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Rational to rationalise? Australia's future naval combat helicopters revisited

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Introduction

The surface ships and submarines announced in the recent Defence White Paper captured much attention in the press. That is not surprising given that those initiatives are likely to cost somewhere in excess of $50 billion. But the projects that will deliver the new ships and submarines will not require significant expenditure for almost a decade. Two of them are not even in the new four-year *Defence Capability Plan 2009* (DCP 09). In fact, the biggest naval project in dollar terms in the next few years will be a new fleet of at least 24 naval combat helicopters.

ASPI published a *Special Report* on the subject of naval combat aviation in March of this year.[1] In that paper we noted the capability deficiencies of the current *Seahawks*[2] and noted the importance of a capable multi-role helicopter to enhance the reach and capability of the surface combatant component of the Royal Australian Navy (RAN). This *Policy Analysis* will not cover the same ground, and the interested reader can refer to the earlier paper. Instead, we focus here on the 'big picture' policy choices that should underpin future decisions.

Background

The 2006–16 DCP included an upgrade and life-extension program for the *Seahawk* combined with an acquisition program for a replacement for delivery around 2018. Subsequently, as noted in the March ASPI paper and formalised in the DCP 09, the upgrade idea was scaled back to a *Seahawk* Capability Assurance Program (SCAP) that would ensure the aircraft's safety and reliability, but which involved no new major systems.

As far as replacement is concerned, we noted in our March publication that there were really two contenders; the Lockheed Martin-Sikorsky MH-60R '*Romeo*' version of the US Navy's *Seahawk* and the NATO Helicopter Industries NH-90 *NFH*. The *Romeo* is a mature platform that would provide a significant capability boost, but it is not as capable as the *NFH* in the full suite of embarked roles—the US Navy (USN) operates another *Seahawk* variant to cover other roles. On the other hand, the more versatile *NFH* is only just completing its initial development process and is yet to be proven operationally.

We concluded that a choice on the replacement should be made 'at such time as operator experience with both types, operating in their full range of tasks, is available'—probably around 2012–13 given the planned in-service date of 2011 with the Dutch and French navies.[3] At the time, the timetable for a decision seemed to be consistent with such an approach. According to US Navy budget request documentation, the *Romeo* production line will be open to at least 2015.[4]

However, the timeline for Australia's decision appears to have contracted with the announcement in the 2009 Defence White Paper that:

> As a matter of urgency, the Government will acquire a fleet of at least 24 new naval combat helicopters to provide eight or more aircraft concurrently embarked on ships at sea. These new aircraft will possess advanced anti-submarine warfare capabilities, including sonar systems able to be lowered into the sea and air-launched torpedoes, as well as an ability to fire air-to-surface missiles.[5]

The subsequent DCP 2009 [6] presented a revised timetable for the relevant project—see Table 1. It is not made clear why this has become a matter of urgency. An answer may lie in the time that it takes to develop the true operational capability of new platforms. And ASPI has noted in previous work that the development of anti-submarine warfare (ASW) capability is time consuming and requires a lot of practice. Australia's current ASW capability is poor, and increasingly out of step with a region in the process of acquiring submarines at an unprecedented rate.[7]

Rebuilding the ASW capability is important, and if we could have it sooner rather than later, that would clearly be preferable. Of course, this has to be balanced against the cost and benefits of possible replacements, to which we return later in this paper.

It is also worth noting that, while some upgrades of current sensor and weapon systems are underway, some other ASW-related naval initiatives in the White Paper have a significantly longer timeframe. For example, the future frigate program is described as being prepared for government consideration 'some time after 2019' in the new DCP, consistent with the vision of the Defence White Paper of the ADF in 2030.

DCP 2009 includes the *Seahawk* Capability Assurance Program phases 1 and 2 (SCAP1 and 2). For approval around 2010 and 2011 respectively[8], and at a total cost of over $200 million[9], this project is intended to address *Seahawk* obsolescence issues.

Table 1. The former and revised timetables for acquisition of a new combat helicopter.

	DCP 2006–16	DCP 2009
First pass approval		2009–10 to 2010–11
Year of decision	2015–16 to 2017–18	2010–11 to 2011–12
Initial operating capability	After 2017 to 2019	2014 to 2016

There is an undeniable appeal of mature systems over ones still in development—perhaps even more so after the *Super Seasprite* experience.

So, given that the fully-capable *NFH* is scheduled to be delivered to its first operational customers in 2011, the contracted timeframe would appear to weight the choice more heavily towards the mature *Romeo* option. (And perhaps cast some doubt on the cost-effectiveness of at least some elements of the SCAP.) To understand what the opportunity cost of such a decision might be, it is worth revisiting some previous decisions made on the ADF's helicopter fleets.

Fleet rationalisation

Rationalising the number of distinct platforms is a way to increase the capability return from investment. Savings are made by having to maintain fewer supply chains for spares and through the ability to reduce the amount of training required for flight and maintenance personnel. A corollary of that is that building on investment already made, by acquiring additional numbers of existing types, is a cost-effective way to increase ADF capability and capacity.[10]

Rationalisation of the ADF's helicopter fleet in order to achieve efficiencies in logistics, maintenance and training has long been part of the thinking behind Project AIR 9000—the overarching project for the development of the ADF's helicopter fleets. The rationale was articulated clearly in the 2006–16 DCP:[11]

> A key part of efficiently managing the ADF's helicopter fleets is the rationalisation of types where this is appropriate, efficient and operationally effective. In 2006 there are 10 helicopter types in or entering ADF service (*Kiowa, Iroquois, Black Hawk, Chinook, Tiger*, MRH-90, *Squirrel*, *Sea King*, *Seahawk* and *Super Seasprite*). The Air 9000 Helicopter Strategic Master Plan has identified a way in which as few as four types could effectively perform all roles (training, Armed Reconnaissance Helicopter, medium lift and one multi-role platform with different mission equipments for a variety of roles). Such a reduction in helicopter types has the potential to provide significant efficiencies across personnel, tools, spares, training and facilities. This is not to say four types will necessarily be achieved, but a significant reduction in types is both achievable and desirable over the next five to 15 years.
>
> Project Air 9000 also seeks to encourage investment in Australian industry in order to help build a sustainable aerospace industrial base that can provide high levels of support to the ADF and compete as part of the global supply chain.

Note that the 'four types' envisaged as a possible solution would require a single-platform solution for Army's general trooplift and for Navy's embarked operations. (The training helicopter is currently the *Squirrel*, the armed reconnaissance type is the *Tiger* and medium lift is provided by the *Chinook*.)

This reasoning played no small part in the selection of the MRH-90 as a replacement for both the Army's *Black Hawks* and Navy's *Sea Kings*. As well, forty-two of the forty-six MRH-90s are being assembled at the Australian Aerospace facility in Brisbane—seen by the previous government (and backed by an investment of over $25 million) as being a way to develop in-country through-life support services.[12]

It is also worth noting that both Navy and Army helicopters will operate from the decks of the *Canberra* class amphibious ships to be delivered around the middle of next decade. While the combat helicopters are intended for the surface combatants, there are bound to be times when it would be useful

to have the ability to embark additional combat helicopters in a task group, especially for ASW tasks. In those cases, even partial commonality in the embarked helicopters would assist in achieving logistic efficiencies and in reducing the number of personnel required to support flying operations.

Weapons

Warfighting helicopters need missiles and torpedoes to be fully effective. Inadequacies in their weapons fit are a significant problem with the existing *Seahawks*. Their current anti-submarine torpedo (the US-sourced Mk 46) is essentially obsolete and they are not configured to fire anti-ship missiles. To meet the requirement for an anti-shipping capability, the *Super Seasprite* was intended to be fitted with the Norwegian AGM 119B *Penguin* missile but, after the cancellation of that project, the missiles are now in storage pending disposal.

Any decision on the future naval combat helicopter must also consider the management of the ADF's weapon stocks. Rationalising the number of types in service makes good sense for weapons as well as for the platforms that carry them.

Torpedoes

In 1999, the EuroTorp MU90 *Impact* torpedo was selected to modernise the ADF's ASW torpedo stocks, with the associated aim of having a single torpedo in service with the RAN and the RAAF.

It was intended to integrate the MU90 with the RAN's FFG and ANZAC class frigates, its *Seahawk* and *Super Seasprite* helicopters and the RAAF's AP-3C *Orion* maritime patrol aircraft. However, the task was more involved than initially estimated, and the torpedo has only been integrated onto the warships.[13] The *Seahawks* and *Orions* continue to employ the Mk 46 (although the latter will receive either the MU-90 or another torpedo—most likely the US-sourced Mk 54—from around 2012). That means that a ship with an embarked *Seahawk* needs to carry and maintain two different torpedoes and their associated support systems.

Table 2 shows the current and future RAN and RAAF anti-submarine torpedo fits. The 'default' ASW torpedo shown in the table is the one that has already been integrated onto the platform. (Or, in the case of the P-8 and AWD, the torpedo they are planned to have.) In principle any ASW torpedo can be integrated onto any platform, but the lesson from the MU-90 project is that integration of weapons onto existing platforms should be approached with caution.

Table 2. ASW torpedo fit of ADF current and future ASW platforms.

ADF 2009	ASW torpedo	ADF 2020	ASW torpedo
RAN			
S-70B2	Mk 46		
FFG	MU-90		
ANZAC	MU-90	ANZAC	MU-90
		AWD	MU-90
		NFH or MH-60R	MU-90 Mk 54
RAAF			
AP-3C *Orion*			Mk 46
		P-8 *Poseidon*	Mk 54*

* Other P-8 customers might request and/or fund integration of another torpedo.

Table 2 shows that the RAN could move to a single-torpedo MU-90 fit for its ships and aircraft by choosing the *NFH* as its future combat helicopter. While the integration of the MU-90 onto the *Romeo* version of the *Seahawk* should be possible, there is no reason to think that the task would be easier than current experience with the *Bravo* models now in RAN service. And that would defeat the aim of keeping the aircraft to USN baseline standards. The RAAF will most likely find itself with the USN's Mk 54 as the standard fit on its new P-8 *Poseidons*, although other international sales could see other weapons integrated onto the platform.

The current situation of having two different torpedoes aboard our surface combatants reflects historical decisions and a number of failed or only partially-successful projects. Future decisions should aim for consolidation.

Missiles

Finally, it is worth noting the missile fits of the two leading contenders. The anti-ship capability of the *Romeo* is limited to the *Hellfire* missile (on one or two launchers, each of which can carry four missiles). The *Hellfire* would have the advantage of being common with the Army's *Tiger* armed reconnaissance helicopter. It is an effective anti-vehicle weapon (and has been used as such in Iraq and Afghanistan) but is short-ranged (8 km) and the 50 kg missile carries a very small warhead of less than 10 kg. As an anti-ship weapon, it would not allow the aircraft to safely engage anything other than minor vessels, and in any case lacks the terminal effect required to achieve a mission kill on a ship of significant size.

The *NFH* will be delivered with the capability to deliver two MBDA MARTE Mk 2/S anti-ship missiles. This 300 kg weapon has a range of 25 km (still questionable in terms of safely engaging a vessel with air defence capability) and a warhead of approximately 70 kg, making it much more suitable for the anti-ship role. Unlike the *Hellfire*, the MARTE would be a unique weapon in the ADF inventory.

Conclusions

In some ways, this project reflects a larger problem with decision-making on defence acquisitions. They are always a balance of capability, through-life cost, interoperability with allies and within the ADF, and project risk (complexity and/or technological maturity). Sometimes we opt for a solution near one side of that multi-dimensional decision space and at other times we seem to be diametrically opposite. And past mistakes in one direction can have a disproportionate effect on future decisions. In some respects, the *Romeo* is the opposite of the *Super Seasprite*—it is here, now and proven. That may make it appear more attractive than hard analysis would suggest.

The aims of delivering a capability boost, achieving seamless interoperability with our major allies and minimising the through-life costs of equipment are not mutually exclusive. A case in point is the acquisition of the *Super Hornet* for the RAAF. As an in-production aircraft already in service with the USN and one that offers a relatively easy transition from the existing *Hornets*, there were no alternatives that could constitute a compelling case in the short or medium term.

But, because of past decisions, there does not seem to be a corresponding case for off-the-shelf US-sourced naval helicopters. We have made significant investments in the MRH-90 for Navy and Army and into Australian industry (it would almost certainly have been cheaper to buy the aircraft from European

production lines). Together with the choice of the MU-90 as the preferred ASW torpedo, these decisions leave us well-placed to harvest some of the efficiencies that should follow from fleet rationalisation.

Of course, previous investments are sunk costs and it is only future costs and benefits that should influence the decisions to be made in the next couple of years. But, on balance, it appears that there remains a strong case for sticking with the policies that drove those earlier decisions. The snag is that the *NFH* is still developmental and not yet in service with proven capability and operationally-tested support costs and logistics footprint. But, if the SCAP does its job and stabilises the *Seahawk* for continued operations, the timeframes for production of the *Romeo* and the planned in-service date of the *NFH* should allow for a comparison of two mature systems.

When considering the first-pass approval of the future naval combat helicopter, the government could usefully think about the bigger picture and the aims that have led to the current state of play with respect to the ADF's helicopter fleet. So the conclusion is a reiteration of ASPI's earlier one. In a period of apparent strategic calm, we should wait until hard data on both options becomes available and we should resist any temptation to opt for a solution that is expeditious in the short term unless we can be sure that we have identified the best through-life solution.

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Endnotes

1 *Australian naval combat helicopters-the future*, Special Report 21, February 2009. Available at http://www.aspi.org.au/publications/publication_details.aspx?ContentID=200&pubtype=10

2 The current *Seahawks* in the RAN are a *Bravo* variant (designation S-70B2). In this paper we will usually refer to them as *Seahawks* and the USN's current MH-60R variant will be called '*Romeo*'.

3 The first aircraft will enter service towards the end of 2009, but will be configured only for utility and search and rescue duties. The full military configuration, with anti-submarine and anti-ship systems, as well as electronic support measure systems, will enter service in 2011.

4 According to the *Department of the Navy Fiscal Year (FY) 2009 budget estimates; Aircraft Procurement, Navy, Volume 1*, eighteen aircraft will be procured for the USN in each year 2009–13 inclusive, with twenty-six more after that date. Export sales would further increase the longevity of the line.

5 *Defending Australia in the Asia Pacific Century: Force 2030*, Defence White Paper 2009, 2 May 2009, paragraph 9.16. Available at http://www.defence.gov.au/whitepaper/

6 *Defence Capability Plan 2009*, available at http://www.defence.gov.au/dmo/id/dcp/DCP_2009.pdf

7 *The enemy below: Anti-submarine warfare in the ADF*, ASPI Special Report 2, March 2007, available at http://www.aspi.org.au/publications/publication_details.aspx?ContentID=116&pubtype=10

8 These dates are the mid range of the year of decision in the DCP2009. The actual DCP 2009 dates are FY2009–10 to FY2010–11 and FY2010–11 to 2011–12 respectively. Unless otherwise stated, all planning dates here are the mid-point of the ranges quoted in the DCP.

9 The DCP 2009 cost band is $100–500m (towards the lower end of the band) for each phase.

10 This effect was very clearly shown in the force structure costs presented in *Strategic choices: Defending Australia in the 21st century*, Strategic Insight 45, December 2008. Available at http://www.aspi.org.au/publications/publication_details.aspx?ContentID=193

11 *Defence Capability Plan 2006–16*, p.39, available at www.defence.gov.au/capability/Outputs/docs/DCP_2006-16.pdf

12 *$25 million expansion of helicopter facility to produce new helicopters for ADF*, Minister for Defence Press Release 117/05, 18 July 2005.

13 An account of the MU-90 acquisition decision and subsequent events by Gregor Ferguson can be found in *The Cost of Defence: ASPI Defence Budget Brief 2009-2010*, available for purchase at http://www.aspi.org.au/publications/publication_details.aspx?ContentID=215&pubtype=3

About the Author

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