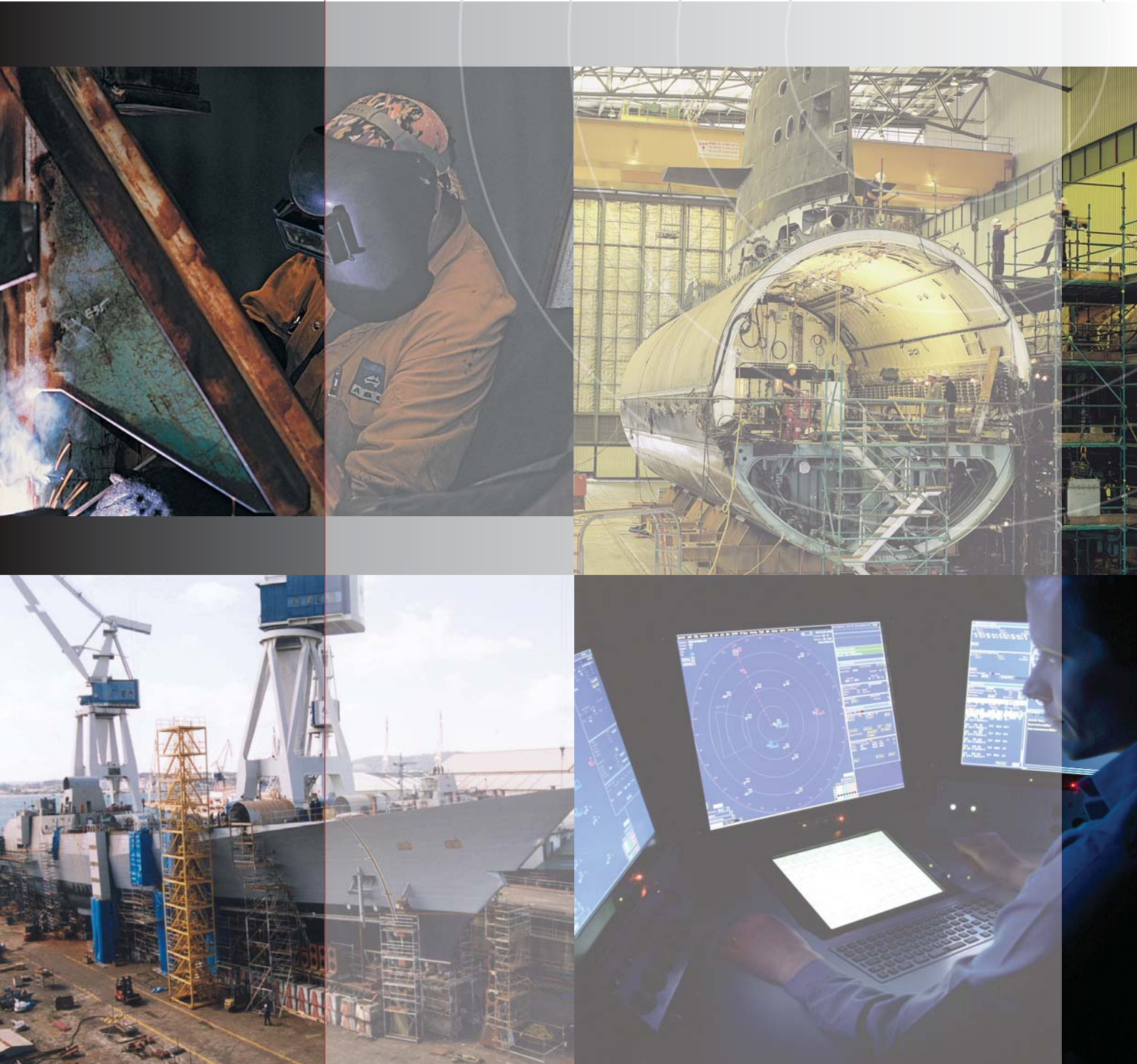


# NAVAL SHIPBUILDING

Australia's \$250 billion Nation Building Opportunity

## EXECUTIVE SUMMARY



## **ACKNOWLEDGEMENTS**

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The Board would like to recognise key contributions from members of the Board's maritime sub-committee:

- General Peter Cosgrove AC MC
- Professor Kim Beazley AC
- Dr Ian Chessell
- Mr Malcolm Kinnaird AC
- Rear Admiral Trevor Ruting AM CSC RANR
- Vice Admiral David Shackleton AO RANR
- Dr John White.

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# FOREWORD

The last two Defence White Papers (and especially the 2009 White paper) literally wrought a 'sea change' in the nation's defence posture. There has been a reorientation of our maritime capabilities evidenced by such initiatives as the Air Warfare Destroyers, a substantially increased submarine force, a new future class of frigates, an enhanced maritime surveillance capability and a broad step-change in the potency of maritime munitions. This adds up to the most ambitious and significant array of Defence acquisitions since World War II.

We will spend as a nation \$250 billion over 30 years on naval ships and submarines – a huge infrastructure project within Australia by any measure. This creates the opportunity, indeed, the need, to revolutionise the efficiency and cost effectiveness of naval shipbuilding and through-life support, and to develop a sustainable national industry and skills capability which will flow through to other 'high tech' industries. Apart from cost efficiencies for Defence, the program will be a driver for jobs growth and improved social well being across the nation.

As a leading State in naval ship building and systems engineering, South Australia is committed to ensuring that this vital national project is achieved efficiently and successfully. Over the past 12 months, the Defence SA Advisory Board, in consultation with a broad range of stakeholders, has prepared a discussion paper on naval shipbuilding which explores the fundamental paths to efficiency and cost effectiveness and embraces a 'whole of nation' solution.

I commend this paper to you as a key milestone in driving toward a pragmatic and timely outcome.



**General Peter Cosgrove AC MC**

**Chairman**

**Defence SA Advisory Board**



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The 2009 Australian Defence White Paper placed naval power at the centre of its plan for the future Australian Defence Force. The Government's vision is for a Royal Australian Navy which is longer-ranged and more heavy-hitting than its antecedents. This will be no small undertaking. In the past 20 years, Navy has commissioned 40 vessels totalling around 140,000 tonnes. Over the next 20 years, the White Paper fleet will require at least 48 new vessels totalling well over 200,000 tonnes – on top of the 65,000 tonnes already being constructed under the amphibious ship and air warfare destroyer projects.

The potential cost is \$80-100 billion for acquisition, with through-life support likely to take the total amount to \$200-250 billion. Compare this quarter-trillion dollar infrastructure investment to the \$8 billion (in today's dollars) cost of the Snowy Mountains Scheme and the nation-building potential inherent in this naval expansion is obvious.

One of the greatest challenges will be the future submarine project, described by Minister Combet as 'the largest defence acquisition this country has ever engaged in'. That we are able to contemplate what is possibly Australia's most complex and sophisticated industrial project speaks volumes for the competency and capacity of Australian industry today.

The Government's aim is to complete as much of the work as possible in Australia. We are well-placed to build on successful previous projects, but the sheer volume of future work means that we cannot rely on things 'being right on the night'. A rigorous examination of current structural issues and policy settings is required.

## **Key Findings**

This paper seeks to inform the debate about the future of naval shipbuilding in Australia. Developing, realising and sustaining the Navy of the future will not only be a major industrial challenge, but also presents a major strategic opportunity to capitalise on substantial government investment in this sector over the past 25 years. A coherent and forward-looking policy framework is required and successful management of the future program will require every element of the sector to be working efficiently. Some restructuring will be inevitable.

Properly managed, with a coherent overarching view of the naval shipbuilding sector, the effort can be leveraged into a sustainable strategic national industrial capability. The aggregation of skills and competencies will pay dividends well beyond the naval shipbuilding sector, providing flow-on benefits to the broader high-tech sector. The intellectual capital developed for complex shipbuilding projects would also be directly applicable to areas such as the energy, resources and infrastructure sectors.

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Australia has a good record with naval projects despite some early challenges with the Collins project and has delivered a series of successful outcomes, sometimes in sharp distinction to other defence projects in Australia and overseas. But new projects have sometimes had to relearn hard-won lessons, and skilled workforces have had to find work elsewhere because of a 'stop-start' approach. We have been good at putting the right team in place to produce a quality outcome for specific projects but have been less good at retaining them for the next one – the Air Warfare Destroyer program had to rebuild a capability that had largely dissipated when the ANZAC program moved into the production phase.

Major Australian naval shipbuilding projects have used either a fixed-cost, single prime contractor model (ANZAC and Collins) or, more recently, an alliance model with the Commonwealth taking a more active role (AWDs). But the quest for best practice necessarily involves an evolution of business models. What worked well in the industry and technology environment of the 1990s need not be the model of choice for the next 20 years.

Improvements to current business models might be implemented at two levels. Firstly, the skills base required to build new ships strongly overlaps those required to support them through-life. It is highly desirable to manage work flows in order to retain essential workforce skills. Boom-and-bust models do not work well in a sector that requires high levels of individual and team-level expertise and experience.

Secondly, the effectiveness of the Australian market at the prime contractor level needs testing. The performance of Australian shipyards has sometimes been world class; at other times it has fallen short. But data is patchy and there is no consistent benchmarking. A study that provides a 'ground truth' on Australian performance against international standards could provide the base required for rational decision-making.

## **Options for Consideration**

Australia currently has several primary contractors, but that may not be in our best interests. There is an established trend towards rationalisation of the shipbuilding sector. This is not unique to Australia and other countries have already made significant changes. The British Government has opted for a single naval shipbuilding prime contractor, operating under a strategic agreement with the Ministry of Defence.

ASC is a potential candidate to become Australia's sole naval shipbuilder. It would be necessary to ensure transparency and competitiveness, but the apparent reduction in competition in this model would need to be offset by more innovative program and contract arrangements. Also, incentive and capability payments could be structured to promote world's-best practice. One way would be to integrate into ASC a Platform System Engineering Agent (PSEA). The PSEA would supply sub-contractors with platform designs, and manage configurations. It could also monitor subcontractor performance, using the best results of each to improve performance in the others.

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Good governance and experienced and focused management from board level down would be required, but this arrangement potentially offers the best value for Australia. Alternatively, the Government could opt for a different single shipbuilder. But establishing a new organisation, rather than building on the experience and investment in ASC, would introduce greater risk.

The single shipbuilder model is not the only possibility. An alternative is consolidation below the prime contractor level. A single national PSEA could work with a number of shipbuilders and supply platform designs and configuration management across the sector, allowing for further consolidation of systems throughout the fleet.

## **Enhancing the Efficiency of the Build Program**

As well as reform of the shipbuilding sector, the fleet composition will impact overall build program efficiency. Short production runs necessarily incur a higher proportion of fixed costs than longer runs (program management, skills development, infrastructure, etc). Building more units allows fixed costs to be amortised over a greater number of hulls. As well, production efficiency improves as the workforce gains experience with the design. This might mean, for example, that it would be advantageous to build more Air Warfare Destroyers after the three (or four) currently planned to provide at least some of the hulls for the future surface combatants. Alternatively, the future surface combatants could be the start of a continuous build run.

The benefit of commonality across the fleet extends beyond the hulls. Platform System Engineering Agents and Combat Systems Engineering Agents could work across the program, facilitating rationalisation of on-board systems. By choosing systems and architectures suitable for a range of vessels and operational tasks, the through-life cost of the fleet can be reduced. High-level examples include the combat and propulsion control systems. But the concept can extend down to platform systems such as diesels, pumps, air conditioning, refrigeration, motors and electrics.

Maintaining an even work flow across the shipbuilding sector may require a rethink of fleet management. The lifetime of surface vessels could be reduced from the current typical 30 years to perhaps 20 or 25, allowing for a 'rolling-production' model with designs kept in production. The capability outcomes are likely to be positive as well. Major mid-life upgrades have historically been problematic, with cost and schedule overruns being common. Rolling-production and evolutionary enhancements could allow them to be avoided altogether. The size of the fleets under consideration – particularly the submarine fleet – means that rolling production is an especially appealing option, potentially allowing hard-won skills to be retained.

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## **Conclusion**

The Government's proposed program of naval shipbuilding is of immense national importance. The public investment of \$250 billion – with as much to be spent in Australia as possible – is without precedent, and will demand the highest standards of management, governance and accountability.

The naval shipbuilding sector has performed well in the past and has demonstrated the ability to reform itself to meet new challenges. But the quantum leap in tonnage and sophistication of the vessels to be built and supported throughout the life of the platform means that further evolution is required.

Properly managed, the rewards could be far reaching. Not only could we build a strategic and enduring national naval shipbuilding capability, but also in the process boost the Australian economy and the national skills base, and promote local innovation. Defence and Navy will be important players but, because of the breadth of the possible flow-on benefits to other industries, the discussion on the way ahead must be national.

This is an ambitious, but achievable, program. What is needed now is the vision and policy direction to achieve a 'whole of nation' solution.

## **FURTHER INFORMATION**

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