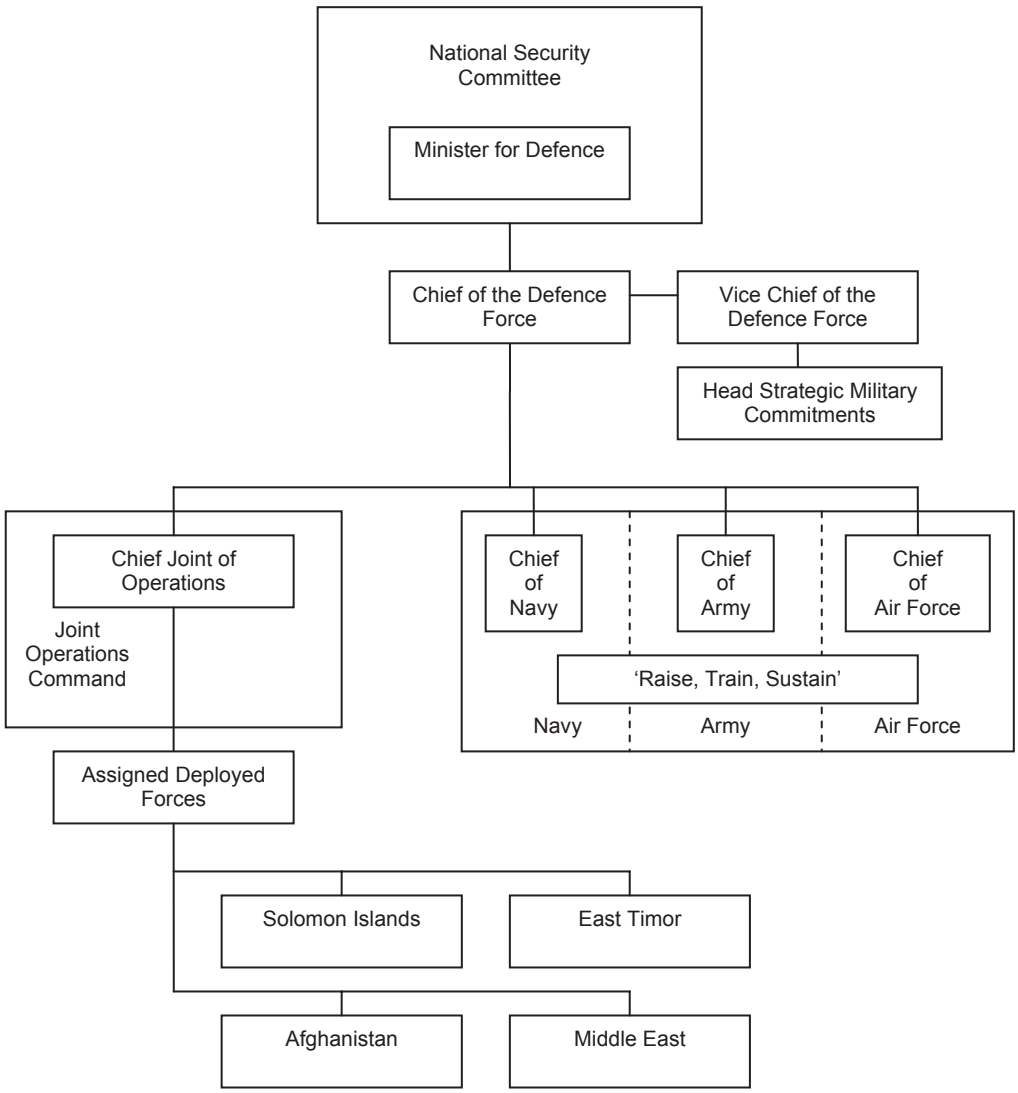
ADF command structure

It is important not to confuse the day-to-day management of the Department of Defence with the command of military operations. The former occurs through the diarchy of the CDF and Secretary and group/program arrangements outlined above. The latter is exercised through a formal command chain and dedicated headquarters structure.

On a day-to-day basis, the three Services (Navy, Army, and Air Force) are responsible for raising, training and sustaining their forces. When forces are deployed on operations or major exercises, the designated force elements are assigned to Headquarters Joint Operations Command (HQJOC) for that purpose. Since late 2008, HQJOC has been housed at a purpose-built facility near Bungendore in rural NSW and is staffed by around 750 personnel.

A more detailed outline of ADF command and HQJOC appears in Chapter 2.3 of this brief under Program 1.11.

Figure 1.3.3: ADF command structure



1.4 National Security Spending

The events of 9/11 prompted the recognition that no single agency has the capacity, or range of capabilities, necessary to ensure our security. The threat of terrorism within Australia, and to Australians abroad, has forced a whole-of-government approach to national security at the federal level. Even beyond the threat of terrorism, it is increasingly recognised that our national security interests are best served by a coordinated approach that uses all the levers available to government.

It's beyond the scope of this Defence Budget Brief to analyse and explain the budgets of all the agencies that contribute to national security. Instead, we'll content ourselves with a broad-brush description of how much is spent in key agencies. If nothing else, it provides a useful yardstick against which we can measure what's spent on defence. Unfortunately, because of the difficulty in finding data, our discussion excludes spending at the state and local levels.

In late 2008 the government foreshadowed the introduction of a 'national security budget'. Nothing appeared in the 2009-10 budget and the closest that this year's budget came to was a graph in the Budget Overview (page 28) of Defence, non-Defence and Defence Operational spending along with the claim that the 2010-11 Budget 'represents the first coordinated approach to national security funding'. Given the absence of any useful detail, we have undated our usual assessment of national security spending.

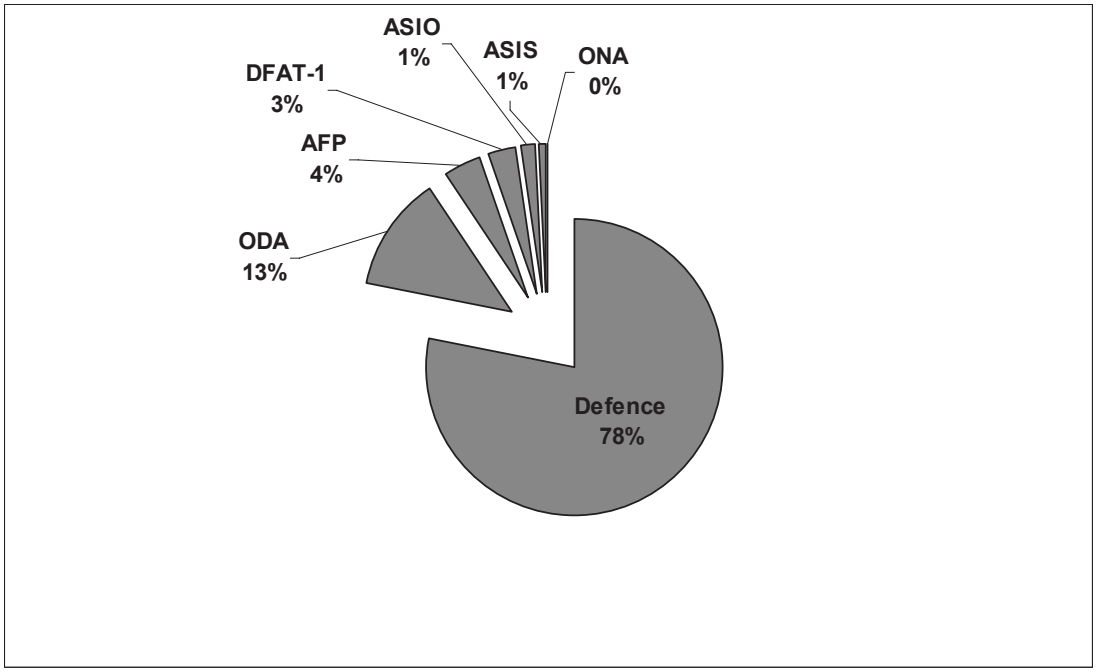
A number of federal agencies can make a credible claim to delivering some part of our national security. In selecting agencies, we have taken a liberal view of what constitutes national security, although we have excluded funding for outcomes within agencies that are clearly unrelated. Here's our list in alphabetical order, which cannot claim to be exhaustive:

- Australian Agency for International Development (AusAID)
- Australian Federal Police (AFP)
- Australian Security Intelligence Organisation (ASIO)
- Australian Secret Intelligence Service (ASIS)
- Department of Defence (DOD)
- Department of Foreign Affairs and Trade (Outcome 1: *Australia's national interests protected and advanced through contributions to international security, national economic and trade performance and global co-operation*.) (DFAT-1)
- Office of National Assessments (ONA).

Clearly, some of the activities of the listed agencies (even with the restriction to specific outcomes) go beyond national security. Conversely, other agencies that have been left out, like the Australian Customs Service, make a significant contribution to national security within their broader range of responsibilities. Such is the challenge of dealing with the aggregated data available in the budget papers. We have removed

the Department of Immigration and Citizenship from this year's reckoning because we have been unable to clearly track the transfer of funds to other agencies. Figure 1.4.1 compares the appropriations allocated to each of the aforementioned agencies in 2008-09. For AusAID, rather than use the appropriation, we have listed Australia's total Overseas Development Aid (ODA) for the year.

Figure 1.4.1: Federal national security spending



Source: 2010-11 Budget Paper No. 4 and ASPI calculation of Net Defence Funding

At the risk of stating the obvious, Defence dwarfs all other federal areas of spending that contribute in some way to national security. This is despite the fact that many agencies (in particular, ASIS, ASIO and ONA) have received large boosts to their funding post-9/11, as Table 1.4.1 below shows. Because changes in outputs and the presentation of budget figures make it difficult to extract precisely comparable figures from year to year, the numbers should be used with caution—though the broad trends are clear. Note also that the calculated growth is nominal rather than real.

Table 1.4.1: Federal national security appropriations 2001-02 to 2009-10

	2001-02 $ m	2002-03 $ m	2003-04 $ m	2004-05 $ m	2005-06 $ m	2006-07 $ m	2007-08 $ m	2008-09 $m	2009-10 $m	2010-11 $m	Nominal 9-year increase
Defence	13,191	14,216	15,439	16,224	17,523	19,142	19,846	22,921	25,196	26,764	103%
ODA	1,755	1,831	1,973	2,198	2,698	3,018	3,174	3,800	3,821	4,349	148%
AFP	523	391	609	777	968	885	1,310	1,385	1,486	1,412	170%
DFAT-1	660	701	709	774	717	740	822	843.4	1,187	1,080	64%
ASIO	69	90	98	161	187	341	450	429	427	438	535%
ASIS	54	59	80	89	100	131	162	217	248	240	344%
ONA	7	8	11	18	28	28	35	38	27	38	443%

Source: 2002-03 to 2010-11 Budget Paper No. 4 and ASPI calculation of Net Defence Funding

1.5 Measuring Defence Spending

The amount a country spends on defence is a direct measure of its commitment to protect itself. Accordingly, a lot of attention is placed on comparing levels of defence spending between countries and on tracking the rates at which those levels are increasing or decreasing. For example, here in Australia a lot of attention has been placed on the promised 3% real growth in the defence budget in recent years. It is important, therefore, that reporting of defence spending captures what's actually going on.

Table 1.5.1 sets out the presentation in the 2010-11 PBS [Table 3, p.17] excluding the administered appropriations. (We ignore the administered appropriations for superannuation and housing because they are not controlled by Defence and are appropriated through the organisation for convenience.) The bottom line is *Total Defence Funding* which, in the past, has been presented in the PBS as 'the most common way of presenting the Defence budget' [2008-09 PBS, p.119].

Table 1.5.1 Total Defence funding FY 2010-11

	2009-10 $'000
Departmental	
1. Output Appropriation	22,192,662
2. Equity Injection	3,578,161
3. Prior Year Appropriation	2,100
4. Current year's appropriation (1+2+3)	**25,772,923**
5. Drawdown of appropriations carried forward	65,000
6 Other appropriation receivable movements	-2,100
7. Returns to Official Public Account (OPA)	-98,989
8 Funding to/from OPA	-36,089
9. Funding from Government (4+8)	**25,736,834**
9. Capital Receipts	134,285
10. Own-source Revenue	1,025,446
11. Funding from other sources (9+10)	1,159,731
12. Total Defence Funding (8+11)	**26,896,565**

Source: 2008-09 PBS

The easiest way to explore what a better approach might be is to examine each of the elements appearing in Table 1.5.1.

Current year's appropriations: This is the least ambiguous part of the problem. Each year the government formally appropriates money to Defence. The breakdown of the appropriation in terms of outputs and equity is an artefact of accrual accounting that need not concern us. What matters is that this is the quantum of cold hard cash that the government plans to make available to Defence for the financial year. As such, any credible measure of Defence funding must include this money.

Drawdown of appropriations carried forward: Following several years where Defence substantially underspent its budget, an Appropriation Receivable account was established to keep track of funds returned to government so that they might be drawn on in future years. Shifts to this account represent either the expenditure of additional public funds by Defence or the return of unspent funds. To properly track the funding employed by Defence, it makes good sense to take account of increases and decreases to the Appropriation Receivable account. However, if this is accepted, it follows that changes to Defence's cash holding must also be accounted for (since that's where the money in the appropriation receivable came from originally).

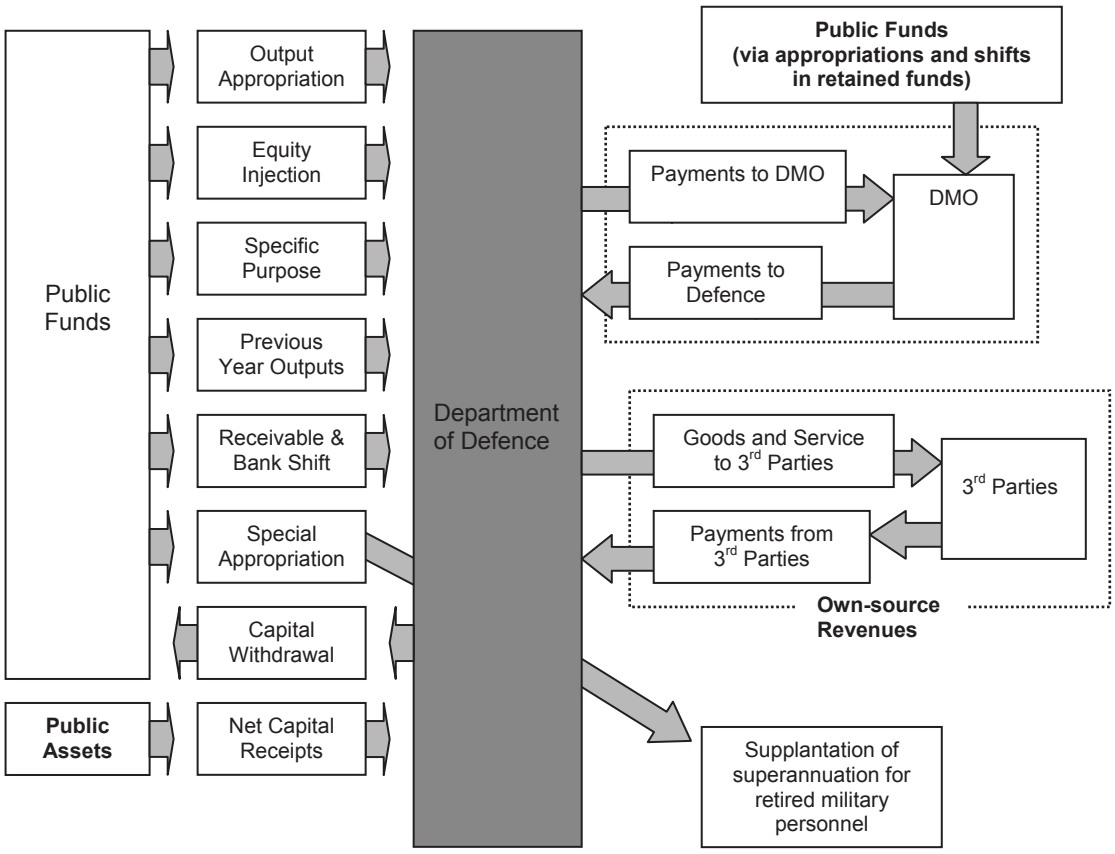
Capital Receipts: As custodian of more than $50 billion of public assets including land, buildings and military equipment, Defence inevitably receives cash from the disposal of items that are no longer needed. Some of this money is returned to government via a Return to the OPA. The remainder is retained by Defence and is called Net Capital Receipts. Given that Net Capital Receipts are generated from the sales of public assets, it is correct to count this income as part of Defence funding.

Own-source Revenues: Defence receives revenue from a number of sources. These include the supply of goods and services to third parties such as Defence personnel, who pay a share of the cost of their food and lodging provided by Defence, and foreign governments that purchase items like fuel. It makes little sense to include this as part of Defence funding. While it is perhaps reasonable to include revenue raised by using public assets (like Defence accommodation), the vast bulk of Own-source Revenue reflects Defence acting as an intermediary that transfers goods between 3rd party providers and 3rd party customers. For example, the sale of fuel to a foreign government or rations to personnel delivers no revenue to Defence that is not at least equal to the cost of doing so. Or to put it another way, no one could seriously contend that Defence funding has risen by $50 million simply because, for example, an extra $50 million of fuel was purchased and sold on to the United States.

Own-source Revenues also includes transfers from Defence Materiel Organisation (DMO) to Defence that cancel payments from Defence to DMO. The worst part is that these funds then get counted *twice* in the calculation of Total Defence Funding. It's hard to put an exact figure on it, but Defence's Own-source Revenues jumped by about $200 million the year that DMO became a prescribed agency, and DMO will pay Defence $246 million in 2009-10 (PBS page 130). If there was ever any doubt that Own-source Revenues should be excluded from what's counted as Defence spending, this should settle the matter. Figure 1.5.1 is our best attempt to depict the situation graphically, though some simplification has been necessary.

Even if the double-shuffle payments to DMO was the only complication, that would be enough to reject *Total Defence Funding* as a credible measure of the Defence budget. But there is more. *Total Defence Funding* also includes payments to DMO that have in the past remained unspent. Over a four year period last decade, more than $927 million accumulated in the DMO Special Account, including $414 million from 2007-08. (To make matters worse, at least $440 million in the DMO Special Account represents delayed major capital equipment purchases that were not disclosed in Defence's reckoning of capital investment that year.)

Figure 1.5.1: Defence Cash and Resource Flows



From a strict accounting perspective, no rules have been broken. Defence reports its funding accurately, and DMO reports its cash flow properly. Yet there is something surreal about failing to reconcile the net impact of the two things to show what's actually going on, especially given the high prominence of defence funding in recent years.

So what is the 'Defence budget'?

While there is an accounting distinction between Defence and DMO, any sensible calculation of the 'Defence budget' must reflect the total impost on the taxpayer in delivering defence capability. This is easily achieved by adding DMO funding to the calculation and ignoring the churn of money in between. Once again, the PBS contains a consolidation of the Defence and DMO budgets but it is not especially illuminating.

In light of the foregoing discussion, it seems sensible to include Funding from Government, Net Capital Receipts (= Capital Receipts – Return to OPA), Net Bank Balance Shifts, Appropriation Receivable and Special Account Shifts, but to exclude Own-source Revenue. And then to do the same for DMO and then add the results together, safe in the knowledge that the accounting transfers between the two entities have been excluded, Table 1.5.2. The addition of DMO appropriations is especially important because under new arrangements, DMO directly receives around $900 million that used to be provided by Defence.

Table 1.5.2: Total Defence resourcing FY 2010-11

	Total Defence Funding	ASPI Net Defence Spending
Departmental		
1. Output Appropriation	22,192,662	22,192,662
2. Equity Injection	3,578,161	3,578,161
3. Prior Year Appropriation	2,100	2,100
4. Current year's appropriation	**25,772,923**	**25,772,923**
5. Drawdown of appropriations carried forward	65,000	65,000
6 Other appropriation receivable movements	-2,100	-2,100
7. Returns to OPA	-98,989	-98,989
8. Funding from Government	**25,736,834**	**25,736,834**
7. Capital Receipts	134,285	134,285
8. Own-source Revenue	1,025,446	
9. Funding from other sources	**1,159,731**	**134,285**
10. DMO Appropriation		899,607
11. DMO drawdown of Special Account		-6,390
12. Total Defence Funding	**26,896,565**	
13. ASPI Net Defence Funding		**26,764,336**

The difference is not large. Our calculation of Net Defence Funding yields a figure only 0.5% below that of Total Defence Funding. The difference would be larger if not for the cancellation of Own-source Revenues and direct appropriation to DMO. Nonetheless, we believe that *ASPI Net Defence Funding* is a better measure of the 'Defence budget' than *Total Defence Funding*.

CHAPTER 2 – DEFENCE BUDGET 2010-11 PBS EXPLAINED

The 226 pages of the 2010–11 Defence Portfolio Budget Statements (PBS) set out the government's plan for the expenditure of around $26.8 billion by Defence in the coming financial year. Although this year's PBS provides a much clearer picture of what's happening than last year's confused effort, less information has been provided in a couple of key areas. Specifically, that regarding the planned availability of naval platforms and the prospective major capital investment projects to be approved in the forthcoming year.

This guide explains and where possible analyses the information in the PBS. In doing so, we skim over those parts of the PBS that are relatively clear, and focus on those areas where explanation might be useful.

Some of the material that follows is unavoidably technical due to the disciplines and complexities of accounting. However, it is not necessary to read this chapter as a whole, or in sequence, to gain insight. Every attempt has been made to enable the reader to jump in and look at those items of most interest.

This Brief does not cover in any detail the funds administered by Defence on behalf of the government for superannuation and housing support services for current and retired Defence personnel.

Most parts of the guide are best read with the PBS at hand. Copies can be downloaded from the web at <http://www.defence.gov.au/budget/>.

2.1: Strategic direction [PBS Section 1.1]

The overview chapter of the PBS begins with a brief discussion of the strategic context. Not surprisingly, the focus this year is on delivering the 2009 Defence White Paper and attendant Strategic Reform Program. Changes to the organisational structure of Defence are then surveyed (see Chapter 1 of this Brief for an explanation).

2.2: Resourcing [PBS Section 1.2 & 1.3]

The 'rubber hits the road' in Sections 1.2 and 1.3 of the PBS, in terms of allocating money to get things done. It contains the resource statements, new budget measures and the funding bottom line.

How much money will Defence get?

On page 17 of the PBS, we get to the heart of the issue. Table 3 gives three key figures for the Defence budget:

- **Funding from Government,** being those funds formally *appropriated* to Defence by the government for departmental purposes along with shifts in appropriation receivable (unspent money from previous years). In 2010-11 this amounts to $25,736,834,000.

- **Total Defence Funding,** being those funds actually *available* to Defence including appropriations and revenue from other sources. In 2010-11 this amounts to $26,896,565,000.

- **Total Defence Resourcing,** being Total Defence Funding plus those funds appropriated administratively through Defence for superannuation and defence housing subsidies. In 2010-11 this amounts to $30,839,763,000.

Of these three figures, *Total Defence Funding* is the one most usually quoted as the defence budget. It represents the funds expended by Defence to deliver the departmental outcomes and maintain the ongoing program of investment in new equipment and facilities. Note, *Total Defence Funding* does not include administered funds for superannuation and defence housing subsidies.

However, as explained in the last chapter, *Total Defence Funding* is inflated by churning of money (including in past years between DMO and Defence) that delivers no military capability or outcome. What's more, Total Departmental Funding ignores the money appropriated directly to the DMO and the money that in recent years has been accumulating unspent in the DMO Special Account. We believe that the *ASPI Net Defence Spending* figure accounts for these issues properly and therefore gives a more accurate picture of how much is being spent on delivering defence capability and outcomes. Henceforth, we will only present the *ASPI Net Defence Funding* figure.

How much money will Defence receive?

Table 2.2.1 displays Defence funding for the past nine, and next four, financial years. Also shown are both the nominal and real year-to-year percentage growth rates.

Table 2.2.1: ASPI Net Defence Funding – real (2010-11$) and nominal (nom)

	01-02	02-03	03-04	04-05	05-06	06-07	07-08	08-09	09-10	10-11	11-12	12-13	13-14
Funds (nom)	13,191	14,216	15,439	16,224	17,523	19,142	19,944	22,921	25,196	26,764	25,919	25,531	27,466
Growth (nom)	7.1%	7.8%	8.6%	5.1%	8.0%	9.2%	4.2%	14.9%	9.9%	6.2%	-3.2%	-1.5%	7.6%
Funds (real)	18,623	19,513	20,313	20,569	21,197	22,189	22,140	24,081	25,826	26,764	25,287	24,300	25,505
Growth (real)	4.7%	4.8%	4.1%	1.3%	3.1%	4.7%	-0.2%	8.8%	7.2%	3.6%	-5.5%	-3.9%	5.0%

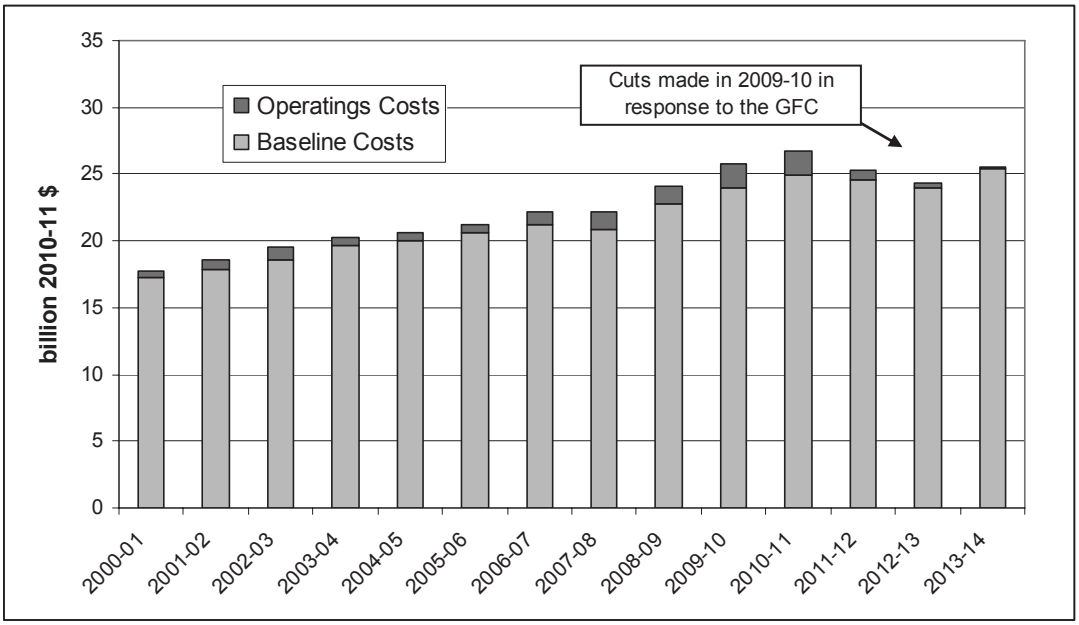
Source: 2010-11 PBS and earlier Defence Annual Reports (DAR).

When calculating the real growth rate, the nominal dollar values of the individual years have been converted to a single base year using the deflator used to maintain Defence buying power in real terms. From 2001-02 until 2009-10 this was the implicit Non-Farm GDP Deflator (NFGDPD) and from 2009-10 onwards it is fixed at 2.5% in accord with the funding model for the 2009 Defence White Paper.

The average *arithmetic* annual rate of real growth in the budget over the decade from 2000-01 (the last year prior to the 2000 White Paper) to 2010-11 is 4.2%. Over the same period, the effective *compounding* annual rate of real growth is also 4.2%. Thus, by either measure, it looks like the 3% real growth funding trajectory set back in 2000 will be more than achieved.

For the period covered by the new White Paper commencing in 2009-10, the five-year *arithmetic* annual rate of real growth in the budget will be 1.3% and the effective *compounding* annual rate of real growth will be slightly less at 1.2%. However, these figures must to be viewed with some caution given the very large shifts due to foreign exchange and the inclusion of substantial additional funding in recent years for overseas deployments. Figure 2.2.1 shows real net defence funding over the past decade and as now planned. A fuller discussion of defence funding appears in Chapter 3 of this Brief.

Figure 2.2.1: Real Net Defence Funding – 2000 to 2013



Source: 2010-11 PBS and earlier DAR.

What is the Defence share of GDP?

Table 2.2.2 gives Net Defence Funding as a percentage of GDP for recent and future years. In 2010-11, the share of GDP will be 1.91% compared with 1.94% in 2009-10 because the expansion of the economy will offset the increase in spending. Over the following three years, falling real spending and a rising economy will push the share of GDP down again. Note, that current and recent spending is boosted by high levels of operational supplementation that are not reflected in the latter years of the forward estimates. In addition, new estimates of historical GDP released in the 2010-11 Budget marginally alter historical GDP percentages compared with that reported in previous Budget Briefs.

Table 2.2.2: ASPI Net Defence Funding as a percentage of GDP

	00-01	01-02	02-03	03-04	04-05	05-06	06-07	07-08	08-09	09-10	10-11	11-12	12-13	13-14
% GDP	1.74	1.74	1.77	1.79	1.75	1.75	1.75	1.69	1.82	1.94	1.91	1.75	1.63	1.66

Source: 2010-11 Budget Overview, 2010-11 PBS and earlier DAR

What is the Defence share of Commonwealth payments?

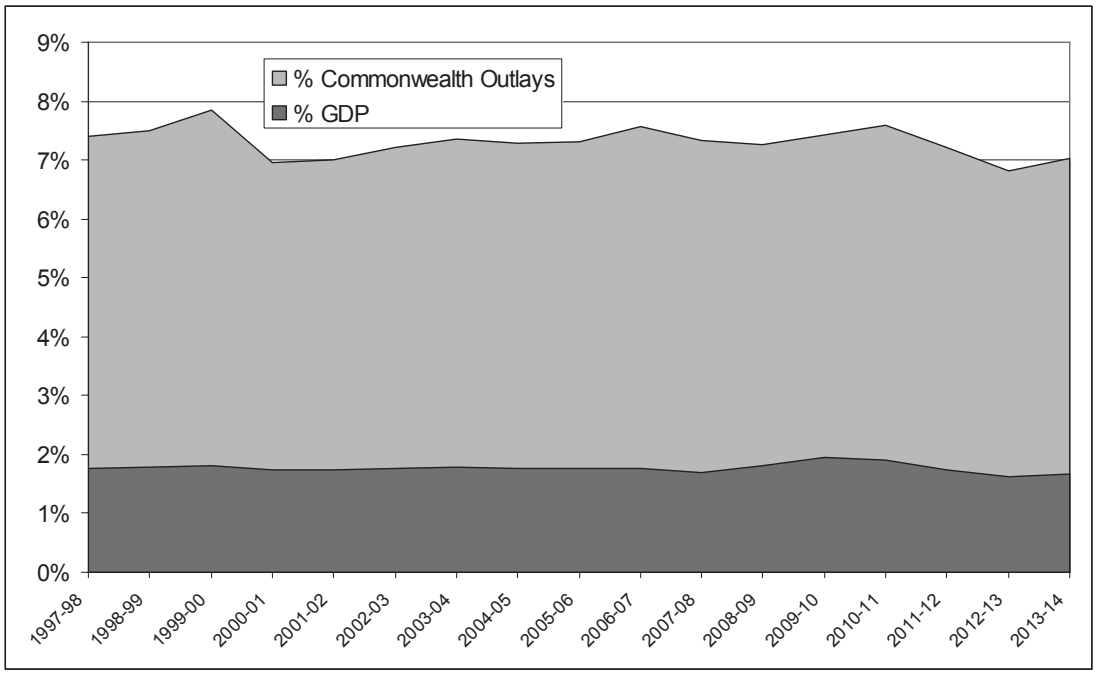
Defence spending as a percentage of total Commonwealth payments is shown in Table 2.2.3. On current plans, Defence's share of payments will rise slightly before falling back over the forward estimates period. Figure 2.2.2 graphs the percentage GDP and share of Commonwealth payments from 1997 to 2013.

Table 2.2.3: Net Defence Funding as a percentage of Commonwealth payments

	00-01	01-02	02-03	03-04	04-05	05-06	06-07	07-08	08-09	09-10	10-11	11-12	12-13	13-14
%	6.96	6.99	7.21	7.36	7.29	7.30	7.56	7.34	7.25	7.42	7.60	7.22	6.83	7.03

Source: 2010-11 Budget Overview, 2010-11 PBS and earlier DAR

Figure 2.2.2: Net Defence Funding as a Percentage of payments and GDP



Source: 2010-11 Budget Overview, 2010-11 PBS and earlier DAR

Changes since the last budget

Since the last budget, several measures and adjustments have been undertaken that provide context for this year's budget. Table 2.2.4 shows the key items from the 2009-10 Portfolio Additional Estimates Statement (PAES) [Table 3, p.17].

Table 2.2.4: Key measures and adjustment from the 2009-10 PAES (million $)

	09-10	10-11	11-12	12-13	4 year total	10 year total
Building works in Tarin Kowt (Afghanistan)	16.8	31.9	-	-	48.7	48.7
Reduction of the number of ADF in East Timor	-14.1	-	-	-	-14.1	-14.1
Adjustment to security detachment in Iraq	3.0	-8.0	-	-	-5.0	-5.0
Counter IED equipment for Afghanistan	-	-	-	-	-	-
ASPI funding	-	-	-	-	-	-
Adjustment cash to Official Public Account			-24.0		-24.0	-24.0
Foreign exchange movements	-909.2	-987.3	-853.8	-815.6	-3,566	-11,528
Property disposal	161.0	-46.3	-71.7	90.6	133.6	133.6
Adjustment to DMO direct appropriation	-49.8	-67.6	-88.6	-112.7	-318.8	-1,470
TOTAL	**-792.3**	**-1,077**	**-1,038**	**-838**	**-3,746**	**-12,860**

Source: 2009-10 PAES.

Building for Tarin Kowt (Afghanistan)

An additional $48.7 million was provided for new and enhanced infrastructure projects at Tarin Kowt 'to ensure appropriate levels of force protection that includes improved working facilities'.

Reduction in the number of ADF personnel in East Timor

Funding of $14.1 million in 2009-10 was returned to the government following a reduction in the number of personnel deployed to East Timor from around 650 to approximately 420 in February 2010. The reduction reflects the improved security situation in the country.

Adjustment to security detachment in Iraq

$5 million funding for the Baghdad Security Detachment was returned.

Counter Improvised Explosive Device Equipment (Afghanistan)

An additional $40 million to be spent on additional Counter Improvised Explosive Device (IED) equipment to provide additional force protection for troops in Afghanistan. Defence will absorb the cost of this initiative from within existing resources.

Australian Strategic Policy Institute – Continuation of funding

Defence to provide $2.8 million in 2009-10 to support the work of the Australian Strategic Policy Institute (ASPI) from within existing resources.

Adjustment of cash to Official Public Account (OPA)

To reconcile Defence's funding position with the government's Central Budget Management System an adjustment of $24 million in funding for 2011-12 was made.

Foreign Exchange movements

Defence is funded on a no-win/no-loss basis for foreign exchange movements. Depending on how the Australian dollar moves relative to currencies that Defence

plans to make purchases in, adjustments are made to maintain the buying power of the Defence budget. As a result of a strong appreciation of the Australian dollar in 2009-10, Defence handed back $909.2 million in 2009-10, $3,566 million over the budget and forward estimates, and $11,528 million over the decade.

Property Disposal
Adjustments to Defence's Property Disposal Program resulted in Defence retaining $161 million in 2009-10 and $133.6 million over the decade.

Defence Materiel Organisation (DMO) Direct Appropriation
Ever since the DMO was established as a prescribed agency in 2005-06 it has received a direct appropriation from the government. This adjustment provides DMO with an additional $318.8 million over the budget and forward estimates and $1,470 million over the decade by reducing the appropriation to Defence by those amounts for those periods.

The 2010-11 Budget Measures and Adjustments [PBS p. 22 – 27]

Changes to the 2010-11 Defence budget are set out in the PBS. The changes fall into two categories: budget measures and budget adjustments. The distinction between budget measures and budget adjustments is variable, with identical items classified differently from one year to the next. There are nine budget measures and four adjustments in this year's budget, which are detailed on pages 22 to 27 of the PBS. For ease of reference, the individual measures and adjustments have been detailed in Table 2.2.5.

Table 2.2.5: 2010-11 Budget Measures and Adjustments (million $)

	2010-11	2011-12	2012-13	2013-14	4 year total	10 year total
Funded Measures						
Middle East Area of Operations - continuation	915.6	207.2	136.1		1,258.8	1,258.8
Afghanistan – enhanced force protection	221.6				221.6	49.7
Afghanistan – civilian engagement	19.6				19.6	19.6
East Timor – continuation	151.1	25.6	7.7		184.4	184.4
Solomon Islands – continuation	42.5	1.4			44.0	44.0
Iraq – transition to civilian security contract	9.2	-1.3	1.8		9.7	9.7
Moorebank Intermodal Terminal	13.7	21.5			35.2	35.2
Reprogramming of funding	4.0	52.0	80.0	-657.0	-521.0	0
Centralisation of government security vetting	0.5	-0.9	-0.9	-1.0	-2.2	-7.7
subtotal	**1,377.8**	**305.6**	**224.7**	**-658.0**	**1,250.1**	**1,593.7**
Adjustments						
Foreign exchange	-662.4	-520.3	-277.6	-146.6	-1,606.8	-5,365.7
DMO direct appropriation adjustment	33.2	33.8	42.5	49.2	158.7	563.6
Property disposal adjustment	30.3			-94.1	-63.8	-63.8
Afghan National Army Trust Fund adjustment	-15.8	-15.8	-15.8	-15.8	-63.4	-63.4
subtotal	**-614.7**	**-502.3**	**-250.9**	**-207.3**	**-1575.3**	**-4929.3**
Variation to Defence funding	**763.1**	**-196.8**	**-26.2**	**-865.3**	**-325.2**	**-3335.6**
Absorbed measures						
Afghanistan – enhanced force protection[1]	**437.4**	**356.0**	**190.6**	**0**	984.0	812.1
Total absorbed measures	**437.4**	**356.0**	**190.6**	**0**	**984.0**	**812.1**

Source: 2010-11 PBS and Budget Paper #2. Numbers may not add up due to rounding. [1] Includes $171.9 million from 2017-18 and 2018-19.

The budget initiatives in detail

Although the PBS does a good job of explaining the measures, further information is sometimes available in Treasury's Budget Paper Number 2. In what follows, the key points are reproduced—often verbatim—from these two sources. See Chapter 6 of this Brief for more on the cost and composition of ADF deployments.

Middle East Area of Operations — continuation and enhancement of Australia's military contribution

The government will provide $1,258.8 million for the net additional cost of continuing and enhancing Australia's military contribution to international efforts to combat terrorism in Afghanistan and the wider Middle East Area of Operations, including anti-piracy operations off the coast of Somalia. Australia's commitment will be extended until June 2011.The measure includes $239.2 million in funding for pre-existing force protection capabilities in Afghanistan that will provide direct protection for Australian Defence Force members from small arms, improvised explosive devices and direct fire.

Afghanistan — enhancement of force protection measures for Australian troops

The government will provide $1,135.5 million to enhance force protection measures for Australian troops deployed to Afghanistan. The measures include improved route clearance capabilities; enhanced protection and firepower for Protected Mobility Vehicles; new night fighting equipment; improved body armour; new biometrics capabilities; additional military working dogs; and a suite of improved intelligence, sensor and reconnaissance capabilities. These enhancements are aimed at preserving life and reducing injuries from small arms, improvised explosive devices and indirect fire encountered in active service abroad.

These investments will be predominantly funded from within Defence's existing capital program, with $911.9 million to be met from within the Department's existing resources. Of the $223.6 million in new funding provided (including $2 million in 2009-10), $171.9 million in new funding will be met within the Defence 2009 White Paper funding commitment by reducing Defence funding beyond the forward estimates (specifically, $86 million from both 2017-18 and 2018-19). As a result, the actual new funding from the government only amounts to $51.7 million (including $2 million in 2009-10).

These enhancements build upon the $246.0 million in force protection enhancements that were provided as part of the measure *Global terrorism — enhancing Australia's commitment to Afghanistan* in the 2009-10 Budget. It is also additional to the $239.2 million for existing force protection elements identified in the related expense measure titled *Middle East Area of Operations — continuation and enhancement of Australia's military contribution*.

Australia's civilian engagement in Afghanistan — an integrated whole-of-government approach

As part of an inter-agency initiative, the government will provide $245.9 million over two years (including capital funding of $22.6 million) to enhance Australia's civilian and police contribution to developing local capacity in Afghanistan, focusing on the Oruzgan Province. As part of this measure, funding of $19.6 million will be provided to Defence in 2010-11 to protect Australian Federal Police officers, other Australian

Government employees and their contractors operating in Southern Afghanistan. Further funding for Defence's role will occur on an annual basis as required.

East Timor — continuation of Australia's commitment to helping to maintain security and stability
The government will provide $184.4 million over three years for the net additional cost of extending Australia's military contribution to maintaining stability in East Timor until June 2011. Due to the improved security situation in the country, greater use will be made of Reservists as is already the case in Solomon Islands.

Solomon Islands — continued Australian Defence Force assistance to the Regional Assistance Mission to Solomon Islands (RAMSI)
The government will provide $44.0 million over two years for the net additional cost of extending Australia's military contribution to the Regional Assistance Mission to Solomon Islands (RAMSI) until June 2011.

Baghdad Embassy — transition towards civilian security arrangements
The government will provide $61.6 million (including $51.9 million for DFAT and $9.7 million for Defence) over three years to continue security measures for the Australian embassy and staff in Baghdad. The funding will enable the transition of responsibility for key elements of security from the ADF to private contractors engaged by the DFAT. The reduction in expenditure for the Defence in 2011-12 represents a reduction in forecast remediation costs.

Moorebank Intermodal Terminal — implementation strategy
The government will provide $70.7 million over two years to the Department of Finance ($35.5 million) and Defence ($35.2 million). The funding will be used to develop, with the Department of Infrastructure, Transport, Regional Development and Local Government, comprehensive business cases, designs, approvals and an implementation strategy for an intermodal transport hub at Moorebank, New South Wales, and for the relocation of Defence's School of Military Engineering to Holsworthy. The funding will come from funds already set aside in the Nation Building program for New South Wales.

Reprogramming of funding to better align with Defence's requirements
The government will reprogram funding to better align with Defence's strategic requirements. The reprogramming will result in a reduction in Defence funding of $657.0 million in 2013-14 with increases in Defence funding of $4.0 million in 2010-11, $52.0 million in 2011-12, $80.0 million in 2012-13 and $521.0 million in 2016-17. This measure will result in savings of $521.0 million over the forward estimates period. Given that the withdrawal comes after the government anticipates returning to surplus, there is no reason to doubt the explanation given.

Australian Government personnel security vetting — centralisation
Defence will return $04 million over two years to establish a central security vetting agency in the Department of Defence for Commonwealth security clearances. The central vetting agency will ensure public servants and contractors have a single security clearance transferable across government, remove unnecessary regulation and generate ongoing efficiency savings from 2010-11.

Funding adjustments:

Foreign exchange
To take account of foreign exchange movements, Defence will hand back $1,606.8 million over four years and $5,366 million over ten years. These adjustments are designed to maintain the buying power of the Defence dollar.

Defence Materiel Organisation direct appropriation adjustment
Defence will receive $158.7 million over four years and $563.6 million over ten years to adjust the relative split of direct appropriations to Defence and DMO.

Property disposal adjustment
This adjustment accounts for reduced revenues from the sale of properties which Defence would have been allowed to retain.

Afghan National Army Trust Fund adjustment
Last year it was decided to provide US$40 million per annum for five years to the Afghan National Army Trust Fund. As a result of foreign exchange movements $63.4 million is being returned to government.

So what happened?

Setting aside the several smaller measures, the Defence budget contained two significant parts. First, additional funding of $1,517 million was provided to cover the net additional cost of operations in the Middle East (including Afghanistan and Iraq), East Timor and the Solomon Islands. Second, $1,135 million will be spent on enhanced force protection for ADF personnel in Afghanistan (including $2 million in 2009-10). Funding for this additional force protection comes from within Defence's existing funding ($911.9 million), by bringing forward existing Defence funding from the second half of the decade ($171.9 million) and from $51.7 million in new funding from the government ($2 million in 2009-10 and $49.7 million in 2010-11). As a result, Defence will absorb $1,083.8 million of the cost of force protection including $911.9 million over the next four years.

Because the additional force protection is 'predominantly funded from within Defence's existing capital program' it is inevitable that some planned facilities and capital projects will now be delayed. The extent and impact of these delays is explored in Chapter 3 of this Brief.

The remainder of Section 1 of the PBS contains a range of information including:

- ***Defence Resource Statement*** [PBS p. 18] which lists the formal appropriation of funds to defence.
- ***Purchase-Provider Arrangements*** [PBS p. 20] which lists the itemised payments to DMO for goods and services rendered.
- ***Operations Summary*** [PBS p. 25] which provides some detail of the funding and composition of ADF deployments.
- ***Capital Investment Program*** and ***Net Capital Receipts*** [PBS p. 28-29] which we explore more fully in Chapter 2.3 of this Brief.
- ***People*** [PBS p. 30–33] which we explore more fully in Chapter 2.4 of this brief.

2.4: Capital Investment Program [PBS Section 1.4]

Information on the Capital Budget is now spread across several areas of the PBS. The Capital Budget represents Defence's plans for capital investment in new equipment, upgrades, facilities and other non-military capital items. It's formally described in accounting terms in the Capital Budget Statement in Table 47 on page 113 of the PBS, although that is not very revealing.

Capital Investment Program [PBS p.30]

The Capital Investment Program is detailed in Table 14 page 28, which we have reproduced in part in Table 2.4.1. Unfortunately, the projected result for 2009-10 has not been included in this year's PBS so we have been forced to use the revised estimate from the 2009-10 PAES.

Table 2.4.1: The Capital Investment Program (million $)

	05-06 actual	06-07 actual	07-08 actual	08-09 actual	09-10 revised	10-11 budget	11-12 forward	12-13 forward	13-14 forward
Unapproved Major Capital Investment (DCP)					240	278	832	1,428	2,859
Approved Major Capital Investment	3,888	4,019	4,030	3,943	4,831	5,517	4,358	3,224	2,659
Subtotal	**3,888**	**4,019**	**4,030**	**3,943**	**5,071**	**5,795**	**5,190**	**4,652**	**5,518**
Capital Facilities Approved & Unapproved	430	653	570	963	1,330	1,509	1,380	1,153	1,199
Other Capital	722	925	829	742	707	631	873	609	464
Total Capital Investment Program	**5,041**	**5,598**	**5,429**	**5,648**	**7,109**	**7,934**	**7,443**	**6,413**	**7,180**

Source: 2010-11 PBS, 2009-10 PAES and various DAR

There are four components to the Capital Investment Program:

Unapproved Major Capital Investment Program or Defence Capability Plan (DCP) This represents Major Capital Investment projects that have not yet received second pass approval from government. Major Capital Investment projects are generally of more than $20 million value and predominantly involve the purchase of military equipment, (previously called 'Pink Book' projects). The preparation of these projects for approval is the responsibility of the Chief of the Capability Development Group. Once approved, projects pass to the DMO for delivery.

Approved Major Capital Investment Program: Projects already approved by government and under way, previously called the 'White Book'. Once approved, projects generally pass to the DMO for delivery.

Capital Facilities: Approved and Unapproved Capital Facilities Projects, including everything from new barracks to upgrades of existing facilities. These projects are the responsibility of the Infrastructure Division in the Defence Support Group.

Other Capital: including Minor Capital Investment (projects costing less than $20 million), repairable items, non-capital facilities, plant and equipment, and software and intangibles.

The figures are misleading

Unfortunately, the figures in Table 2.4.1 for the Major Capital Investment Program are not an accurate representation of the money actually spent on major capital investment. Although they accurately record the money transferred to DMO to purchase new equipment, there is no guarantee that DMO actually spends the money. In some years, substantial quantities of money have been left unspent in the DMO special account—mostly from the acquisition program. Conversely, in recent years DMO has been drawing down the money in their Special Account to fund additional purchases. Table 2.4.2 is our best reckoning of how much has been left unspent or withdrawn from the special account and not accounted for in Defence's reporting of Major Capital Investment spending. As can be seen, the amounts are substantial.

Table 2.4.2: Shifts in the DMO Special Account (million $)

	05-06	06-07	07-08	08-09	09-10	10-11	11-12	12-13	13-14
Closing balance of DMO Special Account	191	565	988	269	505	512	?	?	?
Amount left unspent (+ve) or amount drawn down (-ve)	191	374	423	-719	236	6	?	?	?

Source: 2010-11 PBS and various DAR

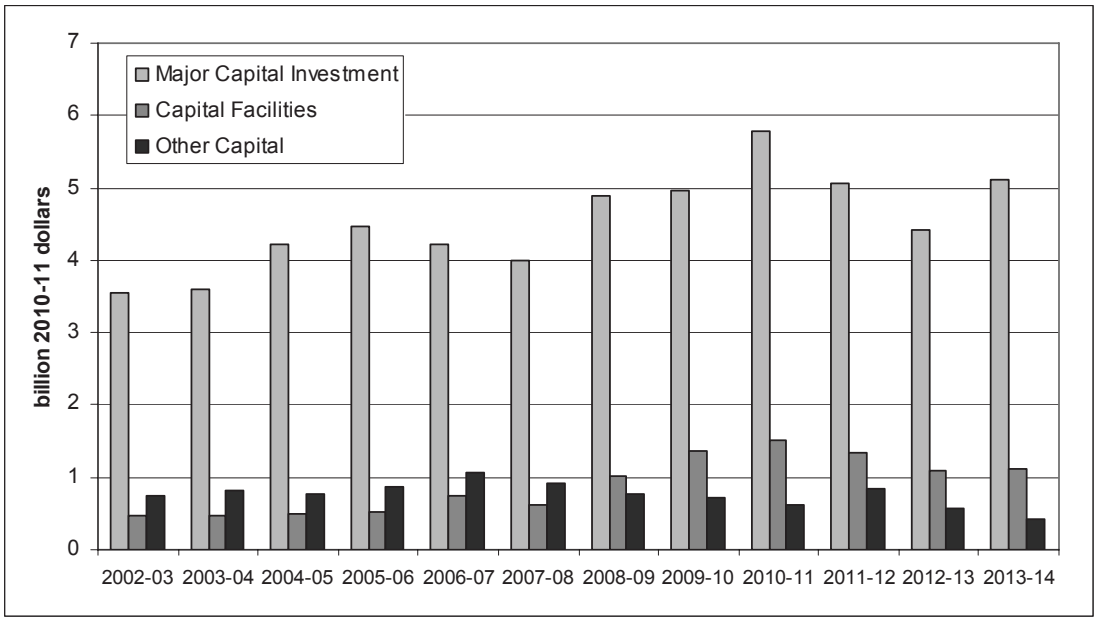
What are the trends in the Capital Investment Program?

Recent actual and projected real spending in the Capital Investment Program is shown in Figure 2.4.1. The trend across the forward estimates is for a decrease (due to the cuts to funding made in 2009-10 Budget) in the Capital Investment Program from $7.9 billion in 2010-11 to $6.4 billion in 2012-13. Thereafter, spending recovers as the impact of the cuts reduces prior to the payback of deferred funds later in the decade. Within these amounts, expenditure on Capital Facilities and Major Capital Investment follows the overall trend while Other Capital fluctuates somewhat.

Investment in Major Capital Investment would have been higher than presently planned but for a deferral of investment that occurred between the 2008-09 PAES and the 2009-10 Budget. Unfortunately, in a marked departure from previous practice, information on the scale and timing of that round of deferrals was withheld. The single datum we have is that $749.4 million was deferred from 2009-10 into undisclosed future years.

Because large shifts in foreign exchange supplementation make it impossible to compare planned investment spending from one edition of the PBS to subsequent PAES and PBS, we cannot say whether further cuts have been made more recently to the Capital Investment Program.

Figure 2.4.1: Recent and planned trends in the Capital Investment Program



Source: 2010-11 PBS and 2009-10 PAES and DAR. Shifts in the DMO Special Account are taken into account

Operating Component of Capital Investment

Not all of the money in the Capital Investment Program actually represents capital investment. There's also an Operating Component of Capital Investment that includes those funds treated as expenses in the process of acquiring the capital equipment or facilities. This includes project office costs, studies, research and development, travel, professional service providers and other overheads.

The operating component of capital investment is not evenly spread across the three components of the capital program, nor is it constant in time (see Table 2.4.3). The mix of funding will continue to change reflecting project throughput and the individual circumstances of each project. The operating component of the Major Capital Investment Program has probably fallen in recent years due to the number of very large projects including the two massive Foreign Military Sale purchases from the United States; the F/A-18 *Super Hornets* and the C-17 Globemaster strategic transports.

Table 2.4.3: Percentage of operating component in Capital Investment Program

	02-03	03-04	04-05	05-06	06-07	07-08	08-09	09-10	10-11	11-12	12-13	13-14
Major Capital Investment	9.8%	13.6%	17.9%	13.9%	13.6%	14.7%	18.0%	8.0%	6.1%	5.7%	5.6%	11.0%
Capital Facilities	0.0%	4.8%	14.8%	11.7%	11.5%	3.6%	10.6%	9.4%	6.3%	6.5%	5.8%	5.9%
Other Capital	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%

Source: 2010-11 PBS, 2009-10 PAES and various DAR

Unapproved Major Capital Investment Program [PBS page 75]

In the past, the PBS has contained a list of DCP projects planned for first and second pass approval in the forthcoming year. Instead, this year, there are two tables of projects 'in development' for first and second pass approval over the period 2009-10 to 2012-13 [Tables 33 and 34, p. 76–77]. This is particularly disappointing because

defence suppliers will be looking for guidance on which projects have been deferred to accommodate the more than $900 million of newly-announced spending on force protection in Afghanistan.

Approved Major Capital Investment Program [PBS page 155]

The approved Capital Investment Program is mainly, but not exclusively, the responsibility of DMO. As a result, most of the information on approved projects can be found in the DMO section of the PBS, including details of the top 30 projects. We examine the Capital Investment Program more closely in Chapter 2.7 of this Brief.

Facilities Projects [PBS pp.57–66]

The PBS lists 36 approved Capital Facilities projects. This includes 22 major projects (worth $15 million each or more) with a total value $5.1 billion, and 14 medium projects of between $25,000 and $15 million with a total value $85.6 million. In the 2010–11 Budget the government has foreshadowed 6 new major capital works projects for parliamentary consideration and 15 medium capital works projects. These are listed in Table 29 and Table 32 of the PBS respectively. Expenditure on facilities projects in 2010-11 is planned to be $1.5 billion compared with $1.3 billion in 2009-10.

Table 28 of the PBS lists the approved major facilities projects. The largest such projects are the Enhanced Land Force facilities at various locations ($793 million), Hardened and Networked Army Facilities at various locations ($597 million), RAAF Amberley Redevelopment ($332 million), the development of Special Forces working accommodation and base redevelopment at Holsworthy ($208 million), the redevelopment of RAAF Pearce ($142 million) and Multirole Helicopter facilities ($137 million) at various locations.

Table 30 on page 64 of the PBS lists 14 future possible private financing projects that are under development as part of the Single Leap initiative. Defence's program of approved and yet-to-be-approved facilities projects is called the Green Book. It used to be found on the Defence website but is no longer publicly available.

Other Capital Purchases

Other capital purchases include Minor Capital Investment, Repairable Items and Other Plant and Equipment. Defence plans to spend $631 million on other capital purchases in 2010-11.

Capital Sales and Receipts [PBS page 31]

The Capital Budget is funded in part through the proceeds from sales of property, plant and equipment and other capital receipts (see table 15 on page 29 of the PBS). On a year by year basis some or all of this money is returned to the government through a capital withdrawal. This is taken into account in determining the appropriations to Defence. Table 2.4.4 shows recently planned and achieved assets sales (including both property and other assets) within the Defence Capital Budget.

Table 2.4.4: Proceeds from the sale of assets ($ million)

	Budgeted	Achieved	Shortfall
DRP to June 2000	–	77	–
2000–01	820	87	733
2001–02	1023	199	824
2002–03	700	632	68
2003–04	306	184	122
2004-05	231	143	88
2005-06	95	108	-13
2006-07	38	134	-96
2007-08	99	65	-34
2008-09	285	5	280
2009-10	287	88	199
2010-11	156		
2011-12	141		
2012-13	109		
2013-14	181		

Source: DAR and 2010-11 PBS

2.5: People [PBS Section 1.2.3]

Overview [PBS p. 31]

The Overview of the PBS 'People' section outlines Defence's policy framework for personnel focusing on the December 2009 publication *People in Defence - Generating the Capability for the Future Force.* The 26-page document, which is available on the Defence website, aims to provide a 'blueprint to facilitate the delivery of our overarching People goal, namely to attract and retain the people we need to deliver on Defence White Paper 2009 targets, and it provides guidance for efficiency cost reductions to be achieved through the Workforce and Shared Services stream of the Strategic Reform Program'. It is left as an exercise for the reader to explore its colourful pages and decide whether either of these aims is delivered. Since the document does not include a single dollar-sign, it need not concern us further.

From a budget perspective there is a lot more to be said about personnel in Defence. Since 2000 there have been a range of initiatives to improve the management of personnel from a business and planning perspective, and to enhance the development, care, recruitment and retention of personnel. Many of these initiatives began in 2001-02, when $500 million was allocated over five years to deal with high priority personnel issues. Subsequently, in the 2006-07 Budget, there were two further personnel measures. First, $182 million was provided over four years for enhanced Reserve remuneration. Second, $194 million was allocated to improve recruitment and retention.

Then, in late 2006, the then-government allocated another $1 billion for recruitment and retention over ten years, and in the 2007 budget a further $2.1 billion was made available. Last year's budget contained three personnel-related measures: retention of accommodation for members on deployment ($30.9 million over four years); an extension of the ADF family health care trial ($44.5 million over four years) and the boost to Navy's personnel numbers of 700 ($405 million over four years).

Now it appears as though the tide has turned. The last twelve months have seen military recruitment and retention exceed expectations and produce dramatic growth in full-time ADF numbers. Presumably, this is why there were no new personnel-related measures in this year's budget and several planned personnel initiatives have been either abandoned or scaled back to generate savings under the Strategic Reform Program (see Chapter 4 of this Brief).

How big is the workforce?

The establishment of DMO as a prescribed agency complicates the reporting of personnel numbers, especially given the different accounting for civilian and military personnel and costs that has been adopted. We've collected together the figures for the entire workforce from the Defence section on page 31 of the PBS and the DMO section on page 149, see Table 2.5.1. (We examine the DMO workforce in Chapter 2.7 of this Brief.)

In 2010–11 Defence will be funded to maintain an average of around 57,276 full-time military personnel, 21,861 civilians (including 5,818 in DMO) and 22,018 Reservists. In addition, there will be 803 Professional Service Providers, including 56 in DMO.

Table 2.5.1: Workforce summary for Defence plus DMO (average funded strength)

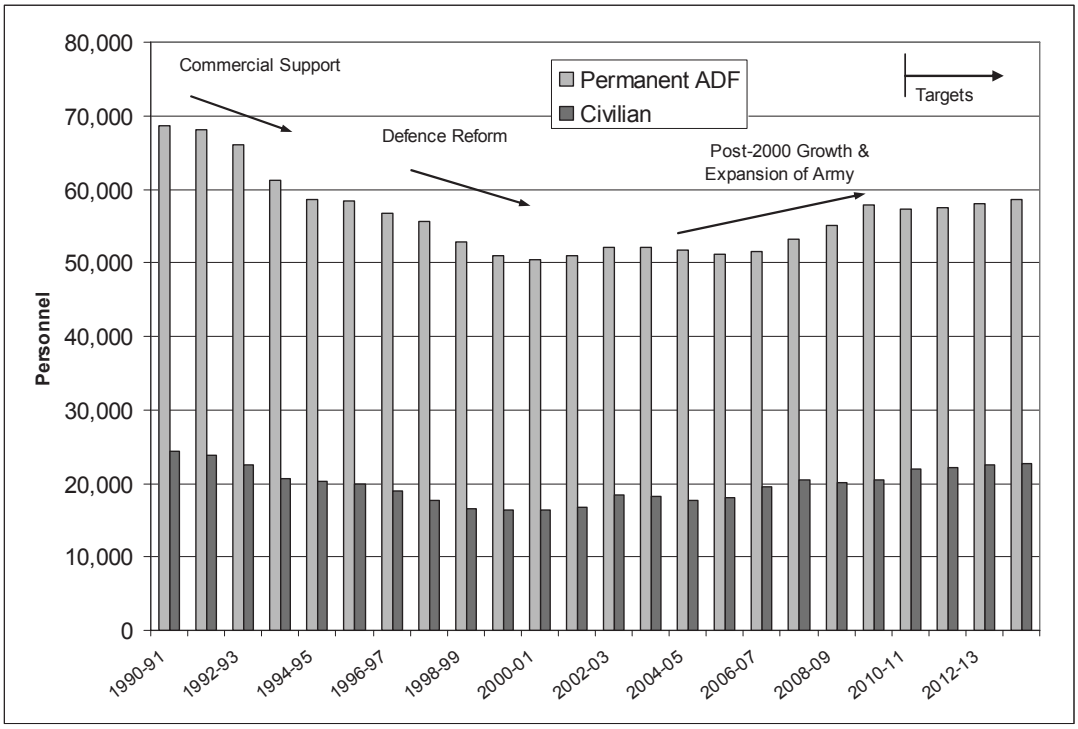
	01-02 actual	02–03 actual	03–04 actual	04–05 actual	05–06 actual	06–07 actual	07–08 actual	08–09 actual	09–10 project	10–11 budget	11-12 est.	12-13 est.	13-14 est.
Navy	12,598	12,847	13,133	13,089	12,767	12,690	12,935	13,182	13,842	14,238	14,216	14,257	14,309
Army	25,012	25,587	25,446	25,356	25,241	25,525	26,611	27,833	29,392	28,811	29,291	29,654	30,098
Air Force	13,322	13,646	13,455	13,368	13,143	13,289	13,621	14,066	14,543	14,227	14,041	14,105	14,162
TOTAL	**50,932**	**52,080**	**52,034**	**51,813**	**51,151**	**51,504**	**53,167**	**55,081**	**57,777**	**57,276**	**57,548**	**58,016**	**58,569**
Active Reserve	18,868	19,620	20,488	19,275	19,464	19,562	20,340	20,277	20,118	20,518	20,868	21,218	21,568
High Readiness	-	-	-	-	-	-	-	-	1,456	1,500	1,626	1,626	1,626
Total Reserve	**18,868**	**19,620**	**20,488**	**19,275**	**19,464**	**19,562**	**20,340**	**20,277**	**21,574**	**22,018**	**22,494**	**22,844**	**23,194**
Civilians													
Defence	16,819	18,385	18,303	13,390	13,577	14,516	15,087	14,489	14,622	16,043	16,290	16,477	16,462
DMO	-	-	-	4,363	4,502	4,951	5,304	5,552	5,833	5,818	5,893	6,031	6,178
Total Civilian	**16,819**	**18,385**	**18,303**	**17,753**	**18,079**	**19,467**	**20,391**	**20,041**	**20,455**	**21,861**	**22,183**	**22,508**	**22,640**
PSP													
Defence		2,311	1,880	1,913	1,277	810	620	1,008	698	747	678	648	634
DMO					374	298	181	176	108	56	52	49	49
Total PSP	-	2,311	1,88	1,913	1,651	1,099	801	1,184	806	803	730	697	683
Total PSP & Civilian		20,696	20,183	19,666	19,730	20,575	21,192	21,225	21,261	22,664	22,913	23,205	23,323

Source: DAR, 2009-10 PBS.

How did we get to this point?

During the 1990s ADF numbers dropped from around 70,000 to 50,000 permanent personnel, as shown in Figure 2.5.1. Over the same period civilian numbers dropped from around 24,400 to 16,300.

Figure 2.5.1 Historical and Planned Defence Workforce



Source: DAR, 2001-02 Defence Budget Brief and 2010-11 PBS

The bulk of these reductions were due to outsourcing under the Commercial Support and Defence Reform programs (although around 5,600 permanent ADF positions had already been transferred to the Reserve by the 1991 Force Structure Review). In fact, the initial goal of the Defence Reform Program (DRP) was to reduce the strength of the ADF to 43,500 but this was soon revised up to 50,000, thereby arresting the decline. This was done by re-directing DRP savings to buy-back the ADF positions, the goal being to redirect personnel from support areas to the combat force—though there is little evidence of this occurring.

The 2000 White Paper then set permanent ADF numbers on a growth path. Until 2003, the target was to build a force of 'around 54,000' permanent ADF personnel by 2010. However, the government accepted the recommendations of the 2003 Defence Capability Review, which will see some capabilities withdrawn from service in the next decade. As a result, the 2004-05 PBS [p.5] referred to 'continued growth of the ADF towards 53,000'. However, subsequent budgets added additional personnel for a range of initiatives including, most especially, the expansion of the Army.

Prior to the 2009 White Paper, the target strengths for the permanent ADF were 57,500 by 2011-12 and 'to more than 57,000 over the decade'. The 2009 Defence White Paper revised the full-time ADF target up to approximately 57,800 and the civilian workforce up to 21,900 over the decade. Subsequent reductions in planned savings under the Strategic Reform Program have seen the targets grow to around 59,000 and 23,000 for the military and civilian workforces respectively.

We return to look at the evolution of personnel targets later in this Chapter.

What are the recent trends?

Permanent ADF Numbers

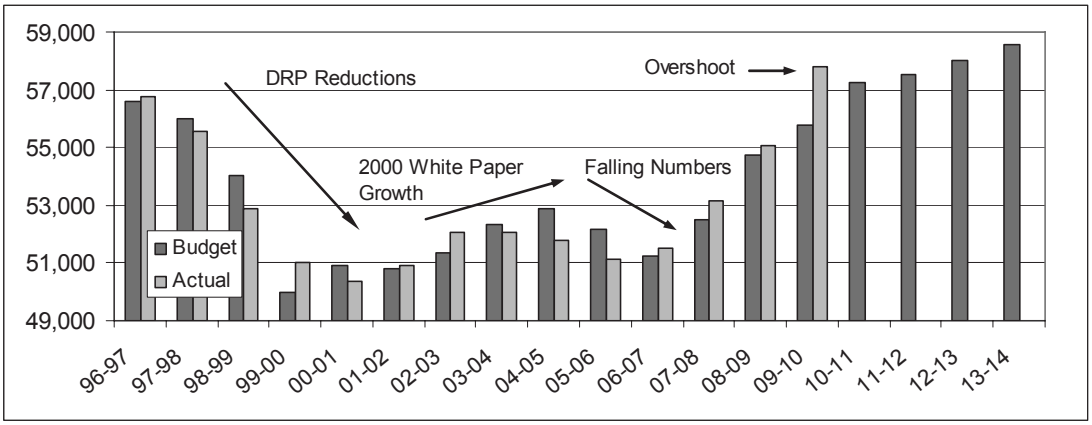
The changing size of the permanent ADF is captured in Figure 2.5.2. In the initial years following the 2000 White Paper, permanent ADF numbers grew steadily until 2003-04 when poor recruiting outcomes saw numbers fall for three years in a row—notwithstanding budgeting for growth in each case. Then, in 2006-07, numbers began to rise to the extent that budget estimates were exceeded three years in a row. All signs being that the revamp of recruiting and retention policy (and a lot of extra money) slowly but steadily turned around the personnel situation. Then, last year, numbers jumped by a massive 2,696 exceeding planned growth by 2,006 positions relative to the figure in the 2009-10 PBS (or 1,454 taking account of the fact that last year's PBS did not reflect the final allocation of positions due to the Strategic Reform Program and White Paper).

The additional numbers have not been shared equally between the three Services. Army has done best, exceeding its target for 2009-10 by 1,266 to register an increase of 1,559 personnel. Air Force grew by 446 personnel, which is 533 positions over what was planned, while Navy's strength grew, exceeding expectations, by 207 to deliver 660 additional personnel.

Next year, to redress the unplanned growth in numbers, the permanent ADF is planned to *decrease* by around 501 people through a cut to Army of 581, a cut to Air Force of 581 and a boost to Navy of 396 extra personnel. Given the long-standing challenge of maintaining Navy numbers, it is not surprising that the plan is to build on their growth in 2009-10. Looking to the end of the forward estimates period, Army

will grow by 792 and Navy by 467 positions above 2009-10 levels. Air Force, on the other hand, will fall by 381 positions compared with its (unplanned) strength in 2009-10.

Figure 2.5.2 Permanent ADF personnel: 1996-97 to 2013-14 (average funded strength)



Source: DAR, 2001-02 Defence Budget Brief and 2010-11 PBS

So why were military numbers allowed to overshoot so dramatically that it is now necessary to shed the excess? Carrying an additional 1,454 military personnel in 2009-10 will have cost around $184 million. Advice from Defence is that one of the factors was the need to advise recruiting agencies of targets ahead of the financial year. Perhaps there is a lesson to be learnt about contracting (or even about managing separation). In any case, where did the money come from to cover this unplanned expense? Was the investment program cut as a result, or is it that Defence was overfunded to begin with?

Recruitment and retention

The annual change in ADF strength is the difference between the numbers of people recruited into and separated from the force (typically around 5,000 in each case). Since the planned change in strength is usually no more than 1,000, the outcome is finely balanced. With this in mind, we turn now to examine ADF recruitment and separations.

Recruitment

Table 2.5.2 shows the percentages of recruitment targets that have been met over the last fifteen years. Following solid improvements earlier this decade, which saw the rate grow from 76% to 93% in 2001-02, performance dropped back to the mid-80% in 2002-03 and 2003-04 before deteriorating to 80% in 2004-05 and then recovering to 84% for the next two years. In 2007-08 and 2008-09 the result fell to around a 15-year low. Although final figures are not available for 2009-10, an interim outcome of 94% has been reported.

Table 2.5.2: Percentage of recruitment targets met

	95-96	**96-97**	**97-98**	**98-99**	**99-00**	**00-01**	**01-02**	**02-03**	**03-04**	**04-05**	**05-06**	**06-07**	**07-08**	**08-09**	**09-10**
Navy	98%	92%	98%	76%	57%	74%	85%	84%	86%	73%	72%	78%	73%	72%	95%
Army	99%	98%	94%	78.5%	83%	79%	100%	79%	84%	81%	98%	86%	76%	76%	93%
Air Force	86%	93%	101%	90.5%	83%	88%	87%	94%	90%	91%	88%	86%	85%	86%	94%
ADF	**96%**	**94%**	**97%**	**80%**	**76%**	**80%**	**93%**	**84%**	**86%**	**80%**	**84%**	**84%**	**77%**	**76%**	**94%**

Source: DAR and Defence submission to the FAD&T References Committee inquiry into ADF recruitment and retention, May 2001. 2009-10 figures are year-to-date 1 April 2010.

It is important to note that recruitment results vary from Service to Service, and that within each Service skilled personnel (like technicians and trades people) are particularly hard to recruit. In recent times, this has no doubt reflected the very buoyant labour market and the national skilled labour shortage that Australia has experienced. As the data shows, Navy has had the most trouble in recent times.

Retention

Table 2.5.3 shows the percentages of ADF personnel who separated from full-time military service over the last fourteen years. Some care must be taken with this data because figures for earlier years were impacted by the deliberate reduction in the size of the ADF between 1997 and 2001 under the Defence Reform Program. Still, separation rates from 2001-02 to 2004-05 were better than in 1995-96 before the cuts to personnel commenced. Note that the separation rate for 2009-10 is the lowest of all the years examined by a fair margin.

Table 2.5.3: ADF separation rates

	95-96	96-97	97-98	98-99	99-00	00-01	01-02	02-03	03-04	04-05	05-06	06-07	07-08	08-09	09-10
Navy	13.0%	11.5%	11.1%	12.6%	13.3%	13.2%	11.5%	11.6%	10.1%	12.2%	11.3%	12.2%	10.9%	10.5%	8.0%
Army	12.5%	10.4%	10.9%	12.9%	13.0%	13.2%	11.5%	9.8%	11.0%	12.7%	12.4%	11.6%	10.3%	9.9%	7.5%
Air Force	9.0%	9.0%	10.0%	11.9%	11.6%	15.6%	10.4%	8.1%	7.4%	8.4%	8.5%	9.0%	7.2%	6.3%	5.0%
ADF	**11.6%**	**10.3%**	**10.7%**	**12.6%**	**12.7%**	**13.8%**	**11.2%**	**9.8%**	**9.9%**	**11.5%**	**10.7%**	**11.1%**	**9.7%**	**9.2%**	**7.0%**

Source: DAR and Defence submission to the FAD&T References Committee inquiry into ADF recruitment and retention, May 2001. 2009-10 figures are year-to-date 1 April 2010.

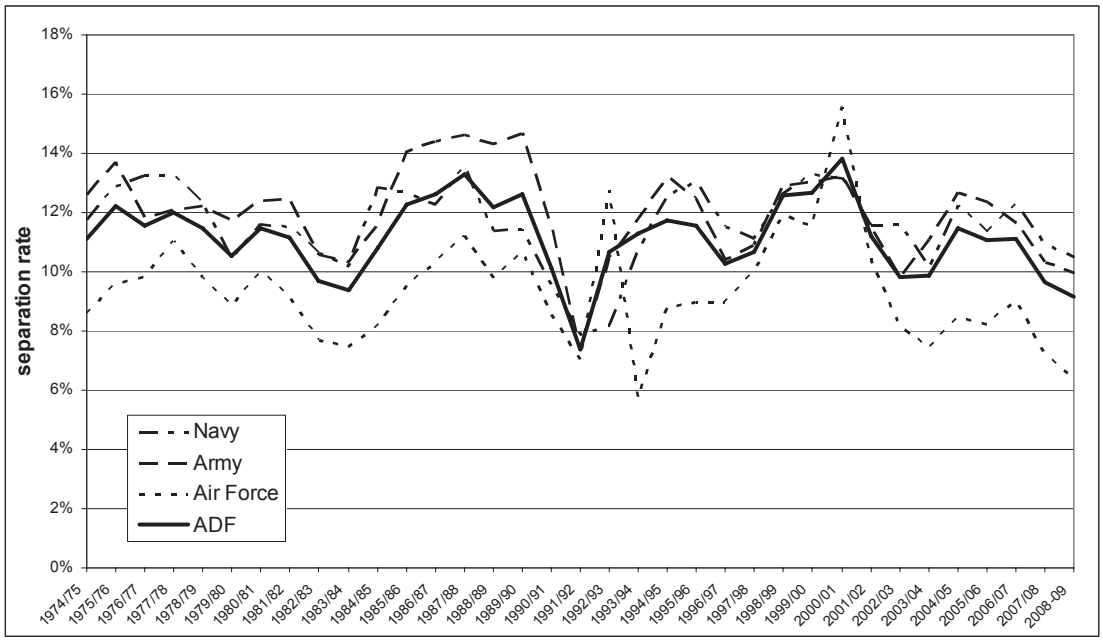
To put recent ADF separation rates in context, Figure 2.5.3 plots the separation rate over the past thirty years. The key point to notice is that recent separation rates are commensurate with rates achieved over the past three decades. Given that a number of factors have arisen in that time to make long-term ADF service more difficult—growing numbers of employed spouses, greater geographical dispersal of the ADF and the trend in society to shorter-term employment—the fact that the ADF is keeping people on average for the same length of time as in the 1970s is a real achievement. It follows that the ADF's problem with personnel numbers is principally a recruitment problem. That is not to deny that retention is an issue in particular categories and ranks. The strong demand for skilled workers in the broader economy has been driving up wages in areas like the trades and engineering that Defence requires for its high-tech capability edge.

While it's highly likely that that the Global Financial Crisis contributed to low separation rates in 2008-09 and 2009-10, other factors are probably at play. Not only did the ADF separation rate fall strongly in 2007-08 (prior to any increase in unemployment) but the correlation between unemployment and separations has been less than clear in recent years—as shown in Figure 2.5.4—despite a longer-term trend for separations to increase as employment rises.

However, it may be that low separation rates are driven as much by the anticipation of adverse economic circumstances as they are by the actual situation prevailing. Given the dire predictions in late 2008 and through much of 2009 of rapidly rising unemployment, military members may have decided to hang on to their jobs. Now that the mining boom has returned in earnest and unemployment is tipped to fall over the medium term, the opposite may occur. It remains to be seen whether the recent

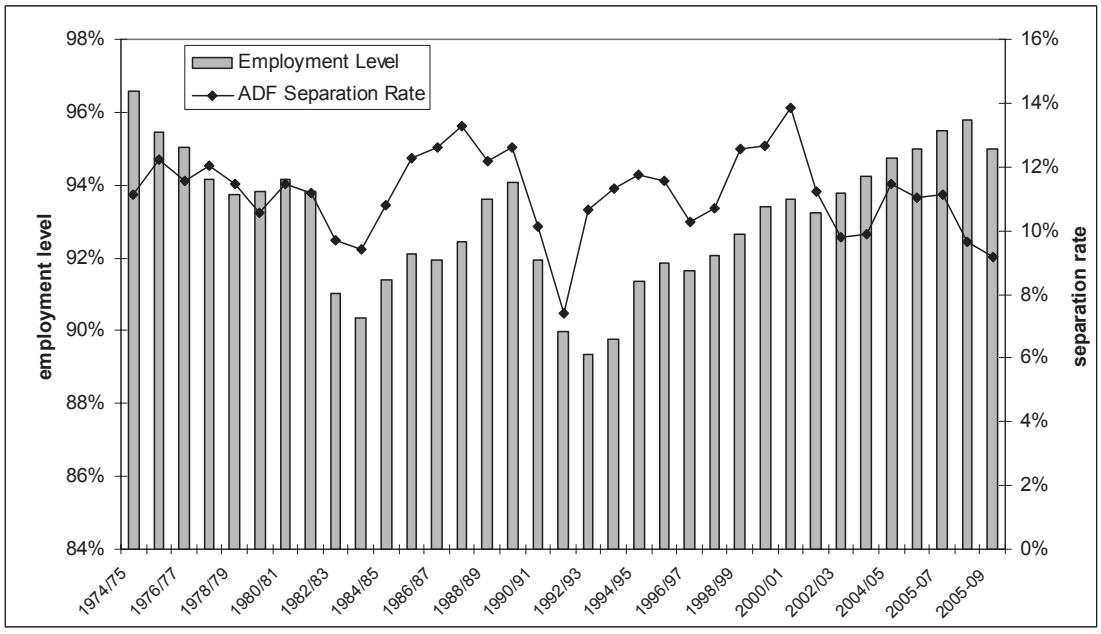
cuts Defence made to recruitment and retention initiatives (euphemistically termed as 'refinements') were prudent or not.

Figure 2.5.3: Permanent ADF separation rate: 1974-75 to 2008-09



Source: DAR 1974-75 to 2008-09

Figure 2.5.4: Employment and ADF separation rates: 1974-75 to 2008-09



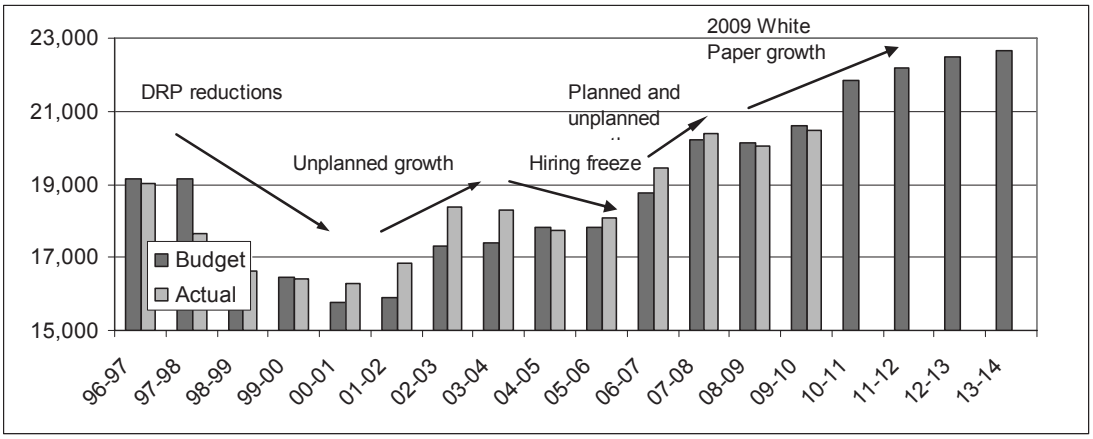
Source: DAR 1974-75 to 2008-09

Civilian Numbers

The situation with civilian numbers is captured in Figure 2.5.5 which plots budgeted and actual civilian numbers from 1996-07 onwards. Although civilian numbers fell quickly under the Defence Reform Program, they grew back very rapidly in the first two years of 2000 White Paper implementation—three times more quickly than military numbers grew. What is more, the growth was largely unplanned, with the size of the civilian workforce in 2001-02 exceeding budget estimates by 5.8% and

similarly in 2002-03 (6.1% in excess). However, in January 2003 a civilian hiring freeze was imposed within Defence after it became clear that the projected number of civilian personnel would exceed the revised estimate given less than two months earlier. In April 2003, the freeze was lifted but direction was given to maintain civilian numbers at current levels. In the 2003-04 Budget, a programmed reduction plan was set in place to reduce civilian numbers by 1,008, from 18,385 to 17,377.

Figure 2.5.5: Civilian personnel: 1996-97 to 2013-14



Source: Defence Annual Reports, 2001-02 Defence Budget Brief and 2010-11 PBS

However, the actual result for 2003-04 (18,303) was only 82 positions below the previous year's figure due, mainly, to a series of government initiatives but also because of an extra unplanned 349 new civilian positions.

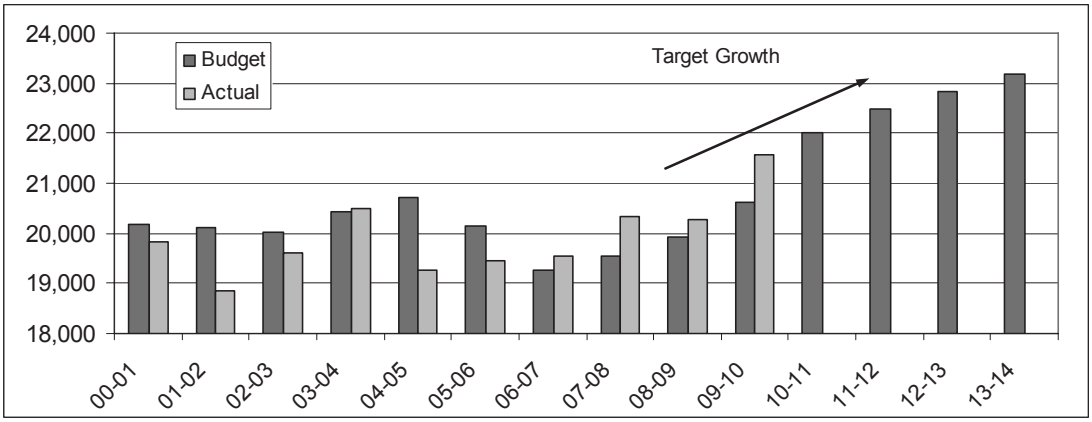
For a while, in 2004-05 and 2005-06, personnel numbers were largely under control resulting in a close alignment of budgeted and actual figures. In 2006-07, civilian personnel numbers were set to rise by 950. Most, but not all, of these positions were related directly to either new government initiatives or the creation of a more efficient workforce. However, the actual result for 2006-07 was an increase of 1,388 personnel, more than 450 above the estimate. Then, in 2007-08, civilian numbers grew by another 1,468, fully 155 above the initial budget estimate. Clearly, whatever constraints were imposed in 2004-05 and 2005-06 were no longer effective.

The plan for 2008-09 was for civilian numbers to fall to around 20,000 and then remain largely static across the forward estimates. However, following the 2009 White Paper civilian personnel numbers were set a target of around 21,900 which was subsequently revised upwards to around 23,000 after many reductions due to efficiency savings were abandoned. In 2009-10 the number of civilians grew by 414 positions which were 663 below the (updated) budget estimate. In 2010-11, civilian numbers are planned to grow by around 1,400 predominately to meet the demands of the 2000 White Paper but also to allow for military civilianisation (188 positions) and contractor conversion (57 positions).

Reserve numbers

Consistent with the unplanned growth in permanent military numbers, Reserve force strength jumped above estimates in 2009-10 accelerating long-term planned growth.

Figure 2.5.6 Active Reserve personnel: 2000-01 to 2013-14



Source: Defence Annual Reports and 2010-11 PBS

What are the long-term targets for the Defence workforce?

In past years, we have included a detailed analysis of how personnel targets have evolved since the 2000 Defence White Paper. Because the 2009 Defence White Paper effectively 'reset the clock', we will instead focus on the evolution of planned personnel numbers from 2009 onwards and only provide a truncated picture of earlier changes. Table 2.5.4 shows what we know about the long-term target strength for the ADF.

Two points are noteworthy: (1) We do not know why the baseline figure for the ADF in 2018-19 fell by 372 positions between May 2009 and April 2010, and (2) The anticipated savings under the SRP have decreased by 1,437 positions—though this figure may rise again as the government approves further SRP initiatives (see Chapter 5). The picture for civilians is similar as shown in Table 2.5.5, where baseline has fallen by 52 positions and the savings from the SRP have been reduced by 824 positions. Once again, however, further cuts may be made at a later date.

Table 2.5.4: Long-term target (circa 2018) for the permanent ADF

	Navy	Army	Air Force	Total
Post-Defence Reform Program Baseline	**13,800**	**23,000**	**13,000**	**50,000**
East Timor Boost 1999		+3,000	+555	+3,555
2000 White Paper Target	**13,800**	**26,000**	**13,555**	**53,555**
Changes made 2000 to 2009	-311	+4,538	+500	+4,721
Estimated pre-2009 White Paper Target	**13,689**	**30,538**	**14,055**	**58,282**
Baseline (May 2009)				**58,648**
Extra White Paper Positions				1,979
SRP impact				-2,813
2018-19 target strength (May 2009)				**57,812**
Baseline (April 2010)				**58,276**
Extra White Paper Positions				1,979
SRP impact				-1,376
2018-19 target strength (April 2009)				**58,879**

Source: Budget Papers and the May 2009 and April 2010 SRP Booklets

Table 2.5.5: Long-term target (circa 2018) for the Defence civilians & contractors

	Civilian	Contractors	Total
Estimated pre-2009 White Paper Target	**20,000**	**-**	**-**
Baseline (May 2009)			**21,672**
Extra White Paper Positions			2,290
SRP impact			-2,015
2018-19 target strength (May 2009)			**21,937**
Baseline (April 2010)			**21,620**
Extra White Paper Positions			2,290
SRP impact			-1,191
2018-19 target strength (April 2009)			**22,719**

Source: Budget Papers and the May 2009 and April 2010 SRP Booklets

How much do personnel cost?

Personnel expenses for Defence including DMO in 2010-11 will be around $10.1 billion rising to $11 billion in 2013-14. Note: these figures include the cost of military personnel and Defence civilians from PBS Table 18 on page 33 and DMO civilians from Table 3.2.2 on page 196. Apart from a gap pending the release of the 2009-10 annual report (where we have interpolated) it is possible to calculate the recent and estimated per-capita cost of civilian and military personnel over time. The results of this calculation appear in Tables 2.5.6 to 2.5.8. The per-capita expenses include salaries, allowances, superannuation, health, redundancies, housing and fringe benefits tax. We've done our best to account for the cost of Reserve personnel in the estimate for the permanent ADF. In addition, the transfer of military compensation to Veterans Affairs in 2004-05 has been adjusted for.

Table 2.5.6: Per-capita permanent ADF personnel expenses

	Military Numbers	Expense $ 000's	Per Capita	Nominal Growth
00-01	50,355	4,047,121	$80,372	
01-02	50,932	4,273,863	$83,913	4.4%
02-03	52,080	4,458,208	$85,603	2.0%
03-04	52,034	4,890,100	$93,979	9.8%
04-05	51,813	4,757,900	$91,828	-2.3%
05-06	51,151	5,093,100	$99,570	8.4%
06-07	51,504	5,515,651	$107,092	7.6%
07-08	53,109	6,062,882	$114,159	6.6%
08-09	54,748	6,764,100	$123,550	8.2%
09-10*	57,777	7,322,109	$126,731	2.6%
10-11	57,276	7,700,862	$134,452	6.1%
11-12	57,548	7,531,382	$130,871	-2.7%
12-13	58,016	7,854,320	$135,382	4.6%
13-14	58,569	8,301,237	$141,734	4.6%
			Average	**4.6%**

Source: Defence Annual Reports and 2010-11 PBS, expenses adjusted to take account of Reserve component.
*Estimated from 2009-10 PAES and 2010-11 PBS

Table 2.5.7: Per-capita DMO civilian personnel expenses

	DMO Civilians	DMO Expenses	DMO Per Capita	Nominal Growth
05-06	4502	$353,892	$78,608	
06-07	4951	$409,262	$82,662	5.2%
07-08	5304	$458,992	$86,537	4.7%
08-09	5657	$457,613	$80,893	-6.5%
09-10*	5833	$510,808	$87,572	8.3%
10-11	5818	$569,496	$97,885	11.8%
11-12	5893	$595,579	$101,066	3.2%
12-13	6031	$634,438	$105,196	4.1%
13-14	6178	$674,236	$109,135	4.4%
			Average	**4.3%**

Source: Defence Annual Reports and 2010-11 PBS.
Note: excludes DMO past 2005-06. *Estimated from 2009-10 PAES and 2010-11 PBS

Table 2.5.8: Per-capita Defence civilian personnel expenses

	Civilian Numbers	Expense $ 000's	Per Capita	Nominal Growth
00-01	16,292	$956,661	$58,720	
01-02	16,819	$1,086,116	$64,577	10.0%
02-03	18,385	$1,235,752	$67,215	4.1%
03-04	18,303	$1,363,205	$74,480	10.8%
04-05	17,753	$1,293,100	$72,838	-2.2%
05-06	13,577	$1,084,382	$79,869	9.7%
06-07	14,516	$1,212,393	$83,521	4.6%
07-08	15,087	$1,271,223	$84,259	0.9%
08-09	14,815	$1,308,445	$88,319	4.8%
09-10*	14,622	$1,401,332	$95,837	8.5%
10-11	16,043	$1,535,700	$95,724	-0.1%
11-12	16,290	$1,593,100	$97,796	2.2%
12-13	16,477	$1,666,100	$101,117	4.8%
13-14	16,462	$1,723,200	$104,677	4.4%
			Average	**4.8%**

Source: Defence Annual Reports and 2010-11 PBS.
Note: excludes DMO past 2005-06. *Estimated from 2009-10 PAES and 2010-11 PBS

The average rates of growth for per-capita employee expenses in Table 2.5.6 to 2.5.8 do not account for inflation. Once inflation is taken into account, the calculated compounding annual rates of growth for the three groups are as follows: permanent military personnel 1.4%, Defence civilians 1.5% and DMO civilians 1.0%. However, these relatively low figures only arise because the PBS shows per-capita personnel expenses growth will be contained over the next few years—see Table 2.5.9.

Table 2.5.9: Past and projected annual growth in per-capita personnel costs

	Military	Civilian
2000-01 to 2008-09	2.5%	2.3%
2008-09 to 2013-14	-0.4%	0.3%

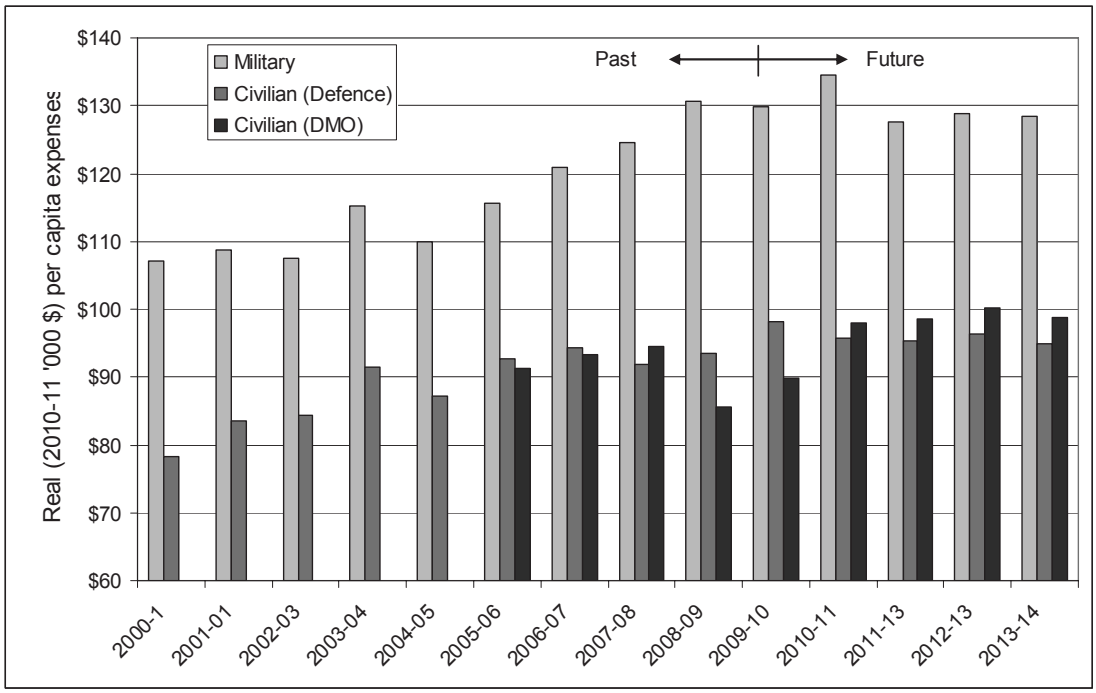
It may be that the fall in per-capita costs comes about, in part at least, because the latter years of the forward estimates do not include the allowances presently being

paid to deployed personnel. Or there may simply be an error. Certainly there are peculiarities in the data. For example, although the PBS (Table 16) projects that the ADF will grow from 2010-11 to 2011-12 by 272 permanent positions and 476 reservists, ADF salaries are planned to fall by $209 million, or 5.5% taking account of inflation.

Finally, a caution is in order when looking at the data in the last three tables; the ongoing impact of accrual (non-cash) shifts can make very significant differences. This has probably contributed to some of the big year-on-year variations in growth in both civilian and military per-capita expenses. An additional complication this year arises because of the 'White Paper Unassigned' category. We are unable to say where these additional personnel might be assigned and therefore cannot estimate their impact on per-capita growth rates. Accordingly, the trends are at best indicative and should be treated with care—but they are the best that we can extract from the budget papers.

Defence's optimism about containing salaries is apparent in Figure 2.5.7 which graphs past and projected real per-capita costs.

Figure 2.5.7: Past and projected per-capita personnel costs



Source: Defence Annual Reports and 2010-11 PBS.
Note: excludes DMO past 2005-06. *Estimated from 2009-10 PAES and 2010-11 PBS

Personnel structures

To facilitate understanding of the structure of the Defence workforce, it is useful to understand the nominal equivalence between different levels in the APS and ADF and between the three services. A comparison of relative ranks/levels has been provided in Table 2.5.10 below.

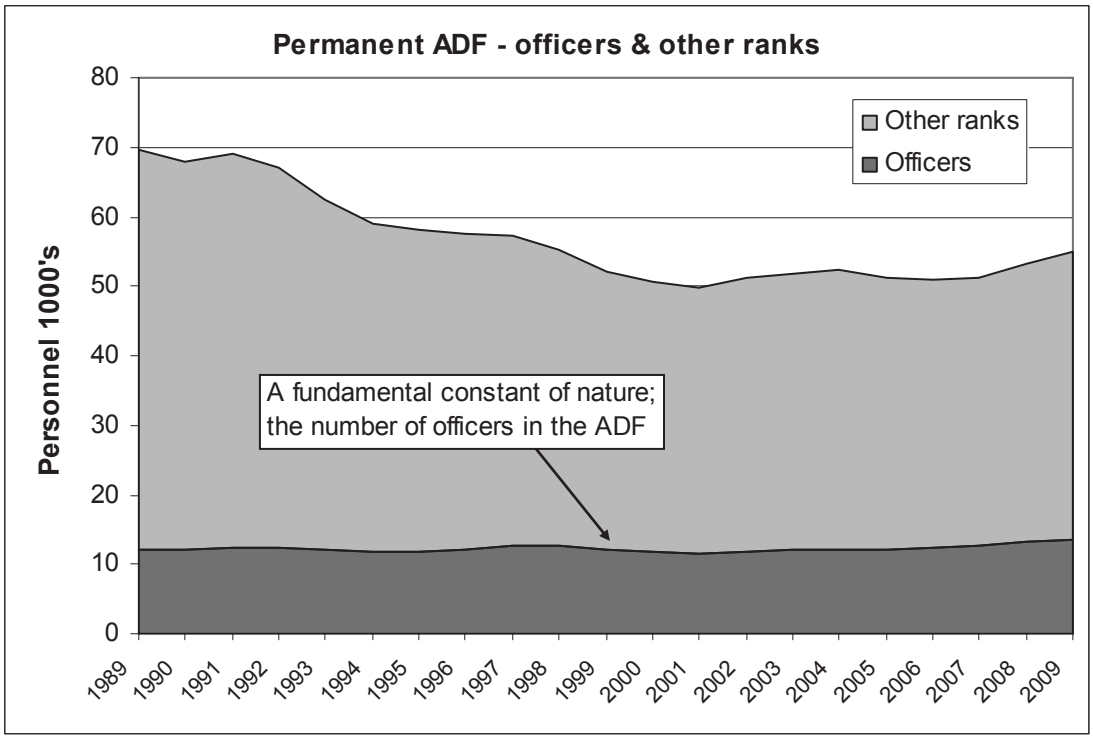
The breakdown of ADF personnel by rank, and civilians by level, appears in Table 17 on page 32 of the PBS and in Table 65 on page 150 for DMO. As the ADF contracted during the 1990s, the number of officers remained more or less constant. Then, as the

size as the ADF grew over the past few years, the number of officers grew more quickly (see Figure 2.5.8). As a result, the percentage of officers in the ADF has grown from 17.2% in 1989 to 24.4% in 2009. This means that there are now around three enlisted men for every one officer. In comparison, recent figures for the UK and US are around 19% and 16% respectively although it should be noted that they both have larger economies of scale.

Table 2.5.10: Rank/level comparison:

Civilian	Navy	Army	Air Force	
APS-4	Sub-Lieutenant	Lieutenant	Flying Officer	Officers
APS-5	Lieutenant	Captain	Flight Lieutenant	
APS-6	Lt-Commander	Major	Squadron Leader	
EL-1	Commander	Lt-Colonel	Wing Commander	Senior Officers
EL-2	Captain	Colonel	Group Captain	
SES-1	Commodore	Brigadier	Air Commodore	Star-ranked and Senior Executive Service
SES-2	Rear Admiral	Major General	Air Vice-Marshal	
SES-3	Vice Admiral	Lt General	Air Marshal	

Figure 2.5.8: Permanent ADF Numbers 1989 – 2009 as at 30 June



Source: Defence Annual Reports 1989-90 to 2008-09

Generals and Mandarins

The trends in star rank, senior executive, and senior officer numbers are shown in Table 2.5.11, the most recent data is taken from the 2010-11 PBS. Changes in reporting account for the gaps and lack of earlier data.

As shown, in the past twelve years the number of civilian senior executives has increased by 66% and military star-rank officers by 59%. At the same time, the civilian workforce grew by only 31% and the military workforce by only 9%. Over a similar time frame, the numbers of civilian and military senior officers have grown by 85% and 35% respectively. However, the fastest rate of increase has occurred at the level of Deputy Secretary and 3-star military officer (Table 2.5.12) where much of the growth is very recent, including as a result of the 2007 Defence Management Review.

Table 2.5.11: Numbers of Senior Ranks and Executive Levels; average funded strength

	1998-99	1999-00	2000-01	2001-02	2002-03	2003-04	2004-05	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11	%
Civilian														
Executives (Defence)	100	106	103	117	130	123	96	102	108	121	126	125	128	
Executives (DMO)							30	29	29	32	35	36	38	
Total	**100**	**106**	**103**	**117**	**130**	**123**	**126**	**131**	**137**	**153**	**161**	**163**	**166**	**66%**
Senior Officers[1] (Defence)	0	0	3317	3844	3824	3889	3081	3385	3656	3911	3970	4187	4520	**36%**
Senior Officers[1] (DMO)	0	0	0	0	0	0	995	1064	1225	1388	1502	1582	1644	**55%**
Total	**0**	**0**	**3317**	**3844**	**3824**	**3889**	**4076**	**4449**	**4881**	**5299**	**5472**	**5631**	**6162**	**85%**
Military														
Star Officers	110	0	120	119	120	119	125	135	149	176	169	174	174	**59%**
Senior Officers[2]	1360	0	1415	1467	1507	1528	1551	1594	1684	1768	1852	1924	1841	**35%**

Source: Defence Annual Reports and 2010-11 PBS

Table 2.5.12: Band 3 and 3-Star officers (equiv. Chief of Service - Deputy Secretary)

	1998-99	1999-00	2000-01	2001-02	2002-03	2003-04	2004-05	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11	%
Band-3 (Defence)	3	4	7	5	5	5	5	5	5	7	8	8	9	133%
Band 3 (DMO)*	1	1	1	1	1	1	1	1	1	4	4	4	5	400%
Band-3[#] (DSTO)	2	3	2	3	3	3	3	3	3	3	3	3	3	50%
subtotal	**6**	**8**	**10**	**9**	**9**	**9**	**9**	**9**	**9**	**14**	**15**	**15**	**17**	**183%**
3-Star Officers	4	4	4	4	4	5	5	5	5	6	6	6	6	50%
Total	**10**	**12**	**14**	**13**	**13**	**14**	**14**	**14**	**14**	**20**	**21**	**21**	**23**	**130%**

*Source: Defence Annual Reports and 2010-11 PBS. [#]Chief of Division Grade 3 in Defence Science and Technology Organisation. *Includes CEO which was previous deputy secretary level*

Whatever problems Defence might have, they are not a result of being under-managed at the senior level. At every senior level in the civilian and military workforce the number of managers and executives has increased at a rate well in excess of the growth in the size of the overall workforce.

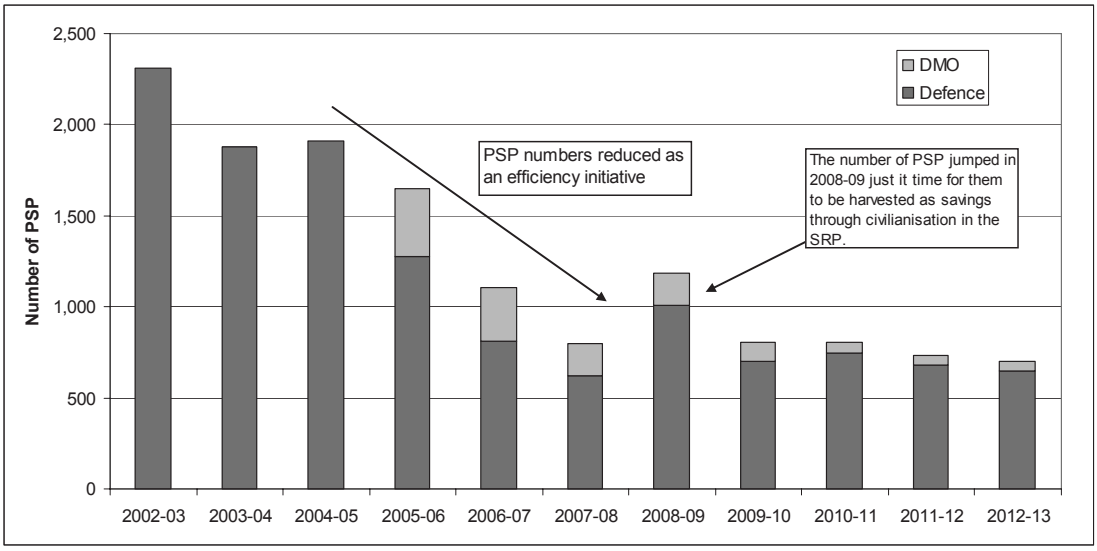
Professional Service Providers

The Defence workforce includes a limited number of Professional Service Providers (PSP) in line positions within the organisation. For most of the past decade, there was a concerted effort underway to reduce the number of PSP employed by Defence and DMO. In fact, Defence has claimed successive reductions in the number of PSP represents as an internal efficiency and are doing so again within the SRP.

Defence Remuneration

The PBS does not deal with Defence remuneration. But because the largest single slice of the Defence budget goes towards civilian and military salaries we have included a short summary of the key data. Further detail can be found on the Defence Personnel Executive website: *http://www.defence.gov.au/dpe/*

Figure 2.5.9: Professional Service Providers

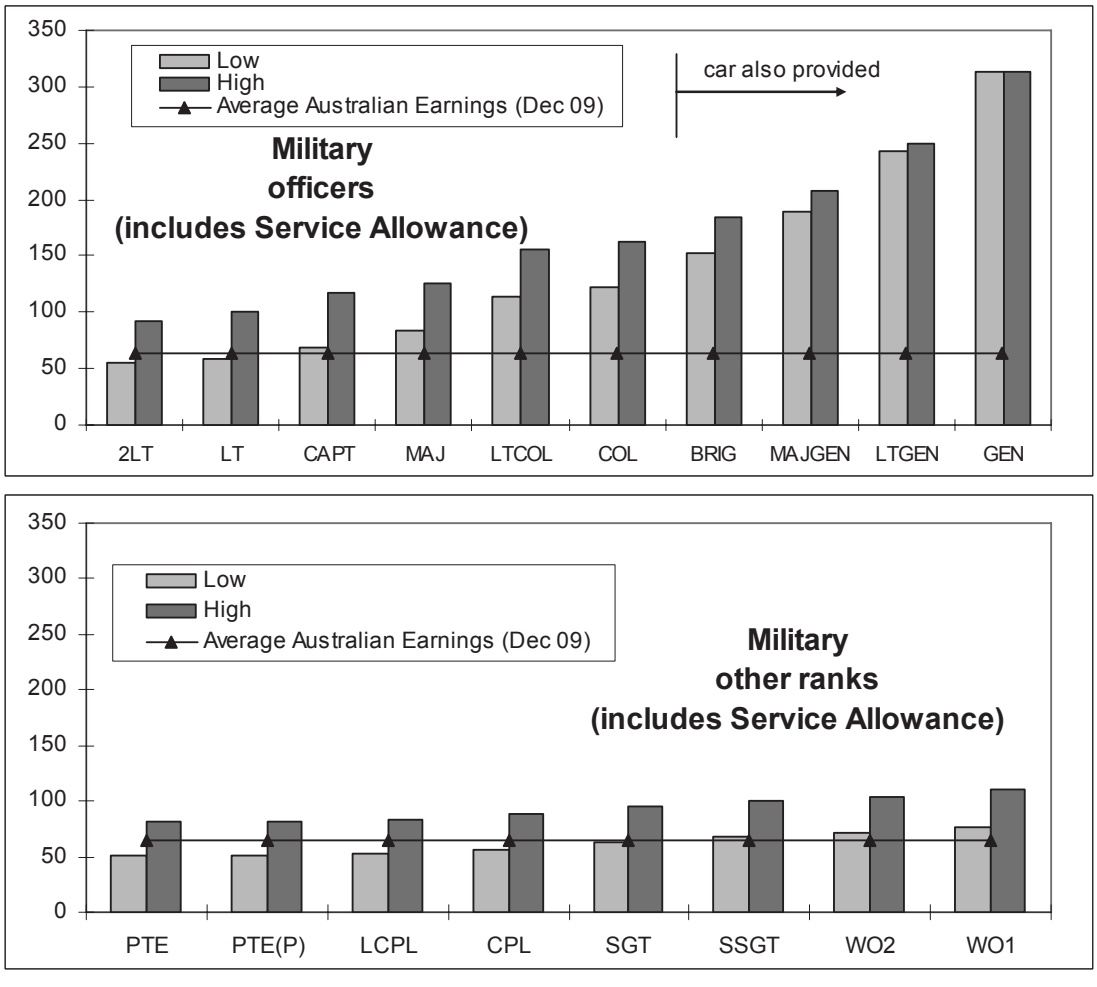


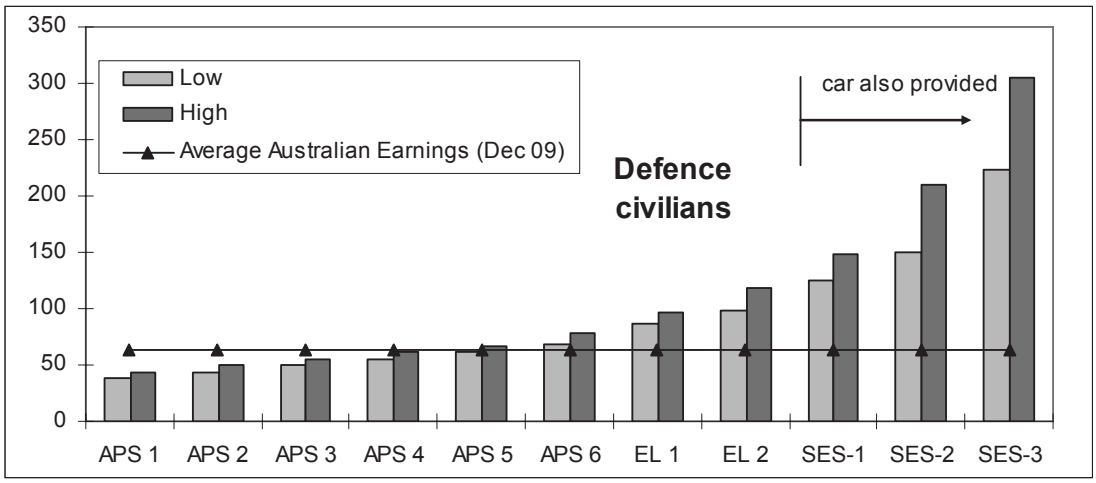
Source: Defence Annual Reports and 2010-11 PBS.

Defence Salaries

Figure 2.5.10 shows Defence military and civilian salaries circa late-2008/early-2009 benchmarked against the latest available Average Weekly Ordinary-Time Earnings for Full-Time Earning Adults (AWOFTEA) from December 2008. (Salaries for SES civilians and two/three-star military officers are for mid-2008.)

Figure 2.5.10 Defence salaries, November 2009



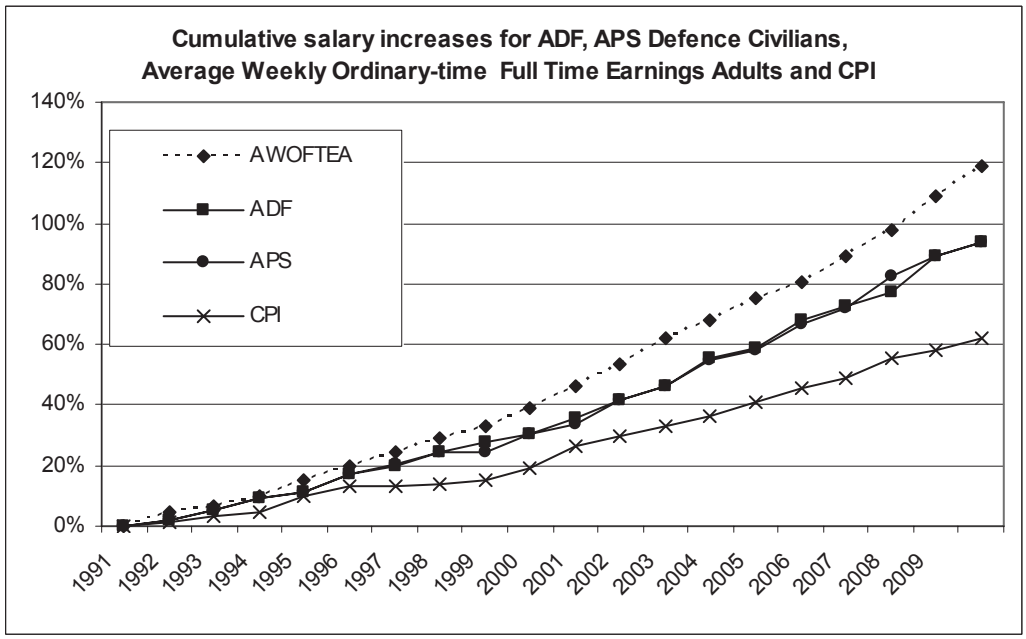


Source: ABS weekly earnings data; Defence pay rates from http://www.defence.gov.au/dpe/pac/
Note: SES, LTGEN and GEN pay rate are from June 2009 (2008-09 DAR)

Note that the military figures in Figure 2.5.10 include both salary and the service allowance of $11,355 per annum received by all service personnel below the rank of Colonel. No account has been taken of the ancillary benefits received by military personnel like housing, medical, rations and specific allowances for skill, hardships and deployments. For comparison, all three graphs use the same scale.

The comparison of defence salaries with AWOFTE in Figure 2.5.10 represents only a snapshot in time. The relative dynamics of average earnings, defence salaries and the cost of living is quite another issue. Indeed, as Figure 2.5.11 shows, over the past decade and a half, defence salaries have consistently grown more slowly than average earnings but more quickly than the Consumer Price Index (CPI).

Figure 2.5.11: Defence civilian and military salaries – rate of increase



Source: ABS weekly earnings data and Defence pay rates.

Four points can be made about the relative growth in average earnings, defence salaries and consumer prices. First, because the salary increases for the (largely

distinct) ADF and APS workforces are now explicitly linked, any suggestion that they are driven by productivity is tenuous to say the least.

Second, the fact that average earnings have outpaced defence salaries does not *necessarily* mean that defence remuneration has failed to keep pace with community standards. It may be that the stronger growth in average earnings reflects structural changes in the Australian workforce.

Third, the actual remuneration of civilian personnel has increased much more quickly than for the military workforce, in part, through the 'level enrichment' shown in Table 2.5.13 (Civilian senior officers make up 28% of the civilian workforce while military senior officers only account for less than 3%, so that the former is much more sensitive to growth than the latter.) The effect is significant. Comparing per capita wages, salaries and leave expenses over the decade 1998-99 to 2008-09 reveals that average per-capita ADF costs grew by 43% while civilian costs grew by 61%. Over the same period, average weekly earnings in the broader economy grew by 57%.

Finally, it is important to note that Defence executive remuneration is not limited by the salary increases granted to the rank and file. Over the past three years, the Defence annual report disclosed salary ranges for various levels of employee. As Table 2.5.13 shows, it has been a particularly good time for senior executives and star-ranked officers (with the exception of 3-star military officers who only received almost the same as that granted to the lower echelons). The range of increases corresponds to changes to the upper and lower levels of the salary range in each case.

Table 2.5.13: Senior executive salary increases 2005-06 to 2008-09

Civilian level	Increase	Military level	Increase
Deputy Secretary SES-3	40-49%	Lieutenant General (E) 3-star	13.5%
First Assistant Secretary SES-2	17-24%	Major General (E) 2-star	31-38%
Assistant Secretary SES-1	15-18%	Brigadier 1-star	13-21%
Non-executive APS	13.2%	Non-star ranked ADF	13.2%

Source: 1998-99 and 2008-09 DAR

Longer-term trends in executive salaries are difficult to extract due to the paucity of historical data. Nonetheless, it is possible to track the growth in average senior executive remuneration over the past decade. As Table 2.5.14 shows, increases to average executive (military plus civilian) remuneration have comfortably outpaced that for average civilian and military salaries and wages.

Table 2.5.14: Per capita increases 1998-99 to 2008-09

	1998-99 ($)	2008-09	Percentage increase
Average senior executive remuneration	144,513	250,030	73%
Average ADF salary/wages plus leave	51,468	73,726	43%
Average APS salary/wages plus leave	46,464	74,800	61%

Source: 1998-99 and 2008-09 DAR

Demographics of the ADF

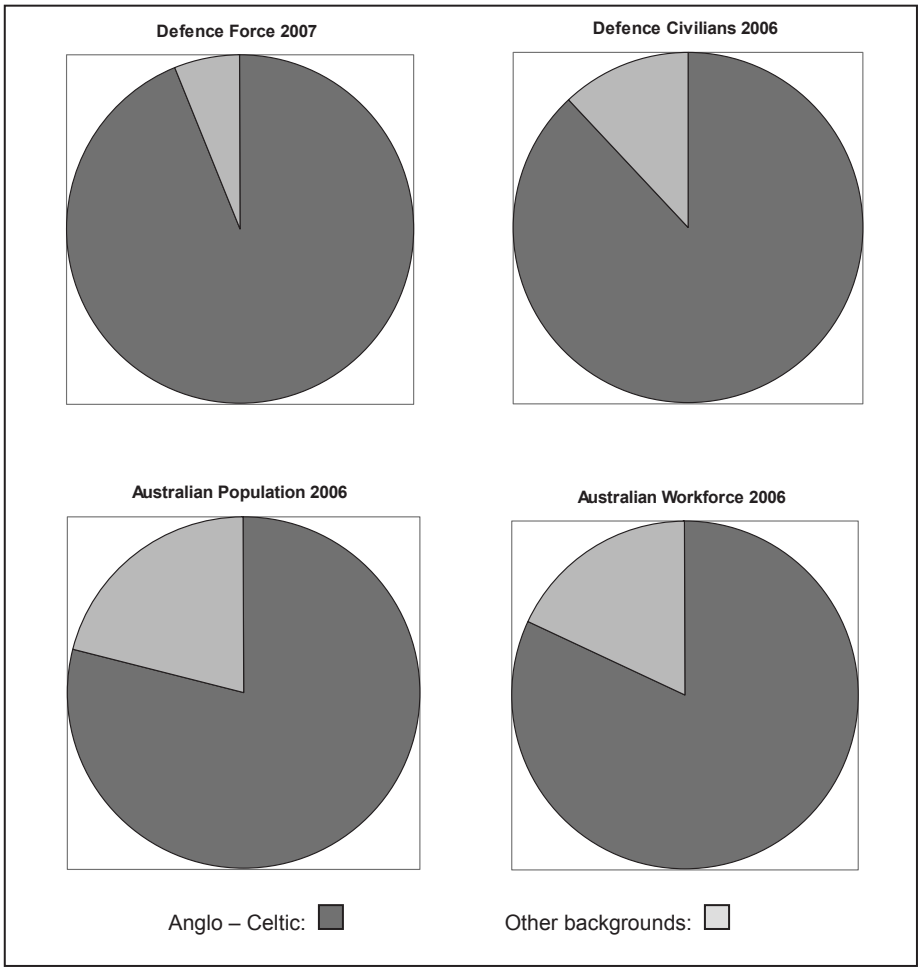
The defence force is disproportionately drawn from the Anglo-Celtic part of the Australian population. The extent of over-representation is difficult to fully assess because the only available data concerns country of birth and not family background. Even so, as Table 2.5.14 shows, there are significant differences between the defence force and the community (similar results were found in the 1999 ADF Census). The essential results are reproduced graphically in Figure 2.5.12. The figures are similar for the part-time Reserve force. Curiously, the over-representation of Anglo-Celtic born individuals extends to the civilian workforce of the Department of Defence.

Table 2.5.14: Ethnic composition of the Australian Defence Force

Place of Birth	Defence Force 2007	Australian Population 2006	Australian Workforce 2006	Defence Civilians 2007
Australia	87%	71%	73%	79%
UK and Ireland	5%	5%	6%	8%
New Zealand	2%	2%	3%	1%
Europe	1%	3%	3%	3%
Asia	1%	6%	7%	4%
Other	4%	12%	8%	5%

Sources: Defence military and civilian figures from the 2007 Defence Census; all other figures from Census 2006 conducted by the Australian Bureau of Statistics.

Figure 2.5.12: Ethnic composition of the ADF by birth



Sources: Defence military and civilian figures from the 2007 Defence Census; all other figures from Census 2006 conducted by the Australian Bureau of Statistics.

There are probably several reasons for the low rate of enlistment of those from other than Anglo-Celtic backgrounds. The customs and accoutrements of our defence force are as unashamedly British as they are alien to those of continental Europe, the Middle East or Asia. Equally, in geopolitical terms, we are part of the inner circle of US allies—the so-called Anglo-sphere—who all happen to speak English. As Australia steadily evolved into a more diverse and multi-ethnic society following the end of World War II, the cultural flavour of our military affairs remained largely static.

Whatever the reason, it is disappointing that our defence force is unable to attract recruits equally from across the Australian community. By relying on a limited part of the population, the defence force misses the opportunity to recruit some of the best and brightest in the community. Moreover, the language skills and cultural empathy of a largely Anglo-Celtic defence force are likely to be less than those of a more cosmopolitan force. Finally, there is something unsettling about a defence force that is unrepresentative of the society it exists to protect—especially for a country like Australia that defines its identity so closely with its military history and ethos.

Another area where the demographics of the Australian defence force and the society differ is gender. Table 2.5.15 shows the proportion of women and the share of jobs open to women, across the permanent uniformed and civilian workforces. Similar results hold for the part-time Reserve force.

Table 2.5.15: Women in the defence force

	Navy	Army	Air Force	Total military	Defence civilians
% of positions open to women	98.3%	51.0%	96.6%	72.6%	100%
% of women in uniform	18.3%	9.7%	16.8%	13.5%	42.8%

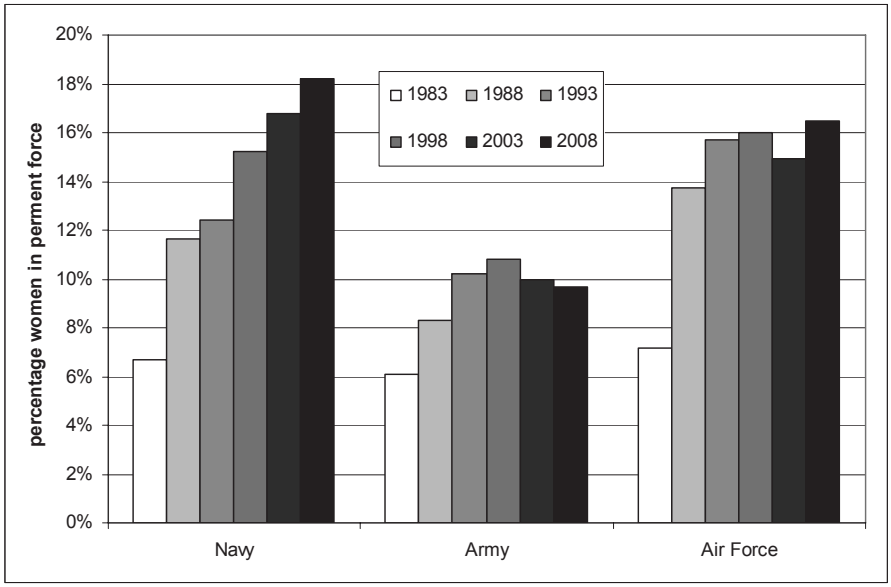
Source: 2001-02 and 2008-09 DAR

It is not that the defence force has ignored the issue. Over at least the past fifteen years a serious effort has been mounted to recruit and retain women in the force. A zero-tolerance policy towards sexual harassment is now in place across the entire force. Recruiting advertisements depict women as integral members of the defence force and highlight the opportunities available to them (and the same has more recently become true for persons from diverse ethnic backgrounds). The number of positions open to women has been expanded in all three sevices and an increasing number of women are reaching the higher ranks. More flexible arrangements are now in place to help female members manage the dual demands of career and family, and childcare facilities have been established in and around most military bases. Yet, the proportion of women in the force has remained essentially unchanged from a decade ago as Figure 2.5.13 shows.

The contentious issue of opening more combat positions to women is a red-herring. Navy and Air Force open all but a tiny fraction of positions to women, yet the number of women choosing to serve is small. In the long run, women may not, for their own reasons, choose to serve in the defence force in larger numbers than today. This would not be surprising; the proportion of women in allied forces is similarly low—New Zealand 17%, United Kingdom 8.5% and United States 17%. That does not mean that the defence force should relax its effort to attract women to serve. The defence force

needs the best people it can find and women represent the largest underutilised pool of potential recruits in the community.

Figure 2.5.13: Women in the defence force



Source: 1982-82 to 2007-08 DAR

2.6 Outcomes and planned performance [PBS Section 2]

The Cost of Outcomes and Programs

Under the framework explained in Chapter 1.3 of this Brief, the government funds Defence to achieve designated outcomes via a series of programs. The core of the Defence Budget is a statement of the costs and planned performance of outcomes and programs on p.34–94 of the PBS. Unfortunately the 2009-10 transition from 'output groups' to 'programs' was accompanied by the abandonment of 'outputs' that contained a more granular explanation of capabilities held by the three Services. Specifically, twenty-two capability related outputs were coalesced into a mere three programs resulting in a seven-fold decrease in information.

The net cost (revenues minus expenses) of outcomes and programs appear in Table 2.6.1. To capture the overall cost of delivering programs, non-cash expenses due to the depreciation of equipment are included in the net cost. Funds appropriated for administered programs (which are not controlled by Defence) for home-loan assistance and military superannuation and retirement benefits have been omitted.

Table 2.6.1 Net outcome and program costs

Outcome 1: The protection and advancement of Australia's national interests through the provision of military capabilities and the promotion of security and stability	**Net Cost 2008-09**	**Net Cost 2009-10**	**Net Cost 2010-11**
Program 1.1: Office of the Secretary and CDF	207,055	185,508	203,357
Program 1.2: Navy Capabilities	3,979,224	4,031,425	3,699,293
Program 1.3: Army Capabilities	5,014,621	4,462,320	4,724,623
Program 1.4: Air Force Capabilities	3,905,684	4,126,879	3,751,170
Program 1.5: Intelligence Capabilities	501,071	564,265	581,772
Program 1.6: Defence Support	3,168,997	3,288,473	3,791,755
Program 1.7: Defence Science and Technology	374,906	395,219	435,623
Program 1.8: Chief Information Officer	696,623	847,717	832,435
Program 1.9: Vice Chief of the Defence Forces	1,317,631	867,201	849,162
Program 1.10: Joint Operations Command	95,462	58,486	29,048
Program 1.11: Capability Development	129,739	898,753	941,974
Program 1.12: Chief Finance Officer	818,598	596,128	409,813
Program 1.13: People Strategies and Policy	256,727	354,262	357,016
Departmental outputs contributing to Outcome 1	20,466,338	20,676,636	20,607,041
Outcome 2*:* The advancement of Australia's strategic interests through the conduct of military operations and other tasks as directed by Government			
Program 2.1: Operations contributing to the security of the immediate neighbourhood	173,161	229,184	212,485
Program 2.2: Operations supporting wider interests	557,360	1,412,999	1,359,984
Outcome 3: Support for the Australian community and civilian authorities as requested by Government			
Program 3.1: Defence Contribution to National Support Tasks in Australia	14,557	12,626	15,252
Total net cost (non-administered)	**21,211,416**	**22,331,445**	**22,194,762**

Source: 2010-11 PBS and 2008-09 Annual Report

While one might expect that Outcome 2 would include the net additional cost of operations undertaken by the ADF, the total figure is more than $200 million less than that given in Table 12, page 25 of the PBS. The only explanation for this discrepancy that we can think of is that the difference is capital investment in equipment in support of deployments—though one might expect the cost of equipment to be higher.

The outcome and programs for the DMO are listed in the second part of the PBS [p. 155, 178 & 191], for convenience these are listed in Table 2.6.2.

Table 2.6.2: Total outcome and program expenses

Outcome 1: Contributing to the preparedness of the Australian Defence Organisation through acquisition and through-life support of military equipment and supplies	Expense 2008-09	Expense 2009-10	Expense 2010-11
Program 1.1 — Management of Capability Acquisition	4,841,871	5,623,207	6,081,201
Program 1.2 — Capability Sustainment	4,772,368	4,948,933	5,342,209
Program 1.3 — Policy Advice and Management Services	75,486	89,361	111,855
Total DMO Outcome 1	9,689,725	10,661,501	11,535,265

Source: 2008-09 DAR, 2009-10 PBS

There is considerable overlap between the funds listed under the Defence outcomes/outputs and those for DMO. Around $5.3 billion worth of Defence's program costs represent the purchase of sustainment services from DMO (Output 1.2). Put simply, around half of DMO's programs are inputs to Defence's programs. DMO's other $6.1 billion program (Program 1.1) does not contribute to Defence's outputs. Instead, it represents the purchase of new capital equipment that will be used to deliver Defence's programs in the future.

As mentioned in Chapter 1, the new outcomes and programs are much more closely aligned with the actual organisation of Defence than were those employed from 1999-00 to 2007-08. Nonetheless, there are significant linkages between certain elements. We have tried to capture the situation in Figure 2.6.1. The essential points are as follows. The programs under Outcome 2 and 3 do not align with any single organisational entity. Instead they capture the net additional cost of operations that is apportioned to those groups that actually support and deliver the operations including DMO. At the same time, the DMO sustainment budget is reflected in the costs attributed to the various output groups, principally Navy, Army and Air Force.

Program Statements

For each of the programs, the PBS contains an entry detailing the key performance indicators and a cost summary. In many cases, the key performance indicators read like the entries in a corporate plan. For example, the Office of the Secretary and CDF has twelve deliverables including;

'...provide overarching strategic guidance, policy and supporting plans to inform Defence decision making including the development and use of Defence capability and the deployment of the ADF.'

and three performance indicators, including;

'...the Ministers are satisfied with the timeliness and quality of advice, including Cabinet documentation, provided by the Department.

Little would be gained by rehearsing the very large number of equally sensible (and largely anodyne) key performance indicators that appear in the PBS. The interested reader can pursue them at leisure. Of more interest are the concrete performance measures set out for the military capability outputs.

Capability Performance

There are three key performance measures for the capability related programs; preparedness, core skills and quantity. These same performance measures have been employed in Defence Annual Reports and PBS in one way or another since 1999. We explore these three measures below. In doing so, it's important to remember that many capability programs have additional specific performance measures.

Preparedness refers to the readiness and sustainability of the ADF to undertake operations, be it national support tasks, peacekeeping or war. The process by which preparedness targets are set is worth recounting.

To begin with, the government's White Paper sets out the broad strategic tasks that the ADF needs to be prepared to undertake – for example 'contributing to the security of our immediate neighbourhood'. Using this as a basis, Defence develops what is called *Australia's Military Strategy* which includes for each strategic task a series of *Military Response Options* which define the broad operational objectives without specifying how they are to be accomplished—for example 'maintain sea lines of communication to the north of Australia'. These Military Response Options then form the basis of the annual *Chief of the Defence Force's Preparedness Directive*.

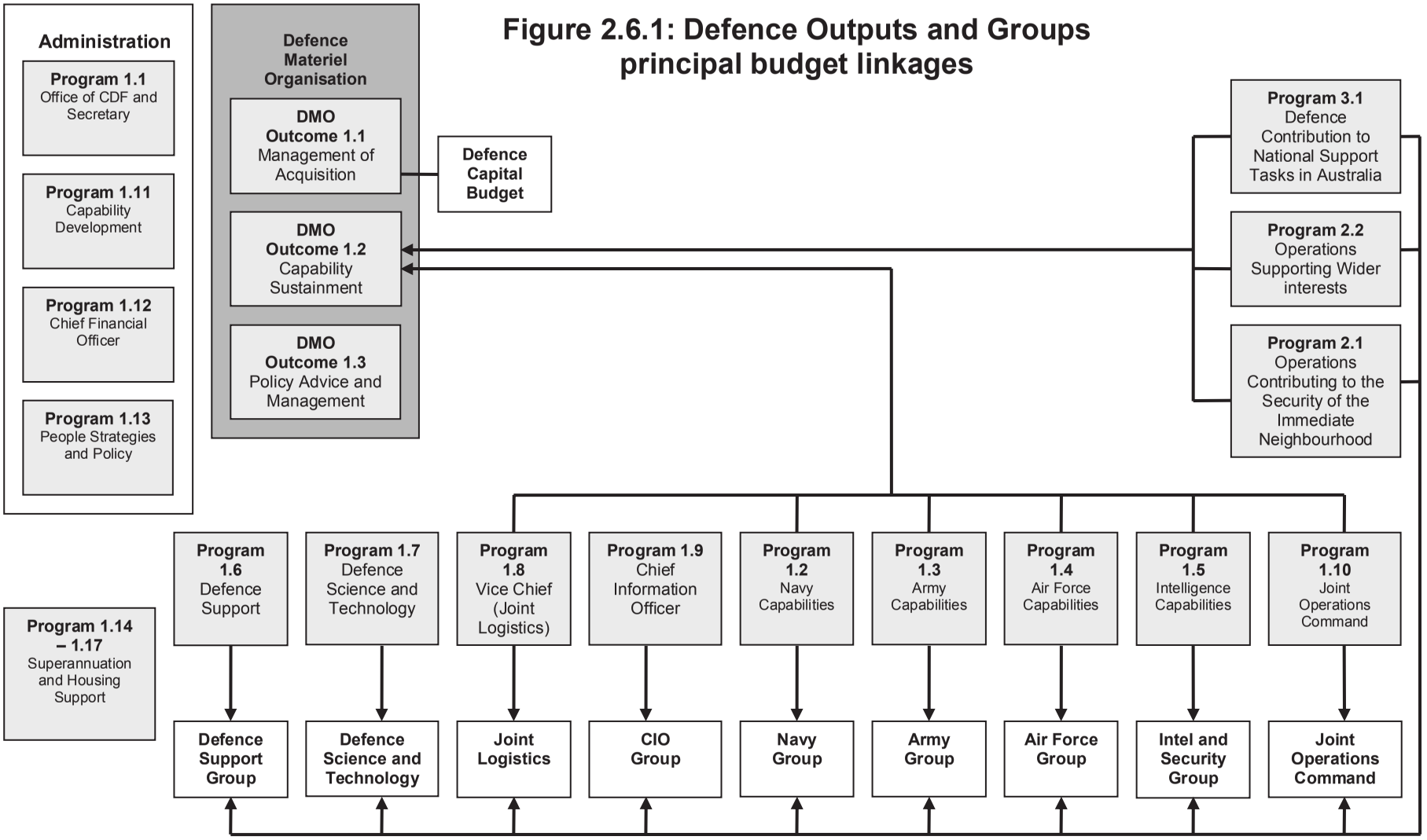
The final result is a series of specific targets for each output. They are classified. But, for example, the light infantry output might be required to 'be prepared to deploy a battalion at 90 days notice to assist in a regional peacekeeping operation and to maintain the deployment for 12 months' (this example is purely illustrative).

Core Skills Preparedness targets are driven by Military Response Options with an anticipated warning time of less than 12 months. To take account of possible longer-term tasks and the requirement to retain broad expertise in the three Services, an enduring performance target for the capability programs is to 'achieve a level of training that maintains core skills and professional standards across all warfare areas'. The assessment of what is to be achieved, and whether it has been achieved, is ultimately based on the professional military judgement of the Service Chiefs.

Quantity All of the capability programs include one or more 'quantity' measures that try to capture some aspect of how much capability will be delivered. Each of the three Services uses a different type of measure.

Army: With the exception of Army Aviation, the quantity measure used by Army is the presence of adequate quantities of trained personnel and equipment within an Output. No quantified targets are released publicly. In practice we get a qualitative assessment in the Annual Report.

Figure 2.6.1: Defence Outputs and Groups principal budget linkages



Navy: The basic measure of quantity used by Navy relates in some sense to the availability of ships and their crew to undertake a mission. From 1990-91 to 1998-99 the measure used was the average number of vessels available over the year, from 1999-00 to 2000-01 it was the number of vessel days at Minimum Level of Capability (MLOC) and in 2001-02 it was the numbers of vessel days Fully Mission Capable (FMC). In 2005-06 yet another measure was introduced, the planned number of Unit Ready Days (URD), defined as follows: Unit Ready Days are the number of days that a force element is available for tasking, by the Maritime Commander, within planned readiness requirements. While this looks similar to the previous definition of Fully Mission Capable we're told that it is actually a different measure, and we therefore caution against comparison between the two quantities.

Air Force: The quantity measure used by Air Force and Army Aviation is the number of flying hours undertaken by the Program. These measures have been applied consistently for over a decade and constitute a useful diagnostic tool given the established baseline.

Activity levels

Of all measures employed, flying hours are the only real measure of ADF activity that is disclosed (it would be useful if Navy's steaming-days and Army's track-miles were disclosed as they were in the past).

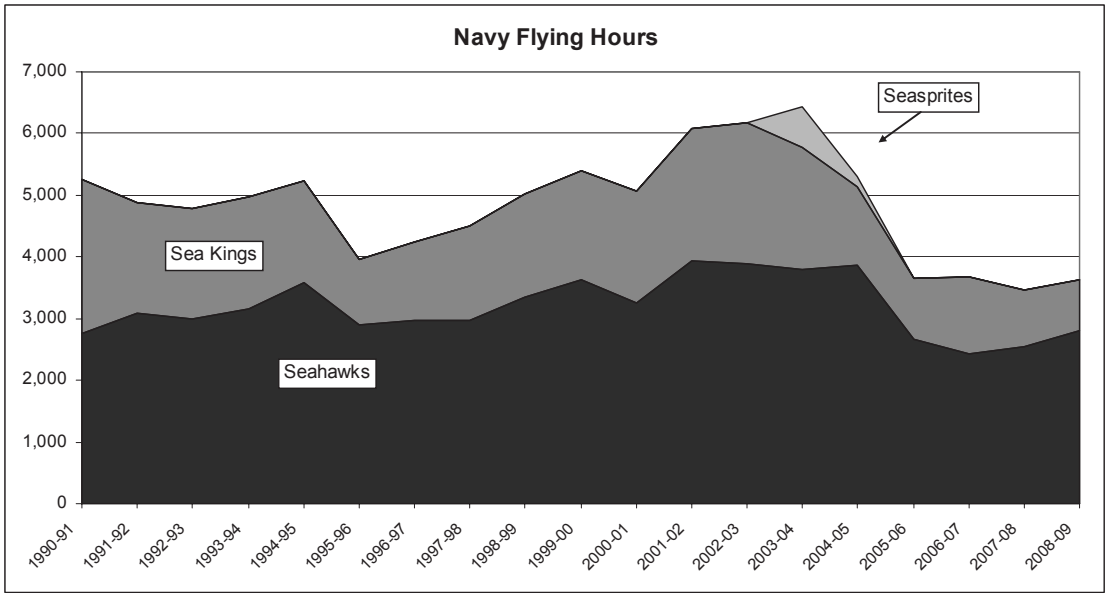
Table 2.6.3 details planned flying hours for key ADF platforms for 2009-10 and 2010-11. Figure 2.6.2 displays the longer-term trends in ADF flying hours.

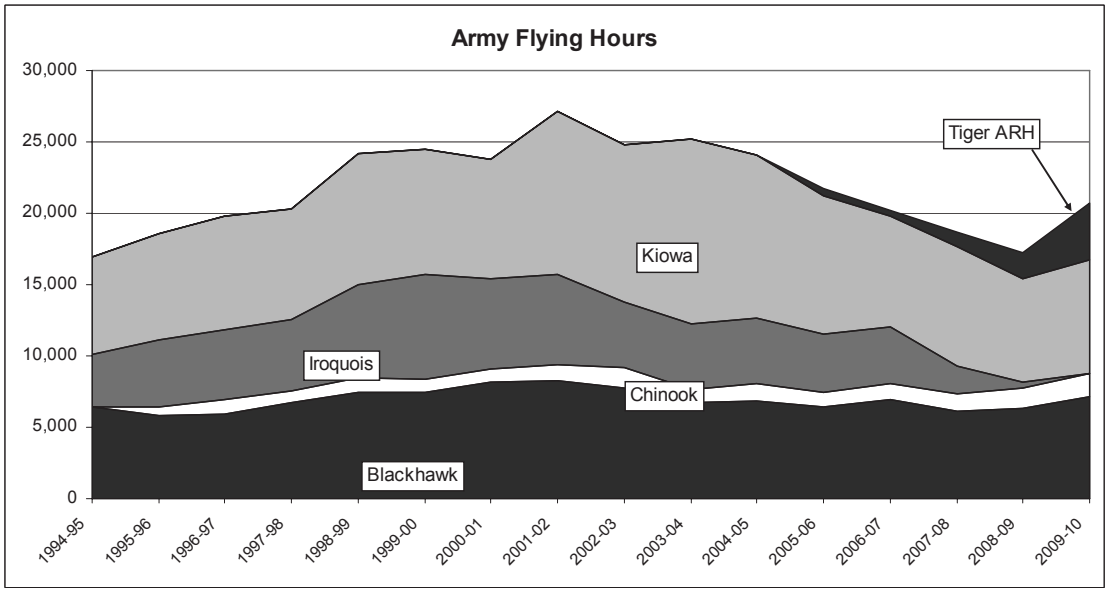
Table 2.6.3: ADF flying hours 2009-10 and 2010-11

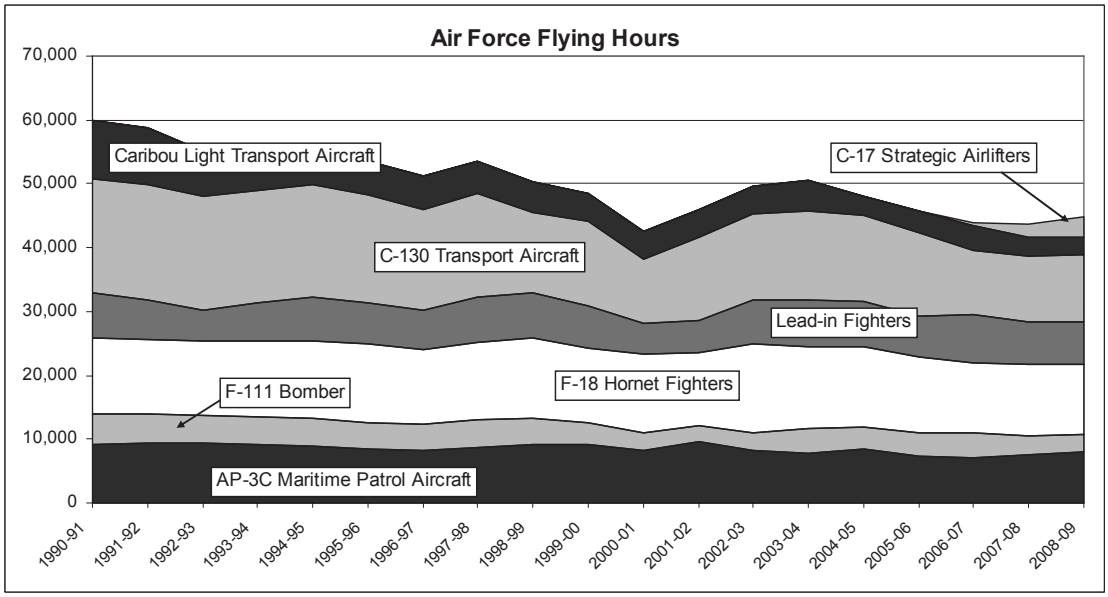
Platform	2009-10	2010-11	Change	Remarks
F-111 bomber	2,700	800	-70%	Retiring from service in 2010
F/A-18 fighter	12,000	13,000	8%	
F/A-18 Super Hornet	500	2,100	320%	Entering service
C-130 transport	10,550	10,550	0%	
AP-3C Orion	7,900	7,900	0%	
C-17 transport	3,450	4,500	30%	
Hawk Lead in fighter	6,800	8,000	18%	
Chinook helicopter	1,570	1,570	0%	
Black Hawk helicopter	8,600	7,500	-13%	
Kiowa helicopter	8,360	9,360	12%	
Armed recon helicopter	4,000	6,000	50%	Entering service
MRH-90 helicopter	1,050	3,420	226%	Entering service
Seahawk helicopter	3,400	3,600	6%	
Sea King helicopter	1,100	1,100	0%	

Source: 2010-11 PBS

Figure 2.6.2: Long-term trends in ADF flying hours







Source: Defence Annual Reports

Recent Performance

Table 2.6.4 summarises the non-quantity key performance indicators from the 2008-09 Annual Report. Defence uses a four-point performance scale of zero, one, two or three ticks (✓). This replaces the earlier system of 'not achieved', partially achieved', 'substantially achieved' and 'fully achieved'. The 'overall' assessment in Table 2.6.4 is the percentage of ticks received out of those possible for all performance indicators.

Table 2.6.4: Output Performance from the 2008-09 Defence Annual Report

Output	Advice	Preparedness	Core Skills	Overall
1.1 CDF Secretary	✓✓✓			78%
1.2 Navy	✓✓	✓✓	✓✓	66%
1.3 Army	✓✓✓	✓✓	✓✓✓	89%
1.4 Air Force	✓✓✓	✓✓✓	✓✓✓	100%
1.5 Intelligence	✓✓✓			100%
1.6 Defence Support				96%
1.7 Science & Technology	✓✓✓			100%
1.8 Chief Information Officer	✓✓			71%
1.9 VCDF	✓✓✓			100%
1.10 Joint Operations Command		✓✓✓		100%
1.11 Capability Development	✓✓			89%
1.12 CFO	✓✓✓			83%
1.13 People Strategies & Policy	✓✓✓			100%
2.1 Operations - neighbourhood				100%
2.2 Operations - wider interests				100%
3.0 National Tasks				100%

Source: 2008-09 DAR

Table 2.6.5 shows the planned and actual key performance indicators for quantity (URD and flying hours) for the major platforms operated by the three services. The results have been rated on the four-level scheme as follows; above 95% =✓✓✓, 95% to 75% =✓✓, below 75% =✓. While this is a less stringent scheme than used by Defence in the 2008-09 Defence Annual Report, it is consistent with that used in previous years.

Table 2.6.5: Capability quantity planned and delivered 2008-09

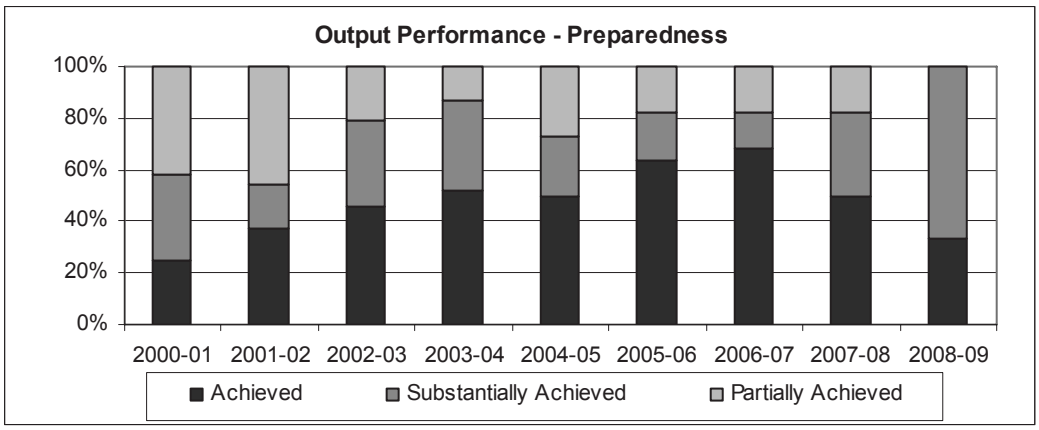
Output	Planned	Actual	Percentage	Assessment
Navy fleets				
Frigates	2,948 days	3,088 days	105%	✓✓✓
Submarines	648 days	622 days	96%	✓✓✓
Afloat Support	645 days	659 days	102%	✓✓✓
Amphibious	2,965 days	2,883 days	97%	✓✓✓
Mine Warfare	2,208 days	1,979 days	95%	✓✓✓
Hydrographic	1,742 days	1,878 days	93%	✓✓
Patrol Boats	3,500 days	3,471 days	99%	✓✓✓
Seahawks	3,100 hours	2,809 hours	91%	✓✓
Sea Kings	1,100 hours	815 hours	74%	✓
Army fleets				
Blackhawk	7,500 hours	7,175 hours	96%	✓✓✓
Chinook	1,270 hours	1,388 hours	110%	✓✓✓
Kiowa	10,360 hours	7,978 hours	77%	✓✓
Armed Recon	5,520 hours	1,795 hours	33%	✓
MH-90	600 hours	122 hours	20%	✓
Air Force fleets				
F-111	3,600 hours	2,933 hours	82%	✓✓
F/A-18	12,500 hours	11,301 hours	90%	✓✓✓
Lead-in fighter	7,600 hours	6,561 hours	86%	✓✓✓
C-130	10,900 hours	10,235 hours	97%	✓✓✓
Caribou	4,100 hours	2,626 hours	64%	✓
C-17	5,000 hours	3,367 hours	67%	✓
B737 BJ	1,414 hours	1,551 hours	110%	✓✓✓

2008-09 PBS and 2008-09 Annual Report

Figures 2.6.3 to 2.6.5 plot the delivery of Defence capability programs (previously outputs) as reported in the Defence annual reports between 2000-01 and 2008-09. There was a steady improvement over the first five or so years then a levelling off of performance followed by a decline over the ensuing couple of years.

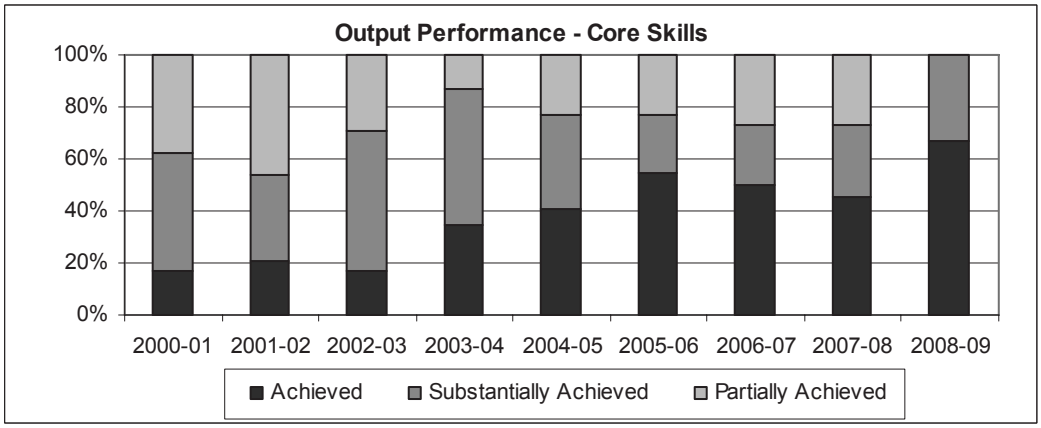
Some care needs to be exercised in comparing the results for 2008-09 with that from earlier years due to the reduction in detail that arose in that year. The move from twenty-two capability sub-programs to a mere three (one for each Service) inevitably results in a reporting regime constrained to a smaller number of possible outcomes for preparedness and core skills.

Figure 2.6.3: Output performance – preparedness



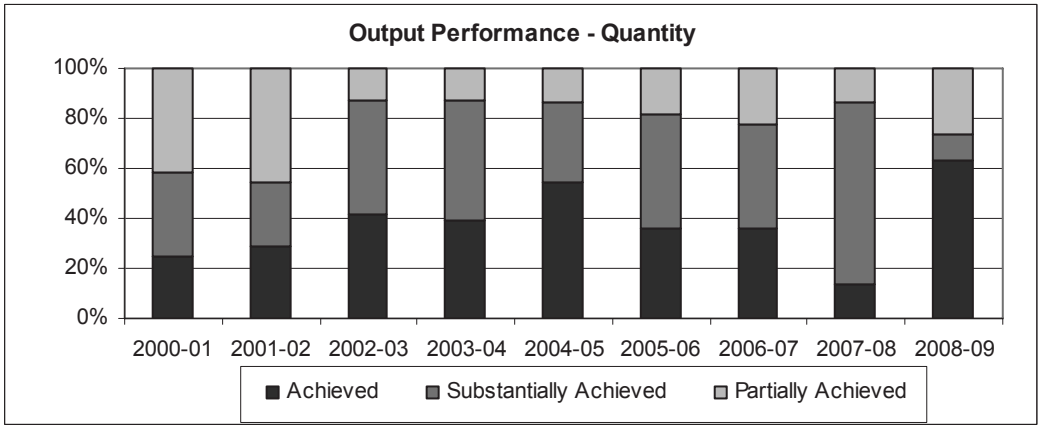
Source: 2000-01 to 2008-09 DAR

Figure 2.6.4: Output performance – core skills



Source: 2000-01 to 2008-09 DAR

Figure 2.6.5: Output performance – quantity



Source: 2000-01 to 2008-09 DAR

Program Summaries

To augment the information provided in the PBS, we have prepared short program summaries containing background and historical performance information. In doing so, we have not sought to reproduce the material in the PBS but to complement it. Given the acute paucity of information provided in the PBS on what is to be delivered at the sub-program level, only a limited picture is possible. Information has been drawn from a variety of sources, including the Defence website.

Because the recently adopted program structure aligns closely with the actual organisational structure of Defence, we have taken the opportunity to sketch out the key elements in each of the programs. For those readers not familiar with the senior military and civilian levels, Table 2.6.7 details the correspondence of executive levels across the three services and civilian Senior Executive Service (SES).

Table 2.6.6: Executive comparison:

Civilian	Navy	Army	Air Force	Star Rank
Assistant Secretary (SES-1)	Commodore	Brigade	Air Commodore	*
First Assistant Secretary (SES-2)	Rear Admiral	Major General	Air Vice-Marshal	**
Deputy Secretary (SES-3)	Vice Admiral	Lt General	Air Marshall	***
Secretary	Admiral	General	Chief Air Marshal	****

Drawing this information together (Table 2.6.7) reveals an interesting picture of where senior executives and star-ranked officers are employed within the organisation. In most cases, the figures represent the minimum number of executives employed—hence the total figures fall below that known from aggregate numbers given in the budget papers for Defence as a whole. Note that DMO has not been included.

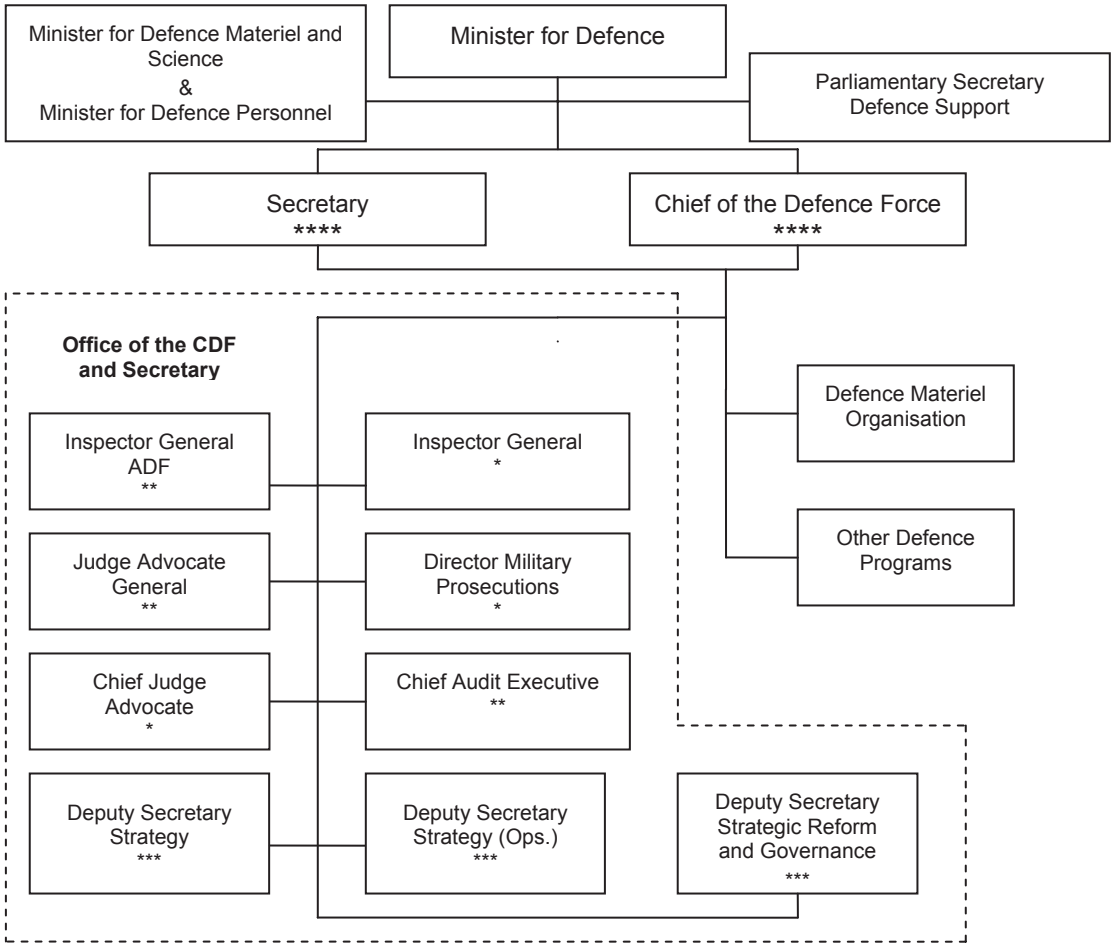
Table 2.6.7: Approximate breakdown of senior executives and star-ranked officers by group

		CEO		SES-3 3 Star		SES-2 2 Star		SES-1 1 Star		Total	
		Secretary	CDF	Civilian	Military	Civilian	Military	Civilian	Military	Civilian	Military
1.1	Office of Secretary and CDF	1	1	3	0	7	4	14	8	25	13
1.2	Navy			0	1	0	3	2	14	2	18
1.3	Army			0	1	0	5	1	14	1	20
1.4	Air Force			0	1	0	2	1	10	1	13
1.5	Intelligence			1	0	3	2	?	?	?	?
1.6	Defence Support			1	0	4	1	13	3	18	4
1.7	Science and Technology			3	0	13	0	5	0	21	0
1.8	Chief Information Officer			1	0	2	1	8	3	11	4
1.9	VCDF			0	1	0	6	1	15	1	22
1.10	Joint Operations Command			0	1	0	3	0	3	0	7
1.11	Capability Development			0	1	1	2	1	6	2	9
1.12	Chief Finance Officer			1	0	2	0	7	0	10	0
1.13	People Strategies and Policy			1	0	1	1	4	3	6	4
	Total	**1**	**1**	**12**	**6**	**33**	**30**	**57**	**79**	**101**	**115**

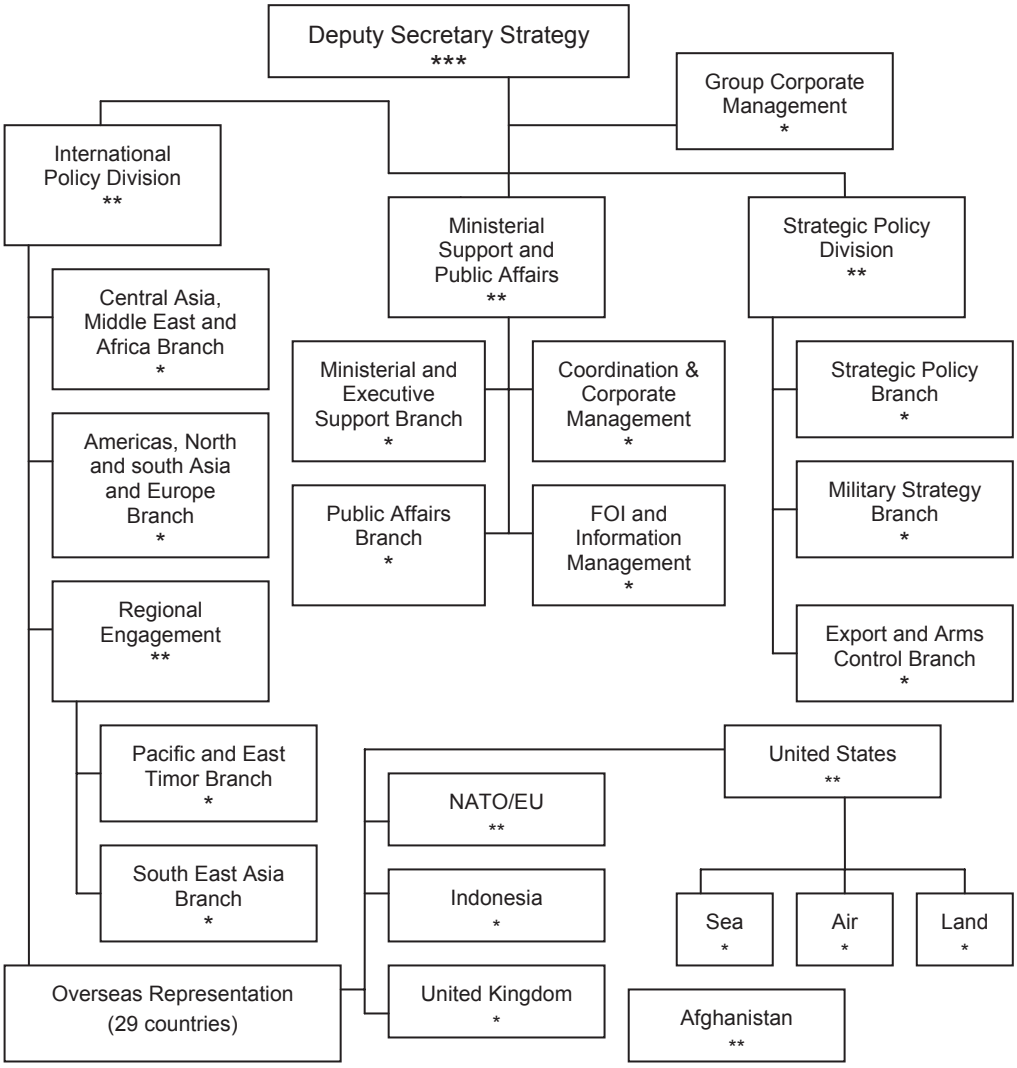
Program 1.1 – Office of the Secretary and CDF

Program expenses 2010-11: $203 million

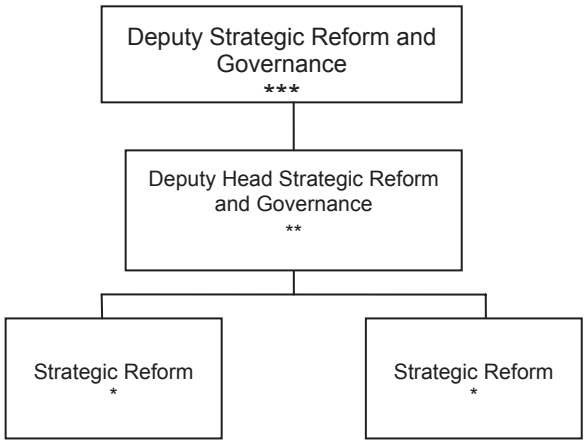
The Office of the Secretary and CDF was a created as a result of the 2007 Defence Management Review. It combines three central policy organisations led by deputy secretaries—Strategy, Strategy (Operations) and Strategic Reform and Governance—and six quasi-independent legal/audit appointments under the joint control of the Secretary and CDF. It is not an exaggeration to observe that the Office of the Secretary and CDF has as many senior executives as a small department of state. At a minimum, there are three Deputy Secretaries, eight First Assistance Secretary / Major General equivalents and twenty Assistant Secretary / Brigadier equivalents.



Deputy Secretary Strategy manages three divisions as set out overleaf. International Policy Division manages Defence's day-to-day international relationships and provides policy advice in that area. Responsibilities include oversight of Defence's overseas representatives in 29 countries around the world (mostly within Australian diplomatic missions). Strategic Policy Division provides advice on strategic plans and military strategy, while also managing Australia's arms export controls. Ministerial and Public Affairs Division includes branches that manage Defence's interaction with the public in general and the media in particular, and support Defence's communication with its Ministers. Deputy Secretary (Operations) acts as a special advisor on key Defence operations.



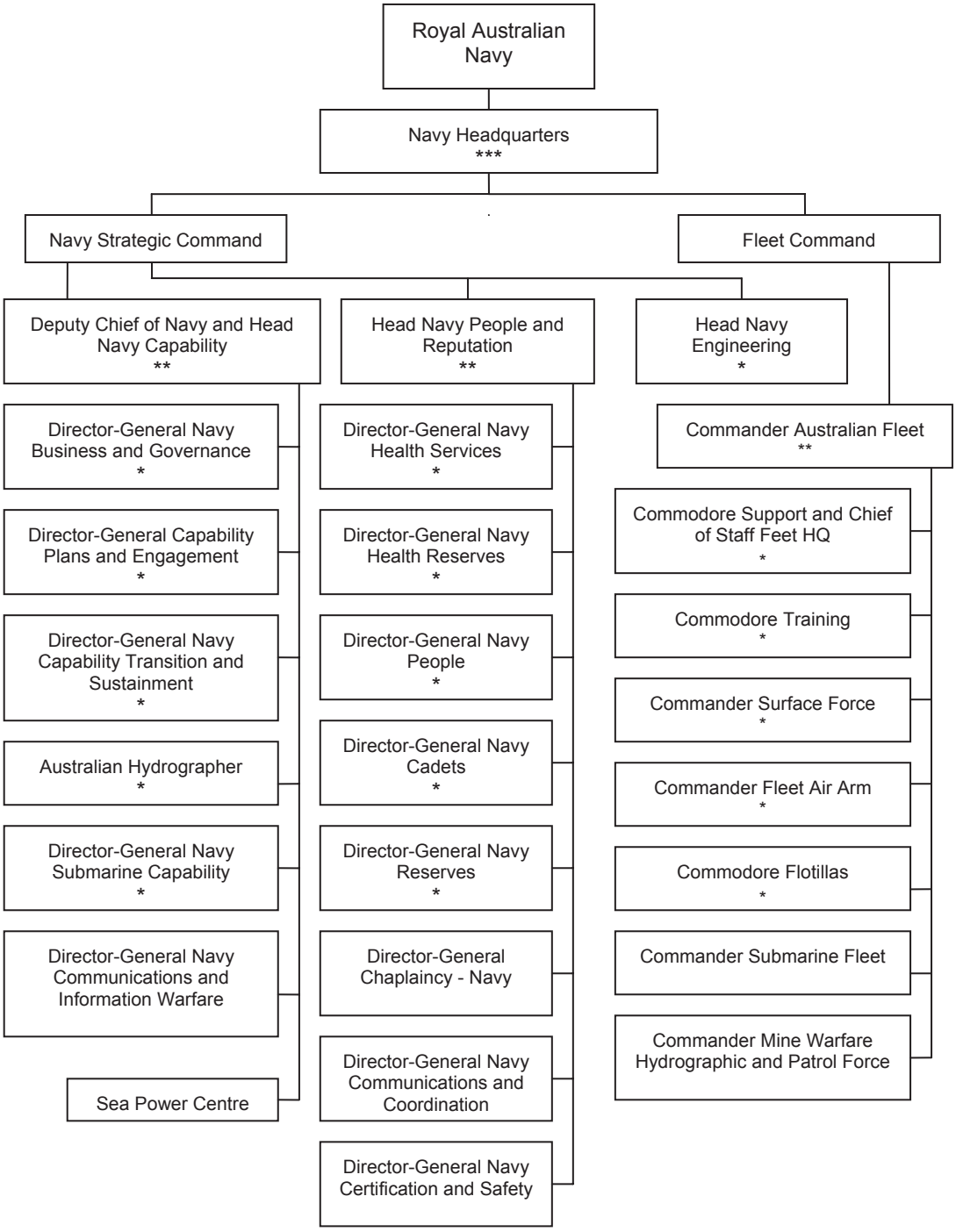
Deputy Secretary Strategic Reform and Governance is responsible for oversighting the Strategic Reform Program and its accompanying decade-long $20.6 billion savings program. Note that there has also been an organisation established at the Deputy Secretary level in DMO and at the First Assistant Secretary level in Corporate Support Group (since disbanded) to further oversight the Strategic Reform.



Program 1.2 – Navy Capabilities

Program expenses 2010-11: $3,699 million

The Navy is divided into two parts; Navy Strategic Command and Fleet Command. To a good approximation, Strategic Command is responsible for capability plans, personnel, administration and technical regulation, while Fleet Command is responsible for the day-to-day operation of the fleet. The structure and recorded performance of the RAN fleet is outlined in the pages that follow.

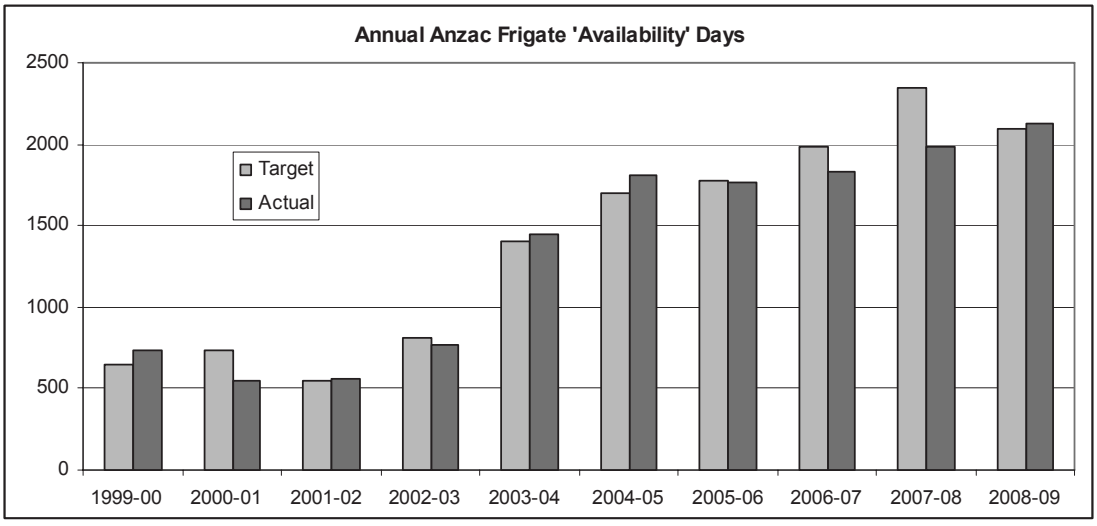


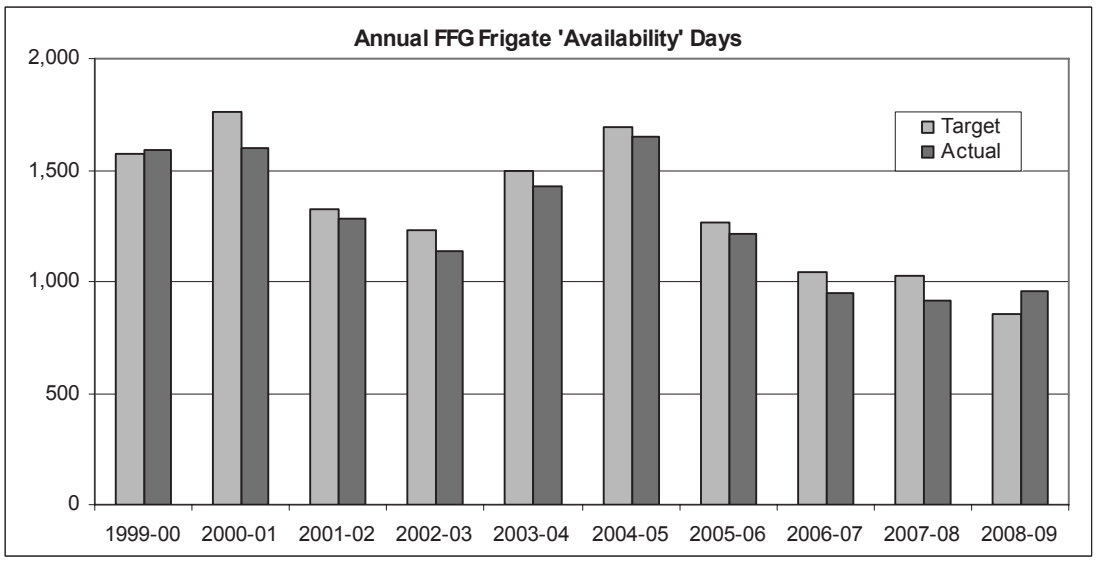
Surface combatant fleet

Four 1980s *Adelaide* class (US Oliver Hazard Perry class) Guided missile frigates (FFG) plus eight newer German-designed and Australian-built *Anzac* class frigates (FFH). Both vessels carry *Harpoon* anti-shipping missiles (*Anzac* currently being fitted), anti-submarine torpedoes and, eventually, Evolved *Sea Sparrow* surface-to-air missiles. Only the FFG are equipped with the more capable *Standard* surface-to-air missile (which are being upgraded to SM-2).

The *Anzac* class have a 5" gun useful for shore bombardment (as seen in the Gulf in 2003) while the FFG has a less capable 3" gun. Both classes of vessel can embark a *Seahawk* anti-submarine helicopter, although the current availability and capability of these aircraft is less than desired.

Upgrades are underway on both fleets. The FFG is nearing completion of the long-delayed $1.4 billion FFG-upgrade project and the FFH are progressively being fitted with a range of new systems including an anti-shipping missile defence suite. In addition, three new Air Warfare Destroyers are presently under construction.





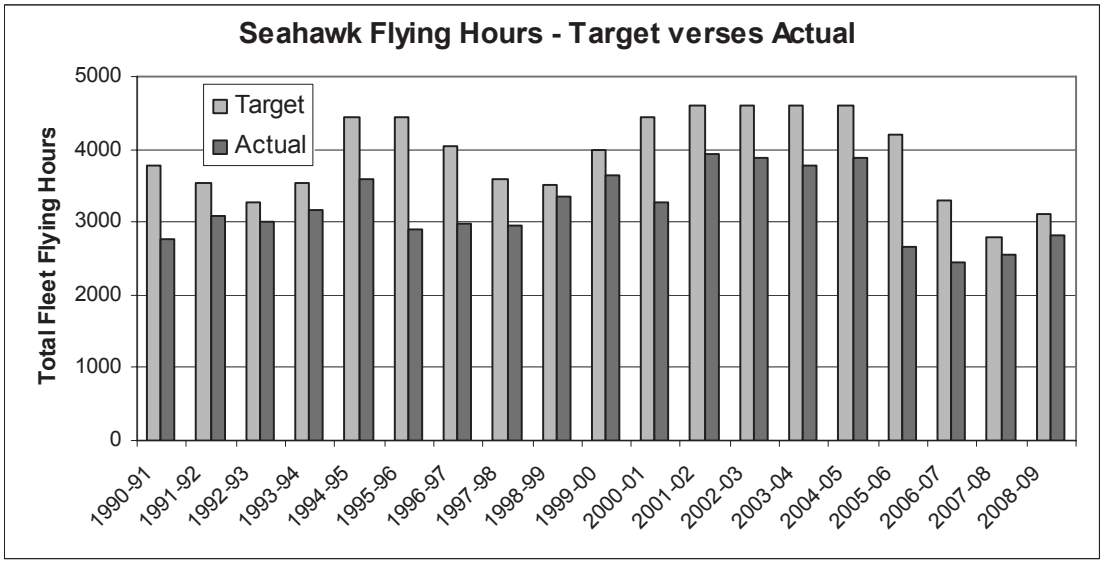
Units of measure:
1999-00 to 2000-01; 'Minimum level of capability days'
2001-02 to 2003-04; 'Fully mission capable days'
2004-05 to present; 'Unit ready days'

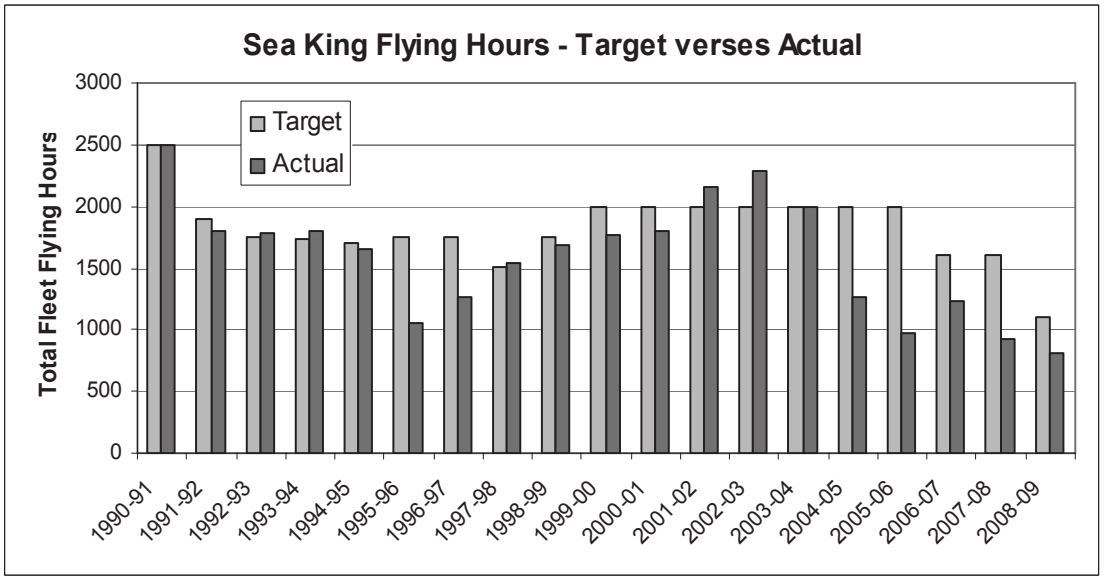
Naval aviation

The RAN has sixteen 1980s US-designed *Seahawk* helicopters that can be embarked on the *Anzac* and FFG class frigates. They are configured for anti-submarine and surface search/targeting although the later role is increasingly less practiced. There are six 1970's UK-built *Sea King* helicopters used for troop lift and logistics tasks that will be replaced by six MRH-90 aircraft from 2010.

Thirteen *Squirrel* light helicopters are used for training and short-term operations at sea. In addition, ten Australian-designed *Kalkara* unmanned aerial targets provide a training capability. A project to deliver eleven *Super-Seasprite* helicopters for the *Anzac* frigates was cancelled in early 2008. Navy leases three Augusta Westland A190E aircraft for training and general duties.

In recent years, the performance of both the *Sea King* and *Seahawk* fleets has been compromised by personnel shortages, maintenance issues and ongoing aircraft upgrades and modifications.

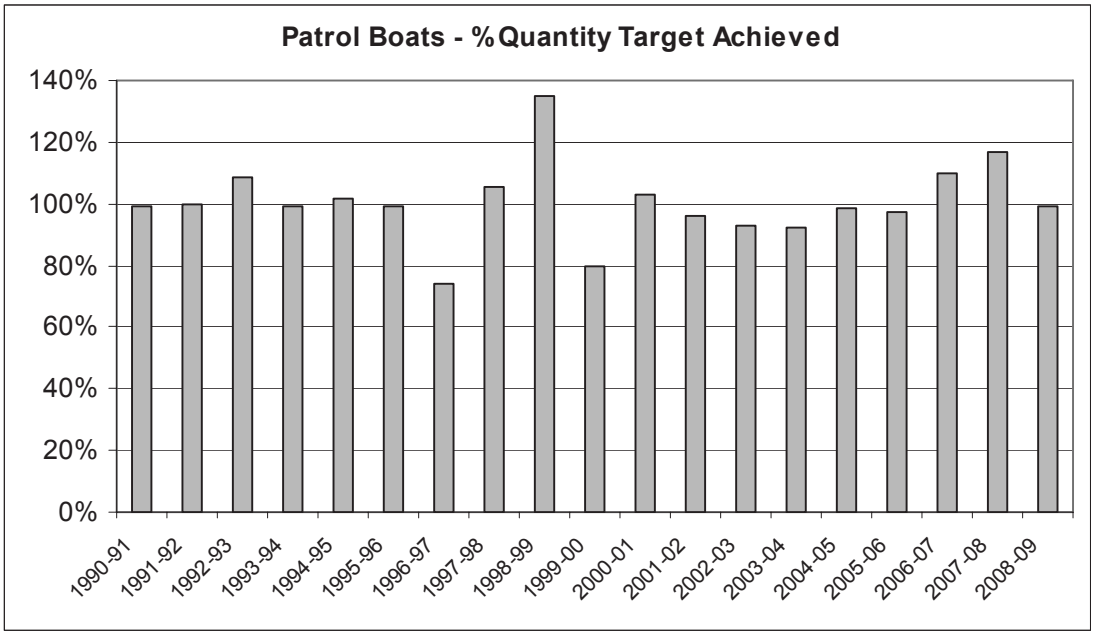




Patrol boat fleet

All of Navy's fleet of fifteen 1980s vintage Australian-built, UK-designed, *Fremantle* Class Patrol Boats (FCPB) have now been replaced by 14 new *Armidale* Class Patrol Boat (ACPB). These vessels are mainly tasked in support of the civil surveillance program through Border Protection Command. They can also be used for the insertion and extraction of army patrols on the coast, including Special Forces.

Through an innovative program, the Navy multi-crews the *Armidale* Class vessels, thereby reducing the burden on sailors and their families while maintaining a high utilisation of the assets. At present there are 21 crews spread across 14 vessels.



Note: Differing and incompatible quantity measures used over time have been converted to percentages.

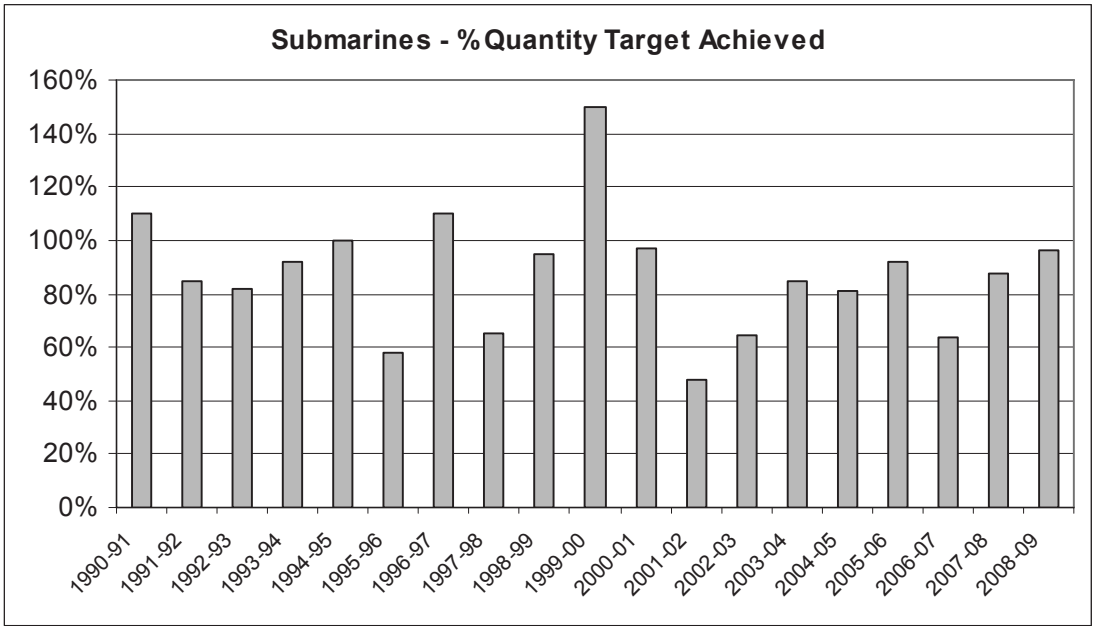
Submarine fleet

The RAN has six *Collins* Class submarines. Their primary roles are to attack enemy shipping and to counter the threat of adversary submarines. In addition, they can collect intelligence and insert and extract Special Forces. The *Collins* Class is equipped with *Harpoon* anti-ship missiles and the US Mk 84 heavyweight torpedo.

The delay in the introduction of the *Collins* Class into service as the *Oberon* Class left service disrupted both submariner training and the retention of skilled personnel. This is now being corrected through a remediation program.

In the meantime, a shortage of submariners is severely reducing the delivery of capability. Personnel shortages are so acute that submarines have been tied up or put into maintenance early. Longer than expected maintenance periods coupled with mechanical problems have further compromised the availability of boats. So much so that as few as one vessel has been available for operational deployment at times.

Notwithstanding the many trials and tribulations that have arisen with the locally-built *Collins* fleet, the 2009 Defence White Paper outlines plans for an even more ambitious indigenous replacement program.

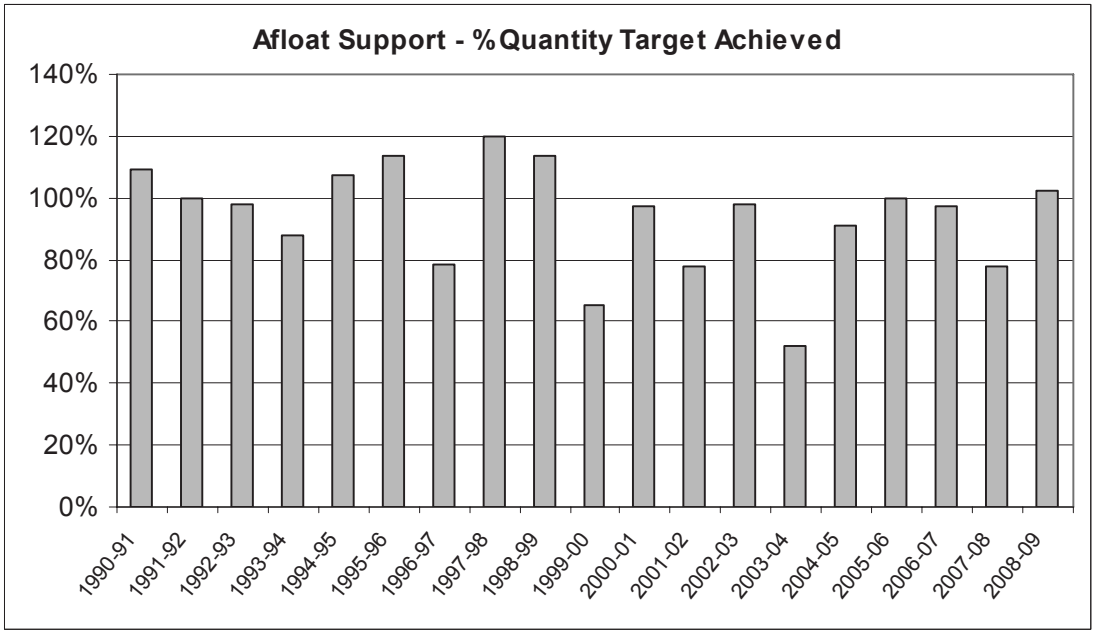


Note: Differing and incompatible quantity measures used over time have been converted to percentages.

Afloat support fleet

The afloat support force refuels and re-supplies Navy vessels and embarked helicopters at sea and provides logistics support to land operations. The fleet comprises two vessels: HMAS *Sirius:* a South Korean-built 46,017 tonne full displacement commercial vessel which was refitted to Navy specifications as an Auxiliary Tanker (AO). HMAS *Success:* a 1980s French-designed, Australian-built 17,900 tonnes full displacement Auxiliary Replenishment Tanker (AOR).

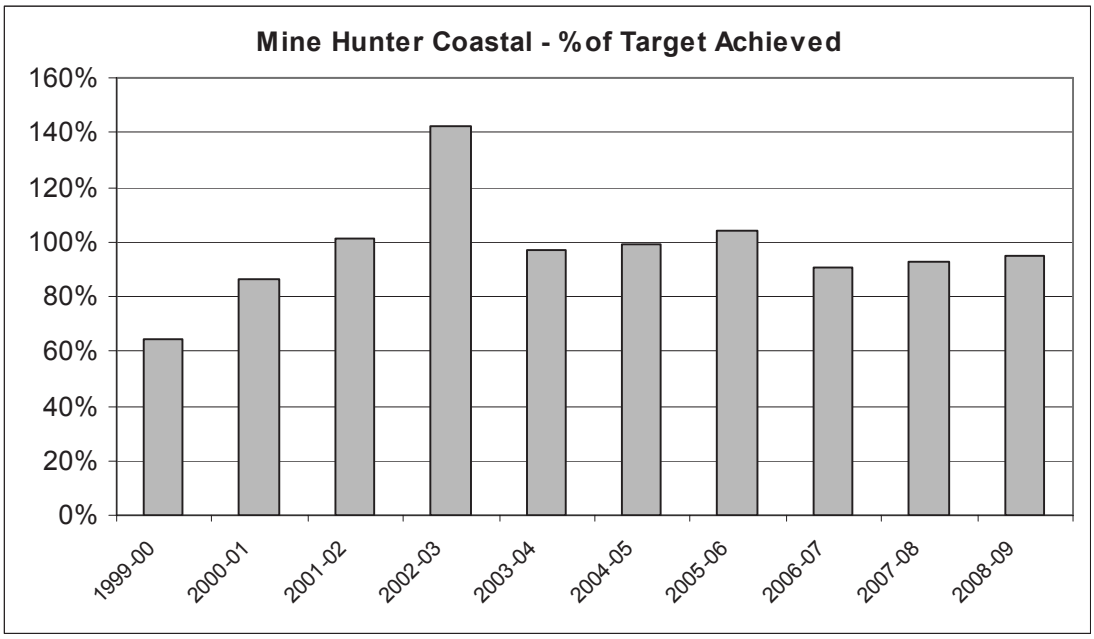
Although HMAS *Sirius* has been touted as an example of how commercial-off-the shelf equipment can meet ADF requirements quickly and at reduced cost, there is some disquiet about the vessels performance. In particular, it has been suggested that the seakeeping of the vessel is problematic when it vessel is partially laden.



Note: Differing and incompatible quantity measures used over time have been converted to percentages.

Mine warfare fleet

6 *Huon* Class Coastal Mine Hunters (MHC) – 720 tonnes displacement, glass-reinforced plastic hulled, Italian-designed and built in Australia in the late 1990's. The ships employ sonar to search for mines, which can then be destroyed using a remote controlled mine disposal vehicle or otherwise. 2 Auxiliary Mine Sweepers – 1980's converted tugs that physically sweep for mines. 2 Clearance Diving Teams – one on each coast at Sydney and Perth, capable of clearing mines and other ordinance, clandestine survey and obstacle clearance, and submerged battle damage repairs.



Note: Differing and incompatible quantity measures used over time have been converted to percentages.

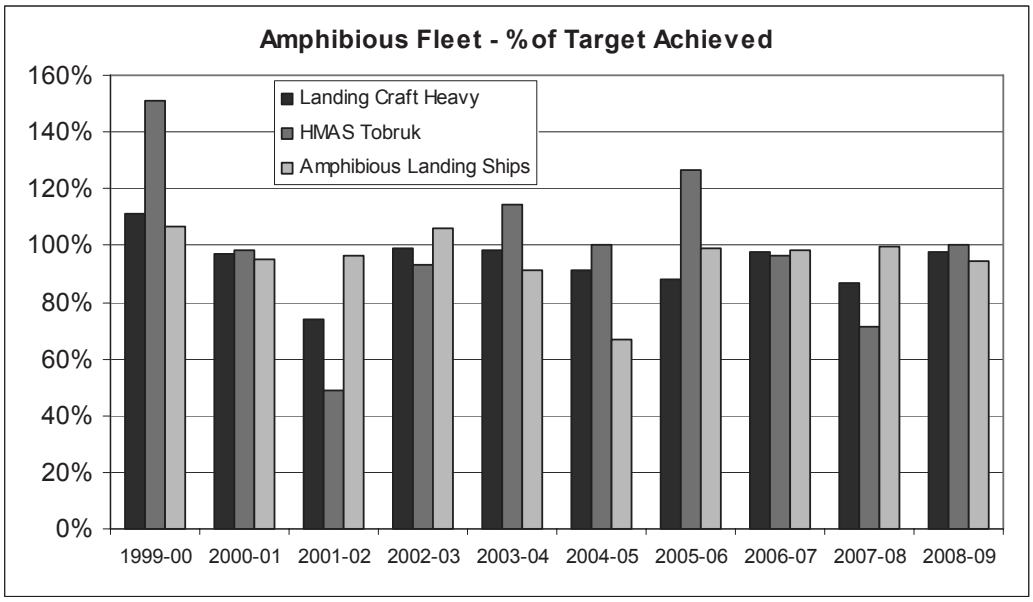
Amphibious lift fleet

2 *Kanimbla* Class Landing Platforms Amphibious (LPA), HMAS *Manoora* and HMAS *Kanimbla*: refurbished in the mid-to-late 1990's from two second-hand 1970's US *Newport* Class Landing Ship Tank vessels. They displace 8,450 tonnes and can carry 450 troops along with vehicles and landing craft. In addition, they have been fitted with medical and command and control facilities, and have the ability to house up to four troop-lift helicopters.

1 Heavy Landing Ship (HLS), HMAS *Tobruk*: a 1980's UK-designed and Australian-built vessel capable of carrying 315 soldiers, 18 tanks and 40 armoured personnel carriers. She displaces 5,800 tonnes and can operate any ADF helicopter from her deck.

6 Landing Craft Heavy (LCH): a fleet of 1970's craft that can carry a load of up to 180 tonnes a distance of over 1,200 nautical mines. Each vessel can carry three tanks, twenty-three quarter-tonne trucks or thirteen armoured personnel carriers. The LCH completed a life-of-type extension in 2003.

Two new large amphibious (Landing Helicopter Dock) vessels are under construction and are due to enter service in the first half of the decade. The vessels will each displace around 26,000 tonnes and carry 1,000 troops plus helicopters and vehicles.



Note: Differing and incompatible quantity measures used over time have been converted to percentages.

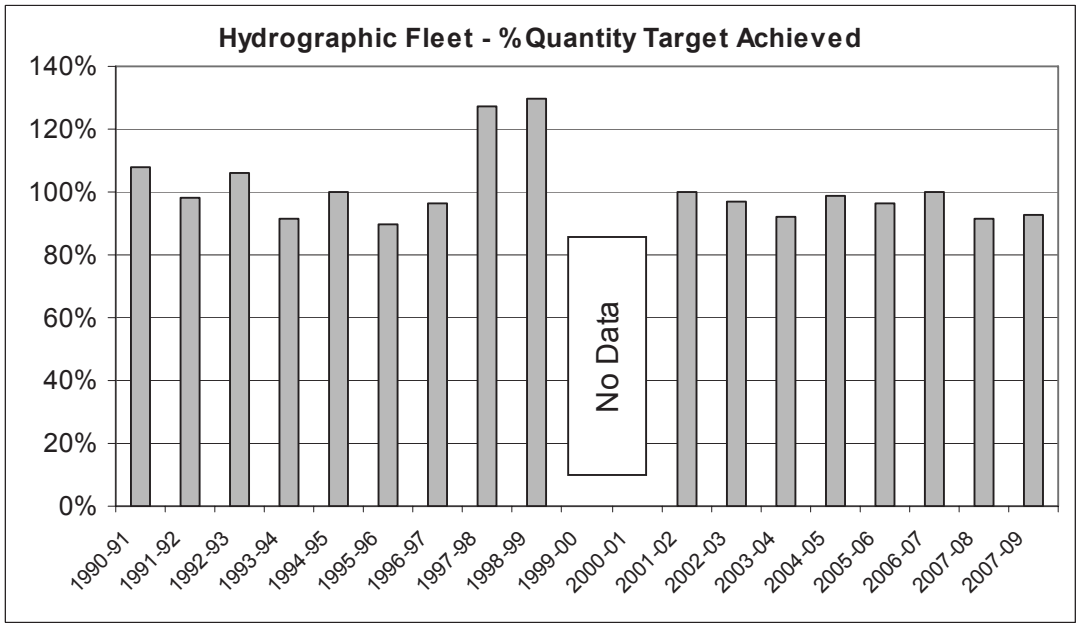
Hydrographic, metrological & oceanographic fleet

The Navy produces maritime military geospatial information for the ADF and undertakes hydrographic surveying and charting for civil use. The hydrographic component is supported by the Australian Hydrographic Office in Wollongong, NSW, and also comprises the Hydrographic Office deployable survey unit. The fleet includes;

2 *Leeuwin* Class Hydrographic Ships (AGHS): 2,250 tonne Australian-built hydrographic ships.

4 *Paluma* Class Survey Motor Launches (SML)*:* 320 tonne Australian-built survey launches.

1 Laser Airborne Depth Sounder (LADS) aircraft: an airborne depth sounder capability used in shallow water.



Note: Differing and incompatible quantity measures used over time have been converted to percentages.

Program 1.3 – Army Capabilities

Program expenses 2010-11: $4,725 million

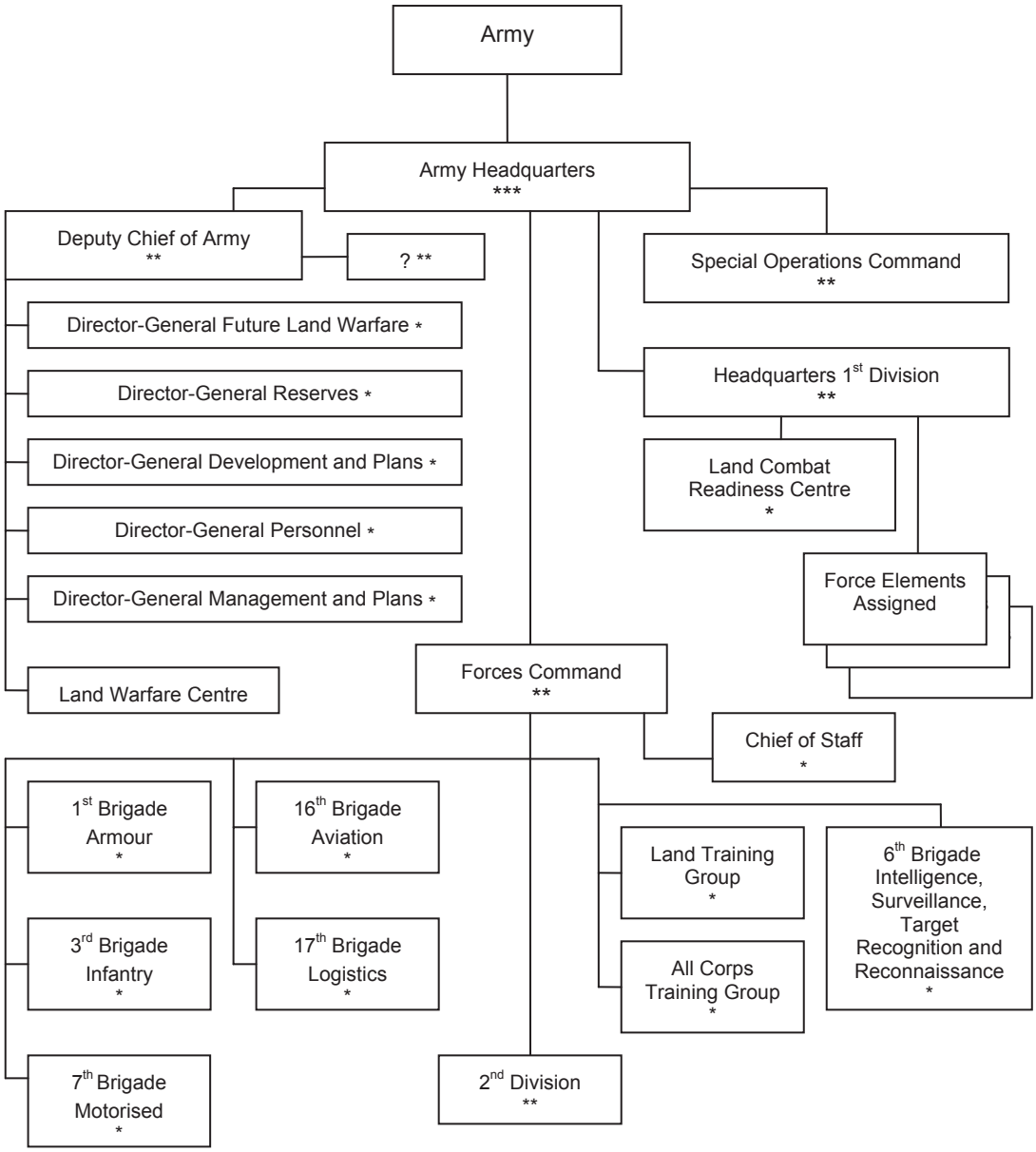
The Army is currently being restructured to deliver the end-state depicted below. Once complete, the Army will be structured around three functional commands and a headquarters under the Deputy Chief of Army. The three functional commands will be:

Special Operations Command commanding Army's Special Forces units

Forces Command responsible for raising and training the force-in-being

Headquarters 1st Division preparing assigned forces for deployment overseas.

The units that comprise Special Operations Command and Forces Command are detailed on the pages that follow. Where possible, performance information has been included.



Special Operations Command

Components include: Special Air Services Regiment (SASR) in Western Australia whose roles include special recovery (including domestic and overseas counter terrorism by the west coast Tactical Assault Group - TAG), long-range reconnaissance and offensive operations. Commando Battalion - 4 RAR (Cdo) in Sydney including the east coast TAG. One reserve Commando Regiment 1 Cdo Regt split between Sydney and Melbourne. Commando roles include land, sea- and air-borne offensive raids. 126 Signals Squadron in Sydney provides a reserve Special Forces signals capability and 152 Signals Squadron in Perth provides a similar full time capability. There is also an Incident Response Regiment based in Sydney that is capable of dealing with nuclear, chemical and biological incidents, plus a Special Forces Logistics Squadron in Sydney and a Special Forces Training Centre.

1st Brigade (medium combined arms)

Components include: 1st Armoured Regiment equipped with reconditioned US-made M1A1 *Abrams* tanks. 2nd Cavalry Regiment (reconnaissance) equipped with 1990s North American-designed but Australian modified ASLAV light armoured vehicles. 5th and 7th Battalions Royal Australian Regiment - mechanised infantry battalions equipped with 1960s US-made M113 armoured personnel carriers (presently being upgraded) and Australian-made *Bushmaster* infantry mobility vehicles. 8th/12th Medium Regiment (artillery) equipped with US-made 155mm M198 Medium Howitzers and the British designed 105mm L119 Hamel light gun. In addition, 1st Brigade includes extensive organic logistics and engineer support including 1 Combat Engineer Regiment, 1 Combat Service Battalion, 1 Combat Service Support Battalion and 1 Communications Support Regiment.

3rd Brigade (light combined arms)

Components include: Two light infantry battalions; 1st Battalion Royal Australian Regiment (1 RAR) and 2 RAR (Townsville), One parachute infantry battalion, 3 RAR (Sydney), 4th Field Regiment (artillery) equipped with the 105mm L119 Hamel light gun, B Squadron 3rd/4th Cavalry Regiment with *Bushmaster* infantry mobility vehicles, and organic engineer and logistics support including 3 Combat Engineer Regiment, 3 Combat Service Battalion and 3 Communications Support Regiment. The brigade includes a Parachute Battalion Group comprising 3 RAR along with airborne medical, artillery and other support elements. However, 3 RAR is being re-roled as a light infantry battalion.

7th Brigade (motorised combined arms)

Motorised Combined Arms Operations are based around the mostly medium readiness 7 Brigade (7 Bde). It is an integrated-regular formation including an HQ in Enoggera, Queensland, and including three motorised and light infantry battalions; 6th Battalion Royal Australian Regiment (Brisbane), 9th Battalion Royal Queensland Regiment (Brisbane), 25th/49th Battalion Royal Queensland Regiment (Brisbane and Darling Downs region), and the 2nd/14th Light Horse Regiment (Queensland Mounted Infantry) (Recon) (Brisbane), 1st Field Regiment (artillery) (Brisbane), 2nd Combat Engineer Regiment, 7th Combat Support Regiment and 7th Combat Services Support Battalion.

17th Brigade (operational logistics support)

The Logistics Support Force (LSF) is a brigade-sized grouping of reserve, integrated and permanent ADF units which can sustain a brigade on operations for extended periods while concurrently maintaining a battalion group elsewhere. It provides supply, fuel, communications, transport (surface vehicle and small watercraft), repair, and health and psychology capabilities. Elements include; 17th Combat Service Support Brigade HQ (Sydney), the 2nd (Glenorchy, Tas), 9th (Sydney) & 10th (Townsville) Force Support Battalions, 1st (Sydney), 2nd (Brisbane) & 3rd (Adelaide) Health Support Battalions, 130th & 145th Signals Squadrons (Sydney), Deployed Forces Support Unit (Sydney), Force Support Group HQ (Sydney), 1st Psychology Unit (Sydney), 1st Petroleum Company (Oakley South, Vic), and 3rd Recovery Company (Dandenong, Vic), a logistics support force workshop and Ships Army Detachments on HMAS *Tobruk* and the two LPA vessels.

2nd Division (reserve)

The 2nd Division commands all those Reserve units not integrated into other formations. It is structured around six infantry brigades, each of which has a HQ, two or three infantry battalions, an armoured reconnaissance unit and combat and logistics support units. These are; 4th Brigade in Melbourne, 5th & 8th Brigades in Sydney, 9th Brigade in Adelaide and Hobart, 11th Brigade in Townsville, and 13th Brigade in Perth.

6th Brigade (intelligence, surveillance, target recognition and reconnaissance)

Headquartered at Victoria Barracks in Sydney, the 6th Brigade commands a diverse collection of units including: 1st Ground Liaison Group, 1st Intelligence Battalion (Sydney), 16th Air Defence Regiment in South Australia equipped with the Swedish RBS 70 shoulder launched, optically guided, surface-to-air missile, 19th Chief Engineer Works (Sydney), 20th Surveillance and Target Acquisition Regiment (Brisbane), 7th Signals Regiment - Electronic Warfare (Carbalah, Qld), 6th Engineer Support Regiment, 2/30 Training Group (Butterworth, Malaysia), and the 21st Construction Regiment (HQ in Sydney) comprising 17th Construction Squadron (Sydney), 21st Construction Squadron (Brisbane) and 1st Topographical Survey Squadron (Enoggera, Qld).

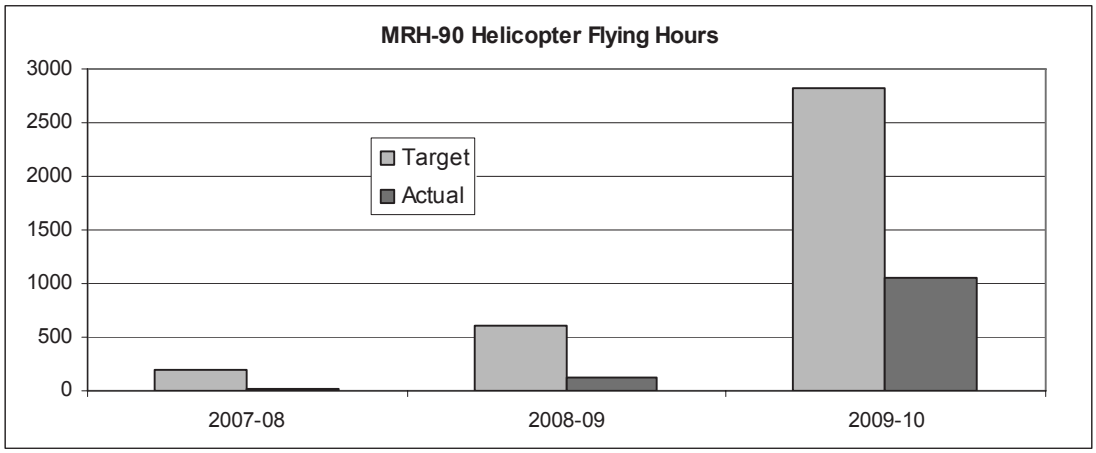
6th Brigade also includes three regional surveillance units predominately manned by reserve personnel. These are: *51st Battalion Far North Queensland Regiment* (Cairns, Qld.) responsible for conducting reconnaissance and surveillance over 640,000 square km in Far North Queensland and the Gulf country; The West Australian based *Pilbara Regiment* (Karratha, WA) with 1.3 million square km to cover from the Kimberley boundary in the north, to Shark Bay in the south, then east to the NT/SA/WA border; and *North West Mobile Force (NORFORCE)* (Darwin) which covers the Northern Territory and the Kimberly region of northern Western Australia, an area of operations covering nearly one quarter of Australia's land mass—1.8 million square kilometres.

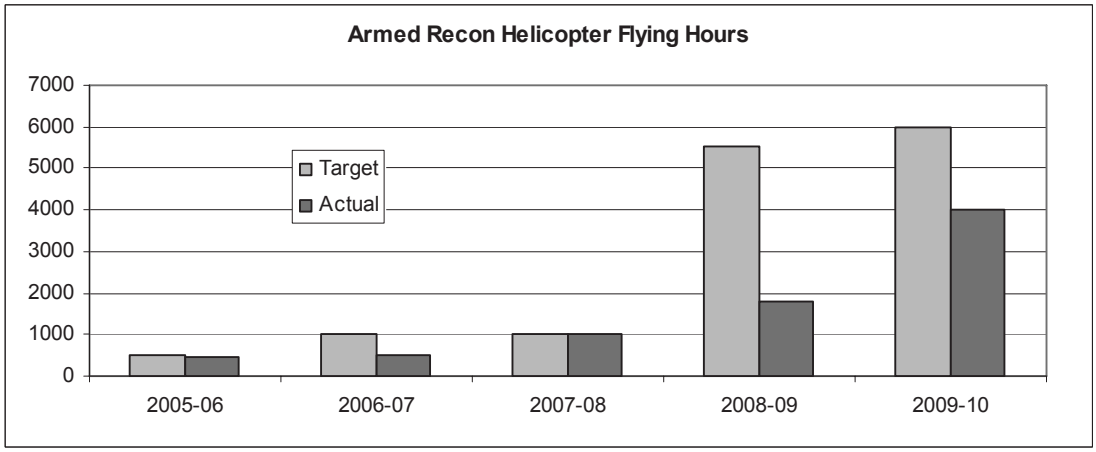
16th Brigade (army aviation)

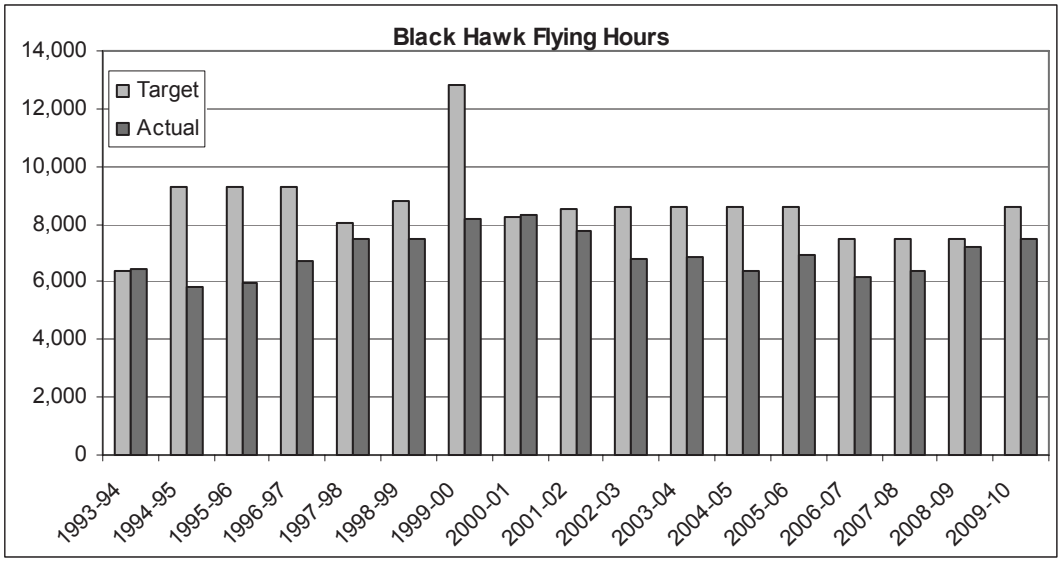
Army aviation is based around 16th Brigade that commands the 1st and 5th Aviation Regiments, which have components in Oakey and Townsville in Queensland, Darwin, Northern Territory, and Sydney, New South Wales. The force structure includes:

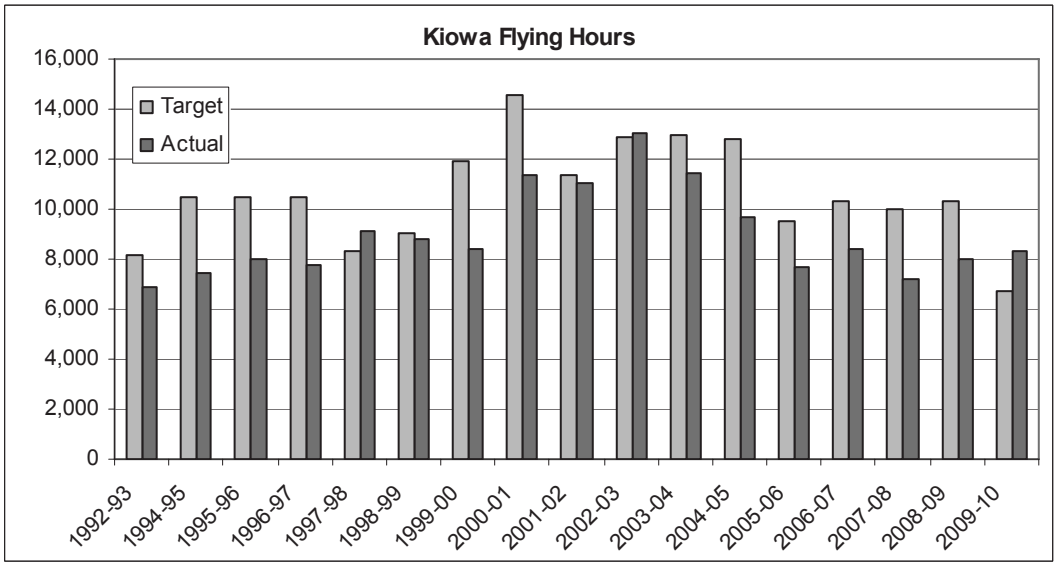
- thirty-four 1970s-designed *Black Hawk* troop-lift helicopters
- forty-one 1970s-designed *Kiowa* light observation & training helicopters
- six 1960s-designed *Chinook* medium lift helicopters. All these helicopters are of US design
- twenty-two of an eventual fleet of twenty-four European-designed *Tiger* Armed Reconnaissance Helicopters (ARH) are now flying
- fifteen of an eventual forty MRH-90 troop-lift helicopters
- three *Super King* Air fixed wing aircraft are used for surveillance and command & control support.

The now-retired *Iroquois* fleet and the *Black Hawk* aircraft are being replaced by forty MRH-90 troop-lift helicopters (from 2011). Although the aircraft have met their planned 'in-service-date' of 2007, an initial operational capability is not expected until 2010 for Navy and late 2011 for Army. These aircraft will be configured to operate from the Navy's LPA and future LHD vessels






Black Hawk Flying Hours
Target
Actual
14,000
12,000
10,000
8,000
6,000
4,000
2,000
0
1993-94
1994-95
1995-96
1996-97
1997-98
1998-99
1999-00
2000-01
2001-02
2002-03
2003-04
2004-05
2005-06
2006-07
2007-08
2008-09
2009-10


Kiowa Flying Hours
Target
Actual
16,000
14,000
12,000
10,000
8,000
6,000
4,000
2,000
0
1992-93
1994-95
1995-96
1996-97
1997-98
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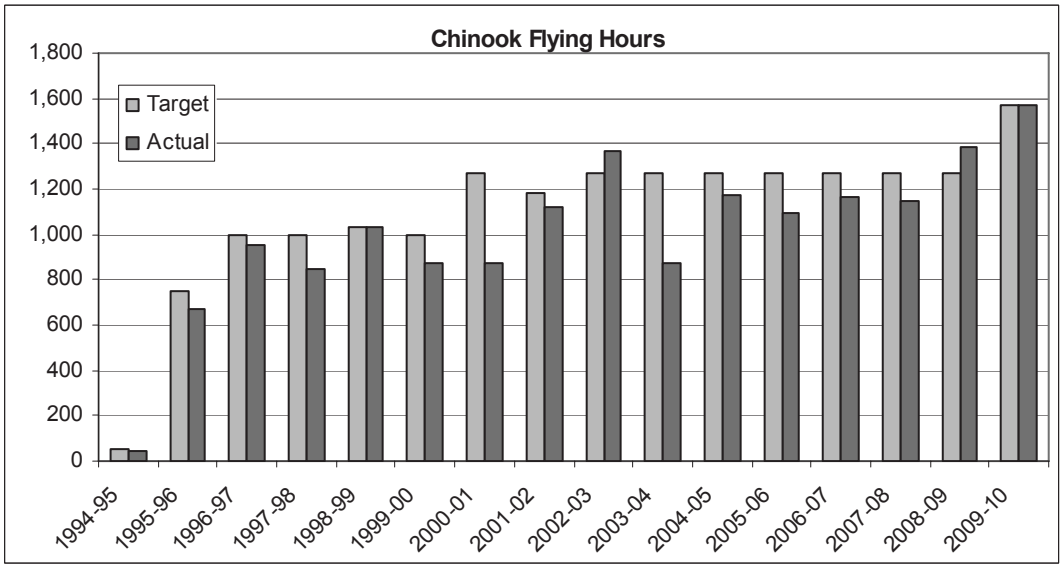
2001-02
2002-03
2003-04
2004-05
2005-06
2006-07
2007-08
2008-09
2009-10


Chinook Flying Hours
Target
Actual
1,800
1,600
1,400
1,200
1,000
800
600
400
200
0
1994-95
1995-96
1996-97
1997-98
1998-99
1999-00
2000-01
2001-02
2002-03
2003-04
2004-05
2005-06
2006-07
2007-08
2008-09
2009-10

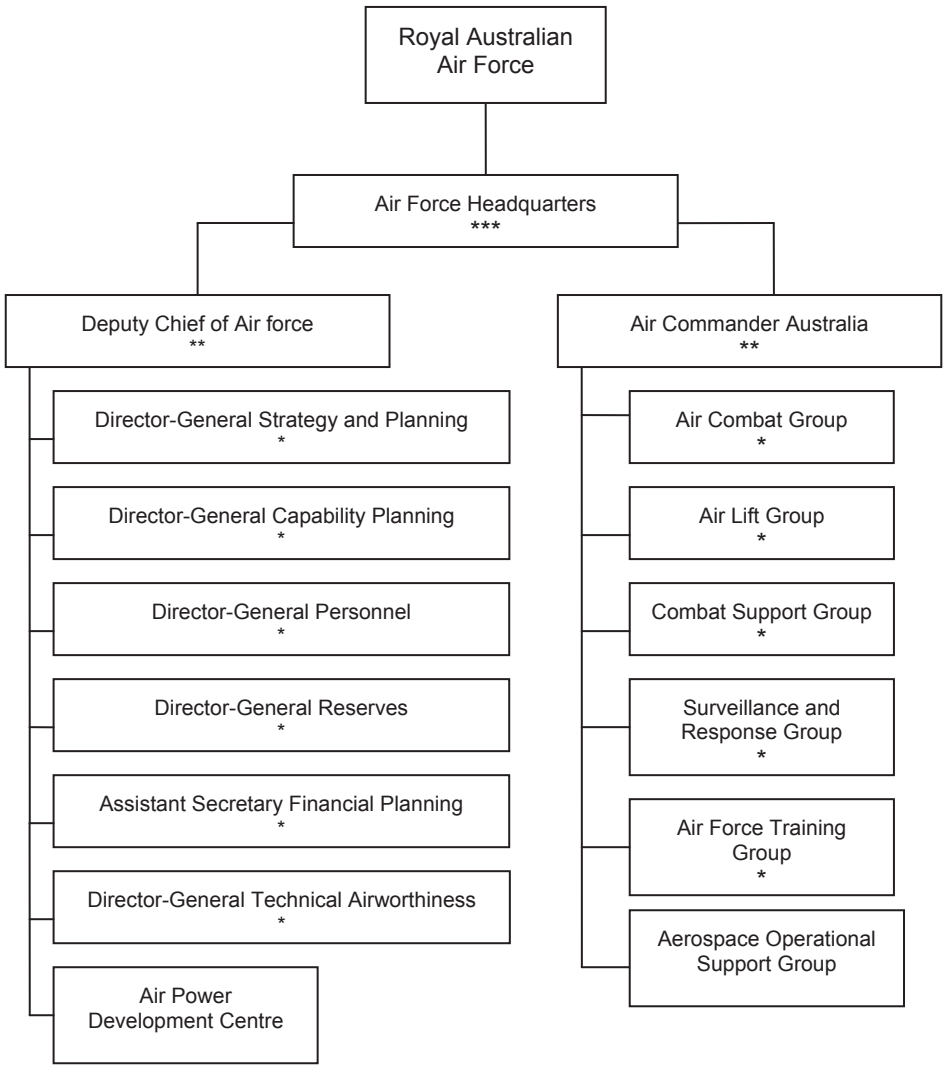
Program 1.4 – Air Force Capabilities

Program expenses 2010-11: $3,724 million

Of the three military services, the Air Force has the leanest and most streamlined organisational structure. The organisation is split into two parts. Corporate planning and administration occurs under the direction of the Deputy Chief of Air Force while Air Commander Australia takes care of six training, support and flying groups.

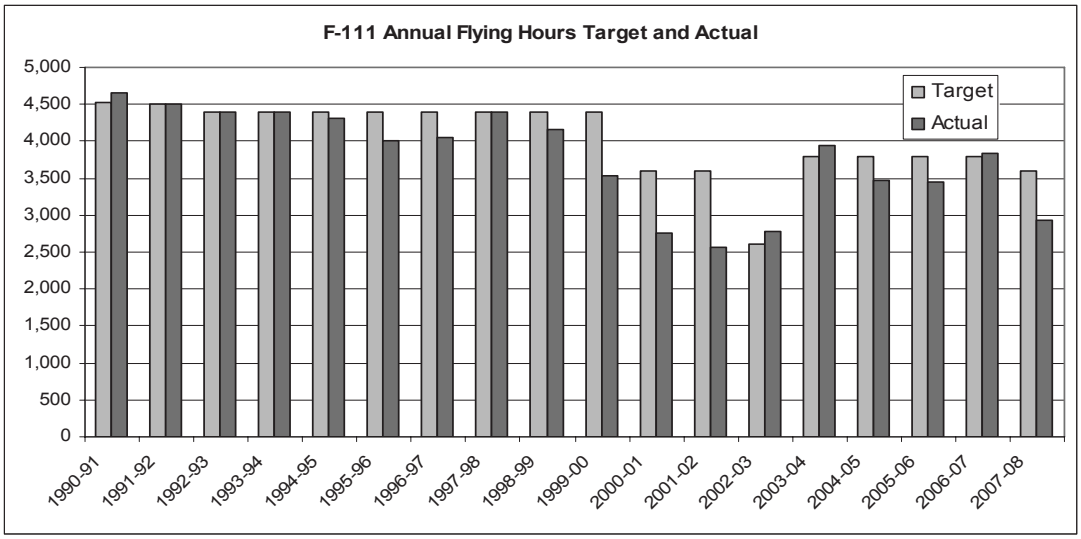
At the present moment, Air Force is introducing or preparing to introduce several new fleets of aircraft into service. These include the six new *Wedgetail* Airborne Early Warning and Control Aircraft (AEW&C), five replacement Air-to-Air Refuelling (AAR) aircraft and twenty-four *F/A-18F Super Hornet* aircraft to replace the soon to retire F-111C strike fleet. By the end of the decade, the Air Force hopes to be operating new F-35 *Lightning II* Joint Strike Fighter aircraft from the United States.

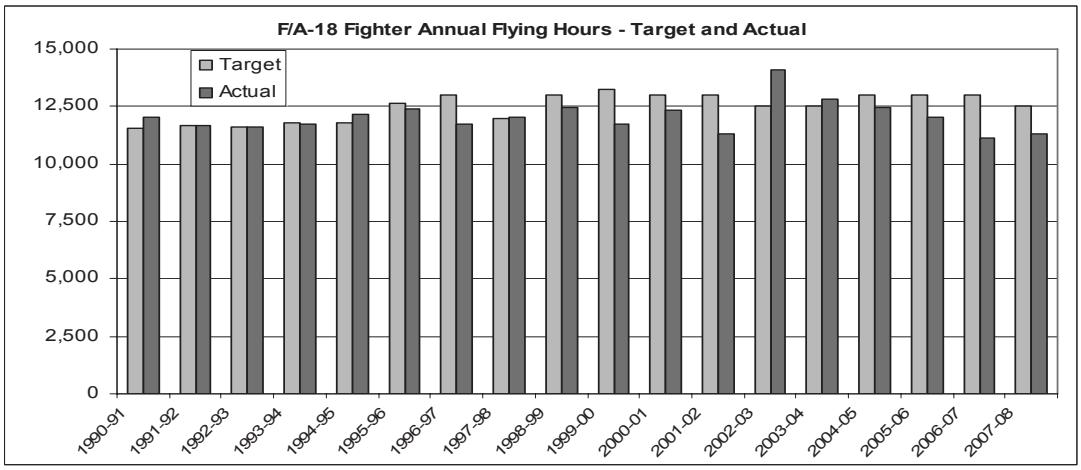
The current Air Force inventory is detailed overleaf, including performance information where available.

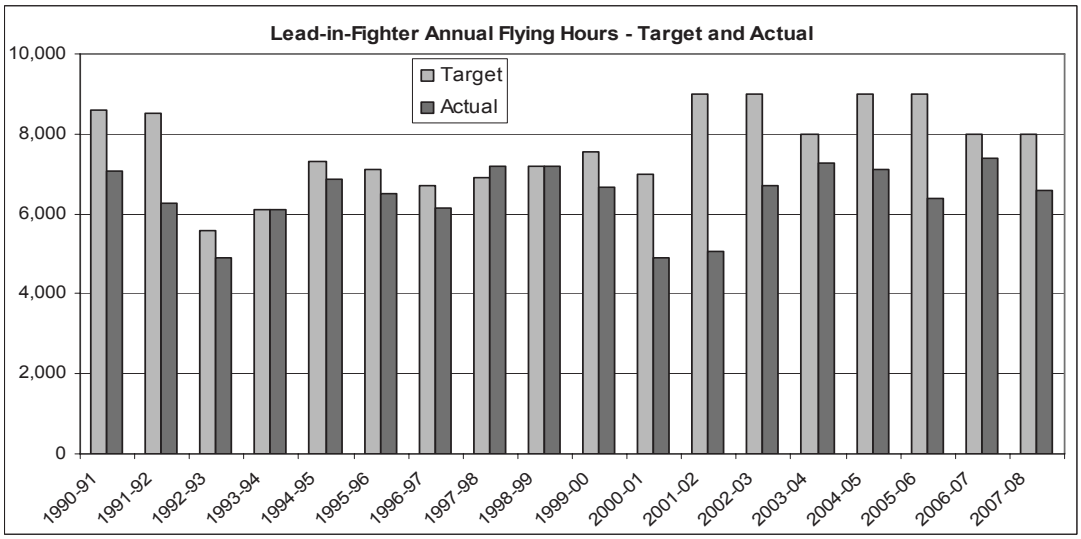


Air Combat Group

The Air Combat Group comprises fifteen F-111C strike aircraft and seventy-one F/A-18 A/B *Hornet* fighter aircraft. In addition, thirty-three *Hawk* Lead-in-Fighters (LIF) provide a training capability. Four PC-9(F) forward air control aircraft are used to designate ground targets. The F-111C fleet is due to retire later this year and be replaced by twenty-four 'interim' F/A-18 F *Super Hornets*.

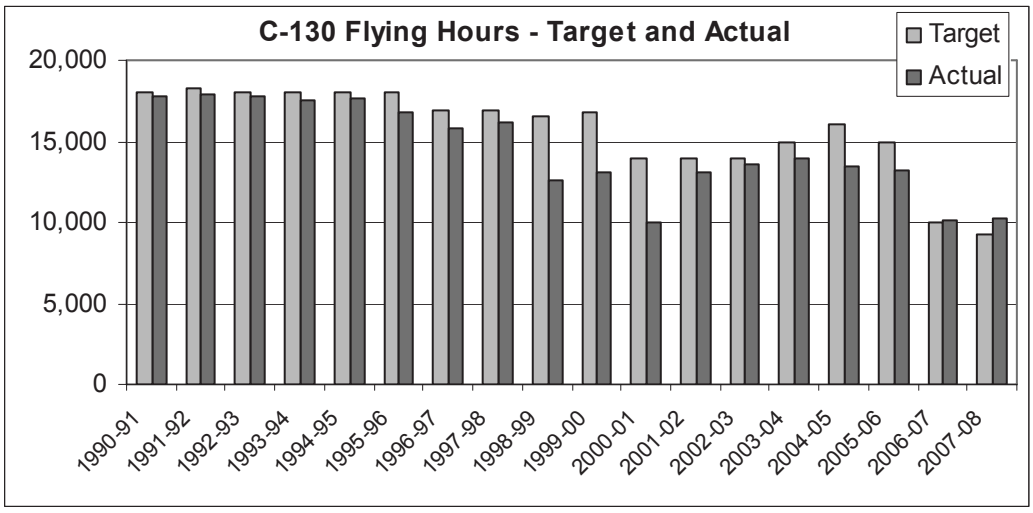


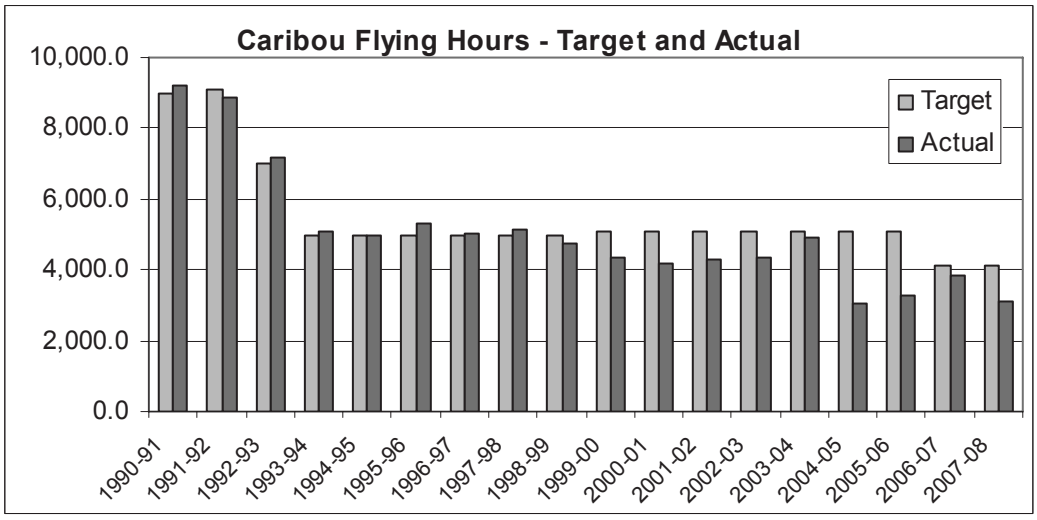


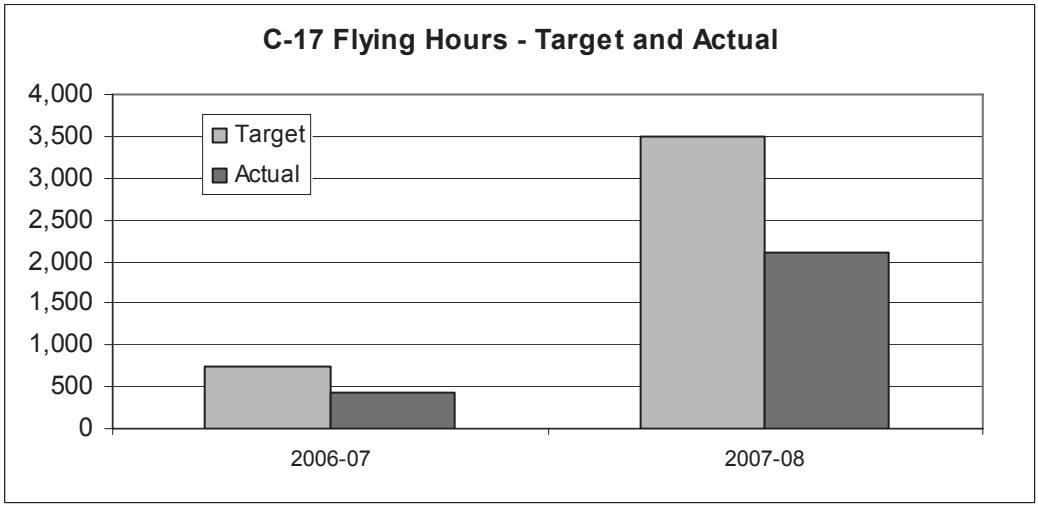


Airlift Group

The Air Force has twelve C-130J *Hercules* and twelve C-130H *Hercules* transport aircraft which are also capable of parachute operations and medical evacuation. The recent acquisition of four Boeing C-17 *Globemaster IIIs* provides the capability to transport large and heavy loads over long ranges. In addition, two Boeing 737 BBJ and three CL604 *Challenger* aircraft provide VIP transport for the government. The remaining fourteen DHC-4 *Caribou* tactical transport aircraft were retired in 2009.







Surveillance and Response Group

The Surveillance and Response Group comprises a diverse range of capabilities including:

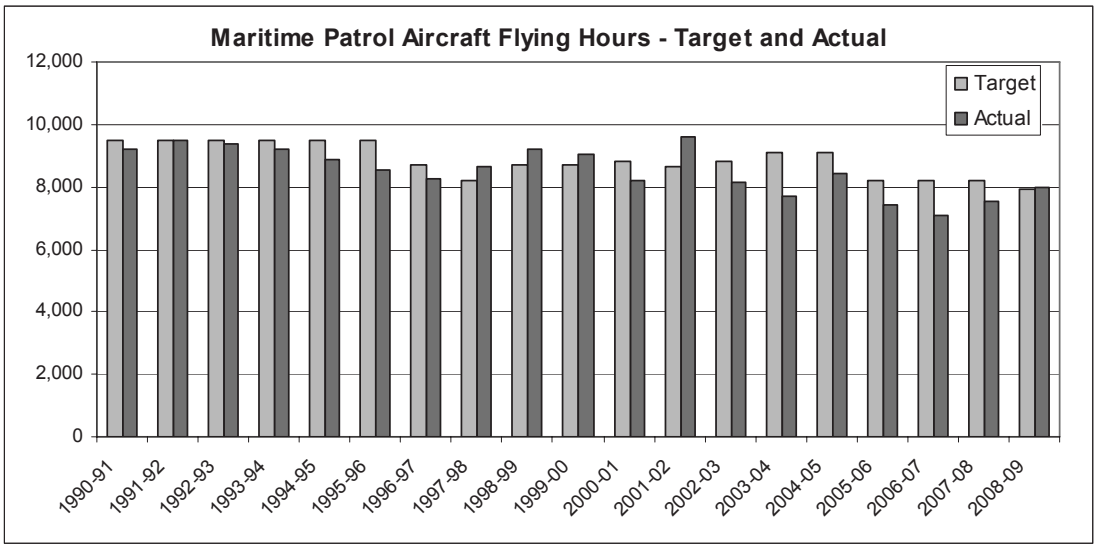
Nineteen 1970s vintage AP-3C *Orion* maritime patrol aircraft which undertake maritime patrol, maritime surveillance, reconnaissance, offensive air support, surface & sub-surface strike, and search and survivor supply. All nineteen aircraft have been upgraded to AP-3C standard through an Australian-unique upgrade program.

Ten Air Traffic Radars, including nine fixed radar and one mobile for the control of ADF air traffic.

Four Tactical Air Defence Radars: ground based radar to detect hostile and own aircraft.

The JORN Over-the-Horizon-Radar network, including radar sites in Laverton WA and Longreach Qld, and seventeen coastal beacons in the north of Australia and Christmas Island. The network is run from the Jindalee Operational Radar Network Correlation Centre in Edinburgh, SA, and can detect both sea and air-borne moving objects. The Jindalee facility Alice Springs serves a research and development function. JORN is operated by No. 1 Radar Surveillance Unit.

Six *Wedgetail* AEW&C aircraft based on Boeing *737-700* platform whose entry into service has been delayed by more than four years due to technical problems



Aerospace Operational Support Group

The Aerospace Operational Support Wing provides a range of technical support to the ADF in general and the Air Force in particular. Key components of the Group include:

Information Warfare Wing provides electronic warfare support and advice, aeronautical information, operational and tactical targeting information, and an information warfare capability in support of air operations.

Air Systems Development and Test Wing tests and evaluates existing and new ADF aircraft and provides a range of engineering services and advice.

Institute of Aviation Medicine conducts research and training relevant to the physiological demands on ADF aircrew.

Woomera Test Facility provides an instrumented test and evaluation range for the ADF.

Combat Support Group

The Combat Support Group is the largest of the Air Forces force element groups. It provides the capability to establish and operate air operating bases from remote locations in Australia and overseas. This entails the provision of airfield communications and navigational aids, airfield engineering, aircraft loading and unloading, airfield rescue and fire services, airfield and aircraft security, health support and aero-medical evacuation crews, and catering.

Details regarding the composition of the Group are difficult to find beyond that it includes two Expeditionary Combat Support Wings and one Health Services Wing.

Air Force Training Group

The Air Force Training Group is made up of a headquarters and Air Training Wing, RAAF College and Reserve Training Wing. The headquarters of the Air Training Group is located at RAAF Base Williams – Laverton, Victoria.

Air Training Wing conducts basic and instructor air training for Air Force personnel including pilots, air crew and air traffic controllers. Basic pilot training employs PC-9/A aircraft while aircraft and navigator training occurs on B350 aircraft. Air Training Wing also includes the RAAF Roulettes, who provide fly pasts and displays, the RAAF Museum and the RAAF Balloon. The Air Training Wing is also responsible for air crew combat survival training.

RAAF College provides initial and ongoing training for non-aircrew personnel, including security, fire and ground defence, administration and logistics, technical trades, and explosive ordnance. The RAAF College also maintains the RAAF Band.

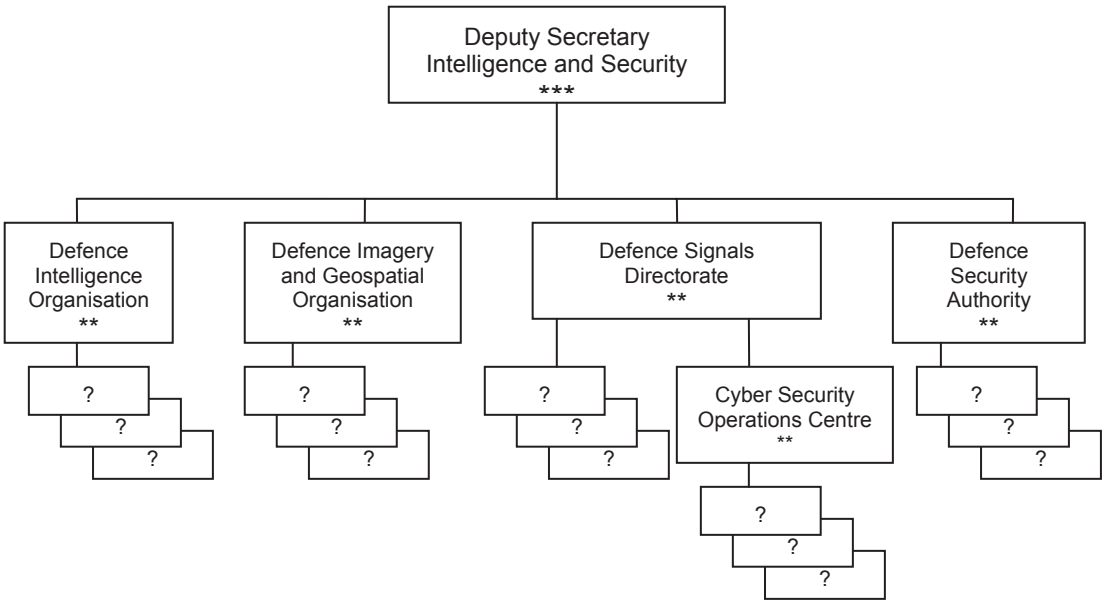
Reserve Training Wing provides ground training to Air Force Reserve members at a number of locations around Australia.

Program 1.5 – Intelligence Capabilities

Program expenses 2010-11: $582 million

Overview

The Intelligence and Security Group is responsible for a number of Defence and national intelligence capabilities and the Defence Security Authority.



Defence Intelligence Organisation (DIO) at Russell Offices in Canberra analyses information and generates intelligence. They produce reports, briefs and assessments on an ongoing basis as well as in response to emerging areas of concern. Topics range across military, economic, technical, scientific and political areas.

Defence Imagery and Geospatial Organisation (DIGO) includes a HQ at Russell Offices in Canberra and the Geospatial Information Branch in Bendigo. It acquires, processes and distributes imagery and geospatial intelligence, including maps and charts. DIGO also sets technical standards for imagery and geospatial products.

Defence Signals Directorate (DSD) collects and distributes foreign signals intelligence (and is prohibited by law from collecting domestic intelligence) and provides information security advice, products and services to the government and ADF. DSD has its HQ in Russell Offices in Canberra and maintains collection facilities at multiple locations elsewhere. The recently created Cyber Security Operations Centre is located within DSD.

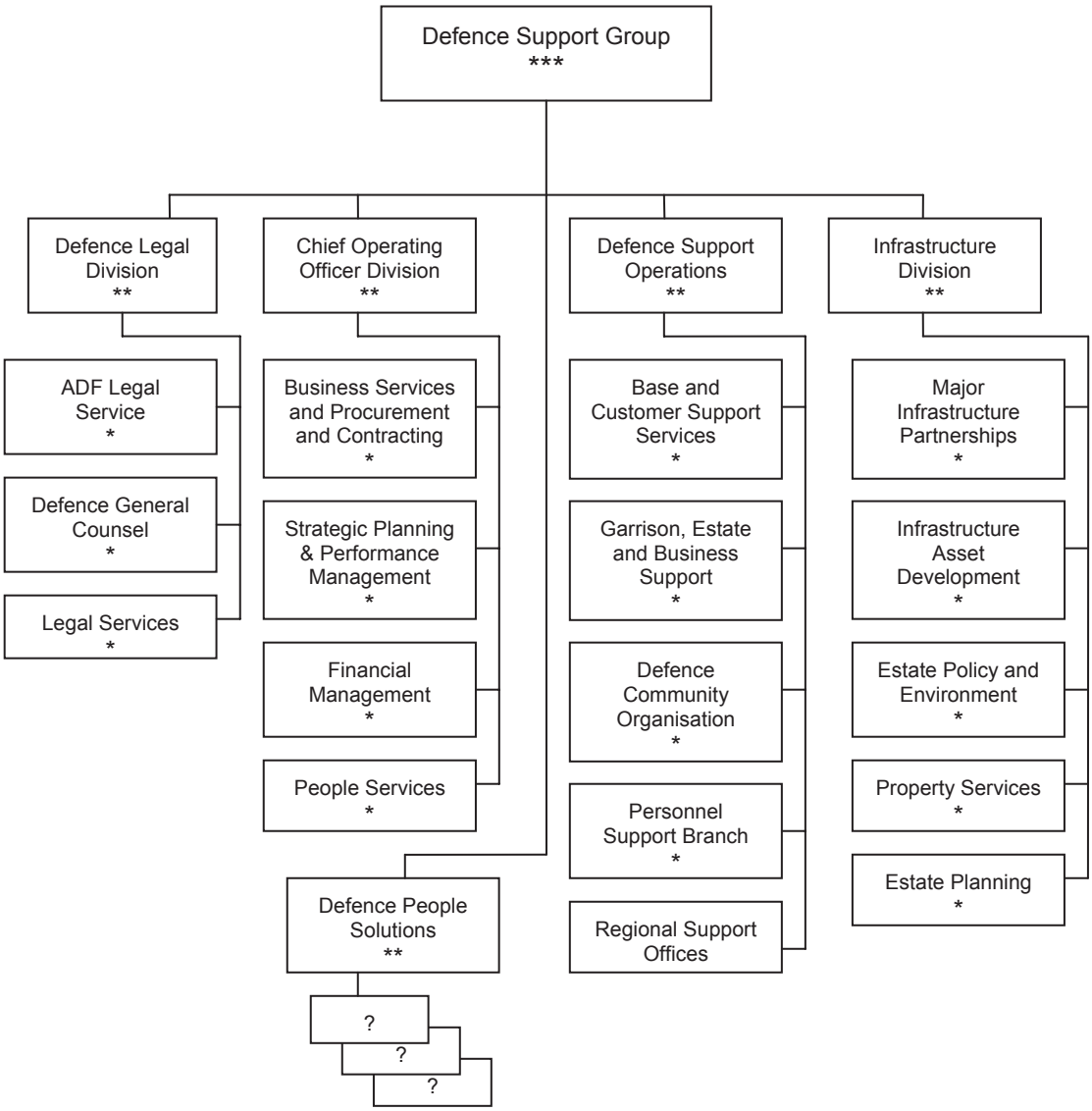
Defence intelligence collection and analysis supports ADF operations, Defence policy making (including force development) and supports wider government decision making.

The Defence Security Authority is responsible for the security of Defence assets and information, including the vetting of personnel for access to classified information.

Program 1.6 – Defence Support

Program expenses 2010-11: $3,792 million

The Defence Support Group provides a range of administrative, garrison, legal, personnel and estate services to Defence. The Group is divided into six divisions. Infrastructure Division plans, builds and upgrades the Defence estate. Defence Support Operations Division delivers facilities maintenance and garrison support, including grounds maintenance, hospitality, training area management, base security, transport, air support and fire-fighting and rescue services. Defence Legal Division provides legal services and advice to Defence. Defence People Solutions is responsible a range of personnel-related services including OH&S programs, rehabilitation management and the Defence Work Experience program.



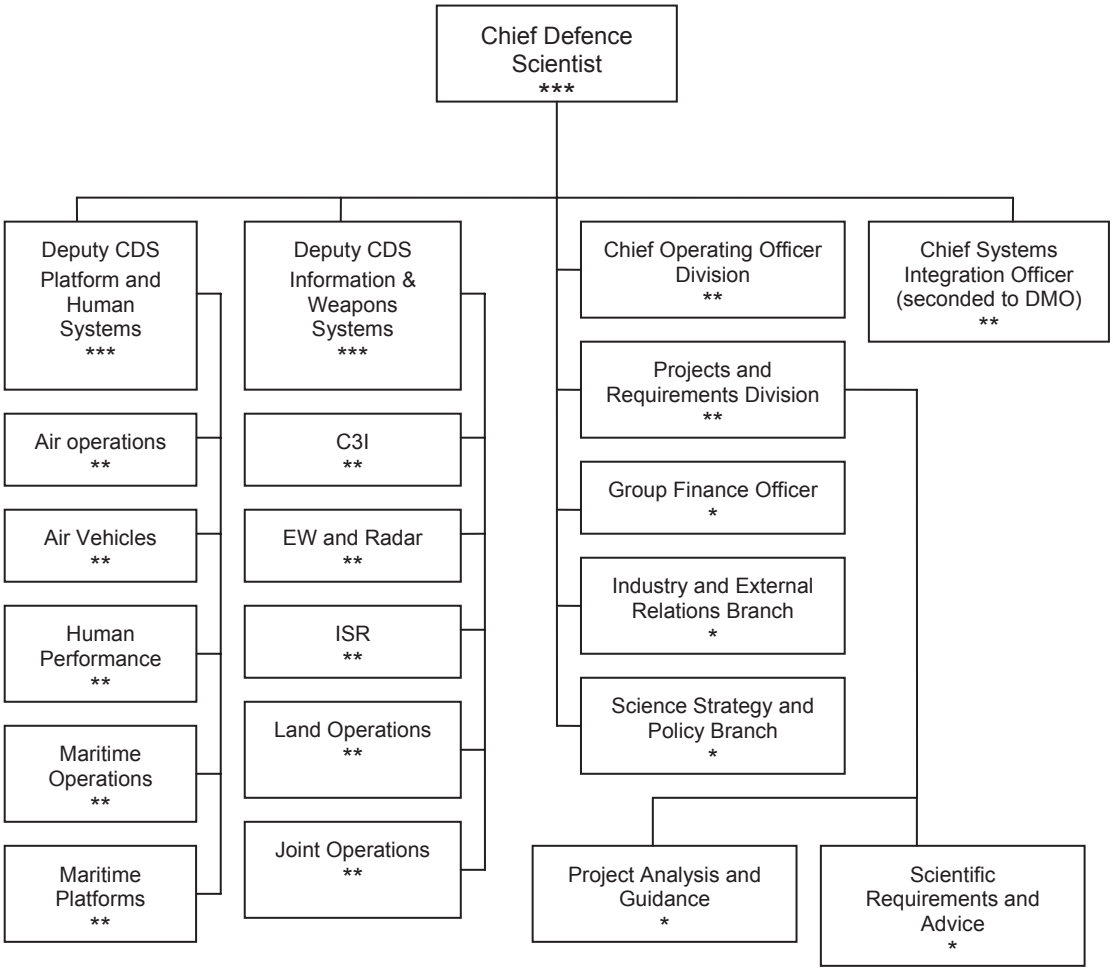
Program 1.7 – Defence Science & Technology

Program expenses 2010-11: $436 million

The Defence Science and Technology Organisation (DSTO) provides scientific and technical advice and support to the ADF. The main body of the organisation is divided into two parts Platform and Human Systems and Information and Weapons Systems – each under the control of a Deputy Chief Defence Scientist (equivalent to a Deputy Secretary). Within each of these two groups are a number of divisions each led by a Chief of Division (equivalent to a First Assistant Secretary or in one case a Deputy Secretary).

Below the level of Chief of Division it is difficult to outline the organisational structure because branch level entities in DSTO are led by nominally Executive Level 2 officers that are not accounted for in the reckoning of the Senior Executive Service (despite being paid the same salary as SES-1 officers).

Scientific Advisors are out-posted from DSTO to the Army, Navy, Air Force, Capability Development Group, Defence Materiel Organisation, Vice Chief of the Defence Force and Intelligence and Chief Information Officer Groups.



Program 1.8 – Chief Information Officer

Program expenses 2010-11: $832 million

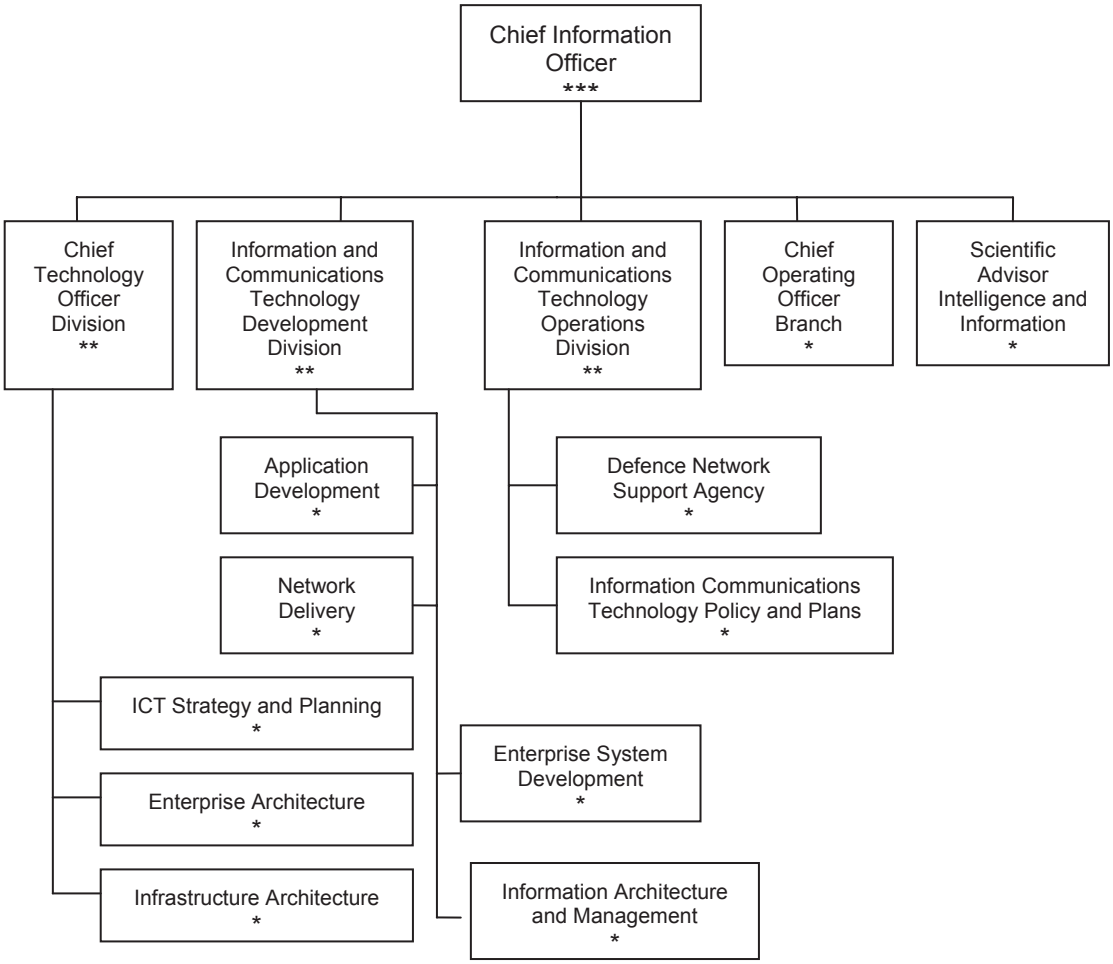
The Chief Information Officer Group is responsible for providing Information and Communications Technology (ICT) to Defence. The bulk of the Group resides in three divisions.

Chief Technology Officer Division develops and documents Defence's ICT architecture, identifies relevant systems and defines ICT standards for Defence.

Information and Communications Technology Development Division designs and develops Defence information infrastructure.

Information and Communications Technology Operations Division delivers and supports the Defence Information Environment.

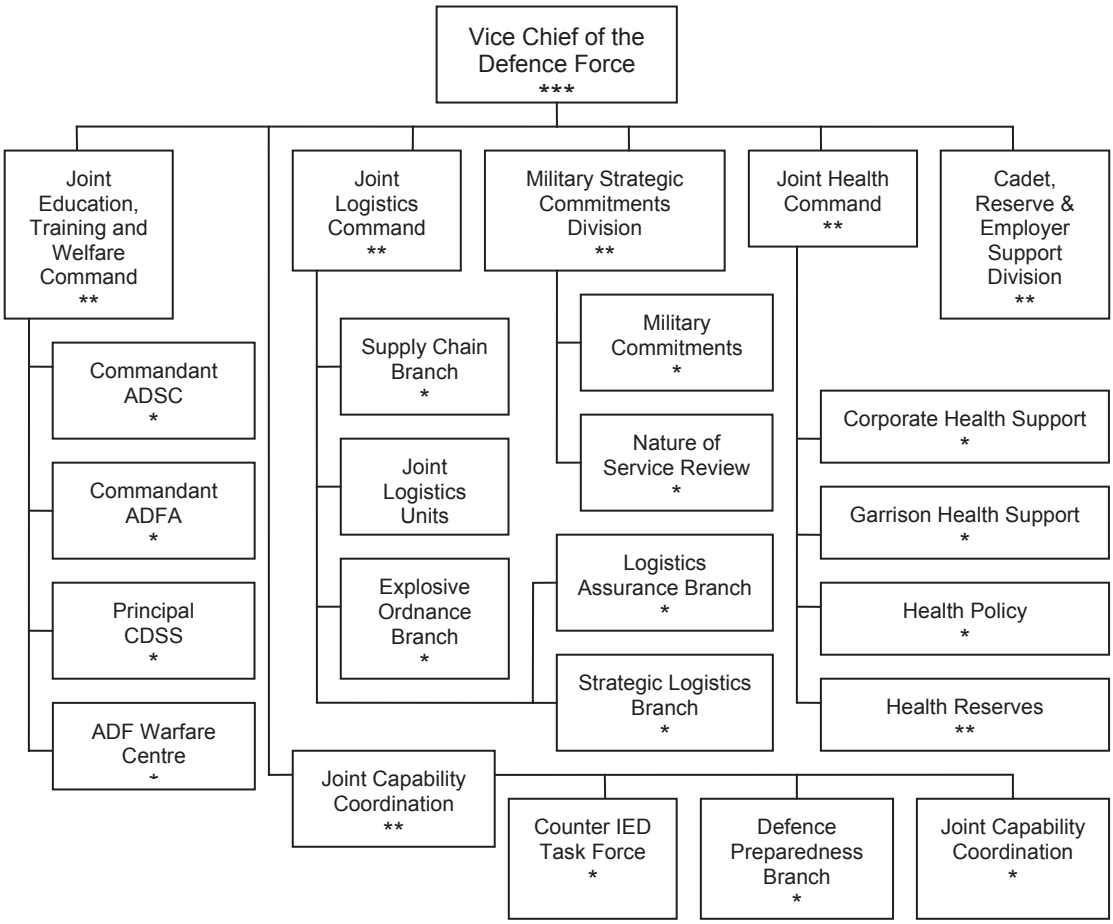
In addition to the three core divisions in the Group, the Chief Operating Officer Branch manages financial, governance and administrative matters.



Program 1.9 – Vice Chief of the Defence Force

Program Expenses 2010-11: $849 million

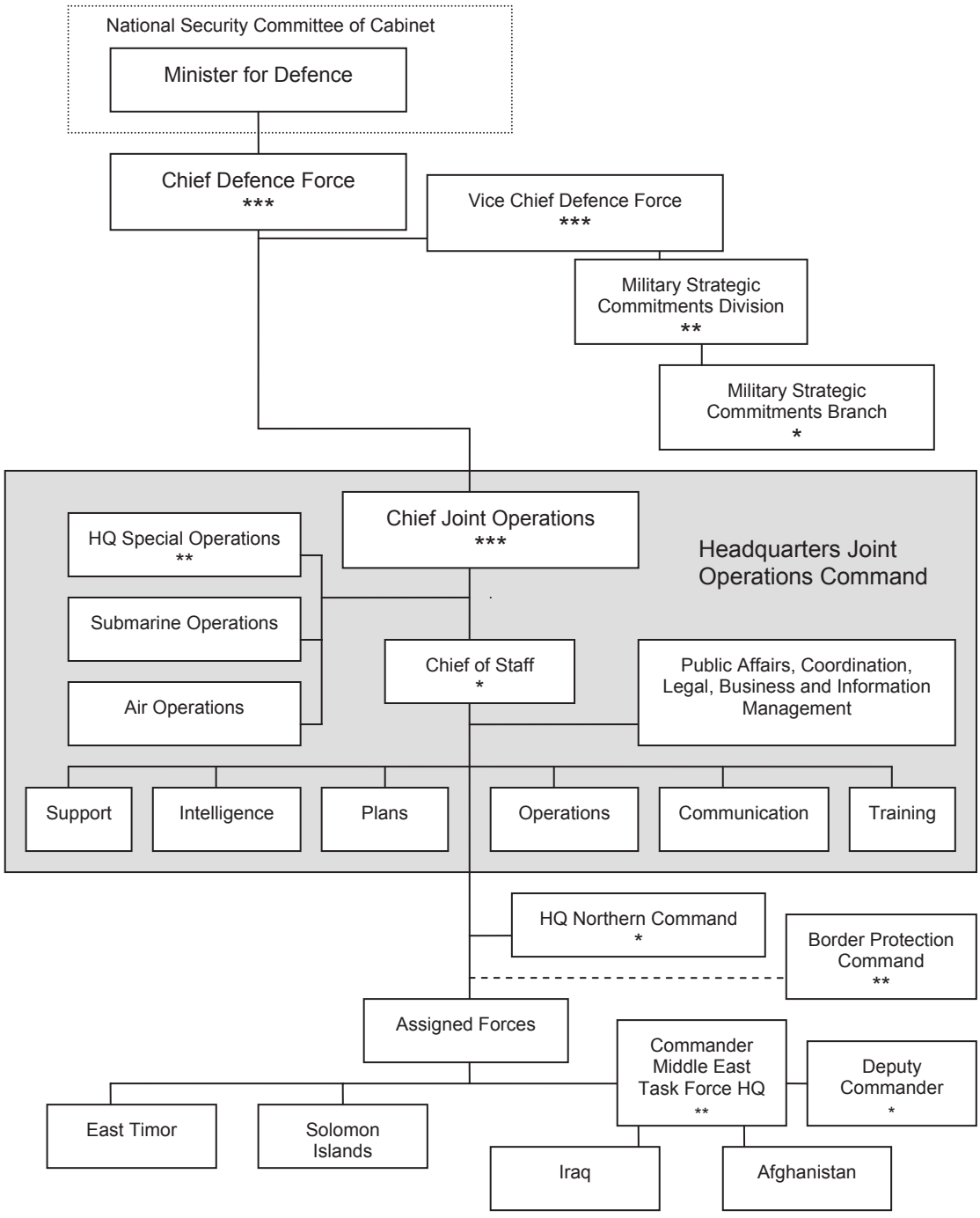
The Vice Chief of the Defence Force (VCDF) is the military deputy to the CDF. In addition, the VCDF is responsible for the following: Joint Education, Training and Warfare Command delivers joint professional military education and individual joint warfare training. This is achieved through the Australian Defence Force Warfare Centre and the Australian Defence College (comprising the Centre for Defence and Strategic Studies, the Australian Command and Staff College and the Australian Defence Force Academy). Joint Logistics Command coordinates peacetime and operational logistics for the ADF including management of warehouses, maintenance, and distribution facilities. This does not include the extensive range of materiel maintenance provided by the DMO. Military Strategic Commitments Division provides strategic management and situational awareness of potential and current ADF operations. This includes providing joint military strategic input for engagement with government, other agencies, allies and coalition partners. Reserve and Employer Support Division works 'to enhance the capacity of Defence Reserves to support ADF capability', including by advising the CDF on Reserve policy matters. Joint Health Command delivers garrison healthcare to the ADF and exercises technical control through the Surgeon General Australian Defence Force. Joint Capability Coordination Division manages ADF preparedness and joint capability coordination.



Program 1.10 – Joint Operations Command

Program expenses 2010-11: $29 million

Joint Operations Command (JOC) commands ADF operations on behalf of the Chief of the Defence Force. Located in a purpose built command facility in Bungendore NSW, JOC is assigned force for operations from the three Services. The total ADF command arrangement is outlined below. At present, there are around 3,300 ADF personnel deployed on operations and somewhere around 1,000 personnel involved in planning, advising and commanding operations, of which around 750 reside in JOC.



Program 1.11 – Capability Development

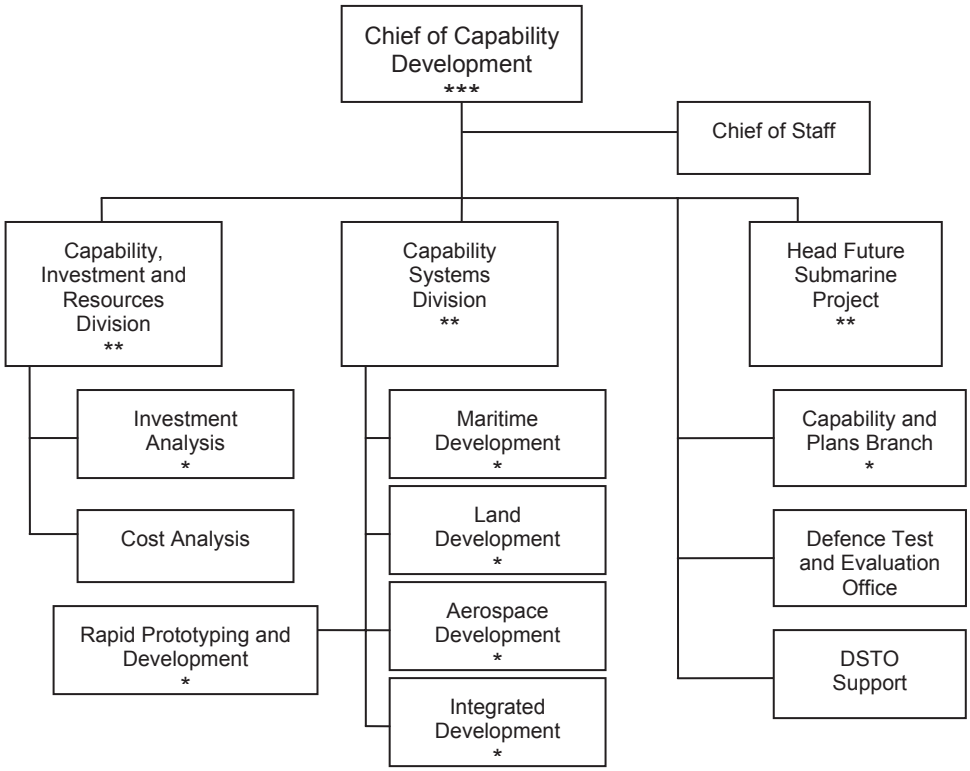
Program expenses 2010-11: $942 million

The Capability Development Group prepares new capability development proposals for government consideration. Two divisions, Capability Systems and Capability Investment and Resources, constitute the core of the Group. Three other elements within the Group are Capability and Plans Branch, the Australian Defence Test & Evaluation Office and a DSTO support cell.

Capability Systems Division is a largely military organisation which develops capability development options for government approval. It is divided four branches; three environmentally-based (land, sea and air), and one dealing with integrated capabilities that cross environmental lines. Another element is the Rapid Prototyping and Development Organisation, which works with industry and academe to develop capability solutions for the ADF.

Capability Investment and Resources Division is a largely civlian organisation that independently analyses and reviews capability proposals. It is made up of one core branch, Investment Analysis, and a costing cell.

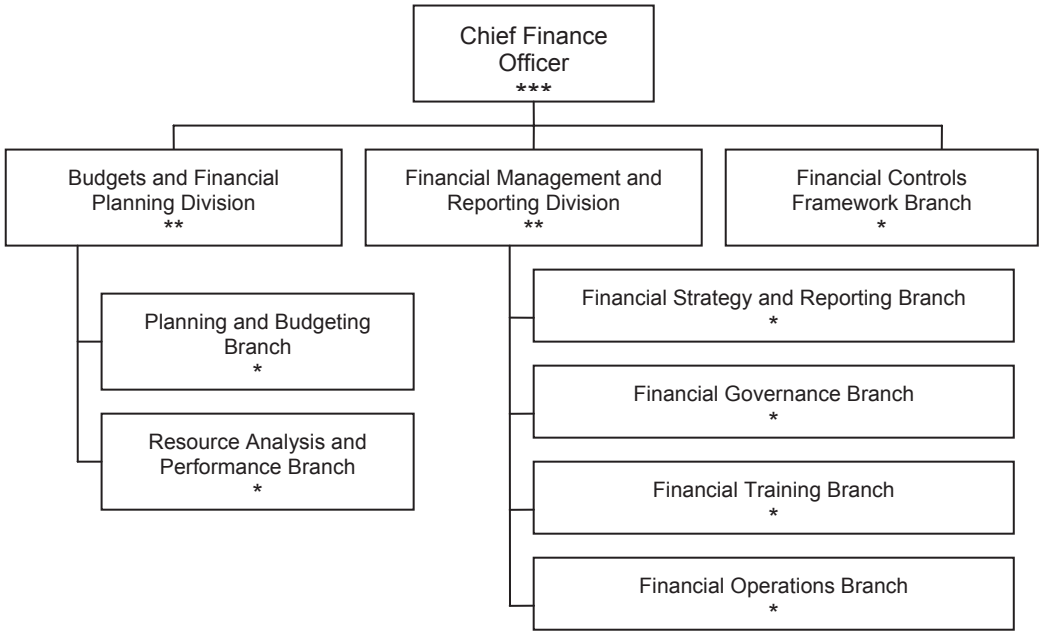
In 2010, the Head of the Future Submarine Project transferred from the DMO to the Chief of Capability Development Group.



Program 1.12 – Chief Finance Officer

Program expenses 2010-11: $410 million

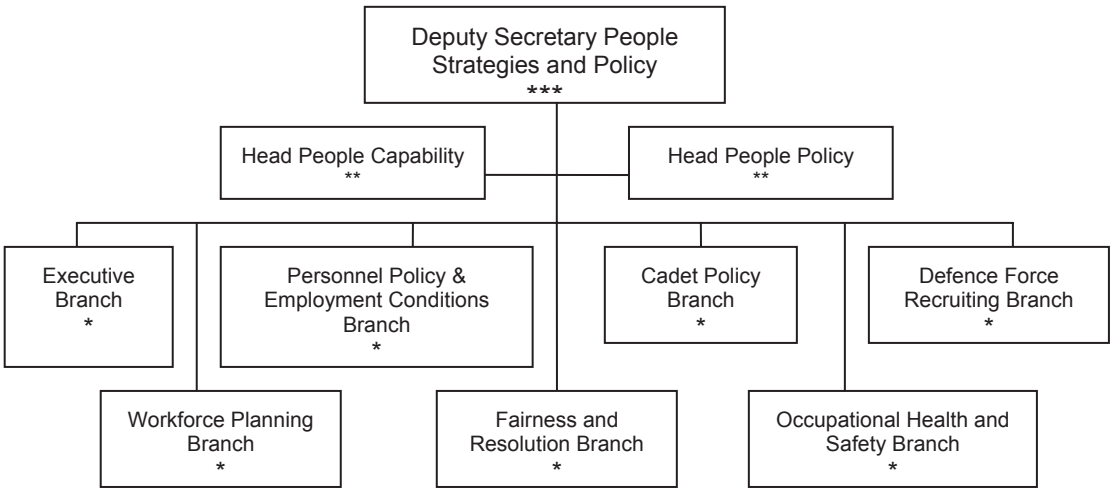
The Chief Finance Officer Group is responsible for Defence's financial planning, budgeting and reporting.



Program 1.13– People Strategies and Policy

Program expenses 2010-11: $357 million

The People Strategies and Policy Group formulates personnel policy for the ADF and Defence civilian workforces. Apart from Defence Force Recruiting and Fairness and Resolution Branches, the actual delivery of personnel services is the responsibility of other entities, especially the Defence Support Group.



Program 2.1 – Ops in the immediate neighbourhood

Program expenses 2010-11: $212 million

- Op *Gateway*: Indian Ocean and South China Sea maritime patrols (since 1981)
- Op *Anode*: Support coalition police forces in Solomon Islands (since 2003)
- Op *Astute*: Security support for the Government of East Timor and UN mission (since 2006)
- Op *Tower*: Contribute to UN Integrated Mission in East Timor (since 2006)

Program 2.2 – Ops supporting wider interests

Program expenses 2010-11: $1,360 million

- Op *Paladin*: Contribute to the UN Truce Supervisory Mission in the Middle East (since 1956)
- Op *Mazurka*: Contribute to Multinational Force and Observers in the Sinai (since 1982)
- Op *Slipper*: Contribute to ISAF in Afghanistan (since 2001)
- Op *Azure*: Contribute to UN Mission in Sudan (since 2005)
- Op *Palate II*: Liaison Officer to UN Mission in Afghanistan (since 2005)
- Op *Hedgerow*: Contribute to UN-AU Mission in Darfur (since 2008)
- Op *Riverbank*: Contribute to UN Mission in Iraq (since 2008)
- Op *Kruger*: Security support to AS diplomatic mission in Iraq (since 2009)

Program 3.1 – National support tasks

Program expenses 2010-11: $15 million

- Op *Solania*: Conduct South west Pacific maritime patrols (since 1988)
- Op *Resolute*: Contribute to whole-of-government maritime enforcement effort (since 2006)

Defence's contribution to national support tasks ranges from the ongoing routine allocation of Patrol Boat and AP-3C Maritime Patrol Aircraft time, to the allocation of specific capabilities at short notice in a national support emergency. National support tasks include security, ceremonial, civil maritime surveillance, search and rescue, bush fire response and support to the Army / ATSIC community assistance program.

2.7: Explanatory Tables and Budgeted Financial Statements [PBS Section 3.2.2: pp. 108 – 139]

The budgeted financial statements for Defence appear in Section 3.2.2 of the PBS. Once again consolidated financial statements for Defence and DMO have been included.

2.8: Defence Materiel Organisation PBS [Defence Materiel Organisation PBS: pp. 141 – 202]

On 1 July 2005 DMO became a prescribed agency under the *Financial Management and Accountability Act 1997*. Since then it has had its own independent part in the Defence portfolio PBS.

Overview

DMO acquires and supports equipment for Defence on a quasi-commercial basis. It is an independent entity from a financial perspective, but administratively is something of an agency within an agency (hence the PBS within a PBS).

Organisational structure

DMO contains fifteen divisions, each headed by a band-2 SES civilian or 2-star military officer, as shown in Figure 2.8.1. Over the past four years, five deputy-secretary level General Manager positions have been created to oversee clusters of divisions.

The divisions fall into three categories:

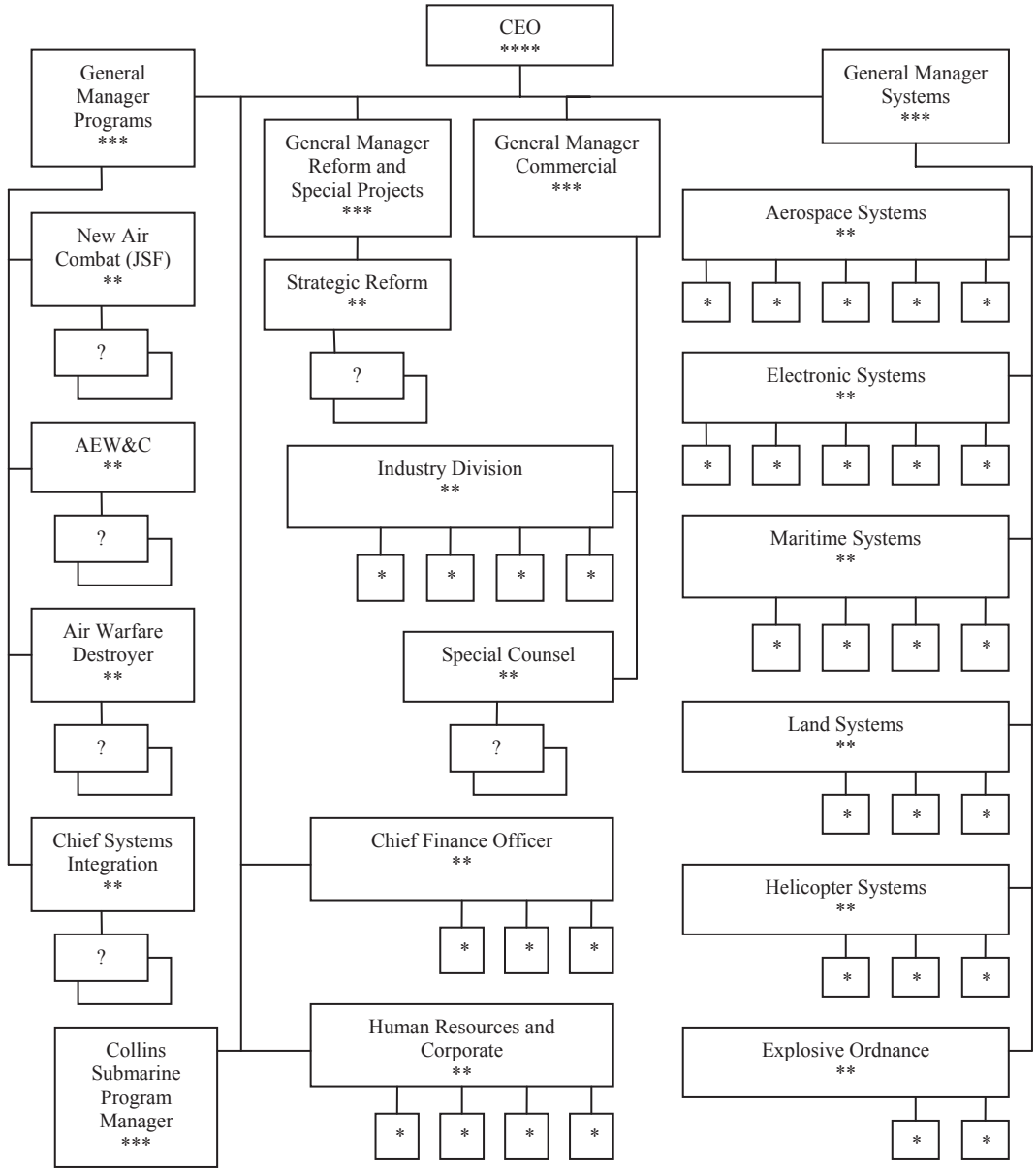
Systems divisions are set up on the traditional environmental domains of land, sea, and air, plus divisions dealing with electronics/weapons and explosives. They manage and deliver the vast bulk of the 210 major equipment acquisition projects (and more than 150 minor acquisition projects) that DMO is responsible for, and take care of the materiel support of existing capabilities—some 100 major fleet groupings—across all domains.

Programs divisions acquire high profile capabilities of strategic significance. That is, if a project is big, important (and politically sensitive) enough it gets it own dedicated division. At the moment there are three such programs: Air Warfare Destroyer, AEW&C and New Air Combat Capability (Joint Strike Fighter). In addition, there is a fifth division headed by the Chief of Systems Integration. The new submarine project used to have its own program but this has been taken away from DMO. A two-star officer still oversees the new submarine program from (probably) within Capability Development Group.

Four *'Corporate'* divisions provide corporate services, including those of Human Resource Management and Corporate Services, Chief Financial Officer, Special Counsel (legal) and Acquisition and Sustainment Reform. Two of these divisions report directly to the CEO, one to General Manager Commercial (along with an Industry Division) and one to General Manager Reform and Special Projects.

The fifth General Manager oversees the *Collins* Submarine Program.

Figure 2.8.1 DMO organisational structure



Source: 2010-11 PBS and online government directory

A prescribed agency

The September 2003 report from the Defence Procurement Review (known usually as the Kinnaird Review) recommended a number of changes to Defence and DMO. Key among them was to establish DMO as a separate executive agency. After consideration, the government decided to take the lesser step of making DMO a 'prescribed agency', which delivers a high degree of financial autonomy but does not provide the level of accountability or transparency intended by the Kinnaird or subsequent Mortimer reviews.

As a prescribed agency, the CEO of DMO is accountable directly to the Minister for Defence for financial matters, hence the need for separate financial statements and budgets. On other matters, DMO still remains close to Defence from an administrative

perspective; the CEO being accountable to the Chief of the Defence Force through the *Defence Act 1903* and to the Secretary through the *Public Service Act 1999*.

Resources for 2010-11 [PBS p. 151–154]

DMO will incur expenses of $11.54 billion in 2010-11. Sources of funding to cover these expenses include:

Departmental Appropriation from government to pay for policy advice and management services. In 2010-11, this will be $899.6 million.

Revenues from Defence in payment for acquisition and sustainment services from Defence. In 2010-11 this totals $10,537 million.

Drawdown of special account: -$6.3 million of unspent funds from prior years will be spent in 2010-11 by running down the residual in the DMO special account.

Non-appropriation receipts including things like the disposal of commercial vehicles and payments from foreign forces for materiel services provided. In 2010-11 this will amount to $54.7 million, this would be called own-source revenues in Defence.

Because DMO presents its resourcing differently to Defence, we have reconstructed how the expenses are resourced as best as we can in Table 2.8.1, the residual difference is likely an accrual factor we have been unable to track down.

Table 2.8.1: DMO funding 2010-11 ($ '000s)

Funding from government		
Sustainment	4,699,00	Table 9, p. 20
Acquisition	5,837,800	Table 9, p. 20
subtotal	**10,536,800**	Table 9, p. 20
Departmental Appropriation	899,607	Table 62, p. 147
Drawdown of special account in 2010-11	-6,390	Table 73, p. 194
Non-appropriation receipts	54,681	Table 62, p. 147
Total	**11,484,698**	
Cost of DMO Outcome	**11,535,265**	Figure 5, p. 151
Difference	**- 50,567**	
Expenses not requiring funding	44,213	Table 66, p. 154
Funding gap	**6,354**	

Source: 2010-11 PBS

DMO Special Account

Unspent funds have accumulated in the DMO Special Account in recent years. Table 2.8.2 calculates the net money deposited and withdrawn from the account since 2005-06. In effect, the residual in the Special Account represents working capital, and an element of delayed spending that is not disclosed in Defence's accounts.

Table 2.8.2: DMO Special Account movements ($ '000s)

	Opening balance	Closing balance	Net change
2005-06	0	167,205	167,205
2006-07	167,205	542,852	375,647
2007-08	542,852	987,862	445,010
2008-09	987,862	269,296	-718,566
2009-10	269,296	505,434	236,138
2010-11	505,434	511,824	6,390

Source: 2010-10 PBS and various DAR

Purchaser-provider arrangements

Central to the resourcing framework for DMO are purchaser-provider arrangements with Defence for acquisition and sustainment services. In 2010-11, DMO will receive $5,838 million through *Materiel Acquisition Agreements* with Defence, and another $4,699 million through *Materiel Sustainment Agreements*. In addition, there are several *Shared Services Agreements* (for which no payment is made) that cover such services as payroll, accommodation, and banking services provided by Defence, and contracting policy and advice provided by the DMO. A useful breakdown of the payments to DMO appears on pages 20 of the PBS. It includes the amount of money to be spent on various categories of acquisitions and sustainment support.

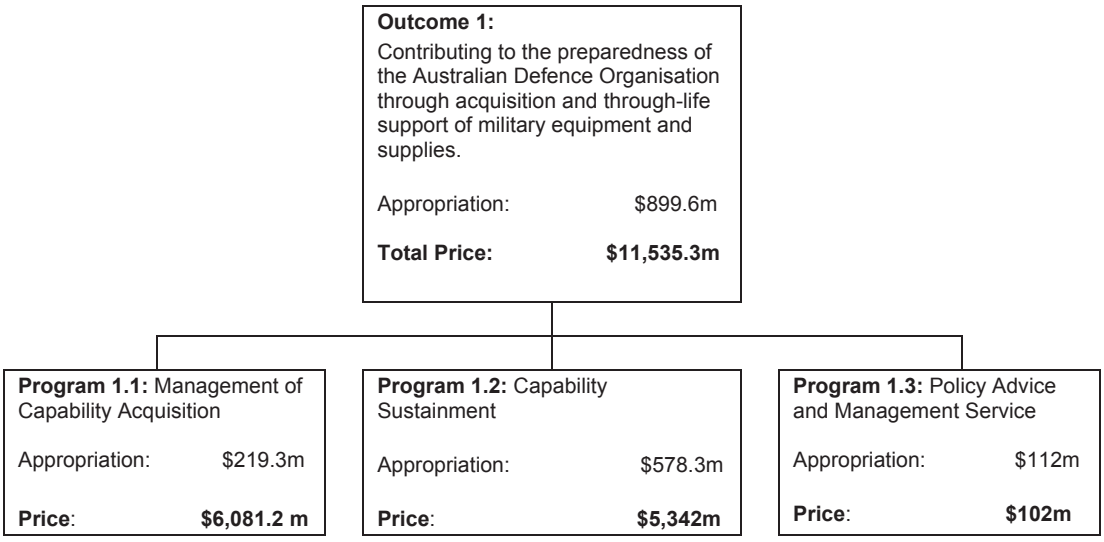
In 2010-11, DMO will make use of some 1,760 permanent and 320 reserve military personnel whose salaries and other personnel expenses are counted in Defence's financial statements. DMO pays Defence for the services provided by these personnel, as a suppliers expense (rather like payments made to companies for contractor staff). In 2010-11DMO will pay $457 million to Defence for military personnel and other costs covered by the Defence-DMO Service Level Agreement.

Outcomes and programs [p. 151]

As a prescribed agency DMO has its own outcome/program structure as detailed in Figure 2.8.2.

The first two programs are predominantly funded through the Materiel Acquisition and Sustainment Agreements with Defence, while the third is mainly funded through the Departmental Appropriation. Note that DMO refers to the 'price' of outputs rather than 'net cost' as in Defence.

Figure 2.8.2 DMO Output prices 2010-11



Source: Table 6 p.134 of the 2010-11 PBS

Outcome and planned performance [p. 152]

The PBS sets performance targets for the three DMO outputs and outlines how they will be evaluated. We have reproduced the essential features in Table 2.8.3.

Table 2.8.3: DMO program objectives performance indicators

Program	Objective	Performance Indicators
Program 1.1 **Management of Capability Acquisition**	Acquisition projects will be delivered, in a transparent and accountable manner, on time, within budget and to the required standard as identified in the specific Materiel Acquisition Agreements.	The indicators vary with each project and are specified in the Materiel Acquisition Agreements.
Program 1.2 **Capability Sustainment**	The ADF and its capabilities will be sustained to meet operational requirements as identified in the specific Materiel Sustainment Agreements.	Indicators are included in individual Materiel Sustainment Agreements. The DMO reports to its customers against these.
Program 1.3 **Policy Advice and Management Services**	The DMO will meet Ministerial, government, Defence and DMO expectations and timeframes for the provision of policy, advice and support, including the delivery of programs to support Australian Defence Industry.	The DMO meets Ministerial, government, Defence and DMO expectations and timeframes for provision of policy, advice and support.

Management of Capability Acquisition – Program 1.1

Each of the more than 200 major acquisition projects undertaken by DMO has a Materiel Acquisition Agreement with Defence that specifies scope, schedule and budget. The PBS summarises the top-30 acquisition projects by expenditure in 2010-11 (see top-30 projects below). Agreements also exist to cover the more than 120 minor acquisition projects DMO manages. In 2007-08 and 2009-10, the variation to project cost approvals for the top-30 projects was provided [2008-09 PBS Table 2.5.5 & 2.5.6, p. 168-9] but this was discontinued in the 2009-10 PBS.

Capability Sustainment – Program 1.2

On pages 178 to 190, the PBS details the goals and challenges for 2010-11 in the area of capability sustainment. Such detail, which was first provided in the 2005-06 PBS, gives a useful insight into the range of activities undertaken. In general, capability sustainment include repair and maintenance, engineering, supply, configuration management and disposal, as well as the provision of spares, technical data, support and test equipment, training equipment and explosive ordnance. For the fourth year in a row, the top-20 sustainment products by weapons system has been given [PBS Table 71 p. 180], we discuss this new information below.

Policy Advice and Management Service – Program 1.3

This includes contracting and procurement policy advice for Defence and the DMO, industry policy and advice to Defence and the government, and corporate reporting requirements. Key performance targets for this output are given on page 191 of the PBS and relate primarily to advice to government and effective corporate governance and reporting.

The 'Top Twenty' sustainment products

The top 20 sustainment activities for DMO by forecast expenditure from Table 71 in the PBS are listed in Table 2.8.4, 2.8.5, 2.8.6 and 2.8.7 along derived figures based on

planned rates of effort. These include per-platform and per-flying-hour costs. Where possible, comparisons with previous year's costs have been included

Table 2.8.4: Top 20 sustainment products – aerospace and helicopters

	Number	Cost ($m)	Hours flown	Annual cost per platform	Cost per flying hour
Super Hornet*	24	95	2,100	$3,958,333	$45,238
AP-3C Orion	19	115	7,900	$6,052,632	$14,557
F/A-18 Hornet	71	105	13,000	$1,478,873	$8,077
Hawk LIF 127	33	88	8,000	$2,666,667	$11,000
C-130J	12	75	7,350	$6,250,000	$10,204
C-130H	12	61	3,200	$5,083,333	$19,063
MRH-90	15	124	3,420	$8,266,667	$36,257
Seahawk	16	59	3,400	$3,687,500	$17,353
Black Hawk	34	64	7,500	$1,882,353	$8,533
ARH Tiger	22	97	6,000	$4,409,091	$16,167

Source 2010-11 PBS, *The high per-hour cost for the Super Hornet is a reflection of the low flying our rate accompanying its introduction to service. When the platform enters service in full, the cost per hour is expected to fall substantially.

Table 2.8.5: Recent budgeted sustainment costs per unit – aerospace and helicopters

	Cost per aircraft ($ million)				Cost per flying hour			
	2007-08	**2008-09**	**2009-10**	**2010-11**	**2007-08**	**2008-09**	**2009-10**	**2010-11**
Super Hornet			$4.33	$3.96			$208,000	$45,238
F-111	$8.11	$6.50	$4.72		$49,778	$44,251	$31,481	
AP-3C Orion	$6.37	$6.90	$6.31	$6.05	$16,063	$16,369	$14,458	$14,557
F/A-18 Hornet	$1.68	$1.61	$1.68	$1.48	$10,530	$10,236	$9,917	$8,077
Hawk LIF 127	$2.88	$2.70	$2.61	$2.67	$15,183	$13,565	$12,647	$11,000
C-130J	$5.42	$9.42	$8.01	$6.25	$14,130	$15,684	$13,197	$10,204
C-130 H		$6.25		$5.08		$22,189		$19,063
C-17	$13.75	$9.75	$14.50		$26,166	$11,583	$16,812	
MRH-90		$47.50	$6.73	$8.27		$780,608	$96,190	$36,257
Seahawk	$4.94		$4.81	$3.69	$31,066		$22,647	$17,353
Black Hawk	$1.97	$2.15	$3.12	$1.89	$10,555	$10,174	$14,133	$8,533
ARM Tiger				$4.41			$23,500	$16,167

Source: DAR, 2009-10 PAES, 2010-11 PBS

The above figures need to be treated with caution. Various fleets enjoy different amounts of contracted support (the cost of which is included) and manpower support from Defence's own workforce (which is not included). More generally, there are usually other costs (like fuel) that are not included separately for each platform. Also, one-off costs can heavily influence the results, including when platforms are first being brought into service. It will be some years before useful trends emerge.

Table 2.8.6: Top 20 sustainment products – maritime

	Number	2007-08 ($m)	2008-09 ($m)	2009-10 ($m)	2010-11 ($m)
Collins- subs	6	33	324	349	352
Anzac frigate	8	219	301	214	222
FFG Frigate	4	103	115	103	103
Mine Hunter Coastal	6	61	61	-	

Source: DAR, 2009-10 PAES, 2010-11 PBS

Table 2.8.7: Top 20 sustainment products – miscellaneous

	2007-08 ($m)	2008-09 ($m)	2009-10 ($m)	2010-11 ($m)
ADF Clothing and Equipment	117	89	91	60
ADO Commercial Fleet	73	75	69	
B Vehicles	117	127	122	82
Explosive ordnance	357	360	345	249
Wide Area Surveillance	77	79	71	72
Battlespace Communications	32	51		
Fuels and Lubricants	422	419	456	454
AEW&C System				142
Protected Mobility Fleet				60

Source: DAR, 2009-10 PAES, 2010-11 PBS

It is interesting to note the downward trend in some categories of sustainment expenditure, including explosive ordnance and, encouragingly, many of the RAAF aircraft fleets.

People

The DMO workforce is a mixture of military personnel, civilians and contractors as detailed on p.148 to 150 of the PBS. The key information is collected in Table 2.8.8 overleaf.

The civilian and military personnel in DMO are held under slightly different arrangements. Civilians in DMO are Defence employees and the CEO of DMO has delegations from the Secretary of the Department that he exercises in this regard. The expenses associated with DMO's civilian workforce appear in their financial statements as employee expenses.

In contrast, the military personnel in DMO are provided through a purchaser-provider arrangement with Defence. This does not cover the full per-capita cost of the military personnel, but rather represents a payment for their services roughly corresponding to their costs exclusive of allowances and overheads specific to their military role (and this is broadly commensurate with what would be needed to secure similar skills in the labour market). Thus, if the military fail to deliver sufficient personnel (due, for example, to operational demands or shortages) DMO has the money to hire people from outside. Note that the budgeted and estimated personnel figures for DMO represent a *maximum ceiling* and that DMO will only engage the staff necessary to perform acquisition and sustainment tasks that arise in future years.

Table 2.8.8: Workforce summary for DMO (average funded strength)

	04–05 Actual	05–06 Actual	06–07 Actual	07–08 Actual	08–09 Actual	09–10 Revised	10–11 Budget	11–12 est.	12–13 est.	13–14 est.
Navy	306	277	281	277	296	368	367	374	381	386
Army	461	411	389	386	404	500	465	472	486	498
Air Force	770	762	763	794	808	926	928	978	963	981
subtotal	**1,537**	**1,450**	**1,433**	**1,457**	**1,508**	**1,794**	**1,760**	**1,824**	**1,830**	**1,865**
Civilian	4,363	4,502	4,951	5,304	5,552	5,833	5,818	5,893	6,031	6,179
Reserve	125	191	249	311	?	316	320	320	320	320
PSP	388	393	298	181	176	108	56	52	49	49
Total*	**6,288**	**6,345**	**6,682**	**6,942**	**7,236**	**7,735**	**7,634**	**7,769**	**7,910**	**8,093**

Source: DAR, 2009-10 PAES and 2010-11 PBS.
*Total excludes reservists.

The 'Top Thirty' projects

The PBS lists the top 30 major capital investment projects by 2010–11 expenditure [PBS Table 68 page 157] and provides a description of each. We reproduce the top-30 projects in Table 2.8.9 below. This year, ASPI has again commissioned a team of defence specialist journalists to prepare reports on interesting recent and current projects (see Chapter 8 of this Brief). The PBS also includes a listing of previously approved top-30 projects that is useful (Tables 69, p. 172).

It is interesting that the provision for slippage in projects has been reduced from last year's 19% to 14%. This demonstrates greater confidence by DMO that projects will progress and money will be expended. However, and as the PBS notes, the reliance on a relatively small number of large projects makes the outcome sensitive to how each of these large projects performs.

Table 2.8.9: Top 30 Defence Major Capital Investment Projects (million $)

Project	Project Number	Approved Project Expenditure	Spend to 30 June 2010	2010-11 Budget Estimate
General Manager Systems				
Aerospace Systems Division				
Bridging Air Combat Capability	AIR 5349 Phase 1	3,629	2,226	493
Air-to-Air Refuelling Capability	AIR 5402	1,889	1,076	493
F/A-18 Hornet Upgrade	AIR 5376 Phase 2	1,947	1,484	107
Airborne Surveillance for Land Operations	JP 129 Phase 2	135	2	77
Electronic Systems Division				
Next Generation Satellite Program	JP 2008 Phase 4	894	223	193
Ultra High Frequency Satellite Communications	JP 2008 Phase 5A	444	110	145
Battle Management System	LAND75 Phase 3.4	331	46	124
Dismounted Battlegroup and Below Command, Control Communication System	LAND 125 Phase 3A	115	10	65
Battlespace Communications Systems (LAND)	JP 2072 Phase 1	275	32	59
Tactical Information Exchange Domain	JP 2089 Phase 2A	103	24	35
High Frequency Modernisation	JP 2089 Phase 3A	663	413	34
New Air Defence Command and Control Systems	AIR 5333	275	205	34
Explosive Ordnance Division				
Follow-on Standoff Weapon	AIR 5418 Phase 1	400	190	70
Lightweight Torpedo Replacement	JP 2070 Phase 2	344	223	46
Lightweight Torpedo Replacement	JP 2070 Phase 3	306	188	40
Mulwala Redevelopment Program	JP 2086 Phase 1	371	244	39
Helicopter Systems Division				

Multi Role Helicopter	AIR 9000 Phase 2	3,755	1,600	424
Armed Reconnaissance Helicopter	AIR 87 Phase 2	2,026	1,714	151
Land Systems Division				
Bushmaster Infantry Mobility Vehicle	LAND 116 Phase 3	926	578	144
Overlander Field Vehicles	LAND 121 Phase 3	2,879	51	106
Upgrade of M-113 Armoured Vehicles	LAND 106	888	622	97
Artillery Replacement 155mm Howitzer	LAND 106	329	7	76
Direct Fire Support Weapons	LAND 40 Phase 2	145	5	67
Maritime Systems Division				
Anzac Anti-Ship Missile Defence	SEA 1448 Phase 2B	459	242	76
Standard Missile Replacement (SM-1)	SEA 1390 Phase 4B	620	277	49
Guided Missile Frigate Upgrade	SEA 1390 Phase 2	1,530	1,339	36
General Manager Programs				
Air Warfare Destroyer Program				
Air Warfare Destroyer – Build	SEA 4000 Ph3	7,740	2,142	1,146
Airborne Early Warning and Control System				
Airborne Early Warning and Control Aircraft	AIR 5077 Phase 3	3,883	2,585	385
Amphibious Deployment and Sustainment				
Amphibious Deployment and Sustainment	JP 2048 Ph4A/4B	3,161	1,056	553
New Air Combat Capability				
Detailed Analysis and Acquisition Planning	AIR 6000 Phase 2A/2B	2,573	4	43
TOTAL TOP 30 APPROVED PROJECTS		**43,067**	**19,186**	**5,407**
Other Approved Project Estimate		35,542	30,148	916
Total Program		78,609	49,334	6,323
Management Margin (14% slippage)				-893
Net from existing projects				5,430
Projects Planned for Government Approval				250
Total Funds Available				**5,680**

Source: 2010-11 PBS

CHAPTER 3 –FUNDING AND THE WHITE PAPER

This Chapter deals with defence funding and the delivery of the 2009 Defence White Paper. It is divided into four parts: (1) a brief survey of Australian defence funding from the mid-1980s through to 2009; (2) an analysis of defence funding since the 2009 Defence White Paper; (3) an assessment of progress made towards delivering the White Paper's goals; and (4), a discussion of the affordability of the White Paper and the risks to its delivery.

For ease of reference, we shall refer to the 2000 and 2009 Defence White Papers as *Defence 2000* and *Defence 2009* respectively. Readers interested in a more detailed historical survey should consult the obituary for *Defence 2000* in Chapter 3 of last year's ASPI Budget Brief.

Defence funding from the 1980s to 2009

The late 1980s and 1990s were lean years for Defence. Apart from fluctuations due to foreign exchange movements and operational supplementation, defence spending was kept more-or-less constant in real terms across the period. In fact, the Defence budget was higher in 1985-86 ($14.5 billion) than it was eleven years later in 1996-97 ($13.7 billion) as measured in real 2008-09 dollars.

Because the cost of maintaining military capability exceeds inflation by 2–3%, the Defence budget came under growing pressure as the years went by. To try to close the gap between means and ends, successive governments pursued 'efficiency' programs of one sort or another through the 1990s (see Chapter 5 for further details).

Nonetheless, by the end of the decade Defence was in a sad state: the permanent force had shrunk by more than 20,000 positions compared with the mid-1980s; a 'train wreck' of block obsolescence was getting closer with no money in sight for modernisation; the preparedness of the force was poor with many fitted-for-but-not-with platforms and others badly in need of upgrade; and logistics was hollow and underfunded. It was against this background that the then government decided to develop a White Paper in 1999 with the aim of putting Defence planning and funding on a sustainable footing.

The tumultuous events in East Timor in 1999 delayed the White Paper until the end of 2000. But it was perhaps a delay worth having. East Timor was the largest Australian operation since Vietnam and it stretched parts of the defence force severely. In the process, serious shortcomings were exposed in equipment, logistics and preparedness. It is unlikely that the government would have been as generous in 2000 without the experience of the East Timor operation.

The 2000 White Paper

The only Defence White Paper produced by the previous government, *Defence 2000*, sought to achieve a coherent package of strategy, capability and funding for Australia's defence for the decade 2001-02 to 2010-11. On the capability side, a *Defence Capability Plan* (DCP) was published that detailed 165 separate phases of 88 capability proposals, valued at around $50 billion, planned for the forthcoming decade.

The entire package, including new and pre-existing capability, was funded through a decade-long funding envelope that roughly equated to 3% average annual real growth. Although earlier White Papers had alluded to near-term funding levels, never before had a decade-long funding commitment been made—let alone one with a talisman-like goal of '3% real growth'.

Defence 2000 provided more than $30 billion spread across four categories, including; $21 billion for the purchase of major capital equipment; $3.2 billion to cover the through-life support costs of new capabilities planned to enter service as a result of the DCP; $5 billion to cover an expected annual 2% growth (above inflation) in personnel costs and; $1 billion to augment the operating cost baseline in the Defence budget. In addition, Defence was allowed to retain within its annual funding base around $450 million of unspent operational supplementation from East Timor.

After 2000, the 3% funding commitment was extended out to 2017-18 in the 2006 and 2008 budgets. Before turning to look at these and other funding measures from the last decade, it's worth pausing to look back at *Defence 2000* and ask how far Defence has got in delivering the goals set for it.

At the risk of oversimplification, *Defence 2000* sought to achieve four things: (1) modernise the ADF by replacing or upgrading ageing assets and introducing new capabilities in select areas; (2) improve the preparedness of the ADF so that it was made up of 'fully developed capability' rather than hollow units and fitted-for-but-not-with platforms; (3) boost the capability of the ADF to undertake expeditionary operations in the immediate region; and (4) sustainably align Defence plans and funding.

Of the four goals, the modernisation of the ADF was the least successful. Persistent and widespread delays in the approval and execution of defence acquisitions delayed the delivery of many capabilities, with delays of 4-5 years not uncommon. In part, this reflected a systematic underestimation of costs which ensured that there was never going to be enough money to deliver all that was planned. Further delays arose due to insufficient industry capacity, tardy approval of new acquisitions and all too frequent technical problems with equipment under development. In fact, the combination of delayed approvals and delayed projects saw Defence unable to spend all the money it had been given to buy new equipment. Over the period covered by *Defence 2000*, we estimate that at least $4.4 billion of planned investment was deferred. The actual figures are probably higher but we cannot be sure because the government ceased disclosing the full extent of the deferrals in the 2009-10 Budget.

One area where Defence can claim success is in improving the preparedness of the defence force. While problems remain in some areas such the submarine force, the trend over the past decade has been favourable. Not only is the ADF now more ready and able to mount and sustain deployments—as evidenced by its current high operational tempo—but within Defence, the management and internal reporting of preparedness is much better than it was a decade ago. Similarly, the capacity of the ADF to conduct expeditionary operations in our immediate region is better now than at any time since the Vietnam conflict.

As for putting Defence finances on a sustainable footing, it was not long before Defence was struggling to deliver the outcomes sought by *Defence 2000* within the

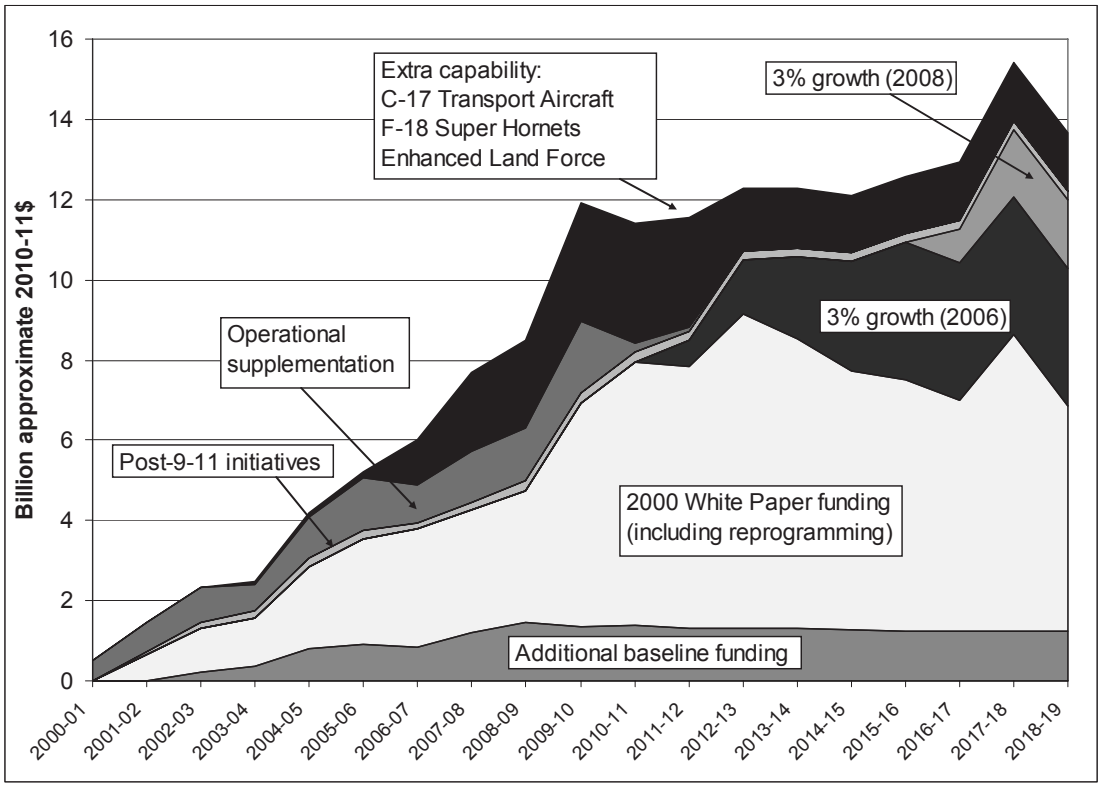
funding provided. In 2003 an internal Defence Capability Review recommended cuts to the force structure to contain costs including the decommissioning of two FFG frigates, the early retirement of the F-111 fleet and the laying up of two mine-hunting vessels. But these cuts failed to bring the books into balance and from 2005 onwards additional funds (amounting ultimately to around a $1 billion a year) were made available to Defence to manage the baseline cost of personnel, estate and logistics. At the same time, savings measures of $200 million a year were imposed on Defence to redirect money towards combat capability.

Boom times: 2002-2008

Bridging the gap between the means and ends of *Defence 2000* was only the start of the government's generosity to Defence. From around 2006, the previous government provided additional money for a range of new capability initiatives, including four C-17 transport aircraft ($3.2 billion), twenty-four F/A-18F *Super Hornet* fighters ($6 billion), and the Enhanced Land Force initiative that will add two infantry battalions to the Army at a cost of $10 billion over a decade. This additional funding came on top of that provided for new and expanded capabilities in the aftermath of 9/11 and the deployments that followed.

Because official budget figures are invariably given in 'out-turn' format that anticipates future inflation and foreign exchange rates, it is difficult to give a definitive figure for the value of additional funds provided post-2000. The best we can do is to capture the scale of funding using the historical values that appeared in the budget papers at the time, converted to 2010-11 dollars. The result appears in Figure 3.1.

Figure 3.1: Additional funding including 2000 White Paper and subsequent 3% growth



Source: ASPI analysis of budget papers and DAR, CPI inflation used

Despite all the money flowing into Defence, it remained unclear whether adequate funds were available pre-*Defence 2009* to deliver the capabilities then sought. On one hand, it looked like not enough money had been set aside to crew and operate the raft of new capabilities under development—hence the $10 billion savings program announced in early 2008. On the other hand, Defence was unable to spend the money it had for both investment and recurrent spending. So much so, that they were directed to absorb $1.1 billion of measures in 2008-09 following an abnormally large windfall from price supplementation (and the embarrassing hand-back of $830 million of unspent funds from 2007-08). This was the confusing state of Defence funding prior to the release of *Defence 2009*.

The 2009 Defence White Paper and beyond

On 3 May 2009, the Prime Minister released the long-awaited 2009 Defence White Paper at the Garden Island dockyard in Sydney with a chorus of sailors and a frigate standing watch in the background. Entitled *Defending Australia in the Asia Pacific Century: Force 2030* the 138-page document included one and half pages—585 words to be precise—on how the government planned to fund Defence over the next 21 years. The plan had two parts.

First, a funding model with the following elements:

- '3 per cent real growth in the Defence budget to 2017-18'
- '2.2 per cent real growth in the Defence budget from 2018-19 to 2030'
- '2.5 per cent fixed indexation to the Defence budget from 2009-10 to 2030'
- 'that Defence will reinvest savings from its [$20 billion decade-long] Strategic Reform Program back into priority Defence capabilities as agreed by the Government'
- 'shortfalls against the White Paper funding plan will be offset by Defence'.

Second, 'Defence [will] undertake a substantial program of reform, efficiencies and savings to underpin the achievement of White Paper objectives... [and] correct long-term hollowness and remediate the enabling functions of the Australian Defence Force'. This is, of course, the $20 billion Strategic Reform Program.

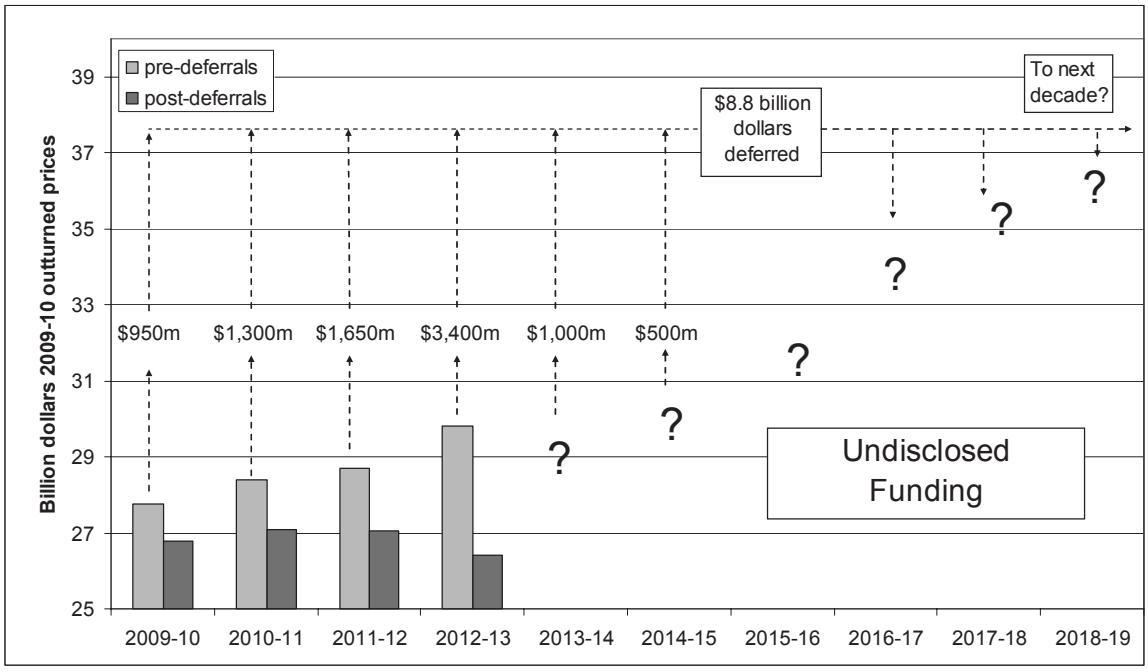
Further detail was provided eight days later in the 2009-10 Budget. And, while the wording of the funding commitment in *Defence 2009* was retained, the government baulked at actually handing over the money. Instead, a substantial wedge of promised funding was deferred into the future. As best we can work out (last year's budget contained as much obfuscation as information) the net result was:

- the new funding model added in excess of $10.5 billion over the decade, including $5.3 billion in the first four years
- $8.8 billion was deferred within the decade, including $6.8 billion in indexation from the first six years along with another $2 billion from the first four years
- the eighth, ninth and tenth years of the decade received some deferred funds, with the remainder pushed into the next decade.

Figure 3.2 depicts the deferral of funding that occurred in the 2009-10 Budget. In addition to this deferral and the imposition of the decade-long $20 billion savings

program, Defence was also directed to 'absorb' additional new budget measures amounting to $585 million over four years and $1.7 billion over the decade in the 2009-10 Budget.

Figure 3.2: Defence funding as inferred from the 2009-10 PBS



Source: ASPI analysis of budget papers

As detailed in Chapter 2.2 of this Brief, this year's budget preserved previously-planned defence funding, apart from $1.4 billion in routine defence supplementation for operations and adjustments due to foreign exchange movements. However, Defence has once again been required to absorb the cost of new measures amounting to $912 million over the next four years and $1,084 million over the decade.

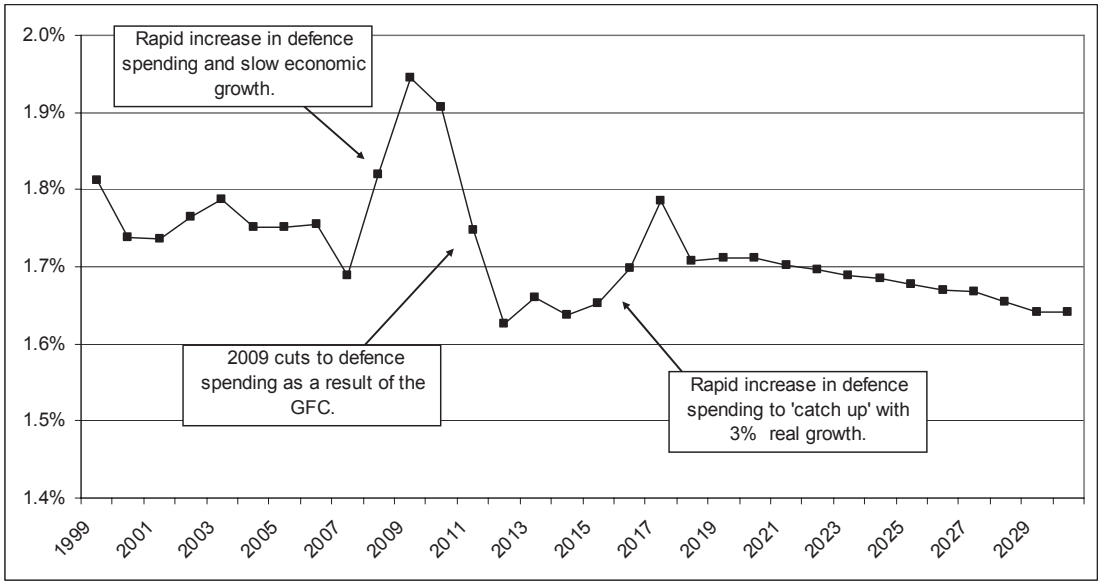
Neither *Defence 2009* nor the 2009-10 or 2010-11 Budgets disclosed the actual level of planned defence funding beyond the forward estimates period. But in February 2010, the government's Intergenerational Report (perhaps inadvertently) provided a graph of long-term defence funding as a share of GDP from which it is possible to calculate defence spending. The original graph (updated to take account of the latest GDP figures) and the implied level of defence spending appear here, in Figures 3.3 and 3.4 respectively.

Two points are worth making about the trends reflected in Figures 3.3 and 3.4. First, the projected level of GDP share entailed in the government's plan for funding Defence is not excessive in historical terms. As shown in Chapter 5, as recently as the 1980s Australia's defence burden was well above 2%. Second, the planned underlying real growth in defence spending depicted in Figure 3.4 is largely consistent with the promised 3% and 2.2% rates once last year's deferral of funds is taken into account.

Delivering 'Force 2030'

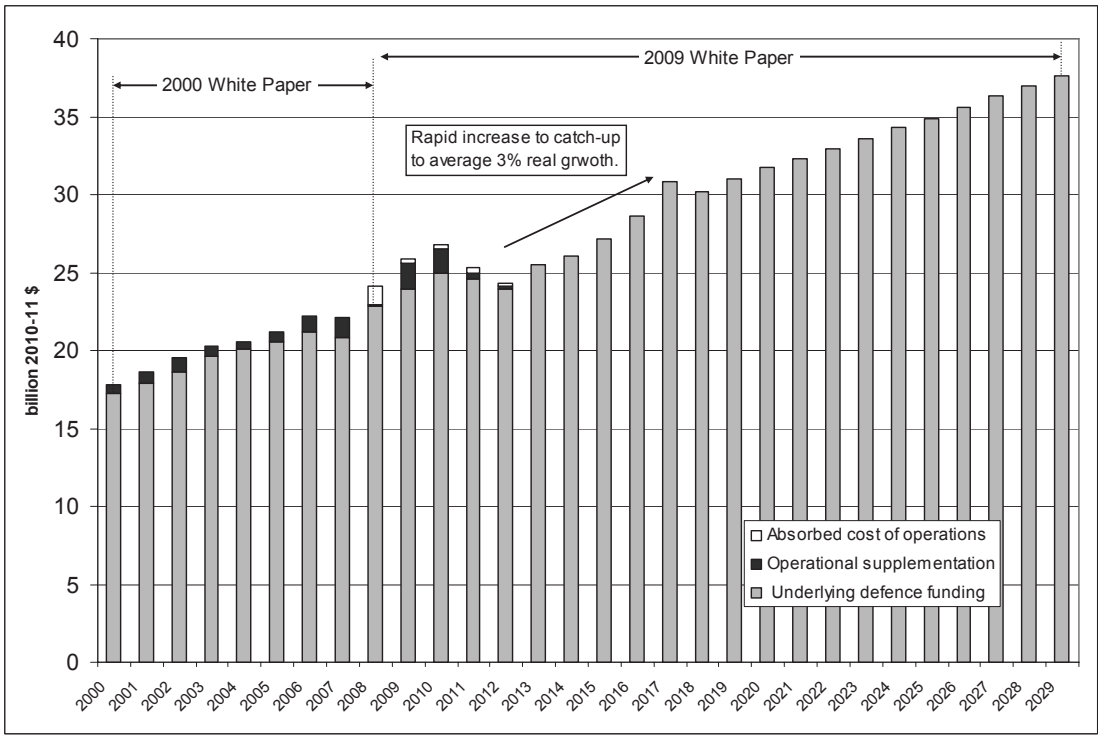
Even if the government and its successors maintain the funding promised in *Defence 2009,* the plan to deliver the end state of *Force 2030* is far from assured. The clear lesson of the past decade was that while planning new capability is easy, delivering it can be very difficult.

Figure 3.3: Defence funding as a share of GDP 1999 to 2030



Source: 2010 Intergenerational Report updated by 2010-11 Budget Papers and Defence PBS.

Figure 3.4: Defence funding 2000 to 2029



Source: 2010 Intergenerational Report, 2010-11 Budget Papers and Defence PBS.

In fact, there are already clear signs that the new capability envisaged in the White Paper will not be delivered as planned. In particular, the schedule for first and second pass approval of major capital investment projects in the 2009 DCP is looking shaky. Table 3.1 and 3.2 show the status of projects planned for approval in the first two years of the 2009 DCP and 2009-10 Portfolio Budget Statement (PBS) taking account of adjustments made in February 2010.

Unfortunately, the PBS departs from past practice and does not list those projects planned for approval in the next twelve months. Instead, in PBS Tables 33 and 34, we

get an omnibus of projects that are being developed for approval over the next two to three years. This makes it impossible to assess the progress likely to be made in approving DCP projects over the next year. It is not known why the public and defence industry have been denied information that used to be routinely disclosed.

Table 3.1: Projects planned for first pass approval 2009-10 to 2010-11

2009-10		
AIR 9000 Ph 8	Future Naval Aviation Combat System	Approved
AIR 8000 Ph 1	Additional C-130J Aircraft	Delayed by 1-2 years in Feb 2010
AIR 5276 CAP 2	AP-3C Capability Assurance Program 2	
AIR 5428 Ph 1	Pilot Training System	Approved
AIR 5438 Phase 1A	Lead-In-Fighter Capability Assurance	
JP 2097 Ph 1B	Special Operations Enhancements	
JP 2044 Ph 3A.1	Project Eagle Eye	
JP 2044 Ph 4	Digital Topographical System Upgrade	
JP 2065 Ph 2	Integrated Broadcast System	
JP 2072 Ph 2A	Battle Communications System (Land)	
JP 2080 Ph 3	Management Information Systems - Finance	
JP 2085 Ph 2/3	Explosive Ordnance Warstock	
JP 2090 Ph 1C	Information Environment	
SEA 1439 Phase 6	Collins Sonar	
SEA 1442 Ph 4	Maritime Comms - 1	
SEA 1448 Ph 4A	ANZAC enhancements	
2010-11		
AIR 5232 Ph 1	Air Combat Officer Training System	
JP 2008 Ph 3H	Military Satellite Capability - Terminals	
JP 2070 Ph 4	AP-3C Light Weight Torpedo Integration	Deleted in Feb 2010
SEA 1397 Ph 5A	Nulka Missile Decoy Enhancements	
2010-11 to 2011-12		
AIR 5431 Ph 1	Deployable Air Traffic Management & Control	
AIR 5431 Ph 2/3	Fixed Base Air Traffic Management & Control	
AIR 8000 Ph 2	Caribou Replacement	
AIR 9000 SCAP2	Seahawk Capability Assurance Program	Deleted in Feb 2010
DEF 7013 Ph 4	Joint Intelligence Support System	
JP 129 Ph 4	Tier 1 Unmanned Aerial Vehicle	
JP 1544 Ph 1	Project Eden - Document Handling	
JP 2047 Ph 3	Wide Area Communications Network	
JP 2064 Ph 3	Geospatial Information & Services	
JP 2069 Ph 2	High Grade Cryptographic Equipment	
JP 2072 Ph 2B	Battle Communications System (Land)	
JP 2072 Ph 3	Battle Communications System (Land)	
JP 2080 Ph 2B.1	Management Information - Personnel	Brought forward but not approved
JP 2089 Ph 3	Tactical Information Exchange Domain	
JP 2096 Ph 1	Surveillance Enhancement	
JP 3021 Ph 1	Joint Combined Training Capability	
JP 3024 Ph 1	Woomera Range Remediation	
JP 3025 Ph1	Deployable Incident Response Capability	
JP 3027 Ph 1	JDAM Enhancements	
LAND 121 Ph 5A	Overlander (Army Vehicles)	
LAND 125 Ph 4	Soldier Enhancements Version 3	
LAND 136 Ph1	Land Force Mortar Replacement	
LAND 988 Ph 1	Replacement Aviation Fire Truck	
SEA 1350 Ph 1	Navy Surface and Subsurface Ranges	
SEA 1354 Ph 1	Submarine Escape Systems	
SEA 1439 Ph 3.1	Collins Obsolescence Management	
SEA 1778 Ph 1	Deployable Mine Counter Measures	

Table 3.2: Projects planned for second pass approval 2009-10 to 2010-11

Project Number	Project Title	Status
2009-10		
AIR 5416 Ph 4B1	C-130J Radar Warning Receiver	Approved
AIR 5416 Ph 4B2	C-130J Infrared Countermeasures	Not approved delayed 2 years in Feb 2010
AIR 5440 Ph 1	C-130J Block Upgrade Program	Approved
AIR 6000 Ph 2A/2B	New Air Combat Capability	14 of 72 aircraft approved but purchase delayed
AIR 9000 SCAP1	Seahawk Capability Assurance 1	
JP 154 Ph 1	Counter Improvised Explosive Device	
JP 2008 Ph 3H	Military Satellite Capability – Terminals	
JP 2089 Ph 2B	Tactical Information Exchange Domain	Approved
JP 2070 Ph 4	AP-3C Light Weight Torpedo Integration	Cancelled
JP 2110 Ph 1A	CBNR Defence	Approved
LAND 75 Ph 3.4	Battlefield Command Support System	Approved
LAND 125 Ph 3A	Soldier Enhancement Version 2 – C4I	Approved
LAND 125 Ph 3C	Soldier Enhancement Version 2 – Lethal	
SEA 1397 Ph 5A	Nulka Missile Decoy Enhancements	Approved
2010-11		
JP 2030 Ph 8	ADF Joint Command Support Environ	
LAND 17 Ph 1	Artillery Replacement	Part approved and part delayed
SEA 1000 Ph 1A	Future Submarine – Concept Design	Some funded studies have been approved
LAND 112 Ph 4	Overlander (Army Vehicles)	Brought forward but not yet approved
2010-11 to 2011-12		
AIR 9000 Ph 8	Future Naval Aviation Combat System	
AIR 9000 SCAP2	Seahawk Capability Assurance Program	Deleted in Feb 2010
JP 66 Ph 1	Replacement for Air Defence Targets	
JP 2044 Ph 3A.1	Project Eagle Eye	
JP 2065 Ph 2	Integrated Broadcast System	
JP 2069 Ph 2	High Grade Cryptographic Equipment	
JP 2072 Ph 2A	Land Communications System	
JP 2080 Ph 2B.1	Management Info Systems – Personnel	
JP 2080 Ph 3	Management Info Systems – Finance	
JP 2090 Ph 1C	Combined Information Environment	
JP 3027 Ph 1	JDAM Enhancements	
JP 5408 Ph 3	ADF Navigation Warfare	
LAND 121 Ph 5A	Overlander	
LAND 125 Ph 3B	Soldier Enhancement 2 – Survivability	delayed by 2 years in Feb 2010
LAND 146 Ph 2	Combat Identification for Land Forces	delayed by 3 years in fen 2010
Approved early		
AIR 9000 Ph 5C	Additional Heavy Lift Helicopters	Brought forward and approved

Looking at the progress reported over the past twelve months, the picture is mixed. While 64% of the projects planned for second pass approval in 2009-10 have been approved (plus one extra which was originally planned for later years), the first pass approval of projects is less impressive. Of sixteen projects planned for approval in 2009-10, only two (12.5%) have so far made it through. It looks very unlikely that the program will recover in the next twelve months. Table 3.3 compares the number of approvals achieved in 2009-10 with those needed to get back on track in 2010-11. It is based on the outstanding projects originally scheduled for 2009-10, 2010-11 and half of the projects scheduled for the two year period 2010-11 to 2011-12.

Table 3.3: Comparison of 2009-10 achievement and 2010-11 approvals to recover

	1st pass planned	1st pass achieved	2nd pass planned	2nd pass achieved
2009-10	16	2	14	10
2010-11 to get back on track	29		13	

2009-10 figures includes all 2009 DCP Projects, 2010-11 excludes subsequent deletions and deferrals.

The prospects for project approvals in 2010-11 and the years which follow are further diminished by the much reduced amount of money available to fund new projects. As Table 3.4 shows, the amount of money available for new DCP projects is substantially reduced in each of the next three years before recovering in the final year of the forward estimates. The upper row of percentages represents the raw arithmetic reduction, while the second row adjusts half of the 2009-10 figures down by the ratio of USD-ASD exchange rate assumed in the 2009-10 (72c) and 2010-11 (90c) budgets.

Table 3.4: Funding available to initiate new projects 2009-10 & 2010-11 ($m)

	Budget year	Year 1	Year 2	Year 3
2009-10 budget	631.5	1,433.7	2,231.9	2,271.7
2010-11 budget	277.9	832.3	1,427.6	2,858.8
Reduction	353.6	601.4	804.3	-587.1
Per cent reduction	55%	42%	36%	-26%
Adjusted per cent reduction[1]	51%	35%	29%	-39%

[1]Assumes that half of the amount is exposed to the US-AS exchange rate.

Why the government is not being more forthcoming about the situation is a mystery—unlike wine, bad news does not improve with age. Surely it would be better to give defence industry a clear picture of acquisition plans for the next twelve months rather than leave them in the dark.

Because the 2009 DCP came out *after* both the 2009 White Paper and 2009-10 PBS, the large-scale slippage of projects is not a consequence of the deferral of funding or the imposition of absorbed costs in last year's Budget. The most likely explanation is that the capital investment program has been cut to accommodate cost pressures elsewhere in the portfolio, including the $912 million cost of enhanced force protection in Afghanistan. In fact, the PBS says that enhanced force protection will be predominately 'funded from Defence's existing capital investment programs'. Consistent with this, we know that the capital facilities program was cut by $162 million in 2010-11 and $268 million in 2011-12, and that the unapproved capital investment program was cut by $110 million in 2010-11 (due to foreign exchange movements and, critically, reprogramming of the DCP). Insufficient public information exists to estimate the cuts in subsequent years.

Other factors that might have played a part include strong performance of the approved capital investment program (although this is difficult to discern from the data, 'slippage' has been reduced from 19% to 14% in this budget) and the failure of Defence to adequately prepare proposals in a timely manner. Given the relatively small amounts of money needed after first pass approval, delays in this area are conceivably the result of tardy processes.

However, reports of large deferrals in the capital investment program (~$3 billion) emerged as early as December 2009, and we now know that the Joint Strike Fighter acquisition was slowed down in November 2009 relative to earlier plans (see Chapter 8). Given the scale and timing of these delays it seems that other cost pressures were being felt by the capital investment program before the recent imposition of enhanced force protection. This would imply that the supposedly 'fully costed' White Paper failed to properly budget for equipment expenditure from the very start.

The Affordability of Force 2030

While it is clear that the planned capital investment program has been severely disrupted over the past twelve months, the situation needs to be kept in perspective. For one thing, there can be no questioning the priority to give deployed troops the best protection possible. If that means the path to Force 2030 takes a diversion; that is how it should be. And in any case, once defence funding accelerates upwards after 2012-13 there will be ample financial opportunity for things to get back on track. With well in excess of $100 billion of investment planned for the next two decades, it would be wrong to lament the diversion of a couple of billion dollars to emerging priorities.

In the longer term, things are less clear. The notion that 2.2% real growth will be adequate past 2017-18 seems overly optimistic. Previous ASPI analysis of the underlying cost of maintaining defence (see Thomson and Davies, *Strategic Choices: Defending Australia in the 21st Century,* 2008) estimate that to 'tread water' in terms of size and scope of capability while maintaining an inventory of modern equipment requires average annual growth above inflation of around 2.6%. This also accords with the long-term post-WW II trend in Australian defence funding (see Chapter 5 of this Brief).

Further corroboration can be found in the long-term trends in US defence spending and output (see Thomson, *Trends in US defence spending: implications for Australia*, 2010). Using historical data going back to the 1950s, it's possible to measure the real annual increase in the cost per unit of US military capability. Calculated key results include an increase in the cost of aircraft of 3.5% per year, personnel 2.6% and naval vessels 3.5%. Combining these results and accounting for central defence-wide costs gives an estimate of 3.1% as the minimum real annual growth required to maintain an advanced military force. Thus, it seems doubtful that the 2.2% funding promised post-2017-18 will be enough to maintain the ADF, let alone expand its maritime forces as planned.

But given that we are talking about the decade after next, it would be a mistake to get too excited—there will be ample opportunity for adjustments to be made between now and the end of the decade. Of more interest is the question of whether the recent economic downturn is likely to hold any lingering risks for defence funding.

The impact of the Global Financial Crisis

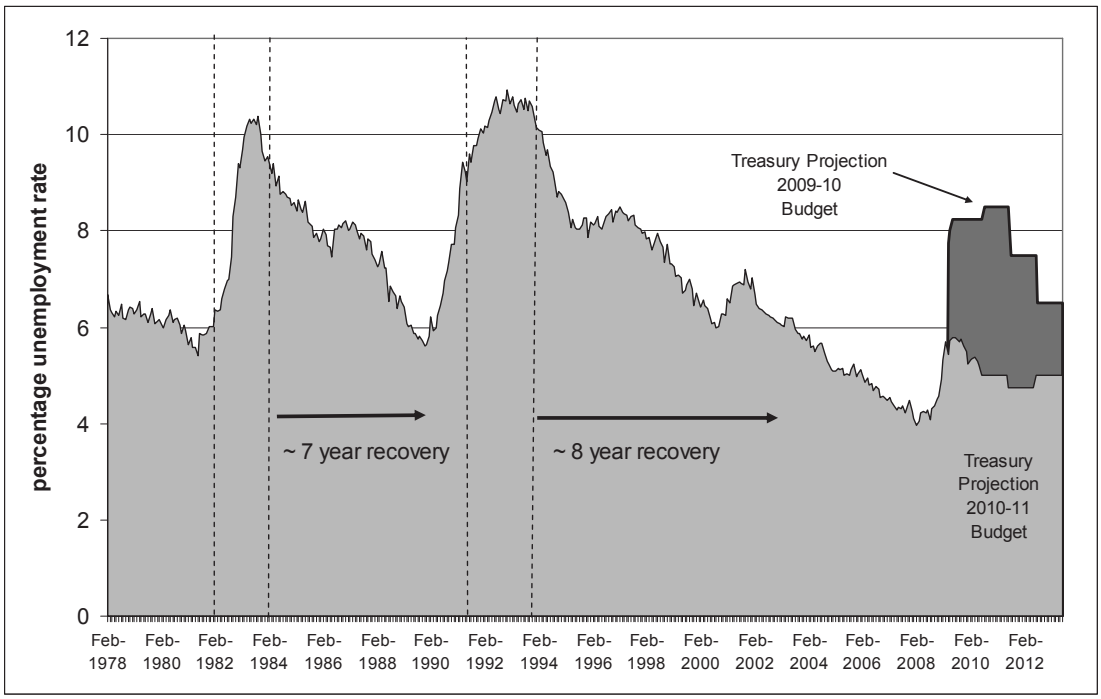
Compared with the seemingly dire outcomes anticipated this time last year, Australia has—so far—escaped the worst of the Global Financial Crisis (GFC). As Figure 3.5 shows, the present economic downturn has had significantly less impact on employment (and by implication economic growth) than the two full-blown recessions of the early 1980s and 1990s, and much less of an impact than was anticipated twelve months ago.

In part at least, the less than anticipated depth of downturn reflects the efficacy of the government's fiscal response. But while the impact of the recession has been softened considerably, the government has still been forced into deficit. Before looking at the interplay between defence spending and the government's fiscal situation, it's worth pausing to see how previous recessions have impacted on the defence budget.

As shown in Figure 3.6, in the early stages of past economic downturns the government has increased defence spending consistent with an expansionary fiscal

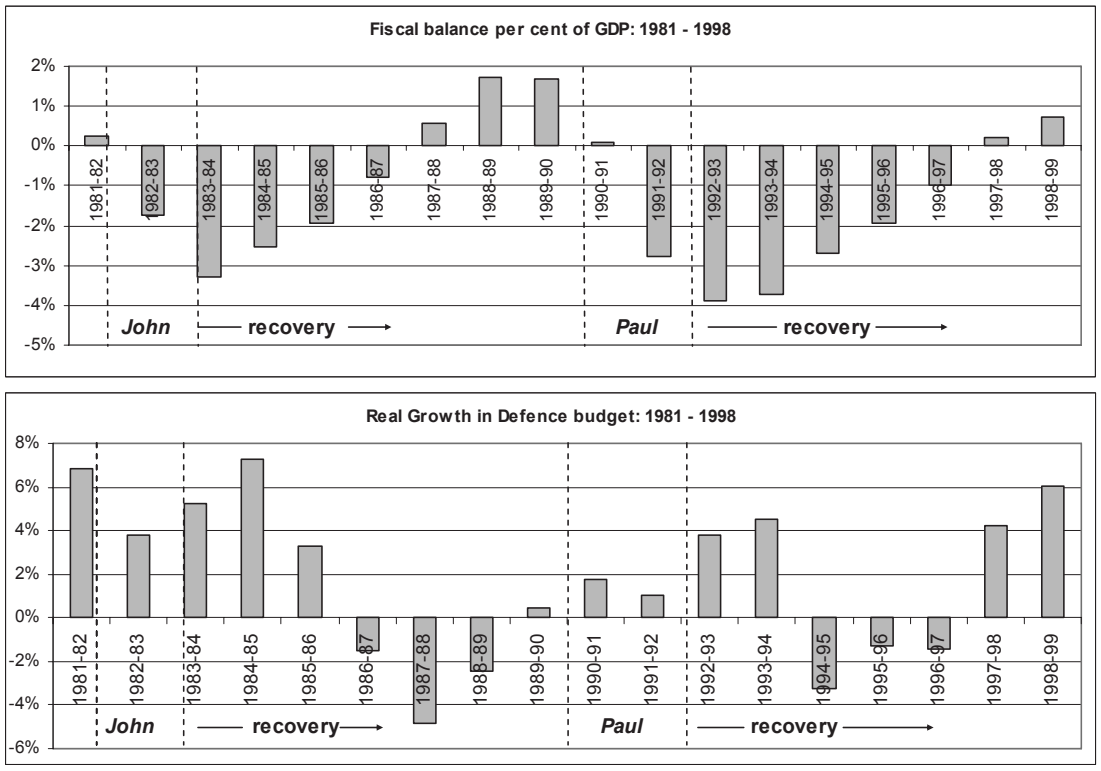
policy. Then, as the recovery rolls on, a progressively tighter fiscal position is adopted spending becomes less necessary to fuel growth. Finally, as the prospect of a surplus looms, the belt is tightened even further to deliver what has by then become a political Holy Grail: a fiscal surplus. Accordingly, the last two recessions saw the defence budget grow during the recession and contract in the latter stages of the recovery.

Figure 3.5: Unemployment 1978–2013



Sources: Reserve Bank of Australia and 2009-10 & 2010-11 Treasury Budget Paper #1

Figure 3.6: Spend early – save later

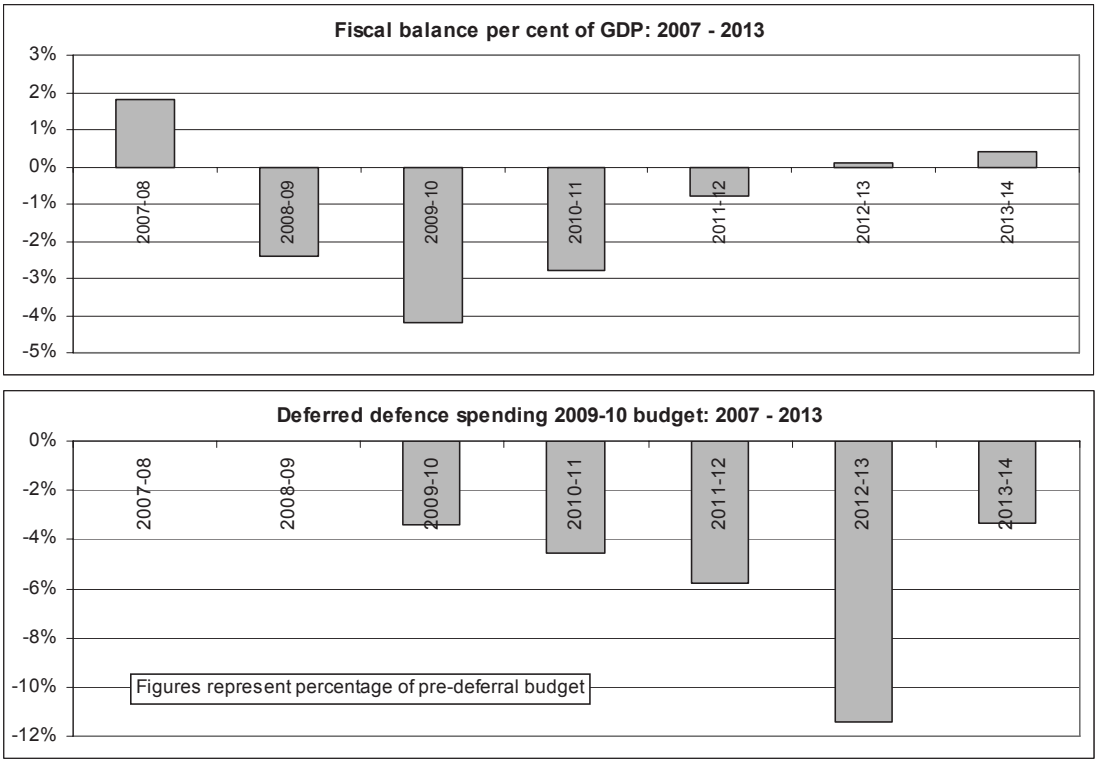


Source: Reserve Bank of Australia and DAR

Of course, without looking closely at specific decisions about defence spending around the time of the last two recessions (for which information is not readily available) it is impossible to know what other factors were at play. (Unfortunately, time has prevented an analysis of pre-existing plans to isolate the impact of the recession.)

This time, however, there is little doubt about what the government has done. Figure 3.7 shows the projected fiscal balance for the next four years in parallel with the percentage reduction to defence spending that the government made last year. As things turned out, it looks like last year's cuts match perfectly with the presently anticipated return to surplus. In fact, last year's $3.4 billion cut to defence spending in 2012-13 is the difference between surplus and deficit from both a fiscal and underlying cash perspective. This is fortunate for Defence; had the return to a surplus been projected later, Defence might have been forced to endure further cuts to hasten its arrival.

Figure 3.7: Projected fiscal balance, defence funding deferrals and budget growth



Source: Treasury Budget Paper #1, PBS, DAR, ASPI analysis

But things might still get interesting. Fiscal projections three years out are hardly certain. If the economy does not grow as quickly as expected, or there is a modest downturn due to international conditions (a major international downturn would be a different story), Defence might yet be asked to contribute more to the task of balancing the budget. With 2012-13 (a pre-election year) now announced with great fanfare as the date for a return to surplus, the political impetus to do so will be very strong.

In fact, unless things turn out better than anticipated, Defence will likely be in trouble. The projected underlying fiscal balance in 2012-13 is only $2 billion and the underlying cash balance is even slimmer at $1 billion. But if the ADF are still in Afghanistan and East Timor in two budget's time, an additional $1.4 billion of

operational costs will need to be found from somewhere. If the choice comes down to announcing that the surplus will have to wait another year, or telling Defence to absorb the cost of operations (as they had to in 2008-09), the outcome is not difficult to predict.

Of course, the chance that things will be that finely balanced in three years time is small—the result will likely be somewhat better or somewhat worse than presently anticipated. All other things being equal, that implies a 50% probability that the news will be bad for Defence and a 50% probability that it will be favourable.

CHAPTER 4 – EFFICIENCY IN DEFENCE

Henry Ergas

Few issues are as longstanding as concerns about the efficiency with which governments supply national defence. This section aims at guiding the reader to an understanding of why those concerns are such hardy perennials. It starts off by explaining what is meant, from an economic perspective, by efficiency, and then sketches out how tolerable levels of efficiency are achieved in the market sections of the economy. That discussion serves to highlight why the conditions that make for efficiency in private production do not hold in public production, and especially fail in the provision of national defence. In particular, the supply of defence is determined by one group of people spending other people's money, which creates pervasive principal-agent problems (a concept explained in the text). Having set out those problems, and their manifestation at each level of defence supply, the section concludes by considering possible pathways to reform.

What do we mean by efficiency?

Efficiency, as the term is understood in economics, simply refers to making good use of scarce resources: that is, getting as much benefit from them as can be achieved. That benefit is defined in terms of consumers' valuation of the outputs those resources are used to produce, compared to the benefits derivable from the outputs they could otherwise have been used for. An efficient use of resources is one that maximises the difference between the benefit consumers gain from the actual pattern of output and that which would be derived were those resources used for other purposes instead.

It follows from this definition that a pattern of use of society's resources is inefficient if some reallocation of that pattern would increase the valuation one or more consumers place on the resulting output without reducing the valuation placed on output by the remaining consumers: i.e. if it is possible to reallocate resources in such a way as to make some people better off without making anyone worse off. It also follows that a pattern of use of society's resources is efficient if no reallocation of that pattern can make someone better off without making anyone else worse off.[1]

By this definition there must be many efficient patterns of use of resources, each corresponding to the ultimate working out of a different initial distribution of resources, for instance in the form of money income, among society's members. As that initial distribution translates into demand for goods and services, and as suppliers adjust to that demand, an outcome is secured which is efficient (subject, of course, to a wide range of conditions being met, such as the presence of well-functioning markets).

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[1] A weaker definition of efficiency, often used in policy analysis, defines a situation as inefficient if a change in the pattern of use of resources would increase the valuation one or more consumers place on the resulting output by more than it reduced the valuation placed on output by the remaining consumers: i.e. if it is possible to reallocate resources in such a way as to make some people better off by enough that they could compensate those who had been made worse off. It also follows in this definition that a pattern of use of society's resources is efficient if no reallocation of that pattern can make someone sufficiently better off to compensate anyone else who would be made worse off

That outcome will have a number of well-defined characteristics, including that each input to production is used in proportions that equate its marginal product to its marginal cost, and each good is consumed in quantities that equate the marginal benefit consumers receive from the final unit they consume to its marginal cost. These characteristics of an efficient allocation are usually referred to as the equi-marginal conditions. They ensure that starting from an efficient outcome, reallocating (say) a bit of consumption from one good to another will not yield a net gain (including because the definition of an efficient outcome is one where the marginal benefit from consumption of a good is equal to its marginal cost, so if marginal costs rise as production increases, greater consumption must impose a marginal benefit less than marginal cost, reducing net income).

It follows naturally from these characteristics that (for a given initial distribution of income) an efficient outcome will ensure *efficient consumption* (that what is produced is allocated to those consumers who value it most, a feature sometimes referred to as 'allocative efficiency'), *efficient production* (that it is produced at minimum cost, a feature sometimes referred to as 'productive' or 'technical' efficiency) and *efficiency in the product mix* (that marginal rates of substitution in consumption equal marginal rates of transformation in production, which is another way of saying that changing the mix of products cannot increase efficiency).

How efficiency is obtained

The primary means by which this efficient outcome occurs, in what is obviously a highly simplified (but not completely unrealistic) model of the economy, is through voluntary exchange, that is, trade. Consumers manifest their willingness to pay for goods by 'voting' with their dollars, suppliers of inputs (such as labour) post prices for their supplies, and producers (the firms that are intermediary between input suppliers and consumers) react to those offers in a way that maximises their profits. Trade proceeds until all mutually beneficial exchanges have been carried out, and as each such voluntary exchange must make those who participate in it better off (if it didn't, they would withdraw from the transaction), the full realisation of the gains from trade exhausts the scope to increase valuations through resource reallocations.

No central planner is needed to devise the efficient allocation or indeed, could possibly hope to cope with the task, given the mass of information required. Rather, it is markets that act to transmit information to producers about how much consumers are willing to pay and how much input suppliers are willing to accept.

A key factor guiding this process towards efficient outcomes is the *direct link* markets create for consumers between paying and getting, and for suppliers between selling and getting. As a result, consumers only get what they are willing to pay for and only pay for what they want, while producers can only get by selling to a consumer, and only sell for what they are willing to accept. It is these direct links – between paying and getting, and selling and getting – that ensure that it is individual preferences that guide the use of society's resources, and (in the simplified model referred to above) ultimately translate into the equi-marginal conditions being met.

These direct links also guide the process of identifying better ways of doing things. Because consumers control the disposition of their dollars, and hence can reward and punish producers, there is an obvious incentive for entrepreneurs to seek out

opportunities to meet currently unmet needs, or better respond to existing ones. Equally, because firms know how much input suppliers need to be paid, and how much consumers are willing to pay, opportunities to more effectively transform inputs into outputs offer scope for gains to the intermediaries between these two sides of the market. And because those intermediaries (i.e. firms) compete, the ones that find better ways of doing things can displace their rivals, forcing those rivals to respond, be it by matching the innovator or by eventually exiting the field.

Again, central to the efficacy of this mechanism is that an innovator can appeal directly to individual 'voters', i.e. consumers. The direct link for the firm between selling and getting means that it is the innovating firm's ability to attract these individual 'voters' that will ultimately determine its fate, and hence shape the process by which new approaches displace old ones.

The problem of public goods

The purpose of thus emphasising what may seem obvious is to stress the role the direct links markets establish between spending, selling and getting play in securing efficient outcomes. For there is an important class of goods in which that direct link cannot work. That is the class usually referred to as 'public goods'.

Taken in their purest form, these goods have two characteristics. The first, commonly referred to as 'non-rivalry', is that once supplied, greater consumption by one individual does not reduce consumption by any other. Ideas are a case in point: the fact that I learn more about the laws of physics in no way reduces the stock of knowledge available to others. As a result, the opportunity cost of my consumption of the laws of physics is zero, at least in terms of the quantum of those laws that my knowledge detracts from that of others. The second, referred to as 'non-excludability', says that once the good is available, no consumer can be prevented from consuming it. A classic (though, as it turns out, not entirely accurate) example is the service provided by a lighthouse, that illuminates the path for any ship that comes within sight of its beam.

While there are few (or perhaps even no) goods that display these characteristics in pure form, it is obvious that some come closer to fitting this description than others. Defence is such a good. Thus, the defence of Australia from invasion could be viewed as a public good to all Australians: it is difficult to think that a slight increase in the number of Australians (i.e. a marginal increase in the consumption of 'defence services') would raise its costs, so it is non-rivalrous in consumption; and it is equally difficult to conceive of excluding particular individuals in Australia from the benefit that protection creates, making it non-excludable.

There are obvious reasons why public goods are difficult to fit into the model, sketched out above, of efficiency guided by voluntary exchange. An important feature of that model is that each individual contracts for the goods he or she consumes. That direct contracting forces each consumer to face the marginal costs of consuming more or less, and hence to determine the value he or she places on the good relative to alternatives. It also ensures each supplier, and suppliers collectively, provide no more of the good than consumers value, and have incentives (from the hope for profit, and the fear of displacement) to find better ways of doing things.

With public goods, however, the marginal cost of the amount the individual consumes is zero. Reducing Australia's population by one person would not reduce the cost of protecting the country from invasion. As a result, were each consumer to pay his or her marginal cost, the revenues received would be insufficient to finance the good's production.

Even more important is non-excludability. This characteristic implies that producers cannot limit consumers' use of the good they produce. As a result, there can be no market in which beneficiaries can signal the value they place on varying amounts of the good, and hence guide the allocation of resources between this good and others. In practice, for a good like defence, we all consume the same amount, which once produced, rains on us like manna from heaven. The option of a consumer contracting to receive more or less defence, and to pay accordingly, though attractive, has so far proved impossible to realise in modern conditions. And if individuals were asked to pay for defence in line with the benefit they thought they obtained, each individual would have strong incentives to free ride (i.e. to claim to obtain zero benefit, and hence contribute nothing, while nonetheless continuing to consume the good).

The outcome of all this is that public goods (such as defence) are provided on a basis that completely separates getting and spending: individuals benefit from defence, but it is not their individual valuations that determine how much they pay for it, how much is made available for its production, or how much of it is produced. There is therefore no mechanism that assures that the efficient quantity will be produced. Rather, what is produced and how is determined by one group of people spending other people's money.

At the same time, it is in the nature of defence that its supply is a natural monopoly: indeed, that is inherent in the state's retention of a monopoly over the legitimate use of violence. Moreover, it seems reasonable to think the economies of scale and scope inherent in defence technology make it inefficient to have duplicate forces (though they do not preclude some degree of duplication, for instance within the services).

Of course, there is potential and actual competition with adversary forces, most dramatically on the field of battle. The possibility of that competition can provide a greater spur to efficacy than occurs for other goods supplied by government, but even so, that spur may not be very strong under peacetime conditions. If there is a better way of producing the defence of Australia than the way it is currently supplied, there is no market (and associated price mechanism) in which that better way can be revealed and flourish.

In short, the separation of getting from spending inherent in the supply of defence as a good eliminates the key means by which economies such as ours ensure that resources are used tolerably efficiently.

Of course, that would not matter were the taxes required to finance the provision of defence services collected by an omniscient social planner, who, given complete information about costs and benefits of alternative patterns of resource use, could select the efficient level of that provision and perfectly monitor its supply. With perfect knowledge about the effect of any decision on the level of welfare, the planner (assuming he or she had only the interests of society at heart) would ensure that the

marginal dollar spent on defence (and on government supplied goods generally) had a benefit in that use equal to the benefit that would otherwise have been secured by leaving that dollar in taxpayers' hands, thus assuring the correct aggregate level of public expenditure. The planner would also ensure that the marginal benefit of public expenditure was equalised across all public programs, projects and project elements, thus assuring the efficient composition of public output.

Merely to state these conditions is to highlight how far they are from reality. Rather, the getting and spending decisions are taken in political and bureaucratic processes that suffer from many inherent limits in terms of their ability to achieve efficiency in public production. While a comprehensive discussion of these limits is well beyond our scope here, the most important for our purpose are those that arise from what are referred to by economists as principal-agent problems.

Principal-agent problems and efficiency

Simply put, principal-agent problems arise when one party (the principal) directs another party (the agent) to undertake activities on the principal's behalf in circumstances in which two conditions are met: first, the objectives of the two parties differ, so the principal and the agent value outcomes differently; and second, the principal cannot costlessly monitor the agent's character or performance. Typically, the principal can to some degree monitor the outcomes the agent achieves, but those outcomes may be shaped by many factors other than the diligence with which the agent has undertaken the tasks he or she has been set. As a result of this asymmetry in information, the principal cannot fully reward the agent for good behaviour or punish the agent for slacking, as attempts to do so will, at least in some instances, exonerate the guilty or penalise the innocent.

This exposes the principal to two sets of risks: those of adverse selection on the one hand and of moral hazard on the other.

Adverse selection refers to the risk that the principal, in selecting an agent, will find it difficult to gauge whether the agent is in fact best suited to the task, for instance in terms of being most productive. Not being able to distinguish highly productive from less productive agents, the principal will have to set the reward to the agent on a basis that allows the more productive agents some slack. The agent may, in other words, have hidden characteristics, preventing the principal from always and only contracting with those agents who are least cost and paying them accordingly.

Moral hazard, in contrast, arises from the fact that the principal cannot costlessly monitor the agent's conduct – it arises from the agent's hidden actions, rather than his or her hidden characteristics. In particular, because the principal cannot disentangle the factors that account for outcomes, the agent may put in less effort than he or she would invest were the principal fully informed.

Why principal-agent problems are especially acute in defence

The problems created by adverse selection and moral hazard are, of course, not specific to the public sector, much less to national defence. Moreover, there are responses the principal can deploy to deal with them, albeit only in part. But these

problems are perhaps more acute in the public sector setting and especially markedly so in defence.

This is, to begin with, because the outputs of public sector production are so hard (and in some cases even impossible) to measure. It would surely be difficult, even for a well-informed observer, to assess just how much defence Australia actually obtains, or how much more or less defence we would obtain from marginal changes in defence outlays. Compounding this difficulty is the fact that defence (unlike say, health care) is entirely relative: it is good if we get more bang for the buck but if the other side makes changes that (as used to be said during the cold war) give it even more rubble for the rouble, we are less well defended. Defence output cannot, in other words, be evaluated in isolation from the resources devoted to military activities by actual or potential adversaries, the efficiency with which those resources are used, and the scope adversaries have to negate any actions we take. And complicating the assessment yet further is the fact that defence deals in contingencies, whose precise characteristics, likelihoods and possible consequences are not readily amenable to statistical modelling, and where the links between inputs and outputs are affected by myriad factors as unpredictable as they may be unfamiliar.

All of this makes it difficult for any notional principal to monitor the performance of the defence force as an agent. At the same time, the supply of defence, like that of other public production, involves layer upon layer of principal-agent relationships, with each layer introducing monitoring costs of its own.

Thus, at the highest layer, the community (acting as the principal) vests in the political system (as its agent) the task of determining the quantum and composition of public production, and then monitoring its supply. In turn, the political system (in practice, the government of the day), now acting as the principal, delegates the task of actually delivering defence services to the defence force and the associated bureaucracy, which are its agent. (We refer to the entity supplying defence as ‘Defence’, and to what it supplies as ‘defence’). Finally, Defence (and its administrative agencies), this time acting as the principal, contract with other agents, such as defence contractors, to provide needed inputs, for instance, specialised military equipment. At each layer of this hierarchy, monitoring problems abound.

Principal-agent problems in the political system

For starters, the community’s ability to itself control the efficiency with which its elected representatives manage the provision of defence is relatively limited. Each voter will have limited incentives to invest in gathering the information required to properly undertake that monitoring, and probably even fewer means of translating that monitoring into action. While this is true in all areas of public production, it is likely especially so in defence services, both because relatively few voters have much opportunity to interact closely with Defence, and hence assess its performance, and because Defence (understandably) has more scope than many other areas to hinder monitoring through officially sanctioned secrecy. While the media to some extent fills the gap, it hardly does so perfectly.

One result of this imperfect monitoring is that government may supply too much or too little defence – or perhaps most likely, both, as too many resources may be allocated to Defence, but also excess costs imposed upon it.

For example, in a Westminster system, with its strong party discipline, governments have strong incentives to shift resources towards marginal seats, maximising their prospects of re-election. (In contrast, in the United States, where party discipline is weak, defence outlays tend to be shifted towards the seats controlled by the longest serving and hence most powerful members of congress, buttressing and rewarding their positions). This leads to phenomena such as the continued production of uniforms, at exorbitant cost, in marginal Victorian electorates, the concentration (again at high cost) of defence industry in South Australia, and the continued funding of small, relatively inefficient, bases scattered throughout the country. Additionally, pressure groups such as the RSL and other defence-related associations may extract concessions in the form of unnecessarily generous service benefits. All these instances of high cost production may then be accompanied by under-investment in activities or assets that have high military, but low political, value.

Monitoring of defence efficiency by government

At the same time, it is hardly easy for the government itself to monitor the efficiency with which defence is supplied. Of course, governments seek to discipline the allocation of resources through the budget process, but that process is a highly imperfect exercise in bargaining, which typically is far more effective at rewarding agents for justifying costs than for reducing them. While that is true for public production generally, the difficulties and distortions tend to be especially great in defence.

This is first of all because defence is an area where the information asymmetry between principals and agents is particularly marked. It is an inherent feature of modern democracies that the defence force has a unique knowledge of the management of violence. Moreover, in modern democracies, there is a high degree of institutional and occupational separation between the military, other areas of public administration and the political process. And there is additionally a well-established convention that control over operational matters rests with the military. There is consequently much that the military knows that others either cannot know or can only learn at high cost.

It is true that some of that information (for instance, about different ways of achieving particular objectives) may be revealed as a result of competition between the services, but that competition is not especially effective in eliciting information revelation. In effect, the services are engaged in a repeated game, creating strong incentives for a collusive pattern of "you pat my back and I'll pat yours". This log-rolling is all the more likely as the services tend to be mainly complements rather than substitutes, with limited scope for greater use of one service to replace reduced use of another. Interdependence between the services diminishes each service's ability to secure market share in defence production at the expense of rivals and hence reduces the gains a service can make by defecting from the collusive pattern. Rather, the typical outcome is for governments to be faced with what are effectively agreed positions, often defined in terms of 'requirements' for the services collectively.

At the same time, the government's difficulties in assessing the merits of Defence claims are increased by the unusual moral authority the defence force can command. It is the special feature of the defence force that its members are asked by the

community to put their lives at serious risk for the sake of their mission. This places them in a position that is obviously quite different from that of, say, the providers of postal services. In a country which rightly assigns a very high value to the lives of its service men and women, it is inevitable that great weight will be put on the arguments advanced by the defence force about the resources it requires to meet its missions at least cost to Australian life.

The overall result is that government is poorly placed to measure with any precision the output of Defence, the efficiency with which it is produced or the desirability of altering the level of defence resources or the manner in which they are used.

The difficulties Defence itself faces in securing efficient outcomes

Nor is it easy for Defence itself to secure efficiency in the use of the resources put at its disposal.

This is in part due to the sheer technical difficulty of the task. It is reasonably easy to determine what is efficient in situations where there are simple, stable and identifiable relations between inputs and outputs, and where outputs themselves are relatively independent (so that the optimal quantity of one output can be identified more or less separately from that of others, using relative prices as proxies for wider effects). In Defence, however, there are often (and increasingly) pervasive interdependencies between inputs, making it crucial that combinations of different assets are coherent. Moreover, many important assets come in large lumps (one cannot have half a destroyer, at least for long), and have long lives, high fixed costs and long lead times to commissioning and decommissioning. At the same time, the inputs need to be capable of being deployed to yield military outputs in many, often poorly specified, contingencies, where their value will depend on such difficult to predict factors as the capabilities, strategies and precise objectives of adversaries.

These are characteristics far removed from those conventionally assumed in economic optimisation. They lend themselves more to operations research in the small – the assessment, for example, of the cost-effectiveness of alternative ways of structuring particular weapons systems – than to identification of overall optima. Indeed, the notion that Defence could identify such an overall optimum is fanciful.

Rather, the search for efficiency in the supply of defence services is at best a piecemeal, highly incremental, process, based more on bargaining (both within Defence and between the defence establishment and other agencies) than on any idealised form of rational resource allocation. That bargaining, and its limits, are embedded in, and only understandable in terms of, the distinctive social structure of defence organisations.

Defence differs from other areas of public production in being a highly specialised vocation or profession, rather than an occupation within the broader public sector as such. That profession is organised along distinct hierarchical lines, imbued by a particular ethos, culture and traditions, and operates to norms aimed at underpinning its efficacy in the highly unusual task of exercising violence (or credibly threatening the exercise of violence) on behalf of the state. Those norms – an emphasis on honour and camaraderie, faithfulness in obeying orders and acting on the basis of duty, respect for and loyalty to political authority, emphasis on the autonomy of the military

sphere from politics – are central to the socialisation of individual service men and women, and are associated with relatively fixed conceptions of how things should be.

True, the resource-intensive (and increasingly capital-intensive) nature of the military task, the high value of preparedness, and the emphasis on the ability to secure victory, have combined to lead defence organisations to place great importance on long-term planning and on the capacity to mobilise, deploy and manage resources. But the internal norms that guide these activities (and the detailed policies and procedures they give rise to) tend to emphasise process rather than product, all the more so as the product is hard to define and usually impossible to measure. Moreover, to the extent to which product is important, the defence structure generally prizes the skills involved in being effective (including that of managing the political process within Defence itself), more than those involved in being efficient. Unsurprisingly, there are especially few rewards for the individual who finds a way to shed costs, particularly when those cost reductions will cause pain to others in the defence force and in any event, ultimately flow back to consolidated revenue.

Moreover, it is an important feature of external and internal labour markets that they tend to match individuals with organisations whose norms they share, most obviously through recruitment, promotion and discharge decisions. The ability to thus attract, identify and promote such 'motivated agents' (as they are referred to in economics) can help organisations control adverse selection and moral hazard, even in the absence of effective monetary incentives. It is especially important in underpinning high performance at times of peak stress, in the midst of battle, when the ability to elicit such performance, in situations where direct hierarchical monitoring and control may be impossible, is of very high value. However, it also acts to entrench organisational norms and to reduce internal challenge and diversity.

Combined with the sheer size and complexity of Defence, the inevitable outcome is a structure that is highly bureaucratic, while being somewhat impervious and opaque to the other bureaucracies in government. This bureaucracy is naturally vulnerable to goal displacement, with an ever-present risk that the objective of preserving institutional repertoires and routines will become an end in itself. That risk is perhaps especially great in situations such as that of recent years, which combine general peace and national prosperity (loosening budget constraints), with a multiplicity of localised conflicts and a heightened threat perception (justifying high levels of expenditure). The result is a structure in which (to use the title of a classic RAND study of the US war in Vietnam) "bureaucracy does its thing", consuming an ever growing resource base while facing few pressures to challenge and deeply reconsider the manner in which it operates.

Defence and its contractors

Finally, further complex principal-agent problems arise in the relations between Defence and its contractors, particularly the suppliers of specialised military equipment.

Buying advanced weapons systems is not like buying laundry soap or paperclips - rather, it is an undertaking of exceptional difficulty, beset by uncertainties and risks. Contemporary weapons systems are among the largest and most sophisticated engineering projects our societies undertake, involving millions of interdependent

parts, each technically demanding in its own right and then needing to inter-operate effectively and reliably under combat conditions.

Experience and common sense suggest the costs and time required to successfully complete projects of this kind will be difficult to predict. As a result, it is simply unrealistic to expect each project to be completed on time and to budget. There is indeed a mass of evidence showing that such schedule delays and budget blowouts are a common feature of large scale engineering projects in areas such as software development and the construction of major infrastructure.

That technically challenging projects should sometimes fail is unsurprising; but what does need probing is why the difficulties are so often severely underestimated at the outset. Three factors seem to be involved.

First, overconfidence, which manifests in unduly optimistic forecasts, appears to be an inherent feature of managerial decision-making. While "gilding the lily" can arise from the self-interest that proponents of projects have in getting things under way, that is not the whole story. Equally important, though more subtle, is the fact individuals with high levels of self-confidence (not only relative to others, but compared to their own abilities) tend to do better in organisations, and perhaps especially so in the military. This embeds an "optimism bias" into even stringent decision-making processes.

Second, as previously ignored difficulties emerge, the "tyranny of sunk costs" comes into play. Projects which would not have been undertaken if their total costs had been known at the outset are not cancelled because the benefits of completing the project are thought to be greater than the marginal cost of completion. Total costs mount as each evaluation concludes that spending a (relatively) little bit more will make the exercise worthwhile. Rationally (at least from an ex ante perspective), good money is thereby thrown after bad. The likelihood of that occurring is then accentuated by the well-known tendency of decision-makers to escalate their commitment to failing courses of action – doubling the bet in the hope of its eventually coming good, or at least of shifting on to a future decision-maker the political costs and pain of ‘pulling the plug’.

Third and last, as the time taken to resolve problems causes project timetables to stretch out, pressures arise to adapt the systems being developed to take advantage of new technologies and to provide expanded functionality. This rework inevitably increases total project costs, especially in systems that rely on large numbers of closely integrated subsystems.

These features, which seem common to technologically complex projects, are greatly accentuated in the weapons acquisition process.

This is partly due to the technical characteristics of advanced weapons systems, notably their sheer complexity and need for extensive, real-time interoperability. But it is also because these systems, as well as being extremely complicated, are also – and perhaps uniquely – required to operate effectively in the face of hostile actions aimed at destroying them. Indeed, as with defence generally, the performance of a

weapons system is only usefully defined relative to the capabilities likely to be arrayed against it. This has important consequences.

To begin with, it introduces significant additional complexities into the design stage. Understanding how a system will behave under combat conditions is extremely challenging and has results that are inherently difficult to predict. Equally, because weapons systems are designed to be employed in combat, they are of little use if they cannot evolve as adversaries' capabilities increase. The systems must, in other words, be capable of being modified in line with changes in the technologies and strategies that will be used against them.

The life cycle of weapons systems can be forbiddingly long. Developing a new system can take eight to fifteen years, with even longer lags in individual cases. The Air Warfare Destroyer, for example, has been in planning since 1999, is now in production and will be so through to about 2015, and will remain in the fleet for thirty or more years. That circumstances will change over that period is inevitable.

These very long planning and deployment periods create a risk that a system will become obsolete even before it comes into service. Dealing with that risk involves allowing some degree of system redesign during development and acquisition. It also involves providing scope for extensive modification during the system's operating life. As a result, for most technically complex weapons systems, it is an illusion to believe that specifications can ever be set in concrete before the procurement process is well under way. But the fact that specifications are inevitably open-ended creates substantial difficulties for the process of buying and modifying weapons.

In particular, this means that contracts for complex weapons systems cannot exhaustively specify the full range of contingencies that will arise. Rather, significant elements will be determined only in the course of contract life, through the interpretation, addition, modification or deletion of contract conditions. This exposes the buyer − in Australia's case, DMO − and the seller to considerable risks.

From the buyer's perspective, the risk is that sellers will play what US defence economists call the "get well" game − in which the seller incurs losses in securing the initial contract, including by bidding artificially low for any early stages of work, but then uses changes in contract conditions to inflate costs and profits. Once the work is under way, the buyer is more often than not locked in to the chosen supplier. This gives the supplier a degree of market power that shortcomings in the original contract, and changes in requirements, allow it to exploit.

Risks arise for the seller too. In practice, the seller is dealing with a monopsonist - that is, a sole buyer. Once the seller has incurred significant costs in developing a system − costs it would not be able recoup should the project be cancelled − it too is vulnerable to being "held up". Specifically, the buyer may force changes that materially reduce the profits the seller might have secured, even though they do not drive the seller to the point where continuing is no longer financially viable.

The negotiations that inevitably occur during the life of weapons contracts are therefore fraught with risks and tensions. Each side has incomplete information as to the costs and benefits accruing to the other, and limited scope to credibly convey or

signal that information. The fear of being exploited, or of forgoing gains one might have made by pushing that bit harder, cannot but colour and complicate the negotiating process.

These conditions hardly make for efficient outcomes, at least relative to an idealised standard of what would be "first best". Rather, they are more likely to and often do, result in what seems like a mess, as costs escalate, delivery falls behind initial promises and adverse Audit Office reports catch the attention of politicians, media and public alike. Little wonder then, that Defence gets a reputation as an area where resources are poorly used and even more poorly managed.

Pathways to reform

All this may suggest that seeking efficiency in Defence is pointless. There is an obvious, indeed trivial, sense in which that is right: the supply of defence is beset by a multiplicity of imperfections ('government failures') that mean it will never attain anywhere close to first-best outcomes. However, it is equally obvious that there may be options and strategies for doing better, i.e. for limiting the costs those imperfections impose.

Better information

A first option is to improve the information available for decision-making. Thus, as stressed above, it is one of the key functions of markets to provide mechanisms and incentives for the truthful revelation of information. On the demand side, consumers, through their purchasing decisions, disclose information about their willingness to pay. Equally important, on the supply side, competition drives suppliers' prices towards their costs, in the process revealing information about how much it costs to do things. Knowing those cost levels, potential innovators have a target to try to better, and laggard firms a measure of how far they are from the efficiency frontier.

Unfortunately, it is impossible to replicate this process in the supply of national defence, and the resulting absence of mechanisms that can force truthful information revelation is at the heart of the principal-agent problems discussed above. Improving the information on which principals can draw in monitoring the performance of agents is therefore a key element in a strategy aimed at enhancing defence efficiency.

Two types of information are especially important. First, Australian taxpayers have a right to be better informed than they currently are about defence spending, its composition and evolution. Constant changes in the way budget information is disclosed, and self-interested tinkering by governments with reporting formats and conventions only muddy the waters and undermine accountability. It would be far better to determine a standard format and stick to it, much as the United States has done for many years now.

Second, it will be impossible to improve the efficiency of defence decisions without substantially improving the information on which they are based. There is, in particular, a strong case for making far greater use of program budgeting and of cost-benefit analysis in defence decision-making.

These techniques are hardly new; rather, they took form in the 1950s. Applied in a defence setting, they aim at:

- Forcing more explicit identification of the objectives being pursued in each area of defence resource use;
- Promoting consideration of alternative ways of meeting those objectives, and doing so using a common, consistent, and hence more readily testable, analytical framework;
- Spotting areas of imbalance, and identifying and avoiding further expansion in program areas that are on the 'flat part' of the cost effectiveness curve;
- Facilitating post-mortems on decisions and performance, by comparing out-turns to expectations; and in all of those ways,
- Assisting decision-makers to evaluate whether the current and likely future aggregate level of resources could provide more defence output and/or whether the current and required future aggregate level of defence output could be provided using fewer resources.

A detailed discussion of these techniques would go beyond the space available. Suffice it to say that less systematic use seems to be made of them in Australia than in comparable defence establishments overseas.

This reflects a lack of recognition of the fact that choosing strategies and weapons systems is fundamentally an economic problem, using the term in its precise sense. It is, in other words, a problem in determining how best to use limited dollars and limited resources that, at least in a long run sense, must be valued in dollars. It is simply impossible to address this problem properly without thinking through the purposes of alternative force structures, formulating good criteria of effectiveness, and then considering alternative systems and structures (or mixes of systems and structures) in terms of their effectiveness and their properly measured life-cycle costs.

This is not meant to suggest these kinds of measures can ever be perfect – far from it. All the technical difficulties of defence planning outlined above ensure that will never be the case. However, it is reasonable to believe that if alternatives are carefully arrayed, and a serious (even if necessarily imperfect) attempt made to apply criteria to choose the most efficient ones, decision-making and the monitoring of decision-making will be improved.

Moreover, while it is inevitable that political and other pressures will twist the evaluation process out of shape from time to time, the availability of good analysis may still be helpful in getting rid of the worst projects. As Aaron Wildavsky, an eminent US scholar of public administration, once observed, avoiding the worst where one can't get the best is no small accomplishment.

There is, in fact, a well-known model in economics, developed by the Nobel laureate James Mirlees and Professor I. M. D. Little (one of the pioneers of cost-benefit analysis) which suggests that, under plausible assumptions and accepting that all forecasts are imperfect, the social value of proper project appraisal is in the order of 10 per cent or more of project value. Given the many billions of dollars devoted to defence, gains of this magnitude are certainly worth seeking.

Developing and retaining the capability to generate this kind of information, to high quality levels, is as difficult as it is important. It requires processes for collecting, auditing, updating and systematically reviewing information and analyses, searching out inconsistencies, identifying areas for improvement, and mobilising the resources required to implement them. Defence, if it ever possessed this capacity, does not do so now. Without that capacity, decisions will only be tolerably efficient by chance.

Better structures

Better information is of value if decision-making structures can make good use of it. At the same time, improving structures can itself help generate better information.

As a broad generalisation, efforts at developing better decision-making structures in defence have typically involved two elements:

- Moving responsibility for decision-making closer to those who have the information required to best take decisions; and
- Improving the ability to move information from those who have it to those who need it to take decisions.

Decentralisation, which is the crux of the first of these, is not a new idea in defence. After all, the sheer size and complexity of defence establishments has long imposed a degree of decentralisation on decision-making. The question is whether that decentralisation can be harnessed to increase efficiency.

This question arose in the late 1940s when US defence economists, recognising the inherent limitations of central planning, sought ways of introducing "market like" mechanisms into the workings of the US defence establishment. By the 1950s, responsibility for some ancillary military activities, such as clothing supply and some transport functions had been devolved to specialist units. 'Customers' had thus been separated from 'contractors', with the intention that these parties would deal with each other on a quasi-commercial basis (the 'customers' being the fund-holders, while the 'contractors' operated as trust accounts).

While this did lead to increased management focus, greater cost transparency, and associated gains in efficiency, it also highlighted a number of complex, and still largely unresolved, issues. To understand these issues, it is useful to note that decentralisation assumes:

- That the complex of decisions being taken can be broken down into distinct segments, with responsibility for each such segment being allocated to a particular decision-maker; and

- That having thus allocated responsibility to a particular agent for a well-specified set of decisions, that agent will have (or can be given) incentives to take efficient decisions.

The problem with the first of these assumptions is the pervasiveness of spill-over effects, that is, interdependencies in decision. If dimensioning and managing the air transport capability is separated from decisions about what needs to be transported, the result may be a complete mismatch in requirements. Efficiency requires some mechanism for assuring the coherence between decisions that jointly determine outcomes.

Broadly, the changes that have occurred in defence – including the shrinking number of major assets (as the per unit price of assets rises) and the ever-greater emphasis on enhancing the effectiveness of those assets through inter-operability across platforms and services – makes securing that coherence all the more important. This tends to militate against decentralisation, at least of major investment decisions.

That said, it is obviously possible to define some activities that can be set up as notional business units (for instance for delivering asset management services) along customer/contractor lines. This can yield substantial efficiencies and indeed, in the case of DMO, has. However, the second of the conditions set out above for successful decentralisation – the need for effective incentive structures – then comes into play.

Thus, the customer/contractor model relies on the customer's ability to specify the outputs required and reward (or penalise) the contractor on the basis of the outputs received. But performance is often hard to measure, at least in some potentially relevant dimensions. Focussing performance assessment on those dimensions that can be measured (and punishing or rewarding decision-makers accordingly) would distort the allocation of effort, away from what is difficult to measure and towards what is measured readily.

This difficulty is referred to in the economics of incentives as 'the multi-tasking problem'. Where multi-tasking matters, providing strong performance-based incentives to decision-makers can be hazardous: it may, in fact, be better to allow agents to shirk on work effort than to have them under-produce dimensions of output that though difficult to contract for, are highly valued.

An example of the potential problems is where short term gains can be achieved in measured performance (say, in terms of cost savings) by compromising performance over the long run – for instance, by skimping on maintenance and degrading a system's potential in ways that are difficult to discern but no less real. In this case, decision-makers, if there are substantial rewards for cost reduction, may claim those rewards by shifting even greater costs on to future users. This is a negative externality: i.e. a cost one actor imposes on another, because he or she can secure benefits from so doing without fully bearing the costs his or her action creates. From the standpoint of Defence as a whole, an outcome in which the work takes slightly longer than required might well be superior to one in which this externality is imposed.

Accentuating the difficulties of providing incentives for good performance is the fact that the contractor/customer split within defence typically results in a small number of internal 'customers' facing a single internal 'contractor' (or at best, a small number of 'contractors', who may, but usually do not, act as competitors). With both sides having a degree of market power, price-setting is unlikely to be efficient. Moreover, as a practical matter, such a structure is more likely to give rise to a repeated form of bargaining than to anything resembling market competition.

In short, there are real limits on the ability to emulate market-like, decentralised processes in the defence environment. While devolution of responsibility can lead to gains, it can also encourage the devolved units to play cost-shifting games and to concentrate on achieving the targets that have been set for them, rather than on securing the outputs of greatest value to Defence as a whole. These risks need to be recognised in the design of any decentralisation scheme, as the failure to do so can impose high costs.

A corollary of this conclusion is that moves to decentralisation generally require some parallel moves to new forms of centralisation. There is a difference here with markets, where competition – the primary form of decentralisation – replaces the need for hierarchical control. In contrast, in an administrative environment, devolution of the right to take decisions *ex ante* typically requires better controls *ex post*. Outputs must generally be managed centrally, even if inputs are best managed locally.

As a result, systems and processes are needed to set objectives for individual decision-making units, monitor the decisions they take, assure those decisions' aggregate coherence, and revise plans, targets and (from time to time) structures in the light of those analyses. In that sense, decentralisation is not a substitute for, but rather a complement to, a focus on better moving information from those who have it to those who need it.

This highlights the importance of putting in place the other elements of the program budgeting approach discussed above, particularly careful definition of objectives, systematic performance reporting against those objectives, and (especially important) effective performance-related auditing. Moreover, those elements need to be implemented consistently over time, if the information and experience required for performance evaluation is to be accumulated. This may seem entirely obvious; but experience shows that this principle has been respected largely in the breach.

The results are evident in the successive efficiency drives Defence has experienced. Each largely re-invents the wheel, devising new systems, metrics and processes, thus limiting the scope for learning and hence for sustainable improvement. Without more systematic thinking about what structures can support efficiency in the long run, the pattern is likely to simply repeat itself time and again.

Better contracts

One form of devolution that has become ever more pronounced in Defence over the years is contracting out, i.e. the replacement of internal production by market purchases. While internal production is managed through administrative direction over inputs, market purchases are managed through contracts that primarily relate to outputs. Well-designed, properly implemented, contracts are therefore pivotal to

successful outcomes, particularly in complex procurement situations involving the acquisition and sustainment of specialised military equipment.

While cost-plus contracts have been the norm in the United States, Australian defence contracts have generally been fixed price, though often with escalation factors related to general inflation and to changes in some input prices. This difference partly reflects differences in the procurement situation, with the US purchasing more systems at a developmental stage in the product life cycle (when costs are difficult to predict), while Australia has tended to purchase existing systems, but then adapt them to Australian needs. It also reflects some difference in emphasis, with Australian decision-makers putting a premium on budget certainty.

In practice, the certainty has often been illusory. Thus, in many instances, negotiations over contract variations have reopened the effective contract price, but under conditions even less competitive than those prevailing at the time of contract signing (as shifting to another supplier is almost always out of the question once the initial contract is underway). Moreover, when contracts run into difficulties, either price overruns have been accepted, or delays allowed (which can amount to much the same thing), though it is true that there are instances where the contractor has borne a substantial loss (as in Boeing's Wedgetail contract). Finally, with Defence increasingly feeling the 'heat' for cost overruns, there has been some tendency in recent years to reduce the risk of overruns by building greater 'fat' into contract prices, which can be less efficient than explicitly accepting a degree of cost-passthrough in contract terms.

All these issues have raised the question of whether the design of Australian procurement contracts could be improved, and if so, how. In essence, the question is whether better designed contracts can assist in terms of ***selection efficiency*** on the one hand, and ***performance efficiency*** on the other.

Selection efficiency refers to the process by which contracts are allocated. In principle, a high degree of selection efficiency occurs when contracts are awarded to those who can best implement them, increasing efficiency generally and reducing the risk poorly selected contractors impose on Defence. In contrast, performance efficiency refers to the extent to which contract structures align performance incentives between the customer and the contractor, inducing the agent to act in ways that maximise the payoff to the principal.

Viewed in this perspective, both pure cost-plus and pure fixed price contracts are only likely to be efficient in polar cases. Thus, a pure cost-plus approach is typically desirable at early stages of system development, when cost uncertainty is high, specifications necessarily open-ended, risk best borne and managed by the customer, and contractor selection based primarily on (known or at least assessable) technical competence. In contrast, pure fixed price contracts are best suited to situations in which products are mature, specifications stable and well-documented, and supply conditions competitive (so that the competitive process itself reveals reliable information about suppliers' costs).

However, when those polar cases do not hold, efficient contracts are likely to involve a target cost, a target quality and a profit-adjustment clause. The simplest of these

contracts combines a a fixed price element, an element based on some degree of cost-reimbursement, and (possibly) an element linked to contractor performance in dimensions other than costs. Such a contract can have an "*F + sC + (P*Q)*" form, where '*F*' is the fixed price component, '*s*' the degree of cost sharing, '*C*' the measure of costs, '*P*' the payment (positive or negative) for over- or under-delivery on each measure of contractor performance and '*Q*' the measure of the relevant dimensions of contractor performance. In more complex contracts, there can also be elements that relate to term and to quantity purchased (so that the buyer has options over additional units, typically at prices that reflect information gathered in the production of the initial units).

Where there is competition between potential suppliers, the simple linear contract (*F + sC + (P*Q)*) can yield greater selection and performance efficiency than would be available from fixed price or pure cost-plus alternatives. Thus, ignoring for the moment the issues associated with the quality element, if the buyer sets the 's' term and risk-averse rivals compete on '*F*', the fact that the buyer is providing some degree of cost insurance can induce the more efficient suppliers to bid more aggressively. So long as the '*s*' parameter is not too high, the resulting gains can be shown to outweigh the incentive for cost padding that arises from cost-sharing.

Moreover, where some suppliers are better at reducing costs than others, further gains can be made by allowing suppliers to bid in their preferred cost-sharing factor (the '*s*' in the linear contract structure above). This is because the more efficient suppliers will have greater confidence in their ability to control costs, and hence will bid in a lower '*s*'. By thus cashing in a part of the potential cost savings (since a low '*s*' means they do not have to return expected cost reductions to the buyer), they can be more aggressive in their bidding on '*F*', benefiting the buyer.

Finally, the '*P*Q*' term can be used to signal to suppliers the value Defence places on various measures of outcomes, for instance, availability factors in sustainment contracts. To have the desired effect, these measures need to be based on a careful analysis of the gain or loss to Defence from marginal changes in each of these dimensions of performance, thus ensuring that a supplier does not incur costs in seeking to improve on one of these measures that exceed the benefit Defence would gain were that improvement to occur.

In practice, such incentive- and performance-based contract structures have been far more frequently discussed in Defence than implemented. And even in those areas where some implementation has been recommended – such as sustainment contracts for aircraft – the performance-based component has played little role in practice.

This may partly reflect market structure considerations. Where the degree of competition is limited, there may be a sense in Defence that it is better to try to lock in a price up-front, reducing the exposure to the repeated exercise of market power. However, while the lack of competition will almost inevitably worsen the terms Defence faces, it may still be preferable to use an incentive contract (rather than a pure fixed price arrangement), if the incentive contract allocates risk more efficiently than a fixed price contract would (thus lowering costs and the monopoly price).

That said, the limited use of incentive- and performance-based contract structures

seems likely to primarily reflect a lack of confidence about precisely how such contracts should be designed and implemented. It is certainly plausible that contract officers would be uncertain about quite how the cost-sharing factor should be determined, or about exactly what measure of costs such a factor should be applied to and why. Given that there is little or no guidance in current contracting policy on these issues, it would be easy to understand if contracting officers placed these contract structures in the 'too hard' basket. The fact that DMO does not really have the resources – for example, in terms of cost inspectors – required to implement these contracts, or the associated systems (for instance, for systematically benchmarking suppliers), only makes a shift to incentive- and performance-based contracts more difficult.

For all of these reasons, there is some road to go before better contracting practices can become widespread in Defence. Analysis and experience suggests that road is well worth travelling. But that is not to suggest that better contract structures are a panacea – they plainly are not. Nor should they be a substitute for other changes that are needed if taxpayers are to get value for money from defence procurement, including greater use of MOTS/COTS options, more rigorous cost-benefit testing of any deviations from MOTS/COTS, and systematic efforts to increase the extent and efficacy of competition for defence contracts. However, properly implemented, they can usefully complement those changes, and ensure reforms yield the greatest benefits to Defence and the community.

Conclusions

Concern about the efficiency with which defence is supplied is a hardy perennial. The analysis set out above suggests those concerns are not likely to go away. This reflects features of defence supply that impede efficient provision and will continue to do so.

Especially important are the difficulties involved in defining and measuring defence outputs. One consequence of these difficulties is a tendency to focus on inputs rather than outputs, with the share of GDP devoted to defence gaining almost talismanic status as an indicator of the adequacy of our defence effort. This treats costs as if they were benefits, which is plainly incorrect.

While perfect measurement of defence outputs is impossible, it should be possible to develop better indicators than are currently available. The development of such indicators is an integral component in improving the use of cost-effectiveness and cost-benefit analysis in Defence, which in turn, is essential if the community is to be assured of getting value for money from defence outlays.

This, and other changes which could enhance defence efficiency, require a realisation that the question "how much is enough?" (which Robert McNamara famously asked about the defence budget) is fundamentally an economic question: that is, a question about the allocation and best use of scarce resources. That question can only be answered by taking proper account of opportunity costs in setting defence priorities, which in turn requires an understanding of both the costs and consequences of strategic choices.

Seen in this perspective, it is an error to proceed as the 2009 Defence White Paper seemed to, by starting at the top with broad national objectives and circumstances,

and then deriving a strategy, and from that strategy, identifying force requirements (such as the next generation of submarines). This is mistaken because the costs of each option must be considered in choosing between alternative objectives and alternative strategies. It may be that the advantages of a somewhat more ambitious strategy would have exceeded its somewhat greater cost – or conversely, that the savings arising from less ambition would outweigh the resulting diminution of capability. And, of course, the cost and effectiveness of each strategy will depend on the cost and effectiveness of the systems and platforms on which it relies.

As a result, the line of causation cannot run only one way, be it from the strategy to the forces, or, for that matter, from budget to strategy. Rather, there is an interdependence between decisions about objectives, strategy, forces, and systems, that arises from the need to balance scarce dollars on the one hand with the value placed on desirable ends on the other.

Undertaking such analyses requires improving the information base on which Defence relies, both in terms of costs themselves and in terms of the relationship between costs and consequences. Developing that information would not only yield improvements in Defence decision-making but would also make for better assessment of Defence performance by government and the broader community.

Better information alone is not sufficient; rather, it needs to be accompanied by decision-making structures and processes that can make good use of that information. While many of these issues have been canvassed in previous efficiency drives in Defence, there has been a lack of continuity in reform efforts, giving the process a start-stop character that undermines effectiveness. A clearer understanding of the root causes of the problems, and of the potential and limits of any solutions, may help in setting a more realistic perspective within which the search for efficiency can be pursued.

CHAPTER 5 –STRATEGIC REFORM PROGRAM

Defence and efficiency

At the risk of reiterating the discussion in the previous chapter, efficiency refers to the quantity of output delivered per dollar spent. For Defence, the output is principally military capability. The all too-frequent cry that Defence should focus on effectiveness, rather then efficiency, is wrong-headed. For a given budget, greater efficiency delivers greater output and therefore greater military capability and effectiveness. And this is precisely the circumstance that Defence is faced with today—the government has said that efficiency must be improved to fund budget shortfalls, remediation, and new capability initiatives. The vehicle for achieving these savings is the *Strategic Reform Program* (SRP).

Just as it is important not to see efficiency and effectiveness as incompatible, it is equally important not to confuse efficiency and savings through reduced output. It is always possible to save money by, for example, delaying equipment procurement or reducing preparedness, but these sorts of actions reduce the amount of capability delivered as much as they reduce costs—hence effectiveness falls and, all other things being equal, efficiency stays where it was.

What follows is divided into three parts. First, we survey previous attempts to make Defence more efficient and ask how effective they have been. Second, we look at the development which led to the announcement of SRP in last year's Defence White Paper. Finally, we look at what we know about the SRP and its $20 billion savings program.

The long drive for efficiency

To put the present goal of freeing up $20 billion over the next decade in context, it's worth recalling how we got to where we are today.

Serious efforts to improve efficiency within Defence began with the 1990 report by Alan Wrigley entitled *The Defence Force and the Community*. It laid out a scheme whereby support roles traditionally performed in-house by Defence personnel (uniformed and civilian) would be transferred to the private sector. Through the 1990s, and in tandem with the sale of government-owned naval shipyards, aircraft factories and munitions plants, activities in Defence that were deemed unnecessary to retain 'in uniform', and which could be delivered more efficiently by the private sector, were outsourced.

Until the latter part of the 1990s, the outsourcing occurred under the auspices of the *Commercial Support Program* (CSP) which systematically applied cost-benefit analysis to activities. The original goal of the Program was to accrue $200 million in recurrent savings by 1998 from within a Defence budget of around $8 billion per year. As a result of the CSP and direct cuts to the force structure made in the 1991 *Force Structure Review* (which removed more than 6,570 positions from the permanent ADF) the size of the full-time uniformed force fell from 68,700 to 57,000 between 1990 and 1997. Over the same period civilian numbers fell from 24,000 to 18,000.

When the new government arrived in 1996, Defence was initially quarantined from the widespread cuts to the Public Service that occurred. Apart from a $125 million administrative savings measure which was redirected to military capability, it was untouched. But in October of that year, the government commissioned an external *Defence Efficiency Review* to look for ways to improve efficiency. As with the current SRP, the aim was not to take money from Defence but to redirect funds to the sharp end.

There was good reason to do so; the CSP had been delivering savings much more slowly than cost pressures emerged. As a result, a growing gap between means and ends was having an increasingly deleterious effect on the preparedness of the ADF and the state of its equipment. In retrospect, this is hardly surprising given that the Defence budget was effectively held constant in real terms over the period at the same time as the cost of personnel, equipment and support comfortably outpaced inflation.

The *Defence Efficiency Review* led to the *Defence Reform Program* (DRP). The DRP was nothing if not ambitious. From an annual Defence budget of around $10 billion, the DRP sought to generate $941 million in recurrent savings and $675 million in one-off savings—all without any reduction in military capability. In comparison, prior to the DRP the CSP had only delivered $155 million in savings.

To free up what amounted to almost 10% of the Defence budget, the DRP proposed:

- accelerating and deepening the contracting-out of activities to the private sector
- consolidating duplicated administrative and support activities
- reducing the Defence property portfolio through consolidation and sale of surplus assets.

In consequence, a total of 12,201 military and 8,303 civilian positions were to be removed through efficiency measures or examined for market testing.

Of course, planning to save money and actually doing so are different things. And, while the sale of properties did eventually deliver $1.5 billion in one-off savings, it is frustratingly difficult to judge the extent to which the DRP achieved its goals for recurrent savings. There are two reasons for this.

First, Defence made few attempts to monitor individual initiatives and measure the near-term, let alone long-term, impact on the cost of delivering capability or the quanta of capability delivered. As a general comment, Defence's coordination of the program was poor and reporting was lax. In many cases, efficiencies were deemed to have occurred by simply reducing sub-organisational budgets and telling people to live within the means provided. Given that significant budget pressures re-emerged well before the end of the decade, it is likely that a good share of claimed efficiencies were an illusion. And, in any case, the claimed efficiencies fell well below target. According to a 2001-02 Audit Office Report, of the $941 million of planned savings only $644 million was claimed as achieved or *in progress* as of 2001. No subsequent accounting or reporting of overall results occurred.

Second, rather than redirect the savings to meet shortfalls in capital investment or logistics, the decision was taken to use the savings to 'buy back' ADF personnel and increase the planned long-term (post-DRP) strength of the permanent force from around 45,000 to 50,000. In theory, this meant continuing to outsource non-core military positions and re-employing those personnel to deliver additional combat capability. However, despite the claim that additional capability resulted from the 'buy back', no new battalions were raised, not a single additional vessel set to sea and no extra aircraft took to the air.

Whether the DRP delivered efficiency in the long-term is hard to say. Despite a singular fixation with financial accounting (at great cost and no tangible benefit), until recently Defence has proven itself to be largely indifferent to understanding or planning its business. It may be that in some cases the DRP simply transferred activities from inefficient public hands to monopoly rent-seekers in the private sector. This risk is particularly high where services are so defence-specific that set-up costs restrict the entry of new suppliers after initial contract award. Moreover, it may be that the initial justification for some outsourcing was skewed by the one-off availability of already trained ex-Defence personnel—resulting in rising costs once suppliers had to take on the burden of training personnel.

In any case, the overall perception of the DRP among Defence personnel—particularly military personnel—is negative. Defence folklore holds that the DRP cut costs by reducing the quality and responsiveness of services while at the same time undermining the sustainability of military career paths in many areas. It is likely that these perceptions have some justification. The only way to tell would be to compare the cost and output of individual activities from 1996 through to the present. As a general rule, Defence has not bothered to collect the data to allow such a comparison.

Beyond the opacity and confusion of the DRP, the next milestone in the drive for efficiency was the 2000 White Paper, *Defence 2000*. In what was a serious attempt to baseline the cost of delivering military capability, *Defence 2000* set out what was believed to be a fully funded ten-year program for the ADF.

Apart from specific additional funds to acquire, man and operate planned new equipment, it injected approximately an extra $450 million in baseline costs from 2001-02 onwards (through the retention of 1999 'force generation' funds intended, but never used, to expand the ADF to sustain operations in East Timor) plus $150 million in annual baseline operating costs from 2004-05 onwards. In addition, Defence was directed to find efficiency savings of around $200 million a year as part of the White Paper funding strategy to 'free up funds to offset unavoidable cost pressures'.

As it turned out, *Defence 2000* failed to properly anticipate—by an appreciable margin—the full cost of developing and maintaining the capabilities it planned for the ADF (in part due to *ab initio* underestimation and at least in equal measure due to escalating capability goals). So, from 2003-04 onward, Defence received a series of additional funding injections to cover rising baseline costs in personnel, logistics and estate. Over time, these top-up funds grew to around an extra $1 billion a year (the nature and timing of this additional funding appear in Chapter 3 of this Brief). With so much extra money flowing into Defence so soon after the White Paper, it is hard to give any credence to the claim that $200 million a year in White Paper savings was

delivered by simply 'rebaselining' group budgets within the organisation. There is no efficiency gained by claiming savings on paper while accepting new funding at the same time.

This conclusion is further reinforced by the fact that in 2003, following what was called the *Defence Capability Review*, a wedge of funds was removed from Defence and returned to the government in anticipation of the early retirement of two FFG frigates and the planned early retirement of the F-111 fleet in 2010. As a result, at least some of the new money provided to Defence was offset by money clawed back by the government through cutting military capability.

Curiously, at the same time as additional funds flowed into Defence, a series of new efficiency and savings programs were imposed on the organisation. These are set out in Table 5.1 and described below. For completeness the White Paper savings initiative has been included in the table.

Table 5.1: Defence 'efficiency' initiatives 2000 to 2009 ($m)

	01-02	02-03	03-04	04-05	05-06	06-07	07-08	08-09	09-10	10-11
Budget cuts										
Extra Administrative Savings						70	60	12		
Progressive Efficiency Dividend[1]					3	16	36	59	85	109
2007-08 Efficiency Dividends							11	51	57	58
Rationalisation of Command/Control						6	13	21	31	31
subtotal					**3**	**92**	**120**	**143**	**173**	**198**
Absorbed measures										
Absorbed Budget Measures 2005-06					65	78	46	28		
Absorbed Budget Measures 2008-09								1,113	35	26
Absorbed Budget Measures 2009-10[2]									146	146
subtotal					**65**	**78**	**46**	**1,141**	**181**	**172**
Internal efficiencies										
2000 White Paper savings initiatives	50	200	200	200	200	200	200	200	200	200
Administrative Savings Initiatives[3]			50 (61)	100 (126)	150 (169)	153 (175)	200 (202)	200	200	200
subtotal	**50**	**200**	**261**	**326**	**369**	**375**	**402**	**400**	**400**	**400**
Total	**50**	**200**	**261**	**326**	**437**	**545**	**568**	**1,684**	**754**	**770**

[1]After 2009-10 the efficiency dividend will continue to grow by roughly $30 million per annum.
[2]Average of $584 million in absorbed measures over 4 years (detailed phasing undisclosed)
[3]Achieved administrative savings are shown in brackets
Source: various DAR and Budget Papers

The first category of initiatives in Table 5.1 (budget cuts) involve reducing funding while maintaining output. On the basis of publicly available information, it is impossible say how or whether these efficiencies have been delivered. In some cases the initiatives reflect salami slicing of funding by the Department of Finance as part of broader government austerity. In a somewhat different category is the Rationalisation of ADF Command and Control. It came about after Defence undertook a review of its

network of headquarters and found that they could get by with 241 fewer personnel. Credit is due for this self-generated efficiency.

The second category (absorbed measures) arises when defence is asked to absorb the cost of a new budget measure. Assuming that the new measure is delivered and Defence does not cut capability elsewhere, this represents improved efficiency. Last year, for example, Defence was told to absorb $584 million of new initiatives over four years. Note that the more than $1 billion absorbed measures in 2008-09 involved special circumstances; Defence was told to absorb operational deployment costs after a windfall gain in indexation and a hand-back of around $850 million of unspent money from the previous year. As a general observation, it would be naïve to think that substantial costs can be absorbed without cutting or deferring other activities. The latest round of absorbed costs in this year's budget makes no such claim, and conceding up front that the costs will be covered by cuts to Defence's existing capital investment programs.

The final category (internal efficiencies) involves freeing up funds within the existing budget and redirecting those funds to military capability or other priorities. Usually, this entails cutting administrative costs, the presumption being that the administrative or other functions are henceforth performed more efficiently—but as with other Defence efficiency programs, it is hard to determine if this is the case. Take for example the *Administrative Savings Initiatives.* When Defence last reported on the program, there were 28 separate initiatives claimed. Trouble is, it was impossible to confirm reduced spending in any of the areas in the absence of baseline and ongoing spending information. Disappointingly, Defence ceased disclosing actual expenses by category in the 2006-07 Annual Report (not long after ASPI pointed out that claimed savings in travel were not substantiated).

So while the savings listed in Figure 5.1 look impressive, we have no way of verifying that the savings actually occurred; unlike Defence's financial statements, savings initiatives such as theses are not subject to external audit. It could be that the various initiatives offset rising costs and averted what would have been a much large funding gap prior to the 2009 White Paper. Alternatively, successive efficiency measures may have done nothing more than feed off accumulating administrative overheads and inefficiencies—a khaki magic pudding.

Background to the Strategic Reform Program

As the end of the last decade approach, there emerged two (almost contradictory) propositions about Defence funding. First, that there was not enough money in projected Defence funding to afford all that was planned in terms of new equipment and attendant personnel and operating costs. Second, that Defence was not as efficient as it could be having grown fat and complacent after close to a decade of escalating funding. In essence, the SRP came about as an attempt to at least partially solve the former problem by addressing the latter.

ASPI tried to assess the efficiency of Defence back in 2008-09 by surveying the limited data available on Defence's costs and performance. This task was made difficult (and continues to be so) by the repeated changes to the way Defence reports its spending and performance. Nonetheless the somewhat cautious conclusion was

reached that 'there is, at least, *prima facie* evidence that Defence is less efficient than it might be'. Key indications at that time included:

- a dramatic increase (41%) in the number personnel working in administrative and headquarters areas over the preceding decade
- a rapid increase in suppliers expenses (75% over seven years) despite relatively static activity rates
- a disproportionately large increase in the number of full-time civilian employees (26%) compared with full-time military personnel (6%) over the preceding seven years.

In the two years which have followed, two independent external assessments of Australian defence efficiency have been undertaken and made public. The first is the 2008 Defence Budget Audit undertaken by Mr George Pappas; the second is the 2010 international benchmarking of defence performance undertaken by the consulting firm McKinsey and Company. Both reports conclude that significant opportunities exist to boost the efficiency of Australia's defence effort. Because the McKinsey and Company report has since been revised to exclude Australia from its analysis, it need not concern us further.

The 2008 Defence Budget Audit

In May 2008 George Pappas was appointed to undertake an audit of the Defence budget. In June 2008 a team of consultants was engaged from McKinsey and Company to support the audit. The consulting team included 9 full-time consultants and 11 part-time consultants from McKinsey's overseas offices. The audit concluded in February 2009 and a report was delivered to the Minister in April 2009. In November 2009, the report was made public with only a limited number of items redacted. Electronic copies of the 303 page report can be downloaded from the Defence website. Key recommendations (based on a 2007-08 budget baseline) included:

- a new funding model based on a tailored basket of inflators
- tight strategic planning
- accurate forecasting of acquisition and operating costs
- effective planning and management of major equipment expenditure, including, where feasible, by purchasing military-off-the-shelf (MOTS) equipment
- creating a lean military support backbone
- creating efficient enterprise support functions, including by moving to more centralised service provision
- capturing efficiency while reforming Information and Communications Technology (ICT)
- reducing non-equipment procurement costs
- reducing the cost of major capital by buying more MOTS equipment, greater competition, reviewing non-strategic local sourcing

- reducing the cost of combat capability through the use of the Reserves in a flexible surge model
- removing inefficiencies through base consolidation
- adopting an outputs-driven budget model

Table 5.2 lists the quanta of prospective savings relative to the baseline year of 2007-08. As best we can tell, the savings estimated in the Budget Audit were given in 2008 dollars. To allow comparison with the planned savings from the SRP, the estimated 'out-turned' savings including inflation have been provided in the final column for the decade commencing 2009-10.

Table 5.2: Estimated potential savings identified by the 2008 Budget Audit

Initiative[1]	One-off savings	Annual savings ($m)	Decade savings ($b)	Our-turned Decade savings ($b)
Lean military support	218 to 398	354 to 615	3.45 to 6.15	4.07 to 7.06
Efficient enterprise support		363 to 406	3.63 to 4.06	4.17 to 4.66
ICT reform and efficiency		215	2.15	2.47
Non-equipment procurement		326 to 518	3.26 to 5.18	3.74 to 5.95
Use of Reserves		50	0.5	0.57
Total	**218 to 398**	**1,299 to 1,804**	**13.0 to 18.0**	**15.0 to 20.7**

Source: 2008 Defence Budget Audit

Potential savings of between $345 million and $669 million from changes to acquisition were also identified but not counted in the total savings estimated by the Budget Audit. Similarly for long-term savings from base consolidation which were estimated at between $700 million and $1,045 million annually in 2035.

In releasing the report, the Minister said that the government 'had accepted the vast majority of the Audit recommendations and these will be implemented through the Strategic Reform Program'. Those which were not accepted include adopting a basket of inflators to maintain the buying power of the Defence dollar and the politically sensitive question of consolidating existing ADF bases into a lesser number of 'super-bases'. In regard to base consolidation, Defence was tasked to undertake further work. It's anticipated that this will take 12 to 18 months to complete, at which time an 'independent commission will then be appointed to consider Defence's recommendations'.

From an economic perspective, the Budget Audit made some interesting choices. On the one hand it stressed the importance of an output-driven budget that would see '[d]rive reform from the Services back into the support functions' by giving the Service Chiefs (sometimes referred to as capability managers) control of a larger share of the budget. On the other, it placed great faith in driving achieving efficiencies through greater centralisation and standardisation of support activities.

The Strategic Reform Program

The SRP is a central component of the 2009 White Paper. To quote the Minister from April 2010; 'To be blunt, while we have already started to build Force 2030 through

decisions over the past year, achieving it in its full potential will not be possible without achieving the SRP in all its dimensions.' As such, the SRP is a package of reforms and efficiency initiatives to improve Defence's performance and deliver $20 billion of savings over the next decade. This section examines the SRP and other planned changes to Defence management.

The appearance of yet another Defence reform program comes as no surprise. Over the past forty years, repeated attempts have been made to reorganise, restructure or otherwise fix the way Defence goes about its business. It usually takes four or five years before dissatisfaction emerges and the cycle begins anew. In this instance, it is only two years since the Defence Management Review ushered in the most recent package of changes.

It would be a mistake, however, to view the SRP as just another routine shuffling of the deck chairs. While it's not as complex or ambitious as the 1997 Defence Reform Program, the SRP is a serious undertaking with an ambitious savings target. The SRP was developed within Defence and brings together;

- initial work undertaken within Defence to find $10 billion of savings following the government's direction to do so in early 2008

- analysis undertaken in the series of Companion Reviews commissioned within Defence in 2008 that examined the Defence workforce, capability planning, facilities and estate, information technology, logistics, defence industry, preparedness, personnel and operating costs, and science and technology

- recommendations by already mentioned Defence Budget Audit undertaken by Mr George Pappas with assistance from the McKinsey and Company consulting firm in 2008.

Consistent with the scale of the reform program, the SRP is being overseen by an independent Defence Strategic Reform Advisory Board 'to provide advice to the Government on how the strategic reforms within Defence should be implemented, and to assist in ensuring the savings programs are delivering the results that are expected'. The board is chaired by George Pappas and includes the Secretary and the Chief of the Defence Force as well as the CEO of the Defence Materiel Organisation and the Secretaries of Finance, Treasury and the Department of Prime Minister and Cabinet. Private sector representatives include John Fletcher, David Mortimer and Linda Nicholls. The board subsumes the role of the former Defence Procurement Advisory Board.

The SRP has three key elements; improved accountability, improved planning and enhanced productivity. These are examined below along with the reforms resulting from the Mortimer Review.

Improved accountability

Defence is a sprawling conglomerate of the three military services and a host of civilian agencies that provide support and administrative services. One of the long-standing problems has been that those nominally responsible for delivering capability only control a small part of the resources necessary to do so. Instead,

services like base support, personnel administration, logistics and information technology are provided to them as essentially 'free goods' by common providers.

While this collective service delivery approach generates economies of scale, it unavoidably clouds accountability and prevents capability managers (essentially the Service Chiefs) from managing the full range of inputs to the capability they are nominally responsible for. ASPI has long argued that the capability managers need to be given much closer control so that they can drive performance. See for example, *Improving Defence Management* published in 2007 which recommended:

> As a long-term goal, make the Service Chiefs responsible for the cost-effective delivery of military capability and able to make the decisions inherent in exercising that responsibility. Like any other managers, they should be personally accountable through incentives and sanctions for the results they achieve.

It was heartening, therefore, to see the White Paper announce a new management model that will provide 'senior leaders with greater authority to manage their budgets and non-financial inputs'. While details of the new 'outputs-driven budget management model' are scarce, the Budget Audit recommended allocating more funding directly to capability managers.

Despite originally planning to commence implementation of the new output-focused budget model in 2010-11, it did not occur in this year's PBS. Not only will we have to wait and see how much accountability and transfer of resources actually occurs, but the opportunity for the Services to 'drive reform' has been deferred another year. Consistent with this, the planned savings have been folded into existing internal budgets and people have been told to live within their means—just as occurred in the 1997 Defence Reform Program. In the longer term, it remains to be seen whether Defence is finally going to move away from the Soviet-style central planning model introduced by the 1997 Defence Reform Program.

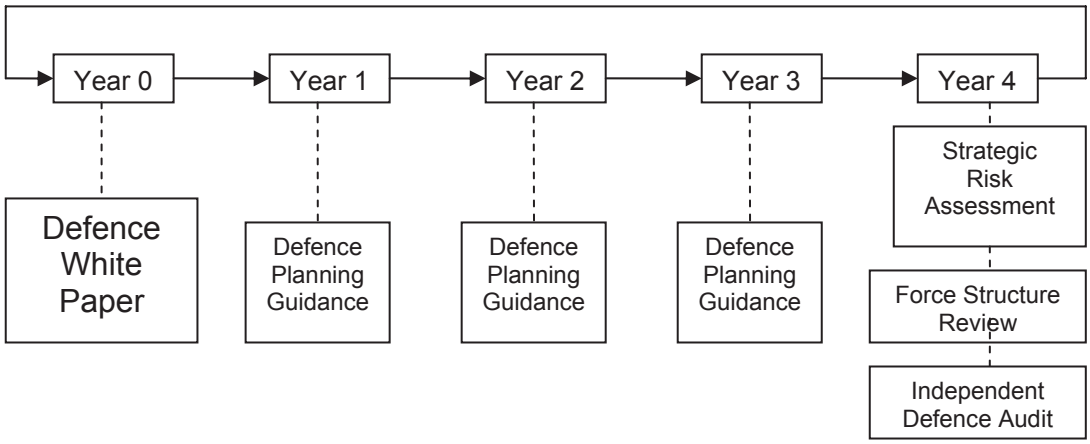
In the meantime, it is worth considering the interplay between the new outputs-driven budget arrangements (when they arrive) with the more centralised approach to the delivery of shared services and non-equipment procurement planned under the SRP. Although the capability managers might be able to change the mix of inputs (people, equipment, materiel services etc.) that they use to delivery capability, they will have no choice but to purchase standardised goods and services from the designated in-house providers.

More generally, the inevitable soundtrack to each and every Defence reform program, is a chorus announcing clearer responsibility and greater accountability. Perhaps this time it will happen. The critical question is how accountability will be exercised? Absent a rewrite of the Public Service and Defence Acts, there is only a very limited opportunity to impose the sorts of rewards and sactions that drive performance in the private sector.

Improved planning

Defence management begins with the plans that the government endorses for the organisation. To ensure that the government's plans for defence evolve to meet changes in the strategic environment, a five-year planning cycle has been introduced as depicted in Figure 5.1.

Figure 5.1 The new five-year strategic planning cycle



In the three years following a White Paper, Defence will produce a classified Defence Planning Guidance (DPG) document that looks 3-5 years into the future so that plans can be adjusted to take account of changing circumstances. In the fourth year, a Strategic Risk Assessment, Force Structure Review and Independent Defence Budget Audit will be undertaken preparatory to a White Paper in the fifth year.

In the future, no new force structure option will be considered unless it has been generated through this process—either through a DPG or as a result of the periodic Force Structure Review. To support the new approach, some of the processes and techniques developed for this year's White Paper will become permanent features of how Defence goes about analysing and planning capability. In addition, the government has said that it will more closely oversee the capability development process than in the past.

While the commitment to a five-year planning cycle is to be commended, it will be difficult to achieve in practice. If nothing else, the superposition of the federal electoral cycle will inevitably disrupt the process at unforeseeable times.

The SRP also includes a number of other initiatives arising from the Companion Reviews and Independent Defence Budget Audit. These include improvements to the management of defence force preparedness, improved estate planning and better estimation and management of costs.

None of these initiatives are retrograde steps. The very nature of defence requires coherent long-term planning and budgeting; and the more that can be done to achieve this goal the better. Nonetheless, it will do nothing to alter the underlying principal-agent problem that sees Defence as almost the sole source of advice available to the government. Like an education system run by teachers or a health system run by doctors, there are inherent problems with such an arrangement.

Given the highly specialised nature of national defence, it's inevitable that the military and their attendant civilian bureaucrats will have a critical part to play in advising the government on defence issues. The easiest ways to counterbalance this would be to introduce robust contestability within the Defence, or to open Defence up to greater external scrutiny—neither of which is in envisaged in the SRP.

Enhanced productivity

Table 5.3 summaries how the planned savings will be achieved, based on the three sources currently available;

- 30-page SRP booklet, *The Strategic Reform Program: Delivering Force 2030,* released in May 2009 and written for public information
- 31-page booklet, *The Strategic Reform Program: Making it Happen*, released publicly in April 2010 (but perhaps prepared earlier), written to communicate the SRP to the Defence workforce
- forty single-page *SRP Information Sheets*, released in April 2010, which detail a selected subset of the 300 separate initiatives in the SRP.

In assembling Table 5.3, precedence has been given to the most recent sources, noting that only the first booklet discloses reform costs. Defence invariably quotes savings in out-turned dollars that have been inflated by 2.5% each year into the future. At a rough estimate, once the out-turning is removed to generate a 'real' figure in 2009-10 dollars gross savings fall from $20.6 billion to around $18.1 billion and net savings fall from $18.2 billion to around $15.9 billion. To avoid confusion, all figures will henceforth be out-turned unless otherwise indicated.

Table 5.3: The Strategic Reform Program savings 2009-10 to 2018-19 (out-turned)

Savings Initiative	Gross Savings[1]	Reform Costs[2]	Net Savings
SRP savings streams			
Information Technology and Communication	-1,948	708	-1240
Inventory	-700	8	-692
Smart Maintenance	-4,827	361	-4,466
Logistics	-350	637	287
Non-Equipment Procurement	-3,767	127	-3,640
Preparedness, Personnel and Operating Costs		96	96
Reserves	-359	40	-319
Shared Services	-1,864	232	-1,632
Workforce Reforms	-925	124	-801
Mortimer Reforms		69	69
subtotal	**-14,740**	**2,404**	**-12,338**
Other savings			
Zero-Based Budget	-3,922		-3922
Cuts to Minor Capital Program	-238		-238
Cuts to Facilities Program	-510		-510
Administrative Savings	-70		-70
Productivity Savings	-357		-357
Reduced NPOC	-586		-586
Cuts to Personnel Initiatives	-238		-238
subtotal	**-5,920**		**-5,920**
TOTAL	**-20,640**	**2,404**	**-18,258**

[1] *The Strategic Reform Program—Making It Happen* and SRP Factsheets (April 2010)
[2] *The Strategic Reform Program: Delivering Force 2030* (May 2009)

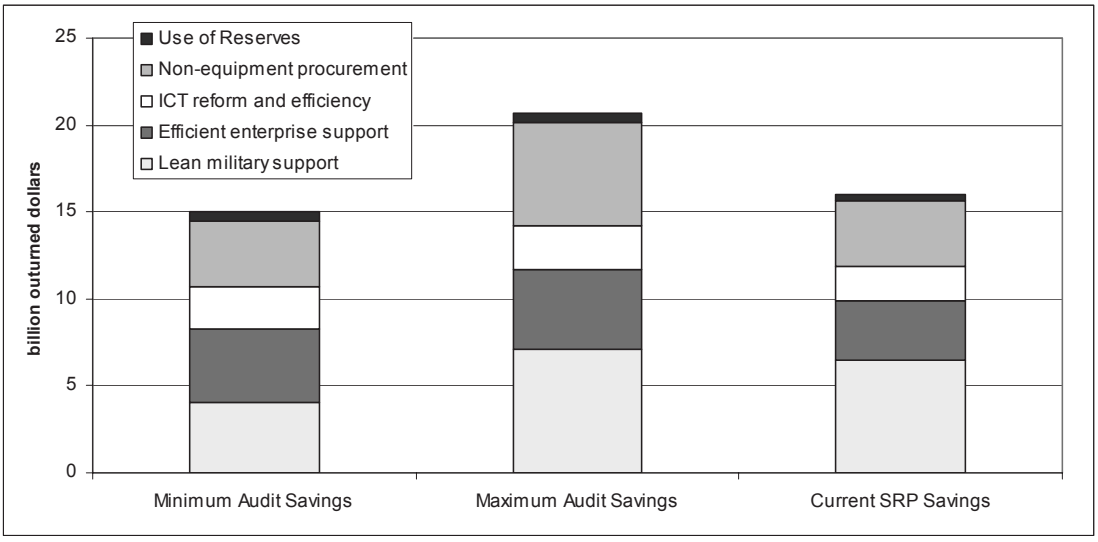
Between the release of the first and second SRP booklets, the composition of the savings program changed, as shown in Table 5.4. Advice from Defence is that some of the changes reflect a recategorisation of activities; these are explained below.

Table 5.4: Planned SRP gross savings 2009 and 2010 over the decade

Savings Initiative	May 2009	May 2010	% change
SRP savings streams			
Information and Communications Technology	-1,948	-1,948	0%
Inventory	-706	-700	-0.8%
Smart Maintenance	-4,391	-4,827	+9.9%
Logistics	-326	-350	+7.4%
Non-Equipment Procurement	-4,449	-3,767	-15.3%
Reserves	-384	-359	-6.5%
Shared Services	-1,426	-1,864	+30.7%
Workforce Reforms	-1,914	-925	-51.7%
subtotal	**-15,544**	**-14,740**	**-5.2%**
Other savings			
Zero-Based Budget	-3,922	-3,922	0%
Cuts to Minor Capital Program	-238	-238	0%
Cuts to Facilities Program	-510	-510	0%
Administrative Savings	-70	-70	0%
Productivity Savings	-357	-357	0%
Reduced NPOC	0	-586	-
Cuts to Personnel Initiatives	0	-238	-
subtotal	**-5,096**	**-5,920**	**+16.2%**
TOTAL	**-20,641**	**-20,660**	**+0.1%**

Our best attempt at comparing the current SRP savings program with those envisaged in the Defence Budget Audit appears in Figure 5.2, where we have only included those items common to both.

Figure 5.2: Comparison of current SRP savings with the Budget Audit estimates



To be specific; 'lean military support' has been interpreted to include current *logistics*, *maintenance*, *reduced net personnel and operating costs (NPOC)* and *inventory savings*, and 'efficient enterprise support' has been taken to include *workforce reform* and *shared services*, *administrative savings*, *cuts to personnel initiatives* and *productivity savings*. *Reserves*, *ICT reform* and *non-equipment procurement* are unchanged. As will be argued later, the *zero-based budget* and cuts to the *facilities* and *minor capital investment programs* do not represent credible savings and have no comparator in the Budget Audit framework anyway. Accordingly they are not included. The key point is that Defence is pursuing savings very close to the lower bound of the range given by the Budget Audit. Moreover, because the Budget Audit was based on a snapshot of defence spending in 2007-08 and the savings will occur over a decade when defence spending increases on average by 3% above inflation (at least that's what's been promised), the actual SRP savings are even more modest relative to Budget Audit expectations than appears in Figure 5.2.

Specific initiatives within the SRP are examined below. Details have been drawn from the two SRP booklets and the forty single-page *SRP Information Sheets* released in April 2010—all of which are available on the Defence website. Where appropriate, data from the 2008 Pappas Budget Audit has been included. Note that the *SRP Information Sheets* do not claim to be exhaustive (being as they are an internal communications tool) so it is not unexpected that many of the details about how savings will be achieved remain unexplained.

Information Technology and Communications (ITC)
($1.9 billion gross savings over 10 years)

The White Paper sets out an ambitious program for the 'networking' of Defence operationally and corporately. Space prohibits reproducing the many innovations that are promised, aside from mentioning the notion of a single 'Defence Information Environment'. An important part of the White Paper's vision for Defence ITC is a more rigorous governance framework including greater standardisation and centralisation.

Amid all this new development, there is still room for gross savings of $1.9 billion over the decade, from which net saving of $1.2 billion will remain after allowing for costs of $700 million. In the longer term, it's anticipated that mature annual savings of around $250 million will be delivered, representing 21% of the current $1.2 billion annual spend. Specific initiatives are described in Table 5.5 with data from the *SRP Factsheets*.

Table 5.5: Information technology SRP initiatives (out-turned million dollars)

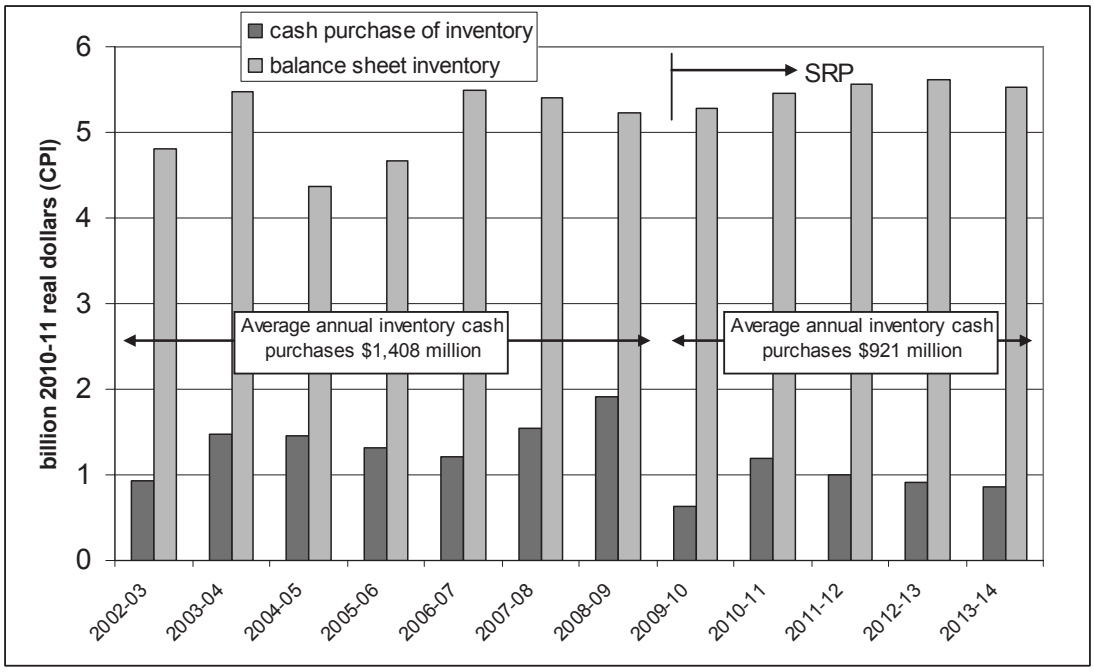
Initiative	Gross Savings	Reform Costs	Net Savings
Consolidate Defence data centres and server rooms from 200 to 10	-420	?	?
Introduce a single Secret/Restricted desktop		?	?
ICT infrastructure remediation	-110	?	?
Software Licensing Remediation	-90	?	?
Unified communications on the Secret network	-30	?	?
Subtotal – disclosed savings	**-650**	?	?
Total planned savings	**-1,948**	**708**	**-1240**
Unexplained savings	**-1,298**	**?**	**?**

Note that there are almost $1.3 billion in unexplained savings. Given that neither the SRP booklets nor information sheets make mention of personnel reductions due to ITC initiatives, the additional savings are unlikely to involve personnel cuts. Consistent with this, the Pappas audit found that overall ICT staffing matched the average industry benchmark. Thus it remains to be seen how the remaining $1.3 billion of savings will be delivered.

Inventory management
($700 million gross savings over 10 years)

It's anticipated that $700 million can be saved over the decade by reducing inventory purchases and holdings. In 2008-09, Defence spent $1.8 billion on inventory and maintained $4.9 billion in inventory holdings. To deliver $700 million in saving, Defence will have to reduce inventory purchases by around $63 million a year (equivalent to 3.5%). Figure 5.3 shows past and planned inventory cash purchases and inventory holdings.

Figure 5.3: Real inventory holdings and inventory purchases, past and planned.



Source: DAR and 2010-11 PBS

Comparing inventory purchases before and after the onset of the SRP in 2009-10 reveals an average fall of $487 million a year, representing a 34% drop, although Defence advises that around $200 million of this is due to an accounting reclassification. Nonetheless, as one would hope, reduced inventory purchases are apparent in the data. It is unclear why inventory holdings do not fall as a result of the reduced purchases, although accounting changes cannot be ruled out as a factor.

In any case, because inventory holdings and consumption cannot fall indefinitely, this reform will only deliver long-term savings through reduced transport and storage costs. Consistent with this, the Pappas audit identified one-off savings of between $218 and $398 million and recurrent annual savings of between $13 and $32 million.

Smart maintenance
($4.8 billion gross savings over 10 years)

Under the SRP, the maintenance of ADF assets will be systematically examined over the next four years to find ways to reduce the cost of ownership. Initial fleets from each of the three Services were examined in the second half of 2009 and $197 million of savings are planned for 2009-10. In total, $4.8 billion of gross savings are anticipated over the decade. Indicative sources of savings are demand management (50%), increased supplier productivity (30%) and improved internal efficiency and contracting (20%). It's envisaged that incentive-based contracting will be used to drive contractor performance.

The planned savings are based on a sampling of maintenance activities by the Pappas budget audit. Extrapolating across all maintenance activates, the Pappas audit estimated that annual savings of between $293 and $535 million could be achieved. Between May 2009 and May 2010, planned savings from Smart Maintenance (Smart Sustainment minus Logistics) grew by $436 million. Defence advises that the bulk of the change is due to the transfer of responsibility for fuel, explosive ordnance and clothing from the Non-equipment Procurement category (which fell by $682 million). We are at a loss to explain the $247 million difference.

Defence's latest estimates of maintenance and inventory savings from April 2010 appear in Table 5.6. The unexplained amount of $541 million is particularly vexing. Among all the *SRP Factsheets,* those for Smart Maintenance and Inventory appear to completely cover the range of activities within the category. It will be interesting to see where the additional savings come from.

Table 5.6: Maintenance and inventory (out-turned million dollars)

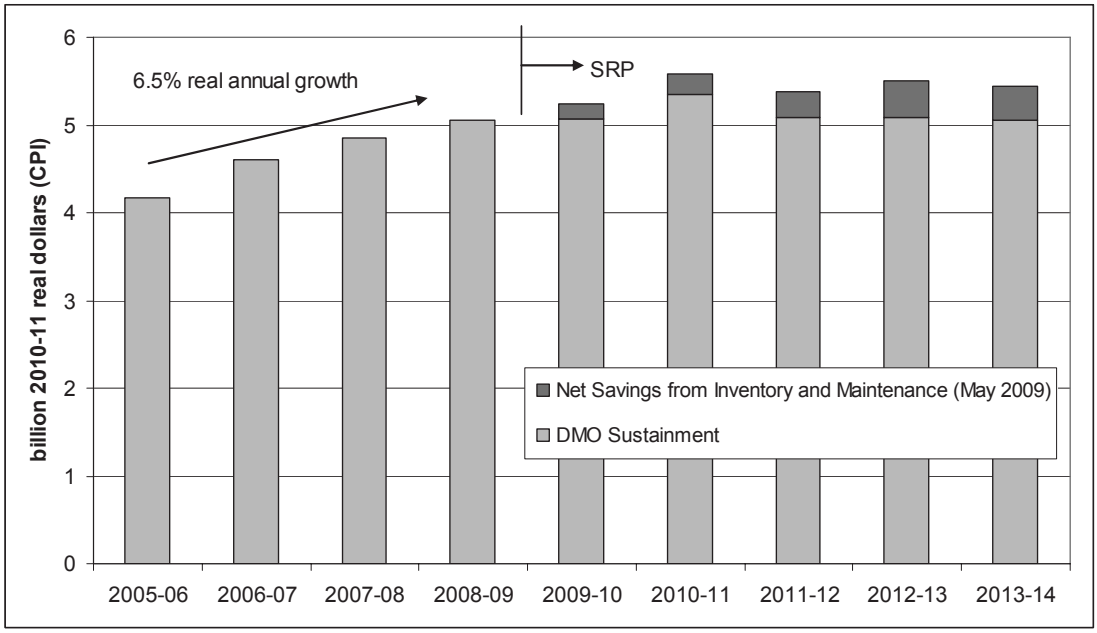
Initiative	Gross Savings	Reform Costs	Net Savings
Land – maintenance and inventory	-1,471	?	?
Maritime – maintenance and inventory	-1,873	?	?
Air – maintenance and inventory	-1,642	?	?
Subtotal – disclosed savings	**-4,986**	?	?
aggregate planned maintenance savings	-4,827	361	-4,466
aggregate planned inventory savings	-700	8	-692
Total planned savings	**-5,527**	**369**	**-5,158**
Unexplained savings	**-541**	**?**	**?**

As will be explained later, it's likely that the bulk of the newly introduced 'Reduced NPOC' initiative will largely result in additional savings from the Smart Maintenance and Inventory categories in the second half of the decade.

Figure 5.4 shows past and planned real DMO sustainment spending and the net savings anticipated from smart maintenance and inventory reform. It is interesting that the pre-existing trend of 6.5% per annum growth prior to the onset of the SRP is anticipated to cease even without the SRP savings despite the entry into service of a number of new capabilities over the next several years. However, it's dangerous to draw conclusions from this aggregate picture because we cannot properly account for the cost of sustaining operational deployments. Here as elsewhere, the absence of a

reliable baseline makes it impossible to say whether savings are being delivered or not. Nonetheless, it should be noted that there are encouraging downward trends apparent in several specific sustainment categories (see Chapter 2.8).

Figure 5.4: DMO sustainment budget and planned savings



Source: DAR, 2010-11 PBS and SPR Booklets 1 and 2.

Logistics
($350 million gross savings over 10 years)

The bulk of the logistics savings will come from consolidating warehousing from twenty-four to seven sites and introducing new and improved technologies and processes. In addition, land materiel maintenance will be modernised and automated identification technology will be introduced. Over the next decade, additional costs of $637 million will be incurred (including for the construction of new purpose-built facilities) as part of these initiatives. While recurrent long-term savings of around $59 million a year are anticipated, the net impact over the forthcoming decade will be additional costs of $310 million. Defence advises that the savings target has been increased relative to that of May 2009 by the transfer of Freight and Cartage savings from the Non-equipment Procurement category, which may explain the residual $19 million in Table 5.7.

Table 5.7: Logistics (out-turned million dollars)

Initiative	Gross Savings	Reform Costs	Net Savings
Wholesale storage and distribution	-285	?	?
Land materiel maintenance	-5	?	?
Automated identification technology	-41	?	?
Subtotal – disclosed savings	**-331**	?	?
Total planned savings	**-350**	**637**	**310**
Unexplained savings	**-19**	**?**	**?**

Non-equipment procurement
($3.8 billion gross savings over the decade)

At present, Defence spends around $2.8 billion a year on 20 categories of support services, including training, travel, catering and business. From this, total savings of $3.8 billion are planned over the decade (down from $4.4 billion in planned savings in May 2009 following adjustments, including the transfer of responsibility for fuel, clothing and explosive ordnance to Smart Sustainment). Reforms include establishing a 'centre of procurement and contracting excellence' in the Defence Support Group and 'commercially savvy procurement and negotiation of contracts to deliver real value for money.'

Specific initiatives include consolidating ADF messes and reducing the range of availability of meals (hopefully with a reduced rations charge to ADF members), centralising and standardising office furniture and supplies, better planning and delivery of procured training, and more efficient facilities and common support services. In addition, savings will be made to from travel, professional services and utilities. The comprehensiveness of the initiatives is captured in the following passage from the SRP Factsheet for common support services:

> Applying commercial standards to the cleaning of offices, workshops and external areas, as well as for accommodation will produce cost reductions. Additionally, reviewing the standards for grass cutting, rationalising the number and location of waste disposal bins, and optimizing transport services and fleet usage will also produce cost reductions.

Around 60% of savings are anticipated from changes to policy, usage and demand, 20% from standardisation and improved governance arrangements, and 20% will be achieved from 'improving supporting processes to remove waste and duplication across Services and Groups. The savings expected from individual initiatives are listed in Table 5.8. Defence advises that, of the remaining $595 million in savings, $531 million is accounted for by reforms in the categories of Advertising, Health Services, Removals and Research and Development.

Table 5.8: Non-equipment procurement (out-turned million dollars)

Initiative	Gross Savings	Reform Costs	Net Savings
Hospitality and catering	-241	?	?
Office furniture and office supplies	-68	?	?
Procured training	-607	?	?
Common support services	-418	?	?
Facilities maintenance	-505	?	?
Professional services	-709	?	?
Travel	-624	?	?
Utilities	-64	?	?
Subtotal – disclosed savings	**-3,172**	?	?
Total planned savings	**-3,767**	**127**	**-3,640**
Unexplained savings	-595	?	?

Unfortunately, it is not possible to separately identify non-equipment procurement in Defence's financial statements after the reduction in the level of useful detail reported compared to several years ago.

Preparedness and Personnel and Operating Costs
($95 million gross additional costs over the decade)

Defence's preparedness management system is being improved at a cost of $96 million over the decade.

Reserves
($359 million savings over the decade)

The Pappas budget audit identified potential savings of $50 million a year from using the Reserve as a surge capacity to support ADF deployments. The idea was that infrequently used regular capabilities could be transferred to the Reserve. Specific examples explored were Army armour and artillery capabilities. Consistent with this, the May 2009 SRP booklet proposed establishing a skills database and considering options to flexibly surge long-lead time capabilities, including through the use of Sponsored Reserves. Moreover, it said that Army would consider ways that the Reserve can better support prolonged deployments, including through transitioning capability elements from the full-time to part-time force.

However, after an internal review by Defence, the thrust of Reserve reform has been refocused on reducing the cost of current Reserve arrangements. Table 5.9 lists the piecemeal (and, as argued below, seemingly implausible) measures now envisaged. Of the two largest measures, neither will be able to be verified because neither trainee wastage nor regular transfers are reported. Defence advises that the remaining $162 million of savings will come from other initiatives, including an enhanced (yet somehow less costly) High Readiness Reserve, and cost reduction due to 'improved administration' in the Navy and Air Force Reserve of around $25 million each.

Table 5.9: Reserves (out-turned million dollars)

Initiative	Gross Savings	Reform Costs	Net Savings
Increase transfer of regulars to the Reserve by 15%	-137	?	?
Decrease Army Reserve trainee wastage	-44	?	?
Reduce Reserve readiness testing	-16	?	?
Subtotal – disclosed savings	**-197**	?	?
Total planned savings	**-359**	**40**	**-344**
Unexplained savings	**-162**		

In early 2010, controversy emerged over constraints placed on Reserve training days, including (it was claimed) participation in Anzac day ceremonies. On 23 April Defence released a document entitled *Facts on Reserves and SRP* in which it said that:

(1) The constraints were not a result of the SRP but rather because 'strong full-time ADF recruiting and retention has reduced Defence's ability to access unused full-time salaries to provide additional funds for Reserve salaries'. Given that Defence overshot the size of the full-time ADF workforce by around 1,500 personnel in 2009-10, this probably understates the situation.

(2) That 'Army, Navy and Air Force are continuing to allocate the mandated minimum number of training days for Active Reserve members' and '[c]ost reductions will be achieved through efficiency reforms—not cut backs'.

It is difficult to reconcile the latter statement with the initiative to save $16 million by, according to the *SRP Factsheet*, 'a decreased requirement for Army Reserve units to conduct readiness-specific training activities resulting in *a saving of one day of Reserve Training Salary for members annually*' [italics added]. Defence has since advised ASPI that the decreased readiness requirement will deliver reduced 'organisational, travel and administrative costs'. In doing so, however, Defence has did not clarify whether the *Factsheet* explanation that savings will come from reducing the number of annual Reserve Training Salary days still holds.

More curious still is the proposal to save $137 million through a 15% increase in the transfer of regulars to the Reserve so as to alleviate the need for recruit, basic and promotion training. According to the most recent ADF Census, around 17% of the Army Reserve is made up of former Australian Regular Army (ARA) members. Assuming that this percentage is reflected in Reserve enlistments, this would imply that around 350 of the annual 2,056 Army Reserve enlistments (2008-09 DAR) will result from transfers from the ARA. Increasing this figure by 15% yields an extra 53 ARA personnel enlisted each year. To save $137 million over the next nine years implies that each ARA enlistment will save $227,000 in 2010-11 dollars (including the impact of out-turning). Given that ARA transferees will undertake Reserve training anyway (and be paid at a higher rate than *ab initio* enlistments while they do) this seems a very large amount of money to be counting on per person.

Put simply; ARA transfers will do their twenty days one way or another. Annual savings (or additional costs) will only accrue due to the difference between the costs of basic, recruit, and promotion training, and the cost of ongoing training that takes its place. A similar comment can be made about the savings anticipated by reducing separation rates.

Thus, while increased transfers from the permanent force and reduced separations from the Reserve will both deliver a more effective part-time force, it is difficult to see how substantial savings can be achieved for redirection. And remember, we were told last year that the SRP savings are about finding savings to fill up a 'black hole' of unfunded items, among which the Reserve has never rated a mention.

Workforce and shared services
($2.8 billion savings over 10 years)

The original (May 2009) target for workforce and shared services was for $3.3 billion, made up of workforce reform ($1.9 billion) and changes to the delivery of shared services ($1.4 billion). In contrast, the latest publicly available information on the SRP from April 2010, refers to $2.8 billion of savings over the decade from workforce reform ($925 million) and changes to the delivery of shared services ($1.9 billion).

However, Defence advises that while the total cost reduction to be achieved from these two areas will occur, the specific workforce movements are yet to be finalised. How it is possible to determine the quanta of savings in the absence of the attendant workforce movements is unclear. Moreover, and in contradistinction to this, the 2010-11 PBS does not hedge when it announces (page 30) that the permanent ADF

will grow to approximately 59,000 members and the civilian workforce to 23,000 as the result of 'the detailed diagnostic program *completed* as part of the Strategic Reform Program' [italics added]. We do our best to understand this confusing state of affairs in what follows. Specific workforce and shared services initiatives are detailed in Table 5.10.

Table 5.10: Workforce productivity and shared services (out-turned million dollars)

Initiative	Gross Savings	Reform Costs	Net Savings
Civilianise 500 to 600 military support positions	-381	?	?
Convert 700 contractor positions to APS civilians	-400	?	?
Centralise payroll and personnel administration in Defence Support Group	-330	?	?
Centralise career management	-138	?	?
Streamline and standardise shared financial services	-169	?	?
Reform Defence education and training	-69	?	?
Subtotal – disclosed savings	**-1,487**	?	?
Planned workforce savings	**-925**	**124**	**-1790**
Planned shared savings	**-1,864**	**232**	**-1193**
Total planned savings	**-2,789**	**356**	**-2,983**
Unexplained savings	**-1,302**	**?**	**?**

Civilianisation

In May 2009 the plan was to convert 1,100 military support positions to APS civilian jobs with the vast bulk of the transition complete by 2012-13. But in April 2010 the goal shifted to 'between 500 and 600' by 2014, with any longer-term civilianisation left ambiguous. This is consistent with the explicit year-by-year civilianisation figures in the second SRP booklet, which result in an end state of 517 fewer military positions and 517 additional civilian positions.

As best we can estimate using the annual average per-capita personnel expenses from the 2010-11 PBS (extrapolating forward at 4.4% per annum past 2013-14) the original figure of 1,100 positions would have delivered $344 million in savings and the latest figure of 517 will deliver $204 million in savings. Yet, savings of $381 million are currently planned.

Contractor conversion

In May 2009 the plan was to convert 1,086 contractor positions to APS civilian jobs with the vast bulk of the transition complete by 2012-13. But in April 2010 the goal became 'approximately 700'. Assuming a 35% cost premium for contractors, the savings to be expected (once again at average per-capita rates extrapolated forward) from converting 700 contractor positions is around $241 million. Yet, savings of $400 million are currently planned.

Shared services

Of the four initiatives that have been detailed in information sheets under the rubric of shared services (the last four items in Table 5.10), none make mention of personnel reductions or indeed of the actual concrete mechanism through which savings will be delivered. Instead, we find variously that activities will be streamlined, standardised, simplified, improved, centralised, integrated, maximised, reduced, better-governed,

consolidated, and made more efficient, effective, holistic and continuously improved. As reassuring as this all sounds, the question is: will less people be employed or will we buy less stuff?

The situation gets more interesting if we look at what the Pappas audit had to say about back-office and service delivery activities. Pappas benchmarked the number of personnel involved in delivering shared services in the areas of finance, non-equipment procurement, information technology and communication, and human resource management. The results appear in Table 5.11.

The benchmarked workforce included around 6,000 APS employees, 5,700 military and 600 contractors. A further 5,000 civilians and 860 contractors work in areas like legal, logistics, hospitality and clerical services which were not benchmarked but which the Pappas audit concluded might also deliver an 18% reduction, worth around $84 million a year. In addition, the Pappas audit reported that DMO has already committed to delivering annual savings of $40 million on its annual service fee of which $24 million comes from workforce reductions (notwithstanding that DMO staffing was more efficient than the NATO benchmark applied by the Pappas audit). At 2007-08 rates, this corresponds to a reduction of around 301 personnel from the 5,000 strong civilian DMO workforce. Finally, the Pappas audit estimated that DSTO could reduce its workforce by 5% to deliver savings of $10.8 million per annum in addition to savings of $15.7 million committed to in the 2008-09 Budget. Taken together, this implies a reduction in DSTO staffing of around 182 personnel.

Table 5.11: Budget audit benchmarking of shared services

Activity	Personnel (2007-08)	Potential reduction to meet average benchmark	Potential personnel reduction	Estimated annual saving at 2007-08 rates
Information and communication technology	1,649	0%	-	-
Shared financial services	1,860	14%	260	$25 million
Non-equipment procurement services	544	31%	172	$16 million
Human resource management	8,103	22%	1783	$145 million
Total	**12,156**	**18% (average)**	**2,215**	**$186 million**

Source: Defence Budget Audit

The personnel reductions envisaged by the Pappas audit are summarised in Table 5.12 and lead to a final figure of 3,753 surplus positions.

Table 5.12: Budget audit benchmarking of shared services

Activity	Personnel (2007-08)	Estimated reduction	Potential personnel reduction	Estimated annual saving at 2007-08 rates
Benchmarked shared services	12,156	18%	2,215	$186 million
Non-benchmarked activities	5,860	18%	1,055	$84 million
DMO Sustainment	5,000	6%	301	$24 million
DSTO	2,300	13%	182	$26.5 million
Total	**25,316**	**15%**	**3,753**	**$320 million**

Source: Defence Budget Audit

How this relates to the four shared services initiatives in Table 5.10 is unclear, though the original SRP booklet in May 2009 planned on a very similar number of personnel reduction 3,793 compared with 3,753. Of more interest, however, is how the revised savings figures from workforce and shared services will be achieved.

The personnel reductions outlined in the April 2010 SRP booklet under the heading of 'efficiency improvements' (404 military and 979 civilian) will only deliver around $1.3 billion of savings over the decade, substantially less than the $1.9 billion planned. However, Defence advise that the April 2009 SRP booklet only included the workforce movements that had been agreed by government at that time, and that the 'remainder of the specific workforce movements that will deliver the total savings will be published following consideration by government'. To deliver the full $1.9 billion in savings we estimate that around a further 658 positions will need to be cut. Even so, the resulting total of 2,041 is still well below the originally planned 3,753. Moreover, it is not clear how the need for further cuts can be made consistent with the seemingly definitive statement in the PBS about approximately 59,000 military and 23,000 civilians as the long-term workforce end state.

Other savings
($5.9 billion gross savings over the decade)
Most of the 'other savings' in the SRP are remnants of the $10 billion decade-long savings program announced back in 2008; specific measures are listed in Table 5.13. The final two items—reductions to NPOC and personnel initiatives—only appeared in April 2010.

Table 5.13: Other savings

Initiative	Gross saving
Zero-Based Budget	-3,921
Cuts to Minor Capital Program	-238
Cuts to Capital Facilities Program	-510
Administrative Savings	-70
Productivity Savings	-357
Reduced Net Personnel and Operating Costs	-586
Cuts to Personnel Initiatives	-238
Total	**-5,920**

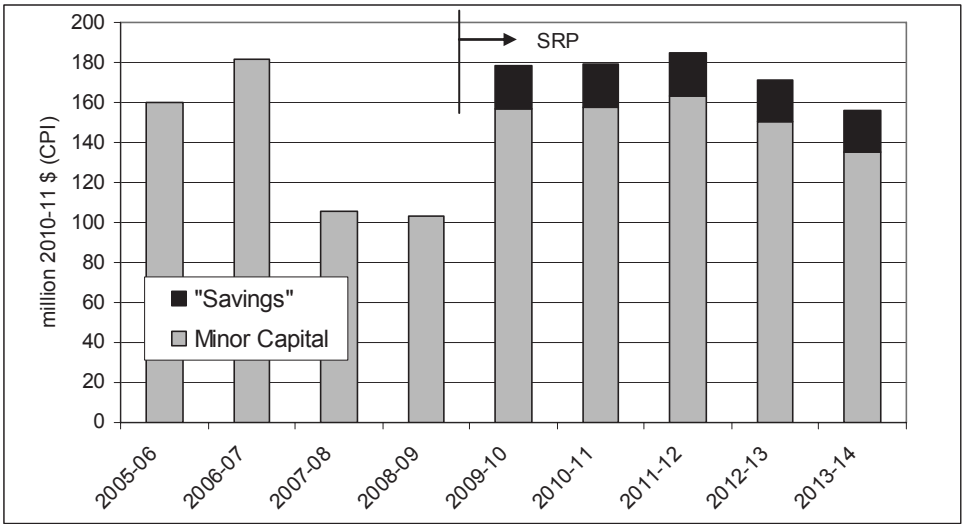
Zero-based budget
The largest component by far is that from the so-called 'zero-based budget' which represents the reallocation of funds held centrally that were programmed in earlier years for price indexation and 3% real budget growth. Using funds that were appropriated to meet rising costs is neither a saving nor an efficiency improvement—it is a disingenuous accounting trick.

Cuts to Capital Facilities and Minor Capital
Further savings come from cuts to the minor capital and capital facilities programs. The first point to stress in both these cases is that scaling back on planned investment does not generate efficiency. Rather, it causes a simultaneous reduction in both inputs and outputs. At best, it represents a reprioritisation that allows money to be shifted

from one use to another. Such adjustments are common from year to year within the budget and no one pretends that they constitute a savings of any sort. In the case of minor capital equipment, the 'savings' are difficult to discern on the basis of historical and projected spending, Figure 5.5. As shown, the savings are relative to a substantially elevated profile which is 70% above that recorded in the previous two years.

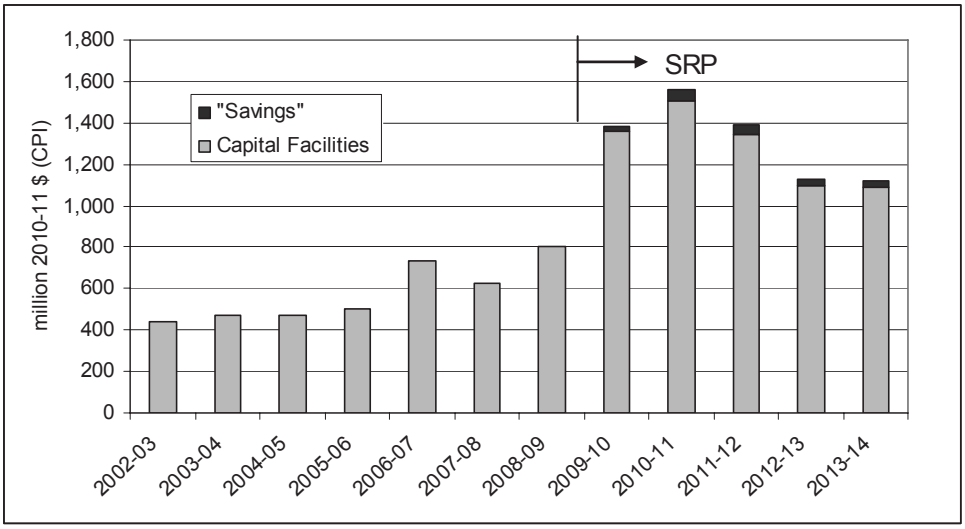
In the case of the facilities program the situation is particularly egregious. Over the first four years if the SRP, $150 million in previously planned capital facilities investment has been cancelled and designated as a 'savings'. Yet, at the same time, the SRP touts a $190 million capital facilities reinvestment program to 'help address the deterioration in Defence facilities' over the same period. What's more, capital facilities investment has not been reduced relative to an existing trend. As Figure 5.6 shows, the reductions are once again relative to a substantially elevated baseline of spending.

Figure 5.5: The Minor Capital Equipment Program



Source: DAR, 2009-10 PAES, 2010-11 PBS and SPR Booklets 1.

Figure 5.6: The Capital Facilities Program



Finally, the implausibility of trying to label as savings a reallocation of funds from the capital facilities program to elsewhere is made clear by the fact that, in the last twelve months, a total of $364 million of planned facilities investment has been cut from the years 2010-11 to 2012-13 (the three years that overlap in the 2009-10 and 2010-11 PBS) and reallocated to elsewhere in the budget, see Table 5.14. At least we can be thankful that Defence didn't append this amount to their list of 'other savings'.

Table 5.14: When is a transfer a savings?

	2010-11	2011-12	2012-13	total
2009-10 PBS	1,670	1,647	1,087	**4,405**
2010-11 PBS	1,509	1,380	1,152	**4,041**
difference	**-162**	**-268**	**+65**	**364**

Administrative Savings

The next 'other savings' initiative—administrative savings—represents a legitimate efficiency savings but nonetheless raises a question. We are told that $70 million will be saved by 'removing minor administrative activities, which were considered a low priority', yet the savings only occur over the first five years of the decade. Can it really be that the low priority administrative activities will be reinstated in the second half of the decade? If it's that the SRP initiatives will supplant these measures after mid-decade—why not combine them from the start? More importantly, given that there are no personnel reductions listed against this initiative, how exactly are the savings to be delivered?

Productivity Savings

The 'productivity savings' are a legitimate savings measure. They entail reductions in military and civilian personnel numbers in light of anticipated productivity improvements after the SRP initiatives have been implemented mid-decade. By 2018-19, the reductions will amount to 455 military and 729 civilian positions. Running the planned annual reductions through a model of average per-capita personnel expenses yields an estimated saving of $500 million—fully $144 million in excess of that planned.

Reduced Net Personnel and Operating Cost Guidance

This initiative reflects $586 million of savings over the decade from '[a]djustments to the Net Personnel and Operating Cost provision from 2012-13 which allows for the productivity improvements' due to other SRP initiatives. In effect, this is the additional savings to be expected from the reforms when applied to the new capabilities being introduced during the decade. It is a legitimate saving. Defence advises that there are no personnel reductions associated with this initiative. On past experience, around 80% of NPOC translates into sustainment funding for DMO. For this reason, most of the reduced NPOC provision represents further savings in the Smart Sustainment stream.

Cuts to Personnel Initiatives

In April 2010, a new savings stream was introduced; *refinement of personnel initiatives* worth $252 million over the next nine years. In light of strong recruitment and retention, the ADF gap year will be scaled back, the (yet to be introduced) ADF Financial Advice Scheme will be abandoned, and the ADF Job Options Service will

be deferred until 2014-15. While these all represent savings relative to planned spending, none of them reflect increased efficiency.

What do we know and not know?

Before turning to look at the SRP as a whole, it's worth pausing to take stock of what we know and what we don't know about the various savings streams. Table 5.15 summarises the results from the preceeding pages. Around a quarter of the SRP stream savings are yet to be explained, including $1.3 billion in ICT savings and $1.2 billion in shared services. Although Defence has clarified to ASPI the sources of a couple of previously unidentified savings (for example the $50 million in Navy and Air Force Reserve savings), we've only counted a saving as explained if a moderately complete explanation has been published.

Note that in some areas where savings have been explained (such as Reserves and workforce) it is difficult to credit the amounts claimed on the basis of the actions to be taken.

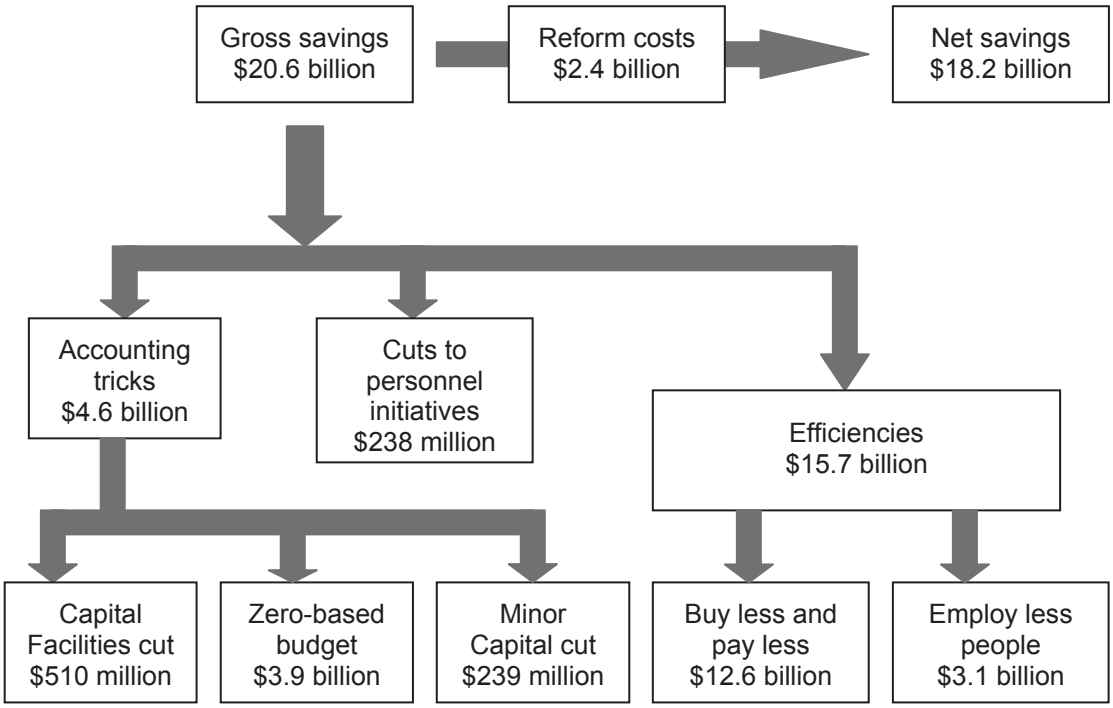
Table 5.15: What we know and what we don't know about the SRP

	Planned Savings	Explained Savings	Unexplained Savings	Comment
SRP savings streams				
ITC	-1,948	-650	-1,298	Impossible to verify from publicly available information
Inventory	-700	-700	0	Reduced inventory purchases are apparent in budget papers
Smart Maintenance	-4,827	-4,286	-541	Trends in sustainment budget indicative of onset of savings
Logistics	-350	-331	-19	Impossible to verify from publicly available information
Non-Equipment Procurement	-3,767	-3,172	-595	Impossible to verify from publicly available information
Reserves	-359	-179	-162	It is difficult to see how these measures will deliver the savings
Shared Services	-1,864	-706	-1,158	Impossible to verify from publicly available information
Workforce Reforms (civilianisation of ADF & PSP)	-925	-781	-144	The level of savings claimed appears high
subtotal	**-14,740**	**-10,805**	**-3,917**	
Other savings				
Zero-Based Budget	-3,922	-3,922		Not a saving or efficiency
Cuts to Minor Capital Program	-238	-238		Not a saving or efficiency
Cuts to Facilities Program	-510	-510		Not a saving or efficiency
Administrative Savings	-70	-70		Savings without personnel cuts?
Productivity Savings	-357	-357		Probably understates value of savings
Reduced NPOC	-586	-586		Will mainly result in additional savings from sustainment
Cuts to Personnel Initiatives	-238	-238		
subtotal	**-5,920**	**-5,920**	**-3,917**	
TOTAL	**-20,640**	**-16,725**	**-3,917**	

So what's going on?

Because it's easy to get lost in the myriad of details that make up the SRP, we've captured the key elements in the schematic diagram of Figure 5.7. The figure of $3.1 billion for 'employ less people' assumes (rightly or wrongly) that the savings from workforce reform and shared services will come from personnel cuts.

Figure 5.7: Planned SRP savings



Setting aside the accounting tricks and cuts to personnel initiatives (which might not seem such a great idea should unemployment falls as predicted to 4.75% in 24 months time) it is interesting that reductions to personnel numbers only make up 20% of the $15.7 billion of actual efficiency savings. This means that fully 80% of the saving will come from cuts to the price and quantity of goods and services that Defence purchases externally. As a defence industry CEO observed at an industry conference in early 2010, personnel savings typically make up a much larger share of commercial efficiency programs than those planned under the SRP.

In fact, his comment was made in the context of the original (May 2009) SRP plan, which had a larger impact on the Defence workforce than the present plan does. While it is hard to be certain about the scale of reductions presently planned, as best we can tell, outright efficiency cuts have fallen from around 3,800 to 2,000, contractor conversions have fallen from around 1,000 to 700, and civilianisation of military positions has fallen from 1,100 to 700 (although this last figure might increase). It is probably best to use Defence's words from the PBS to explain the change:

> These numbers reflect the outcome of the detailed diagnostic program completed as part of the Strategic Reform Program. The increase to the work force numbers previously estimated is due to the greater level of fidelity achieved in determining the Defence workforce necessary to meet White Paper capability requirements while providing the cost reductions necessary for the Strategic Reform Program.

While this sounds eminently reasonable, it is worth remembering that the retreat on personnel savings comes on top of substantial additional personnel being added. Relative to the number of personnel in 2008-09, the gross additional number of personnel planned for Defence over the next decade is 5,174 military personnel and 2,685 civilians. On present planning, once savings are subtracted, the final result will be 58,879 military and 22,719 civilians representing net increases of 3,798 and 1,494 respectively. Even if we subtract from this the extra 658 positions that we think might be needed to achieve planned savings, that's still an increase of more than 4,500 positions.

Given the several additional capabilities planned to enter service in the near future, and most especially the substantial expansion of the Army underway, it is to be expected that the number of military personnel will expand significantly in the years ahead. No such explanation comes readily to hand for the very large number of civilians planned.

At this point, if the reader has not yet had the opportunity to read Chapter 2.5 of this Brief they should do so now. It tells the story of how civilian numbers have grown rapidly over the past decade (often absent of any plan to do so) and also of how the number of executives and senior officers has increased rapidly over the same period. If there is one area that the SRP fails to grapple with, it is the top-heavy administrative overlay that Defence has enveloped itself in since the start of the century.

Unfortunately, leaving Defence to undertake its own 'detailed diagnostic program' the government has allowed Defence to substantially reduce the personnel savings envisaged by the independent Budget Audit. As a result, there is little doubt that Defence will easily deliver the (much depleted) personnel savings.

That leaves the question of *if and how* Defence will reduce its expenditure on external good and services by $12.6 billion over the next nine years. The question *if* is as important as *how*. It is perfectly possible for Defence to declare savings relative to hypothetical projection of its future expenditure while nonetheless spending more each year. Indeed, given the expansion underway to deliver the White Paper, this will be the case—savings are going to be relative to a counterfactual estimate of what costs would have been absent reform. This is effectively what's happened with personnel numbers—saving are being claimed but military and civilian numbers are going to increase anyway. The critical question is whether the 'business as usual' baseline is accurate or not; it is only by comparison with an established trend that the validity of savings can be established. But, as Table 5.15 makes clear, this is not possible using publicly available information.

In most areas, we will probably never know whether the planned savings are delivered or not. Over the decade, savings will take the form of slower than anticipated increases in costs rather than absolute reductions. In any case, given recent experience, we are unlikely to be given anything more than unverifiable aggregate headline figures. Even the absence of funding pressures in the years ahead will not be a sign of success. There are billions of extra dollars set to flow into Defence and precious few publicly available targets for what Defence has to deliver.

Conclusion

All signs are that the SRP will herald major changes across Defence. Whether this will lead to long-term systemic changes to the way Defence does business remains to be seen. The good news is that the intent and leadership appears to be in place to make a serious attempt. They even have a snappy slogan 'Make every minute, dollar and round count.' Okay, it's not snappy, but they are trying.

The long-term success or failure of the reform probably hinges on the yet to be revealed output-focused budget model. Unfortunately, its introduction has slipped so that the savings program continues to be driven from the centre of the organisation. Ultimately, unless the Service Chiefs are given authority and responsibility for the cost-effective delivery of the combat capabilities of their respective Services, it's hard to see how the gains being sought can be made enduring.

In the meantime, the savings program is proceeding as usual; budgets have been cut and people have been told to live within their means. Given that the quantum of (real) efficiency savings is around the minimum deemed achievable by the Defence Budget Audit, there is no reason why the savings should not be delivered. But there are worrying signs. As a result of Defence's own 'detailed diagnostic program' there has been some serious back-pedalling on the level of personnel cuts likely to occur. At the same time, some of planned initiatives are difficult to reconcile with the level of savings being claimed.

In any case, with the bulk of the savings ($12.6 billion) planned to come from reducing the price and quantity of goods bought from outside, the public might never be able to tell whether the savings have been delivered or not. The temptation within Defence will be to do a little less, take a little longer, and otherwise make do with reduced budgets by delivering less—especially easy to do with defence funding set to rise in the medium-term and alleviate pressure. Moral hazards abound.

But this does not have to be the way it is. If the SRP really is 'a major public sector reform initiative' as the Minister has said, why not open it up to public scrutiny?

Two things should happen: First, the SRP savings should be rebaselined to remove the fanciful accounting tricks. It brings neither Defence nor the government credit to exaggerate the amount of savings to be delivered.

Second, regular and detailed public reporting of the program should begin immediately, including—and this is critical—disclosure of the baseline extrapolations of historical trends against which savings are claimed. It is a matter of public and parliamentary interest to see whether the savings are being delivered and, perhaps more importantly, what the impact on capability is. Recent public concerns surrounding changes to the Reserves are an example.

If Defence really is actively managing the SRP savings as comprehensively as we are told, the information should already exist. So let's see it. Surely there is nothing to hide.

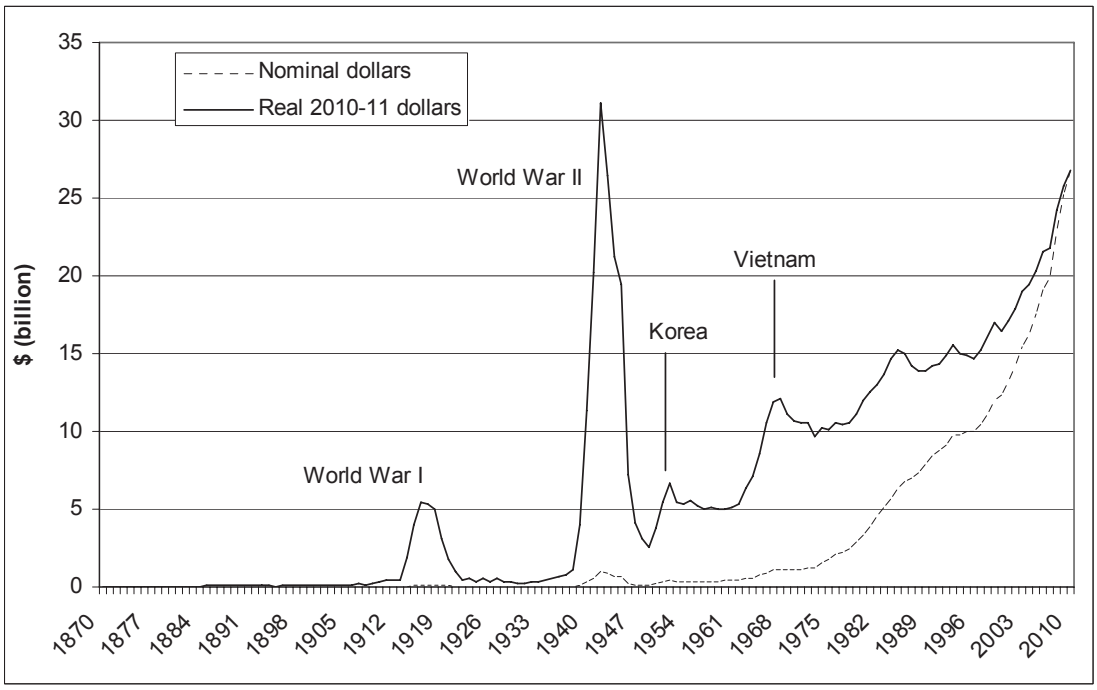
CHAPTER 6 – INTERNATIONAL DEFENCE ECONOMICS

This section is divided into four parts. The first examines historical Australian defence spending, the second compares present Australian defence spending with that of other countries, the third examines economic and defence spending trends in our region, and the fourth briefly assesses the impact of the Global Financial Crisis (GFC) on defence spending.

Historical Australian defence spending

Real and nominal Australian defence spending from 1870 to the present appears in Figure 5.1. Although inflation dominates the nominal data and obscures much of the historical detail, the impact of the wars of the twentieth century is clearly visible in the 'real' data corrected for inflation.

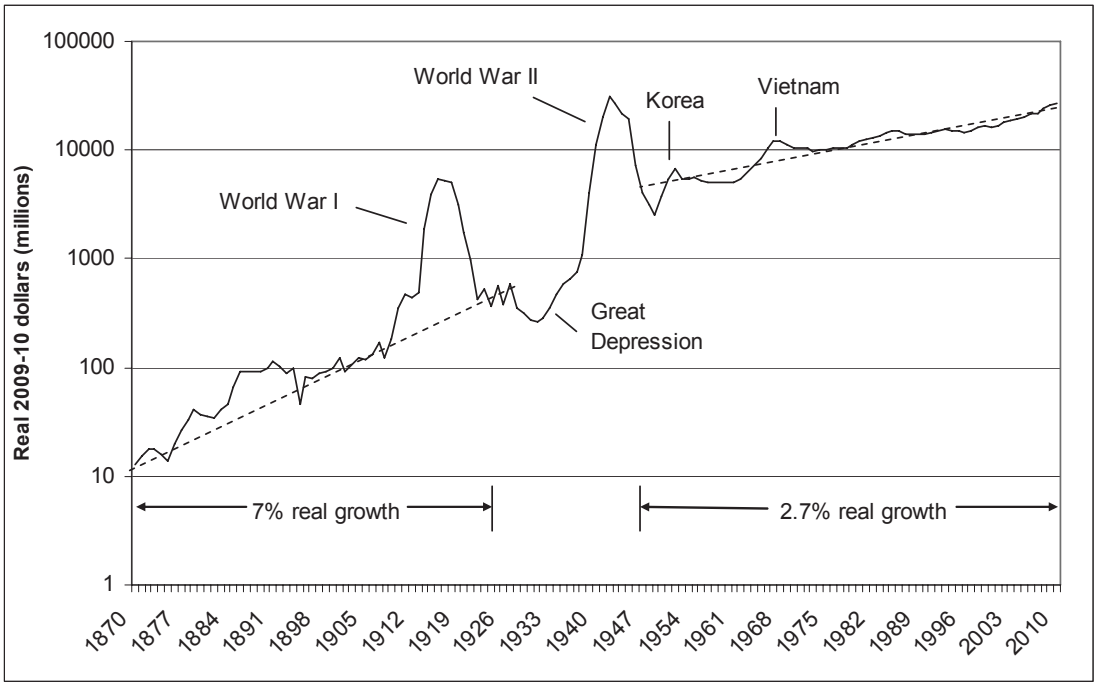
Figure 5.1: Australian defence spending, 1870–2010.



Source: ASPI collation of data from various sources, real dollars calculated using retail/consumer price index.

An even more useful graph of historical spending appears in Figure 5.2 where real spending has been plotted on a logarithmic scale, where exponential growth (which is close to compounding growth for small rates of increase) appears as a straight line. As shown in Figure 5.2, there have been two epochs of underlying steady growth in defence spending; from 1870 to 1929 spending grew by around 7% per annum, and from 1945 to the present underlying spending grew by around 2.7% per annum. This should not be taken as implying that the defence force has significantly expanded during the post-war period—it has not. Rather, the observed growth in defence spending largely reflects the rising intrinsic cost of delivering modern military capability. The 2003 ASPI publication, *A Trillion Dollars and Counting,* estimated that real growth of around 2.65% per annum was necessary just to maintain the present scale and range of capabilities in the ADF. Thus, the recent and ongoing rise of 3% per annum is more about maintaining than significantly expanding the defence force.

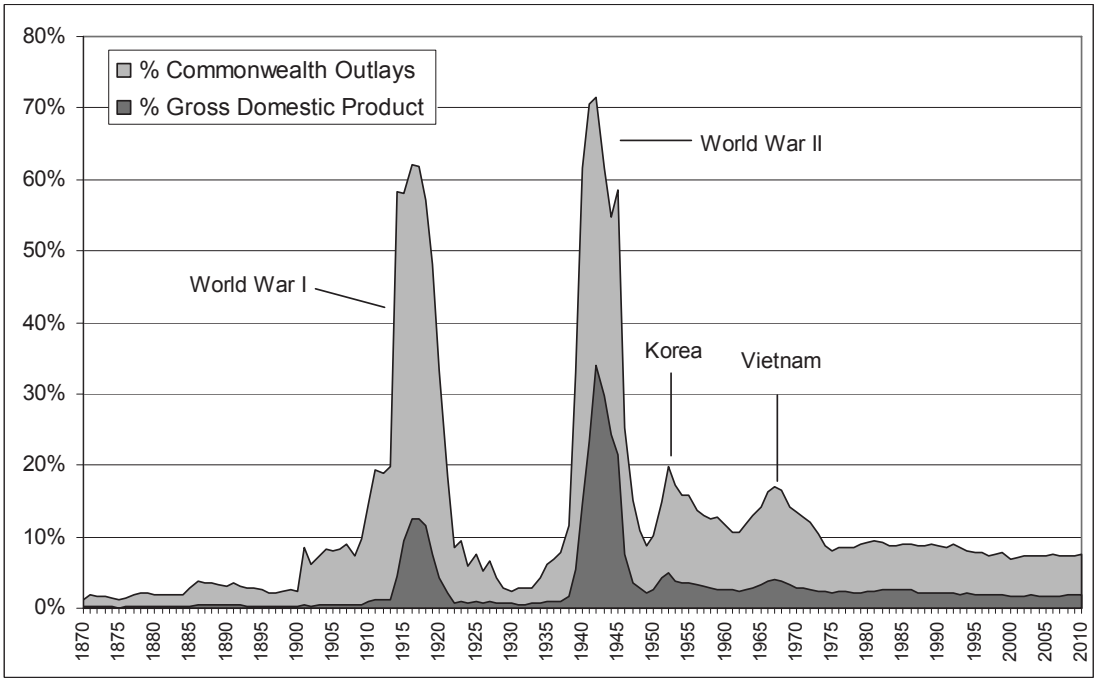
Figure 5.2: Australian defence spending, 1870–2010.



Source: ASPI collation of data from various sources, real dollars calculated using retail/consumer price index.

The steady increase in real defence spending since the end of the Second World War has been possible because of ongoing growth to the Australian economy over the same period. In fact, as a share of Gross Domestic Product (GDP) the longer-term trend has been for defence spending to account for a progressively smaller share of domestic output. Figure 5.3 plots defence spending as both a share of GDP and as a proportion of total Commonwealth outlays.

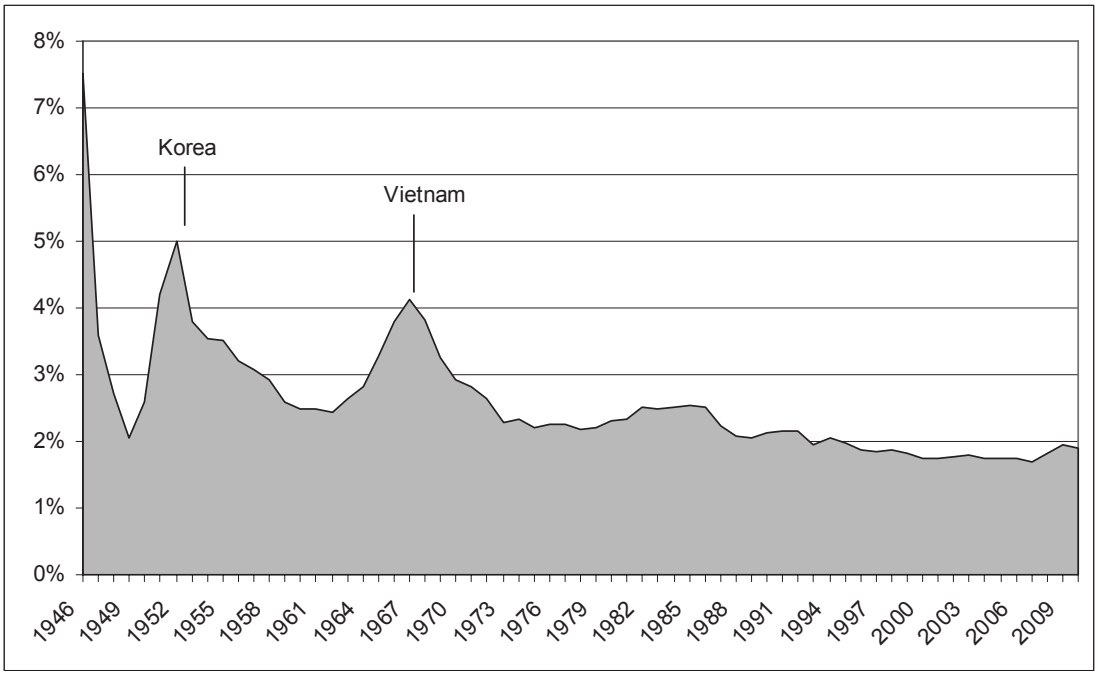
Figure 5.3: Australian defence spending as a share of GDP and Outlays.



Source: ASPI collation of data from various sources.

Given the importance of defence spending as a share of GDP, a magnification of the post-war period has been prepared in Figure 5.4 including the prospective trend out to 2030 based on the government's commitment in the 2009 Defence White Paper and economic growth as projected in Treasury's 2010 Intergenerational Report (but taking into account the latest growth estimates from the 2010-11 Budget).

Figure 5.4: Defence burden 1945–2010



Source: ASPI collation of data from various sources.

GDP share is not a measure of the adequacy or otherwise of defence spending—that's something that depends on the task at hand. Rather, it measures the proportion of national wealth that a nation devotes to defence. Often, this is captured by the use of the term 'defence burden'.

The planned growth in Australian defence spending will see the share of GDP devoted to national defence rise to 1.65% by 2030 which is not high by recent standards (see Figure 5.4 above and Figure 5.5 overleaf). The United States is presently expending 4.9% of GDP and the United Kingdom 2.3%.

Even taking account of the growing fiscal burden due to the ageing of the Australian population, there is no reason to conclude that a defence burden in the range of 2% to 3% is unsustainable. While it is true that health and ageing will steadily demand a growing share of GDP in the decades ahead, the concurrent rise in individual prosperity (as measured by GDP per-capita) will allow living standards to grow appreciably even if a larger share of national product is diverted for public goods like health, aged care and defence.

A more detailed examination of the affordability of Australian defence spending can be found in the 2008 ASPI publication *Strategic choices: Defending Australia in the 21st century*.

Australia's defence effort in an international context

According to the International Monetary Fund, in 2008 Australia had the fifteenth largest economy on earth measured at market exchange rates (and seventeenth using Purchasing Power Parity—PPP). From this annual bounty of around 1.4 trillion dollars, Australia finds the money to fund its defence. Table 5.1 displays Australia's 2008 defence spending (the latest year for which comprehensive data is available) along with that of a selection of countries including allies, regional neighbours and other developed industrial economies around the globe. All figures are given in US dollars calculated at prevailing market exchange rates.

Table 5.1: Defence spending and burden 2008

2008 GDP		2008 Defence expenditure		% GDP	
Country	$US(b)	Country	$US(b)	Country	%
USA	14,268	USA	696.2	Israel	7.4
Japan	4,950	France	67.2	USA	4.88
China	4,425	United Kingdom	60.8	Singapore	4.2
Germany	3,667	China	60.2	Vietnam	3.19
France	2,859	Germany	46.9	Pakistan	2.97
United Kingdom	2,666	Japan	46	Taiwan	2.76
Italy	2,308	Russian Fed	40.5	South Korea	2.6
Russian Fed	1,679	India	31.5	India	2.58
Spain	1,605	Italy	30.9	Russian Fed	2.41
Canada	1,514	South Korea	24.2	France	2.35
India	1,222	Canada	19.8	United Kingdom	2.28
Australia	991	Spain	19.3	Malaysia	1.97
South Korea	930	Australia	18.8	Australia	1.9
Netherlands	871	Israel	14.8	Turkey	1.85
Turkey	731	Turkey	13.5	Thailand	1.57
Indonesia	511	Netherlands	12.3	Netherlands	1.41
Sweden	479	Taiwan	10.5	Sweden	1.39
Taiwan	380	Singapore	7.7	New Zealand	1.39
Thailand	274	Sweden	6.7	China	1.36
Malaysia	222	Indonesia	5.1	Italy	1.34
Israel	199	Pakistan	4.4	Canada	1.31
Singapore	182	Malaysia	4.4	Germany	1.28
Philippines	168	Thailand	4.3	Spain	1.2
Pakistan	149	Vietnam	1.9	Indonesia	1
New Zealand	126	New Zealand	1.8	Japan	0.93
Vietnam	60	Philippines	1.4	Philippines	0.85
PNG	6	PNG	~	PNG	0.56

Source: International Institute for Strategic Studies: *The Military Balance*, 2010. Note Australian results vary somewhat from local reporting.

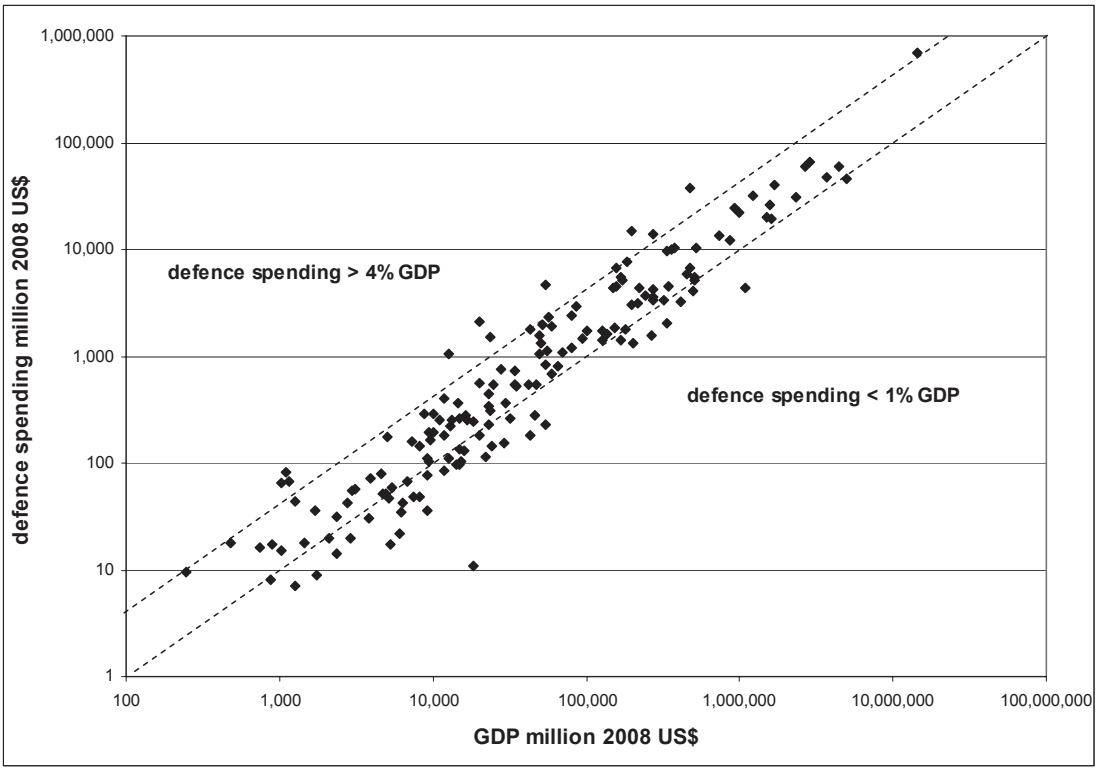
With the caveat that fluctuation in exchange rates can make a significant difference in relative ranking, there are three observations worth making. First, our level of defence spending gives us a budget broadly comparable with South Korea and the Netherlands, but far below heavy hitters like Italy, Germany, UK, Japan, France and China. Second, we out-spend all our Southeast Asian neighbours by a considerable margin. Third, the United States remains in a class of its own.

In terms of defence spending as a percentage of GDP, we devote significantly more than the Netherlands (1.4%), Germany (1.3%), Spain (1.2%), Canada (1.3%) and Japan (0.9%). According to the data, the only fully developed Western countries to allocate a larger share of GDP than us are the United States (4.9%), France (2.4%) and the United Kingdom (2.3%). Closer to home, we devote a smaller share of GDP than Vietnam (3.2%), India (2.6%), South Korea (2.6%), and Singapore (4.2%), but more than Indonesia (1.0%), Thailand (1.6%) and the Philippines (0.9%). Not surprisingly, we rank well ahead of New Zealand (1.4%).

To summarise, we spend a greater share than most developed Western nations but a lesser share than many of our significant regional neighbours. This probably reflects two things: (1) the synergy derived from collective defence in Western Europe, and (2) that some of our poorer neighbours have to spend a larger share of GDP to meet the demands of a more challenging strategic environment than that of Western Europe.

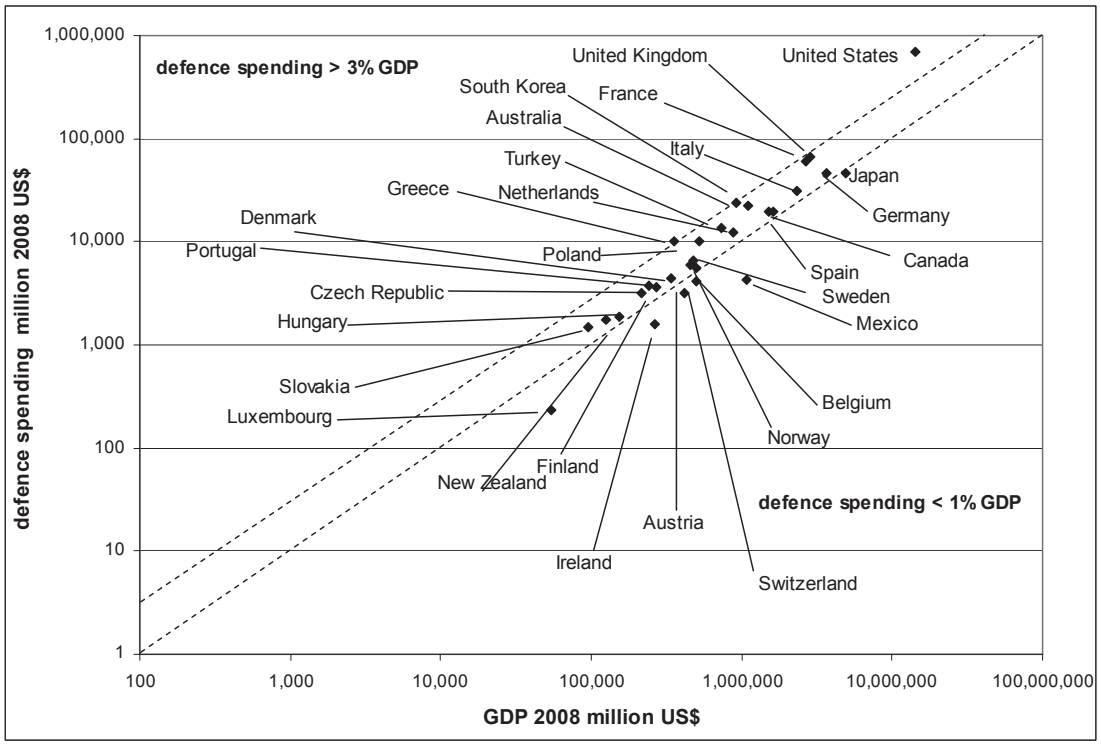
An alternative and often illuminating depiction of the economic resources a country allocates to defence can be achieved by plotting its position on a graph of GDP against defence spending along with other nations. We've done this in Figure 5.5 for some 154 countries based on data collected by the International Institute of Strategic Studies (IISS). In Figure 5.6 we've isolated the results for (mainly) OECD countries. To properly capture the wide spread of GDP and defence spending values, the data has been plotted on a dual logarithmic scale.

Figure 5.5: GDP and defence spending – all countries 2008



Source: Compiled from data in International Institute for Strategic Studies: *The Military Balance*, 2010.

Figure 5.6: GDP and defence spending – OECD 2008



Source: Compiled from data in International Institute for Strategic Studies: *The Military Balance*, 2010.

A couple of things are immediately apparent. Most obviously, there is a clear correlation between defence spending and economic size; the larger a nation's economy the more it tends to spend on defence. In addition, the vast bulk of nations spend within the band of between 1 and 4% of GDP on defence. Not surprisingly, those countries that spend larger shares of GDP tend to have more challenging strategic circumstances than those that spend less, or else they are impoverished nations that need to spend a greater share of their meagre resources to achieve a credible capability. Small shares of GDP spending tend to correlate with advantageous geography, strong alliances and benign neighbours. But another factor is also at play. Economically prosperous developed nations tend, understandably, to be able to provide for their defence with a smaller share of GDP.

Money is not the only resource that a nation has available to devote to its defence; there is also people. Table 5.2 lists population numbers, permanent defence force numbers and population percentage in the armed services for our selection of allies, neighbours and Western powers.

Here Australia is less well endowed. According to the US Census Bureau, Australia ranked 54th in population in 2008, ahead of Cote d'Ivoire and below Sri Lanka. We have about one-third the population of the larger European powers and less than one-tenth that of the US. In regional terms, we're just a little smaller than Malaysia, North Korea and Taiwan, but only a quarter the size of Thailand and the Philippines. Indonesia has more than ten times our population, and we are but a drop in the ocean compared with India and China. The sobering fact is that we account for less than one-third of one percent of the world's people.

Table 5.2: Human resources circa 2008 ~ 2010

Country	POP 2008	Country	Armed Forces 2010	Country	% of POP
China	1,330,044,605	China	2,285,000	North Korea	4.71%
India	1,147,995,898	United States	1,580,000	Israel	2.49%
United States	303,824,646	India	1,325,000	Singapore	1.58%
Indonesia	237,512,355	North Korea	1,106,000	South Korea	1.40%
Pakistan	167,762,040	Russian Fed	1,027,000	Taiwan	1.27%
Russian Fed	140,702,094	South Korea	687,000	Russian Fed	0.73%
Japan	127,288,419	Pakistan	617,000	Turkey	0.71%
Philippines	92,681,453	Turkey	511,000	France	0.55%
Vietnam	86,116,559	Vietnam	455,000	Vietnam	0.53%
Germany	82,369,548	France	353,000	United States	0.52%
Turkey	71,892,807	Thailand	306,000	Italy	0.50%
Thailand	65,493,298	Indonesia	302,000	Thailand	0.47%
France	64,057,790	Italy	293,000	Malaysia	0.43%
United Kingdom	60,943,912	Taiwan	290,000	Pakistan	0.37%
Italy	58,145,321	Germany	251,000	Spain	0.32%
South Korea	49,232,844	Japan	230,000	Germany	0.30%
Spain	40,491,051	Israel	177,000	United Kingdom	0.29%
Canada	33,212,696	United Kingdom	175,000	Netherlands	0.28%
Malaysia	25,274,133	Spain	128,000	Australia	0.27%
North Korea	23,479,089	Philippines	120,000	New Zealand	0.24%
Taiwan	22,920,946	Malaysia	109,000	Canada	0.20%
Australia	20,600,856	Singapore	73,000	Japan	0.18%
Netherlands	16,645,313	Canada	66,000	China	0.17%
Sweden	9,045,389	Australia	55,000	Sweden	0.14%
Israel	7,112,359	Netherlands	47,000	Philippines	0.13%
PNG	5,931,769	Sweden	13,000	Indonesia	0.13%
Singapore	4,608,167	New Zealand	10,000	India	0.12%
New Zealand	4,173,460	PNG	3,000	PNG	0.05%

Source: International Institute for Strategic Studies: *The Military Balance*, 2010.

Our permanent armed forces in 2008 amounted to around 53,167, which puts us near the bottom of the table in our selection of countries. Overall, there are around 61 countries with armed forces numerically superior to ours. As a proportion of population, we have around one-quarter of one percent of our population engaged as full-time military personnel. This is less than European nations Germany (0.30%) and France (0.55%), and behind the United States (0.52%). In fact, in our selection, the only Western countries we comfortably beat are those well-known strategic optimists, Canada and New Zealand (both of which have their strategic approaches covered by more powerful neighbours) and Sweden which makes extensive use of reserve personnel. In regional terms, we fall well behind Singapore (1.58%), Malaysia (0.43%) and Thailand (0.47%) but ahead of Japan (0.18%), China (0.17%), Indonesia (0.13%) and the Philippines (0.13%).

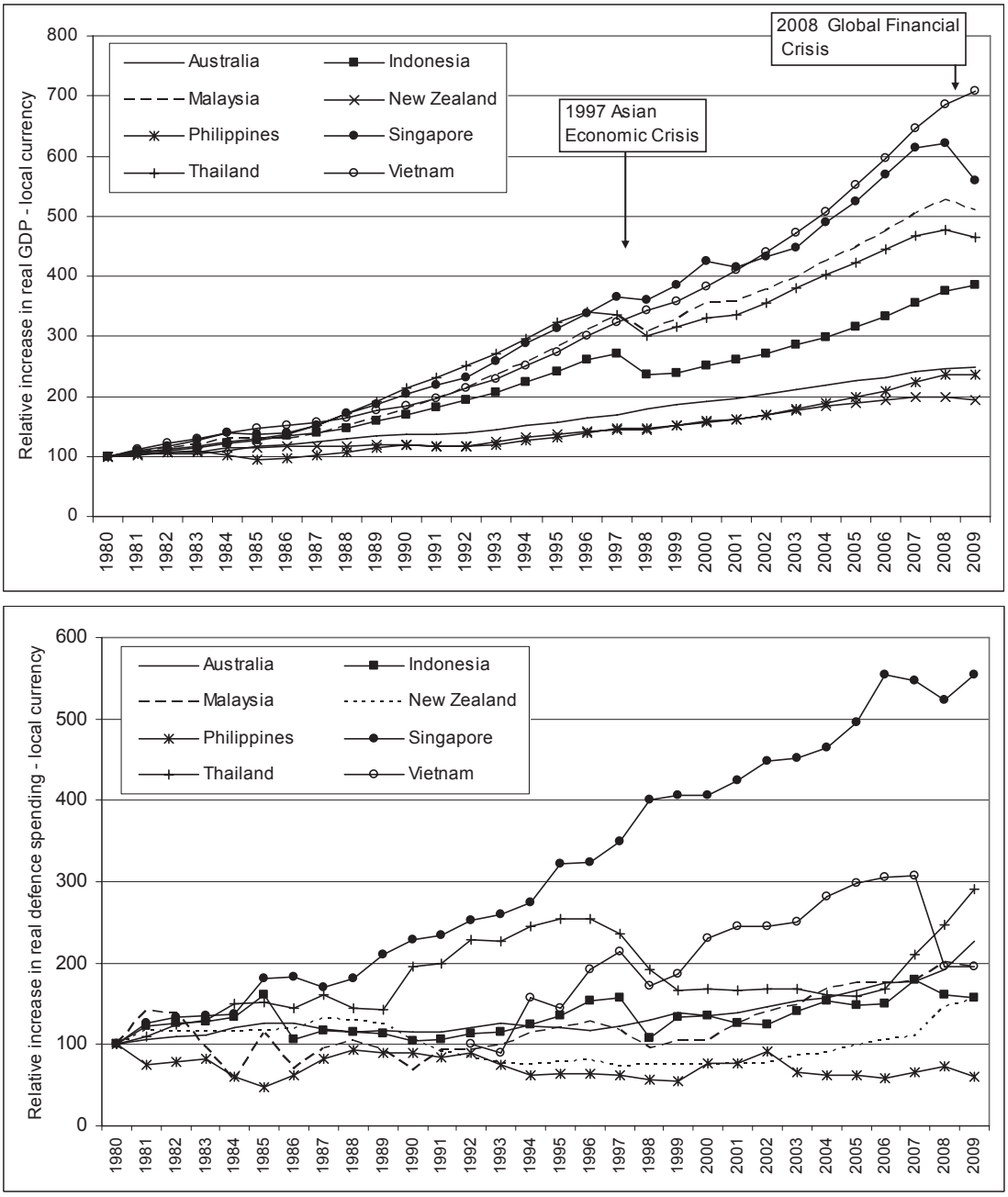
Australia's relatively modest ranking in terms of proportion of population needs to be seen in the context of our avowed 'maritime strategy'. With the exception of a short period in the 1960s which saw conscription boost the Army to over 40,000, Australia has never maintained a large peacetime standing Army. As a country with no land borders and no prospective adversaries with an amphibious capability, the imperative to develop a manpower-intensive land force is slight.

Regional economic and defence spending trends

The least ambiguous way to track *relative changes* in the size of a country's economy is to adjust its GDP in local currency to a single base-year using its GDP-deflator. Similarly, the least ambiguous way to track *relative changes* in defence spending is to adjust spending in local currency to a single base year using its CPI index.

With 'real' GDP and defence spending so calculated, the relative growth between countries can be compared by normalising the initial values in the base year. This has been done for a selection of countries in maritime Southeast Asia and Greater Asia in Figures 5.7 and 5.8. Data sources for these and subsequent graphs are listed at the end of this section.

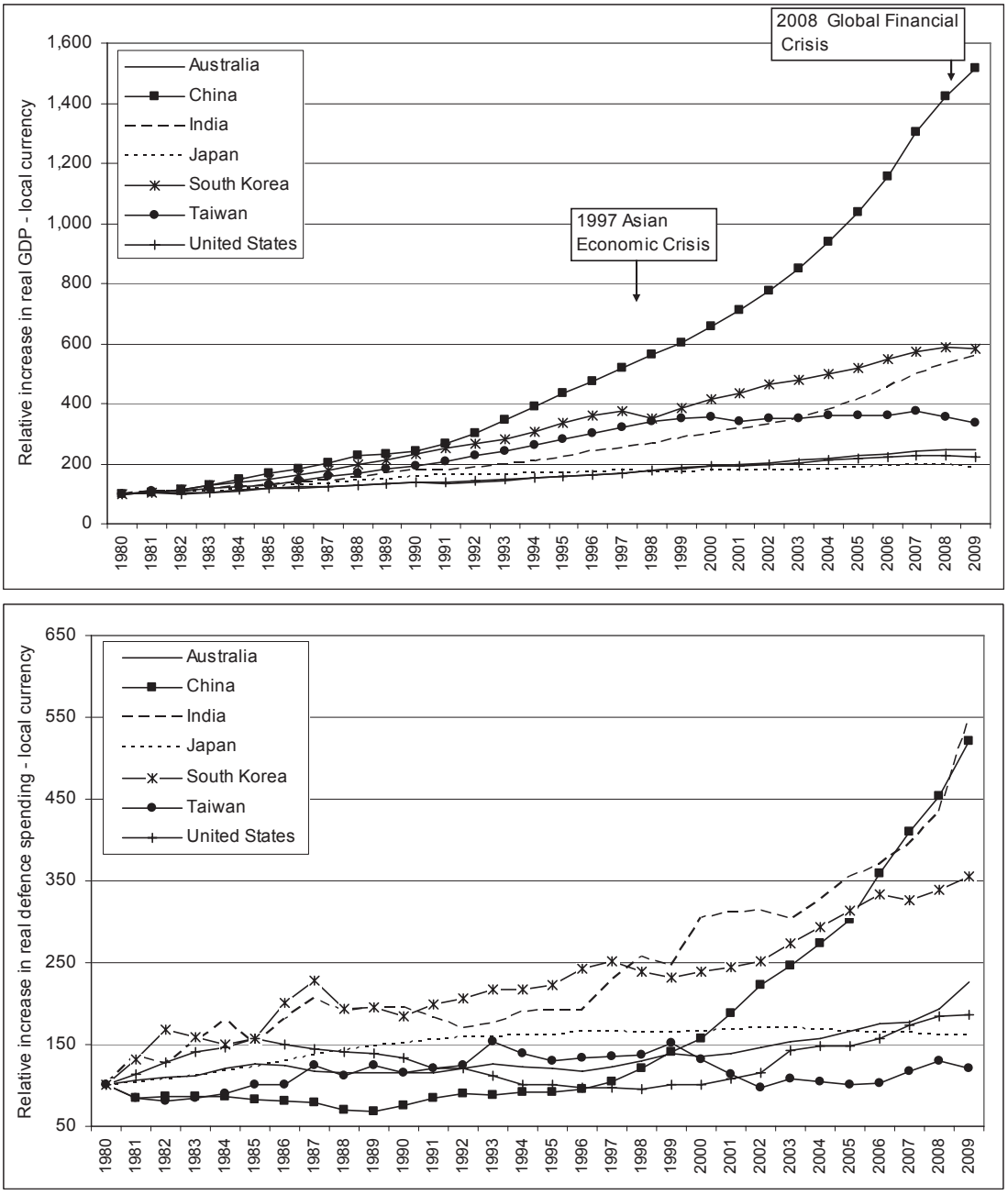
Figure 5.7: **Relative economic and defence spending growth, Maritime Southeast Asia**



It is clear that developing countries have achieved faster economic growth than their more-developed counterparts. China in particular has achieved spectacular economic growth since the early 1990s—though its military spending did not take off until around a decade later. Among the countries of maritime Southeast Asia, Singapore has managed steady economic growth which has been reflected in a similar trend in their defence spending. In comparison, our closest neighbour, Indonesia, has achieved healthy economic growth but has not taken the opportunity to increase its defence spending.

The impact of the 1997 Asian Economic Crisis is apparent in Figure 5.7 and to a lesser extent in Figure 5.8.

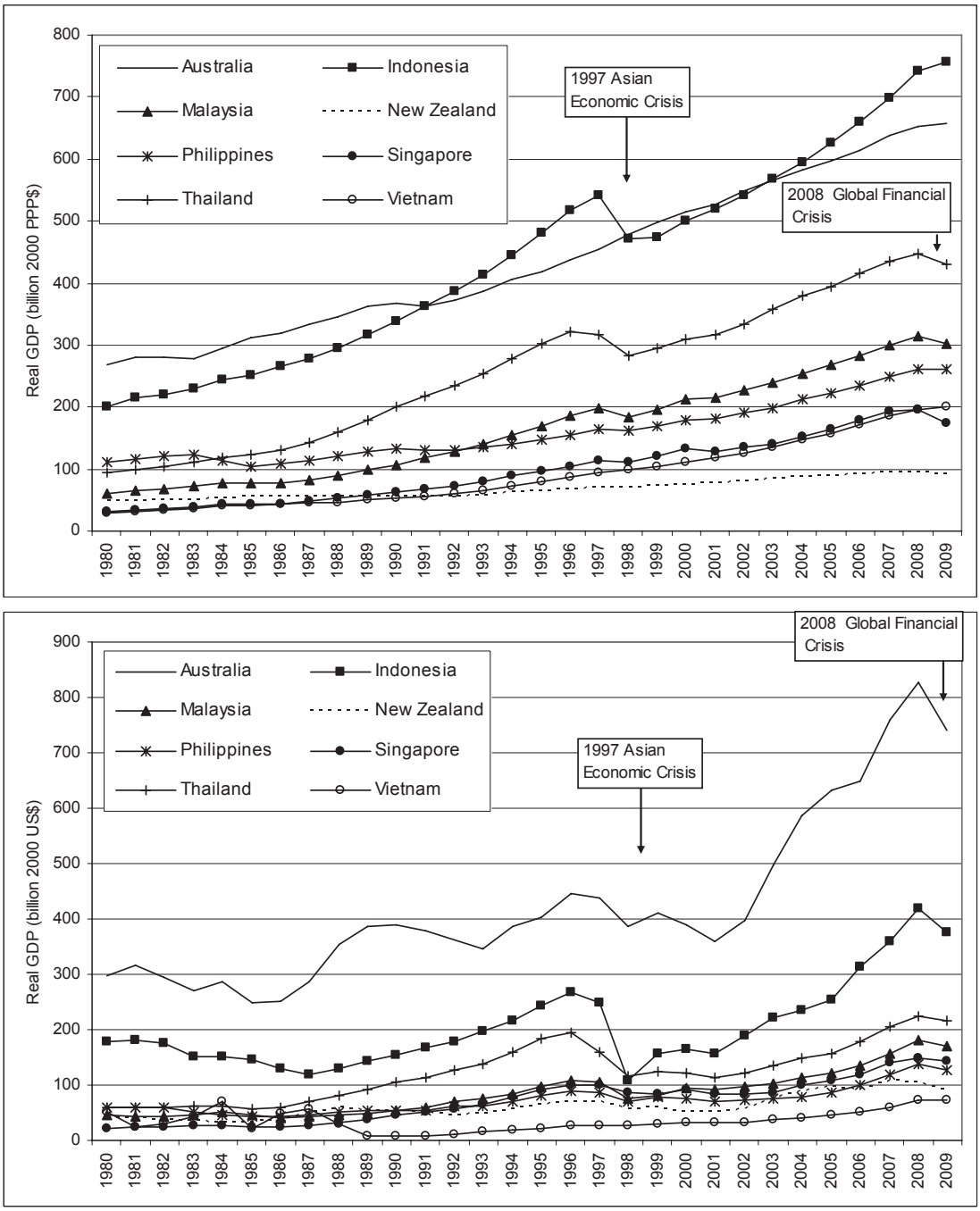
Figure 5.8: **Relative economic and defence spending growth, Greater Asia**



Comparative economic performance

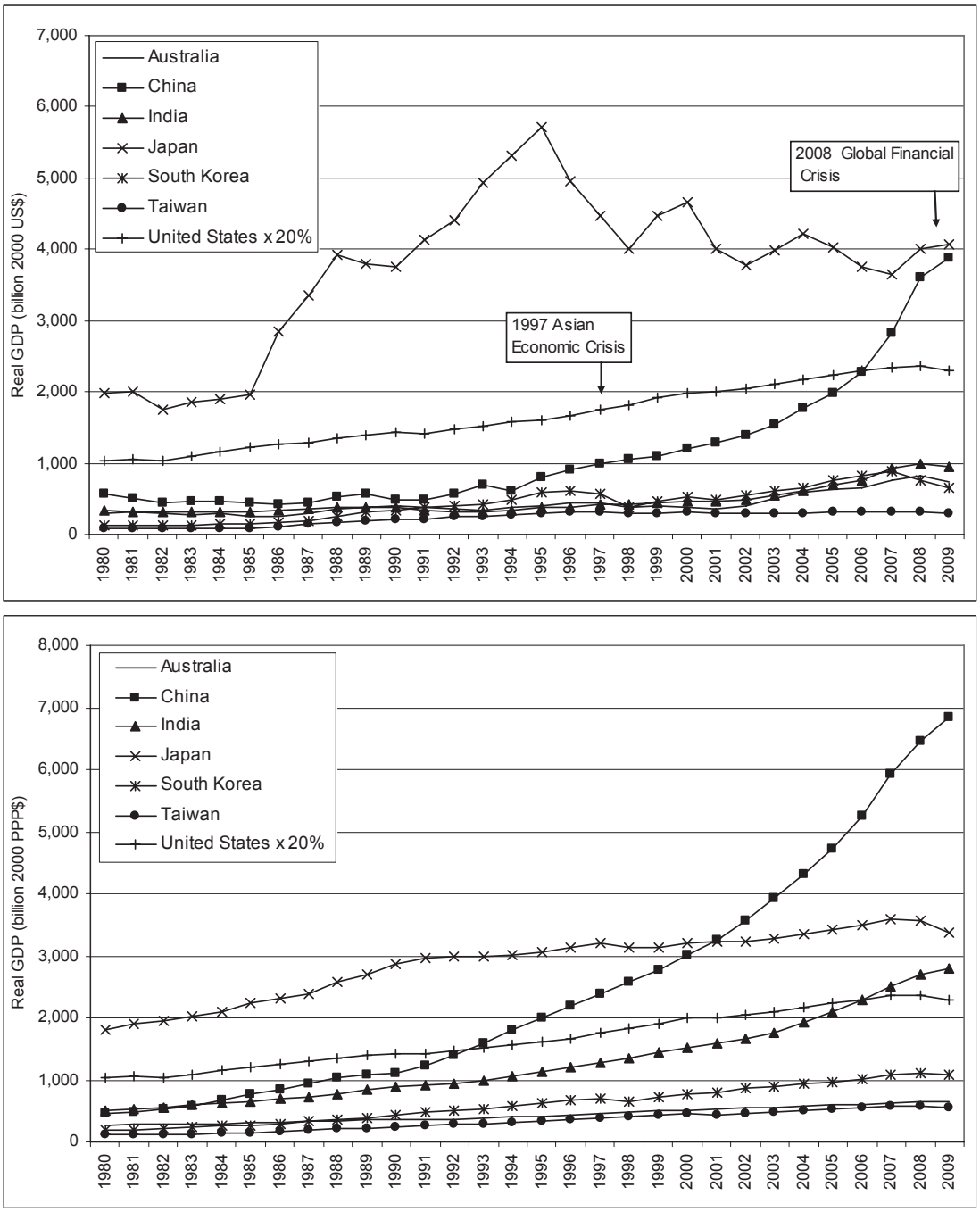
Comparing the relative size of economies (as opposed to the relative rate of growth in size) requires converting the domestic currencies involved to a common currency. In practice, this is performed in one of two ways; either by converting to US dollars at prevailing market exchange rates, or by using the World Bank's Purchasing Power Parity (PPP) exchange rates which attempt to capture the buying power of the currency within the country it is used. Typically, PPP exchange rates yield a significantly larger figure for developing countries than market exchange rates. By construction, PPP exchange rates are normalised relative to the US dollar. Figure 5.9 and 5.10 plot national GDP at market exchange rates and PPP for Maritime Southeast Asia and Greater Asia respectively.

Figure 5.9: **Comparative economic performance, Maritime Southeast Asia**



Whether market exchange rates or PPP exchange rates present a more accurate picture of comparative economic performance is debatable. In some sense, they provide complimentary views of what is occurring. That said; the substantial volatility of international exchange rates (which are driven more by near-term financial factors than long-term economic fundamentals) introduces large transient vagaries into time-series. For example, the rapid rise of Australian GDP in terms of US$ in Figure 5.9 and the oscillation of Japanese GDP in terms of US$ in Figure 5.10 are both artefacts of exchange rate fluctuations rather than any reflection of actual changes in economic performance. Note that in Figure 5.10 the size of the United States economy has been scaled by a factor of five to accommodate it on the chart without compressing the data for other countries.

Figure 5.10: **Comparative economic performance, Greater Asia**



Comparative defence spending—Maritime Southeast Asia

Just as was the case with GDP, comparing the level of defence spending between countries requires conversion to a common basis, usually either US$ or PPP$. In terms of maintaining modern high-tech military capabilities, spending expressed in US$ is probably a better comparative measure. Conversely, the cost of maintaining a large low-tech defence force is probably better compared using PPP exchange rates. Figures 5.12 and 5.13 plot defence spending in Maritime Southeast Asia from 1980 to the present in terms of US$ and PPP$ respectively.

The only countries to consistently and significantly increase their defence spending post-Cold War are Australia, Singapore and Vietnam. All the others have either decreased their spending or are still working to recover ground lost in the 1997 Asian Financial Crisis. An equally sanguine picture emerges from the trends in the share of GDP devoted to defence. The long-term trend for all the countries of maritime Southeast Asia is one of declining defence burden. Even for those countries with the fastest growth—Singapore and Australia—GDP share has not been growing by an appreciable amount in recent years.

At the risk of contradicting those who discern a 'regional arms race', there is little in the defence spending patterns of Maritime Southeast Asia to support such a conclusion. Given that the cost of high-tech military equipment is increasing by around 4% above inflation every year, it is hard to see how anyone other than Australia and Singapore can afford to modernise or significantly expand their air and naval assets on present spending trends.

Figure 5.11: **Defence burden, Maritime Southeast Asia**

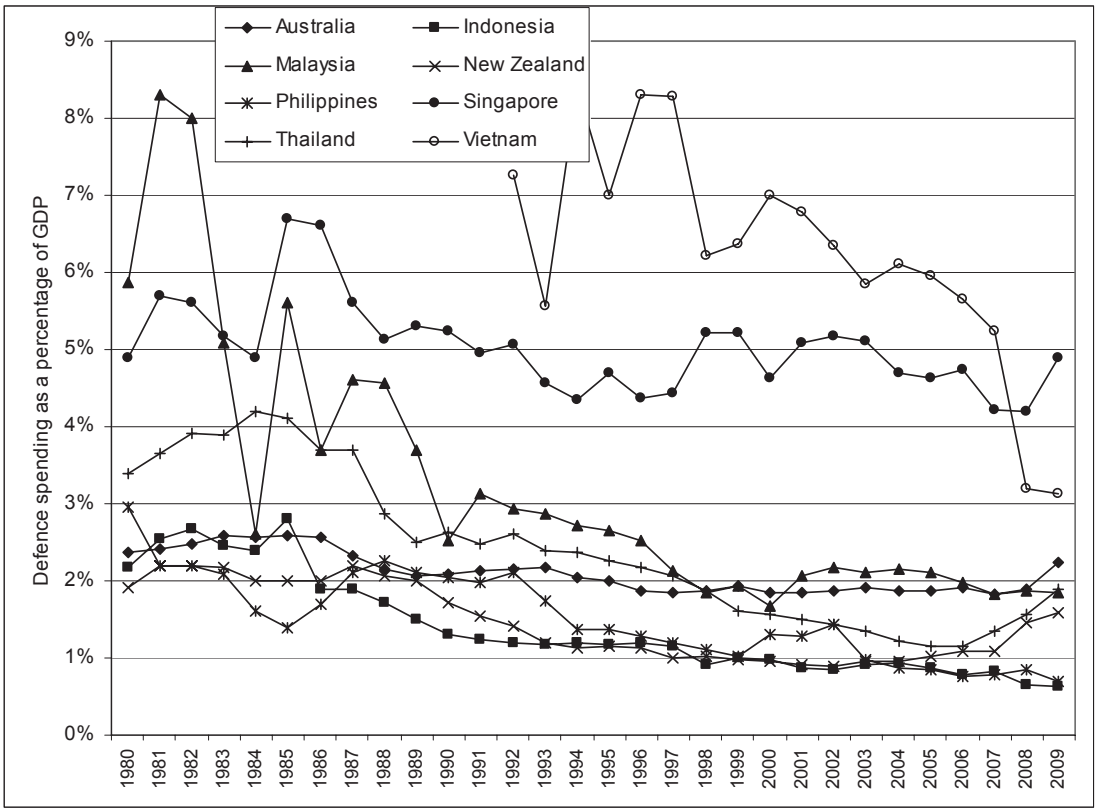


Figure 5.12: **Real defence spending (2000 US$), Maritime Southeast Asia**

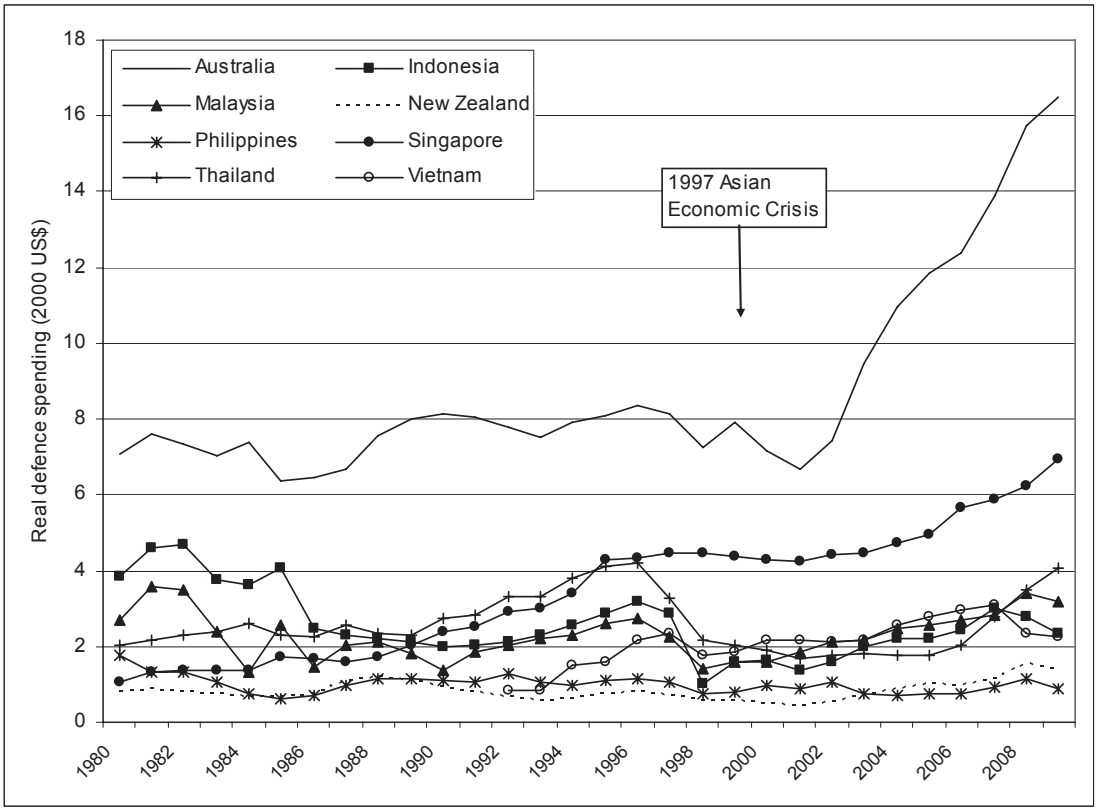
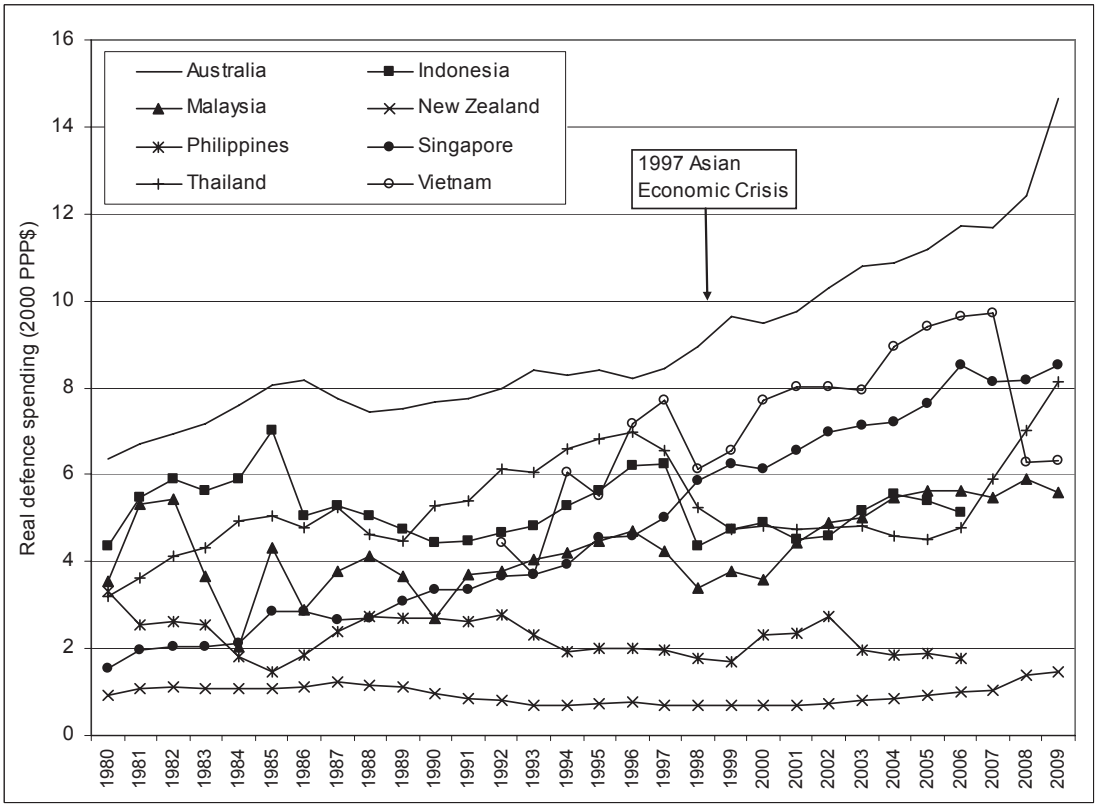


Figure 5.13: **Real defence spending (2000 PPP$), Maritime Southeast Asia**



Comparative defence spending—Greater Asia

A somewhat more interesting picture emerges of defence spending in Greater Asia and the United States. The strongest and clearest trend has been the steady and substantial decline in the defence burden carried by countries since 1980, see Figure 5.14. The only countries to exhibit a significant rise in defence burden in the nearer-term (albeit limited compared with historical levels) are China from the late 1990s and the United States from 2001 onwards.

In terms of absolute spending levels (see Figure 5.15 and 5.16) several points are worth making. China's defence spending has grown appreciably by any measure and is now approaching Japan's in US$ terms having surpassed it in PPP terms late last decade. The United States remains far ahead of any other country but having reduced its spending through the late 1980s and 1990s is now ramping up at a rate only a little slower than China. India's defence spending continues to rise as does South Korea's. Taiwan has given up.

Unlike Maritime Southeast Asia, it is clear that the military balance of power is slowly but surely shifting among Greater Asia and the United States—to the extent that defence spending translates into military capability. China has comfortably overtaken Taiwan, South Korea and India, and is rapidly catching up with Japan. Critically, the Chinese spending figures presented here are taken from official sources (the 2008 Chinese Defence White Paper) and are deemed by many observers to understate the true picture. The latest US Pentagon report to Congress on Chinese Military Power argues that defence spending by the People's Republic is appreciably larger than disclosed.

Figure 5.14: **Defence burden, Greater Asia**

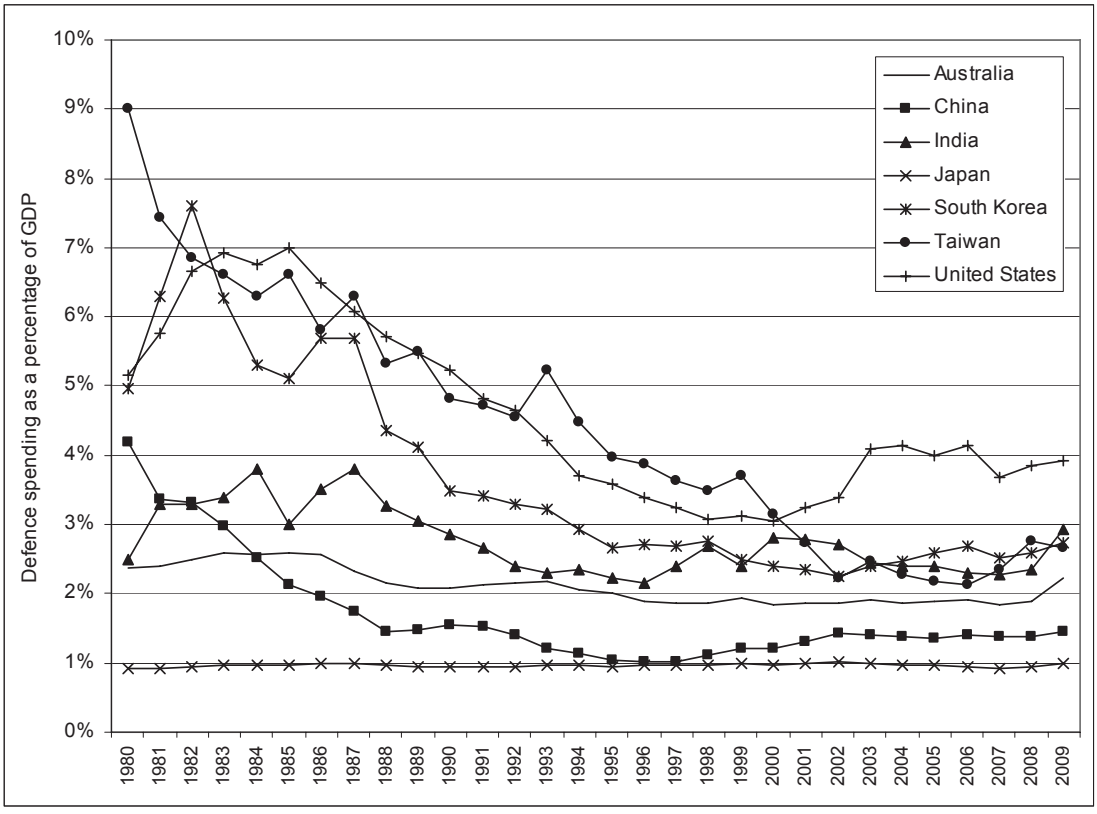


Figure 5.15: **Real defence spending (2000 US$), Greater Asia**

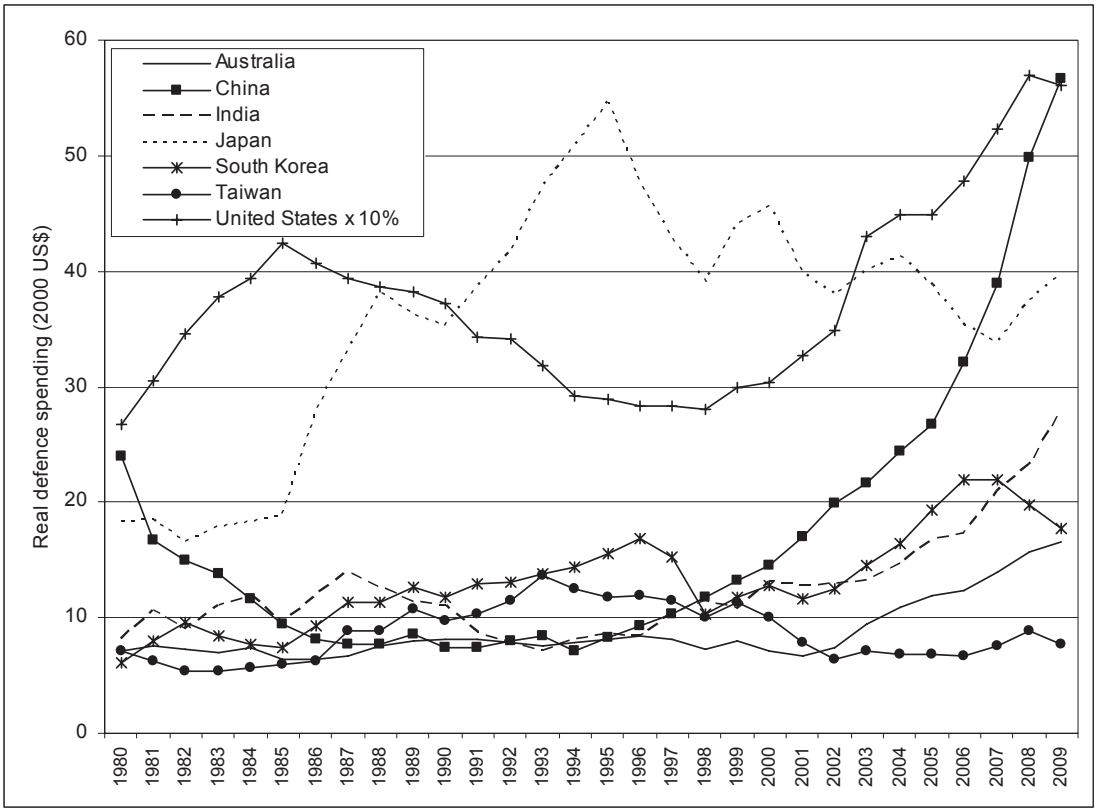
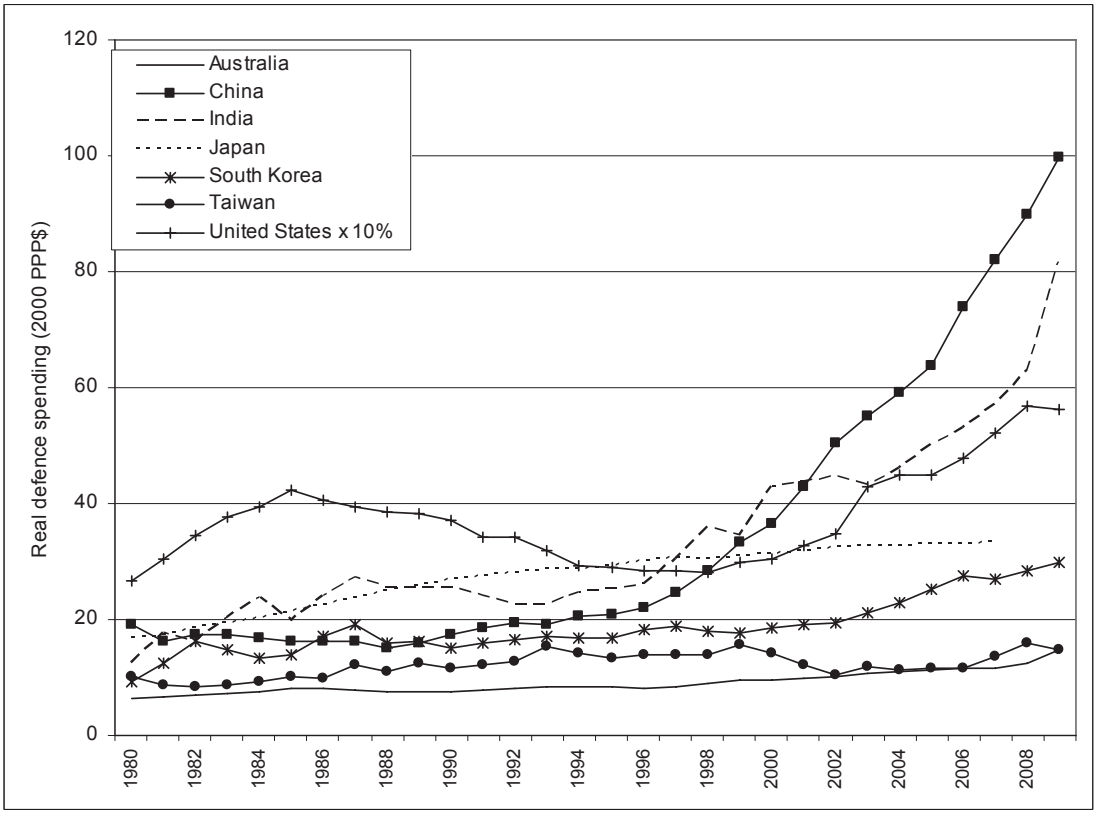


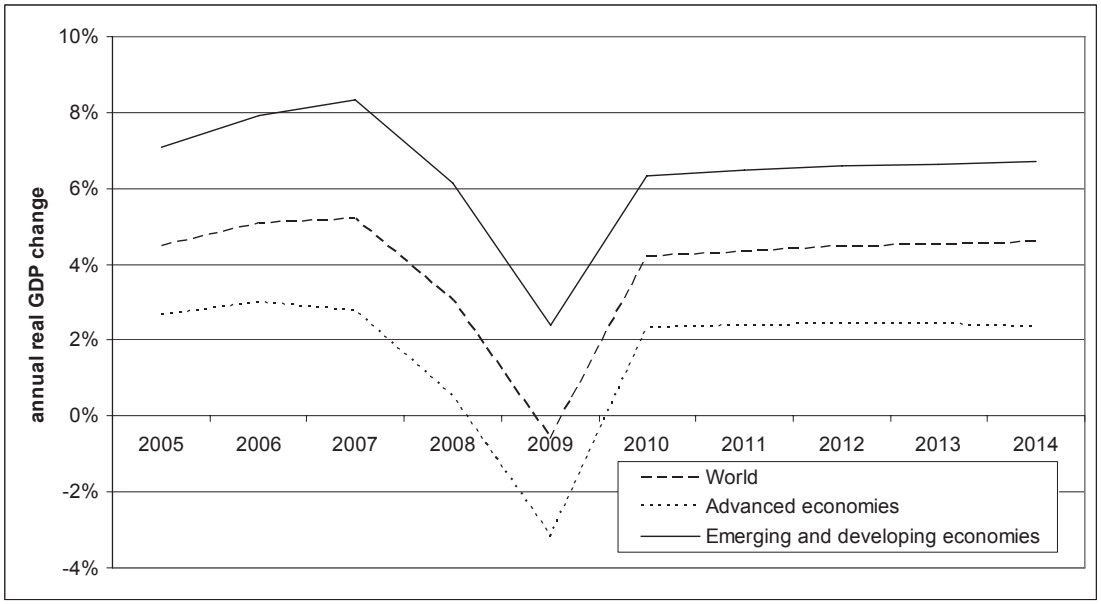
Figure 5.16: Real defence spending (2000 PPP$), Greater Asia



Impact of the Global Financial Crisis

Last year, the ASPI Budget Brief devoted an entire chapter to the potential impact of the GFC. The key aspects of that analysis are updated below (and further in Section 3 for Australia). Figure 5.17 shows the recorded and prospective economic contraction globally and for advanced and developing economies separately. As can be seen, the impact is expected to be more severe in the former. In fact, compared with the initial estimates from early 2009, developing countries have gotten off even more lightly than expected—typically 2-3% less contraction—thereby widening the gap between the impact on developed and developing counties.

Figure 5.17: The Great Recession



Source: International Monetary Fund, *World Economic Outlook*, April 2010.

The projected shape of the downturn does not vary much from one country to the next, so the relative impact of the recession can be captured by comparing the depth of contraction projected for 2009 with the growth from 2007. Table 5.3 shows the results for a selection of countries and regions of interest.

Table 5.3: Past and projected economic growth rates for key countries

	2007	2009		2007	2009
Australia	4.7%	1.3%	China	13%	8.7%
United States	2.0%	-2.4%	India	9.3%	5.7%
G7 industrial countries	2.2%	-3.4%	Indonesia	6.3%	4.5%
United Kingdom	2.5%	-4.9%	ASEAN-5	6.3%	1.7%
Euro region	2.8%	-4.1%	Korea	5.1%	0.2%
Russia	8.1%	-7.9%	Taiwan	5.7%	-1.9%
Japan	2.4%	-5.2%	Singapore	7.8%	-2.0%

Source: International Monetary Fund, *World Economic Outlook*, April 2010.
Note: Australian figures are from the IMF and are for calendar rather than financial years.

The extent to which a country decides to reduce, maintain or defer its defence spending as a result of the recession will depend on many factors—economic, strategic and cultural. A proper analysis of how these factors might come together for even one country is beyond the scope of this brief.

What can be done, however, is to collect the relevant fiscal and economic data for countries of interest and then attempt to judge the relative pressure each might be under as a result of the recession.

Two factors arguably have the potential to erode a country's capacity and willingness to sustain defence spending; in the near-term the depth of the recession will be important while in the medium- to longer-term the cumulative government debt will be decisive.

Consistent with the disproportionate impact of the recession on advanced economies, the accumulation of public debt will be concentrated in developed countries over the next few years. The IMF projects that the gross public debt in advanced economies will grow from a pre-crisis level of around 78% to around 109% in 2015. In comparison, public debt in emerging and developing economies will fall from 36% to 33% over the same period.

The latest projections from the IMF (and other sources) for the relevant economic factors appear in Table 5.4. The results are consistent with the aggregate IMF projections. France, Germany, Italy, the United Kingdom and the United States all face sizable growing debts. With the possible exception of the United States, these countries will come under pressure to contain spending in the years ahead. The United States is a possible exception only because it owns the world's reserve currency and is thereby removed from fiscal reality—at least for the time being.

It is worth noting that the debt held by advanced economies will be more difficult to pay off than that in developing countries. Not just because advanced economies tend to owe a greater share of GDP, but also because developing economies grow two or three times faster than their advanced counterparts. Japan, in particular, faces an increasingly serious situation where its ageing population will impede growth at the same time as aged care and health costs rise in the years ahead. China, on the other hand, could erase its public debt within several years if it chose to do so.

While there is no algorithm for calculating how much a country will spend on defence given its fiscal and economic situation, it looks to be the case that the GFC will place more pressure on advanced economies to rein in defence spending than on developing ones. Among the advanced countries, Australia is in a relatively strong position given its low debt and relatively shallow downturn.

References and sources

Economic data including GDP, deflators and CPI indices comes taken from the International Monetary Fund's *World Economic Outlook Database 2010* (October 2009) available at www.imf.org. Most of the defence spending data is taken from successive editions of the International Institute of Strategic Studies' *Military Balance* from 1980 to 2009. Additional data has been drawn from the Department of Defence's *Defence Economic Trends* produced by the Defence Intelligence Organisation between 2000 and 2007. *Defence Economic Trends* is available at http://www.defence.gov.au/dio/product.html. Additional national defence spending data has been taken from: *Analysis of the FY 2010 Defense Budget Request*, 2010, from the Center for Strategic and Budgetary Analysis available at www.csbaonline.org; *China's National Defense in 2008*, the Defense White Paper for the People's Republic of China, available at http://china.org.cn/e-white/index.htm; *Historical Statistics of Japan;* The Statistical Bureau of the Ministry of Internal Affairs and Communications, Japan, http://www.stat.go.jp/english/data/chouki/index.htm.

Table 5.4: Pressures on government spending that might curtail defence spending

	Fiscal balance 2010	Percentage annual GDP growth			Net government debt (IMF) or Public debt (CIA) as a share of annual GDP		
		2007	2009	2011	2005	2009 or 2010	2015
Advanced economies							
Australia		4.7%	1.3%	3.5%	-2.7%	3.2%	~5%
Canada	-3.5%	2.5%	-2.6%	3.2%	30%	32%	30%
France	-8.5%	2.3%	-2.2%	1.8%	57%	75%	85%
Germany	-5.5%	2.5%	-5.0%	1.7%	63%	69%	75%
Italy	-3.5%	1.5%	-5.0%	1.2%	104%	116%	122%
Japan	-7.0%	2.4%	-5.2%	2.0%	84%	123%	154%
Korea	0%	5.1%	0.2%	5.0%	21%	28%	
Netherlands	-6.7%	3.6%	-4.0%	1.3%	56%	62%	
New Zealand		2.8%	-1.6%	3.2%	22%	29%	
Singapore	-1.5%	8.2%	-2.0%	5.3%	102%	118%	
Spain	-8.1%	3.6%	-3.6%	0.9%	53%	50%	
Taiwan	-1.1%	6.0%	-1.9%	4.8%	32%	34%	
United Kingdom	-11.2%	2.6%	-4.9%	2.5%	37%	72%	84%
United States	-10.6%	2.1%	-2.4%	2.6%	43%	66%	85%
Regional economies							
Indonesia	-1.7%	6.3%	4.50%	6.2%	56%	30%	
Malaysia	-5.6%	6.2%	-1.70%	5.1%	45%	48%	
Philippines	-3.5%	7.1%	0.90%	4.0%	74%	59%	
Thailand	-4.0%	4.9%	-2.30%	5.5%	48%	46%	
Vietnam	-6.2%	8.5%	5.30%	6.5%	66%	52%	
Emerging powers							
China	-2.8%	13.0%	8.70%	9.9%	31%	18%	
India	-5.5%	9.4%	5.70%	8.4%	60%	60%	
Russia	-7.2%	8.1%	-7.90%	3.3%	28%	7%	

Source: Australian Government Treasury Paper 1 2010-11, International Monetary Fund *World Economic Outlook,* April 2010, *CIA Factbook* 2010 and various media.

CHAPTER 7 – THE COST OF WAR

Introduction

The 2003-04 ASPI Budget Brief included a full analysis of the cost of all deployments since 1999-2000. Since then, rather than repeat that extensive discussion, we've maintained a shorter format. This chapter includes an explanation of how Defence is funded for deployments, updated tables of historical deployment costs, a summary of the cost of the Iraq, Afghanistan and other recent operations, and an assessment of the impact on peacetime rates-of-effort of recent operations.

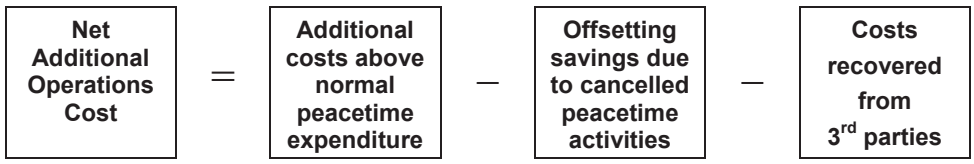
What do we mean by the cost of a war?

As a rule, Defence is supplemented for the *net additional* cost of any major military operation. This makes good sense because, in principle at least, it ensures that Defence does not have to compromise peacetime training to fund operations, and avoids them having to maintain a contingency reserve to cover unanticipated costs. This practice was suspended in 2008-09 because of a surplus of funding. It was then reinstated in 2009-10 before being applied only in part this year.

Figure 6.1 shows how the net additional cost of an operation is calculated. In the past, Defence only disclosed the aggregate net additional operations cost, the total value of new capital investment and the amount recovered from 3rd parties. However, although offsets remain undisclosed, Defence sometimes provides itemised lists of the individual costs incurred in operations.

Figure 6.1 Calculating the 'Net Additional Cost of War'

Where:



The net additional operations cost includes the additional cost of personnel allowances, shipping and travel, repair and maintenance, health and inoculations, ammunition, contracted support, fuel, inventory, consumables etc. Offsetting savings include the money saved from foregone activities like the cancelled Exercise Crocodile 99 and the Avalon Air Show in 1999-00 due to the deployment of Australian Forces to East Timor. Those costs recovered from 3rd parties include the partial recouping of costs from the UN when participating in a UN peacekeeping operation.

The net additional capital investment usually represents the accelerated filling of capability gaps specific to the operation. Recent examples include the purchase of

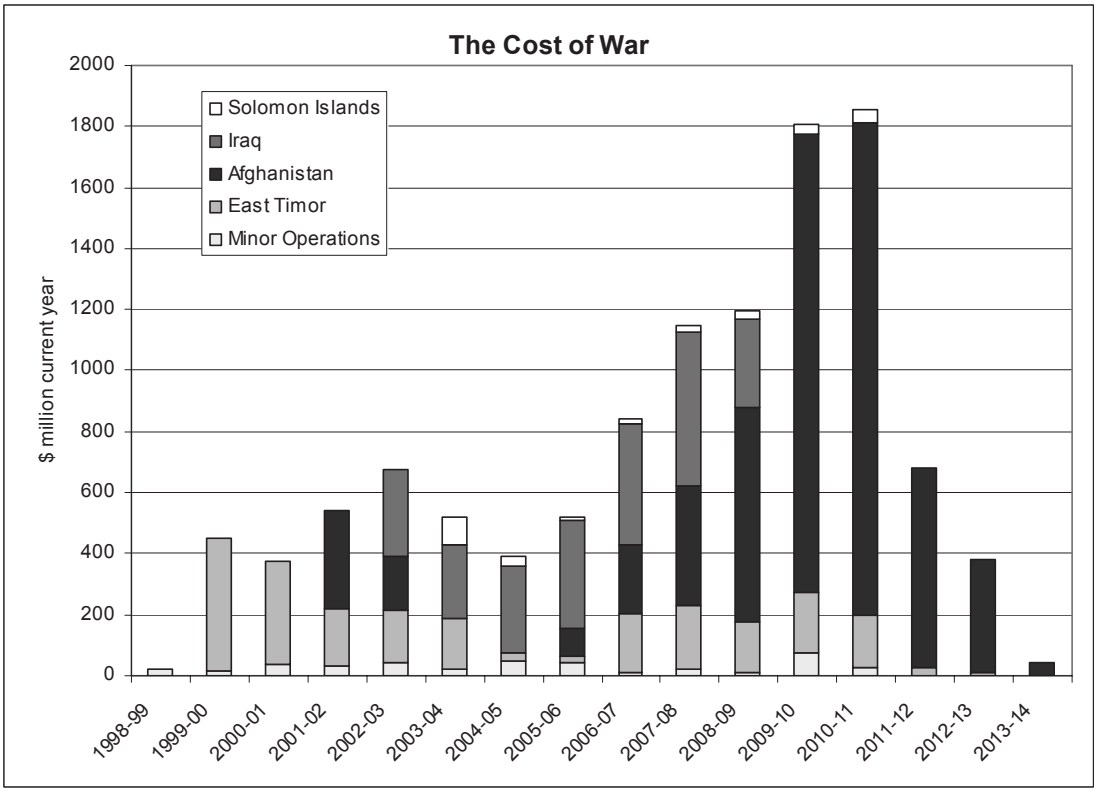
additional electronic warfare self-protection (EWSP) equipment for the AP-3C maritime patrol aircraft for Iraq, and the rapid acquisition of the Javelin anti-armour missile for Afghanistan. Capital costs sometimes also include modifications to platforms and additional inventory purchases.

Finally, it's worth being specific about what is not included. The net additional cost of an operation does not include pay and allowances that would normally be incurred, or the cost of operating platforms within the planned peacetime rate of effort. Nor does it cover the costs incurred outside of Defence by the AFP, DFAT or others involved in operations. Thus, aside from additional items like new equipment, ammunition, transport and contracted services, the net additional cost is the *marginal cost* of increased ADF activity due to an operation.

What's the big picture?

Figure 6.2 shows the net cost of Defence deployments from 1998-99 to 2013-14. Note that Defence had been directed to absorb costs of $22 million in 2007-08, $1,082 million in 2008-09 and $266 million in 2010-11.

Figure 6.2: The net additional cost of ADF operations



Source: Defence Annual Reports and Budget Papers

Minor operations include Bougainville, which cost $109 million between 1998 and 2003 (of which $43.3 million was absorbed by Defence); Border Protection, which will incur costs of $150 million between 2001 and 2010; and the 2006 Commonwealth Games ($13 million).

Figure 6.2 excludes the 'force generation' costs nominally associated with expanding the ADF by 3,555 troops for East Timor in late 1999. This was roughly $450 million

per annum permanently included into the Defence funding base at the time of the 2000 White Paper. In the figure, 'Afghanistan' includes the Multinational Interception Force (MNIF) which became part of the Iraq operation in March 2003 as well as the cost of enhanced force protection measures in the 2010-11 budget.

As shown in Figure 6.2, the cost of operations has grown for the sixth year in a row despite the draw-down of Australian troops in Iraq.

New money for operations in the 2010-11 Budget

The PBS explains the additional supplementation that has been provided to cover the net additional cost of operational deployments [PBS pages 22 to 24]. Note that the duration of the spending should not be taken as implying anything final about the likely length of deployment; additional money is often provided post-deployment for repatriation and reconstitution of equipment.

Iraq

Responsibility for protecting Australian diplomats in Iraq is being transferred from the ADF to private contractors working for the Department of Foreign Affairs and Trade. The government has provided $13.1 million in 2010-11 for this purpose.

Afghanistan

The government has funded the ADF deployment to Afghanistan until June 2011 at a cost of $1.6 billion for 2010-11, including $487 million for enhanced force protection measures. The total cost of operations in Afghanistan now stands at $6.1 billion since 2001.

East Timor

The government has extended the ADF deployment to East Timor until June 2011 and has provided $203.7 million in 2010-11 for that purpose. The total cost of operations in East Timor now stands at $4.2 billion including 'force generation' supplementation since 1999.

Solomon Islands

The government has extended the ADF deployment to Solomon Islands until June 2011 and provided $42.5 million over one year for that purpose (including previous funding). The total cost of operations in Solomon Islands now stands at $271 million.

Impact of operations on peacetime rates of effort

The impact of deployments on planned peacetime rates of effort is often counter-intuitive because rates-of-effort sometimes fall due to disruption caused. For example, despite getting $14 million for increased AP-3C operating costs due to the Iraq deployment during 2002-03, the fleet fell short of its planned rate of effort by 15% in that year. Table 6.1 lists the rate of effort for key platforms employed in recent operations. Unfortunately, figures are not available for Navy vessels, although anecdotal evidence is that they regularly deliver substantial numbers of steaming days in support of operations, well above peacetime rates-of-effort. In 2008-09 the rate of effort for deployed platforms once again tended to fall below the budgeted level. Note that Defence has not requested supplementation for additional flying hours in recent operations.

Table 6.1: Impact of deployments on flying hour rates

Platform	*Budgeted peacetime rate of effort*	*Actual*	*% Difference*
1999-00 (period including East Timor INTERFET operation)			
Black Hawk	9,260	8,179	-11.67%
Kiowa	8,985	8,379	-6.74%
C-130	16,762	13,144	-21.58%
Caribou	5,080	4,356	-14.25%
2001-02 (period including War on Terror & Border Protection operations)			
C-130	14,000	13,102	-6.4%
F/A-18	13,000	11,287	-13.2%
P-3C	8,660	9,624	+11.1%
2002-03 (period including Iraq war)			
C-130	14,000	13,622	-2.7%
F/A-18	12,500	14,077	+12.6%
AP-3C	9,600	8,172	-14.9%
Chinook	1,270	1,364	7.4%
2003-04 (period including Iraq, East Timor and Solomon Islands)			
C-130	15,000	13,992	-6.7%
F/A-18	12,500	12,820	2.6%
AP-3C	9,100	7,702	-15.4%
Chinook	1,270	876	-31.0%
Black Hawk	8,600	6,864	-20.2%
Kiowa	12,970	11,425	-11.9%
2004-05 (period including Iraq and Solomon Islands)			
C-130	16,000	13,502	-16.0%
AP-3C	8,2000	8,431	3.0%
DHC-4	5,080	3,038	-40.0%
2005-06 (period including Afghanistan, Iraq, East Timor and Solomon Islands)			
Chinook	1,270	1,091	-4.1%
Black Hawk	8,600	6,918	-19.5%
AP-3C	8,200	7,418	-5%
C-130	15,000	13,149	-12.3%
2006-07 (period including Afghanistan, Iraq, East Timor and Solomon Islands)			
Chinook	1,270	1,168	-8.0%
Black Hawk	7,500	6,157	-17.9%
AP-3C	8,200	7,094	-13.5%
C-130	10,000	10,182	1.8%
2007-08 (period including Afghanistan, East Timor and Solomon Islands)			
Chinook	1,270	1,143	-10%
Black Hawk	7,500	6,348	-15%
AP-3C	8,200	7,533	-8%
C-130	9,200	10,235	+11%
2008-09 (period including Afghanistan, East Timor and Solomon Islands)			
Chinook	1,270	1,388	+ 9%
Black Hawk	7,500	7,175	- 4%
AP-3C	7,900	8,003	+1%
C-130	10,900	10,585	- 3%

Sources: Defence Annual Reports and Portfolio Budget Statements for 1999-00 to 2008-09.

What do we get for our money?

Table 6.2 lists the net additional cost of recent ADF operations, along with a brief description of what the operation entailed. We've done the best we can to separate out the capital component of the funding but in many cases the data is not available. In some cases the figure given for capital represents the minimum amount that has gone towards capital equipment. The indicative number of personnel deployed on

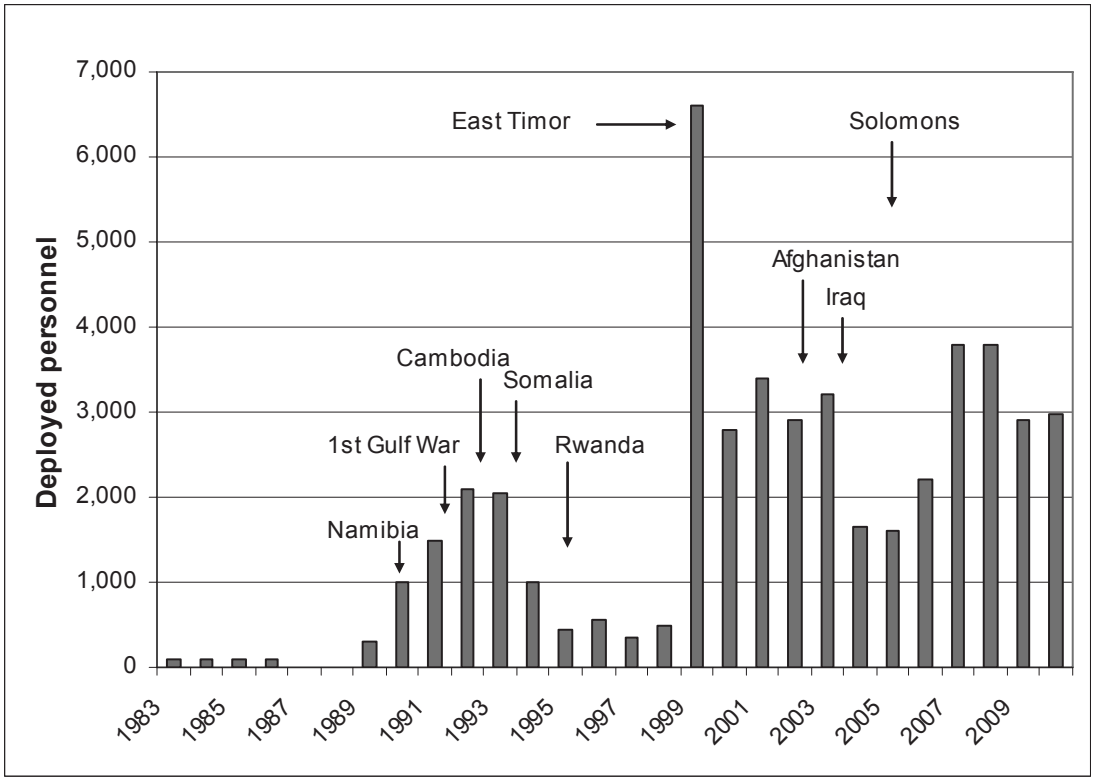
operations over the past 26 years is plotted in Figure 6.3. The 450 to 500 people that have been assigned to border protection since 2001 are not included.

Table 6.2: Cost of recent ADF operations ($ million)

Operation	Net Additional Operations Cost	Net Additional Capital Investment	Duration (months)	Description
East Timor 1999-00	429.7	70.4	9	A peak of 6,000 personnel reduced to 1,600 in June 2000. Included 12 Black Hawk plus a troop of Kiowa helicopters, plus extensive airlift (Caribou and C-130) and sealift support.
East Timor 2000-01	335.9	123.5	12	1,610 personnel in theatre. Included 4 Black Hawk and a troop of Kiowa helicopters, Caribou detachment plus airlift and sealift support.
East Timor 2001-02	187.5	0	12	1,470 personnel. Included Battalion Group, troop of Kiowa helicopters plus airlift/sealift support. (Black Hawk & Caribou use unknown.)
East Timor 2002-03	172.4	0	12	1,250 personnel. Included Battalion Group, troop of Kiowa, and detachment of Black Hawk helicopters plus airlift/sealift.
East Timor 2003-04	169.1	0	12	Similar to above but drawing down. By 30 June 2004 there were only around 440 personnel and a Black Hawk detachment remaining.
East Timor 2004-05	27.4	?	12	Australian contribution to extended UN peacekeeping in East Timor. Around 100 personnel with no helicopters.
East Timor 2005-06	23.9	?	2	Australian response to request from East Timor government for assistance following outbreak of unrest in April 2005. Troop numbers vary with need and have ranged between 3,000 in mid-2005 to around 1,100 in mid-2007. Black Hawk (8) and Kiowa (4) helicopters have been involved in the operation.
East Timor 2006-07	191.4	?	12	
East Timor 2007-08	205.6	?	12	
East Timor 2008-09	164.7	?	12	
East Timor 2009-10	199.5	?	12	650 personnel, including a joint task force HQ, an infantry battle group (2 companies), aviation task group (with Black Hawks) and a Battery from 16 Air Defence Regiment.
East Timor 2010-11	170.0	?	12	400 personnel, including a joint task force HQ, an infantry battle group, aviation task group (with Black Hawks) and a Battery from 16 Air Defence Regiment.
Afghanistan & MNIF 2001-02	180	140	9	1,100 personnel. Included 2 Frigates, 1 LPA Amphibious Vessel, 4 F/A-18 Fighters, 2 B707 Air-to-Air Refuelling Aircraft, 2 AP3C Maritime Patrol Aircraft, C-130 Transport Aircraft, 150 Special Forces plus command elements.
Afghanistan & MNIF 2002-03	169	30	MNIF 9 Afghan 3	1,100 personnel. Included 2 Frigates, 1 LPA Amphibious Vessel, 2 P3C Maritime Patrol Aircraft. C-130 Transport Aircraft, 150 Special Forces plus command elements.
Afghanistan 2003-04	-5	0	-	Remediation and repatriation costs
Afghanistan 2005-06	91	?	9	190 strong SF Task Group for 12 months from September 2005 onwards and 2 CH-47D Chinook helicopters with 110 personnel.
Afghanistan 2006-07	223.3	?	12	240 strong Reconstruction Task Force (and 2 CH-47D Chinook helicopters with 110 personnel until April 2007), growing to around 970 by mid-2007 with the addition of Special Force Task Group.
Afghanistan 2007-08	394.9	?	12	1,000 personnel including Reconstruction Task force plus Special Forces Task Group and 2 Chinook helicopters and support personnel from February 2008.
Afghanistan 2008-09	701.9	?	12	1,080 personnel including Reconstruction Task force plus Special Forces Task Group and 2 Chinook helicopters.
Afghanistan 2009-10	1,500.5	?	12	1,090 personnel including Mentoring and Reconstruction Task Force plus Special Forces Task Group, 2 Chinook helicopters, Air Control and Reporting Centre, force level logistics. Supported by a frigate in Gulf, and RAAF C-130 and AP-3C detachments (an extra 800 personnel). An extra 450 troops will deploy in 2009-10.
Afghanistan 2010-11	1,612.3	?	12	1,550 Afghanistan and 800 in Middle East Area of Operations. Forces as above plus an Unmanned Aerial Vehicle Detachment, counter IED task force and various other support elements.
Iraq 2002-03	285.3	?	7	2,000 personnel. Included 2 Frigates, 1 LPA Amphibious Vessel, 14 F-18 fighters, 3 C-130 Transport Aircraft, 2 P3C Maritime Patrol Aircraft, 2 Chinook helicopters, 500 Special Forces, Clearance Diver

				Team plus command elements.
Iraq 2003-04	240.6	?	12	830 personnel including 279 in Iraq. Deployment included C-130 Airlift detachment, Air Traffic Controllers, AP-3C Maritime Patrol Aircraft, Frigate, Army Training Team, Medical Team various HQ elements and a security detachment for the embassy in Iraq.
Iraq 2004-05	284.9	17.3	12	Pre-April 05: 920 personnel roughly as per 2003-04. Post-April 05: 1,370 personnel including a 450 strong Task Group to Al Muthanna province along with 40 Light Armoured Vehicles (ASLAV).
Iraq 2005-06	351.4	62.8	12	1,370 personnel including a 470 strong Task Group to Al Muthanna province along with 40 Light Armoured Vehicles (ASLAV).
Iraq 2006-07	398.5	?	12	1,400 personnel including a 515 strong Task Group to Al Muthanna province along with 40 Light Armoured Vehicles (ASLAV).
Iraq 2007-08	501.5	?	12	1,575 – as above but with additional training personnel.
Iraq 2008-09	290.9	?	12	As above but with withdrawal of Al Muthanna Task Group from December 2008. 110 strong security detachment, 155 strong C-130 detachment and 170 strong AP-3C detachment to remain.
Iraq 2009-10	2.2	-	12	Baghdad security detachment – 110 personnel 45 embedded personnel being withdrawn.
Solomon Islands 2003-04	90.4	?	12	Initially 1,400 ADF personnel and an unspecified number of civilians. The size of the operation was reduced as stability returned to the country.
Solomon Islands 2004-05	27.6	?	12	Around 30 ADF personnel who assist with AFP patrols and augment headquarters staff. A larger security detachment of around 200 was deployed temporarily.
Solomon Islands 2005-06	17.3	?	12	Around 30 ADF personnel who assist with AFP patrols and augment headquarters staff. Additional ~ 200 troops were sent in early 2006.
Solomon Islands 2006-07 to 2010-11	23.7 25.1 29.6 42.5	?	12	Around 140 ADF personnel who assist with AFP patrols and augment headquarters staff.

Figure 6.3: Indicative deployed personnel numbers, circa May each year.



CHAPTER 8 –SELECTED MAJOR PROJECTS

1. **Keeping afloat—maritime sustainment in Australia**
   - Gregor Ferguson
2. **Rent or buy?—airborne surveillance for land operations**
   - Tom Muir
3. **Joint Strike Fighter—fourteen down, fifty-eight plus to go**
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Gregor Ferguson and Tom Muir are senior writers for *Australian Defence Magazine*

Keeping afloat—maritime sustainment in Australia

Gregor Ferguson

In January this year at the *Pacific 2010* conference and exhibition in Sydney, the Minister for Defence Materiel and Science, Mr Greg Combet announced a significant break with existing practice in the way the RAN contracts for the maintenance and repair of its surface ships. The Defence Materiel Organisation (DMO) has called for industry expressions of interest in establishing long-term performance-based contracts, instead of the current arrangement where each major ship repair or maintenance task is put out to competitive tender.

'By putting every individual ship repair contract out to tender [and] by imposing competition at this level the Commonwealth did not receive value for money and companies were not able to invest in their workforces, infrastructure and capital equipment', Combet said.

The new arrangement will affect the maintenance and repair of the Navy's eight *Anzac* class frigates, four *Adelaide* class frigates (FFG), two Amphibious Landing Ships (LPA) and the Heavy Landing Ship (LSH); it will likely also include the Navy's replenishment ship (AOR) HMAS *Success* once she returns from a planned refit. Defence currently spends about $150 million a year on maintenance and repair for these ships and is seeking to harvest a significant saving over the nominal five-year life of the new contracts. (Although not yet confirmed, the intention at this time is to let five-year initial contracts, with rolling performance-based contracts in the longer-term).

The new arrangement will lead to the 'batching' of Defence's maritime sustainment requirements, based on ship class and/or the home port for the ship. Defence may also extend this maintenance concept to new ships when they enter service, although the sustainment concept for future deliveries is not yet finalised. If implemented successfully, the new Major Fleet Unit Repair and Maintenance Program could help Defence achieve a number of important goals: reduced costs (in line with Strategic Reform Program expectations), an up-skilling of Australia's defence industry and the establishment of a robust and more efficient industry support base for the RAN.

Industry should benefit also—or at least, the successful bidders will benefit: bidding costs and the delays and inefficiencies associated with tender evaluation would be drastically reduced; start-up and wind-down costs for discrete tasks would be reduced; continuity of work would encourage greater investment in both skills and infrastructure; and better visibility of future workload enables greater efficiency in the allocation of resources, especially if the customer can afford to be flexible in some of his scheduling decisions.

Combet's announcement has been widely welcomed, but the structural and commercial issues affecting the RAN, DMO and industry are significant. The program is likely to result in a smaller, but more stable and 'smarter', workforce and an overall drop in revenue for this sector of the industry—otherwise, how could this contribute to the savings sought under the Strategic Reform Program?

To provide some context for this, in February 2010 at the annual *Australian Defence Magazine* Congress in Canberra, the CEO of the DMO, Dr Stephen Gumley, highlighted the Strategic Reform Program (SRP) challenge as it affects DMO; basically, to meet the demands of the Defence Capability Plan, resources and money will be transferred from sustainment to capital acquisition. The DMO's 'Smart Sustainment' Program aims to capture around $5.5 billion of savings from maintenance, inventory management and non-equipment procurement (fuel, clothing and so on). More efficient demand management should deliver about 50% of these savings—simply getting the ADF to be more efficient and flexible in how it uses equipment, schedules servicing availabilities and specifies maintenance and support needs.

Gumley believes that another 30% will come from re-thinking how Defence selects and works with its contractors—productivity is a more sophisticated measure of industry performance than costs, provided that these can be measured properly and that security and diversity of supply aren't compromised. The final 20% will come from better internal processes in the DMO—using performance-based contracts, avoiding re-work and seeking optimal order quantities to enable more efficient supply from contractors.
If successful, the new Major Fleet Unit Repair and Maintenance Program could be a prototype for the way the ADF sustains much of its equipment in the future. But it is also likely to teach some hard lessons to everybody involved.

First—the problem

This program will address several issues. The first is the budgetary problem for Defence. The SRP requires an efficiency dividend of about 10% from just about every part of the wider Defence enterprise, and the cost of ownership of the ADF's equipment is the subject of intense scrutiny. Multi-year batched maintenance of these major surface ships under performance-based contracts is expected to deliver savings in the order of $12-$15 million a year, or up to 10% of their current annual maintenance and repair costs.

The second issue bears directly upon national self-reliance: maintaining a cost-effective industry capability to sustain the RAN's surface ships. This has given rise to a Priority Industry Capability (PIC): Ship Dry Docking Facilities and Common User Facilities.
Defence describes this PIC in the following terms: 'These capabilities are required for ongoing support and maintenance of our naval capabilities, but more important is the need for these capabilities to be available in a conflict for battle damage repair. This includes the provision of ship dry docking facilities on both the east and west coast and for patrol boats in northern ports. It also includes the Common User Facilities for ship building and repair'.

Defence considers very carefully before paying any sort of premium for locally-produced equipment or for sustainment of local industry capabilities. To the extent that the availability of efficient and proficient docking and repair facilities depends upon the financial health of the contractors operating them, a ship repair and maintenance program which maintains the health of this industry sector without

requiring any direct or indirect financial support from Defence would seem to be a very positive outcome.

The third issue is directly related to the second: a contracting regime in which every ship repair task is put out to tender is a significant disincentive for industry to invest in essential skills and infrastructure and therefore insidiously threatens the RAN's overall preparedness. The DMO's traditional approach has been to use competition as the mechanism for achieving value for money. However, where Defence demand is insufficient, or is insufficiently predictable, to sustain the levels of skill, expertise and quality it demands in its contractors, overuse of this mechanism works against its interests.

The DMO's Ship Repair and Maintenance Reform Program for Major Fleet Units (for brevity: Ship R&M Reform) recognises the fragility of the current contracting regime and seeks to replace it, without weakening Defence's commercial position. It is also an implicit acknowledgement of Australia's national interest in having a competitive, sustainable and profitable robust naval maintenance and repair sector, and the hope that this can be achieved without paying any sort of premium.

The job

The Ship R&M Reform program will see 5+ year contracts awarded for the maintenance and repair of fifteen ships on a 'class' or geographic location basis. This work is quite separate from major upgrades such as the *Anzac* frigate Anti-Ship Missile Defence (ASMD) and FFG Upgrade projects, which are major capital equipment projects in their own right and funded and contracted in a quite different way.

Currently, under the Ship Repair Panel Agreement (SRPA) Defence issues restricted Request for Tenders (RFT) to the four panel members for repairs and refits of vessels exceeding 1,500 tonne displacement. The four members are Thales, BAE Systems (formerly Tenix), Forgacs and United Group (formerly Kilpatrick Green). These vessels primarily are supported by three DMO System Program Offices (SPO): FFG SPO, the *Anzac* SPO, and the Amphibious & Afloat Support SPO.

Typically, warships follow a five-year cycle between major 'dockings', when all underwater systems are checked and overhauled as needed. Between dockings they undergo periodic, shorter maintenance periods tied up alongside. For frigates and destroyers, these consist either of a low-level Intermediate Maintenance Availability (IMAV) or a much deeper Selected Restricted Availability (SRA). For the amphibious ships External Maintenance Availabilities (EMAs) are conducted afloat between dockings. Depending on the type of availability and nature of the work needing doing, these maintenance periods can last from three weeks to three months.

The RAN's ships follow a Usage Upkeep Cycle of about nine to twelve months between maintenance availabilities. Usually, depot level maintenance and a dry docking will be underway on two or more ships at any one time. The four members of the Panel Agreement could each submit tenders for seventeen to twenty availabilities each year. The new arrangement will see the demise of the SRPA; the ships affected

by the new arrangement are split unevenly between the east and west coasts (see Table 1).

2011 Ship Repair and Maintenance Reform Program for Major Fleet Units; ships and classes affected

Ship Class	Number	Home Port
Adelaide Class FFG	4	Sydney
Anzac Class FFH	3	Sydney
Anzac Class FFH	5	Fleet Base West
LPA – *Manoora* and *Kanimbla*	2	Sydney
LSH - *Tobruk*	1	Sydney
AOR – *Success*	1	Sydney
Total Sydney	**11**	
Total Fleet Base West	**5**	

Note: HMAS *Success* is about to undergo a hull upgrade and will return to service thereafter and is not included in the current batched maintenance proposal

The DMO issued an Invitation to Register interest (ITR) in the Naval R&M business late last year; responses closed on 19 March. The intention is that these will shape RFTs to be issued later this year, although the formal decision to omit a Request for Proposal (RFP) step has not yet been made. The ITR responses, says Defence, will help shape the scope and content of the work to be tendered as well as forming the basis for selecting companies to receive the RFT. They will also provide a database of potential suppliers and subcontractors for use by the potential prime contractors. On current plans the RFT should close by the end of this year, with contracts signed by early to mid-2011.

Challenges

Potential contractors all agree there is plenty of scope for savings in Naval R&M. The likelihood of capturing these savings depends, however, on a number of factors outside their control.

The first of these is an issue that is fundamental to Navy's operational capability: recruitment and retention. This affects the Naval R&M program directly: the RAN doesn't want to send ships away from their home ports for R&M work which separates sailors and their families unnecessarily for weeks or even months at a time. A planned separation is bad enough, but if a ship is delayed and the sailors spend extra time away from their families, morale suffers even more. There's anecdotal evidence that lengthy separations associated with submarine refits at ASC in Port Adelaide has contributed to the current submarine service crewing difficulties, and Navy isn't keen to see this problem impair its surface fleet.

Navy has a strong desire to have R&M work done in home ports (though this is not an 'at any cost' consideration). This isn't really an issue in Western Australia where the work will almost certainly be done at Henderson, within a very short distance of Fleet Base West. On the east coast, however, capacity at Sydney's Garden Island dockyard isn't a problem, but that facility is operated exclusively by Thales, and other east coast contenders may bid to do the work elsewhere, such as Newcastle or even Brisbane. It

might be possible to leave ships' companies at home while a skeleton crew sails the ship to a more distant R&M site, be it Newcastle, Nowra, Brisbane or even Melbourne's Williamstown dockyard. The complete crew would then assemble at the dockyard when the work is complete and conduct sea trials before sailing the ship back home. But this is a cumbersome approach, especially if the ship is delayed.

The second factor is safety and seaworthiness: after the tragic engine room fire aboard HMAS *Westralia* back in 1998, which was attributed to faulty work by a contractor, the RAN will not tolerate any reduction in standards. There are no shortcuts to safety so, for this reason and also to ensure a credible battle damage repair capability, the credentials and experience of potential R&M contractors and subcontractors will be scrutinised carefully.

The third is operational capability. The Navy won't accept lower levels of training or readiness in return for a significantly lower R&M bill.

The fourth factor is the way ships are used. Notwithstanding the near-certainty of short notice contingencies, the RAN probably could be more flexible in scheduling maintenance and refit activities. The service couldn't reduce sea time significantly, as certain jobs and qualifications require minimum amounts of sea time to maintain proficiency and certification. But if circumstances allow, keeping ships alongside for slightly longer than is currently the case and carrying out more individual and collective training ashore or alongside using virtual and synthetic trainers would certainly reduce R&M costs.

Finally, there is evidence that other ADF equipment fleets—notably some of the Army's B-vehicles—are over-maintained. This is likely to be true also of some RAN ships.

The majority of R&M tasks fall into three categories: standard maintenance activities, defect repairs, and configuration changes and upgrades. Maintenance activities revolve around a time or condition-based requirement to check and repair equipment. This can also include the planned exchange of major components which then return to a central pool for overhaul and re-use on other ships. Defect repairs involve rectification or replacement of faulty equipment. Configuration changes or upgrades are pre-engineered changes designed to enhance the capability of the ship, to manage obsolescence, or to remedy a performance shortfall. Many of these are quite small, but occasionally they are significant and may impact on many areas of the ship and its systems, requiring significant planning and coordination with the maintenance and defect rectification work.

Using modern health and usage monitoring technology could allow more 'on-condition', rather than schedule-driven maintenance, resulting in a lower overall expenditure without impacting on reliability and availability. This sort of approach may only be economical under a longer-term R&M contract rather than the current fragmented one. But contractors warn that the advancing age of some of the RAN's ships, especially the LPAs, *Tobruk* and to a lesser extent the recently upgraded FFGs, means they demand considerably more attention and work than younger ships—Navy's expectations of R&M savings on these ships needs to be calibrated against this reality.

Industry's view

Sustainment—the maintenance and repair of ADF equipment—is by far the biggest source of local defence industry revenue. At the *Australian Defence Magazine 2010 Congress* in February this year, Dr Gumley stated that the 2009-10 DMO budget allocated $5.4 billion to acquisition and $5.3 billion to sustainment. Approximately 59% of his organisation's budget flows directly to local companies, a proportion that he warned will fall to about 55% over the coming decade. Of this the majority—up to 80% in some years—is accounted for by sustainment rather than capital equipment design and manufacture.

As Defence seeks to reduce the cost of ownership of its various fleets, changes in the R&M workload or contracting regime have a significant impact on the prospects for the industry. Many local defence industry prime contractors have performance and contract management tools and expertise honed in other sectors. For example, in the civil airline industry things like aero engines are sold almost at a loss, and then maintained by the manufacturer on a 'power by the hour' basis which delivers the essential profit to one and reliable, affordable service to the other. Similar approaches can work successfully in the defence sector, industry believes, but this depends absolutely on a long-term outlook and partnership between customer and contractor in order to achieve maximum efficiency.

Under the current Naval R&M regime, dockyards may have only three to six months of work in hand, or in prospect, which provides no basis for predicting workforce, training and facilities needs. Furthermore, having several contractors chasing R&M work on a surface fleet of just sixteen major vessels means that many dockyards are operating well below full capacity, driving costs up.

Industry agrees with Dr Gumley that there are considerable savings to be made from re-engineering the entire Naval R&M business process, from both sides of the transactional boundary; one of the key bottlenecks which drive up costs and reduce efficiency is its interaction with the DMO's SPOs. Information flows are neither quick nor simple and there is often uncertainty over the allocation of responsibilities and delays in decision-making. Part of the problem, says industry, is that the SPOs aren't really project managers as such, but contract managers—they don't actually manage the workforce or the assets employed, but they still retain much of the decision-making power over day to day activities, which can cause delay and friction.

By some industry estimates, longer-term contracts which deliver economies of scale by embracing all or most of the ships from a single class or based at a single port could deliver an efficiency dividend approaching double-digit percentages. And simply providing enough work to run a shipyard at or near full capacity, instead of the 50% or less that's the case in some yards, could improve productivity still further by an extra 10-20%, depending on the site. These are back of the envelope figures—the contractors won't discuss specifics with a tender in the offing. But they suggest that the DMO's goal of a $12-$15 million a year saving in costs is eminently achievable.

So how many contractors are required to support the ships affected by the new program? Industry's view is that engaging too many contractors would negate any benefits from adopting longer-term contracts. One contractor on each coast would

probably have sufficient work to ensure efficient use of facilities, personnel and infrastructure. Given the unequal division of ships between east and west coasts, however, it's possible to imagine a single contractor being appointed on the west coast to support the entire *Anzac* frigate fleet, with a partner or sub-contractor responsible for looking after the three *Anzac* frigates based in Sydney. A separate contractor (arguably a preferable arrangement to maintain some diversity in the sector) would then be able to look after the FFGs and amphibious ships located in Sydney, and probably also HMAS *Success*, once she returns from her planned upgrade. But the total number would seem to be set to be less than the current four.

The states

The states are important stakeholders in this program, as well as potentially valuable players. State governments recognise the local benefit from ongoing defence work so invest heavily to bolster the competitiveness of their local industry. This all works to the advantage of the ADF and DMO (if not ultimately to the taxpayer, who may be trading one inefficiency for another). The states all recognise that submarine and ship construction will revolve around South Australia's TechPort for the foreseeable future; the only long-term opportunities outside ship construction lie in naval R&M. The states do not generally support specific contractors. They try instead to create benign, supportive conditions for existing and new industry players which provide a local advantage over industry groups or contractors elsewhere.

The governments of two states heavily involved in the maritime industry—Western Australia and South Australia—have invested several hundreds of millions of dollars between them developing Common User Facilities (CUFs) at Henderson, WA, and Osborne, SA, to attract and sustain industry players; in each case there was no duplication of existing infrastructure. In Victoria and New South Wales slipways, dry docks and other specialist workshop facilities already exist in the naval dockyards at Williamstown and Garden Island, respectively; Forgacs also has extensive facilities in Newcastle and Brisbane. Williamstown dockyard is owned by BAE Systems and Garden Island's facilities are leased to Thales until 2013.

The NSW Government's plans to establish a naval industry 'hub' are still under development but don't include duplicating infrastructure which already exists at Garden Island and Newcastle. Victoria has a single, but very influential, naval prime contractor in BAE Systems, which owns the Williamstown yard and built the *Anzac* ships and two FFGs there. Notwithstanding the Navy's preference to have R&M work carried out close to or at the ships' home ports, the Victorian Government and BAE Systems believe the right sort of flexible approach to R&M could make it attractive to use Williamstown.

In Sydney, Thales's Garden Island facilities are under-utilised, but not available to other contractors. This might change after 2013—Defence may decide that it wishes Garden Island to become in effect a CUF; or it may sign another lease with Thales or some other firm. Unfortunately, this decision is not due to be made until after the new naval R&M contracts are signed, so it's hard to tell whether or not it could be a factor in selecting a contractor, or in the various bids submitted by potential contractors. Defence's official position is that it is still too early to speculate on the possibility of

establishing a CUF at Garden Island, as the manner in which the dockyard is managed will be informed by the outcomes of the upcoming tender process.

It's easy to see why the CUFs and dockyards became identified as a PIC. Not only are they critical for RAN support, CUFs are also a mechanism for ensuring essential facilities such as wharfs and covered working areas aren't monopolised by a single contractor. Because they are available to industry players on a level playing field basis they resonate strongly with the DMO's desire for competition: industry players which don't enjoy a monopoly on high-end facilities don't then have what might be seen as an unfair advantage. For this reason, a decision by Defence to transform Sydney's Garden Island dockyard into a CUF can't be ruled out.

The CUF concept could result in a relatively stable workforce over several contracting cycles, with each change in contractor resulting simply in a change in the logo on the staff's uniforms. However, it has been pointed out that this could also result in unwelcome workforce mobility as the ebb and flow of attractive commercial opportunities creates turbulence in the naval R&M workforce. The danger is that a volatile workforce won't retain corporate knowledge and maintain essential levels of skill and quality.

Implications of changing the contracting regime

Changing the contracting regime for Naval R&M will have a number of consequences for all parties. The first is the likely loss of competition in this sector once the first contracts are awarded. If all of the available R&M work goes to two, or perhaps three, contractors for the next five years, what will the other contenders do? What happens then once the contracts come up for renewal? Who will compete for them, and what skills, expertise, specialist naval experience and facilities will they be able to offer? And what happens in turn to the DMO's commercial leverage? If it can't use competitive pressure to drive down costs and deliver value for money, then what other levers can it pull?

This is one reason why the DMO is reluctant to sign long-term contracts. Dr Gumley and many of his senior colleagues have warned repeatedly about the dangers of signing a long-term contract with a supplier or service provider which then results in competitors departing the sector. Once this happens, they caution, the contractor's behaviour can change and the customer has no leverage to rectify this. Defence told ASPI: 'A challenge with the new strategy is to ensure the facilitation of open and effective competition across the Major Fleet Units whilst preserving the strategic ship maintenance and ship building capabilities and capacities in a Strategic Reform environment that demands cost reductions'.

Arguably, if there is insufficient competition for a contract (and that may be a purely subjective judgement on the customer's part) this is a blunt message from the marketplace about the amount and value of work available, the risks it carries, the potential for growth in this sector and the levels of profitability it can support—the customer is as much at the mercy of market forces as the contractors. Other countries have been forced to confront the same dilemma and have chosen to establish carefully-constructed long-term agreements with contractors, recognising that this will almost certainly result in a rationalisation of the industry.

An example is the UK's Surface Ship Support Alliance, which brings the UK MoD's platform project teams into a tripartite alliance with Babcock Marine (which runs the Rosyth and Devonport Dockyards) and BVT Surface Fleet (now BAE Systems Surface Ships which runs the Portsmouth dockyard). The Alliance was established in response to a common problem: the UK was unable to maintain competitive pressure while at the same time retaining the necessary capacity and skills across its three refit yards. Competition between the yards resulted in unmanageable peaks and troughs in workload, as well as unsustainable price competition. There was a real risk one or more of the yards would be forced out of the defence sector altogether, and the problem was compounded by the Royal Navy's shrinking fleet, with fewer ships in service and the newer ships requiring less maintenance. This new Alliance arrangement batches maintenance of the major fleet classes using gainshare/painshare contracts with open book accounting and planning and workload sharing by agreement within the Alliance. This will become the default method for in-service ship support across the Royal Navy.

As a caution, it should be noted that the UK model has not been operating for long enough to see whether it will deliver on the strategic intent. The new arrangement essentially provides BAE with a monopoly, and it remains to be seen what the long-term effect of the reduction of competitive forces will be.

Here in Australia, hedging against a potential monopoly by engaging several naval maintenance, repair and operations contractors might look attractive on paper. If too many are engaged, however, none may achieve economies of scale, so costs may not come down as much as Defence wants. And squeezing the companies to deliver beyond what their resources or profit needs allow might leave the DMO and Navy no better off than they are at present. The 'correct' number of contractors might lie somewhere between the current arrangement and the establishment of an effective monopoly. And there is a good case to be made that the contracting arrangements—while important—are only part of the efficiency story. The effectiveness of management (on both sides of the contract) plays an important role in determining the quality of the outcome.

Table 2 shows how the RAN's surface fleet could look in 2016—leaving aside the *Armidale* class patrol boats, *Huon* class minehunters, *Collins* class submarines and the hydrographic ships, which are all supported under separate arrangements.

Table 2: 2016 - RAN Major Surface Fleet Units

Ship Class	**Number**	**Home Port**
AWD *Hobart* Class DDG	2[3]	Sydney
Adelaide Class FFG	3[4]	Sydney
Anzac Class FFH	3	Sydney
Anzac Class FFH	5	Fleet Base West
LHD – *Canberra* and *Adelaide*[1]	2	Sydney
LPA[2]	1	Sydney
AOR[5] – Success replacement	1	Sydney?
Fleet Tanker - *Sirius*	1	Fleet Base West
Total Sydney	**11?**	
Total Fleet Base West	**6**	

1 - HMAS Tobruk will be replaced by one of the LHDs. The LHD and AWD support arrangements are still to be determined, and may be incorporated into the Ship R&M Program if the chosen arrangements are compatible.
2 – *Manoora* or *Kanimbla* will remain in service until replaced by a strategic sealift ship under a future phase of JP2048
3 – HMAS *Hobart* and *Brisbane* are scheduled for provisional acceptance by 2016
4 - State of acceptance of AWDs, and their crewing demands, will dictate retirement dates for the FFGs
5 – HMAS *Success* is currently scheduled for replacement under the DCP.

The total number of ships doesn't change over the period of the contract, but the average age does, especially on the east coast where all of the surface ships currently based at Garden Island, with the exception of the three *Anzac* frigates, are due to retire between 2014 and 2018 and three new classes are expected to enter service. As well, there are no mature support concepts for the LHDs and AWDs. They will be included in the broader contracted support arrangements when and if it is determined that it is efficient and effective to do so.

The future

What happens in 2016 will depend upon what happened between 2011 and 2016, and what the DMO and Navy feel about it. The worst-case scenario would be an increase in maintenance costs and a reduction in ship availability and operational capability. Unexpected age-related issues with, say, the FFGs or LPAs may result in such an outcome, but this isn't something most observers anticipate.

More likely is a regime that has broadly met its goals, though not without some unexpected difficulties. If the cost of ownership of the RAN's surface fleet has been reduced significantly, the probable cost will be a significant rationalisation of the naval R&M industry sector. If the RAN judges that the benefits outweigh the costs, then the process of renewing the contracts could be relatively simple and harmonious. If the new regime has been judged a failure at the operational level—safety, seaworthiness and capability—or through excessive costs, the process of developing a new contracting regime may be extremely painful.

Rent or buy?—Airborne surveillance for land operations

Tom Muir

The ADF's quest for airborne surveillance for land operations has a complex history. The origins of Joint Project 129 can be found lurking in the pre-history of AIR 87 (which ultimately delivered the *Tiger* armed reconnaissance helicopter). AIR 87 formerly included a fixed-wing broad area surveillance capability, which was hived off to become Project AIR 129, with a suggested budget of $250 million. There it was to be joined in early 1996 by the Unmanned Aerial Vehicle (UAV) requirement from project *Ninox*, whose UAVs had been trialled under project Land 50 *EW Systems*.

This rather confused picture morphed once more with the release later in 1996 of an industry issues paper for Joint Project 129 *Airborne Surveillance for Land Operations*. This provided a comprehensive view of the ADF's plans 'for an airborne surveillance system to cover broad and focal areas in northern Australia.' Essentially the system would comprise:

- *sensors mounted on an airborne platform(s)*
- *data transfer and communications systems*
- *sensor data and analysis systems*
- *interfaces for the ADF's C2 network*
- *a systems support facility.*

The platforms would be fixed-wing, manned or unmanned. Interestingly, other issues raised in the paper included leasing parts of the capability versus outright purchase. The possibility of funded studies prior to release of the Request for Tender (RFT) was also canvassed. Indicative project timing was characteristically over-optimistic, with the release of an Invitation to Register (ITR) Interest in late 1997, RFT release in late 1998, and first delivery early 2001.

Instead, JP129's Phase 1 saw the start of a three year risk mitigation program which included a series of trials during 2000, conducted mainly by Defence Science and Technology Organisation (DSTO), to determine the military utility of airborne multi-sensor surveillance and reconnaissance operations using various surveillance and sensor systems. For the focal area surveillance aspects, a tactical UAV, the Bombardier CL-237 *Guardian* VTOL system, participated briefly in one of the trials, but retired hurt.

In August 2001 things started to move on the Phase 2 Tactical UAV (TUAV) requirement, when Defence embarked on a grand 'fishing' expedition with two main aims. The first was to encourage early industry input in the capability development phase and the second was to obtain system level capability and cost information for the acquisition of the TUAVs and their utilisation. The Phase 1 risk mitigation study had prepared the ground for the survey through its assessment of command and control (C^2) aspects, likely data analysis workloads, its determination of the best mix of sensors, and the development of operational concepts for airborne land surveillance.

Industry was invited to participate in the development of the TUAV capability and its support as a prelude to further defining the requirements in preparation for the TUAV acquisition phase. To this end, the JP 129 project office provided extensive updated information about the high level requirements, and the utilisation and mission of the TUAV capability system in support of deployable battle groups, on or offshore. In turn, the survey sought industry feedback and suggestions on the proposed capability and its operational and peacetime usage as well as information from potential UAV suppliers, including:

- a description of UAV systems and suggested system architectures that would meet the defined requirements
- costing data for procurement or lease of the systems and their life support, as well as suggestions for alternative support and acquisition strategies.

Defence offered three architecture options as a general expectation of the systems desired but without limiting the scope for other, innovative approaches from industry. The first option was for a conventional Intelligence, Surveillance, Target Acquisition and Reconnaissance (ISTAR) system for land operations, which would see the

procurement of three systems of TUAVs, each comprising approximately four air vehicles and associated ground stations.

The second option was for a combined land and maritime system, for which the ADF would procure three conventional systems together with one for operation from maritime platforms. It was assumed that a TUAV would need to be launched from a maritime platform to support amphibious landings, over the horizon targeting, battle damage assessment or open ocean surveillance and reconnaissance.

Interestingly, the last option brought in the concept of an integrated multi-tier system of UAVs able to conduct a broader range of roles and mission. The smaller TUAVs, typically with a smaller logistics footprint, higher mobility and greater flexibility, would operate in similar fashion to those in the first option. For selected operations, the smaller (low altitude) system would be complemented with a longer-range/endurance (high altitude) UAV able to carry multiple payloads to provide greater all-weather detection and cueing capability for other reconnaissance systems, including the low altitude TUAVs. This option may have sown the seed for the current two-tier capability sought under Phase 2 and 4 of JP129.

JP129 Phase 2 RFT

The JP129 project office took considerable time to digest the market survey responses. Three years later—in July 2004—an RFT for the TUAV capability was released, with bids due by November that year and the system to be operationally available by early 2008. Source selection was completed by July 2005 with contract award expected towards the end of that year. While the TUAV requirements were broadly similar to those described in the earlier market survey, the system's operational concepts had been updated and reflected the system's role as the ground manoeuvre commander's principal ISTAR assets with an emphasis on deployed operations.

As part of the ISTAR system, the TUAV would significantly contribute to the 'find', 'inform' and 'stimulate effect' functions required of Army ISTAR. With the ADF by now committed to operations in Iraq and Afghanistan, the requirements reflected operational experience and the system was specified to fill capability gaps identified in Army's current ISTAR architecture by providing:

- a Near Real Time (NRT) reconnaissance capability for a deployed Joint Task Force
- an integral, responsive and accurate target acquisition system capable of providing a NRT sensor-to-decider-to-response asset link
- a Battle Damage Assessment (BDA) capability.

With an in-service date planned for the latter half of 2008, the TUAV capability was to be operated by a new Surveillance and Target Acquisition Regiment based at Enoggera Barracks, Brisbane. This new regiment would comprise the existing 131 Surveillance and Target Acquisition Battery together with a Combat Support Services Battery.

In December 2006, Boeing Australia, teamed with Israeli Aircraft Industries (IAI), was awarded a $145 million contract for the TUAV capability, to be provided by the IAI medium level *I-View* 250A system. This Israeli development exceeded the ADF's requirements in a number of respects, leading to its selection over other in-service systems proposed by ADI Limited (Elbit *Hermes* 450) and BAE Systems Australia (AAI *Shadow* 200).

This is a depressingly familiar tale. The Defence requirement was for a 'non-development' system. IAI represented the system as such and conducted a flying demonstration. However, the system was not in serviceand considerable developmental work remained. So the *I-View* 250 was chosen, with Australia as launch customer based on promised (but unrealised) advanced capabilities, which appeared to have blinded Defence to the cost and schedule risks of introducing what was an advanced developmental solution. Follow-on reports indicated that promises of a combination of sensor flexibility, integration with Australia's C^4ISR systems via Boeing, and risk reduction at landing where many UAVs are lost, were instrumental in *I-View* 250 winning the contract.

Due to extensive delays with the JP 129 program—negotiating the contract alone took more than one year—and pressing operational requirements, an interim TUAV capability was introduced by the fielding of two systems, the manportable Elbit *Skylark* system and the Boeing-Insitu *ScanEagle*, both of which have since seen considerable and useful service with the ADF land force in Iraq and Afghanistan.

Program delays continued, due in part to seemingly insurmountable technical difficulties. When the technical difficulties with introducing the *I-View* 250 system finally proved irreconcilable, that phase of the program was cancelled in September 2008. In his announcement, the then Defence Minister said that the Defence Materiel Organisation (DMO) and Boeing Australia had agreed to terminate the contract on what were said to be mutually acceptable terms. He then went on to say that this 'decisive action' would enable Defence to focus on the earliest acquisition of an alternative TUAV to meet the JP129 requirement, noting that the Army would continue to use the *ScanEagle* currently in-service in the Middle East. A further contract for *ScanEagle* services was subsequently signed with Boeing.

Since the cancellation of the contract, Defence has sent teams overseas to survey the TUAV market and ADF personnel have studied TUAV systems and operations of its allies in Afghanistan as part of the process of identifying potential capability solutions for the ADF. The focus has been on a fielded off-the-shelf TUAV system that meets the ADF's capability requirements, is proven in operations with a strong record of airworthiness, and can be readily introduced into service. It also needs to be sustainable for the Phase 2 expected life of type.

In addition to renewed offerings from previous contenders and others, Defence has sought configuration, cost and schedule information from the US Army on the AAI *Shadow* 200 system which is in-service with both the US Army and the US Marine Corps. Defence has been quoted as saying that their response will inform Defence advice to government on the way forward for JP129. At the time of writing no RFT had been released.

In its US Army configuration the *Shadow* may well be the logical choice for JP 129's Tier 3 capability, possibly through a Foreign Military Sales (FMS) acquisition. The *Shadow* system is in wide US military service, has just about all the operational features the ADF needs, is likely to cost considerably less than the original contract with Boeing for the *I-View* 250, and will also be available by the manufacturer on a full fee-for-service arrangement if desired.

On 6 May 2010, the Defense Security Cooperation Agency (DSCA) notified Congress of a possible Foreign Military Sale to Australia of two RQ-7B *Shadow* 200 Unmanned Aircraft Systems (UAS), and associated equipment, parts, and logistical support for an estimated cost of $218 million. In its notification, the DSCA said the Government of Australia had requested a possible sale of two TUAV systems (each of four aircraft), communication equipment to include four ground control stations, support equipment, spare and repair parts, tools and test equipment, technical data and publications, personnel training and training equipment, US government and contractor engineering, technical and logistics support services, and other related elements of logistics support. The Congressional notification price is US$218 million, although Defence advises that the actual price is expected to be 'substantially less'.

Defence has now finalised its capability requirements for this phase of the project, which places emphasis on operationally proven off-the-shelf systems that can be delivered in minimum time to support current and future operational needs. An analysis of candidate TUAV systems against capability, schedule, risk profile and cost has been completed, and an acquisition business case is being prepared for government consideration. Planned project expenditure during 2010-11 will include the acquisition of primary TUAV system hardware, required for fielding of two systems in 2011-12.

JP 129 Phase 4

While Defence mulls over the choice of system for the Tier 3 UAS requirement, JP 129 Phase 4 has now emerged. This phase is intended to provide organic Intelligence, Surveillance and Reconnaissance (ISR) support, primarily for land force operations through the acquisition of small Tier 1 UAS, as well as provision of a system that can be operated from or within confined areas (such as in urban environments). The small UAS are intended to provide units with enhanced situational awareness and increased force protection.

The DCP notes that Army currently operates the Elbit *Skylark* UAS, acquired as an interim solution and not intended to provide an ongoing capability. Now the intention is to acquire non-developmental systems based on proven designs with a service life of ten years. An RFT for this capability has yet to be released.

Project *Nankeen*

The RAAF is the ADF's lead ISR service and supports land and naval operations with a variety of capabilities in a variety of operational scenarios—primarily because air power has the reach, persistence and ubiquity to best undertake the ISR mission. The RAAF is currently acquiring significant ISR platforms, such as airborne early warning & control (AEW&C) aircraft, and it is expected that all future acquisitions will also

contribute to the joint ISR capability. The current trend is towards multi-role platforms whose primary roles may not be ISR but will contribute to the integrated and networked Defence ISR system—a possible role model in this respect is the use by the US Navy of the *Super Hornet* as an ISR platform over Iraq.

In response to an urgent operational user requirement for increased ISR capabilities for operations in Afghanistan, the RAAF's *Heron* Medium Altitude Long Endurance (MALE) Unmanned Aerial System was acquired and fielded in April 2009, under a rapid acquisition program named Project *Nankeen*. Working in conjunction with RAAF HQ, the DMO signed a contract with Canadian company MacDonald, Dettwiler and Associates (MDA) to lease *Heron* UAV services for the provision of high resolution capabilities. The UAV service contracting was performed by UAS leasing experts in the JP129 project office, using RAAF funds.

The $91million one year lease (with an option for an additional two years) is for the provision of sufficient IAI *Heron* UAVs to provide a stipulated number of flying hours (300 hrs/month to begin, rising to 550 hrs/month), mission payloads, automatic ground control stations and full maintenance support. *Heron* can conduct operations in excess of 24 hours duration, with a maximum speed of more than 100 knots (180 km/h) and at altitudes of up to 10,000 metres.

Heron was chosen over a number of competitors after it successfully completed a series of tests of its ISR capabilities. The first Australian-leased *Heron* began operations in Afghanistan earlier this year, delivering real time ISR information to ADF commanders, augmenting and enhancing the capabilities currently provided by RAAF AP-3C *Orions* and Army's *ScanEagle* tactical UAS. Australian industry involvement in the project includes the firms Geospatial Intelligence, Carbine Security Installations and Fujitsu Australia.

From the outset of Project *Nankeen* the RAAF is reported as saying it has had full engagement with the Army, and incorporated lessons learned through experience in operating *ScanEagle* from the ISTAR and Combat Support group.

JP129 Phase 2 Project Budget

Cumulative expenditure for JP129 to 30 June 2010 is $2 million from an approved budget of $135 million. Forecast expenditure for 2010-11 is $77 million.

Joint Strike Fighter—fourteen down, fifty-eight plus to go

Gregor Ferguson

In early February 2010 the Minister for Defence, Senator John Faulkner, took a very unusual step: unprompted, he issued a statement commenting on the 2011 US defence budget. In this case, he was applauding a decision by US Secretary for Defense Robert Gates to restructure the multinational Joint Strike Fighter project to stabilise the program's schedule and control its costs. The development phase of the project is thirteen months behind schedule, the estimated cost of the overall project was

predicted to rise by 57% above the estimated cost in 2001, and Gates has had to increase its development budget by US$2.8 billion.

Australia's approach to the JSF cost and schedule is more conservative than the original baseline, and this announcement seems to have caused little angst here. Less than two months later, on 29 March, Senator Faulkner told the RAAF Air Power Conference in Canberra, 'It is the JSF which represents the next generation of air power for Australia. The JSF's combination of all-weather strike, stealth, advanced sensors, advanced networking and data fusion capabilities will provide unprecedented situation awareness, survivability and lethality—allowing Australia to maintain its capability edge and control its sea and air approaches'.

Secretary Gates told the US Congress that month that 'It is important to remember that the F-35's cost- and schedule-related issues—and I regard them as serious, to be sure—are problems primarily related to program administration and management, not the technology or capability of the aircraft. The Joint Strike Fighter will do everything the military services need it to do, and will become the backbone of US air combat for the next generation'.

Just in case the message wasn't getting through, on 3 May at the JSF Advanced Technology and Innovation Conference in Melbourne, the Minister for Defence Materiel and Science, Mr Greg Combet, described the JSF as 'an affordable fifth-generation stealth fighter that will be the backbone of our tactical air combat capability for the next generation'. Acknowledging the intense scrutiny and analysis of the project by US government auditors and other official bodies, he added, 'It is important to restate that overall, no official review of the JSF program such as the 2009 Joint Estimating Team report have discovered any fundamental technological or manufacturing problems with the JSF program, or any change in the aircraft's projected military capabilities'.

In other words, the debate over whether or not the JSF is the right aircraft for Australia is over, as far as the Australian Government and Department of Defence are concerned. It ended in November 2009 when Faulkner announced government approval for the purchase of fourteen F-35A *Lightning II* JSFs, along with equipment, infrastructure and support required for initial training and testing, at a total cost of $3.2 billion. In 2012 the government will consider the purchase of a second batch of fifty-eight F-35As, bringing the total to seventy-two aircraft, in line with the 2009 Defence White Paper—sufficient for three frontline squadrons and a training unit.

So the focus on the JSF program has shifted from 'should we buy it'? to 'when will we get it and how much will it cost'? Nine separate governments are asking these questions. Most of the public answers are coming from US government auditors and investigators of one kind or another, although here Defence's New Air Combat Capability project office has made its own independent estimates, which have been quoted in various fora and appear to have shifted upwards slightly over the years. From the Australian government's studied lack of dismay over Gates's announcement about the JSF schedule and project costs, it appears that Australian estimates were more realistic than the optimistic schedule put forward when the project began. Also, the revised figures from the US reflect the introduction of the Weapon System Acquisition Reform Act of 2009, which is a fundamental change in the way the US

Department of Defense does cost estimates, in some ways aligning more with Australia's processes.

On current plans, the first two Australian aircraft will come off prime contractor Lockheed Martin's assembly line in Fort Worth, Texas, in 2014. Australia's first F-35A squadron will become operational at RAAF Base Williamtown in 2018—a full three years behind the original goal of 2015—with three squadrons scheduled to be operational in 2021. This delay may be a deliberate decision on the government's part to avoid ordering aircraft early in the production run when they will be more expensive, driven in part by the cost escalation the project has experienced to date, and made possible by the acquisition of the *Super Hornet* as a bridging capability.

Some time after 2015 the Australian Government will consider the purchase of a final batch of twenty-eight F-35As, for delivery in 2022 and 2023, bringing the RAAF fleet up to 100. This will be examined in conjunction with a decision on the withdrawal of the F/A-18F *Super Hornet* bridging fighter, the first of which arrived in Australia in April 2010.

The core of Gates' announcement in February was formal acknowledgement of a thirteen--month delay in the JSF development program and rise in its costs. However, cost estimates and progress reporting are complicated by the fact the aircraft is being developed in three different versions simultaneously: the F-35A Conventional Take-Off and Landing (CTOL) variant for the US Air Force (the version on order for the RAAF); the F-35B Short Take-Off and Vertical Landing (STOVL) variant, a *Harrier* replacement for the US Marine Corps, the UK and Italy; and the F-35C carrier variant (CV) for the US Navy. Each of these will have a different price and will enter service at a different time; the F-35B is the first due to enter frontline service (with the US Marines); the F-35A is expected to be the least expensive. Also complicating matters is the fact that the price actually paid for each aircraft so far is 'proprietary/competition-sensitive cost data and cannot be released', according to Lockheed Martin, so extrapolating from current data is difficult.

The total planned production run for the F-35 at present is 3,173 aircraft, with the US planning to buy 2,443. The JSF program was structured originally in three phases: System Development and Demonstration (SDD), which will see construction of twenty aircraft in all three versions for flight and ground testing; Low-Rate Initial Production (LRIP) which will see aircraft built in annual batches of increasing size over nine years; and then Full Rate Production (FRP), which was due to begin with aircraft ordered in 2015 and which will see aircraft ordered in multi-year batches of several hundred (and possibly as much as 1,000) at a time. The fourth LRIP batch is in the final stages of negotiation. The fifth LRIP batch has been included in the President's budget for FY2011 but is still being considered by Congress.

In 2002, a year after being named prime contractor, Lockheed Martin briefed the Australian media that the F-35A was expected to cost Australia US$37.3 million (FY02)—AUD$67 million (FY02), at the then exchange rate of 0.56c. At that time the SDD phase was set to comprise twenty-two aircraft, including eight for ground testing, with full production due to get under way in 2008. Initial Operational

Capability for the three separate variants were to be 2010 (F-35B), 2011 (F-35A) and 2012 (F-35C). The first RAAF deliveries were scheduled tentatively for 2012.

According to the US Government Accountability Office (GAO), in October 2001 the SDD phase was expected to cost US$34.4 billion (FY02) and production of 2,866 aircraft for the US alone was expected to cost US$143 billion (FY2002 dollars). When Secretary Gates submitted his 2011 budget request earlier this year these figures had changed: SDD had climbed to US$49.3 billion (FY02$), and it would cost around US$200 billion (FY02$) to build a reduced number of 2,457 aircraft for the US. Delivery of the first operational aircraft has drifted from 2008 to 2010, and Initial Operational Capability (IOC) for the F-35B from 2010 to 2012.

When US program costs exceed original estimates by more than 15%, the so-called Nunn-McCurdy statute requires formal notification to the US Congress. A 25% blowout results in program termination unless the US Secretary of Defense can convince Congress that the program is essential for national security, that no suitable alternative of lesser cost is available, that new estimates of total program costs are reasonable, and that project management arrangements have been strengthened to control these costs.

Pre-empting the Nunn-McCurdy breach, Gates announced sweeping changes to the JSF project in early 2010: a thirteen-month extension of the SDD program, the addition of an ninth LRIP batch, a twelve-month delay in the start of Full Rate Production to 2015, the establishment of an additional software test line, the production of an additional SDD flight test aircraft and the diversion of three LRIP aircraft to the flight test program to help it along. The SDD program was provided a further US$2.8 billion to accommodate the additional time and test assets. To provide this additional funding, reduce the ramp-up rate to address production rate risk and accommodate the higher estimated aircraft cost within the existing funding, a total of 122 aircraft were deferred from the 2010-15 period to later in the program.

Gates also fired the two-star general heading the program, and replaced him with a more senior three-star general; and he withheld some US$614 million-worth of award payments from prime contractor Lockheed Martin in order to focus their attention on project performance. The Nunn-McCurdy breach was formally notified to Congress on 26 March and the necessary certification process is expected to be completed in June.
Key measures of project success that have been initiated as part of the Program restructuring action are completion of deliveries of SDD aircraft, progress in flight testing, and the price and schedule for LRIP aircraft. The first two measures are related: by the end of 2009 only four of thirteen SDD aircraft had entered the flight test program and only 3% of planned flight tests had taken place instead of the 13% originally scheduled. However, the program is recovering: the F-35B has completed its first vertical landing, the first avionics aircraft has flown and the first CV aircraft is on track to fly in May/June. The Program is on track to deliver all test aircraft to the test centres and the first two CTOL aircraft were delivered to the USAF test centre at Edwards Air Force Base on May 18.

Thus far the test program is ahead of its schedule for 2010 and the test fleet is proving remarkably reliable for an all-new, developmental aircraft. Despite delays in SDD and

flight testing, LRIP is under way on the original schedule, though quantities have varied significantly (Table 1).

Table 1. F-35 low-rate initial production (LRIP) numbers

LRIP Batch and date of order	1 2007	2 2008	3 2009	4 2010	5 2011	6 2012
Planned	2	12	19	32	46	118
Actual[1]	2	12	17	32	43[2]	53 (planned)

Source: Lockheed Martin, US Congressional Research Service
1 —includes US and partner nation aircraft
2 —budget request for FY2011; the Pentagon has also asked for long-lead funding for an additional five aircraft to allow a 'buy to budget' of 48 if costs permit.

The cost drops quite dramatically for each successive LRIP batch and both the Pentagon and Lockheed Martin are trying to push it lower than the latest official estimates from the Pentagon's Cost Analysis & Project Evaluation (CAPE) team. The 3rd LRIP Batch cost US$2.3 billion, significantly less than recent estimates by the CAPE team. In fact, LRIP 3 contract prices are lower even than the CAPE estimate for the 4th batch according to Lockheed Martin, suggesting that when customers start buying significant quantities the price should fall faster and further than the CAPE predictions.

The revised program will now see production deliveries of the F-35B to the US Marines, Royal Navy and RAF in 2011; F-35A deliveries to the USAF begin in 2010 and F-35C deliveries to the US Navy in 2012. All of these early production aircraft will go to Eglin Air Force Base in Florida, which is the initial Integrated Training Centre (ITC) for all JSF air and ground crew. Australia's first F-35As will also be delivered there to train the RAAF's first squadron, which will become operational at RAAF Williamtown in 2018.
Senator Faulkner's announcement in 2009 of the purchase of fourteen F-35As also included a revised schedule and acquisition profile. Table 2 below shows the indicative Australian buy profile as per the multi-nation Memorandum of Understanding (MoU) as of late 2009. The result is that the second and subsequent batches of RAAF aircraft, if approved, will now be ordered during the FRP phase when unit costs have fallen; previously 27 F-35As were to be ordered during the LRIP phase.

Table 2. Australian delivery schedule for F-35A aircraft –original and revised.

	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Original	4	8	15	15	15	15	15	13			
MoU	-	2	4	8	15	15	15	13		15	13

The first operational F-35s will be the US Marine Corps' F-35Bs, which are scheduled to enter frontline service in 2012 equipped with the Block 2 version of the JSF avionics software. All other operators will begin frontline service with aircraft equipped with the Block 3 version, which won't complete testing and certification until 2015. Initial Operational Capability (IOC) for the US Air Force and US Navy has slipped, but the new IOC date hasn't been announced yet.

Despite delays in flight testing, production continues apace. The first LRIP aircraft will be delivered at the end of this year, triggering the start of aircrew and ground crew training at Eglin AFB. Project schedule is affected by the ramp-up in production rates, and the progress of avionics and mission system development and testing. The aircraft is designed to be quicker and cheaper to manufacture than previous generation aircraft; its stealthiness depends on levels of manufacturing precision which, at high production rates (up to 230 aircraft a year), can only be achieved using precise and highly automated assembly processes. The supply chain feeding this process extends to nine partner countries. Getting this production line working smoothly has delayed construction of the SDD aircraft and slowed the first two LRIP lots: it has taken 50% more man hours to build the early aircraft, though quality is higher and defect rates significantly lower than experienced by previous aircraft programs.

The mission system integration and flight test program are the tricky bits. The F-35 is the most highly integrated combat aircraft ever built and the vehicle itself and its associated ground-based logistics and training system together require some 20 million lines of software code. About 85% of the software has already been written, according to the GAO, and about 40% has been integrated and tested.

The software is being developed and integrated in successive 'Blocks'. The differences between the Blocks are the level of functionality they allow and the range of weapons that have been certified: current test aircraft are flying with Block 0.5 software; testing of the Block 1 software has just started in the 737-base avionics test-bed the 'CATBird'. The first test aircraft to carry the complete mission system (albeit with Block 0.5 software), an F-35B, has just entered the flight test program. Block 2 testing should begin in 2011, in time for the US Marines to declare their first F-35B squadron operational in 2012. This is the high-risk part of the test program; significant delays in software development and/or testing will see production aircraft delivered with Block 0.5 or Block 1 software which allows nothing more than training. It is a case of 'so far, so good'. Remarkably given the complexity of the systems, no flight test time has been lost due to software failure.
The net total effect of the pluses and minuses is that, disappointingly, the F-35 seems set to follow a well-established trend. Despite significant efforts to reduce project risks and development and manufacturing costs, the growth in the cost of US fast jets over the past four decades has been remarkably regular. Data from the US Government's own Selected Acquisition Reports shows that the cost per kilogram (a proxy measure for complexity) of new jet fighters has risen at a constant exponential rate ever since the F-4C Phantom of the early 1960s. It would appear that the best efforts of successive generations of engineers fail to actually reduce costs and succeed only in keeping their inexorable rise down to a predictable level.

The only exceptions to this rule have been the F-22A, which is considerably more expensive, and the F/A-18E/F *Super Hornet* and F-15E *Strike Eagle*, which are slightly less expensive because they are merely derivatives of existing aircraft. The F-35 family is slightly below the trend line at present, but its cost has been rising steadily and the program average over the three types may yet come in at about US$85 million each (2010 dollars).

While this seems a somewhat coarse measure, it has proved surprisingly accurate and may be the best guide to what the RAAF will pay for its aircraft. This estimate puts the cost of 100 F-35As at roughly US$8 billion; adding a further 50% or so for additional infrastructure, logistics and training overheads brings the cost to US$12 billion, roughly in line with cost estimate in the 2006 DCP.

So the delays and cost over-runs experienced so far haven't come as a complete surprise to the ADF. Indeed, Defence sources maintain that Australia's estimates of the cost and schedule for the JSF program were not based on the early projections by Lockheed Martin or the Pentagon, which can be seen now to be quite unrealistic. The ADF's New Air Combat Capability (NACC) project team had made its own independent cost and schedule estimates. ASPI was told that these are reasonably conservative and carry a robust level of contingency.

For that reason, Secretary Gates's announcement of the program delays made very little difference to Australia, and required no action on Canberra's part. Senator Faulkner put it succinctly: 'As part of the Government's JSF acquisition strategy, significant cost and schedule buffers were built into Australia's project in anticipation of the steps announced in the US today. As is to be expected with such a large and complex project, the JSF will continue to face risks. Australia will continue to work closely with the US and other international partners to closely manage these risks and ensure the success of the JSF Program'.

The NACC team obviously expected to pay more for the F-35A than Lockheed Martin was suggesting eight years ago. The basis of its analysis has not been disclosed, but DMO's CEO, Dr Stephen Gumley, told the Senate Estimates in 2008 (reiterated this year) that Australia's expected average aircraft-only price for the 100 is A$75M (at an exchange rate of 0.92). The 2006 DCP budgeted up to $12 billion for the first seventy-two aircraft, including all training, logistics and support infrastructure, and up to $3.5 billion for the remainder. The 2009 DCP isn't even as specific as this, though it does include $1 billion extra to pay for the F-35A's new weapons, making a grand total of up to $16.5 billion, of which $3.2 billion has already been committed.

Hornet and Super Hornet

The full cost of Australia's upgraded air combat capability includes not only the F-35A and its associated infrastructure and weapons. It also includes the cost of maintaining an effective and credible air combat capability between the retirement of the RAAF's F-111s in December 2010 and the arrival in significant numbers of the F-35A. One component of that cost is the so-called bridging fighter, the *Super Hornet*, which is planned to serve the RAAF for 10 years, at a total cost, including weapons, spares, simulators and in-service support, of $6 billion. The first five *Super Hornets*, of twenty-four ordered by the RAAF, arrived at Amberley in March 2010 to start replacing the F-111.

The second component is the cost of keeping the RAAF's older 'Classic' F/A-18A/B *Hornets* operational until the F-35A is operational. The current planned sustainment effort for the classic *Hornet* is predicated on standing down a squadron of *Hornets* as

each F-35A squadron becomes operational. The decision to scale back the centre fuselage replacement program (the so-called centre-barrel replacement) for forty-nine *Hornets* was predicated on a retirement date of 2018.

How much longer will the *Hornet* now be required to serve? And how many are required to see through the introduction of the F-35A? Given that the *Super Hornet* is scheduled for withdrawal in 2021, and the third F-35A squadron won't be operational until the following year, and that Defence's goal is to field a force of 100 F-35As, will it be necessary to extend the lives of at least some ageing *Hornets* to get them through to 2020 or 2021?

Lacking any insight into the expected airframe life of the oldest members of the classic *Hornet* fleet, the table below shows how the RAAF's fighter fleet might look at key points over the next fifteen years:

AIRCRAFT	**2010**	**2012**	**2015**	**2018** 1st F-35 Sqn	**2020** 2nd F-35 Sqn	**2021** 3rd F-35 Sqn	**2025** 4th F-35 Sqn
F-111	15[1]	0	0	0	0	0	0
Hornet	71	71	71	<71[4]	0?	0?	0
Super Hornet	12[2]	24	24	24	24	24	0
F-35A	0	0	6[3]	29	72	72	100
Total	**86[1]**	**95**	**101**	**<124**	**96?**	**96**	**100**

Source: ADF Data and JSF PSFD MoU November 2009

1. F-111 retires at end-2010; RAAF won't have 15 F-111s and 12 Super Hornets operational simultaneously
2. Super Hornet will become operational at the end of 2010
3. F-35A deliveries begin 2014; aircraft will remain in USA; first squadron won't be operational until 2018
4. By 2018 the inventory of 'classic' Hornets will be declining

The *Super Hornets* are planned to remain in service until at least 2021. This will mean that the RAAF will be able to maintain four operational squadrons at all times—provided that there are no unforeseen problems with the classic *Hornets*. In that case, if 100 aircraft is considered essential, then the RAAF would have to consider either extending the classic *Hornets* through further upgrades and/or structural work, acquiring extra *Super Hornets*, or ordering more F-35As and getting them delivered earlier.

However, it may be moot how many of the current classic *Hornet* fleet will make it past 2018 without needing significant additional work. Adding such expense to the already significant overhead costs of maintaining three separate fast jet types may place unbearable budget pressure on Defence. Rationalising down to a two-type fast jet fleet would be more economical and would allow the pilot training to concentrate on the two types. And a mix of eighty-four *Super Hornets* and F-35As in 2020 will represent a far superior capability to eighty-six classic *Hornets* and F-111s in 2010.

Finally (1)—The HF Modernisation project delivers final network

Tom Muir

Back in the early 1990s the Land Force's tactical communications used low capacity mobile and high capacity transportable radios. The Navy's tactical HF communications was based at the two naval communications stations (NAVCOMMSTA) in Canberra and Darwin, and the Air Force used an HF radio network for its Air Operations Communications System (AOCS), with stations at Sydney, Perth, Darwin and Townsville. The RAAF also had a transportable HF capability. In short, ADF HF long-range tactical communications were outdated, inefficient, inflexible, expensive to maintain and operate, and incapable of carrying military traffic of the type and volume needed even then. Some of this equipment had been in use since the 1960s and the different systems used a variety of communications standards, not all compatible with each other or Australian civil standards, and special interfaces were required for intercommunication.

The HF Modernisation program aimed to replace the HF components of the Naval Communications Stations Canberra, Darwin and Harold E Holt, the Naval NAVCALS stations at Sydney, Fremantle and Cairns, and the RAAF AOCS stations at Darwin, Perth, Sydney and Townsville. The project was initiated in May 1993 with an ITR for a competitive Project Definition Study for the first of a number of HF radio stations. These were to be established around Australia to form an integrated ADF tactical network.

By late 1993, a target definition study for the first station in the Riverina had been completed, a new site near Wagga (NSW) had been chosen, and the land acquired. However, the approach to what was obviously going to be a major communications infrastructure task changed when Defence decided to establish—in one fell swoop—a network of four distributed remotely-controlled HF transmit and receive stations, linked by a wide area network to two Network Management Centres.

Advanced network technologies

Defence wanted the network—later to be known as the 'core system'—to be based on the latest commercial technology available in 1996-97, including such advances as adaptive radio and, where appropriate, Automatic Link Establishment (ALE) protocol, electronic protection and a real time frequency management system. To achieve this, an addendum to the original ITR was released late in January 1994, describing the scope of the HF Modernisation project and providing an expanded task description for the Project Definition Studies (PDS) based on the whole HF network rather than just the Wagga transmit and receive station.

Among the tasks for the PDS contenders would be the selection of sites for the other three HF stations, with a preference for collocation with existing Defence assets where feasible. Possibilities included Townsville, Tindal, Pearce, HE Holt, and even collocation with JORN sites. A shortlist of up to six potential prime contractors would be selected from the ITR responses to receive tender documentation for the PDS, with two competing primes undertaking the PDS phase, of which one would be selected for the final implementation phase.

Ten potential prime contractors responded to the earlier ITR and the project office left it open to the original respondents to decide whether or not to amend their responses in light of the changed scope of the PDS. However it was anticipated that with a project of this size—heading towards the $500 million mark—it was likely to attract new players.

Indicative timing of the project anticipated completion of the network definition study by mid-1994, issue of the RFT for the PDS by mid-1994, competitive PDS from early 1995 to early 1996, and HF Mod implementation from early 1997 to late 1999.By April 1994 there was a strong response to the ITR for studies for what were now four or five fixed HF communications stations. The project director said there were ten respondents seeking prime contractor positions and a further thirty-four as subcontractors and suppliers.

But it wasn't until June 1997—three years later—that Boeing Australia was selected as preferred tenderer over the only other shortlisted contender, Telstra Applied Technologies, for the implementation of JP 2043. The $310 million contract signed on 31 December 1997. Thus it had taken more than three years to assess the project definition studies and evaluate the responses for the implementation contract.

The new high frequency communications system to be developed by Boeing and its team had grown slightly and now comprised four new HF transmit and receive stations, interconnected by a WAN and linked to upgraded HF systems in Navy, Army and Air Force mobile platforms. The latter upgrades were to enable the selected mobile platforms to utilise the advanced capabilities provided by the new network including automation, email and secure voice, data and facsimile. The platforms included *Chinook* and *Black Hawk* helicopters, Coastal Mine Hunters, *Armidale* Class Patrol Boats, Hydrographic Ships, and selected Army mobile units. Also included were facilities at RAAF No. 1 Combat Communications Squadron, and the Defence Force School of Signals Watsonia (Simpson Barracks).

Technology changes impact program

But the modernisation program had been further complicated by the rapid changes occurring in the Defence information, computer technology and satellite communications environments. Upgrading the HF communications systems in mobile platforms, which were themselves undergoing either production or upgrade, added a further dimension of technical and programming complexity to the project.

Defence saw this as requiring further investment of time and effort in systems engineering analysis and the definition of requirements as well as the cooperation of the Navy and Air Force user communities, who had been active in the definition of requirements. This was a process that Defence acknowledged as taking considerably longer than anticipated. As an example, there was conflict over the system architecture with Air Force users, who were keen to retain the system used for the AOCS, only (then) recently refurbished by GEC Marconi (now part of BAE Systems Australia).

Defence now regarded trading-off schedule against getting the requirements right as a prudent strategy since it would ultimately lead to the development of a system finding acceptance across a wide set of users. At the same time, it would satisfy Defence's overarching goal of replacing the existing fragmented HF communications system with a survivable, Australian-owned and controlled long-range communications network.

Delays a common and increasing experience

An initial milestone, the Integrated Baseline Review, was completed in August 1998, but anticipated expenditure under Boeing's contract was reduced to $13.5 million (out of a projected spend of $18 million), reflecting delays that were to be a common and growing experience with the project. By March 1999 cumulative expenditure was estimated at $112.6 million.

By 2001 the project was described as delivering the HF capability in three stages: core, intermediate and final. Completion of the detailed design review for the 'core system' (replacement of the existing HF facilities) with the integration of the core system components, system testing and the transition of existing Navy and Air Force HF stations capability and staff to the integrated core system, was now scheduled for 2001-2002. However, due to delays in software development and integration, system acceptance of the first stage was not achieved until the end of 2004.

This initial phase encompassed four main fixed sites in the Riverina, Townsville, Darwin, North West Cape, and a network control site in Canberra with (interim) backup facilities. The second phase of the project had two components. The first was intended to provide enhancements to the system already installed for increased levels of automation, improved capability, enhanced security and survivability, and reduced reliance on staff. The second was to upgrade communications for the selected mobile platforms as well as RAAF No. 1 Combat Communications Squadron, Defence Force School of Signals and Deployable Minewarfare and Clearance Diving Headquarters, as well as the provision of a second network management facility for redundancy purposes.

The preliminary design review for the next stage was scheduled for late 2004 to early 2005, which would see the second (intermediate) stage introduced progressively between 2005 and 2008 with installation into mobile platforms potentially extending to 2010.

By 2005-2006, with the completion of the first core stage and its acceptance into service, the program continued under what was now described as Phase 3A—remainder of the network. By now total project expenditure had increased to $307 million and the preliminary design review for the second stage had again been re-scheduled, this time for September 2005. However, the detailed design review for the final fixed network system wasn't completed until September 2006, with the second stage fixed network system being introduced for completion in early 2008. Installation into mobile platforms now extended to 2010.

DMO concerns

By 2007-08, with close to $360 million now spent on the project, the Defence Materiel Organisation (DMO) advised Boeing Defence Australia of its concerns over risks to the program, which related to the schedule for the introduction of the second stage fixed network capability and for the installation of upgrades into mobile platforms. To reduce risk to the schedule for the fixed network, the DMO announced that an independent review of the prime contractors' schedule would be undertaken during 2008 to ensure the contractor minimised any schedule impacts. It was accepted that platform availability was a major risk against the schedule for the mobile platform upgrades. An evaluation of risk mitigation options was also undertaken to closely monitor any platform availability changes and to seek alternative opportunities.

By 2008-2009 the DMO reported that the introduction of the second stage fixed network, planned for 2008, was not now expected before early 2009, due to prime contractor delays. This delay was seen as impacting the schedule for the upgrade to mobile platforms, which was now planned for completion by the end of 2010. The DMO said the highest risk to this project was further delay by Boeing in the delivery of the final system. To mitigate this risk, the DMO was negotiating with Boeing a new schedule, based on an incremental delivery approach. A revised date for final systems acceptance was scheduled for July 2010.

However, in the revised estimates for 2009-2010, which included a cumulative spend of $373 million, the DMO noted that earlier expenditure estimates for the year of $17 million were pessimistic, based on contractor performance to date and progress with delay dispute negotiations. Since the beginning of the financial year there had been a turnaround with the dispute resolved in April 2009 and the prime contractor now overachieving on a revised formal schedule.

In September 2009 the DMO confirmed the introduction into service of the final system which provides greater levels of automation, performance and capability for ADF users, a backup network management facility, and two Generic Mobile Upgrade Systems — one land-and-sea component and one air platforms component.

As of late April 2010, all major deliverables under the prime contract had achieved contractual acceptance. This includes the final fixed network, and the generic air and generic land/sea mobile upgrade systems. Upgrades to mobile platforms included in the scope of the project, but not in the prime contract with Boeing, are currently being progressed and may extend through to 2016, depending on platform availability.

Following acceptance of the final fixed network system in April 2010, all work remaining on this system is expected to be completed by early 2011. Designated mobile platforms will now be upgraded on a progressive basis through to 2016 using products and design material developed under the prime contract with Boeing Defence Australia. The majority of mobile platforms are not included in the prime contract with Boeing and are yet to be contracted.

Comment

Now finally delivered, some seventeen years since industry was first alerted to the requirement and over twelve since the prime contract was signed with Boeing

Australia, the ADF's military high frequency communication system (MHFCS)—the product of the HF Modernisation project—is considered one of the world's most advanced strategic HF communications network due to its automation levels, range and clarity, traffic volume and connection speed. But as indicated, this complex, software intensive project has been subject to very significant delays both on the part of the Commonwealth, especially in the initial stages, and the prime contractor. As well, not all of the initial requirement has been met—as well as the outstanding mobile platform fits, some other components were overtaken by events and abandoned along the way.

An Australian National Audit Office (ANAO) Major Projects Report attributed delays to 'requirements instability', in that Defence continued to change specifications well into the project time-line. They were also attributed to 'contractor delays with software development and system instability'.

Project budget

Of approved project expenditure of $ 663m cumulative expenditure to June 2010 is estimated at $413m and forecast expenditure for 2010-11 is $34m.

Finally (2)—Late early warning; Wedgetail—the last lap?

Gregor Ferguson

On 28 April this year the US civil registration codes were removed from two Boeing 737 *Wedgetail* Airborne Early Warning & Control (AEW&C) aircraft at RAAF Base Williamtown. This Initial Acceptance milestone marked the handover of the aircraft from their manufacturer, Boeing, to the RAAF's 2 Squadron. The RAAF now formally owns its first two *Wedgetails* and can fly them without requiring a Boeing crew onboard.
By the end of this year, or early in the first quarter of 2011, Boeing and the RAAF hope to achieve Final Acceptance of all of six *Wedgetails* ordered by Australia and to be introducing them into frontline service. The journey will have taken almost exactly ten years since the order was signed in December 2000.

It's been a long road so far for both parties, as well as for Northrop Grumman, manufacturer of the *Wedgetail's* innovative MESA, or Multi-role Electronically Scanned Array, radar. Barring increasingly unlikely contingencies, it now looks as if the initial phase of the *Wedgetail* program, Project AIR 5077, is drawing to its close.

The capability in question is the ability to scan the airspace above Australia's maritime approaches in order to detect both air and maritime threats, and then direct and control the aircraft and warships sent to defeat them. From a cruising altitude of 30,000 ft, the MESA radar mounted on the upper fuselage of the *Wedgetail* aircraft is designed to detect targets more than 400 km away in all directions, track air and sea targets simultaneously, track high-performance aircraft while continuously searching for other targets and also detect certain types of hard to see targets such as cruise missiles. The *Wedgetail* will also act as a flying command post and communications node in many other scenarios.

It won't operate in isolation: the $3.9 billion *Wedgetail* AEW&C system is part of a much larger 'system of systems', a network of aircraft, ships, sensors and ground control stations designed to provide a seamless surveillance, air defence and strike capability.
The *Wedgetail* was designed specifically to meet an RAAF requirement drawn up in the 1990s and the Commonwealth has borne most of the development risk.

The wider context for the *Wedgetail* program is the federal government's 2003 decision that the RAAF's F-111s and *Hornets* would be replaced by the F-35A *Lightning II* Joint Strike Fighter, with the F-111 retiring first, in 2010. To extend the capabilities provided by the *Hornets* and prepare for the arrival of the more capable F-35A, the RAAF planned to field the *Wedgetail* AEW&C system, the *Vigilare* ground-based command and control system (for which Boeing Australia is prime contractor and something of a saga in its own right), a new long-range strike weapon, the Joint Air-Surface Stand-off Missile (JASSM), and a new fleet of aerial tankers to extend the range and endurance of the *Hornets* and, eventually, the F-35As. These elements needed to be in place before the F-111s could retire as planned in 2010. It'll be a close call, but when the F-111 retires in December 2010, all of these capabilities should just be entering service. The *Wedgetail* program has had one of the hardest roads to travel and is now some forty-nine months behind the original schedule set in December 2000.

The first reports of difficulties integrating the MESA radar's side-facing antennas and the fore-and-aft-facing 'Top Hat' antenna mounted above them emerged in 2006. There were also issues with the stability of the mission system software, which needed re-booting after as little as two hours, and difficulties integrating the aircraft's communications and electronic warfare suites. By mid-2008, the DMO was extremely concerned that the *Wedgetail* system was simply not delivering the radar performance the RAAF sought and, despite assurances from Boeing and Northrop Grumman, it was not prepared to accept it for customer testing.

To resolve the issue, in early 2009 the Commonwealth and Boeing began a complex Test & Evaluation (T&E) program to determine the exact state of the *Wedgetail* system and the path forward, if any. Concurrently with the Commonwealth's own Acceptance T&E program, a *Wedgetail* undertook what was termed an Operational Utility Demonstration as part of a major ADF air defence exercise, EX *Arnhem Thunder*, in April 2009. And the Massachusetts Institute of Technology's Lincoln Laboratory studied the MESA radar closely to determine whether or not it was working or, if not, could be made to work.

The verdict in all three cases was positive. The Lincoln Laboratory gave the MESA sensor a clean bill of health: it reported that the radar works and is a sound basis for further development. However, it also warned the radar was at the limits of what technology can currently achieve in one specific, though fairly narrow, area of performance. Its advice was to let the technology continue to evolve and conduct additional R&D to determine options for improving performance in this area. The Lincoln Laboratory believes that remediation options do exist but without undertaking extra research it could not quantify at that time how far radar performance would improve.

On EX *Arnhem Thunder* the *Wedgetail* showed both its ultimate potential and some solid, useable performances. It switched from the 'blue' to 'red' forces on an ad hoc basis to test or demonstrate different elements of its capability, including—importantly—its ability to share its radar picture and other tactical information with the RAAF's upgraded *Hornets*. Whenever it was withdrawn from the exercise, the side it had been supporting immediately felt the lack and suffered in tactical terms.

Networking

One of the features of *Wedgetail* which makes it so effective is its communications suite. Formerly the cause of considerable concern, this is maturing into a stable networking capability. As well as the normal radios and satellite links, *Wedgetail* incorporates the Link 16 Tactical Data Link, which enables similarly equipped aircraft, ships and ground stations to exchange considerable volumes of very complex data in real time. In particular, Link 16 carries radar and electronic warfare (EW) data. It sends the *Wedgetail's* radar data down to the *Vigilare* ground control station where it is fused with data from warship and ground-based radars and integrated into the so-called Recognised Air Picture (RAP). Via Link 16, this is then shared in real time with the *Wedgetail* which passes it on to the tactical aircraft.

This constantly updated situational awareness bestows a massive combat advantage on the air combat fleet and is one reason why the ADF is investing so heavily in both *Wedgetail* and *Vigilare* and their respective networking capabilities. If the *Wedgetail* is operating independently it creates its own air picture and passes this to friendly aircraft.
On EX *Arnhem Thunder* the *Wedgetail* was able to share the RAP with the RAAF's upgraded *Hornets* using Link 16 (this capability was part of the *Hornet* upgrade). Also last year, Boeing initiated the first Link 16 data exchanges between *Wedgetail* and the *Vigilare* ground station. Still to come are demonstrations of Link 16 connectivity with the RAAF's new Boeing *Super Hornets* and the RAN's recently upgraded FFG frigates.

However, there were still two significant challenges facing the project: the radar performance shortfall mentioned earlier, and the unfinished Electronic Support Measures (ESM) and Electronic Warfare Self-Protection (EWSP) systems, for which BAE Systems Australia is responsible. Neither Defence nor Boeing will discuss the radar issues, though it's understood that the sole significant performance shortfall is in an area where the radar has encountered the limits of current technology. Privately, both Defence and Boeing acknowledge that this part of the specification was known to be highly ambitious.

However, Defence reports that initial scoping activity for a collaborative radar study by the Commonwealth, Boeing and Northrop Grumman is yielding positive results and the *Wedgetail* Program Office hopes to have this effort fully underway by mid-2010. Studies by the Lincoln Laboratory and DSTO here in Australia have erased any doubt within DMO about the radar's current capability and future potential. Both Defence and Boeing say the radar has exceeded its contractual specification in several other areas, and has the potential to do even better in the future. Meanwhile, in testimony to the federal parliament's Joint Standing Committee on Foreign Affairs,

Defence and Trade in March 2010 the DMO's general manager programs, Mr Warren King, stated, 'We anticipate 98% compliance with [specification] at final acceptance. And radar stability is now at around ten hours,' he added.

For context, a typical Wedgetail surveillance mission is expected to last around ten hours: one hour to get on station, eight hours on station and then an hour's flight back to base. Achieving a specified level of system stability is one of the DMO's Final Acceptance criteria, King told the committee. So is a specified level of ESM system performance, which King described as 'the remaining piece of the capability that needs to be corrected or brought up to the final operational state.'

The ESM system is important because it detects hostile radars and other electronic transmissions at ranges well beyond that of the *Wedgetail's* own radar detection range (and that of the adversary radar) and so provides additional surveillance and situational awareness. It also stores and analyses the signals it detects to build up an intelligence 'library'. Among other uses, this library can be uploaded into the EWSP systems of other aircraft so they can also identify hostile radars and take evasive action.

The ESM system on the *Wedgetail* is an updated version of BAE Systems' successful ALR-2001 ESM system already installed aboard the RAAF's AP-3C *Orions*. Significant amounts of development were required to integrate it with the Boeing 737 airframe and the complex *Wedgetail* radar and mission system. This has been slow, difficult work; at the time of writing less than one third of the planned ESM test and acceptance program was still outstanding, and this should be completed around the third quarter of 2010.

The EWSP system, on the other hand, is largely complete and has been installed on all the aircraft. This is designed to provide full spherical coverage and protection against Infra-Red (IR) guided missiles. It consists of the threat warning system, chaff and flare decoy dispensers and a directed IR counter-measures (DIRCM) system which trains a laser onto the heat-seeking head of an IR guided missile to 'blind' it.

Against this more promising background Boeing and the Commonwealth negotiated a new iteration of the prime contract, enabling progressive delivery of aircraft and their acceptance by the Commonwealth as these outstanding issues were resolved; it also included compensation for the Commonwealth for the anticipated performance shortfall. This agreement was signed in November 2009 and almost immediately the first two aircraft were delivered to Williamtown to enable air crew and ground crew training and the start of Production Acceptance T&E.

In January 2010 the Commonwealth and Boeing signed a five-year, $800 million In Service Support (ISS) contract, which covers the maintenance and support of the six aircraft as well as ongoing development work by Boeing and Northrop Grumman to achieve the full, contracted radar performance. A third aircraft is already at Williamtown and scheduled for initial acceptance in June, with the fourth due in September. These first four aircraft will support the RAAF's ramp-up of training and Operational Test & Evaluation (OT&E) activities. The remaining two will be delivered by the end of the year; one from Brisbane, where Boeing Australia is completing the extensive *Wedgetail* modification program, and the last from the USA,

where Boeing has been using it as the principal test aircraft. These will be delivered in the final configuration; the earlier aircraft will be brought up to this configuration with software and minor hardware modifications.

The last aircraft is scheduled to undergo a searching test exercise mid-year, probably on EX *RIMPAC* in Hawaii. This is both a contractual requirement and a US State Department condition for export to Australia. This should confirm US interoperability as well as full integrated system performance—the radar, mission system and EW system all working as a unified whole. It will clear the way for the Final Acceptance milestone which, for the first aircraft, is still scheduled for December 2010.

Concurrently, the RAAF and DMO will be exploring the emergent *Wedgetail* capability in a series of ADF and RAAF air defence exercises, probably including EX *Pitch Black* in August and then EX *Arnhem Thunder* 2010 in November. These are intended to form part of the *Wedgetail* acceptance process, to train the *Wedgetail* air and ground crews and to introduce the rest of the RAAF to the operational concepts required to operate with an AEW&C aircraft. The biggest test for *Wedgetail* is likely to come in mid-2011 when it takes part in the combined US–Australia EX *Talisman Sabre*. If all goes well, this should be a showcase for the rejuvenated RAAF's new capabilities, including *Wedgetail*, the *Vigilare* command and control system, its new A330 tankers and twenty-four new F/A-18F *Super Hornets*.

In-service support

Defence has adopted a practice in recent years of making the prime contractor responsible for in-service support of the equipment they provide. Indeed, this is frequently a factor in tender evaluations, and is designed to identify whole-of-life costs, not just the up-front purchase price. Defence's Strategic Reform Program (SRP) also requires significant cost savings across the portfolio, and outsourcing support work to contractors is a good way of identifying and then managing the real costs of sustaining ADF capabilities.

Boeing's five-year, $800 million ISS Performance Based Logistics (PBL) contract to support the *Wedgetail* will see the company's team collocated with RAAF logisticians and engineers in the AEWC System Project Office (SPO) at Williamtown. Northrop Grumman will provide support for the MESA radar through its Canberra-based subsidiary CEA Technologies. The contract contains renewal options which will enable the company and the DMO to renegotiate its value for the next five-year period. Defence anticipates a reduction in costs during the second five-year contract period because the aircraft will be a mature capability with its teething difficulties behind it.

Boeing is an aerospace industry leader in PBL support, especially in the airline market; it says these types of contract make it possible to drive costs down continuously. The ISS contract will address many of the technical uncertainties inherent in operating a complex, all-new aircraft for the first time and help determine what the cost of ownership actually is for the *Wedgetail* aircraft. The company is exploiting its commercial airliner expertise: it claims a dispatch reliability of 99.6% for the baseline Boeing 737-700 aircraft, and the *Wedgetail* platform and propulsion maintenance processes will be based on those for civil B737s, employing a similar

inspection and maintenance regime. However, Defence anticipates an ongoing radar development program to explore additional improvements over its service life; it's not clear yet how this will be funded and contracted.

Conclusion

Australia took a brave step in ordering the all-new *Wedgetail* AEW&C capability, but it forms part of a carefully planned enhancement of the RAAF's combat capabilities. In itself the *Wedgetail* capability is unique and world-leading. Its full benefit, however, comes as part of a network of sensors, control centres, combat aircraft and warships.

The RAAF will get most of what it asked for this year, albeit four years late. There is still nothing else available on the market which delivers a comparable capability, and the ten-year development program is probably a more realistic measure of the technical difficulties inherent in such an ambitious task than the original six-year schedule.

But the service hasn't finished exploring the technical limits of what *Wedgetail* can do nor of what its wider networked combat force can achieve so there's undiscovered capability to come, a point made by the director of the *Wedgetail* project, AVM Chris Deeble in January 2010 when he signed the ISS contract with Boeing: 'I believe this will have far more utility than we conceived of, but we don't know what we don't know yet.'

Finally (3)—Upgrading the FFGs: was it worth it?

Tom Muir

The Oliver Hazard Perry or FFG-7 class warships were designed in the United States in the mid-1970s as general-purpose escort vessels, inexpensive enough to be bought in large quantities to replace World War II-era destroyers. They were being built about the time the RAN was paying off its Type 12 Destroyer Escorts (DEs) and the FFG was seen as an attractive replacement, particularly with its modest crew requirements. Fifty-five ships were built in the United States, fifty-one for the US Navy and four for the Royal Australian Navy (RAN).

The RAN acquired two ships from the first batch of FFGs to be built and two from the third batch. Several years later the government committed to build two more FFGs at Williamstown Naval Dockyard, then operated by the Navy. But when it appeared that this project would fail, Transfield Defence Systems purchased the dockyard and accepted a fixed price contract to complete the construction of the ships, which were delivered within the contracted time and at the budgeted cost.

The design of the FFG was straightforward and not particularly innovative. Propulsion was by a single LM 2500 gas turbine engine, driving a large single screw, which problematically protruded well below the keel. Bow-mounted harbour manoeuvring propulsors provided a 2-3 knot speed if the main engine failed. The aluminium alloy superstructure was prone to cracking under hull 'twisting' and a remedial boron/epoxy patch was developed by DSTO.

Sensors included a Raytheon SQS-56 open ocean, medium power, medium frequency hull-mounted sonar, a Raytheon SPS-49 2D L-band long-range surveillance radar, an X-band navigation radar, and a Raytheon SLQ-32(V)2 ESM. Weapons included MK46 torpedo tubes, an Italian Oto Melara 75 mm automatic rapid fire gun and the Raytheon SM-1 Standard medium range AAW missile. With the exception of the gun, all the sensors and weapons were already in service on other USN ships.

The fire control system and the tactical data system were essentially new. The fire control system was a Sperry Mk.92 derived from the system designed by the then Dutch HSA company. The tactical data system was a derivation of existing USN systems like the Junior Participating TDS provided jointly by Univac and Hughes, but scaled down to suit the ships' operational performance requirements. The FFGs also have the capability to carry and hangar two *Seahawk* Anti-Submarine Warfare (ASW) helicopters as part of the ships' sensor and weapons suite.

But the ships as acquired had salient weaknesses. These included:

- a propeller prone to damage by hitting bottom (as has happened) or being struck by submerged objects
- no torpedo attack protection other than noisemakers
- sonar performance not well-matched to operation in shallow, warm, waters around Australia
- no ECM (jamming) capability
- a short-range gun unsuitable for surface or shore target engagement and minimal capability against air attack
- the SM-1, which was already entering obsolescence when the ships were built and had poor capability against rapidly emerging sea-skimming or high diving missiles
- the fire control system, which operated at X-band, a frequency which is subject to high attenuation under heavy rain and cloud conditions, resulting in reduced performance, (it was accurately described as a fair weather system).

Despite those shortcomings, the ship was a marked improvement on the DEs and the RAN set about progressively improving its operational capability. Notable improvements that have been made over the years include upgrading the performance of the tactical data system using the expertise of the Navy's Combat Data System Centre in Canberra, the addition of Link 16, installation of the *Phalanx* Close In Weapon System, addition of the *Nulka* off- board RF EW decoy, improved communications and most recently the addition of an Electro-Optic Tracking System (EOTS).

Supportability of the RAN's FFG 7 *Adelaide* class was under consideration back in 1987 and, as a precursor to the upgrade, a Surface Combatant Force Study concluded that the class required a boost in capability. Industry first received details of the requirement in July 1994, through the release of an Invitation to Register interest (ITR) with responses sought the following month.

According to the ITR, the project sought capability and maintainability upgrades to the RAN's six FFG-7s to improve their effectiveness against regional threats to about

2010 and to ensure their supportability to the end of their life. The estimated cost of the project was $800 million (in 1994 dollars). The ITR outlined the FFG 7's roles as higher capability destroyers and the Navy's reliance on them for both helicopter operations and for operations in short warning conflicts. Capabilities of the upgraded platforms would include:

- electronic, optical and acoustic sensors for continuous detection, identification and tracking of air, surface and submarine contacts
- C^3I facilities for onboard data processing and control of sensors, weapons, communications and intelligence information
- the ability to win an engagement with, and survive damage from air, mines, surface and subsurface combat capabilities in regional inventories
- comprehensive self-defence capabilities to ensure a high probability of mission survival.

A two-stage approach

The project was to proceed in two stages, with Phase 1 covering Project Definition Studies (PDS) to define options for the next phase and the development of tender documentation for the work. Phase 2 was to cover detailed design, equipment acquisition and ship installation. Two or more contractors were to undertake the PDS and a preferred contractor to undertake the upgrade would be selected after evaluation of the study results and the submitted tenders.

In late December 1994, the Navy released a combined Request for Tender (RFT) for the definition studies together with a concurrent request for proposals (RFP) to meet the required Phase 2 capability. Closing date for responses was 10 April, with PDS contracts due to be signed in August 1995. Australian Submarine Corporation, Transfield, Australian Defence Industries and Rockwell Systems Australia each formed teams to bid for the project. As anticipated, Transfield Defence Systems and ADI Limited were selected to conduct the $13.5 million Phase 1 Project Definition Studies.

An RFT for the detailed design and installation of the upgrade on all six frigates closed in March 1998 and ADI was subsequently selected as preferred tenderer over competitor Tenix Defence Systems. Following protracted negotiations, a $900 million contract was signed with ADI (now Thales Australia Ltd) for the implementation of SEA 1390 Phase 2 in June 1999. Options to enhance the ships' electronic warfare capabilities, and improve training facilities, would push this to $944 million (in February 1998 dollars). There was an additional $322 million for work conducted outside the prime contract, bringing the project total to $1,266 million (February 1998 dollars).

ADI's successful tender included the upgrade of the existing FFG fire control system to a modern variant, the Australian Distributed Architecture Combat System (ADACS), and the installation of an Mk 41 VLS missile launch system. The Evolved *Sea Sparrow* Missile (ESSM) would be used as the short-range self-defence missile, while the *Phalanx* Close-in Weapon System (CIWS) would also be integrated with the fire control system.

The original plan was for a two-year design and engineering phase with the lead ship, HMAS *Sydney*, being delivered to the Navy in May 2003, and the other ships being delivered annually, with the sixth and final in December 2005. Instead, the design and engineering phase took four years, with HMAS *Sydney* then expected to be returned to the Navy between August and November 2005.

FFG fleet reduced from six ships to four

In November 2003 the government determined that the FFG fleet should be reduced from six to four ships, with the two oldest FFGs (HMAS *Canberra* and *Adelaide*) decommissioned, in November 2005 and January 2008 respectively, negating the need for the planned upgrade and life extension. A prime contract change in mid-2006 included the reduction from six to four ships and the settlement of prime contractor delay claims due to changes to the master schedule and changes to the upgraded FFGs provisional acceptance from the prime contractor by the DMO. The overall financial impact was a $54.4 million reduction in the prime contract price. (Or less than 5% of the contract price, despite a 33% reduction in the number of vessels to be upgraded.)

After upgrade implementation commenced in June 1999, cumulative expenditure reached $1,064 million in June 2007. Of that amount, $1,005 million was for the variable priced prime contract. The total remaining prime contract budget was $208.4 million at June 2007. On that basis 83% of the prime contract budget had been spent.

Contract difficulties

The contract was structured in such a way that the prime contractor had sole responsibility for the upgrade of each FFG from handover until offered for provisional acceptance by the DMO. But that arrangement inhibited the project authority's control and thus the ability to maintain sufficient technical involvement and understanding as to whether the FFGs were being upgraded in accordance with contract provisions and with the Navy's technical regulations.

The contract required a comprehensive inspection, test and trials program to be implemented and maintained by the contractor, the intention being that it would allow the project authority to assess contract compliance by reference to test results. Unfortunately, the contract did not deal with the situation where the project authority was not satisfied with the test procedures proposed by the contractor to produce an accurate assessment of compliance. The lack of alignment of the contract with the Navy regulations was one of the difficulties the project authority had regarding HMAS *Sydney's* Initial Operational Release. Another was that the prime contractor claimed that Initial Operational Release was not a concept in existence at the time the contract was signed!

In addition to these acceptance regime difficulties, the DMO was also required to manage the contractor's performance against the contracted schedule. The contractor took substantially longer than the original schedule, which was rebaselined in April 2004 and again in May 2006. Overall, the schedule rebaselinings deferred the delivery

of all FFGs to be upgraded, with the delivery of the last ship delayed by four and a half years.

Again, the contract did not adequately provide for the project authority to exercise control over the contractor's inability to meet the schedule. Other than via milestone payments, the only schedule control mechanisms available were claiming liquidated damages or terminating the contract. DMO's legal advice was that in the circumstances that prevailed since major delays became apparent, neither option was really feasible for the project authority.

HMAS *Sydney* was formally handed back to the Navy on in April 2006, following extensive harbour tests and sea trials, which had commenced in late 2004. It achieved contractual provisional acceptance in December 2006. However, there were known deficiencies with the underwater warfare systems, the electronics support system and the Australian Distributed Architecture Combat System (ADACS) software. Under contract provisions, work by the prime contractor was to continue to rectify the deficiencies before HMAS *Sydney's* acceptance, scheduled for late 2008. Initial Operational Release, previously anticipated in mid-2007 was deferred to 2008, to allow for the resolution of Navy's concerns.

While extending the life and reliability of the platform was not considered unusually difficult, the development and integration of the ships combat system was a major challenge. Schedule risk for this project had always been high due to the complex and extensive weapon, sensor, and command and control systems upgrades. Difficulties with the integration task contributed to the overall schedule delay. This was a troubling issue in view of the RAN's high intensity of operations in recent years.

The second FFG for the upgrade, HMAS *Melbourne*, entered the Captain Cook Graving Dock at Garden Island in mid-February 2006 and formally commenced the production and installation phase of the upgrade later that month. HMAS *Melbourne* achieved provisional acceptance in October 2007. HMAS *Darwin* commenced the docking phase of her upgrade in January 2007, which has now been completed. HMAS *Newcastle* entered the upgrade docking in November 2007 and has now achieved contractual provisional acceptance.

Four years behind schedule

By January 2008, the FFG Upgrade Project was running at least four years behind schedule and the frigates' anti-missile and anti-torpedo detection and defence systems could not be integrated as intended, leaving the ships vulnerable to attack. HMAS *Sydney* was initially not accepted back into service by the RAN because of these problems, which also prevented any refitted ship from serving in a combat zone.

By 2009, HMA ships *Sydney*, *Darwin* and *Melbourne*, and the land-based Warfare Systems Support Centre had been accepted from the contractor, with deficiencies that were to be addressed during 2009-10. The last ship to be upgraded, HMAS *Newcastle*, received provisional acceptance in June 2009 followed by contractual acceptance in September 2009, thus bringing the SEA 1390 FFG Upgrade program to an end.

In January 2010 Thales Australia announced that HMA ships *Sydney*, *Melbourne*, *Darwin* and *Newcastle*, had all been contractually accepted into service by the Navy, and that the project had been struck from the government's notorious 'Projects of Concern' list.

Comment

Apart from supportability improvements, the touted purpose of the upgrade was to improve the FFG fleet's effectiveness against regional threats. With the proliferation of extremely capable sub-launched and ship-launched anti-ship missiles such as the *Brahmos* within our region of interest, it is reasonable to wonder whether this has actually been achieved.

DMO response

It is extensively reported and understood that schedule delays to this program have resulted from the program complexity being underestimated from the outset. Similarly, the performance specifications were not formalised and agreed before contract signature and this impacted the delivery and agreement of the offered capability and development of the test program.

The prime contractor, Thales Australia (previously ADI Ltd), on the basis of sound technical objective quality evidence, has met its contractual obligations and delivered a system that meets the contracted requirement. This was within the original approved project budget, indexed for price and exchange throughout the project life.

The upgrade has resulted in supportability improvements and an improved capability that provides for a layered defence against regional threats. The introduction of the Evolved Seasparrow *missile now to be complemented by the introduction of the Standard Missile 2 (SM-2) as a replacement for the Standard Missile 1 (SM-1) will further enhance the overall effectiveness against regional threats. The sensor and combat system reaction times and performance of the surveillance and fire control and radars are a significant improvement.*

Navy is inducting the FFGs into a formal program of Naval Operational Test & Evaluation to fully characterise the performance of the ship systems in a variety of contemporary operational environments with further testing scheduled for third quarter 2010. This Operational Test & Evaluation program supports the tuning, configuration and operation of the systems in ships deploying into operational areas to ensure that they have the best available capability to meet the threats in those regions.

Project Budget

Cumulative expenditure of the project to 30 June 2009 was $1,297 million from an approved budget of $1,528 million (2009-2010 Additional Estimates). Forecast expenditure for 2009-10 has been reduced from $77 million to $56 million.

Let the contest begin—the future of Australian naval combat aviation

Gregor Ferguson

Two helicopter manufacturers are locked in a highly asymmetric contest to win a Navy helicopter contract worth an estimated $3.5 billion. On 28 April, 2010, the Minister for Defence, Senator Faulkner, announced the Request for Tender (RFT) for Project AIR 9000, Ph.8—Naval Combat Helicopter. This project will see the replacement of the RAN's sixteen aged S-70B Seahawks with at least twenty-four new helicopters from about 2014. The new aircraft will be essentially an off-the-shelf purchase to minimise cost and schedule risk; the federal government will choose the winning bidder in 2011.

Only two companies have been invited to respond: Australian Aerospace, the local subsidiary of European helicopter giant Eurocopter, and a team consisting of US helicopter manufacturer Sikorsky and systems integrator Lockheed Martin. They will be offering the NH90 NFH (for NATO Frigate Helicopter) and MH-60R *Seahawk*, respectively, to replace the S-70B *Seahawks* which entered service in the late 1980s.

The new helicopters will be embarked upon the Navy's existing FFG and *Anzac* class frigates and the new *Hobart* class Air Warfare Destroyers (AWD). The Navy's goal is to sustain eight single-helicopter ship's flights embarked at any one time, a figure based on the anticipated availability of its warships. History shows it takes two to three times as many aircraft to maintain that rate of effort, and the 2009 Defence White Paper explicitly calls for 'at least twenty-four' new Naval Combat Helicopters.

Last year a Defence spokesman acknowledged that, assuming the development process for the NFH proceeds as expected, both contenders could do the job the Navy wants—principally a mix of Anti-Submarine Warfare (ASW) and Anti-Surface Warfare (ASuW), along with search and rescue (SAR) and utility transport and liaison duties, including delivering and recovering boarding parties in the Gulf and elsewhere.

The two contenders are twin engined helicopters in the 8-10 tonne class and for ASW duties both are equipped with a dipping sonar, sonobuoy dispensers, a state of the art sonar processing system, and lightweight anti-submarine torpedoes. For ASuW duties they are both equipped with radars to detect surface craft (including small boats and submarine periscopes) and provide target data for ship-launched anti-ship missiles, Infra-Red (IR) and electro-optic sensors, and air-surface missiles.

They also carry sophisticated Electronic Warfare (EW) suites including an EW Self-Protection system to protect against IR guided missiles and an Electronic Support Measures (ESM) system. The ESM system is a vital part of any modern naval helicopter: it detects and identifies ship, aircraft and missile radars and other electronic emissions at ranges well beyond those of the helicopters' own radars, and can stealthily build up a picture of activity across a wide area without betraying the presence of the helicopter itself.

So how will Defence choose between them? Senator Faulkner said 'any decision Government makes in 2011 will take into account all relevant considerations including capability, cost, interoperability with other ADF capabilities, Australian industry opportunities, risk and value for money'. His deputy, the Minister for Defence Materiel and Science, Mr Greg Combet, added, 'a competitive process … will allow the companies to offer innovative solutions that satisfy the capability, cost and schedule requirements and detail what opportunities they will offer local industry'.

The asymmetry in this contest, and the resulting difficulty for Defence, is that while both aircraft are capable of doing the basic job the RAN wants, they differ markedly and offer very different benefits to the RAN and to Australia more broadly. And the historical baggage associated with naval aviation over the past 20 years has a powerful shaping effect. In particular, the disastrous *Super Seasprite* project, which was intended to acquire eleven ASuW helicopters to equip the *Anzac* frigates but instead wasted around $1.4-billion of taxpayers' money, has left the Navy and the DMO extremely risk-averse.

As a result, there are actually two right answers to this conundrum, but choosing which one is correct for Australia depends on the observer's point of view. The final decision won't be made until 2011, well after the 2010 federal election, so none of the stakeholders (including the federal cabinet) stand to gain significantly from politicising aspects of the contest.

Sikorsky MH-60R *Seahawk*

The MH-60R, or '*Romeo'*, is the latest model in Sikorsky's veteran SH-60 *Seahawk* family and is now in frontline service with the US Navy. Counter-intuitively, Lockheed Martin is Sikorsky's joint prime contractor for the Romeo program, reflecting the fact that its combat effect is delivered by the onboard mission system, sensors and weapons which Lockheed Martin installs and integrates.

The US Navy plans to acquire 298 *Romeos* to carry out ASW and ASuW duties embarked on aircraft carriers, destroyers, cruisers and frigates. Sikorsky builds the aircraft and Lockheed Martin installs the mission system. The first four *Romeos* to enter squadron service were delivered in December 2005 and the partners are expecting to build 24-31 aircraft a year through to 2019.

The *Romeo* is expected to remain in US Navy service to as late as 2040. Furthermore, the RAN would be able to take advantage of the US Navy's Pre-Planed Product Improvements (P3I) program—phased upgrades to the Romeo's communications, navigation and weapons systems which will be introduced throughout its service life. The US Navy's *Romeos* are designed for Network Centric Warfare (NCW) and are equipped with the US Tactical Common Data Link (TCDL) which incorporates the vital Link 16 communications mode. They also carry Mk46 or new-generation Mk54 lightweight anti-submarine torpedoes and up to eight *Hellfire* 2 laser-guided air-surface missiles; these tank-busting missiles also arm the ADF's *Tiger* Armed Reconnaissance Helicopter. However, the *Hellfire* isn't a genuine anti-ship weapon—its small warhead (9kg) and short range (just 8 km) means the *Romeo* couldn't attack a modern warship without coming within range of the target's own defences.

The *Hellfire* works in the context of USN operations, because the helicopters can engage small targets (such as Iranian gunboats) while strike aircraft such as the *Super Hornet* flying from carriers can engage larger targets. However, at least one other potential customer has asked Lockheed Martin to consider fitting a longer-range missile to the *Romeo*.

The first *Romeo* squadron has already completed one sea-going tour of duty aboard the carrier USS *John C Stennis* and has proven it is a mature, effective and reliable aircraft.

NH90 NFH

The NH90 NFH, manufactured by the European NATO Helicopter Industries consortium, has been ordered by four European launch customers; deliveries to the Netherlands and France have begun but isn't yet fully operational. It is the maritime variant of the NH90, of which the ADF has already ordered forty-six (designated MRH90 in ADF service) to replace the Army's S-70A *Black Hawks* and the Navy's *Sea King* Mk50s.

In all, fourteen customers around the world have ordered 529 NH90s, of which 111 will be the NFH naval variant ordered by the Netherlands, France, Italy, Norway and Belgium. The version offered to Australia will be based on the French Navy configuration which includes a European radar and sonar suite, the Eurotorp MU90 lightweight torpedo (which already arms RAN frigates), and the Italian Marte Mk2 anti-ship missile which has a 70 kg warhead and a range of more than 30 km.

Early production models have been delivered to the Dutch and French navies under a two-step process. In Step 1, the helicopters are fully equipped with sonars, radars and EW equipment, and all their functions are available to enable operational ASW and ASuW training. The aircraft can also carry out less-demanding operational missions such as SAR, casualty evacuation and utility transport. Step 2, in mid-2011, will see the completion of mission system software certification and the integration and qualification of all the NFH weapons. The transition to Step 2 is primarily a paperwork activity for the full certification of the weapon systems, according to Eurocopter, along with some minor software improvements.

Difficult choice

The differences between the aircraft reflect their histories and the way their parent navies use them. The basic *Seahawk* design derives from the Army's *Black Hawk* and dates back to the 1970s; an all-metal aircraft, the first *Seahawk* entered US Navy service in 1984, replacing the elderly SH-2 *Seasprite*. The *Romeo*, which may be the last of the *Seahawk* line, has an extensively re-designed structure, an all-new digital cockpit and state of the art mission system. It is deployed alongside its 'sister' MH-60S '*Sierra*' utility aircraft aboard carriers and other ships within the battlegroup.

In the US Navy, many of the combat and utility tasks which RAN helicopters would be required to carry out are performed by a mix of aircraft. For example, *Hornets* and *Super Hornets* carry out maritime strike missions, while the MH-60S carries out

utility, special operations and SAR tasks. This aircraft carries no sonar so has a relatively large, uncluttered cabin for maximum flexibility.

The NH90 NFH is a more modern design, developed during the 1990s. It uses the same carbon fibre composite airframe as the NH90 Tactical Transport Helicopter (TTH) and therefore has a much larger cabin than the *Romeo*, which bestows more versatility. Both contenders' cabins are dominated by the winch for the dipping sonar; the NH90 NFH's larger cabin (60% greater floor area with two sliding doors instead of one) means it also contains seven seats and extra stowage space for weapons and equipment. The *Romeo's* much smaller cabin seats only two or three passengers at most unless the sonar equipment is removed.

The NH90 family's lightweight carbon fibre construction resists metal fatigue and corrosion, so could require significantly less maintenance and repair as it ages. The NH90 NFH and TTH variants use the same engines, fight control system and core avionics and have almost identical airframes—the TTH has a rear cargo ramp which the NFH doesn't need. This similarity in turn creates logistics, engineering and training synergies between the two types.

Asymmetry

And this is where the asymmetries in the contest emerge. Much of the battle between the two aircraft will be fought in the detail of the tender document: purchase price, operating costs, performance and capability. But there are three areas of asymmetry which could also have a decisive effect on the outcome.

The scene for the first was set by the *Super Seasprite* project which drained both the RAN's and DMO's resources (and morale) and caused severe pain to the Navy's aviation arm. For this reason, there is a strong case for decisive action to replace the ageing *Seahawks* and restore the RAN's aviation capability. Until early 2010 there was a powerful lobby within the Navy and Defence to dispense entirely with a competition and acquire the *Romeo* through the US Navy under a US Foreign Military Sales (FMS) agreement.

The argument in favour of the *Romeo* is very strong: it is a modern and mature aircraft, proven in frontline service with Australia's closest ally; thanks to our close relationship with the US we should receive almost the full *Romeo* mission system capability, and not the 'export lite' version; the helicopter will be instantly interoperable with US Navy ships and aircraft and supportable by the US Navy; the RAN's history of operating the *Seahawk* means that introducing it into service will be relatively simple; the *Romeo* is in full production and can therefore be delivered quickly (less than 30 months, according to the manufacturers); and its purchase price and operating costs are fully understood.
Most observers accept the *Romeo* is cheaper to buy than the NH90 NFH and its operating costs are a matter of record, whereas the European helicopter hasn't yet established an operating record in the sea-going role. In short, the *Romeo* is an affordable, low-risk antidote to the damage caused by the *Super Seasprite* fiasco.

The second asymmetry is this: the NH90 NFH supports the strategic intent of Project AIR 9000. This was established at the height of the *Super Seasprite* debacle to

rationalise the ADF's unwieldy helicopter fleet from nine different types down to just four: the *Tiger* ARH (replacing the *Iroquois* Bushranger gunship and *Kiowa* reconnaissance helicopter), a Multi-Role Helicopter (to replace the *Black Hawk*, *Sea King*, *Iroquois*, *Seahawk* and *Super Seasprite*), the *Chinook* heavy lifter, and a new training aircraft to replace the *Kiowa* and *Squirrel*. Buying the *Romeo* would add a fifth helicopter type to this list and additional overhead costs to the Defence budget. (If that is not true then there are serious questions to ask about the business case that saw the *Black Hawks* retired prematurely to make way for the MRH-90.)

The NH90 NFH represents a higher short-term risk than the *Romeo*, but offers a potentially higher long-term reward. While it won't be fully operational with the French and Netherlands navies until after the RFT closes, there's no reason to doubt it will be mature by the time the *Hobart* class AWD enters service in 2014. It is a modern aircraft designed to need less maintenance, especially as it grows older. It is at the start of its production life, so has considerable room for capability and performance growth, and it will be supported by a major European parent navy throughout its life. It is already integrated with the RAN's MU90 lightweight torpedo and could also be modified from the French version to carry the same communications suite as the Army's *Tiger* ARH and MRH90. The NFH would need to be modified with Link 16 and a 'probe' to be compatible with the deck securing system on Australian and US ships.

Diversity brings additional overhead costs in logistics, maintenance and training. Buying up to twenty-four NH90 NFHs would reduce the number of different basic helicopter types in service and generate economies of scale from a seventy-strong Australian fleet of NH90 aircraft sharing common engines, gearboxes, rotor blades, core avionics, and largely identical airframes. The potential for savings in aircrew and ground crew training, as well as logistics and supply chain efficiencies, is potentially significant but requires rigorous examination and, preferably, in-service data for confirmation.

But most analysts agree the *Romeo* is cheaper to buy. And Lockheed Martin and Sikorsky can provide hard data on operating costs from the US Navy. Furthermore, if, as Defence says, both aircraft can do the job, why would it pay extra for what may be redundant capability? In the current budget climate, with Defence pursuing significant savings as part of its Strategic Reform Program (SRP), this may be an important difference.

The NH90 NFH is just entering service; although it's supposed to need less maintenance, hard data on operating and sustainment costs hasn't accrued as yet. If Lockheed Martin and Sikorsky can show a significant difference in operating costs between the *Romeo* and NH90 NFH this may offset any savings the ADF could capture from rationalising its helicopter fleet. That said, before the RFT was released, Eurocopter's assessment of the RAN's needs was that it would take far less than twenty-four aircraft to maintain eight flights embarked on RAN frigates while still having aircraft available for training and deep maintenance—possibly as few as eighteen, depending on the exact requirements set out in the RFT. In any case, if Defence orders the NFH, this should (again—that needs to be tested) reduce some of the overhead costs associated with its MRH90s, making these cheaper in turn.

The final asymmetry is the contracting method: the *Romeo* would be supplied by the US Navy under FMS arrangements while the NH90 NFH would be supplied under a commercial deal. The FMS system doesn't enable the customer to penalise the supplier—in this case the US Navy—for late delivery or non-compliance, and the manufacturer faces little commercial risk. A commercial contract with Australian Aerospace would place significant obligations and liabilities on the manufacturer and far tighter contractual terms; these differences might colour the tender responses quite significantly. That said, Australia's experience with FMS in recent years has been very positive—the C-17 *Globemaster*, M1A1 Abrams tank and *Super Hornet* acquisitions have been rare examples of below-budget and/or ahead of schedule projects.

Both contenders have taken Australian industry involvement seriously. Australian Aerospace has invested significantly in its Brisbane Airport factory, which is already assembling the Army's *Tiger* ARH and MRH90 helicopters. The NH90 NFH would also be assembled there, resulting in 750 new jobs, the company says. An Access Economics study commissioned by Australian Aerospace reportedly shows the *Tiger* and MRH90 projects should be worth some $4.8 billion to the Australia economy, with the NH90 NFH adding a further $661 million to Australia's GDP between 2011 and 2024 alone.

Sikorsky and Lockheed Martin are coming from behind on this point. They are offering local industry involvement and substantial global supply chain opportunities to local suppliers and propose 're-manufacturing' and modernising the ADF's old *Black Hawks* and *Seahawks* so they can be sold to potential customers elsewhere.

At the end of the day it all depends on the detail of the tender responses. The *Romeo's* capability and costs are well-known and its risks are clearly identifiable. The NH90 NFH is a less well-defined quantity. If it is more expensive for acquisition than the *Romeo* then Australian Aerospace must demonstrate convincingly that it offers superior value for money: better capability, better long-term growth potential, lower through-life costs and genuine long-term savings in logistics and training through commonality with the MRH90.

This goes to the very intent of Project AIR 9000. There are real cost penalties associated with operating a diverse helicopter fleet. It will be the tender responses which show whether these offset sufficiently any differences in purchase or operating costs.

Fire supremacy: Land 17's distant target

Tom Muir

Through replacement of the Army's ageing 105mm and 155mm towed artillery pieces with highly mobile indirect fire systems capable of firing a range of advanced munitions, the Land 17 Artillery Replacement Project will have a major impact on the Australian Army's indirect fire support capability and thus its fighting power. According to Land 17 operational concepts, the mission for the indirect fire system is to establish such fire supremacy so that adversaries can neither interfere with friendly operations nor effectively develop their own.

Indirect fire support roles

The description of the Land 17 indirect fire system and its role is impressive: it is required to suppress, neutralise and destroy threat targets in support of the land forces on the complex modern battlefield, including tactical engagements that occur in close proximity to ground forces with little warning. In these cases, the generation of fire supremacy will need to be responsive, accurate and scalable. Essential in these engagements is the coordination and delivery of joint and coalition lethal and non-lethal effects against targets that are of immediate concern, and in close proximity, to ground forces. This type of fire is usually protective in nature and includes Naval Surface Fire Support (NSFS) and Offensive Air Patrol (OAS) coordinated via the L17 Battle Management System-Fires (BMS-F).

The offensive support system supporting the close battle must possess similar mobility and protection as the supported force, and have sufficient range coverage to obviate the need for redeployment to support ground forces. At peak tempo, destructive fires must not only destroy hardened targets, but with minimal adverse effects on non-targets and supported forces. Munitions must provide the necessary lethality, as well as the capability to deliver controlled, lethal effects specifically where needed. Destructive fires will need to be accurate, responsive, and primarily with an autonomous capability (fire & forget) or terminally guided for additional flexibility and accuracy (semi-active laser).

In shaping the battlespace, the L17 system must be able to destroy point targets such as tactical unmanned aerial vehicle ground stations, air defence systems and headquarters, and area targets such as massed forces, individual armoured vehicles and hostile indirect fire units. This task requires the coordination and delivery of precise and discriminate joint and coalition lethal and non-lethal effects that can be generated beyond the immediate battle.

In summary, the aim of Land 17 is to deliver a networked, enhanced and sustainable digitised field artillery system that can coordinate indirect and joint fires, and deliver indirect fire. Enhancements required include the introduction of networked command and control systems to support the ADF network centric warfare roadmap.
Defence points out that operations in Iraq and Afghanistan have highlighted the versatility and dependability of indirect fire and claims that it ensures coalition forces can defeat conventional and unconventional threats. The success of the indirect fire system in these operations is said to be directly attributable to the range of new-generation munitions, networked command and control technology and the increased autonomy and enhanced mobility of platforms within the system. (Given all that, it might seem surprising that the Australian Army hasn't deployed an indirect fire weapon on operations since the early 1970s.)

Distilling the requirements

It was in the context of this hard hitting, combat ready future force that Defence distilled the requirements for Land 17 through a series of function and performance specifications that seemingly grew with every iteration. Finally, in 2004, with a draft

Functional Performance Specification (FPS) on the streets, an industry capability summary prepared and three industry workshops concluded, industry had been pretty effectively engaged in the development of Land 17. And, although first pass approval had yet to be secured, both industry and the project office appear to have been generally buoyed about the project's prospects. However there were some niggles.

Defence's well-meant early engagement with industry included a number of workshops for potential Land 17 contenders and others. But in many respects these left industry none the wiser about the detail of the requirement. The one certainty about Land 17 was the 155mm calibre. An earlier market survey had indicated a requirement for a number of howitzers for light forces, mechanised/medium-weight forces, light armoured/motorised forces and upgraded systems for the Reserves. As a result it was generally assumed that both calibres (105mm and 155mm) would be required to suit light and mechanised forces respectively. This however was not the case—the Army indicated that it was interested only in the 155mm howitzer.

Beyond that there was a general (but unconfirmed) assumption that both towed (and CH-47 *Chinook* underslung) and self-propelled (SP) howitzers would be required. Depending on the source, it was said that wheeled SP systems were in, and tracked SP systems out of contention, or vice versa. But as these assumptions were little more than wishful thinking on the part of those offering wheeled or tracked systems, there was little industry could do to develop their proposals and teaming arrangements, until firm material requirements were defined and approved.

But these were a long time coming. It was hoped that first pass approval could be secured by mid-2005, and thus the establishment of a full project office, when work could start on finessing the capability options, further developing the FPS and firming up the acquisition strategy and its business case, in preparation for second pass approval. Industry felt that project staff would gain more knowledge of available systems through visits to suppliers. But it wasn't until February 2006 that the government gave first pass approval for the replacement of the ADF's 105mm and 155mm artillery pieces with new, more capable artillery systems that feature improved mobility, protection, range and accuracy. The announcement noted that Defence had been working closely with industry and that the Department planned to release an open Request for Tender (RTF) later that year, to identify companies that could provide artillery systems with the level of capability sought.

The statement added that the new system would be brought into service over the period 2011-2013 at a total cost of between $450 million and $600 million. However it wasn't until September 2007 that Defence released solicitation documents for the Land 17 Artillery Replacement Project. They comprised an RFT for the provision of 155mm Self-Propelled Howitzers (SPH) and invitations to register interest (ITRs) for the supply of Lightweight 155mm Towed Howitzers (LW155), Advanced Field Artillery Tactical Data System (AFATDS) Joint Fires C2 systems, and Forward Observer systems.

Self-Propelled Howitzers

The RFT for the 155mm SPH included separate contracts for the acquisition and support of the SPH capability, to meet the following requirements:

- supply of eighteen, twenty-four or thirty SPH systems to achieve an in-service date of June 2011, with an option for the Commonwealth to purchase up to six additional systems within five years following final acceptance under the acquisition contract, and
- provision of an initial seven years support of the SPH capability with options for additional periods of support for the life of the equipment.

Only tenders that addressed both the acquisition and support requirements specified in the RFT would be considered.

In light of contemporary combat experience, the requirements for the SPH now specified levels of protection for personnel beyond those of earlier FPS iterations, leading to some immediate fallout. Tenix Defence, which had teamed with Bofors, decided not offer the wheeled FH-77 BW *Archer*, as the company did not believe it could achieve the Commonwealth's preferred solution against the stated requirements. And Rheinmetall, which was to have primed an upgraded version of the other wheeled SPH, the *Denel* G6, advised Defence that it had decided not to participate in the tender.

Competition for the SPH component of Land 17 then became a run-off between two tracked heavyweights, the Samsung Techwin AS-9, and the Krauss Maffei Wegmann (KMW) PzH 2000. The former had teamed with Raytheon Australia and the latter with BAE Systems Australia.

Lightweight 155mm towed howitzer

The aim of this ITR was to determine the marketplace for a lightweight 155mm towed howitzer (LW155), tactically deployable by air and land to support ADF forces. Industry's interest was sought in the provision of the LW155 capability, comprising a minimum of eighteen (and up to thirty-five) lightweight howitzers, with exact quantities to be determined in the subsequent RFT. An essential requirement was that the complete platform must weigh less than 5040 kg, effectively eliminating the STK *Pegasus*, leaving the BAE Systems M777A2 as the only contender.

In an obvious, if unspoken, reference to the availability of the BAE Systems M777, in service with the US Army, the USMC and Canadian Forces, the ITR made clear the Commonwealth's preference for a non-developmental item with some development only expected for external interfaces with nominated government-provided elements. Defence therefore had to decide whether to acquire this system through a commercial arrangement with BAE Systems or through a Foreign Military Sales case, with the last seen as the preferred course as it offered the opportunity for early delivery of systems.

AFATDS Joint Fires C2 system

The purpose of this ITR was to determine the marketplace for the supply of the latest Windows XP version of the AFATDS, together with the technical resources for its integration into the Land 17 LW155 and SPH platforms and the broader ADF network centric warfare architecture. The requirement also includes software development

services for Australian customisation and training, and through-life support arrangements.

AFATDS is an integrated fire support command and control (C^2) system that processes fire missions and other related information to coordinate and optimise the use of all fire support assets, including mortars, field artillery, anti-air missiles, attack helicopters, air support and naval gunfire. While respondents were asked to provide details as to how they would provide AFATDS and support it throughout its life of type, it was evident that Raytheon Australia was the only credible supplier. Indeed, the previous year the company had arranged demonstrations of the system in Australia. These showed the effectiveness of AFATDS in the coordination of joint fires and led to the adoption of AFATDS as the preferred BMS-F C2 system.

BMS-Fires Forward Observer

The purpose of this ITR was to determine the marketplace for the supply of BMS-F Forward Observer (FO) hardware and software as well as the provision of technical services (managed by the Commonwealth) for the integration with AFATDS and the SPH and LW155 platform fire control systems. Up to 107 FO systems were to be acquired, inclusive of all software and hardware.

An FMS case for the LWT

On 17 July 2008 the US Defense Security Cooperation Agency notified Congress that Australia had requested a possible sale of fifty-seven M777A2 155mm lightweight howitzers, fifty-seven SINCGARS radio systems, integration, spare and repair parts, support and test equipment, publications and technical documentation, together with the impedimenta that goes with such a purchase. The estimated cost was US$248 million. The ITR for LW155 sought a minimum of eighteen LW155 up to a maximum of 35. The exact quantity of systems to be acquired was to be confirmed in a subsequent RFT. But, in the absence of any other than the M777A2 as a candidate for the L17 LW155 requirement, there was no point in issuing an RFT (since an FMS case was already in train), or seeking a commercial deal with M777 manufacturer BAE Systems.

Many observers were surprised at the number of LWT systems sought under the FMS case. Was this a hedge in case the costly SP capability fell over in the White Paper? SP artillery will undoubtedly be more expensive to acquire and to maintain over their thirty-odd year life of type. And sustainment is a major focus for budget savings by the Defence Materiel Organisation (DMO). In October 2008 the DMO's Land Systems Division in Melbourne released notification of an FMS case for M777A2 towed howitzers and support in the sum of $US134.3 million with deliveries to be completed by 30 June 2014.

And it wasn't until 20 October 2009 that second pass approval was granted for the A$493 million project to provide the next generation artillery system for the Australian Army. This phase (1A) will deliver thirty-five M777A2 lightweight 155mm towed howitzers. The AFATDS has been selected as the BMS-F (C2) system and procured through FMS arrangements with the US Government. Initial deliveries of the software, for acceptance testing, is planned to occur from January

2011. The XM1156 Precision Guidance Kit has been selected and will be procured through an FMS case planned for mid-2010. The FMS case for procurement is planned for mid-2010, with initial deliveries for testing planned for mid-2011. Phase 1A has an ISD of mid-2011, with FOC scheduled for achievement in 2013.

Whither (or whether) the Phase 1B SPH component?

There appears to be considerable uncertainty as to how the evaluation of the two SPH systems is proceeding. We do know that, rather than announcing a preferred bidder after what would seem to be a fairly exhaustive and long-winded evaluation phase since tenders closed in April 2008, Defence arranged a further offer definition and refinement process (ODRP). While Raytheon (offering the AS-9) complied, KMW in consultation with BAE Systems declined to participate in the process, disagreeing with the terms and conditions of the ODRP. Nevertheless their tender was not withdrawn and as far as KMW was concerned it stood.

Rumour has it that the Army has a preference for the PzH2000 due in part to its combat history as well as limited ADF experience with the system used by their Dutch coalition partners in Afghanistan. An earlier offer by the Netherlands Government for Australia to take over 18 PzH 2000s, still to be manufactured but surplus to their requirements and at an advantageous price, was declined due to the absence of accurate in-service support costs.

Now there are dark rumours that the SPH requirement will not be considered in the latter half of 2010—when tender validity in both cases will have run out—and that the requirement will be shelved until 2012 when it will again come up for consideration. By then the government may well have second thoughts about the need for heavily-armoured, tracked, self-propelled heavy artillery, and how relevant such systems might be in the context of contemporary warfighting experience and credible future ADF deployments. (It may also note the apparent lack of urgency in deploying systems over the last forty years.) In which case, it might invoke the balance of the M777A2 lightweight towed gun systems approved by Congress in mid-2008 for sale to Australia as the solution to the ADF's requirement for 155mm gun systems able to fire the most advanced ammunition types, and fully networked with the AFATDS C^2 system. Of course, their gun tractors would need to provide superior levels of protection for their crews.

Land 17 Phase 1A Project Budget

Of approved project expenditure of $329 million cumulative expenditure to June 2010 is estimated at $7 million and forecast expenditure for 2010-11 is $76 million.

How many DCPs does it take to buy a truck?—Land 121: Replacing the ADF's 7,000 military vehicles

Tom Muir

As befits a project that aimed to replace the ADF's general service vehicle fleet, comprising some 7,000 vehicles and 4,000 trailers, at the then touted cost of some $1.5 billion, there was considerable industry interest when Defence released details of the requirements through an Invitation to Register interest (ITR) in August 2003. The

expectation at the time was that a shortlist of preferred respondents would receive the Request for Tender (RFT) by mid-2004. In fact the first tender documents for three categories of vehicles under Phase 3A were not released until the end of December 2005! In many ways this shouldn't have been surprising. Project Land 121—'Overlander'—had been around in various conceptual forms since the first half of the 1990s.

The ITR process was introduced to provide industry with the opportunity to influence and guide the development of Land 121. This was expected to encourage various options for the provision of the field vehicle and trailer (FVT) capability other than through the conventional batch acquisition model detailed in the ITR. Similarly, advice was sought from industry on strategies for the ongoing provision and long-term support of the fleet, including the commercial realities of pursuing a rolling acquisition model.

According to a 1999 Australian National Audit Office (ANAO) report, a major difficulty with the procurement process for general service (GS) vehicles in the past was that a complete fleet of each category of vehicle had been purchased as part of the one contract, with deliveries occurring over a four to five-year period. The report found that, as a general rule, GS vehicles had an estimated life of fifteen years but that in the case of the extant fleet it was considered possible that the life would be extended to as much as thirty years. As a result of changes in tasks and functions during such a lengthy period and the introduction of new equipment requiring vehicle support, it was considered highly likely that the initial basis of provisioning might no longer be suitable.

Experience had shown that purchase of additional vehicles incurred a significant cost premium, due in part to the extra costs of small production runs and the difficulty of obtaining components as fleets age. Thus the report suggested there might be quite different cost-benefit outcomes for Defence in either staging the procurement of vehicles over a longer period or adopting a more frequent turnover of the fleets.

The eventual replacement of the ADF's fleet of GS vehicles had been under active consideration since the first half of the 1990s, spawning multifarious operational concept and terrain studies. But Land 121's first phase was initiated with a Project Definition Study (PDS), which set out to develop a comprehensive plan for later phases of the project. And it wasn't until the FY99/00 Budget that Phase 2A was approved, aimed at enhancing the capabilities for heavy recovery and bulk liquid transport and to address Mack cabin noise and personnel/cargo restraint and segregation systems. Phase expenditure of $94 million had been approved. By June 2009, cumulative expenditure on this phase had reached $63 million.

Phase 2A was but a necessary preliminary to Overlander's major acquisition phase, which aimed to ultimately replace the ADF's extant militarised fleets of light and lightweight *Perentie* Land Rovers, *Unimog* 4 tonne trucks, Mack 8 tonne trucks, International S Liner prime-movers and GS trailers. Fleet vehicle numbers comprise approximately 1,100 (heavy), 2,150 (medium), 3,950 (light) and 3,200 trailers.

Although the extant fleet was purchased progressively between 1959 and 1994, the initial expectation was that the entire FVT fleet would be replaced as a single project

delivering a materiel solution based on a common family of vehicles. The intention was to reduce whole-of-life cost, rationalise vehicle types and numbers, incorporate new road safety and legislative design features and bring together new ideas from industry. Fuel consumption would be an important consideration.

According to the ITR, Defence sought a solution with the following preferences:

- all vehicles to come from the one manufacturer, or
- the prime contractor would supply a portion of the fleet and sub-contract to acquire the remainder from another supplier, or
- a consortium to be established from a variety of manufacturers.

The policy was for procurement from Australia of the trailers and modules/shelters, if commercially competitive, and to utilise Australian industry to provide through-life support to the maximum extent possible.

Defence's plan was to use the prime contractor to manage both the production and through-life support of the capabilities chosen. Industry was also being asked to offer alternative financing and replacement options, which could also include a strategy to continuously update the fleet in a rolling program. Under the initial strategy, the replacement fleet would be phased with the high-readiness Townsville based elements of 3rd Brigade along with the RAAF's 382 Expeditionary Combat Support Squadron and 2 Air Field Defence Squadron located at Amberley, being the first to be supplied under Land 121 Phase 2.

Phase confusion

The following phase, Phase 3, which had yet to be approved, was aimed at replacing the remainder of the fleet. At a cost exceeding $1.5 billion, it was expected to stretch over approximately ten years. Here the complications began. Initially, this phase comprised two sub-phases, 3A and 3B, which split this very large acquisition into two separate tranches, each requiring second pass approval from government. Phase 3A sought to replace some 700 vehicles and a slightly lesser number of trailers, with the expectation that the prime contractor for this phase would then receive follow-on orders for the rest of the FVT fleet under Phase 3B.

The implied break of about five years or so between completion of the first tranche of vehicles and the need to ramp-up production for the replacement of the rest of the fleet, as originally planned, was changed and replaced with what appeared to be a rolling acquisition model, with in-service dates for Phase 3A of 2008-2010 and 2011-2013 for the subsequent phase. As the 1999 ANAO report indicated, the earlier arrangement would have proved unacceptable cost-wise.

Phase 3A, which received first pass approval in mid-2004, was planned to commence the replacement of the FVT fleet in high-readiness units with some 1,300 or so vehicles which were to be delivered in-service between 2009 and 2011. The number of vehicles and trailers to be acquired under this phase depended on the government-endorsed capability option and overall project affordability. It was the ADF's intention that the vehicles operate for a minimum of fifteen years and an additional fifteen years was desirable.

Phase 3B was to follow on from Phase 3A, and was aimed at completing the replacement of the ADF's FVT requirements with between 4,000 to 7,000 vehicles during 2012 and 2015. There was an overall cost cap of approximately $3 billion on both sub-phases. Since the intent was that the two sub-phases would be linked, in pricing the initial requirement, tenderers agreed the same pricing mechanisms and controls would apply to the follow-on requirement. The emphasis was that whole-of-life costs across the entire Phase 3 requirement would drive the outcome of Phase 3A selection.

RFTs released for three vehicle categories

Separate RFTs for Phase 3A were released on 13 December 2005, closing mid-June 2006, for the following three categories of vehicles. They were:

Medium/Heavy MOTS vehicles and support—a restricted tender for the acquisition of medium-weight (five tonne) vehicles and modules; medium (10 tonne) vehicles including recovery and semi-trailer vehicles and modules; heavy (16.5 tonne) vehicles including recovery and semi-trailer vehicles and modules; and truck tractor (35 tonne) vehicles. It was intended that all vehicles in the medium/heavy section would be able to be fitted with crew protection against projectiles, land mines and explosive devices. This tender was released to a shortlist of nine companies announced in March 2005.

Lightweight/Light MOTS vehicles and support—an open tender for the acquisition of lightweight (1 tonne) vehicles and light (2 tonne) vehicles and their various task modules.

Trailers—an open tender for trailers (cargo) and their through-life support comprising lightweight trailers (750 kg), light trailers (1,250 kg), medium-weight trailers, heavy trailers and semi-trailers. The RFT for the trailer segment was restricted to Australian-based manufacturers, plus those vehicle suppliers capable of supplying a proprietary trailer. The RFT is tailored to 'encourage the production of trailers in Australia'.

The delivered equipment would need to maintain or enhance current capability through improved availability, mobility and better personnel protection. The last of those requirements necessitated a significant proportion of the acquired fleet to be fitted for (but not with) Survivability Enhancement Kits (SEKs) to protect their crews. Other improvements over extant capabilities sought through these requirements included the provision of communications and tracking systems and higher payloads and systems throughput. Integrated load handling systems for the 10 tonne and 16.5 tonne vehicles were introduced as a new capability.

By late November 2006 the initial evaluation of tenders was completed, a draft source evaluation report was prepared and the recommendations of the Options and Tender Evaluation Board (OTEB) were completed by March 2007. The second pass business case was then developed for submission to government, recommending a shortlist of two contenders in each vehicle category. Second pass approval was received in August 2007, when the government decided that funding approval should be for the whole of the Phase 3 capability. It also agreed to single preferred tenderers in each segment as there was a clear value-for-money selection.

The preferred tenderers

In October 2007 the government announced that the following were selected as preferred tenderers (subject to successful contract negotiations):

- Mercedes Benz Australia/Pacific for Light & Lightweight vehicles (G-Wagon),
- BAE Systems Australia for Medium Weight through Heavy vehicles (based on the US in-service FMTV trucks and Scania truck-tractors), and
- Haulmark Trailers (Australia) for trailers.

This phase included the acquisition of some 1,200 unprotected Mercedes G-Wagon light vehicles, with modules and trailers, to replace around one third of the current Land Rovers to enable tactical training. It also included around 2,300 medium and heavy trucks, at least 1,300 of which were to be protected to enable operational deployment, in total replacing around two thirds of the medium and heavy vehicle fleet. Subject to negotiations that were expected to be completed by the end of February 2008, BAE Systems would supply about 2,400 medium and heavy trucks. Mercedes Benz Australia/Pacific would furnish approximately 1,100 lightweight and light vehicles, while Haulmark Trailers would supply about 3,000 trailers in nine different variants.

Both BAE Systems and Mercedes Benz were to sign fifteen-year support contracts, with each having an option of a further fifteen years. All three companies were to enter into long-term strategic agreements with the DMO to ensure their respective fleets were operated at maximum efficiency. The total cost of Phase 3 was estimated at $3.1 billion.

In late October 2009, nine Prototype Mercedes Benz *Geländewagen* or cross country vehicle-G-Wagon were handed over to Project Overlander. These vehicles are currently undergoing validation testing within Australia. The government would also purchase a further 250 *Bushmaster* Protected Infantry Mobility Vehicles from Thales Australia as part of Project Overlander. (Previously, *Bushmaster* vehicles had been supplied under Land 116, Project Bushranger.) The many specialist vehicle modules, trailers and all the *Bushmasters* would be produced in Australia, worth approximately $800 million.

Re-tender for medium heavy segment

However by August 2008 it was announced that Project Overlander's medium heavy segment would be re-tendered, after contract negotiations with BAE Systems were halted. This was due to increased safety risks with its original vehicle offer and the subsequent need to substantially increase vehicle protection.

In early November, the Overlander Program office consulted with the five companies originally shortlisted for the medium heavy segment tender, including debriefings on their original offers, with the intention of initiating a revised tender refresh process for that segment. This acquisition refresh process for the segment was restarted through a comprehensive comparative evaluation testing program, with the aim of a down-

selection to preferred tenderers, who would then undertake the final offer definition and refinement process.

Mack Trucks withdrew from the tender refreshment process, and the following month the remaining four companies, BAE Systems Australia, Mercedes Benz Australia/Pacific, MAN Military Vehicle Systems Australia, and Thales Australia, received amended conditions of tender. The contenders were required to provide a minimum of five vehicles (three protected) each for the comparative evaluation trials run during 2009 by the Australian Defence Test & Evaluation Office (ADTEO).

In February 2010 the government announced that trials for competing medium to heavy weight trucks for the Australian Army representing about 2000 trucks and modules had been completed. The trial tested twenty-four vehicles in five vehicle categories, employing over sixty-four Army test drivers and putting the trucks through comprehensive field testing, on both public roads and military training areas, over a six month period.

As a result of the trial, Thales' *Bushmaster* Utility, MAN Military Vehicle Systems Australia's HX vehicle series, and Mercedes Benz Australia/Pacific's *Zetros* and *Actros* vehicle series, were identified by Defence as the contenders to proceed to the next stage. The project office released what is referred to as the Stage 2 Amended Request for Tender on 31 March 2010 for tenderers' comment. It has since engaged with the tenderers and is expected to formally release the RFT in the near future.

Following receipt of the tenders in August 2010, the project office will evaluate the responses. Evaluation will be concluded in late 2010, as will the internal review of the evaluation outcomes and governmental noting of the decisions. Negotiations with the preferred tenderer(s) will commence early 2011. Subject to the negotiation process, and pending 2nd Pass Approval and government clearance, it is expected that a contract will be struck in the second half of 2011.

Comment

Industry was first informed of the requirements for Project Overlander, comprising the acquisition of some 7,000 military vehicles and 4,000 trailers, with the release of an ITR in August 2003. By mid-2010 a number of Mercedes Benz G-Wagon lightweight vehicles have been acquired (for testing and validation) and contracts have been let for various trailers and modules. Defence anticipates a contract with the winning tender for the medium to heavyweight being signed possibly by the second half of next year 2011. How soon deliveries then commence remains to be seen but it will be many years later than Phase 3A's planned initial deliveries in 2009!

Land 121 Phase 3 Project budget

Of total approved project expenditure of $2,879 million, cumulative expenditure to June 2010 is $51 million and estimated expenditure for 2010-11 is $106 million.

In memoriam—vale the F-111

Gregor Ferguson

The F-111 will retire from Australian service at the end of this year, leaving the RAAF without a dedicated, specialist bomber in its inventory for the first time since before World War II. In an early, somewhat ironic, echo of the F-35 Joint Strike Fighter which will replace it, the RAAF may have been the first export customer to order a brand new US combat aircraft 'off the drawing board'.

The RAAF ordered the F-111 in 1963 as a strike and reconnaissance platform to replace its ageing *Canberras*. The service understood the strategic dimension to its role: Australia's ability to deter aggression, strike out if necessary at aggressors, and shape its strategic environment was vested strongly in the RAAF's ability to hit key targets on enemy territory with relative impunity. In 1963, when Konfrontasi between Indonesia and Malaysia was at full pitch and a communist threat was over-shadowing Southeast Asia and the Southwest Pacific, the RAAF was well aware of its responsibilities and challenges.

There was never any serious question of Australia developing its own strategic strike/interdictor aircraft. The RAAF would have to choose an aircraft built by its allies, modified slightly to suit Australia's particular requirements. In August 1963 the then-Department of Air in Canberra concluded that nothing currently flying could meet the RAAF's needs, but that the British TSR2 and US TFX (a combined US Air Force and Navy program which evolved into the F-111), might be suitable. These were developmental high-speed penetrating strike aircraft designed to fly low and fast to a distant target and deliver a nuclear or conventional bomb with pinpoint accuracy. The F-111, which was being developed for both the USAF and US Navy, differed in one important way—it had variable geometry 'swing wings' which could be swept forward and backwards for greater aerodynamic efficiency, depending on its speed. On paper, the RAAF reckoned, the F-111 had superior payload/range and was expected to be cheaper. In October 1963 the Australian Government selected it as its *Canberra* replacement. Australia ordered 24 F-111Cs, of which the final four were fitted with reconnaissance cameras on a pallet fitted in the bomb bay and re-designated RF-111Cs.

The F-111 had a maximum take-off weight of 51,846 kg, a maximum speed at sea level of Mach 1.2, rising to Mach 2.5 above 50,000 ft, and boasted an unrefuelled radius of action of 1,000 nautical miles, depending on its bombload—it could carry up to 14,000 kg of bombs, but typical loads are much smaller, especially today when precision-guided weapons are being used. The *Canberra*, by contrast, had a radius of about 700 nautical miles at best, and carried less than 4,000 kg of bombs.

It embodied a massive range of innovations: variable wing geometry; a crew escape capsule rather than ejection seats; terrain-following radar (TFR) to enable high-speed, low-level flight at night and poor visibility; and the first after-burning turbofan engines. Partly for this reason the project got off to a troubled start: the cost of Australia's aircraft ballooned from an estimated $100 million in 1963 to more than $300 million six years later.

The swing-wing mechanism was what worried RAAF engineers. The wing carry-through box (WCTB) which contains the swivel bearings was made of a light and strong, but very brittle, grade of steel, D6AC, whose failure characteristics were not fully understood—even very slight imperfections could result in stress cracking. RAAF airworthiness engineers were concerned they couldn't predict damage to these components, nor repair them and certify them safely once damage was detected.

The first F-111 was officially over to the RAAF by its manufacturer, General Dynamics, at Fort Worth in September 1968, and then returned to its hangar. Persistent problems with the WCTB and other airframe components—including the loss of USAF aircraft deployed to Vietnam due to problems with the horizontal stabilisers—delayed delivery of the F-111s to Australia for five years. As an interim measure, the RAAF leased 24 F-4E *Phantoms* to provide a limited strike capability, as well as a relatively gentle introduction to modern high-speed strike operations. The F-111s were finally delivered to RAAF Base Amberley in 1973 where they equipped 1 and 6 Squadrons.

Once in service, the F-111C proved a revelation: from a base in northern Australia its unrefuelled combat radius would allow it to range far and wide across the immediate region. It could fly low and blindingly fast, maintaining a speed of 540-600 knots at altitudes as low as 100 feet, even carrying weapons slung externally below its wings—no other strike aircraft could do this. And it could follow the nap of the earth, by day or night, using hills and valleys and even clumps of trees for cover. The F-111 was usually a fast-moving target against a very 'cluttered' background. This concealed the aircraft from both ground-based and airborne radars: neither fighters nor surface-air missile batteries could detect it reliably, nor lock onto it, and enemy defences were effectively blinded as the F-111 sped past.

For all practical purposes, the RAAF's new F-111Cs were invulnerable to any air defence system within Australia's immediate region. Their only weakness was the need to overfly a target in order to release some of their weapons; and, in the early days, the need to recalibrate the mission computer before weapons release by making a straight and level pass over a known reference point such as the surface of a lake. Their service entry was difficult, however—four were lost between 1977 and 1979, though for different reasons: there was no systemic cause behind them. These losses were made good through the purchase of ex-USAF aircraft.

The nearest thing to a limiting factor on F-111 operations at this time was range. The RAAF had no tankers, though its F-111 pilots routinely trained with USAF tankers to maintain interoperability, and even when four of its Boeing 707 strategic transports were converted into tankers for training purposes, these lacked the flying boom refuelling system needed for the F-111s.

The federal government and the RAAF never saw a pressing need to acquire tankers for the F-111. This was an important policy decision: a deliberate and very visible limitation on Australia's reach and ambition. The vexed politics of employing the F-111s in combat seem to have been a key factor in the government's decision not to send them to the first Gulf War in 1991. While the aircraft's electronic warfare equipment was by then in need of updating, this could have been done with USAF

support quite quickly. There seem to have been no other credible technical reasons for not sending them to the Gulf at that time.

However, the RAAF's aircraft underwent a range of capability upgrades to exploit new technology and fend off obsolescence. The first was to acquire the *Pave Tack* targeting system, as already fitted to the USAF's F-111F. This uses a forward-looking infra-red (FLIR) sensor and a laser to detect a target, measure its range and then designate it for a laser-guided bomb (LGB). *Pave Tack* provided the RAAF's F-111 simultaneously with an airborne self-designating capability for LGBs which it previously lacked, and a nascent stand-off precision attack capability which meant it didn't need to overfly a target. This required significant work on the aircraft to create a new electronics interface between the digital Pave Tack pod and the largely analogue aircraft. The new pod's only disadvantage was its size and weight (600 kg and over 4 m), which meant it took all of the space in the internal bomb bay, requiring all weapons to be slung externally under the wings. This minor upgrade also enabled the F-111 to fire AGM-84 *Harpoon* anti-ship missiles, augmenting the RAAF's P-3C *Orion* maritime patrol aircraft which were also *Harpoon* capable.

The next upgrade was far more significant: an Avionics Upgrade Program (AUP) which got under way in 1990 saw the introduction of a new attack radar, new inertial and GPS navigation system, new mission computers and stores management system and new digital cockpit displays. After significant technical difficulties and delays, the first AUP aircraft returned to the frontline in 1994.

Meanwhile, shortly after the 1991 Gulf War the USAF announced that it would start to retire its F-111s; the last of these was withdrawn from service in 1998, leaving Australia as the sole operator of this aircraft. In October 1992 the RAAF acquired 15 surplus USAF F-111Gs to extend the type's service life in Australia; it was also granted access to the USAF's F-111 spares stockpile. Although they shared some common avionics and airframe elements, the two marks were different enough that the F-111Gs became used principally for training.

In hindsight, this marked the end of the 'golden age' for the F-111 in RAAF service. Not only was the service now the sole operator, with all of the engineering and risk management this entails, by the mid-1990s the F-111s were nearly 30 years old and age-related issues were starting to emerge. More to the point, the regional threat environment was changing. The writing appeared on the wall when the F/A-18 *Hornet* entered RAAF service in the late-1980s. Its pulse-Doppler APG-65 radar could pick out fast-moving targets against ground clutter—including the F-111. RAAF *Hornet* pilots were easily able to detect and track terrain-following F-111s, and so could anybody else equipped with a similar 'look down, shoot down' capability. More and more air forces were re-equipping with modern western and Russian fighters and ground-based air defence systems built around such radars. Suddenly the F-111 wasn't invincible any more. (This should not have been news—the RAF's *Tornado* fleet suffered multiple losses to radar-guided ground fire during the 1991 Gulf War while doing 'low and fast' attacks.)

This had some important consequences: while speed and terrain-hugging flight still protected it against certain types of threat, the F-111 was now more vulnerable to modern fighters. Its TFR was also easily detectable by modern electronic warfare

systems. The result was that F-111 crews could turn away from the target if confronted with a serious threat, or face a higher risk of being shot down. Either way mission effectiveness was compromised. To overcome this F-111s would need a fighter escort and improved self-protection equipment, and this introduced further limitations on the aircraft: the F-111 could go no further and no faster than its escort, so the advantages of its unrefuelled range and low-level dash speed were reduced.

During the1990s and early 21st century the F-111's original APG-62 radar warning receiver (RWR) was upgraded, and the RAAF acquired the Israeli EL/L-8222 radar jammer, among other measures. Nevertheless, when the second Gulf War began, the RAAF's upgraded Hornets offered a better risk-reward balance than the F-111s: in 2003 it was *Hornets* rather than F-111s which deployed to the Middle East.

The RAAF also acquired the AGM-142 *Raptor* stand-off missile whose 90 km range provided the F-111 with some measure of enhanced protection from the air defences around a target. But the software integration difficulties in this program resulted in lengthy delays and the F-111/AGM-142 combination will see barely three years of operational service before they retire.

Also, during the early part of the new century the aircraft experienced a number of worrying technical and structural failures. A wing undergoing proof testing at Amberley failed unexpectedly, and the fleet needed to be re-winged using components sourced from the USAF's 'boneyard' in Arizona. Then a fuel tank exploded in flight near Darwin, grounding the entire fleet while the cause was investigated. Meanwhile, the economics of producing unique and highly specialised items such as weapons release pyrotechnics and the cutting charge which frees the crew escape capsule from the fuselage were starting to become prohibitive.

Other aspects of this 1950s design were also working against it: the F-111 was never an easy or cheap aircraft to maintain, and the cost of sustaining it rose inexorably. In 2001 the RAAF outsourced the airframe and weapon system maintenance task to Boeing Australia (which had recently acquired Rockwell Systems Australia, the company that implemented the *Pave Tack* and AUP upgrades), and a more efficient through-life support regime saw availability rise and maintenance costs fall quite dramatically.

Nevertheless, the F-111 still required enormous effort and investment, increasingly disproportionate to its capability. Cost-effectiveness fell commensurately: in 2007-08 the F-111 was Defence's most expensive aircraft fleet to maintain. According to the Defence Annual Report, a force of 21 F-111Cs achieved 2,933 flying hours at a cost of $147 million, compared with 3,600 hours that were programmed (81% achieved); some 71 *Hornets* achieved 11,301 hours, or 98% of planned flight time, at a cost of $112 million—or $50,000 of maintenance per flying hour for the F-111, compared with less than $10,000 for the *Hornet*.

The huge maintenance burden was bad enough; the increasing risk of groundings due to unforeseen technical problems meant that availability was becoming hard to guarantee, while the F-111's survivability, as noted earlier, had been compromised by a new generation of air defence weapons and sensors. Furthermore, as the 21st century unfolded, the ability to network formations of aircraft and their ground-based or

airborne controllers become more widespread. The tactical advantages of this shared situational awareness have proved to be significant—but they were largely denied to the F-111 unless they underwent yet another avionics upgrade.

Upgrading the avionics of the F-111 to enable high levels of networking and improve survivability might have delivered important benefits, but wouldn't have overcome the risks associated with ageing airframes and engines. The capital costs of an upgrade, including extensive flight testing and certification, would have been extremely high; aircraft availability would have been reduced while the upgrade was implemented; the lead-time to deliver upgraded aircraft might have been several years, during which time the F-111's relative effectiveness would have declined still further; and platform upgrades to tackle ageing aircraft issues would need to have been developed and tested concurrently, affecting availability still further. And all of this would have had to be achieved as a parent Air Force.

Besides, the risks associated with a major avionics upgrade were by now vividly apparent to the ADF. Installing a new digital avionics, sensor and flight control system into an aircraft designed in the analogue age is a recipe for pain, delay and frustration, as the RAAF and RAN had discovered with the ill-fated *Super Seasprite* project and the more successful but still troubled AP-3C *Orion* upgrade and various minor upgrades to aircraft such as the Boeing 707. The ADF came to the conclusion it could achieve an equal or better operational outcome, at lower risk, if it spent its money elsewhere.

The government announced in 2003 that the F-111 would retire in 2010, once certain other RAAF enhancements had been implemented, including the *Hornet* upgrade, the *Wedgetail* airborne early warning & control (AEW&C) system, the new *Vigilare* ground-based command and control system, a new stand-off weapon for the upgraded *Hornets*, and a new fleet of air-air tankers. In addition, in 2007 the then Defence Minister, Dr Brendan Nelson, announced the purchase of a so-called 'bridging fighter' to ensure there would be no capability gap between the retirement of the F-111 and the arrival of the F-35A *Lightning II* Joint Strike Fighter which, it is planned, will replace both the F-111 and the *Hornet*. The first of twenty-four F/A-18F *Super Hornets* arrived in Australia in March 2010.

Conclusion

What did the RAAF gain from the F-111, and what will it lose with its going? Its operational capabilities and the levels of individual and collective skill required to use it to maximum effect challenged RAAF leadership. The F-111 wrought a generational leap in both technology and operational capability and had a permanent effect on aircrew, engineering and command training across the service. The RAAF's engineering capabilities grew enormously as a result, as did the knowledge base of essential support agencies such as DSTO and industry.

The F-111 has been Australia's 'big stick' for 37 years—it provided a long-range strike capability that was unrivalled, and probably invulnerable in its day. Its deterrent effect within the region was enormous and the fact it never dropped a bomb in anger is probably testimony to its effectiveness. Even today, with the right operational support, the F-111 remains a formidable aircraft in regional terms. But its job was essentially quite simple: to deliver ordnance on target. As it grew older the costs and

risks of achieving a specific, desired effect changed dramatically. The F-111 was no longer the sole answer, and eventually not even a particularly cost-effective one. There was nothing it could do that can't now be done by a different combination of aircraft and weapons, which can also fill other roles and deliver wider operational benefits. According to one 40-year RAAF veteran, the benefits afforded by modern sensors, weapons and networking technology far outweigh anything the current F-111 can offer—and in the past 20 years nobody has tried to develop a new aircraft which even resembles the F-111.

There is perhaps one thing which Australia will miss: the sheer presence of the F-111. It has—for whatever reason—won a place in the 'hearts and minds' of many Australians, even if its most notable contribution in the last few years has been a 'dump and burn' at sporting or civic events. Although the RAAF never flaunted its 'big stick', its very existence meant Australia could afford to speak softly. Nothing which can replace the F-111 carries anything like the same brooding menace. Australia's regional diplomacy will be a little different in the future.

CHAPTER 9 – AUSTRALIA'S FOREIGN AID

Australia's foreign aid is administered by the Australian Agency for International Development (AusAID). The aim of Australia's aid program is 'to assist developing countries reduce poverty and achieve sustainable development, in line with Australia's national interest'.

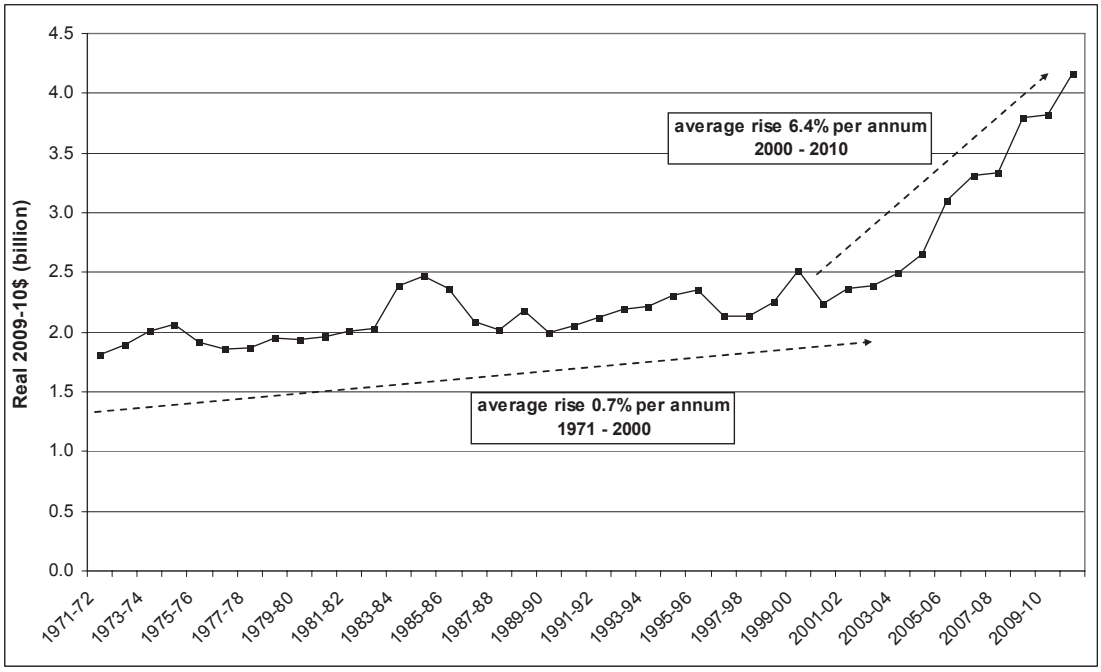
Australia's strategic interests are an important subset of its national interests. In this chapter, we examine the overall foreign aid program with a focus on how it furthers our strategic interests. Extensive details of aid initiatives in specific countries are available on the AusAID website www.ausaid.gov.au.

How much does Australia spend on foreign aid?

In 2010-11 Australian foreign aid will amount to $4.2 billion corresponding to 0.33% of GDP. This represents a nominal boost of $528 million on last year, and 9.1% annual growth in real terms. In effect, after a pause last year due to the GFC when growth was limited to 0.6%, foreign aid has been increased above trend.

This year's increase completes a period of strong growth in the aid budget. Since 2000-01 foreign aid has increased in real terms by an average of 6.4% per annum—more than twice the underlying long-term growth in the Defence budget. Things have not always been so favourable for Australian foreign aid. Prior to the present decade, aid spending grew relatively more slowly (0.7% per year in real terms) over the preceding 30 years. Figure 9.1 shows Australian foreign aid spending from 1971-72 to the present.

Figure 9.1: Australian spending on foreign aid 1971-72 to 2010-11

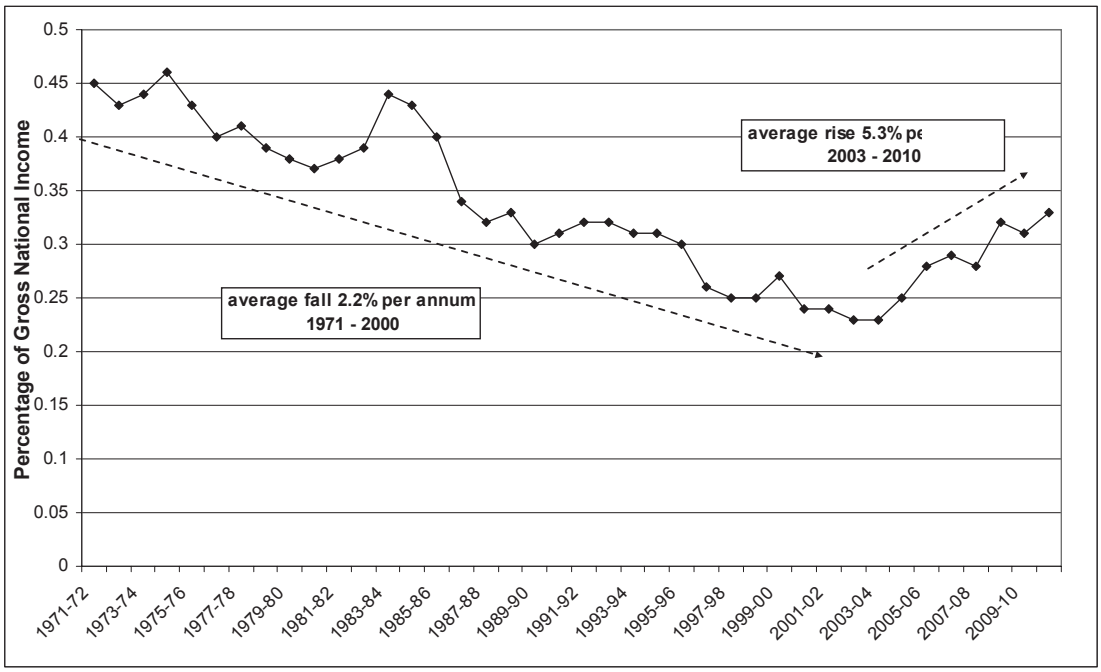


Source: 2010-11 Ministerial Statement on Australia's International Development Assistance Program

In much the same way that defence spending is measured as a share of GDP, foreign aid spending is often measured as a share of Gross National Income (GNI). Viewed in

this manner, the falling priority accorded to aid from the 1970s to the 1990s is very clear as shown in Figure 9.2.

Figure 9.2: Australian foreign aid as a share of GNI 1971-72 to 2010-11



Source: 2010-11 Ministerial Statement on Australia's International Development Assistance Program

No doubt many factors contributed to a higher priority for foreign aid this century. From a strategic perspective, the eroding conditions in the fragile states on our periphery would be reason enough to do more.

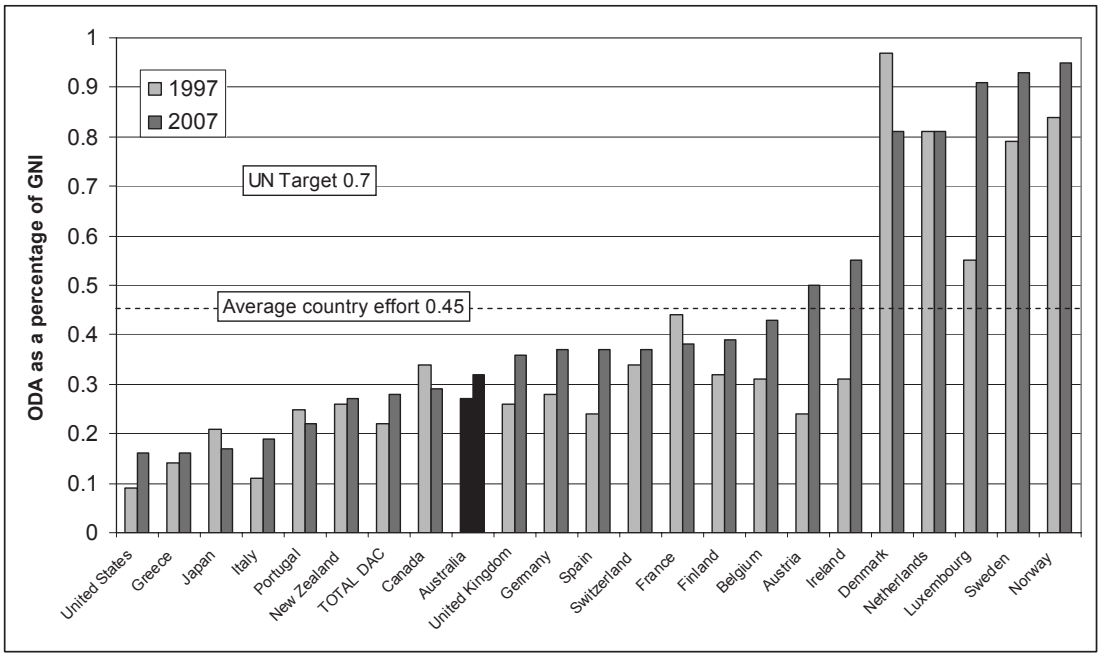
In international terms, Australian foreign aid spending is unimpressive. In 2006, the last year for which comparative data is available, Australia ranked 15th out of 23 OECD countries for aid as a share of GNI, see Figure 9.3. Not only do we fall below the average for industrialised nations, but our 0.33% of GNI is less than half of the agreed United Nations target of 0.7%. However, and consistent with its election commitment, the government plans for foreign aid to reach 0.5% of GNI by 2015-16. Specific targets for the next four years are set out in Table 9.1 along with our projection of what will be necessary for the government to fulfil its promise. Note the especially rapid growth required from 2012 to 2015 to reach the target.

Table 9.1: Overseas Development Assistance (ODA) needed for 0.5% of GNI by 2015-16

	Actual			Budget		Estimated			Projected	
	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16
ODA/GNI	0.29%	0.28%	0.32%	0.31%	0.33%	0.35%	0.38%	0.42%	0.46%	0.50%
ODA (2010/11 $b)	3.31	3.34	3.80	3.82	4.17	4.62	5.23	6.04	6.90	7.83
real increase	6.5%	0.7%	13.8%	0.6%	9.1%	10.8%	13.3%	15.3%	14.3%	13.5%

Source: 2010-11 Ministerial Statement on Australia's International Development Assistance Program.
Note: projection assumes GNI grows at 2.5% real per annum.

Figure 9.3: Comparison of Official Development Assistance from OECD nations

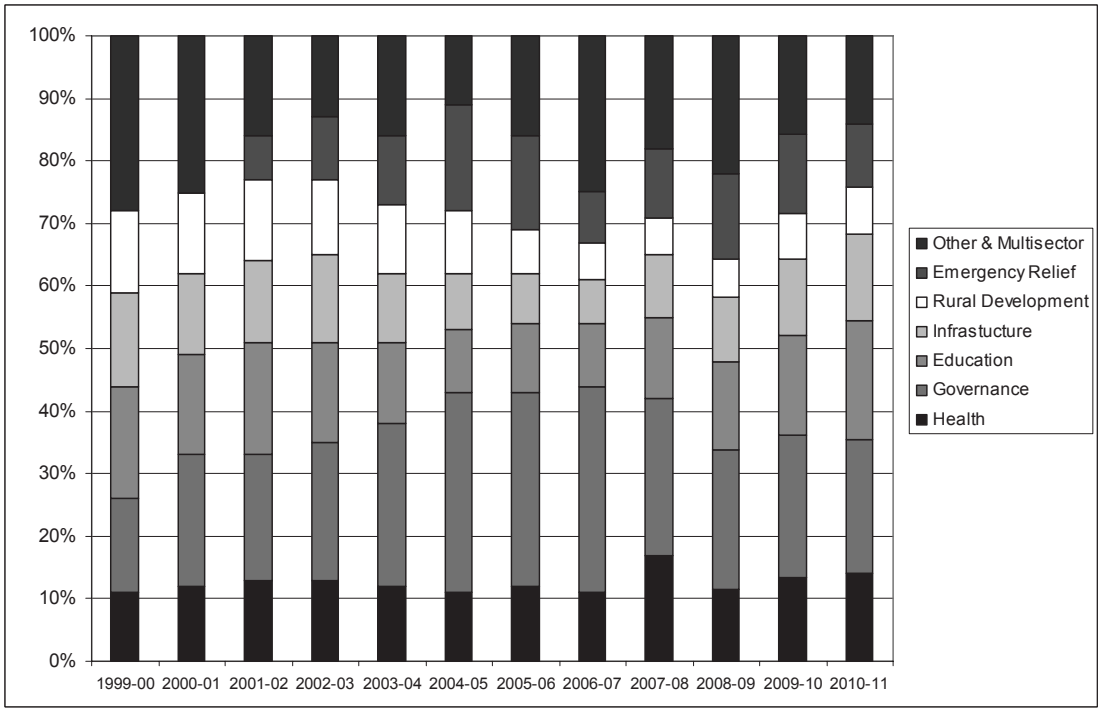


Source: 2009 OECD Factbook, Total for OECD Development Assistance Committee (DAC) also shown

How is the money spent?

At the risk of greatly oversimplifying the complexity of Australia's foreign aid effort, Figure 9.4 sets out the gross categories of aid and how they have changed over the past decade. For our purposes, it is sufficient to note that governance is the largest single area of activity. This makes sense; good governance has a multiplier effect on development and is of strategic benefit to Australia in any case.

Figure 9.4: The composition of Australian foreign aid 1999-2010

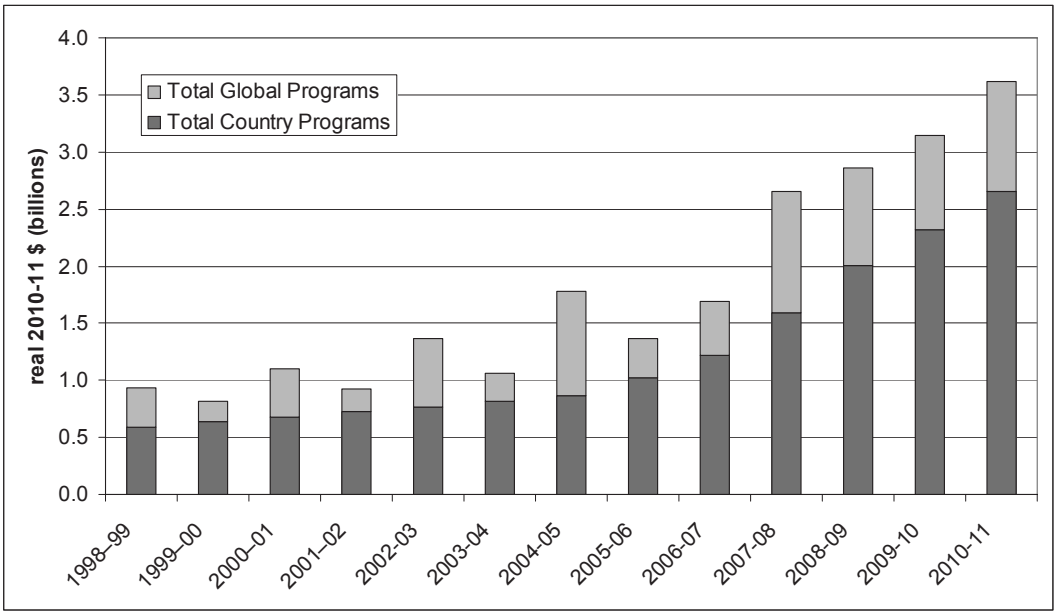


Source: AusAID annual reports and budget papers

Where does the money go?

The annual aid budget is composed of a country-specific program and a global program, see Figure 9.5. The latter includes payments to various development banks and UN and Commonwealth agencies including emergency aid through the World Food Program. Because of multi-year payments, the global program can vary greatly from one year to the next (accrual accounting smooths the payments in reporting).

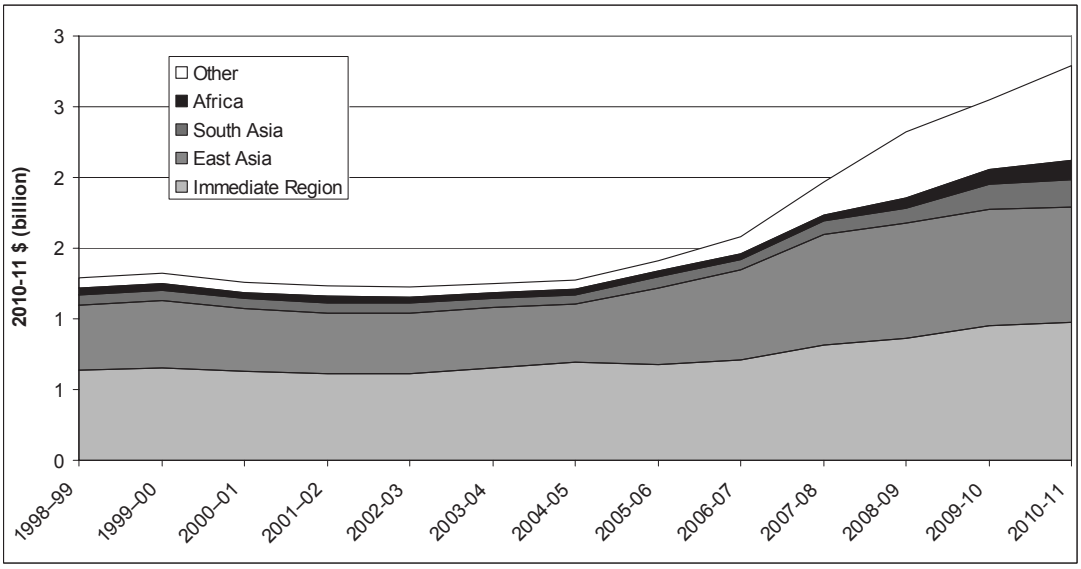
Figure 9.5: AusAID — global and country programs



Source: AusAID annual reports and budget papers

Australian country-specific aid is geographically focused on Asia, Pacific Island states, Iraq, the Palestinian territories and parts of Africa. Australia has no country programs in Europe, Western Africa and (until last year) the Americas. Figure 9.6 shows the size of country-specific aid by region since 1998.

Figure 9.6: Australian aid — spending by region 1998-2009



Source: AusAID annual reports and budget papers

All other things being equal, Australian aid tends to be greater for countries that are closer to Australia. The category of 'immediate region' includes the island states of the Pacific, PNG and East Timor. Though not shown, most of the aid to East Asia goes to Southeast Asia and to Indonesia in particular.

Although the broad distribution of aid over the past twelve years remained largely consistent, recent increases have broadened the spread of funding to more distant locations as shown in Figure 9.6. In part, this reflects substantial new aid to Iraq and Afghanistan. Over the past decade, aid to the immediate region has increased by 56%, that to East Asia by 83%, South Asia 168%, Africa 196% and other spending 911%.

Table 9.2 lists Australia's country-specific aid by value for 2010-11 An additional $326 million is provided through non-specific cross-country funding plus regional funding for the Pacific ($215 million), East Asia ($72.3 million), South Asia ($16.2 million) and South and Central America ($36 million). Nonetheless, the country-specific data provides some indication of Australia's aid priorities.

Table 9.2: Australian aid — spending by country 2010-11

Country	Australian Aid 2010-11$ (million)	Country	Australian Aid 2010-101$ (million)
PNG	415.0	Samoa	26.4
Indonesia	399.1	China	22.0
Africa	139.2	Nauru	17.4
Solomon Islands	114.0	Tonga	17.0
Afghanistan	106.6	Kiribati	16.9
Philippines	105.0	Nepal	13.0
Vietnam	96.0	India	9.9
East Timor	69.0	Tuvalu	6.1
Bangladesh	57.0	Micronesia	4.2
Pakistan	55.4	Mongolia	4.0
Cambodia	50.1	Bhutan	3.0
Vanuatu	49.3	Maldives	3.0
Iraq	39.4	Cook Islands	2.2
Sri Lanka	37.0	Niue & Tokelau	2.2
Laos	32.5	Thailand	1.4
Burma	32.0		
Palestinian Territories	27.5		

Source: 2010-11 Ministerial Statement on Australia's International Development Assistance Program

How does aid further Australia's national interests?

Aside from making us feel better about ourselves, foreign aid furthers our national interests in two ways. First, bilateral aid to countries establishes a *quid pro quo* that facilitates access to, and influence with, foreign governments. Second, aid can bolster the institutions, infrastructure and human capital necessary for economic development and political stability. The rationale for the first category is self-evident; the second furthers our national interest by improving the stability of countries important to our security.

Much of Australian aid is entirely of the first sort. The $22 million we give to China each year, for example, makes no significant impact on its 1.3 billion people or its economic development. Other aid, like that to Solomon Islands, is directly focused on achieving tangible improvements in governance, human security and economic development.

An informative picture emerges by taking the ratio of Australian aid to a recipient country's GDP. High ratios indicate a real effort to make a difference in a country; small ratios reflect largely diplomatic gestures that will hopefully be repaid through access and influence. Table 9.3 lists Australian aid recipients in descending order of the ratio of Australian aid to national GDP for the year 2008 (for which data is easy to find). Not surprisingly, Solomon Islands heads the list followed by other countries from the immediate region. Note that some smaller Pacific countries have been omitted because economic data was not available. For comparison, the latest GDP per-capita in US dollars has been included as a measure of the relative level of poverty in recipient countries. Clearly, Australian aid is only loosely directed on the basis of need.

Table 9.3: Australian aid as a share of GDP 2008-09

Country	Ratio of Australian aid to GDP	2008 per-capita (US$)	2008-09 Australian Aid (A$m)	Country	Ratio of Australian aid to GDP	2008 per-capita (US$)	2008-09 Australian Aid (A$m)
Solomon Is.	19.4%	2,049	105.5	Maldives	0.17%	5,011	2.6
Kiribati	14.1%	3,707	11.6	Bhutan	0.13%	5,240	2
East Timor	10.3%	2,560	58.3	Vietnam	0.07%	2,774	77
Vanuatu	5.7%	4,202	37.4	Indonesia	0.07%	3,990	413.6
Micronesia	5.5%	2,183	15.2	Mongolia	0.05%	3,537	3
PNG	4.8%	2,085	359.8	Philippines	0.05%	3,539	97.3
Nauru	4.8%	4,522	2.5	Burma	0.04%	1,036	6.9
Tonga	4.4%	5,375	13.2	Nepal	0.04%	1,143	5.7
Samoa	3.1%	5,735	19.6	Bangladesh	0.04%	1,408	34.5
Cook Islands	1.1%	16,884	2.7	Iraq	0.03%	3,198	39.4
Fiji	0.5%	4,443	21	Sri Lanka	0.02%	4,589	10.9
Cambodia	0.3%	1,955	37.2	Pakistan	0.01%	2,757	26.8
Laos	0.3%	2,216	17.3	China	0.0005%	5,943	25
Afghanistan	0.3%	783	41.6	India	0.0002%	2,787	2.2

Sources: 2008-09 Ministerial Statement on Australia's International Development Assistance Program, IMF World Outlook 2008, Department of Foreign Affairs and Trade (DFAT) Country Profiles

The level of aid-to-GDP at which aid becomes an entirely diplomatic gesture is impossible to define, though it is hard to argue that figures below 0.5% of GDP reflect a serious effort to have a significant impact—except perhaps in a limited area like governance.

Conversely, it is clear that Australia is trying to make a real difference in those countries where aid approaches or exceeds 5% of GDP. As Table 9.3 shows, this category is entirely within our immediate region of the South West Pacific and East Timor. Unfortunately, as Table 9.4 shows, our efforts at generating sustainable development have been less than spectacular in the last few decades. Recent events in

several of the countries indicate that our attempts to achieve political and civil stability have been little better.

As Australia's aid program ramps up steeply over the next several years, the government will face a question. How much should they increase Australian aid to far-flung countries in Africa and elsewhere, and how much should they focus efforts on getting our own immediate region in order?

From a purely strategic perspective the answer is simple; fix the immediate region as soon as possible. Many countries on our periphery have poor economic prospects and rapidly growing populations. Unless we mount a larger effort (of which aid can only be a part) to build stability and nurture development in places like Solomon Islands, East Timor and Papua New Guinea, problems like those of recent years are likely to become more frequent and severe.

Table 9.4: Australian aid as a share of GDP 2008-09 and economic growth

Country	Ratio of Australian aid to GDP	2008 per-capita (US$)	Australian Aid 2008-09 ($m)	Average annual GDP growth		
				1980-90	1990-00	2000-10
Solomon Islands	19.3%	2,049	105.5	-2.1%	-0.2%	1.0%
Kiribati	14.1%	3,707	11.6	~	~	~
East Timor	10.3%	2,560	58.3	~	~	-0.6%
Vanuatu	5.7%	4,202	37.4	0.6%	0.2%	0.8%
Micronesia	5.5%	2,183	15.2	~	~	~
PNG	4.8%	2,085	359.8	-1.0%	1.4%	0.7%
Nauru	4.8%	4,522	2.5	~	~	~
Tonga	4.4%	5,375	13.2	8.5%	1.2%	1.5%
Samoa	3.1%	5,735	19.6	0.1%	2.6%	3.2%
Cook Islands	1.1%	16,884	2.7	~	~	~
Fiji	0.5%	4,443	21	1.4%	3.8%	1.1%

Sources: 2008-09 Ministerial Statement on Australia's International Development Assistance Program, IMF World Outlook 2008, DFAT Country Profiles

Australia's military cooperation program

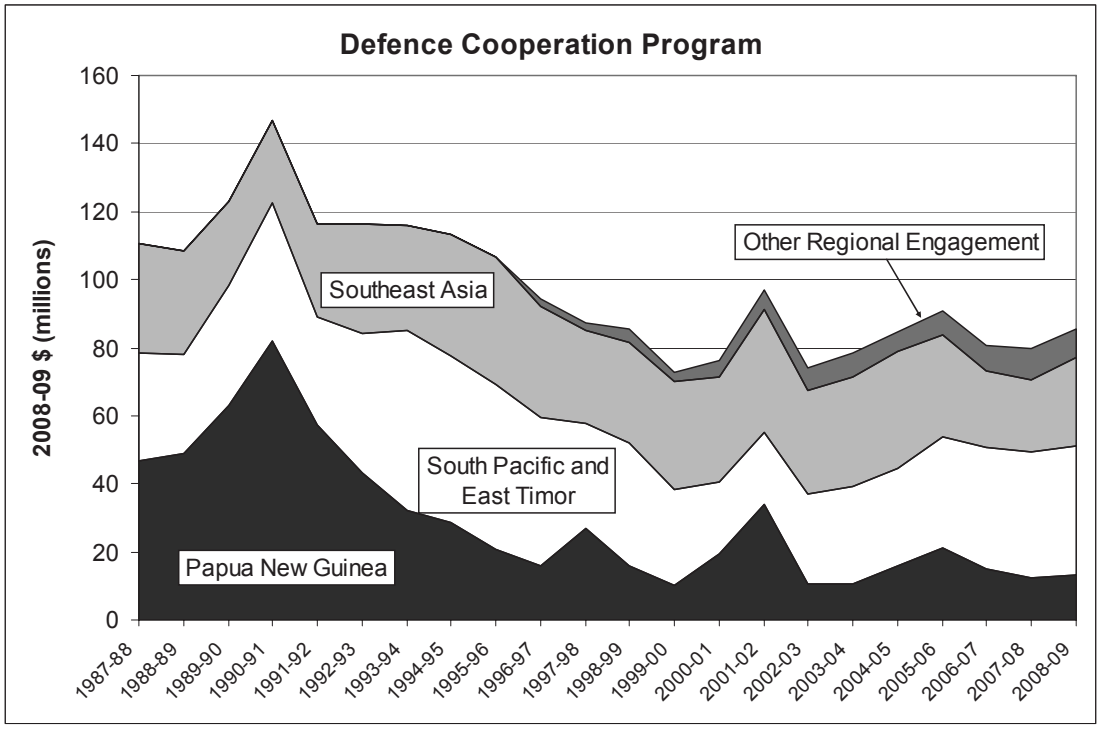
Allied to Australia's international aid effort, is the ~$85 million a year Defence Cooperation Program run by the Department of Defence. According to the 2008-09 PBS, the Defence Cooperation Program supports the government's strategic objectives by:

- contributing to regional security
- working with allies, regional partners and others to shape the global and regional environment in a way favourable to Australia and the ADF
- consolidating acceptance of Australia as an obvious and legitimate participant in deliberations on issues that affect regional security
- encouraging and assisting with the development of defence self-reliance of regional countries.

In practice, the Defence Cooperation Program provides assistance to regional security forces through military advisors, training initiatives, bilateral exercises, capacity building, and equipment and infrastructure projects. A long-standing part of the Defence Cooperation Program is the Pacific Patrol Boat Program that provided 22 Patrol Boats along with training and technical support to12 Pacific Island countries. These vessels allow the countries involved in the Program to independently police their maritime territories.

Figure 9.7 sets out the spending on the Defence Cooperation Program over the past twenty-odd years. For ease of display, individual country spending has been aggregated into convenient categories. Country specific data for 2009-10 and 2010-11 appears in Table 9.5.

Figure 9.7: Defence Cooperation Program—1987 to 2009



Source: Defence Budget Papers

Table 9.5: Defence Cooperation Program—2009-10 and 2010-11

Country	2009-10 ($m)	2010-11 ($m)	Country	2009-10 ($m)	2010-11 ($m)
South Pacific			**Southeast Asia**		
Timor-Leste	9.960	10.721	Singapore	0.164	0.110
Vanuatu	1.264	1.600	Philippines	4.377	4.680
Solomon Islands	1.019	0.872	Thailand	4.384	3.002
Tonga	1.971	1.829	Malaysia	4.636	4.151
Western Samoa	0.674	0.579	Indonesia	5.291	5.315
Cook Islands	0.334	0.308	Vietnam	2.671	2.201
Fiji	0.004	-	Cambodia and Laos	1.087	1.109
Marshall Islands	0.732	0.853	Brunei	0.081	0.036
Micronesia	0.798	0.765	***Sub-total***	**21.691**	**20.604**
Tuvalu	0.780	0.978	Other regional activities	4.737	5.615
Kiribati	0.937	1.044	Defence International Training Centre	4.923	5.452
Palau	0.673	0.852	**Total**	**95.294**	**96.169**
DCP Housing	-	1.234			
Multilateral Assistance	33.078	31.917			
Sub-total	**52.224**	**53.552**			
Papua New Guinea	10.719	10.946			

Source: Defence Budget Papers

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Operations and Capability Program: This program covers ASPI's work on the operational needs of the Australian Defence Force, the development of our defence capabilities, and the impact of new technology on our armed forces.

Budget and Management Program: This program covers the full range of questions concerning the delivery of capability, from financial issues and personnel management to acquisition and contracting out—issues that are central to the government's policy responsibilities.

Outreach Program: One of the most important roles for ASPI is to involve the broader community in the debate of defence and security issues. The thrust of the activities will be to provide access to the issues and facts through a range of activities and publications.

GLOSSARY

ADF	Australian Defence Force
AES	Additional Estimates Statements
AEW&C	Airborne Early Warning & Control
ANAO	Australian National Audit Office
APS	Australian Public Service
CDF	Chief of the Defence Force
CIOG	Chief Information Officer Group
CSP	Commercial Support Program
CUC	Capital Use Charge
DAR	Defence Annual Report
DCP	Defence Capability Plan
DFRB	Defence Force Retirement and Death Benefits
DHA	Defence Housing Authority
DMO	Defence Materiel Organisation
DRP	Defence Reform Program
DSG	Defence Support Group
DSTO	Defence Science and Technology Organisation
EWSP	Electronic Warfare Self Protection
FADT	Foreign Affairs Defence and Trade
FBT	Fringe Benefits Tax
FMA	*Financial Management and Accountability Act 1997*
GDP	Gross Domestic Product
GNI	Gross National Income
GST	Goods and services tax
NPOC	Net Personnel and Operating Costs
OPA	Official Public Account
PAES	Portfolio Additional Estimates Statements
PBS	Portfolio Budget Statement
SES	Senior Executive Service