The Senate

Economics References Committee

Part II

Future of Australia's naval shipbuilding industry Future submarines

November 2014

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Acronyms and abbreviations

ADF	Australian Defence Force
ADI	Australian Defence Industries
AIDN	Australian Industry and Defence Network Inc.
AIP	Air-independent propulsion
AMWU	Australian Manufacturing Workers' Union
ANAO	Australian National Audit Office
AOR	Auxiliary Oiler Replenishment
ASC	ASC Pty Ltd, formerly Australian Submarine Corporation
ASPI	Australian Strategic Policy Institute
AWD	Air Warfare Destroyer
CDF	Chief of the Defence Force
CEO	Chief Executive Officer
CIR Div	Capability Investment and Resources Division
CGT	Compensated Gross Tonnage
CPRs	Commonwealth Procurement Rules
CS Div	Capability Systems Division, Capability Development Group
DCP	Defence Capability Plan
Defence	Australian Defence Organisation
DMO	Defence Materiel Organisation
DSME	Daewoo Shipping and Marine Engineering
DSTO	Defence Science and Technology Organisation
FFG	Guided Missile Frigate
FMI	First Marine International
FMS	Foreign Military Sales

FSC	US Federal Supply Codes
GDP	Gross Domestic Product
HMAS	Her Majesty's Australian Ship
IMO	International Maritime Organization
JSF	Joint Strike Fighter
LCS	Littoral Combat Ship
LHD	Landing Helicopter Dock ship
LPA	Landing Platform Amphibious transport
MOTS	Military-off-the-shelf
MSI	Mission Systems Integrator
NPOC	Net Personnel and Operating Costs
NSC	National Security Committee of Cabinet
PP	Production Package
RAN	Royal Australian Navy
RAS	Replenishment at Sea
RFT	Request for tender
RINA	Royal Institution of Naval Architects
SME	Small and medium sized enterprises
TKMS	ThyssenKrupp Marine Systems
TLS	Through-life support
UK	United Kingdom
US	United States of America
VERTREP	Vertical Replenishment
VFM	Value for money

Executive Summary

The interaction between Australia's unique geographic, strategic, military and political qualities are perhaps most evident in its choice of submarine. Australia is a geographically isolated middle power with a significant leadership role in the Asia-Pacific region. We have a small but powerful military with a wide-ranging remit, including the protection of far-flung sea lanes that we rely upon for our prosperity.

These factors, alongside Australia's decision to opt for a conventional submarine, place Australia in a unique situation. We require a submarine that can travel very long distances, remain on station for long periods of time and perform a wide range of tasks. Australia's future submarine will be a vital part of the Royal Australian Navy's fleet past the middle of this century, so it must provide the best capability at a competitive price for Australian taxpayers.

The future submarine project is now approaching a critical stage. It is, therefore, timely that this committee has examined the options available to the government for this vital strategic capability.

The committee resolved on 28 October 2014 to report its findings to the Senate. The committee took this step because it feared that critically important decisions were about to be made without adequate public consultation and moreover without a fair, proper and transparent competitive tender process.

Evidence provided to the committee by subject matter experts, including Australia's foremost submariners and ship building experts, was compelling.

This evidence has driven the committee to make the following recommendations:

- 1. The government should not enter into a contract for the future submarine project without conducting a competitive tender for the future submarines, including a funded project definition study.
- 2. The government should begin this competitive tender immediately to ensure a submarine capability gap is avoided.
- 3. Given the weight of the evidence about the strategic, military, national security and economic benefits, the committee recommends that the government require tenderers for the future submarine project to build, maintain and sustain Australia's future submarines in Australia.
- 4. The government should formally and publically rule out a military-offthe-shelf (MOTS) option for Australia's future submarines.
- 5. The government should strengthen and build a more collaborative relationship with Australia's Defence industry and engender a co-operative environment in which industry is encouraged to marshal its resources in support of a broader Australian shipbuilding industry capable of acquiring and building a highly capable fleet of submarines.

The need for a competitive tender

There are significant technical, commercial and capability gap risks invoked by prematurely and unilaterally committing to a preferred overseas, sole-source supplier.

Dr John White

If the Government were to make it known that it was sole-sourcing a contract...then it would place that Government in a negotiating position where it would be difficult, if not impossible, to get a good deal on both price and terms and conditions. This would de facto expose Australia to an unacceptable level of risk in the national security domain.

Professor Goran Roos

The only way to pick it is to conduct a competitive project definition study where you can get the answers back to your top-level requirements.

Rear Admiral Peter Briggs (Rtd)

It just beggars belief that you would go with one provider without testing the market.

The Hon Martin Hamilton-Smith, South Australian Minister for Defence Industries

You will never know the true potential cost of a project until you get multiple companies to put their names to dollar figures on firm tender bids.

Mr Chris Burns, Defence Teaming Centre

Witness after witness gave emphatic and overwhelming support for the government to conduct a competitive process before choosing Australia's future submarine. Witnesses agreed that decisive action must be taken to start the tender but insisted that there was time for a competitive process where all proposals from tenderers could be tested and their claims validated.

The reasons for holding a competitive tender are numerous and compelling. It is the only way that we can ensure that Australia secures a conventionally-powered submarine that meets our unique requirements at a price that is competitive for Australian taxpayers.

Witnesses outlined a process and timeline for a competitive tender to acquire the future submarines that would:

- challenge assumptions, interrogate assertions, question and compare proposals and finally allow specialist engineers and technicians to test and evaluate the tenderers' claims to ensure that the capability proposed is deliverable;
- place tenderers under competitive pressure so that they develop an optimal solution for Australia;

- stress test the costings associated with the proposals, compare costings to ensure value for money and pro-actively manage the risks associated with the proposals;
- ensure that the integration of other desired systems (particularly the combat system) is compatible with the proposed designs; and
- provide the means to give priority to an Australian build for the submarine and maximise Australian content in the submarine.

The committee understands that Australia requires international partners to assist in the design to build a world-class submarine.

The only way to ensure that Australia has access to the very best technology and is assisted by capable and reliable partners who share Australia's commitment and ambitions is through a competitive tender. Anything short of this process would be scandalous and place the future submarine at unnecessary risk.

Recommendation 1

The committee recommends that the government not enter into a contract for the future submarine project without conducting a competitive tender for the future submarines, including a funded project definition study.

The tender should invite at least two bidders, preferably up to four, to participate.

The tender for the future submarine project should be conducted in line with the committee's recommendations and the guidelines set out in the Defence Policy Procurement Manual.

A request for tender should invite the bidders to provide the Commonwealth with:

- a Project Definition Study and preliminary design that meets Top Level Requirements; and
- a pricing arrangement to build a certain number of submarines and provide ten vessel years of integrated logistics support, post commissioning.

Avoiding a capability gap

There is still sufficient time available, with adequate contingency, for the competitive PDS to be carried out and to build the Future Submarines in Australia.

Dr John White

There does not have to be a capability gap if we get on with it now.

Commodore Paul Greenfield (Rtd)

Our strong recommendation is that we get bids from all four potential contenders and make a sensible, informed choice at that point and that we get on with it, because the clock is running.

Rear Admiral Peter Briggs (Rtd)

Several independent witnesses gave evidence that there remains sufficient time to conduct a competitive tender for the future submarines while avoiding a capability gap.

This is due to the work on the future submarines undertaken by the previous government.

In his evidence, Dr John White set out a timetable that included a competitive tender process, contracting, construction, testing and introduction to service without a capability gap.

If followed, this timetable would allow the government to obtain the best submarine capability at the best price, while avoiding a capability gap.

Recommendation 2

The committee recommends that the competitive tender process for the future submarines begins immediately.

As noted by several independent witnesses, there remains sufficient time to conduct a competitive tender for the future submarines while avoiding a capability gap. This is due to the work on the future submarines undertaken by the previous government.

In his evidence, Dr John White set out a timetable that included a competitive tender process, contracting, construction, testing and introduction to service without a capability gap.

If followed, this timetable would allow the government obtain the best submarine capability at the best price, while avoiding a capability gap.

Australia can build our future submarine fleet

The future submarine should be designed specifically for Australia and built here in Australia. A sail-away cost of \$20 billion for 12 submarines built in Australia is entirely feasible, and Australian industry has much to offer in solving the truly unique engineering challenges.

Commodore Paul Greenfield (Rtd)

It is better to build to ensure that you have the skills to maintain.

Mr Glenn Thompson, Australian Manufacturing Workers' Union

Australia as a country is at least \$21bn better off to build in Australia than to purchase overseas in addition to creating 120,000 man years of additional jobs in the economy over the life of the project as compared to building overseas.

Professor Goran Roos

When the host nation stopped operating them, the supplies dried up and we had occasions where submarines were unable to sail because of vital components and spare parts that were unavailable.

Commander Frank Owen (Rtd), Submarine Institute of Australia, on Australia's Oberon-class submarines (built in the United Kingdom)

The committee has found that Australia has the capacity and capability to build the future submarines in Australia and that our shipyards have the capability to deliver the submarines at an internationally competitive price for the Australian taxpayer.

The complexity of the submarine and its critical role in Defence's capability strengthens the link between local construction and its maintenance and upgrade over the length of the submarine's operational life.

Indeed, a number of witnesses noted that the submarine would be one of the critical Defence assets where reliance on overseas suppliers could compromise operational independence and ultimately Australia's national security.

Recommendation 3

Given the weight of the evidence about the strategic, military, national security and economic benefits, the committee recommends that the government require tenderers for the future submarine project to build, maintain, and sustain Australia's future submarines in Australia.

When selecting its preferred tenderer the government must give priority to:

- Australian content in the future submarines; and
- proposals that would achieve a high degree of self-reliance in maintaining, sustaining and upgrading the future submarines in Australia for the entirety of their lifecycle.

Rule out the MOTS option

There are no MOTS options. Even the most capable of available overseas submarines will require modification.

Commander Frank Owen (Rtd), Submarine Institute of Australia

A MOTS design will not suit Australia and the design will have to be heavily modified. A MOTS design even slightly modified ain't MOTS. There is no shortcut.

Commodore Paul Greenfield (Rtd)

It is apparent therefore that SORYU would need to be heavily modified to meet the Australian requirements, particularly for long ocean transits and patrols. This would carry cost, performance and schedule risks and will amount to a new design; it will not be a Military Off The Shelf (MOTS) acquisition.

Rear Admiral Peter Briggs (Rtd) and Commodore Terrence Roach (Rtd)

CHAIR: Are you saying that, if we went from where we are now to here, we would be going backwards?

Commander Roach: If we went with Soryu, as described in that publicly available information, yes, we would.

Buying an off-the-shelf submarine with a 6,000-mile range would be worse than a waste of money; it would be an illusion. You will think you have submarine capability and the day you want to use it you will find that it cannot get there or stay there and do the job.

Rear Admiral Peter Briggs (Rtd)

If a Soryu and a Collins left Fleet Base West near Perth together and travelled at 10 knots to Darwin, the Soryu might not actually make it or, if it did, it would be very low on fuel.

Commodore Paul Greenfield (Rtd)

A number of people with a great depth of knowledge and experience of submarines and their technologies have given evidence to the committee that there are no militaryoff-the-shelf submarines that meet Australia's needs.

In May 2013, the previous government suspended investigation of a MOTS option for the future submarine program, in order to focus on the 'new design' and 'son-of-Collins' options.

Given the evidence provided to the committee, particularly in relation to the inadequacy of the current Japanese Soryu submarine to meet Australia's needs, there does not appear to be any benefit in reopening this option for further evaluation.

Recommendation 4

The committee recommends that:

- The government formally and publically rule out a MOTS option for Australia's future submarines.
- The government focus its efforts on the 'new design' or 'son-of-Collins' options for Australia's future submarines and suspend all investigations for acquiring a MOTS submarine, including the current Japanese Soryuclass.

A national endeavour requires nation-wide support

The South Australian government feels that the country has successfully built both naval ships and submarines in South Australia using overseas designed technology transfer; and now, with even more experience under our belts, there is no reason Australian industry and Australian workers cannot do it again.

The Hon Martin Hamilton-Smith, South Australian Minister for Defence Industries

Australia is much better prepared than it was in the 1980s, when it was decided to design and build Collins. Since then we have learned and achieved so much. Our industry partners include specialist submarine support businesses—such as Babcock, Pacific Marine Batteries and MacTaggart Scott—approximately 120 small to medium enterprises and more than 2,000 associated companies that supply products and services.

Mr Stuart Whiley, Interim CEO ASC

A vibrant and sustained naval shipbuilding industry of all shapes and forms is vital to our self-reliance.

Mr Malcom Jackman, Defence SA

Australian industrial tenacity and innovation turned the project around to the point where we now operate among the most capable conventional submarines in the world.

Mr Chris Burns, Defence Teaming Centre, on the Collins submarine

The May 2014 Portfolio Budget Statement identified the following key risk for the future submarine project:

...the mobilisation of resources across Government, industry and academia necessary to manage the Future Submarine Program with appropriate

international support, informed by our experience and knowledge of similar programs. $^{\rm l}$

Evidence before the committee clearly indicates that this particular risk, especially of mobilising the resources of industry and academia, has yet to be addressed.

In fact, the process so far has had the opposite effect—it has tended to ignore, even isolate, defence industry and exclude submarine subject matter experts.

The committee believes that the government and Defence need to reverse this tendency quickly and begin a more transparent and open process that would allow much greater collaboration and feedback from industry, state governments, community organisations and specialists, including the community of retired submariners whose wealth of knowledge and experience should be tapped.

The committee believes that if the future submarine project is to be a truly nation building endeavour then Australians need to be involved.

Recommendation 5

The committee recommends that Defence and the government start immediately to:

- strengthen and build a more collaborative relationship with Australia's Defence industry and engender a co-operative environment in which industry is encouraged to marshal its resources in support of a broader Australian shipbuilding industry capable of acquiring and building a highly capable fleet of submarines;
- listen to the technical community's concerns about risk—the technical community, supplemented by outside expertise from industry and allied technology partners, understand the state of technology and the degree to which a new design extends that technology;
- consult with retired naval engineers and submariners, especially those who have been involved in reviews of the Collins class submarines and subsequent reforms, and include the most knowledgeable and experienced in a first pass gate review;
- work with Australian and Australian-based businesses, from prime contractors to small and medium businesses, to ensure that the contribution that can be made by Australian industry is identified and integrated as much as possible into the project plan;
- ensure that opportunities to improve skills and upgrade facilities, particularly those that have multiple uses, are identified so that

¹ Portfolio Budget Statements 2014–15, Defence Materiel Organisation, <u>http://www.defence.gov.au/budget/14-15/pbs/2014-2015_Defence_PBS_04_DMO.pdf</u> (accessed 27 September 2014).

investment in the human and physical capital required for this project is maximised;

- risks associated with the transfer of technology are anticipated, identified brought promptly to the government's attention and managed effectively—such risks go beyond securing the rights to IP and also take account of potential or real political and cultural incompatibilities; and
 - experienced and senior people in key management positions are involved in the project—this requires a strategy to grow people so they are experienced in various disciplines.

Chapter 1

Introduction

1.1 On 25 June 2014, the Senate referred the matter of the future of Australia's naval shipbuilding industry to the Senate Economics References Committee for inquiry and report by 1 July 2015. The term of reference for the inquiry is straightforward yet comprehensive in its coverage—the future sustainability of Australia's strategically vital naval ship building industry.

Conduct of inquiry

1.2 The committee advertised its inquiry on its website and in the *Australian* seeking views directly from a range of people interested in the future of Australia's naval shipbuilding and repair industry. In addition, the committee wrote to, and invited submissions from shipbuilders, suppliers, unions, professional associations and individuals engaged in the shipbuilding industry such as engineers and architects as well as academics and economists. The committee also invited state governments and relevant Commonwealth government departments to lodge written submissions.

Submissions and hearings

1.3 To date, the committee has received 26 submissions as well as additional information, listed at Appendix 1. The committee also received over 250 brief messages supporting strongly Australia's naval shipbuilding industry and urging the government to ensure that the future submarines would be built in Australia. The committee has held five public hearings so far in 2014:

- 21 July in Canberra, which concentrated solely on the tender for the Navy's two new supply ships;
- 30 September in Canberra, which focused on the acquisition of the future submarines;
- 8 October in Newcastle;
- 13 October in Melbourne; and
- 14 October in Adelaide.

A list of witnesses is at Appendix 2. References to the committee Hansard are to the proof Hansard and page numbers may vary between the proof and the final Hansard transcripts.

Site visits

1.4 The committee also undertook site visits to shipbuilding and Defence facilities. In Melbourne, the committee visited the BAE Systems Williamstown dockyard and, accompanied by Captain Craig Bourke and Mr Bill Saltzer, toured BAE

facilities including the plate shop, panel line and profile cutter, a module hall, blast and paint, the dry dock and slipway. The committee also inspected the Landing Helicopter Dock (LHD) ships at Nelson Pier.

1.5 In Adelaide, committee members visited the Air Warfare Destroyer (AWD) Systems Centre, where they were briefed by Mr Warren King, CEO, Defence Materiel Organisation (DMO), Mr Peter Croser, AWD Program Manager and Commodore Steve Tiffen, General Manager Stakeholder Engagement. Committee members met Mr Roger Duffield, AWD Platform System Coordinating DAR and toured ASC's AWD shipyard to see construction progress of AWD Ship 01 and Ship 02.

1.6 Committee members then visited ASC North, where Commodore John Chandler provided an introductory briefing. Members toured the shipyard to view maintenance reforms and work being carried out on the submarines. They inspected a Collins class submarine. To conclude the visit, ASC CEO Stuart Whiley provided an ASC presentation and was available to answer questions.

Part I—tender process for Navy's new supply ships

1.7 As part of this broad inquiry into Australia's naval shipbuilding industry, the committee resolved to inquire into the tender process for the Royal Australian Navy's (RAN) new supply ships as its first order of business. The committee's decision was prompted by the government's announcement on 6 June 2014 that it had given approval for Defence to conduct a limited competitive tender between Navantia of Spain and Daewoo Shipbuilding and Marine Engineering of South Korea for the construction of two replacement Auxiliary Oiler Replenishment (AOR) ships. The Minister for Defence claimed that the decision to exclude Australian companies from the tender and involve only two overseas companies was due to: the urgent need to replace the vessels and avoid a capability gap; the current low productivity of shipbuilders involved with the AWD project; and value for money considerations.¹

1.8 During this inquiry into the acquisition of the AORs, the committee considered the need and importance of the supply ships to the Australian Navy, the capacity of Australian industry to build the ships and the contribution that such construction could make to sustaining Australia's naval shipbuilding industry. Evidence taken on the tender process for the new supply ships highlighted a number of concerns. They related to the lack of contestability and competition in the limited tender, the lack of industry engagement in the process undertaken so far and the absence of long-term strategic planning that led to the decision.²

 ^{&#}x27;Minister for Defence—Boosting Australia's maritime capabilities', Media Release,
6 June 2014, <u>http://www.minister.defence.gov.au/2014/06/06/minister-for-defence-boosting-australias-maritime-capabilities/</u> (accessed 4 August 2014).

² Senate Economics References Committee, Part 1, *Future of Australia's naval shipbuilding industry: Tender process for the navy's new supply ships*, August 2014, p. 98.

1.9 In particular, the committee found that Defence had not consulted with industry or encouraged open discussion about possible Australian engagement with the project. Indeed, it appeared as though local shipyards were shut out of all consideration. In this regard, the committee formed the view that Defence should have consulted with local shipyards and allowed them to present their case when it came to building the supply ships in Australia. The committee was not convinced that a limited tender involving only two companies was the best way to obtain the necessary information to proceed to second pass.³

1.10 The committee also believed that the way in which the decision for a limited tender was taken and announced was a significant blow to Australian industry. The absence of consultation was at odds with Defence's stated industry policy objectives, which seek to promote competitive, collaborative and innovative industry.⁴

1.11 Overall, the committee concluded that decisions, such as the acquisition of the supply ships, were extremely important for both Defence capability and for the sustainability of defence industry in Australia. They involve huge amounts of taxpayers' money and have long-term implications for Navy's future procurement strategies and, importantly, its capability. In the committee's view, such decisions should be well considered, based on sound research and analysis, and informed through close consultation with industry. The committee recommended that the tender process for the two supply ships be opened up to allow all companies, including Australian companies, to compete in the tender and to make clear in the tender documents that a high value would be placed on Australian content in the project.⁵

1.12 The committee tabled Part I of its report on 27 August 2014. The report is available on the committee's website.

Part II—acquisition of future submarines

1.13 Shortly after presenting Part I of its report on the tender for the Navy's new supply ships, the committee's focus was drawn to developments regarding the future submarine project. The statement by the Foreign Minister that discussions with Japan had included the possibility of purchasing 'entire submarines' fuelled public speculation that the government planned to break its commitment to build 12 submarines in Adelaide. The major concern centred on the possibility that the government was about to make pre-emptive decisions that would effectively shut down potential and viable avenues for acquiring the submarines and again undertake a limited tender. Questions were also raised about the effects that such a decision

³ Senate Economics References Committee, Part 1, *Future of Australia's naval shipbuilding industry: Tender process for the navy's new supply ships*, August 2014, pp. xii–xiii and 93–98.

⁴ Senate Economics References Committee, Part 1, *Future of Australia's naval shipbuilding industry: Tender process for the navy's new supply ships*, August 2014, p. 98.

⁵ Senate Economics References Committee, Part 1, *Future of Australia's naval shipbuilding industry: Tender process for the navy's new supply ships*, August 2014, pp. xiii and 98.

would have on the future of Australia's shipbuilding industry and the overall success of the future submarine project. Rather than subside, talk of a possible agreement with Japan to acquire submarines for the Australian Navy persisted.⁶

1.14 In light of these developments, the committee resolved on 25 September 2014 to hold a public hearing on 30 September to further investigate the various statements and assumptions being made about the future submarine project. As noted earlier, the committee also held public hearings in Newcastle on 8 October; in Melbourne on 13 October; and in Adelaide the following day, where the committee took evidence on the future submarine project.

1.15 Given the importance of the decisions that are to be taken on the future submarines and the thrust of the evidence gathered so far, the committee resolved on 28 October to report its findings to the Senate. The committee took this step because it feared that critically important decisions were about to be made without adequate public consultation and moreover without a fair, proper and transparent competitive tender process.

1.16 The committee is firmly of the view that the future submarine project is of immense national importance and every decision relating to the project should be based on the best advice available. Having access to such advice requires that ideas and proposals are thoroughly contested and assessed objectively. Open and informed debate would confer much needed transparency on government decisions; it would allow genuine scrutiny of government decisions, provoke robust debate and engender public, industry and multi-partisan political support for the proposed acquisition. The decision to acquire the future submarines is a decision in the national interest and should be owned by Australians.

1.17 This report is intended to start this process of much needed transparency and informed debate and the committee encourages all those interested in the purchase of the future submarines to assess critically the evidence taken by the committee and to agitate for a more open and inclusive process.

⁶ See for example, Minister for Defence—Transcript—Interview with Tony Jones, Lateline, 27 August 2014, <u>http://www.minister.defence.gov.au/2014/08/27/minister-for-defence-transcript-interview-with-tony-jones-lateline-3/;</u> ABC News, 'Japanese submarine experts visit Adelaide, sparking fears for shipbuilding future', 27 August 2014, <u>http://www.abc.net.au/news/2014-08-27/japanese-delegates-spark-fears-submarine-future/5699076;</u> 'Johnston plays down SA submarine fears', 27 August 2014, <u>http://www.news.com.au/national/breaking-news/sa-govt-fears-over-submarine-project/story-e6frfku9-1227038567300;</u> Minister for Defence—Transcript—Interview with Justin Smith, 2UE Drive, 9 September 2014, <u>http://www.minister.defence.gov.au/2014/09/09/minister-for-defence-transcript-interview-with-justin-smith-2ue-drive/</u> (accessed 27 September 2014); ABC News, 'Soryu submarine deal: Japanese insiders warn submarine program will cost more, hurt Australian jobs', <u>http://www.abc.net.au/news/2014-09-15/japanese-concerns-over-submarine-deal/5743022</u> (accessed 27 September 2014).

Acknowledgements

1.18 The committee thanks all those who assisted with the inquiry, especially those who made written submissions and appeared before the committee at such short notice.

Chapter 2

Tender process

Recommendation 1

The committee recommends that the government not enter into a contract for the future submarine project without conducting a competitive tender for the future submarines, including a funded project definition study.

The tender should invite at least two bidders, preferably up to four, to participate.

The tender for the future submarine project should be conducted in line with the committee's recommendations and the guidelines set out in the Defence Policy Procurement Manual.

A request for tender should invite the bidders to provide the Commonwealth with:

- a Project Definition Study and preliminary design that meets Top Level Requirements; and
- a pricing arrangement to build a certain number of submarines and provide ten vessel years of integrated logistics support, post commissioning.

2.1 In this chapter, the committee looks at the arguments for and against a competitive tender and at the schedule for the process and considers whether there is sufficient time to conduct a competitive process.

2.2 Without doubt, the choice of the designer and builder for Australia's future submarines is a critically important decision. Not only is the future submarine an expensive acquisition but the fleet of highly-capable modern submarines is a vital part of Australia's Defence force. The safety and well-being of its crew is also paramount. In this context, Commander Frank Owen (Rtd) highlighted the importance of Defence making an informed and timely decision. He stated:

We need a national program that delivers a sustainable and affordable capability for the long term and not just a quick-fix replacement of the Collins-class submarines. Indeed, there are no quick fixes, just as there are no MOTS options. Even the most capable of available overseas submarines will require modification. They will rely on Australian industrial capability.¹

¹ *Committee Hansard*, 30 September 2014, p. 3.

2.3 Rear Admiral Peter Briggs (Rtd) and Commodore Terence Roach (Rtd) also placed a heavy emphasis on the need for 'careful and measured consideration of risks'.² Likewise, Professor Goran Roos noted the importance of the decision to acquire Australia's future submarines. He acknowledged that submarine systems were one of the most important advanced complex defence systems the ADF operates and recognised the vital role they play in protecting Australia's trade routes.³ Rear Admiral Briggs similarly advised:

...we do need to make the right decision and we do need to start with the right process to allow us to make the right decision.⁴

Speculation regarding limited tender

2.4 A number of witnesses thought that the government was not on course to deliver the best submarine. During the inquiry, they expressed concern that the government may be intending, as it did with the new supply ships, to proceed with a limited tender.⁵ For example, the Hon Martin Hamilton-Smith was of the view that the federal government appeared to 'have softened up' the Australian public by criticising Australia's current naval shipbuilding projects, including the AWD and Collins, in order to push through an off-shore build of supply ships and possibly future submarines.⁶

2.5 Mr Malcolm Jackman, Defence SA, harboured the same apprehension. As far as he was aware, DMO was not following the normal procedure for large-scale acquisitions, which was to run a 'comparative and competitive' project definition study process. He told the committee:

In terms of reading the tea leaves, so to speak, we are seeing a process that does not appear to conform to what we would expect out of DMO.⁷

2.6 Likewise, Mr Chris Burns, Defence Teaming Centre, indicated that there appeared to be a strong push towards the Japanese submarine. He observed:

Prior to the election, we were extremely confident, for instance, that the submarines were going to be built in South Australia. It is undeniable that, since that time, there seems to be a walking-away from the commitment to building those submarines in South Australia.⁸

- 6 *Committee Hansard*, 14 October 2014, p. 3.
- 7 *Committee Hansard*, 14 October 2014, p. 8.
- 8 *Committee Hansard*, 14 October 2014, p. 18.

² *Submission 17*, p. 8.

³ *Submission* 25, p. 21.

⁴ *Committee Hansard*, 30 September 2014, p. 9.

⁵ See for example, Mr Hamilton-Smith who raised his concern that the government may again use exemption from the Commonwealth Procurement rules to proceed with a limited tender: that Mr King would not rule out a limited tender. *Committee Hansard*, 14 October 2014, p. 3.

Competitive process

2.7 Witness after witness gave emphatic and overwhelming evidence in support of Defence conducting a competitive process.

2.8 The Hon Martin Hamilton-Smith stated that his government would like to see due process that would involve an open project definition study (PDS), 'an open process, where all the contenders put their offers on the table'.⁹ He argued that a fair and open tender was the way to achieve the best outcome for Australia.¹⁰ In his words:

It just beggars belief that you would go with one provider without testing the market. 11

2.9 Mr Jackman stated that anybody that has deep knowledge of Defence acquisition would say that a competitive comparative PDS was clearly the process to go through.¹²

2.10 Mr Burns similarly argued that a competitive tender was the only way to validate claims made by industry contractors. He explained that you cannot test how much a project is going to cost, including whole-of-life cost benefits, until you go to a fully open and transparent tendering process.¹³ In his view:

When I say 'open and transparent tendering processes', I specifically exclude the sole source and limited tenders being suggested for the future submarines or the farcical situation of Australian industry being specifically excluded from tendering for the replacement of replenishment ships. You will never know the true potential cost of a project until you get multiple companies to put their names to dollar figures on firm tender bids.¹⁴

2.11 He underlined the fact that it was not just a question of price but 'the capacity to actually do the job'.¹⁵

2.12 Mr Brice Pacey also favoured a competitive tender, suggesting that deep consultation with other players would be worthwhile.¹⁶ In 2012, Mr Pacey recommended that the next generation submarine should be an evolution of the Collins design. Since then, however, he has formed the view that if there were new options, they should be considered. He thought that the best way to do that would be

⁹ *Committee Hansard*, 14 October 2014, p. 13.

¹⁰ *Committee Hansard*, 14 October 2014, p. 4.

¹¹ Committee Hansard, 14 October 2014, p. 8.

¹² *Committee Hansard*, 14 October 2014, p. 9.

¹³ *Committee Hansard*, 14 October 2014, p. 18.

¹⁴ *Committee Hansard*, 14 October 2014, p. 16.

¹⁵ *Committee Hansard*, 14 October 2014, p. 18.

¹⁶ Mr Pacey authored Kokoda Paper No. 17, *Sub Judice: Australia's Future Submarine*, January 2012.

through a competitive tender process of some sort, which would be 'entirely consistent with this government's philosophy'.¹⁷ He explained that he had been working in the private sector a long time and thought that potential suppliers need to be put under pressure in order to come up with the optimal solution.¹⁸ He stated:

I think that any alternative, any new opportunity, should be put under the same sort of scrutiny the Collins was in the original competitive process. The exact form of that competition is open for negotiation.¹⁹

2.13 In essence, Mr Pacey agreed with the view that an open, transparent tender process with competitive tension would be good for both the design and the taxpayer and would be the only way to proceed.²⁰

2.14 Dr John White, who participated in the 2014 independent review of the performance of the AWD program, explained the need for funded, competitive PDS to properly and rigorously form up the future submarine project.²¹ In his view, it was appropriate to explore all options—Japanese, Korean, German or Spanish options. He insisted that there was a definite need to have an open process where claims are stress tested and certainty obtained about Australia achieving value for money and maximising the strategic, employment or industrial benefits for the Australian public.²²

2.15 Dr White repeated his contention that the various claims of the contractors who can build submarines suitable for Australian conditions can be best tested by a competitive tender process. He suggested that the claims 'need to be put under some tension, some pressure'. Furthermore, that it was not only the company, the designer, which should be scrutinised but also 'the industry base of that country, the support of the military and the government of that nation'. Put succinctly, he stated:

Unless there is a prize at the end and some competitive tension, the experience is that you really do not get the best offer.²³

2.16 Drawing on the Collins class experience, he explained that under competitive pressure from other countries, the German bidders agreed to comply 'with the

- 22 Committee Hansard, 13 October 2014, p. 32.
- 23 Committee Hansard, 13 October 2014, p. 28.

¹⁷ *Committee Hansard*, 30 September 2014, p. 30.

¹⁸ *Committee Hansard*, 30 September 2014, p. 32.

¹⁹ Committee Hansard, 30 September 2014, p. 32.

²⁰ Committee Hansard, 30 September 2014, p. 32.

²¹ *Committee Hansard*, 13 October 2014, p. 27. Dr White conducted the review with Professor Winter, former Secretary of the US Navy. For further details on Dr White's extensive experience in the area of major construction programs including the acquisition of naval vessels see *Committee Hansard*, 13 October 2014, pp. 25–26.

Australian requirement for a fixed price bid to build all submarines in Australia'.²⁴ He informed the committee:

I can absolutely assure you that, if there had not been a competitive PDS with that as a subject of the competition, that bid for building in Australia would not have been forthcoming. It is every country's preference to keep the work at home. But in 1986 the Germans were able to offer a fixed price.²⁵

2.17 He argued that a competitive tender would be in the government's interests to ensure and demonstrate that the best value for money was obtained in the future submarine project.²⁶ He warned against a sole-source supplier, saying further:

There are significant technical, commercial and capability gap risks invoked by prematurely and unilaterally committing to a preferred overseas, sole-source supplier. Well-established best procurement practice in Australia and many parts of the western world is to undertake a competitive project definition studies, or PDS, process involving the potential suppliers—including or in parallel to the preferred solution, if you have one. This should be done with a view to having a viable fallback option to proceed with should, for whatever reason, the preferred solution prove not to be executable. I understand that this has sometimes been done in parallel when a US foreign military sale, or FMS, is the preferred solution in this country. So this is not new territory.²⁷

2.18 According to Dr White, choosing a sole-source supplier could lead to a capability gap for Australia's submarines. Referring to the Japanese option, he said that even if Japan were the preferred design solution, the government needs 'to develop one or two, preferably two, fallback options in parallel because we do not know for what reason the preferred option, if it is Japan's, may not be able to be brought to a contract'.²⁸ In this regard, he noted that Japan still had not approved the export of products such as the submarine. In his view, there was 'some risk in those processes going through their procedures in Japan'. He accepted that he was no expert in Japan's foreign policy, but would have thought that that process could be a year or two years.²⁹ He explained further:

If the Japanese design solution were the sole option, failure for whatever reason to achieve an acceptable contract over the next year or two—because that is how long it will take to define it—with no fully developed fallback would create significant project risk and lead to a gap, almost definitely, in Australian submarine capability.

²⁴ *Committee Hansard*, 13 October 2014, p. 29.

²⁵ *Committee Hansard*, 13 October 2014, p. 29.

²⁶ Committee Hansard, 13 October 2014, p. 27.

²⁷ Committee Hansard, 13 October 2014, p. 27.

²⁸ Committee Hansard, 13 October 2014, p. 29.

²⁹ Committee Hansard, 13 October 2014, p. 29.

That would be lost time. Overall this could lead to embarrassment for the respective governments and militaries. A separate PDS is therefore, I argue, required for each shortlisted submarine platform design option. This would be not only to finalise the existing design and details for the construction, build, specification, standards and testing regime required to validate the design but also to develop, in conjunction with the RAN the interface requirements for directed design changes, of which there will be many, including combat system control—because we are putting a US combat system in—weapons discharge, external communications, security equipment and of course Australian Navy habitability changes. Separately, those critical and sensor subsystems that may be purchased from third parties—which will definitely be the case—need to be agreed, to consider design options and their required interfaces.³⁰

2.19 As noted earlier, Dr White made the point forcefully that Australia could not afford to go down the path with only one potential supplier; 'you need to take two or three down the path so that at all times you have competition and you have a fall-back'.³¹

2.20 Professor Roos agreed with the proposition that Australia should conduct an open tender. He recognised that competitive tension between contending builders was necessary to ensure there would be the appropriate and effective transfer of technology and a substantial Australian industry participation plan. He argued that such fundamental requirements must 'be built into the procurement process if you want to accomplish the defence objectives of self-reliance for an island continent, and achieve the optimal balance between value for money and sovereign capability'.³²

2.21 He explained further that Defence would require a new class of submarine, no matter what direction was chosen because none of the existing classes in the world would meet Australia's requirements. He argued that in order to make an evaluation of the preferred submarine class, a contested project definition study was required. According to Professor Roos, this approach would be the normal way in which to 'enquire around the world for these type of complex systems that are one of a kind'. He argued that:

We should go to a contested definition study where we give each and every one of them \$10 million, we write down the problems that need to be solved—we do not need to specify anything; we just write down the problems—and we ask them to go away for 12 to 24 months and come back with a specific statement of how they intend to solve those problems, including the transfer of IP and data and so on, as well as how they intend to deal with training and associated issues to secure our sovereign capability. And we ask them what this is going to cost us. That will allow us to compare apples with apples, which at the moment we cannot do.

³⁰ *Committee Hansard*, 13 October 2014, p. 27.

³¹ Committee Hansard, 13 October 2014, p. 30.

³² *Submission* 25, p. 21.

Whomever we choose to move forward with will then be asked to move forward with an Australian industry partner—which is likely to be the one who knows how to build submarines in this domain. That is the logical way to do it.³³

2.22 Supporting Dr White's stance against sole-sourcing, Professor Roos similarly warned about the risks of undertaking a limited tender. He was also concerned about the lack of certainty with Japan's long term commitment:

If the Government were to make it known that it was sole-sourcing a contract e.g. through indicating a 'limited tender' which indicates a unilateral sole-source approach to one submarine designer only, then it would place that Government in a negotiating position where it would be difficult, if not impossible, to get a good deal on both price and terms and conditions. This would de facto expose Australia to an unacceptable level of risk in the national security domain; the political domain; the operating domain; and as previously stated the commercial domain. All this would also take place at an unusually early phase in what is a complex evaluation and procurement process.

It will be impossible if the best option was chosen unless at least one other option was pursued in parallel—also as a back-up in case the Japanese option for some reason is taken off the table by the Japanese themselves for political, performance, commercial or national security reasons. This seems unacceptable given that the submarine project is likely to be Australia's largest defence program for at least the coming 40 years.³⁴

2.23 Commodore Paul Greenfield (Rtd) reinforced the view that a designer should be selected through 'a due diligence process to ensure the right decision is made'. In his view, this process could be:

...through a funded project definition study or a funded concept design. You could have a competition if you wanted to, but the outcome must be acceptable in the capability, technical and total cost sense, not just politically attractive.³⁵

2.24 Rear Admiral Briggs and Commodore Roach supported the view that selecting the most appropriate design partner should be done by undertaking a competitive PDS. They suggested that the study would provide costed, fixed price bids for the design and construction of the submarines in Australia.³⁶ As noted earlier, most witnesses generally accepted that there were four valid starting points—the French, Swedish, German or Japanese designs. Rear Admiral Briggs strongly urged

³³ *Committee Hansard*, 8 October 2014, pp. 17–18.

³⁴ *Submission* 25, p. 5.

³⁵ *Committee Hansard*, 30 September 2014, p. 24. Commodore Greenfield has more than 40 years' experience, 30 of which were in the technical side of Navy's operations, maintenance and acquisition programs. See *Committee Hansard*, 30 September 2014, p. 21.

³⁶ Submission 17, paragraph 56.

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the government to conduct a competitive project definitions study and to invite all four bidders to participate. They would be required to meet the same criteria, including the date of completion; the required performance; and the fact that 'you want them built in Australia'.³⁷ He said:

The only way to pick it is to conduct a competitive project definition study where you can get the answers back to your top-level requirements and, frankly, these can go on two sheets of paper. From that basis you have an informed point to be able to make a decision on what is the starting point and who is going to come with you on the journey.³⁸

2.25 After which the government should make a sensible, informed choice and then get on with the acquisition process because, in his words, the clock was running:

...we know the date; we ought to go out with a competitive PDS which nominates the date and says, 'We want your answers for a submarine in the water on that date'.³⁹

2.26 This approach would allow for the two year transition from the Collins: that March gives two years of capacity that was found to be necessary for the Collins.⁴⁰

2.27 Rear Admiral Briggs reminded the committee about the importance of acquiring the best possible submarine:

It is a fact that in a submarine-on-submarine battle the difference is so fine; and it comes down to the sonar superiority, the training superiority and the weapon. This is a knife fight in a dark alley. If you make the first sweep and miss, you are going to cop it right between the eyes. You have to get it right the first time.⁴¹

2.28 Thus, he reasoned, the only way to ensure that Australia obtains this cutting edge technology was through a competitive PDS. He stressed that 'You will not get it unless you are forcing those four companies into a competition where they have to stump up a promise and a real price'. Commodore Roach endorse this view.

Committee view

2.29 The committee is concerned that many assumptions have been made about the various contenders for the future submarine but these assumptions remain untested.

³⁷ *Committee Hansard*, 30 September 2014, p. 19.

³⁸ *Committee Hansard*, 30 September 2014, p. 9.

³⁹ Committee Hansard, 30 September 2014, p. 16.

⁴⁰ *Committee Hansard*, 30 September 2014, p. 16.

⁴¹ *Committee Hansard*, 30 September 2014, p. 10.

2.30 The committee has highlighted the vital importance of making the right decisions at this critical stage of the project and before Defence takes Australia down a path from which it cannot turn back.

2.31 The process of selecting the designer of Australia's future submarine—a highly complex, expensive, safety-critical asset central to Defence's capability—is far too important to opt for an inferior selection process.

2.32 The committee understands that a competitive process may require additional time, but the committee is confident that such a process can be achieved without a gap in capability for Australia's submarines.

Chapter 3

Competitive tender does not mean a capability gap

Recommendation 2

The committee recommends that the competitive tender process for the future submarines begins immediately.

As noted by several independent witnesses, there remains sufficient time to conduct a competitive tender for the future submarines while avoiding a capability gap. This is due to the work on the future submarines undertaken by the previous government.

In his evidence, Dr John White set out a timetable that included a competitive tender process, contracting, construction, testing and introduction to service without a capability gap.

If followed, this timetable would allow the government obtain the best submarine capability at the best price, while avoiding a capability gap.

3.1 The firm proposal to purchase 12 conventionally-powered submarines dates back to the 2009 White Paper. In this chapter the committee, considers whether there is sufficient time to conduct a competitive process.

3.2 In his evidence, Dr White submitted that there was still sufficient time 'with adequate contingency' for a competitive PDS to be undertaken. He stated:

Based on analysis confirmed by international reputable shipyards, a 12-year time frame is adequate to implement the entire Future Submarine program for the first of class and to deliver the lead submarine, fully tested and accepted, into Australian service—this fits within the window that we have remaining, which I understand is until 2028—provided that the recommended acquisition strategy is followed, along with experienced industry team members to assist Defence and DMO in timely implementation.¹

3.3 Having considered the sequence of events and the projects milestones, Dr White formed the view that while there was still time for a competitive process, 'we would have to get on with it—stop investigating things endlessly'.²

3.4 Rear Admiral Briggs informed the committee that two years before the first of the Collins goes off the line is now a known date for the future submarines. According

¹ *Committee Hansard*, 13 October 2014, p. 28.

² *Committee Hansard*, 13 October 2014, p. 31.

to Rear Admiral Briggs, there was enough time to undertaken a competitive PDS.³ He was of the view that 12 months would be adequate for the government to announce a competitive open tender process.

3.5 He was of the view that the four potential bidders were basically doing designs and indicated that there would be serious doubts if they were not able to give a sensible answer in 12 months.⁴

3.6 In Rear Admiral Briggs' view, there was enough time to complete the acquisition phase including a PDS. He told the committee that 'if we make the right call in the first quarter next year, there is just enough time to do this' and avoid a capability gap.⁵

3.7 According to Commodore Greenfield, the end of Collins' operational life sets the delivery date for the future submarines. He also said that there was enough time to design a submarine specifically for Australia and moreover for the boats to be built in Australia, without there being a capability gap. In his view, there was time to do this, even with a due diligence process, including a funded project definition study:⁶

...the first Collins will complete its next 10-year operational period in mid 2026, and of course the Navy will want to refine that. With Collins, there was a two-year funded project definition study phase, then nine years of design and build before delivery, from 1987—contract award—to 1996. That is nine years plus two for PDS; that is 11 years. Between next year and 2026 is 11 years, and 2028 is 13 years away. I believe there does not have to be a capability gap, provided we just get on with it.⁷

3.8 In addressing the matter of transition and timing and whether there was time to avoid a gap, Commodore Greenfield was convinced that:

As long as work begins immediately, with the assistance of a carefully chosen overseas design/build partner, Australian industry can build a fleet of submarines to world class quality standards, within a period from contract award for the first of class to avoid a capability gap.⁸

3.9 Likewise, Mr Hamilton-Smith argued that there was still time to go through a proper process, to make the right decisions and to have ships in service by the time the Collins was withdrawn.

³ *Committee Hansard*, 30 September 2014, p. 19.

⁴ *Committee Hansard*, 30 September 2014, p. 19.

⁵ *Committee Hansard*, 30 September 2014, p. 10.

⁶ Commodore Greenfield, *Committee Hansard*, 30 September 2014, p. 24.

⁷ *Committee Hansard*, 30 September 2014, p. 22.

⁸ Submission 18, p. 2.
3.10 He estimated that a full competitive tender would take 12 to 18 months and that the submarines would be in the water within 10 years. He understood that 'the first of the Collins goes out of life around 2027, so, in his view, there was time to get the process right rather than to rush into an expensive mistake.⁹

3.11 Mr Stuart Whiley, ASC, drew on the Collins class process to demonstrate that it was possible to have a competitive PDS and still not risk a capability gap. Based on his experience and that of ASC, he stated:

...from contract to delivering Collins was 10 years. The PDS was two years. There is a process to get into the PDS. There is a process to get into contract. In theory you do have enough time to do it before Collins pays off.¹⁰

3.12 Mr King noted that the timeframe 'would be very quick for a full PDS tender'. He went further to indicate that 'you still have to do the detailed design', telling the committee that a tender 'is still just a promise; it is not a delivered fact'.¹¹

Conclusion

3.13 Evidence overwhelmingly supported a competitive selection process for the future submarine which was anchored in the firm belief that such a process was the only way whereby Australia could truly select the best option for its future submarines.

3.14 A contest between potential bidders challenges them to produce the best product at the most competitive price for Australian taxpayers.

3.15 It also provides the opportunity for Defence not only to compare and validate the various claims but to question its own assumptions about what is deliverable.

3.16 Most witnesses agreed that decisive action must be taken to get the process moving but insisted that there was time for a competitive process where all proposals could be tested and claims validated.

3.17 While the committee agrees that timeliness is of the essence, the risk posed by not undertaking a competitive tender process would be ill-considered and highly risky.

⁹ *Committee Hansard*, 14 October 2014, p. 11.

¹⁰ Committee Hansard, 14 October 2014, p. 28. Mr Whiley is the interim CEO of ASC Pty Ltd.

¹¹ *Committee Hansard*, 30 September 2014, p. 48.

Chapter 4

Build in Australia

Recommendation 3

Given the weight of the evidence about the strategic, military, national security and economic benefits, the committee recommends that the government require tenderers for the future submarine project to build, maintain, and sustain Australia's future submarines in Australia.

When selecting its preferred tenderer the government must give priority to:

- Australian content in the future submarines; and
- proposals that would achieve a high degree of self-reliance in maintaining, sustaining and upgrading the future submarines in Australia for the entirety of their lifecycle.

4.1 The acquisition of future submarines is a large and complex design and construction program, which demands personnel with unique skills and capabilities augmented by practical experiences in this area of expertise. In this chapter, the committee considers whether Australia has the capacity to build submarines and, if so, the advantages of a local construction. It also gives particular attention to whether the future submarine, because of its vital importance to Defence's capability and its complexity, should be built in Australia in order to maintain it effectively throughout its operational life.

Expertise and skills in Australia

4.2 In March 2013, Defence published its *Future Submarine Industry Skills Plan*, which was the result of a study on the current state of naval shipbuilding in Australia, undertaken by an expert industry panel chaired by Mr David Mortimer. The panel assessed the capacity of Australia's major shipyard to deliver the ships in the Defence Capability Plan (DCP) including the future submarines. It concluded that:

...Australia has a strong cadre of people who can build complex systems and construct warships. Australia has good skills in the development and integration of combat and platform management systems. Australia has also developed world-leading submarine-systems in areas such as electronic warfare and sonar. These skills have been built up over several decades, benefitting from the continuity of work and challenge of successive projects. Shipyards have the facilities to build the warships required, although some investment would be required to develop launch points for the larger supply vessels.¹

Capability and capacity

4.3 Most witnesses disagreed strongly with claims that Australia did not have the capacity or capability to build the ships in Australia. Many drew on the Collins experience to demonstrate that a submarine workforce could be built up from a low base. Moreover, some argued forcefully that Australia was in a better position today to start a submarine build program than it was almost 30 years ago for the Collins.

4.4 For example, Mr Whiley noted the knowledge that had developed over the last 25 years, which began with 'approximately 150 ASC engineers and designers embedded in Kockums, the original Swedish Collins class designer, working on Australia's first-of-class submarine'. From this engineering base, ASC developed a through-life support engineering capability for the submarine. Mr Whiley explained that it was able to do so because ASC was intimately involved in the original design and build process.² He explained:

Australia is much better prepared than it was in the 1980s, when it was decided to design and build Collins. Since then we have learned and achieved so much. We have developed a quarter of a century of submarine capability and knowledge. We have developed key technical and supply chain capability across Australia and we have learned to work together effectively as one team and we are now ready to help deliver the separate solution for the future.³

4.5 While the Submarine Institute of Australia (SIA) noted that submarines were costly and required advanced levels of skills to operate and sustain, it drew attention to the combined effort that had gone into developing a formidable submarine force in Australia.⁴ Commander Frank Owen similarly pointed out that Australia had invested a lot in its capacity to sustain and upgrade its submarines and was justified in feeling very proud of the result.⁵

4.6 The committee has detailed the problems that beset the Collins class submarine until recently.⁶ The committee has noted, however, the strides that ASC

¹ See Department of Defence, *Future Submarine Industry Skills Plan*, A Plan for the Naval Shipbuilding Industry, p. 82, <u>http://www.defence.gov.au/dmo/Multimedia/FSISPWEB-9-4506.pdf</u> (accessed 7 August 2014).

² *Committee Hansard*, 14 October 2014, p. 21.

³ *Committee Hansard*, 14 October 2014, p. 22.

⁴ *Committee Hansard*, 30 September 2014, p. 1.

⁵ *Committee Hansard*, 30 September 2014, p. 1.

⁶ See chapter 6, paragraphs 6.42–6.50.

have taken to improve its performance on the Collins sustainment program since Coles commenced his review in 2011.

4.7 Mr Andrew Sudholz, who has worked at ASC for almost 23 years and started as a rigger, noted the 'fantastic changes in the infrastructure of the submarine facility' that have come online in the last few months making ASC much more efficient. He noted that the full-cycle docking of HMAS *Farncomb* was 'on track to be completed in half the time it has taken in the past'.⁷ Indeed, committee members saw this work taking place during its site visit to ASC, Osborne. Members toured the three-storey dry dock maintenance support tower that replaced the old scaffolding. This innovation allows workers easier access to the submarines and has provided a definite boost to productivity. Mr Sudholz indicated that:

The learning achieved and experience gained in the Collins project leaves me in no doubt whatsoever that, given the right design, the next generation of submarines can be built here in Adelaide efficiently, delivering a product which will give the Australian Navy the capability it needs to keep this amazing nation secure.⁸

4.8 The people who work on the submarines gave compelling evidence of their ability not only to maintain but also to build the future submarine. In Mr Whiley's view, the maintenance work on the Collins was 'probably harder and more complex to work on than build' and, in fact, that the work carried out in full-cycle docking was 'very, very akin to a build'. He argued that ASC's workforce was more highly skilled than it was during construction and described some of the innovative and highly skilled work being undertaken on the Collins: ⁹

...we have section 100, which is the aft end of the boat, cut off, and we had the main motor—a 40-tonne motor—removed from the boat, to go and do the maintenance. If you had been here 15, 17 or 18 years ago [during the build stage], you would have seen a very similar scenario, with sections of submarine apart, just like you saw today. So it is very akin to a build environment, the way we are doing maintenance today. We are taking the equivalent outside to the platform, refurbishing it off the platform and reassembling it, as opposed to doing the maintenance on the platform inside the equipment. So it is a different philosophy from a maintenance perspective. And, to do that, we have had to generate the seventh and eighth boat set of parts to have that rotated, to a full set of parts going to the platform.¹⁰

⁷ *Committee Hansard*, 14 October 2014, p. 37.

⁸ *Committee Hansard*, 14 October 2014, p. 37. Mr Sudholz began an adult apprenticeship as a mechanical fitter after two years and has since completed a Diploma of Mechanical Engineering.

⁹ *Committee Hansard*, 14 October 2014, p. 31.

¹⁰ Committee Hansard, 14 October 2014, p. 31.

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4.9 Mr Burns also drew attention to some of the significant changes that have recently taken place with the maintenance program for the Collins. He refuted the notion that Australia had lost the capability to build submarines and likewise referred to the new technique of cutting open the submarines to gain access to the motor. He argued that such an exercise was not just maintaining submarines:

When you can cut open a submarine and put it back together, those are build skills.¹¹

4.10 Mr Hamilton-Smith noted that the Collins was an outstanding product and argued:

...the South Australian government feels that the country has successfully built both naval ships and submarines in South Australia using overseas designed technology transfer; and now, with even more experience under our belts, there is no reason Australian industry and Australian workers cannot do it again.¹²

4.11 According to Mr Hamilton-Smith, although there were some problems with technology transfer, 'we have done it before and can do again'.¹³

4.12 Mr Whiley also referred to the considerable submarine support network of Australian companies and organisations supporting the Collins class program including universities, subject matter experts, strong capability partnerships, ongoing relationships with government research establishments, such as DSTO, and a highly sophisticated network of industry partners. He elaborated:

Our industry partners include specialist submarine support businesses such as Babcock, Pacific Marine Batteries and MacTaggart Scott approximately 120 small to medium enterprises and more than 2,000 associated companies that supply products and services. In fact, ASC manages one of the largest and most complex supply chains in Australia.¹⁴

4.13 Based on the evidence presented to the committee and independent studies, there can be no doubt that Australia has a substantial and solid foundation on which to build a competent and highly skilled workforce for the construction of the future submarines.

4.14 There are numerous advantages that flow from building naval ships incountry, especially the highly complex and strategically important vessels such as the submarine.

¹¹ *Committee Hansard*, 14 October 2014, p. 18.

¹² *Committee Hansard*, 14 October 2014, p. 3.

¹³ *Committee Hansard*, 14 October 2014, p. 6.

¹⁴ Committee Hansard, 14 October 2014, p. 22.

Costs

4.15 According to Commodore Greenfield, an Australian build should be no more expensive than an overseas build. He stated that:

A sail-away cost of \$20 billion for 12 submarines built in Australia is entirely feasible, and Australian industry has much to offer in solving the truly unique engineering challenges.¹⁵

4.16 Consistent with Commodore Greenfield's estimate, Professor Roos informed the committee that it would cost the same to build submarines, no matter where they were built, which is \$400,000 per tonne for the modern submarine.

4.17 He stated further, for 'all modern submarines, the number is actually \$400,000 plus or minus 16 per cent', no matter when or where they were built.¹⁶

4.18 Because it will cost no more or no less to build the submarine in Australia or elsewhere, such as Japan or German, the cost would be \$20 billion.¹⁷

4.19 The cost estimates of Commodore Greenfield and Professor Roos have been confirmed recently by one potential bidder for the Future Submarine Project—Thyssen Krupp Marine Systems.

4.20 TKMS CEO Phillip Stanford told ABC Radio that his company could build the new submarines for \$20 billion in Australia:

We believe we can deliver 12 submarines of the size and capability that Australia requires, in a price of \$20 billion, and that's an indicative price, and includes all the programmatic aspects to deliver the submarine in Australia.¹⁸

4.21 Saab Kockums—another submarine builder—has also said they want a chance to be part of a competitive tender:

If there is an open competition, Saab Kockums will be in it. We can compete in the battle for affordability.¹⁹

Economic advantages

4.22 In its report on the new supply ships, the committee also considered the broad benefits, including the economic advantages, to be gained from an indigenous naval ship building and repair industry. For example, Mr Simon Kennedy, Adelaide Ship

¹⁵ Commodore Greenfield, *Committee Hansard*, 30 September 2014, p. 24.

¹⁶ *Committee Hansard*, 8 October 2014, p. 16.

¹⁷ *Committee Hansard*, 8 October 2014, p. 16.

¹⁸ Phillip Stanford, CEO TKMS Australia, 'ABC AM', 24 October 2014.

¹⁹ Australian Financial Review, 12 September 2014, p. 7.

Construction International and Smart Fabrication, wrote of the positive returns on investment from shipbuilding in Australia:

Every dollar spent on a ship or submarine within Australia goes further than the initial transaction. Australian primes engage Australian manufacturers who engage Australian subcontractors. The training and development required to build the ships and submarines not only contributes to our local economy, but also our local knowledge and skills base.²⁰

4.23 An ASC paper on Australia's shipbuilding industry also noted the many advantages that flow through to the national economy from investment in the Australian naval industry—an advanced manufacturing, high value-add sector. The paper referred to studies on the economic effects of projects such as the ANZAC Frigate and the Coastal Mine Hunters projects showing that 'basic benefits to the national economy from in-country construction are nearly double the value of the investment'. Taken together with the flow-through effects of in-country construction, it argued that 'the human capital generated by large projects and innovation spill-overs from in-country design and development work, contribute substantially to the national economy'. It also referred to generating innovation and thus creating even greater spill-overs.²¹

4.24 According to the Australian Industry & Defence Network Inc, naval shipbuilding directly employs some 6,000 people and indirectly nearly 15,000 people. It stated further:

The industry makes a contribution to the Australian economy of between (conservatively) \$1.5 billion up to around \$2.3 billion (based on total multipliers) per annum.

Around 7,400 full time equivalent (FTE) jobs across Australia can be attributed to the production of naval vessels by the five largest prime contractors in the industry. In addition, up to 7,560 FTE jobs can be attributed to the activities associated with through life support of naval vessels.²²

4.25 In the Network's view, more often than not the Defence Department's value for money (VFM) criteria only considers the short term acquisition costs and this drives procurement often to an overseas supplier. Furthermore, that 'a more holistic "Whole of Life" VFM criteria would ensure a more realistic appraisal of competing bids'.²³

²⁰ Mr Simon Kennedy, Adelaide Ship Construction International and Smart Fabrication, *Submission 8*, p. 2.

²¹ An ASC paper, *A Sustainable Australian Naval Industry*, issue 1.0, pp. 15 and 19, https://www.asc.com.au/Documents/Speeches/A%20Sustainable%20Australian%20Naval%20I ndustry.pdf (accessed 7 August 2014).

²² Submission 7, p. 2.

²³ *Submission* 7, p. 3.

4.26 The ACIL Allen report to the Australian Industry Group, *Naval Shipbuilding Through Life Support*, produced the set of figures quoted above, including the potential \$2.3 billion contribution from naval shipbuilding and through-life support to the economy. This report also noted other significant economic benefits—technology transfer, transfer of expertise, and improved practices in areas such as quality assurance, business planning, sub-contracting and dealing with Defence.²⁴

4.27 It drew attention to the 'hidden but real, financial costs that are likely to arise if a decision is taken to source ships from overseas or between different approaches to Australian design, build and sustainment'. One of the key considerations was the possible additional costs to maintain the vessels throughout their service life.

4.28 Some witnesses directed their comments to the specific contribution that an in-country build of the submarines would make to Australia's economy. Looking back at the Collins, Commander Owen argued that building the submarines proved to be an enormous fillip to Australian industry, providing 'tax clawback and benefits to the economy that were significant and long-lasting'.²⁵

4.29 Two witnesses produced statistics concerned solely with the contribution that a submarine build would make to Australia's economy and workforce. Professor Roos argued that it would be more expensive for the economy to buy the submarines overseas.²⁶

4.30 Professor Roos said that the overwhelming conclusion was that it would cost no more to build locally.

4.31 This was partly because Australia has a unique set of operating environments and requirements so there is no off-the-shelf solution available, and partly because there are only four potential international partners to build the submarines (Germany, France, Japan and Sweden) and they are all high cost countries. According to Professor Roos:

The conclusions on these very conservative assumptions is that Australia as a country is at least \$21bn better off to build in Australia than to purchase overseas in addition to creating 120,000 man years of additional jobs in the economy over the life of the project as compared to building overseas.²⁷

4.32 Dr Peter Brain quoted the same figures on the benefits to the economy from building the future submarines in Australia.²⁸

²⁴ ACIL Allen Consulting, *Naval Shipbuilding & Through Life Support, Economic Value to Australia*, ACIL Allen report to Australian Industry Group, December 2013, p. ii.

²⁵ *Committee Hansard*, 30 September 2014, p. 5.

²⁶ See *Committee Hansard*, 8 October 2014, p. 22.

²⁷ *Submission 25*, p. 17.

²⁸ Dr Brain is the Executive Director of the National Institute of Economic and Industry Research but was appearing in a private capacity. See *Committee Hansard*, 13 October 2014, p. 33.

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4.33 He explained that the findings were based on the following numbers— 12 submarines are purchased all built in Australia or all built overseas. The cost for the 12 submarines is \$21 billion. Two assumptions underpin the calculations:

- the expenditures for the submarines are offset elsewhere by reductions in expenditures that otherwise would have been done if the submarines had not been purchased, and that reduction is independent of whether it is built here or built overseas; and
- there are adequate resources to allow the submarines to be built efficiently (resources that will be released by the motor vehicle contraction or alternatively the similar skill resources likely to be released by the downturn in the construction-for-mining industry and also the mining industry itself).²⁹

4.34 The committee notes the importance of taking into account the broader economic benefits that accrue to the economy from having naval ships built in Australia.

4.35 Indeed, the committee noted in Part I of its report on Australia's naval shipbuilding industry the many and significant benefits that flow through to the economy from the construction of naval ships in country. They included: the establishment and further development of a strong industrial base supported by a skilled workforce; expanded indigenous research and development, design, production and management capabilities; and extensive technology transfer across a broad spectrum of activities.

4.36 There are also savings to be considered that may derive from being better able to support the vessels throughout their operational life.

Through-life sustainment and upgrades

4.37 Submarines are no different from other highly complex or large naval vessels in that their operating and sustainment costs far outweigh the original purchase cost. According to Rear Admiral Briggs, in broad terms it is generally one-third to build, two-thirds to own and operate.³⁰

4.38 When considering the costs of an acquisition, industry participants emphasised the need to take account of the through-life expenses which may be many times greater than the initial cost of acquisition. Mr Andrew Fletcher, Defence SA noted the significant through-life support costs as compared to the purchase cost:

...one of the challenges before our nation is for the Defence department to seriously look at whole-of-life-cycle costing when making procurement decisions, because generally whole-of-life-cycle sustainment cost is up to two, three or four times the procurement cost, so you get a very different

²⁹ Committee Hansard, 13 October 2014, p. 33.

³⁰ *Committee Hansard*, 30 September 2014, p. 18.

answer if you model whole-of-life-cycle costing versus the initial procurement. $^{\rm 31}$

4.39 Some witnesses held that there was a strong and direct connection between the build cost and operating and sustainment cost. For example Rear Admiral Briggs suggested that what is learnt through build enables greater efficiency in sustaining.³² According to Rear Admiral Briggs, if you have the capacity in country to maintain and evolve, you are much better able to manage the cost of ownership.³³ He argued:

... if you focus only on build costs, that is in fact a false economy, given you are focusing on a cost that is one-third of your total project and also a cost that is likely to lead to a more efficient procurement and operation of your sustainment costs.³⁴

4.40 In other words, if the focus is not on the total cost of ownership from the beginning, there is the risk of purchasing a submarine that 'might be cheaper to buy but much more expensive to operate and own'. Hence, according to Rear Admiral Briggs, the taxpayer ends up 'paying a lot more for it in the long run'.³⁵

4.41 Commander Owen agreed that the true cost in a Defence program is its whole-of-life costs.³⁶ Mr Fletcher also stressed the point that the initial penalty for upfront procurement in Australia would be defrayed, if the 'whole-of-life-cycle costs and the information, knowledge and skills base is preserved and maintained for future upgrades and sustainment of those vessel'. Likewise, Mr Hamilton-Smith argued that the decision to build off-shore 'will cost the Commonwealth government far more through the full life cycle than any possible savings made in the initial procurement'.

Submarines and national security

4.42 The size and nature of the Australian continent requires a particular focus on the strategic issues that govern our maritime environment. As an isolated island nation with vulnerable northern approaches, Australia attaches great importance to its capability to defend its land mass and secure its sea lanes. Australia's physical environment with its expansive coastlines and long exposed trade routes dictates that Australia retains an independent, self-reliant and effective maritime capability.

4.43 Many witnesses argued that Australia not only needs a potent naval force but must be able to maintain and upgrade that force if it is to keep Australia secure into the future.

³¹ *Committee Hansard*, 21 July 2014, p. 51.

³² *Committee Hansard*, 30 September 2014, p. 18.

³³ *Committee Hansard*, 30 September 2014, p. 18.

³⁴ *Committee Hansard*, 30 September 2014, p. 18.

³⁵ *Committee Hansard*, 30 September 2014, p. 18.

³⁶ *Committee Hansard*, 30 September 2014, p. 3.

National security

4.44 In Part I of its report, the committee considered the security aspects related to the actual construction of naval vessels. It noted that to fulfil its primary role to protect the national interest, Defence must ensure that it has control over the capability and technology needed to secure operational independence in areas vital to Australia's defence. For Navy, that means that its fleet must be equipped to best meet the security challenges it confronts.

4.45 Many argued that to do so, Australia needs an indigenous shipbuilding industry and a domestic capability to support Australia's naval ships and their systems throughout their working lives. For example, the Australian Manufacturing Workers' Union (AMWU) argued that the capability of Australia's naval shipbuilding industry was 'foremost a national security issue as well as being an issue for our economy and our manufacturing industry'.³⁷

4.46 Evidence taken since then soundly reinforced the contention that sustainment of naval vessels is a strategic capability in itself.

4.47 Mr Jackman maintained that a 'vibrant and sustained naval shipbuilding industry of all shapes and forms is vital to our self-reliance'.³⁸ The Australian Business Defence Industry acknowledged that while matters dealing with financial multipliers, economic activity, employment and the retention of important skills were important considerations, the principal focus should be on those aspects that are associated with the mitigation of high strategic risk. It argued that governments need to consider investment decisions on 'strategic grounds, not ideological grounds'.³⁹

4.48 The committee has heard the central role that submarines have in promoting Australia's national interests—particularly protecting its sea lanes and covert surveillance and intelligence gathering during times of heighten tension.⁴⁰

4.49 With regard to the submarine industrial capacity in Australia, the SIA argued that it would be virtually impossible to sustain the submarine capability at an effective level without the Australian submarine building industry and its supporting industries. It advocated that Australia build on the submarine capacity it has fought hard to establish. It suggested that Australia integrate, assemble and sustain the submarine force 'using the best, most cost-effective and relevant technology'; and, most importantly, that it preserve its sovereignty to ensure the safe and secure conduct of its

³⁷ *Submission 4*, p. [1].

³⁸ *Committee Hansard*, 14 October 2014, p. 5.

³⁹ Committee Hansard, 8 October 2014, p. 15.

⁴⁰ For a more detailed account of the critical importance of the submarine fleet to Australia's national security, see chapter 6, paragraphs 6.4–6.6.

future submarine operations. In the SIA's view, it seemed highly likely that this could 'only be achieved in an assembly facility in Australia'.⁴¹

4.50 Dr White, with 40 years' experience in naval shipbuilding and major infrastructure projects, noted the advantages of a local build. In his opinion, if you are going to build the submarines here, there are tremendous advantages, almost necessities, in building the first one here.⁴²

Local build

4.51 With highly complex combat vessels, such as a submarine, many witnesses rejected the notion that the ships should be built overseas. They argued that in order to have the skills and experience to maintain the vessel, they must be built in Australia. Professor Roos reasoned:

We will be the only country using this type of submarine with this type of capability and this means that we will be the parent navy for these things, and that means we have to do it here with the associated capacity, for which we have learning.⁴³

4.52 Many witnesses said that for national security reasons it was imperative for Australia to build the submarines in Australia so that it would have the resident knowledge, skills, know-how and infrastructure needed to sustain and upgrade the boats throughout their long service life. Some raised concerns about potential threats to the submarine's supply chain in times of tension when Australia's trade routes may be under threat or no longer available.⁴⁴

4.53 In this regard, Commander Owen suggested that 'if we are completely reliant on the supply of technology and perhaps components from overseas beyond what we have managed to stockpile then the implications could be quite significant'. He clearly indicated that the building of the new future submarine project in Australia was the best option for this country.⁴⁵ Commander Owen took the committee back in history to 1981 and the lessons learnt from the Oberon, which were submarines operated by Australia but built in the United Kingdom. He explained:

We were second cousin, twice removed of the logistics support capability surrounding that submarine. When the host nation stopped operating them, the supplies dried up and we had occasions [where] submarines were unable to sail because of vital components and spare parts that were unavailable.

⁴¹ *Committee Hansard*, 30 September 2014, p. 3.

⁴² *Committee Hansard*, 13 October 2014, p. 25.

⁴³ *Committee Hansard*, 8 October 2014, p. 16.

⁴⁴ See also chapter 7 of Part I of the committee's report, *Future of Australia's naval shipbuilding industry: Tender process for the navy's new supply ships*, August 2014.

⁴⁵ *Committee Hansard*, 30 September 2014, p. 3.

We determined at that time that the best way to achieve that sort of logistical self-reliance...which was to achieve reliability in our defence capability—was to build them in Australia so that we would have far greater access to any industry that could support it with the components that it had actually provided.⁴⁶

4.54 He strengthened this case for the need for self-reliance with examples of other submarines—the Brazilian and the Canadian forces—where their whole supply chain dried up. In his view:

...if we lose that capability, the ability to sustain and upgrade the future submarine as the capability evolves becomes limited to working from a workshop manual rather than having a deep understanding of the intellectual issues that underpin the design of that capability.⁴⁷

4.55 Rear Admiral Briggs and Commodore Roach maintained that the experiences with the Collins class submarine demonstrated that 'the required transfer of technology can only be gained through the construction of the first submarine in an Australian shipyard and that the associated risks could be successfully managed'.⁴⁸ Rear Admiral Briggs also highlighted the importance of having the 'in-depth capacity to unravel and understand a problem and do a fix; to not have to go back to someone else's capital city and find that they are busy today'.⁴⁹

4.56 Commodore Greenfield stated that in order 'to be able to effectively modify, upgrade and enhance our submarines, our industry must be intimately involved with the design, philosophy and designer's intent, to truly understand the submarine and what can and cannot be done to it'.⁵⁰ He similarly underscored the need for Australia to ensure that it is self-reliant in sustaining its fleet of submarines. He gave a similar example of the vital need to be self-reliant:

When companies who support our submarines are getting phone calls in the middle of the night or the middle of the day from a submarine at sea saying, 'Help, we can't diagnose the fault and it's a serious one,' they do rely on our industry. Our industry is there all the time to support our boats. Submarines of the type that we have, the big heavy submarines, probably spend about half their time in maintenance. There is no getting away from that...You also cannot get away from the fact that you will suffer some defects and you need instant access to people who understand and can diagnose and fix them. You will not get that from overseas.⁵¹

50 Submission 18, p. 3.

⁴⁶ *Committee Hansard*, 30 September 2014, p. 4.

⁴⁷ *Committee Hansard*, 30 September 2014, p. 4.

⁴⁸ Submission 17, paragraph 35.

⁴⁹ *Committee Hansard*, 30 September 2014, p. 10.

⁵¹ *Committee Hansard*, 30 September 2014, p. 25.

4.57 The committee has referred to the reticence of overseas countries to make available their most advanced technology. In this regard Professor Roos stated:

In this global environment, the only way that Australian submarines can develop and maintain a capability edge is if the submarines are built in Australia and fitted with high-end, secret technology through Australian Eyes Only programs which are continuously funded through the service life of the fleet. These technologies would be targeted towards specific areas—stealth techniques, signal processing, and commanding officer's tactical aids—anything that gives our submarines an edge. We have done this before with ultra-quiet pumps, acoustic tiles, special sonars, and so on. Failure to do this will mean Government embarrassment in the least and a tragic loss at the worst.⁵²

4.58 Mr Glenn Thompson, Australian Manufacturing Workers' Union, agreed with this view. In his experience, greater problems arise when maintaining a vessel that 'you do not build'.⁵³ He cited the current major refit going on one of the Collins class submarines. He stated:

The whole back end of that vessel has been dismantled. The drive chain and the piping—some 7,000 pipes—have been removed. If we had not built that vessel we would not have the skills and the capacity to perform such work. We agree with the comments that retired Rear Admiral Briggs and Commodore Roach have made with respect to that. It is better to build to ensure that you have the skills to maintain.⁵⁴

4.59 Mr King agreed that Australia could build the submarines, but noted it was 'very much a government decision'.⁵⁵ Recently, he informed the Senate Foreign Affairs, Defence and Trade Legislation Committee that:

...there are all sorts of matters that come into play in selecting who is going to ultimately design, build and work with us on our submarine. They go beyond price and they go beyond their assessed ability to deliver; they go on to strategic relationships, interoperability and on and on. So there are a number of factors that come into play in the process that you may go through to acquire this submarine.⁵⁶

⁵² *Submission* 25, p. 5.

⁵³ *Committee Hansard*, 8 October 2014, p. 12.

⁵⁴ *Committee Hansard*, 8 October 2014, p. 12.

⁵⁵ Senate Foreign Affairs, Defence and Trade Legislation Committee, Estimates, *Committee Hansard*, 22 October 2014, p. 93.

⁵⁶ Senate Foreign Affairs, Defence and Trade Legislation Committee, Estimates, *Committee Hansard*, 22 October 2014, p. 91.

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4.60 The committee believes that the submarines are in a class of their own and the link between ensuring Australia's close involvement with all aspects of its acquisition and sustainment is strong.

Conclusion

4.61 The committee has already noted that investment in infrastructure may have long-term benefits for the costs in maintaining and upgrading vessels: that by constructing vessels in Australia, the economic costs of maintaining, repairing and refitting large naval vessels throughout their operational lives could be reduced.

4.62 Thus the savings generated by having the infrastructure available for the maintenance and upgrade of the Navy's fleet should be a major consideration. But the argument about through-life support also extends to the know-how and the skills base needed to sustain and upgrade the fleet.

4.63 If Australia is to maintain and modernise its naval vessels, it needs an experienced, knowledgeable and productive workforce to repair and service these vessels throughout their operational life.

4.64 A key strategic priority is the capacity to deploy independent naval strength into the oceans surrounding the continent and maintain control of the long maritime approaches and at the very least deny the control of such approaches to potential enemies.

4.65 The committee notes that there are practical constraints in achieving complete self-sufficiency in the supply and maintenance of Defence assets and the degree of control will differ according to the strategic importance attached to the asset.

4.66 But not having assured access to domestic capabilities in such a critical strategic asset as a submarine would compromise Australia's independence undermining Australia's national security.

4.67 Indeed, some witnesses made a direct and strong connection between the construction of the submarine and the development of the skills base needed for its future support. They argued that local involvement in the build would set the necessary foundation for the submarine's future through-life support.

4.68 The complexity of the submarine and its critical role in Defence's capability strengthens the link between having it built locally and its maintenance and upgrade over the length of its operational life. Indeed, a number of witnesses noted that the submarine was one of the critical Defence assets where reliance on overseas suppliers could compromise operational independence and ultimately Australia's national security.

4.69 Experts giving evidence to the committee strongly argued in favour of building the future submarines in Australia.

4.70 The only way to ensure that Australia has access to the very best technology and is assisted by capable and reliable partners who share Australia's commitment and ambitions is through a competitive tender. Anything short of this process would be folly and place the future submarine at unnecessary risk.

4.71 Given the weight of the evidence about the strategic, military, national security and economic benefits, the committee recommends that the government require the tenderers for the future submarine project to build the submarines in Australia.

Chapter 5

Australia's new submarine cannot be a MOTS

Recommendation 4

The committee recommends that:

- the government formally and publically rule out a MOTS option for Australia's future submarines.
- The government focus its efforts on the 'new design' or 'son-of-Collins' options for Australia's future submarines and suspend all investigations for acquiring a MOTS submarine, including the current Japanese Soryuclass.

5.1 Until recently, the government had made clear that it had suspended consideration of a military-of-the-shelf (MOTS) option for Australia's future submarines.

5.2 The visit by a Japanese delegation to Adelaide, visits by Defence officials, including the CEO of DMO, to Japan to discuss submarine technology and commentary from senior government ministers has unexpectedly indicated that the possibility of buying a Japanese Soryu-class submarine off-the-shelf is being considered.

5.3 In this chapter, the committee investigates the capability of the Soryu submarine and outlines evidence given to the committee that explains why the Japanese boat is not suitable to replace Australia's submarine fleet.

5.4 This evidence confirmed to the committee that no MOTS option exists to replace Australia's submarine fleet. As such, the committee is recommending that the government formally and publically rule that option out.

MOTS

5.5 Because Australia's requirements are very different from those that underpin the design of other nations' submarines, modifications to such designs would be inevitable should Australia opt for such an overseas submarine. Commander Owen explained:

Nations that operate out of Europe, for example, have relatively small ranges to go to the areas in which they might patrol, and the often-shallow waters in which they operate suggest that a smaller submarine design actually fits better into their particular requirements. This is why most of the submarines that are classified are called MOTS in this world. It is really a bit of a misnomer because you do not have a shelf full of 2,000 of these submarines; you are taking one extra off the production line. It is not really off the shelf...¹

5.6 In his view, the smaller submarines do not have the range to meet Australia's requirements. Furthermore, basing Australian submarines further north or even pulling into places like Darwin to refuel would cause difficulties because once exposed any covert operation becomes visible and the clock on its activities must start again. In addition, he noted that the submarine would be 14 or 15 hours on the surface before it could dive because of the very shallow water around Darwin. In his words:

You are operating...at the risk of being under the air cover umbrella of somebody else and, as soon as you have shown your hand, you have actually pointed to where you are going.²

5.7 Commander Owen did not think there was anything at the moment that really had the range and mobility to match Australia's needs.³

5.8 Mr King agreed that Australia's particular geographical circumstances required a unique solution for Australia's operational needs:

5.9 Almost no matter what we do to come up with a submarine that will meet, as best it can, our needs as a nation, it requires some uniqueness to it.⁴

5.10 According to Mr King, most of the time Defence is able to purchase a product developed by one of its allies that comes very close to meeting Australian needs. This availability 'minimises the exposure to risk...we know the price and we can get it delivered on schedule'.⁵ Having described the very demanding and unique requirements of Australian submarines, it is clear that the purchase of submarines is different. As Mr King observed, 'There are a few things [produced by Australian allies] that do not meet Australia's needs, and one of them is submarines'.⁶

¹ *Committee Hansard*, 30 September 2014, p. 5.

² *Committee Hansard*, 30 September 2014, p. 5.

³ *Committee Hansard*, 30 September 2014, pp. 5–6 and 9.

⁴ *Committee Hansard*, 30 September 2014, p. 37.

⁵ *Committee Hansard*, 30 September 2014, p. 38.

⁶ *Committee Hansard*, 30 September 2014, p. 38.



HMAS Rankin berths at Fleet Base West after returning from a Full Cycle Docking activity in Adelaide, South Australia.

(Image courtesy of the Department of Defence)

5.11 Witnesses agreed that an off-the-shelf option should not be pursued. For example, Commodore Greenfield argued that a MOTS will just not work for Australia.⁷

5.12 Furthermore, Commodore Greenfield explained that to modify an existing submarine—any of the MOTS submarines or perhaps Soryu—by swapping the air independent section for fuel tanks, or an extra engine to make it like Collins or even heavier weapons would not be a simple exercise. He advised that such a change would in effect mean a complete redesign with all the accompanying time, costs and risks—'You cannot short-circuit this exercise'.⁸ In his assessment:

⁷ *Committee Hansard*, 30 September 2014, p. 21.

⁸ *Committee Hansard*, 30 September 2014, p. 22.

...a MOTS design will not suit Australia and the design will have to be heavily modified. A MOTS design even slightly modified ain't MOTS. There is no shortcut.⁹

5.13 Likewise, Rear Admiral Briggs stated clearly that there are no MOTS everything involves a degree of adaptation. Even relatively minor modifications may require changes elsewhere as Rear Admiral Briggs and Commodore Roach, both experienced with the Oberon class submarines, the Collins project and developing concepts for the future submarines, explained:

Anything/everything you touch in a SM design interacts with other features of the design. A simple and partial example arising from increasing the volume, eg by adding a hull section for an AIP [air independent propulsion] capability to an existing design:

- More generating capacity is required for the long transits, either larger diesels or more of them.
- These need more fuel.
- If larger diesels are required a larger diameter pressure hull may also be required to accommodate them with the necessary quieting measures.
- Supporting systems such as cooling and switchboards may need to be enhanced, etc.

The result is a substantially new design.¹⁰

5.14 Similarly, Mr Pacey indicated plainly that there was simply no commercial off-the-shelf conventional submarine that comes close to meeting Australia's requirements.¹¹ In his view:

... If we have a look at the submarines that are produced by other countries, they are universally below 2,000 tonnes. There simply was not another submarine available with the sort of range that would allow us to continue to exploit the strategic depth that is a natural benefit of the strategic geography of the Australian continent.¹²

5.15 Rear Admiral Sammut, Head, Future Submarine Program, DMO, reinforced this message, indicating that: 'there would always have to be some form of adaptation for Australian conditions'.¹³

⁹ *Committee Hansard*, 30 September 2014, p. 22.

¹⁰ *Submission 17*, paragraphs 23–24.

¹¹ *Committee Hansard*, 30 September 2014, p. 30.

¹² Committee Hansard, 30 September 2014, p. 30.

¹³ *Committee Hansard*, 30 September 2014, p. 37.

Shortcomings with overseas purchases

5.16 The committee considered the range of concerns raised by witnesses about the transfer of Japanese submarine technology to Australia and the paucity of available data on the Soryu's capability. For example, Rear Admiral Briggs informed the committee about the lack of detail on the propulsion system. He was not at all sure whether the Japanese design had a permanent magnet motor, which was the latest technology in Europe. He explained that the purpose of a competitive process would be to expose these sorts of issues and to get a better understanding about where they were on the technology spectrum and to compare that with one of the other three candidates.¹⁴

5.17 It should be noted that the technology around the Soryu is top secret. One report quoted a former Japanese submarine commander, Toshihide Yamauchi, who was at sea for nearly 30 years and was of the opinion that:

...it took Japan 60 years to develop and master the Soryu technology, and he believed they would not just give it all away.

Mr Yamauchi said Japan may provide just some of its knowledge to Australia.¹⁵

5.18 A country's efforts and resolve to keep advanced technology to itself applies not only to Japan. In its report on the future submarine industry skills plan, the Expert Industry Panel, chaired by Mr David Mortimer, noted:

The advanced technology used in modern submarines is the result of substantial investment in research and development, and delivers the operational advantage all nations pursue for their military equipment. For reasons of national security and industrial sensitivity, the countries that develop the technology closely guard it. This creates challenges for countries like Australia that do not produce much in the way of original submarine technology and so must purchase most of it from overseas.¹⁶

5.19 In this context, Professor Roos similarly warned of the practice of countries guarding their most sensitive secrets, particularly submarine secrets. He stated:

Any exports will be a second tier of technology which has already been surpassed by the country's science and technology programs and engineering development. Anyone who thinks they will be buying the most up-to-date stealthy submarine from another country is naive. Developed countries have three tiers of technology—one for their own use and guarded

¹⁴ Committee Hansard, 30 September 2014, p. 14.

¹⁵ ABC News, 'Soryu submarine deal: Japanese insiders warn sub program will cost more, hurt Australian jobs', 15 September 2014, <u>http://www.abc.net.au/news/2014-09-15/japanese-</u> <u>concerns-over-submarine-deal/5743022</u> (accessed 30 October 2014).

¹⁶ Department of Defence, *Future Submarine Industry Skills Plan*, A Plan for the Naval Shipbuilding Industry, p. 36, <u>http://www.defence.gov.au/dmo/Multimedia/FSISPWEB-9-4506.pdf</u> (accessed 7 August 2014).

very closely, a second 'export' version with older, superseded technology to countries which are termed 'friends and allies' and a third version even older still—a 'vanilla' version if you like.¹⁷

5.20 According to Professor Roos, it was essential for Australia to gain access to 'a submarine design where the "older" embedded technology is not very old and is in fact the best in the world with the exception of the supplying countries own submarine system'.¹⁸

5.21 Commodore Greenfield agreed with the finding that because submarines are stealthy weapons systems and stealth is at the top of the secrecy list, their country of origin will not surrender such information or technology. He echoed the views of the submarine institute and Admiral Briggs that if a country develops something that gives its submarine a capability edge against all others, it would not let that technology out of its sight or allow it to be leaked to anybody else.¹⁹ Furthermore, when it comes to finding solutions to unique requirements, such as those of the future submarines, Commodore Greenfield observed that no other country would be motivated to solve those challenges.²⁰ Mr King noted that at least on some occasions where a submarine is sold by a company resident in a country, the submarine that that country uses is not the same submarine that is exported to others.²¹

5.22 This reluctance of overseas countries to relinquish their most advanced technology means that Australia needs to apply competitive pressure to ensure that it is best placed to obtain the cutting edge technology it is seeking to acquire. Again this need to test and encourage designers and builders to devise the best option for the future submarine is another compelling reason for having a competitive tender.

5.23 There were many other aspects of the boat's design that should be thoroughly explored and which can only be done effectively and fairly through a competitive tender. For example, the committee referred to the standard of habitability. In this regard, Rear Admiral Briggs was of the view that it was a fundamental design feature of submarines and answers on such detail would be obtained from the PDS. This process would enable the tender evaluators to determine the space per person that was available and the provisions made for crew support. In his words, 'If you do it badly you have inefficient, ineffective crews and you will lose submarines in a hot situation'.²²

- 19 *Committee Hansard*, 30 September 2014, p. 25.
- 20 *Submission 18*, p. 2.
- 21 Committee Hansard, 30 September 2014, p. 50.
- 22 Committee Hansard, 30 September 2014, p. 15.

¹⁷ *Submission 25*, p. 5.

¹⁸ *Submission 25*, p. 5.

5.24 Rear Admiral Briggs flagged design philosophy as a major issue and one that must be assessed in getting those responses from the PDS:

You have to understand right down to a fair level of detail what the designer had in mind and what was important to him. How a Japanese crew lives and is prepared to live and operate their submarine, how long they want to keep it at sea, the transit distance, the water temperature, the shock standard, the quieting standard—all those things go into the design philosophy. You need to understand and know all of that in great detail in order to assess the risk as to whether this designer is actually the right man to come with you on the journey and is going to give you a product at the end that is going to be useful to you. It is a dry-sounding term, but it is actually pretty fundamental to getting the right answer.²³

5.25 Mr Graeme Dunk, Australian Business Defence Industry, agreed fully with the view about the need for Defence to take an existing design and to modify it for Australian purposes. He noted in particular that whatever Australia does in the shipbuilding and the submarine-building space, it would use a design where the IP is owned by somebody else. He reasoned that under such circumstances, 'there should be no reason why we cannot go to an open tender to tease out all the nuances that exist and therefore arrive at the best solution'.²⁴

5.26 In responding to suggestions about conducting an open competitive process, Mr King noted that certainly it could extend the time a lot. But Mr King noted that Defence had already done a substantial amout of work to learn about current submarine technology and performance. He stated:

We have built up this body of knowledge and we have done a lot of other work with different consulting groups in understanding the submarine design drivers that we need to take into account to get a submarine that meets Australia's strategic needs.²⁵

Engagement with Japan

5.27 Since February, Defence officials have visited Japan three times to discuss possible cooperation on submarines. The meetings—in February, May and September—were part of a series of meetings that DMO had while in Japan.²⁶ Mr King informed the committee that DMO had conducted a series of meetings with Japan exploring areas of collaboration on a range of science and technology fronts including underwater technologies, with the main focus on hydrodynamics. During the visits, discussions also took place on science and technology agreements being entered into and other strategic discussions. Mr King stated:

²³ *Committee Hansard*, 30 September 2014, p. 13.

²⁴ *Committee Hansard*, 8 October 2014, p. 17.

²⁵ Committee Hansard, 30 September 2014, p. 49.

²⁶ *Committee Hansard*, 30 September 2014, p. 34. Mr King was unsure of the date of the hearing held around the month of May.

...we are looking at various technologies that might be shared between us or collaborated on in the future. We certainly had discussions on potential for submarines.²⁷

5.28 In respect of the submarines, Mr King indicated that it was the biggest item on the agenda for the visits.²⁸ He stated, however, that no agreements had been signed.

5.29 According to Mr King, DMO was currently exploring the relationship with Japan in regard to the Soryu submarine:

...an option of a Soryu as a basis for an Australian submarine was not available to us last year. In making changes to the way the Japanese government deal with defence products, we are exploring the potential of some sort of cooperative program with Japan and others on submarines.²⁹

5.30 Mr King referred to Australia's unique geographical circumstances that require a unique solution for its operational needs. He explained that Japan has a very competent conventional submarine and as a consequence, DMO:

...is looking at the early stages of whether that relationship with Japan can deepen and what is involved in that, and whether or not at the very highest level something like a Soryu would form a basis for something for the future. But it is exploratory in the sense that it is very early days and we are looking at a number of fronts.³⁰

5.31 The initiative to hold the discussions in February with the Japanese came solely from Mr King, who informed the committee that the meeting was cleared by the Secretary of the Department of Defence but not the minister.³¹ While the Minister was not formally advised of Mr King's intention to travel to Japan in February 2014, the visit was prompted by an informal discussion between the Minister and CEO in late 2013. This discussion related to opportunities to explore broad materiel engagement between the two countries ahead of the minister's visit to Japan in 2014.³²

²⁷ Committee Hansard, 30 September 2014, p. 34.

²⁸ *Committee Hansard*, 30 September 2014, p. 34.

²⁹ Committee Hansard, 30 September 2014, p. 36.

³⁰ *Committee Hansard*, 30 September 2014, pp. 36–37.

³¹ *Committee Hansard*, 30 September 2014, p. 38. In an answer to question on notice No. 2, taken on 30 September 2014, the Department of Defence informed the committee that: the approval delegate for international travel to be undertaken by the Chief Executive Officer of the Defence Materiel Organisation (CEO DMO), is the Secretary of Defence. Departmental officials do not routinely advise the Minister for Defence of an intention to travel. In this particular case, the Minister was not formally advised of Mr King's intention to travel to Japan in February 2014.

³² Department of Defence, answer to question on notice No. 2, taken on 30 September 2014.

5.32 Mr King did not think other people in the government would have known about his visit but he spoke to the submarine team about the matters he was going to look at in Japan. In his words, he was exploring a range of ways DMO might collaborate on a submarine program for Australia and that it was very much 'a matter of our own internal business'.³³ He was seeking logical solutions to an important problem for DMO to solve and having made that visit, he reported on what he had learnt.³⁴ Mr King repeated earlier statements that:

...we are looking at the potential to collaborate with Japan on using that class of submarine as a basis for our submarine.³⁵

5.33 During the February visit, Mr King found more options than he originally thought were available. The May visit was a group visit and another meeting was also held in September.³⁶ According to Defence, a senior advisor (Executive Level 2) from the Department of Prime Minister and Cabinet participated in the most recent visit to Japan. This visit, which did not include representatives from the offices of the Prime Minister or the Minister for Defence, took place on 24 and 25 September 2014.³⁷

5.34 Vice Admiral Barrett, Chief of Navy, agreed with Mr King's evidence that Defence was looking at collaborating with the Japanese on technologies that might be used in a submarine designed for Australia.³⁸ He stated:

....As you would expect us to do when we are making a decision on submarines of a certain size, where there are other nations that operate submarines of that size, we would seek to understand more of their capability, and we are doing that.³⁹

5.35 When asked to identify the relevant option under which Australia was pursuing discussions with Japan on its submarine, Rear Admiral Sammut said:

First of all, I will go back to timing. At the time that we were talking about MOTS we were essentially talking about European MOTS because they were the designs that were accessible to us. The constraints around that were that, while we would make some changes...it was still fundamentally the boat as it exists in terms of physical size and so on. Since that decision...Japan has been moving towards freeing up its ability to deal with allies and partners in a progressive way.⁴⁰

³³ *Committee Hansard*, 30 September 2014, pp. 40 and 42.

³⁴ *Committee Hansard*, 30 September 2014, p. 41.

³⁵ *Committee Hansard*, 30 September 2014, p. 43.

³⁶ *Committee Hansard*, 30 September 2014, p. 63.

³⁷ Department of Defence, answer to question on notice No. 8, taken on 30 September 2014.

³⁸ *Committee Hansard*, 30 September 2014, p. 43.

³⁹ Committee Hansard, 30 September 2014, p. 43.

⁴⁰ *Committee Hansard*, 30 September 2014, p. 37.

5.36 This comment regarding Japan 'freeing up its ability' referred to recent political developments in Japan whereby restrictions have been lifted on the export of military technology.⁴¹ As Mr King indicated this move opened up opportunities, previously not available, for Australia to investigate the Japanese submarine.⁴²

5.37 To Mr King's mind, it was obvious that in searching for the best solution for Australia the potential to explore any possible cooperative arrangements with Japan was 'almost a new dimension of exploration'. Accordingly, Mr King argued that it was certainly not the MOTS exploration of small European boats:⁴³

...there are a whole range of matters to be worked through. We are exploring with Japan whether there is potential for some form of program based around the work they have done in producing their Soryu boats. I do not think I described it as 'MOTS'... I would think about it as a new area of exploration because of the change in Japan's position...It is still ongoing. It is incremental. They are making incremental changes to their position. It is not a completed piece of work yet.⁴⁴

5.38 Mr King proceeded to explain that the European boats in the water and operating currently were smaller and had a much more limited capacity and endurance. According to Mr King, he was aware that Japan had a very competent submarine, including a well-proven propulsion drivetrain. He noted that the propulsion system has been a major problem with Collins and he took it upon himself, with the approval of the secretary, to visit Japan.⁴⁵ He explained:

...one of my reasons for going to Japan was that I wanted to understand because their submarine is about the size that we had in mind for our concept work—what they have done with their propulsion system. How reliable is their propulsion system? My thought for that first process was: if they have got a proven propulsion system that can move the submarine effectively through the water, then maybe—that was the original discussion—we could use that. You do not have to test it. It is at sea in multiple boats.⁴⁶

5.39 The main electric motor was another area for potential investigation. Mr King explained that such a motor in a submarine was 'a very big, highly complex device, and clearly not the sort of device available off the shelf'—'it has to be scaled to your submarine'. Mr King indicated that he was interested in the Japanese electric motor

For a more detailed account of the shift in Japan's policy on the export of arms, see paragraphs 5.70–5.73.

⁴² *Committee Hansard*, 30 September 2014, pp. 37–39.

⁴³ *Committee Hansard*, 30 September 2014, pp. 37–38.

⁴⁴ *Committee Hansard*, 30 September 2014, pp. 37 and 38.

⁴⁵ *Committee Hansard*, 30 September 2014, p. 38.

⁴⁶ *Committee Hansard*, 30 September 2014, p. 56.

because Defence was contemplating 'a submarine of about the same size in our concept'.⁴⁷

5.40 Mr King noted that DMO had undertaken previous visits but the Japanese position on defence exports meant that any exploration of technology was not possible until recently. He took the opportunity once more to emphasise the potential advantages that the Japanese submarine offered:

Realising that Soryu was a submarine of about the size that we might be interested in, and understanding that they had a very well proven propulsion train, I thought it would be well worthwhile for me to go and visit Japan and ask them about their program—ask them, for example, whether they would be interested in supporting our program through the release of some of that technology, what restrictions might apply and whether there was any opportunity to pursue that course of action.⁴⁸

5.41 Turning to other potential acquisitions, Mr King stated that he does a lot of work trying to get background knowledge and meeting with different countries, which has included Sweden several times over intellectual property (IP) issues and regular talks to ThyssenKrupp Marine Systems (TKMS).⁴⁹ Vice Admiral Timothy Barrett, Chief of Navy, also noted that the government was looking at options for an Australian-design submarine from a number of countries.⁵⁰ He explained:

In the same way that we have investigated through due process of options 1 and 2 in a previous life—we have looked at German solutions, we have looked at Swedish solutions.⁵¹

The Soryu submarine

5.42 Speculation about the government opting to purchase the Japanese submarine prompted a number of witnesses to question the submarine's capability and its suitability for Australian conditions.

5.43 Range and transit are very important for Australian submarines.⁵² At the public hearing, Rear Admiral Briggs reminded the committee that the Soryu had been designed to meet Japanese requirements. He stated that the Soryu has less mobility, that is the ability to cover the distance quickly. According to his estimates, based on publically available figures, Collins speed is nine to 10 knots and the Soryu is six to 6.5.⁵³ He explained:

- 50 Committee Hansard, 30 September 2014, p. 44.
- 51 *Committee Hansard*, 30 September 2014, p. 44.
- 52 See paragraphs 6.8–6.12.
- 53 *Committee Hansard*, 30 September 2014, p. 12.

⁴⁷ *Committee Hansard*, 30 September 2014, p. 39.

⁴⁸ *Committee Hansard*, 30 September 2014, p. 39.

⁴⁹ *Committee Hansard*, 30 September 2014, p. 40.

Their patrol area is a fraction—perhaps less than a third—of the distance we have to go, compared to Collins as a benchmark. And we are doing this with publicly available figures. We have not had any real exposure to the details of the Soryu, but looking at it with a submariner's eye we can tell quite a lot, and we have been able to talk to people who have experienced the submarine.⁵⁴

Soryu and Collins are about the same size on the surface. That describes a sort of payload capacity that the two platforms have—very similar. From the publicly available figures, Soryu has two-thirds the range, 6,000 nautical miles at six and a half knots. So it is slower and it does not go as far. That is perfectly reasonable for the Japanese situation, but it would be untenable for Australia's situation. If you start from Perth, from Fremantle, and go into the centre of the South China Sea, say—a reasonable bit of geography—you have a 3,500 nautical mile transit and 3,500 nautical miles home. The Soryu might get to the Gold Coast but it cannot come back and it cannot do anything when it gets there. So Collins is expected to be able to do that and then spend up to five weeks on patrol.

...that is 3,500 there and back, 7,000 total, and another 3,000, give or take, on the patrol. You are looking for a submarine with a range of certainly 12,000 nautical miles, and it is not a good idea to come back empty. You want something—10 per cent—left.⁵⁵

5.44 Commodore Greenfield supported the conclusions reached by Admiral Briggs about the differences between the Soryu and the Collins.⁵⁶ He gave a similar example comparing the performance of the Japanese boat to the Collins. He told the committee:

If a Soryu and a Collins left Fleet Base West near Perth together and travelled at 10 knots to Darwin, the Soryu might not actually make it or, if it did, it would be very low on fuel. This is because the power and fuel required increases exponentially with speed—at the cube of the speed.⁵⁷

5.45 He indicated that the design could not simply be altered to suit Australia's needs. In his view, modifications were not straightforward exercises: that a modern submarine was 'very tightly integrated and hugely dense'...full of machinery and electronic cabinets with no empty space to allocate to a new system.⁵⁸

Generators, motor and batteries

5.46 According to Rear Admiral Briggs, generator power and batteries are needed for transit. He informed the committee that the Collins has three 1,400-kilowatt diesels

⁵⁴ *Committee Hansard*, 30 September 2014, p. 11.

⁵⁵ *Committee Hansard*, 30 September 2014, p. 11.

⁵⁶ *Committee Hansard*, 30 September 2014, p. 25.

⁵⁷ *Committee Hansard*, 30 September 2014, p. 22.

⁵⁸ *Committee Hansard*, 30 September 2014, p. 22.

while the Japanese has two 1,400.⁵⁹ In his view, the difference was 'very significant on a transit where you require the power to quickly recharge the batteries'. He advised that it would require the submarine to run its diesels for longer to get the same capacity back in the batteries. He explained 'Every minute you run the diesels, you are exposed to counter detection'.⁶⁰ Noting that Soryu has two-thirds the generating capacity of Collins, he then stated further:

It is the same size—and, in fact, when it is dived, it is 1,000 tonnes heavier. It only has two-thirds the generator capacity of Collins. When it snorts, it is going to have to do so for longer. It will take longer to recharge its batteries. I do not know what its battery capacity is, but I am sure the designer has a balance in his generators and his batteries. I would be very surprised if it has anything like the battery capacity of Collins. It will be smaller. It is designed for a different job. They have very similar top speeds. Soryu has a bigger propulsion motor because, when it is dived, it is 1,000 tonnes heavier and so it needs the extra power. It does not go any faster for it.⁶¹

5.47 To his mind, there was nothing secret about looking at a submarine sitting alongside the wharf and knowing it has two 1,400 kilowatt generators to propel a 4,000-tonne submarine and concluding that it would 'be slow and rather more exposed'.⁶²

5.48 Rear Admiral Briggs also told the committee that the Japanese submarine has a slightly larger main motor—5,900 compared to 5,400. It carries about 1,000 tonnes more weight when it dives, so it is significantly heavier than the Collins. He did not expect it would outmanoeuvre the Collins.⁶³

5.49 In essence, according to Rear Admiral Briggs, Soryu is a submarine that physically looks the same size as the Collins but, in a capability sense, 'is significantly less than Collins' in terms of range installed power etc. In his opinion, it would be difficult to start to amend this and expand it to incorporate the sort of extra diesels and the extra fuel.⁶⁴ According to Rear Admiral Briggs and Commodore Roach, if Defence went with Soryu, as described in publicly available information, the boat would not match the Collins.⁶⁵

5.50 Regarding Soryu's size, Commodore Greenfield wanted to clear up some misconceptions. He informed the committee that size was usually determined by

⁵⁹ *Committee Hansard*, 30 September 2014, p. 14.

⁶⁰ *Committee Hansard*, 30 September 2014, p. 14.

⁶¹ *Committee Hansard*, 30 September 2014, p. 11.

⁶² *Committee Hansard*, 30 September 2014, p. 15.

⁶³ *Committee Hansard*, 30 September 2014, p. 14.

⁶⁴ *Committee Hansard*, 30 September 2014, p. 11.

⁶⁵ *Committee Hansard*, 30 September 2014, p. 12.

surface displacement, not dive displacement—surface displacement was an indication of usable volume. He reasoned:

So we should be comparing surface displacements for Soryu at 2,950 tonnes with Collins at 3,050. To do otherwise is erroneous, except that we believe that Soryu also has 10 metres of air independent propulsion, which is only good for the slow patrol part of the mission and not good for transits...That 10 metres would be about 500 tonnes, leaving about 2,500 tonnes to compare with the Collins at 3,050. Even, if I add another 200 tonnes in there, it is still substantially less.⁶⁶

5.51 To Professor Roos' mind, people should also be cognizant of issues around the design philosophies in submarines:

When you lock down at the beginning of a new class, you lock down a design philosophy that sets certain parameters. For example, a Japanese submarine has 1,300 tonnes of water when it goes...underwater—as compared to a Collins or a normal submarine from the rest of the world, which has 10 per cent, which is around 300 tonnes. That means, of course, that you have a very slow boat to accelerate and to stop; that is a lot of weight to carry around. It also means that, in those scenarios, you have very little crew space to do what you want. In such a situation, trying to make something of a requirement that we would fulfil is impossible with the same buoyancy issues.⁶⁷

5.52 Indeed, Rear Admiral Biggs and Commodore Roach produced a table that compared the Soryu to the Collins (see Table 5.1). Based on the information produced in the table, they concluded that:

It is apparent therefore that SORYU would need to be heavily modified to meet the Australian requirements, particularly for long ocean transits and patrols. This would carry cost, performance and schedule risks and will amount to a new design; it will not be a Military Off The Shelf (MOTS) acquisition.⁶⁸

5.53 Rear Admiral Briggs made clear that the evidence and information in the table were from the publicly available figures, which was the best data available.⁶⁹

⁶⁶ *Committee Hansard*, 30 September 2014, p. 22.

⁶⁷ Committee Hansard, 8 October 2014, p. 16.

⁶⁸ *Submission* 17, p. 6.

⁶⁹ *Committee Hansard*, 30 September 2014, p. 12.

Table	5.1—A	comparison	of	some	characteristics	of	the	Soryu	and	Collins	class
subma	rines ⁷⁰										

Characteristic	Soryu	Collins	FSM	Remarks
			Requirem	
			ent	
Surface	2950*	3100	Not less	Regularly quoted displacement in
Displacement			than	media for Soryu (4200 tonnes) is
(tonnes)			Collins	submerged displacement, which means
				that Soryu carries 1300 tonnes of
				ballast water. Useable space on-board
				is determined by the surfaced
				displacement.
				Without the AIP section, Soryu has
				less useable volume than Collins.
				Note: since Soyru is a double hulled
				design some of the ballast tanks may
				be convertible to fuel tanks, improving
				the useable volume calculation.
Range (NM)	6000 @ 6.5	9000@	Not less	Australian operations require long
	knots	10 knots	than	distance transit to reach patrol area
			Collins	within a reasonable timeframe. Soryu
				is not designed for long transits.
Top Speed	Similar	Similar	Similar	
Diesel	2 x 1400	3 x 1400	Not less	Similar diesel design on Soryu and
Generators	kW	kW	than	Collins.
			Collins	Less installed power results in longer
				snorting time and reduced stealth.
Propulsion	5900 kW	5400 kW	Not less	The higher installed power on Soryu is
			than	required due to the extra ballast water
			Collins	carried when submerged.
Combat	C2	AN/BGY-1	Updated	US based combat system fully
System	(Japanese)	(US/Aus)	version of	integrated on Collins. Integration of
			AN/BGY-	US combat system into Soryu
			1	required.
			(US/Aus)	
Torpedoes	Type 89 –	MK 48	MK 48	MK 48 torpedoes fully integrated on
	(Japanese)	(US/Aus)	(US/Aus)	Collins. Integration of US combat
				system into Soryu required.
Missiles	Harpoon	Harpoon	Harpoon	
Crew	65	58		
Legislation	Japanese	Australian	Australian	Modification of Soryu is required to
and Naval				meet Australian safety and technical
Requirements		• •		regulatory standards.
Operational	16 years	28 years	Not less	Changes in design and support
Life			than	philosophy required for Soryu.
			Collins	New maintenance program required.

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Combat system

5.54 The future submarines' combat system is also an important consideration. Rear Admiral Briggs informed the committee that the Soryu's combat system is Japanese and developed in Japan. They do not use American weapons as Australia does. He then suggested that one of the challenges would be to integrate those into the new submarine.⁷¹

5.55 Rear Admiral Briggs informed the committee that Collins is 'totally comfortable carrying US weapons—Mark 48s and the Tomahawk and already carries the Harpoon missile. He noted that the Japanese submarine uses Japanese developed torpedoes; they are not Mark 48s, and 'you may find when you try and integrate the torpedoes that the 48 is heavier and so the racks that hold it have to be strengthened'.⁷² He had no idea about how well the Japanese torpedoes work. He surmised that they may well do very well now but he did not know. He then stated:

What I do know is that we have a larger partner and ally in the Pacific that has a large number of those torpedoes and, come the need, we will be able to restock hopefully. I also know that they have a regular war shot proving program, which we participate in. So we take a war shot off the rack, and we fire it at a suitable target and watch it work and go bang. I have no idea how the Japanese do it. I do know the Americans are extremely thorough, and I am very comfortable working with those weapons.⁷³

5.56 Commodore Roach explained further it was worth noting the relationship Australia has with the US Navy (USN). In his view, it was 'unique' in as much as:

...we both have sufficient confidence in each other's ability to operate the US combat system in Collins and the practice Mark 48 torpedoes that we fire those torpedoes at each other. The torpedoes are set to miss and they turn away, but nobody else has that relationship where both countries have sufficient confidence to be able to exchange practice torpedoes.⁷⁴

5.57 Rear Admiral Briggs referred to the armament cooperation program that Australia has with the Americans. He noted that Australia was working with them to evolve the Mark 48 torpedo:

The Defence Science and Technology Organisation has been working to improve the sonar in that torpedo. So you actually have Australian smarts going into this USN weapon, and we get the latest version of it with those smarts in it. That is not something they are going to share with you if there is any chance at all of a third party getting an overview.⁷⁵

⁷¹ *Committee Hansard*, 30 September 2014, p. 11.

⁷² *Committee Hansard*, 30 September 2014, p. 12.

⁷³ *Committee Hansard*, 30 September 2014, p. 12.

⁷⁴ *Committee Hansard*, 30 September 2014, p. 12.

⁷⁵ *Committee Hansard*, 30 September 2014, p. 12.

5.58 Professor Roos was also of the view that the Soryu could not in its current configuration carry the heavy version of the MK 28 Torpedo and hence was unsuitable for Australia's armament requirements.⁷⁶ Clearly, the integration of the future submarine's combat system into the future submarines introduces a number of major considerations when selecting the preferred tenderer.

Different operating environment

5.59 In addition, Mr Pacey also noted that the sea conditions under which Australian submarines operate during transit are quite demanding and may be different from those under which other conventional submarine operators move. While he accepted that Japan also has an extremely demanding environment, he noted that it was of a different nature. He explained:

If you look at the northern latitudes and seas that it operates in, they are icebound in winter and indeed for most of the summer. There are comparable latitudes in Scandinavian countries; but, of course, the pattern of ocean currents means that some of the areas that Japan operates in are considerably colder.⁷⁷

5.60 Rear Admiral Briggs similarly observed that in the Northern Pacific, where the Japanese submarines operate, the waters are cooler, which probably does not present a problem. But, he argued, Australian submarines often operated in 'hot tropical waters, and 32 degrees surface water temperature compared to 16 degrees is a quantum change in how much cooling you need'. He explained that the higher temperatures affect how much cooling capacity the submarine needs for its equipment, 'right down to fundamentals like the design of the battery'. According to Rear Admiral Briggs, the battery temperature 'when you are recharging is a significant operational issue'.⁷⁸

Through-life-support

5.61 The 2009 White Paper noted the operational life of the future submarines was anticipated to extend into the 2050s.⁷⁹ Rear Admiral Briggs drew attention to the fact that Japan has a continuous build program, which probably drives a lifetime of about 16 years for the Soryu. Thus, while it may be possible to extend the service life of the Soryu for the 20 or 25 years that Australia prefers, the changes may, according to Rear Admiral Briggs, start to impinge on the design and the design philosophy.⁸⁰ He noted that most countries have a much longer service life for their submarines.

⁷⁶ *Submission 25*, p. 11.

⁷⁷ *Committee Hansard*, 30 September 2014, p. 29.

⁷⁸ Committee Hansard, 30 September 2014, p. 11.

⁷⁹ See Appendix 3—Background to SEA 1000 Phase 1A—acquiring Australia's future submarine capability, p. 83.

⁸⁰ *Committee Hansard*, 30 September 2014, p. 11.

In his assessment, 20, 24 or 28 is the normal operational life of a submarine. He added:

I do not know but I suspect that the 16 years figure is driven by the tempo for the industry to keep the shipyards moving and they have accepted that they will take it out of service earlier than we would normally plan on. That has an effect on the support arrangements. You probably do not choose to modernise to the same degree as you would if you have the submarine running on for another 50 per cent of time to 24 years. So it could have quite a significant impact on the capability. Worse, if you decide that, although it has been designed for 16 years, you are going to run it for 24 years, you are going to find out unpleasant things in the back eight years of that.⁸¹

5.62 On the matter of the Soryu's shorter life in service, Professor Roos concluded that either Japan needs to change its design philosophy or 'Australia needs to change its operational and sustainment philosophy to ensure compatibility'.⁸² Undoubtedly, the shorter operational life of the Soryu is another critical factor when considering it as a suitable starting point for Australia's future submarines.

Crewing arrangements

5.63 Rear Admiral Briggs and Commodore Roach suggested that the crew component for a Japanese vessel was 65 and for the Australian 58. Rear Admiral Briggs accepted the proposition that the estimated difference in the space per crew member on the Japanese vessel may be 20 per cent to 30 per cent less.⁸³

5.64 According to Rear Admiral Briggs, there was sufficient information to calculate precisely the usable volume for crew space. He was of the view that the amount of room per crew member in the Japanese boat would be substantially less than that available to crew in the Collins. He noted that the Soryu had the AIP section added, which normally would be a 10-metre section for the Stirling engines. He estimated that, in fact, the Japanese only lengthened the submarine by two metres, so they have taken eight metres out of somewhere else in the submarine. In his view, one of the most likely candidates would be habitability: that the habitability of the submarine compared to Collins is less—'it is denser; people are packed in'.⁸⁴ While Rear Admiral Briggs acknowledged that this shortage of space would probably not be an issue on the short patrols, it would be a completely different proposition to having a 10-week patrol.⁸⁵ He then detailed some of the facilities available to the crew on a Collins.

- 84 *Committee Hansard*, 30 September 2014, p. 14.
- 85 Committee Hansard, 30 September 2014, p. 14.

⁸¹ *Committee Hansard*, 30 September 2014, p. 13.

⁸² *Submission 25*, p. 11.

⁸³ *Committee Hansard*, 30 September 2014, p. 15.
Collins provides a recreational space—a mess deck where people have meals—that is able to actually take the whole crew. There is nowhere in an Oberon that you can actually get all the crew into one place. If you are working the intensity that submarine crews work—two watches, 12 hours a day plus; 14- and 16-hour days are not untypical—you need somewhere where you can get away from it a little bit and relax. You need some private space. You need your own bunk. You need some locker space to take gear. Probably in the modern submarine you will need an internet inside the submarine—the equivalent of the iTunes Store and Wikipedia available for internal use; you are not going out to the world. All this takes time, space and power.⁸⁶

5.65 According to Rear Admiral Briggs 'ineffective crews make for vulnerable submarines'. He added:

If your crew is not on top of the job, the difference between walking away from this engagement can be a reaction that takes place in the control room measured in seconds. In a submarine-on-submarine engagement, it is a knife fight—the best guy, the quickest guy, walks away from it. That is one impact. The other one which is more easily understood is that you will not retain submariners. People will not go to sea and stay there through a career in a submarine that is very difficult to live in.⁸⁷

5.66 Commodore Greenfield agreed with Rear Admiral Briggs that crew habitability may have been heavily compromised in the Soryu.⁸⁸ Professor Roos, who quoted the same number of crew members for the Soryu and Collins, reached the same conclusions that crew habitability and effectiveness on the Soryu would be much worse than the Collins.⁸⁹

5.67 The living and working conditions of Australia's submariners is yet another matter that requires careful consideration when selecting the design of Australia's future submarine. A competitive product definition study would provide the necessary information on facilities for the crew and space, which are fundamental design features, and allow comparison on these important matters.

Political dimensions

5.68 Professor Roos told the committee that Australians could only speculate on the approaches that Australia had made to Japan. He stated, however, that it was important to realise that there was more than one party to be engaged in the dialogue. For example on the political aspects of acquiring the submission. In this regard, he referred to the excellent relationship between Prime Minister Shinzo Abe and

⁸⁶ *Committee Hansard*, 30 September 2014, p. 15.

⁸⁷ *Committee Hansard*, 30 September 2014, p. 15.

⁸⁸ Committee Hansard, 30 September 2014, p. 22.

⁸⁹ *Submission 25*, p. 11.

Prime Minister Tony Abbott. He then indicated that there was the military aspect and the need to talk to the Japanese navy and their particular interests. Finally, he referred to discussions between DMO and its Japanese equivalent as well as Japanese companies who are the builders of these submarines.⁹⁰

5.69 Mr Dunk concurred with Professor Roos' comments that there were numerous levels and dimensions of engagement between Australia and Japan and not simply the high level political discussions.⁹¹

Technology transfer and cultural differences

5.70 In Part I of its report, the committee touched on the problems with the AWD and some of the difficulties with technology transfer. Indeed, Dr Andrew Davies and Dr Mark Thomson, ASPI, recently suggested that the problems with the AWD program were not only to do with low productivity in the Australian shipyards but with 'the translation of the design to the build stage'. They indicated that:

Frequently, drawings had to be redone—up to four times in some cases when they were found to be unfit for purpose. Given that Navantia had successfully constructed similar vessels in its shipyards at Ferrol, this seems to have been an unanticipated problem, despite spending more than \$200 million on pre-approval studies, including, presumably, a study of the effect of Australian design modifications.⁹²

5.71 Dr White similarly highlighted problems with technology transfer and also cited the AWD program, where the Spanish had not previously exported their design. Such problems have proved costly and caused significant delays. The Collins experience shows that the difficulties are not only experienced during the build phase but with through-life maintenance and upgrades.

Experience exporting military technology

5.72 Commander Owen observed that the Japanese Prime Minister had opened the door only slightly on defence exports, the first one ever to relax the rules. Even so the Japanese have no experience with exporting and supporting overseas construction of their submarines.⁹³ Indeed, for many decades, Japan has had a policy that severely restricted the export of arms, including technologies that were exclusively related to the design, production and use of arms, regardless of the destination.⁹⁴ Recently, Japan has adopted new principles governing the export of arms, which has lifted some of

⁹⁰ *Committee Hansard*, 8 October 2014, p. 21.

⁹¹ *Committee Hansard*, 8 October 2014, p. 21.

⁹² ASPI, *The submarine choice; Perspectives on Australia's most complex defence project,* September 2014, p. 39.

⁹³ *Committee Hansard*, 30 September 2014, p. 7.

⁹⁴ Ministry of Foreign Affairs of Japan, 'Japan's Policies on the Control of Arms Exports, http://www.mofa.go.jp/un/disarmament/policy/ (accessed 27 October 2014).

the export restrictions and, under certain circumstances, allowing the export of military technologies.⁹⁵ One commentator noted, however, that:

The Japanese people still hesitate to embrace the notion of arms sales, as shown by a Kyodo News survey published in March 2014, which found that 66 percent of respondents opposed the relaxation of the old arms export principles. Further, Japanese government agencies do not yet have a mechanism to coordinate with one another in this new field.⁹⁶

5.73 Mr Hamilton-Smith noted the challenges created because Japan has not exported military technology before, especially problems related to through-life support for the future submarines.⁹⁷ Dr White similarly referred to Japan's lack of experience in transferring their technology.⁹⁸

5.74 Rear Admiral Briggs and Commodore Roach also raised concerns about the practicalities of establishing a transparent dialogue with Japan, which 'has no established protocols with Australia for the exchange of classified, sensitive technical data'. It seemed to them, that the fact that Japan 'must develop regimes to regulate this dialogue seem to have been ignored'. Furthermore, in their view, it was 'certain that this will be a very protracted process'.⁹⁹

5.75 The transfer of military technology is clearly a new and unfamiliar area of Japanese endeavour and one that should weigh heavily on the minds of Australia's decision-makers when it comes to the future submarines.

Cultural differences

5.76 In addition, Dr White also noted that, in the case of Japan, the transfer of technology could be further complicated by language challenges. He observed that whereas the Europeans now regularly export work in English, the Japanese do not.¹⁰⁰ Rear Admiral Briggs and Commodore Roach also suggested that the cultural differences between European ship and submarine builders had been sufficient to cause significant problems for the Collins class submarine project and the AWD. They surmised that the prospects for difficulties arising from cultural differences with Japan were all too apparent and very real. They were of the view that:

⁹⁵ For more detail see, Taisuke Hirose, 'Japan Chair Platform: Japan's New Arms Export Principles: Strengthening U.S.–Japan Relations,' Center for Strategic & International Studies, 14 October 2014.

⁹⁶ Taisuke Hirose, 'Japan Chair Platform: Japan's New Arms Export Principles: Strengthening U.S.–Japan Relations,' Center for Strategic & International Studies, 14 October 2014.

⁹⁷ Committee Hansard, 14 October 2014, p. 2.

⁹⁸ Committee Hansard, 13 October 2014, p. 30.

⁹⁹ Submission 17, p. 8.

¹⁰⁰ Committee Hansard, 13 October 2014, p. 30.

To expect to access all relevant technologies during the course of an overseas build of such a complex vessel as a submarine for the initial collaboration with a country, which has no experience in such matters, is extraordinarily ambitious and inherently risky.¹⁰¹

Evolved Soryu

5.77 Professor Roos was of the view that although speculation centred on the existing Soryu class submarines, Australian interest was probably directed at the development of the follow-on class from the Soryu, which is presently five years into its 10-year development phase. In his opinion, it would be impossible to include the Australian requirements into that class development, without putting it five years back in time. He stated further:

It is unlikely that Japan would like to do that, because of the implications it would have for its own defence capability and build cycle. Also, there is no shipyard capability surplus in Japan to do this work, and there is no workforce to do the work if it is going to be above and beyond. In addition to that, as we have seen from the existing media comments, the decision to buy a Japanese submarine will not be made in Canberra—it will be made in Tokyo—and it is highly unlikely that it will be made to a level we are comfortable with, because the IP sits to a great extent in the Japanese companies or the builders, and they have shown no willingness to share it with us, because they believe that would immediately leak to the US, which I think is probably a reasonable assumption.¹⁰²

Comparing capabilities

5.78 Rear Admiral Sammut, DMO, did not disagree with the view that there was a need to understand that Soryu's surface displacement was indicative of its capabilities. Likewise, he was not disputing Rear Admiral Briggs' testimony or that of others. He did, however, question some of the assumptions being made when comparing the Soryu to the Collins. He indicated that there were several ways to list the displacement of a vessel depending on how it was calculated and presented. For example, he suggested that it could be in a laden state, with weapons and fuel fully embarked and so forth. According to Rear Admiral Sammut, these factors are all part of the calculation for surface displacement and have 'a large bearing on what the dive displacement needs to be as well to ensure the submarine remains in a safe state'.¹⁰³ He wanted to make clear that there were many factors involved, but, as a starting point, he mentioned the size considered necessary for the future submarine already existed with the Soryu class. Furthermore, the Soryu's propulsion

¹⁰¹ Submission 17, paragraph 36.

¹⁰² Committee Hansard, 8 October 2014, p. 16.

¹⁰³ *Committee Hansard*, 30 September 2014, p. 59. Rear Admiral Sammut is Head, Future Submarine Program, DMO.

system was a proven main motor that could 'move that mass through the water at about the speeds we think our Future Submarine should move through the water'.¹⁰⁴

5.79 According to Rear Admiral Sammut, there were 'broader considerations not just about the vessel's maximum speed but its speed of advance and so forth, including range and endurance:

It does get a little bit complex when talking about speed and so forth, but a speed at which a submarine will reach a certain point where it will conduct its operation and the speed at which it will be able to return goes much more to the range and endurance issues than to the size of the main motor.¹⁰⁵

5.80 He reminded the committee about the extreme complexity of a submarine's main motor and noted that:

To have a proven main motor that would be able to propel the submarine at the speeds that we would require and of the size that we need is a definite advantage in the case of what our submarine cooperation with Japan may reveal. Similarly, the generating capacity of its diesels may be of the right sort of generator capacity that we would need to charge the batteries and so forth.¹⁰⁶

5.81 Mr King was more forthright in expressing his views on the evidence presented to the committee on the capability of the Soryu. He stated:

Those people are not as informed as us. We are still exploring what it can and cannot do in reality and what we may or may not be able to do collaboratively. We would not be doing this if we were not exploring that very question, and we are not doing it from open source; we are doing it in close collaboration with the Japanese.¹⁰⁷

5.82 According to Mr King the chance to consider the Soryu was 'a wonderful opportunity to explore whether Japan may be able to cooperate with us on the program, because until now nothing in a MOTS sense was even remotely like it'. He noted that another option under investigation, involved people designing significantly smaller boats, with propulsion trains optimised for those small boats, offering on paper a solution which is larger. He observed, however, that there were more questions about that approach.¹⁰⁸

¹⁰⁴ Committee Hansard, 30 September 2014, p. 60.

¹⁰⁵ Committee Hansard, 30 September 2014, p. 60.

¹⁰⁶ Committee Hansard, 30 September 2014, p. 60.

¹⁰⁷ Committee Hansard, 30 September 2014, p. 61.

¹⁰⁸ Committee Hansard, 30 September 2014, p. 60.

Extent of modifications

5.83 Rear Admiral Briggs contended that significant modifications would be required if Australia purchased a Japanese vessel and wanted to achieve the sort of indiscretion rates that Navy were used to. He stated that to achieve the required rates, the generating capacity in the submarine would need to be increased. To do so, means that an extra length would need to be added. He then explained:

...since the submarine is already at the length-to-beam ratio that is stretched as far as it can go, you would have to then actually make the pressure hull diameter bigger. At that point you have progressed a long way from a Soryu off the shelf.¹⁰⁹

5.84 Overall, Rear Admiral Briggs argued that the future submarine would be as good as a new submarine—it will start from that basis, which, he suggested, was 'a perfectly sensible way of doing it'. He explained that the sort of fuel, the range capacity and the generating capacity would be significant additional requirements essentially requiring a new submarine:

....A submarine is an underwater airship. It floats underwater. If you add something, either you have to take weight out or you have to make it bigger otherwise it will not float. When you start making it bigger, you can add sections. This has already been done to this submarine [Soryu]. This submarine has already been stretched. It has had an AIP section put in it. When you come to adding new length, a very long, thin shape is very inefficient. A very fat shape is inefficient. In the middle there is a sweet spot. So you have a restriction on how long you can make it before you have to start increasing the pressure hull. This submarine is on that margin. So you are looking at a larger diameter pressure hull than the current submarine has.¹¹⁰

5.85 Despite the concerns raised about the Soryu's capability in respect of it meeting Australian requirements, a number of witnesses still regarded it as worthy of consideration as a candidate. This opinion was in keeping with the generally accepted view that the future submarines would require a modified design to meet Australian requirements. Dr White applauded the initiative of the government exploring the capability of the submarine from Japan. In his view:

It is one of the options; it deserves to be explored; it should be explored. It should be put into the mix with well-known other submarine designs, realising, as well, that most of those other submarine designers and builders have really long experience of how to transfer their technology. In the case of the Japanese, that is clearly not the case. So there are some apples and oranges to be compared here. Frankly, the only way you are going to do that is over an extended period of time. You cannot afford to just go down

¹⁰⁹ Committee Hansard, 30 September 2014, p. 14.

¹¹⁰ Committee Hansard, 30 September 2014, p. 13.

the path with one; you need to take two or three down the path so that at all times you have competition and you have a fall-back.¹¹¹

5.86 Ultimately, as Rear Admiral Briggs pointed out—the 'starting point is that there is no point in buying something that does not do the job':

There is no point spending any money on a submarine that does not do what you need it to do. You have to modify and extend to get a new Collins-like capability. Buying an off-the-shelf submarine with a 6,000-mile range would be worse than a waste of money; it would be an illusion. You will think you have submarine capability and the day you want to use it you will find that it cannot get there or stay there and do the job.¹¹²

Conclusion

5.87 Witnesses agreed unanimously that there was no off-the-shelf submarine currently in production that would meet Australia's requirements. Despite claims about the Japanese submarine, a number of witnesses expressed strong reservations about transferring this technology to Australia.

5.88 Their concerns ranged across a number of the submarine's features as well as the practical difficulties that may be encountered with modifications and technology transfer. The key concerns related to the uncertainty about the submarine's capability compared to the Collins: that in fact the Soryu may not even match Collins' capability let alone provide an enhanced capability as the future submarine is supposed to do.

5.89 Thus, there were concerns about the extent to which the Soryu may have to be modified in order to meet Australia's requirements for its future submarine fleet. Indeed, Professor Roos was of the view that Australian interest was probably directed at the development of the follow-on class from the Soryu, which is presently five years into its 10-year development phase.

5.90 The integration of the combat system was also a source of great concern as was Japan's inexperience in the export of military technology and less than enthusiastic support for Japan's change in policy with regard to lifting its restrictions on such exports.

¹¹¹ Committee Hansard, 13 October 2014, p. 30.

¹¹² Committee Hansard, 30 September 2014, p. 13.

Chapter 6

What submarine capability does Australia need?

Recommendation 5

The committee recommends that Defence and the government start immediately to:

- strengthen and build a more collaborative relationship with Australia's Defence industry and engender a co-operative environment in which industry is encouraged to marshal its resources in support of Australia acquiring and building a highly capable fleet of submarines;
- listen to the technical community's concerns about risk—the technical community, supplemented by outside expertise from industry and allied technology partners, understand the state of technology and the degree to which a new design extends that technology;
- consult with retired naval engineers and submariners, especially those who have been involved in reviews of the Collins class submarines and subsequent reforms, and include the most knowledgeable and experienced in a first pass gate review;
- work with Australian and Australian-based businesses, from prime contractors to small and medium businesses, to ensure that the contribution that can be made by Australian industry is identified and integrated as much as possible into the project plan;
- ensure that opportunities to improve skills and upgrade facilities, particularly those that have multiple uses are identified so that investment in the human and physical capital required for this project is maximised;
- risks associated with the transfer of technology are anticipated, identified brought promptly to the government's attention and managed effectively—such risks go beyond securing the rights to IP and also take account of potential or real political and cultural incompatibilities; and
- experienced and senior people in key management positions are involved in the project—this requires a strategy to grow people so they are experienced in various disciplines.

6.1 The current fleet of Australian submarines comprises six Collins class boats. Both the 2009 and 2013 Defence white papers recognised the importance of Australia's submarine capability and of the need to replace its ageing Collins class submarines. In this chapter, the committee considers the strategic importance of acquiring submarines that would give Australia the leading-edge capability it was seeking to achieve.

Determining requirements

6.2 The requirement phase in the capability development life cycle of a major naval acquisition is critical. Decisions made during this stage are central to a project's success and to delivering the best capability that Australia can afford. Vice Admiral Barrett explained that, as the Chief of Navy, he sets the capability requirement for naval vessels. Although he will not define the specific submarine that will eventually be chosen, he will specify requirements in terms of range and endurance and operational needs when on site. He explained that it is capability development and then the actual project that will determine how those requirements would best be met. He explained:

It is then a consideration with the DMO to confirm that we are in a position to afford the requirements that I have set, not just for the build but to sustain it through its life with the numbers that have been modelled as being necessary to be able to produce that effect.¹

6.3 According to the Chief of Navy, 'all parts of the system are trying to achieve the best result for Australia based on those capability requirements'.²

Critical importance of right decision

6.4 A number of witnesses highlighted the central role that submarines have in protecting Australia's interests. Commander Owen, SIA, noted that over the past 100 years, submarines have demonstrated their importance to Australia's defence and foreign policy. He argued that they 'are no longer an optional extra in the Australian order of battle': they are 'critical to the pursuit of an independent foreign policy and are part of the Australian armoury for the foreseeable future and for at least the next 100 years'.³ The SIA stated further that submarines are 'the only means available to allow the government to exert consistent influence along the full length of our sea lines of communication'.⁴ Commander Owen highlighted the numerous areas in which Australia's submarines have a critical role. He was not suggesting that submarines were the only means of protecting Australia's sea lines of communication, but they

¹ *Committee Hansard*, 30 September 2014, p. 52.

² *Committee Hansard*, 30 September 2014, p. 52.

³ *Committee Hansard*, 30 September 2014, p. 3.

⁴ *Committee Hansard*, 30 September 2014, p. 1.

would be the only means when access to the sea surface and the air above it was denied. He stated:

Australia relies on trade for its prosperity, most of which is carried by ships, and thus our maritime security is of vital importance. Long-range submarines, capable of stealthy operations over the length and breadth of our trading routes, are Australia's primary maritime deterrent. Their ability to operate covertly in sea areas denied to other Australian forces deter others from military action and guards against the disruption to our economy that would result from conflicts on and around our trade routes. Australia can and does deploy other forces in support of its maritime security...

In peace time, government has the option to exert quite subtle influence through its use of submarines...

Execution of that influence and support of government policy through the full spectrum of contingencies can be achieved by a single submarine through a six-week patrol. It can observe and report without being detected and it can deploy its weapons, should that be required. A capable submarine force is a vital contributor to Australia's prosperity in the 21st century.⁵

6.5 Rear Admiral Briggs, whose naval career spanned 40 years with over half involved in submarines in various roles at sea and on shore, endorsed the comments that emphasised the critical importance of the submarine fleet to Australia's national security. He wanted to underline the uniqueness of submarines, indicating that no other platform in the ADF provided Australia with the reach that 'gives the same punch, the same bite and is useful in situations where you do not own the surface of the sea or the air above it'. He added:

They are high pay-off. They are one of the few offensive assets if need be. If we need to throw it, they are the tip of the spear. You better make sure it is a sharp spear and an effective one. They are equally effective in peace time scenarios and, in periods of tension, they are absolutely critical to understanding what is going on and to giving you some lead time as to what people on the other side of the problem are thinking about.⁶

6.6 There can be no doubt of the integral role that Australian submarines have in Defence capability and in securing Australia's strategic interests. To fulfil this function, Australian submarines cannot be second best. The 2009 and 2013 white papers clearly indicated the government's intention to acquire world class submarines designed to meet Australia's unique strategic needs. Evidence supported this objective. For example, Commodore Greenfield, a qualified weapons and electrical engineer,

⁵ *Committee Hansard*, 30 September 2014, p. 2.

⁶ *Committee Hansard*, 30 September 2014, p. 9.

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stated that Australia's Future Submarines should be 'the most capable vessels possible within a reasonable and affordable price'.⁷



Royal Australian Navy Collins Class submarines exercising off the West Australian coast. HMAS Waller and HMAS Dechaineux were involved in the extensive training exercise which tested both the crew and machine.

(Image courtesy of the Department of Defence)

6.7 In this regard, Mr King explained that DMO wanted the ADF 'to have a technological edge'.⁸

Special requirements

Range and endurance

6.8 Australia's geography imposes certain demands on its submarines, which means they require special features to be an effective force. Many witnesses argued that Australian submarines need endurance, range and reasonable mobility to be able to get into and operate in the areas of strategic importance to Australia. Most notably, Australian submarines operate under extremely demanding circumstances especially

⁷ *Submission 18*, p. 1. Commodore Greenfield is a qualified weapons and electrical engineer with career in operations, maintenance and acquisition programs of ships and submarines with a focus on trials and major contracting and procurement programs.

⁸ *Committee Hansard*, 30 September 2014, p. 50.

their very long transit times and routes.⁹ Rear Admiral Briggs referred to the huge distances that Australian submarines traverse:

We are the only submarine navy in the world that steams a submarine halfway around the world and then expects it to go on patrol and, when it is finished, to come back. It is a huge driver. The transit requirements will determine the size of the submarine. The ability to cover 3,000 miles of open ocean, some of it under other people's surveillance, to do it quickly with good mobility and to arrive in a patrol area without having been spotted and to do your job is absolutely critical to the success of the submarine and no-one else has the geography or the problems that we are dealing with.¹⁰

6.9 Likewise, Commodore Greenfield referred to the long distances to be travelled at speed, which determines the large size of Australia's submarines:

It requires more generating capacity...it requires more fuel, more crew with good habitability to mitigate against fatigue, more food, more weapons and, importantly, extra-large water tanks to ensure a balanced trim and to compensate for changes in buoyancy due to water temperature and salinity, the use of fuel and consumables and weapons et cetera.¹¹

6.10 Importantly, the long transit and time spent undetected in the patrol zone defines the Australian submarine's mission and is the main driver of the boat's design. According to Commodore Greenfield, the submarine's mission is 'like no other country's defining mission'. He recalled the observations of a retired submarine engineer officer who said:

Australia has the only navy in the world which flogs its diesel-electric submarines, dived across thousands of miles across the ocean and then sends them on patrol.¹²

6.11 Commodore Greenfield explained further that the word 'flog' is naval jargon referring to the very heavy punishment received by the machinery during the transit phase. He stated:

The rapid and partial charging and discharging of the battery severely reduces its performance. Remember, we have 400 tonnes of lead acid battery. It is not like the lead acid battery in your car. The reliability of the diesels is affected due to heavy fluctuations in the load, the suction and back pressures, and the masts suffer reliability problems due to high usage rates and vibration.¹³

⁹ *Committee Hansard*, 30 September 2014, p. 38.

¹⁰ *Committee Hansard*, 30 September 2014, p. 9.

¹¹ *Committee Hansard*, 30 September 2014, pp. 21–22.

¹² *Committee Hansard*, 30 September 2014, p. 21.

¹³ Committee Hansard, 30 September 2014, p. 21.

6.12 Such extreme demands on a submarine create a raft of engineering requirements and challenges.¹⁴

Stealth

6.13 Commodore Greenfield noted the need to have stealth as a priority for the future submarines.¹⁵ Having transited to the main area of operation, a submarine must remain undetected. Commodore Greenfield emphasised the importance of maintaining stealth during the long, speedy transit, which, he argued, created a unique challenge for Australian submarines. In his view, Australian industry understands this need for stealth and was constantly developing new ideas and concepts to improve it.¹⁶ He underscored the fact that Australian submarines are sent in harm's way. Based on firsthand experience, he told the committee that the crews 'need blind faith and confidence that systems will work as advertised in emergencies—whether it be fire, flood, battle damage or some other emergency'. He reiterated:

...in these situations, our crews need absolute confidence in the supporting contractors, suppliers and maintainers. And later, of course, they will need quick access to remedial action—and they will only get that from Australia.¹⁷

6.14 The SIA also referred to stealth in submarine operations and the all-pervading need for the highest levels of security throughout the life of the submarine, in order to protect that capacity for stealth. Commander Owen explained further that once a submarine has a low signature or what is called a low indiscretion rate—not exposing the boat's masts and making noise—in regions far removed from its base, it has to operate in an area where there are now several nations that have acquired submarines. He underscored the importance of stealth:¹⁸

So, once you are in that area, you then need to be able to preserve your stealth when you are operating slowly and quietly to perhaps not be put in a situation where you are counter-detected first and the reaction of that less-experienced submarine is to classify you with a weapon. So you need better sensors, better capability and therefore better stealth in order to achieve that.¹⁹

¹⁴ Committee Hansard, 30 September 2014, p. 21.

¹⁵ *Submission* 18, p. 5.

¹⁶ *Committee Hansard*, 30 September 2014, p. 21.

¹⁷ *Committee Hansard*, 30 September 2014, p. 24.

¹⁸ *Committee Hansard*, 30 September 2014, p. 5.

¹⁹ *Committee Hansard*, 30 September 2014, p. 5.

6.15 Clearly, stealth is essential for the safety of the submarine crews and their operations and for the effectiveness of government policy. According to Commander Owen, stealth is a fundamental characteristic of successful submarine operations.²⁰ He noted that stealth in the operational area depends on technology, construction and sustainment; the competence of the operators; and stringent security.²¹

Crewing arrangements

6.16 Commander Owen spoke of a submarine that, having made the long transit, may need to remain in a patrol area undetected for several weeks or months with 50, 60 or 70 people working in close confines and operating completely independently, perhaps without the benefit of communication back home. He noted that in order to sustain that capability with the onboard technical skills, the crew needs to be able to remedy defects that might occur and to have the logistics support, which requires 'the habitability that really only a larger submarine can possess'.²²



ANZAC Frigate HMAS Stuart tracks Collins class submarine HMAS Sheean as she sails past Christmas Island on return to her home port of HMAS Stirling, Freemantle, Western Australia.

(Image courtesy of the Department of Defence)

²⁰ *Committee Hansard*, 30 September 2014, p. 1.

²¹ *Committee Hansard*, 30 September 2014, pp. 1–2.

²² *Committee Hansard*, 30 September 2014, p. 5.

Physical environment

6.17 Earlier, when comparing the Soryu and Collins submarines, the committee referred to the very demanding sea conditions in which Australian submarines operate.²³ Commodore Greenfield cited these very different operating surrounds of Australian submarines as another factor when considering the specific requirements for the future boats. He noted that unlike all Northern Hemisphere submarines, Australian submarines have to deal with tropical, highly saline waters. According to Commodore Greenfield, this environment promotes higher rates of corrosion and biological growth. He referred to 'high machinery and main storage battery operating temperatures—40 degrees, rather than the Mediterranean 25 degrees—and the need for much higher capacity cooling systems'. In his view, these conditions have 'a consequential effect on energy and fuel usage, hence range and endurance'. The designer has to take all these factors into account.²⁴ Mr Pacey, a private sector consultant with wide-ranging experience in defence and national security, also noted that Australia's areas of operations are primarily in warm waters that are characterised by high levels of salinity.²⁵

Nuclear option

6.18 Recent Defence white papers have ruled out the option of a nuclear submarine. Evidence to the committee was consistent with this view. Vice Admiral Jones, Chief, Capability Development Group, informed the committee that both sides of politics have decided that they would not pursue a nuclear option.²⁶ Mr King also noted that as a matter of policy Australia was a conventional boat operator.²⁷ Furthermore, he acknowledged the practical obstacles that would currently make a nuclear choice unworkable for Australia:

With such a decision [to have nuclear-powered submarines] comes an enormous overhead. First of all, you have to change people's attitude towards nuclear power and then, beyond that, the industry behind it to sustain that capability and the cost of operating it. It is an interesting comparison that Japan, which has a nuclear industry and has a substantial nuclear base, chooses to operate conventional submarines.²⁸

²³ See paragraph s 5.57–5. 58.

²⁴ Committee Hansard, 30 September 2014, p. 21.

²⁵ Committee Hansard, 30 September 2014, p. 29.

²⁶ *Committee Hansard*, 30 September 2014, p. 62.

²⁷ Committee Hansard, 30 September 2014, p. 38.

²⁸ *Committee Hansard*, 30 September 2014, p. 62.

Potential suppliers

6.19 The committee has heard evidence that there are a number of different non-MOTS options open to Australia that would enable it to acquire a fleet of world class conventionally-powered submarines suited to the nation's requirements.

Changing technology and the global market

6.20 Changing technology and the increasing costs associated with the design and development of state-of-the-art communication and combat systems for naval vessels means that few countries or companies in their own right can produce sophisticated, highly complex and expensive systems. Recent decades have witnessed an increasing trend toward globally integrated production systems. Countries that seek to remain at the cutting edge of technology quite sensibly explore promising technologies developed elsewhere in the world. Some engage in collaborative developments— alliances or joint ventures, teaming and licensing arrangements—which offer them the opportunities to share research and development costs and combine technical capabilities to produce a more innovative product than might not otherwise have been possible.

Need for partnerships

6.21 Based on the evidence before the committee and the numerous reports dealing with shipbuilding, it is widely accepted that Australia cannot undertake the future submarine project without overseas assistance. For example, the expert industry panel involved in the future submarine industry skills plan was unanimous in its view that:

...Australia had a good range of skills that could contribute to the design of a complex warship like a destroyer or submarine, with such a project requiring the partnership of an established, overseas designer.²⁹

6.22 Witnesses to the inquiry observed that Australia would need a design partner for the submarines and that there would have to be technology transfer.³⁰ They agreed that there were limited contenders for designing and building conventionally powered submarines. Commodore Greenfield noted that all the submarines that are in production at the moment, the so-called MOTS submarines, are either European or Japanese.³¹

²⁹ Department of Defence, *Future Submarine Industry Skills Plan*, 2013, p. 57.

³⁰ See for example, Mr Hamilton-Smith, Minister for Defence Industries, South Australian Government, *Committee Hansard*, 14 October 2014, p. 6.

³¹ *Committee Hansard*, 30 September 2014, p. 25.

6.23 Rear Admiral Briggs said that there were four valid starting points for the future submarines—the French, Swedish, German or Japanese boat.³² Likewise, Professor Roos agreed that Australia needed a partner in the design phase with only France, Germany, Sweden and Japan as likely partners.³³

6.24 According to Mr King, Defence had been in discussions with Japan, Germany, France, Sweden, the UK and the USA. Evidence suggested that some of the European designers and builders had flagged their interest in tendering for the future submarines. For example, Mr Jackman, Chief Executive, Defence SA, indicated that TKMS, builder of the German submarine, was pressing its case to be included in the process. He was also aware that the Swedish, with the Saab organisation, were also keen to do exactly the same. He stated:

Both those organisations have put their hands up to meet with the minister and the Premier to discuss what support they would want from this state to build those submarines in this country.³⁴

6.25 Also, according to Mr King, Defence had paid for some work to be done on submarines by France and Germany and by Sweden to look at the evolved design. He stated further:

We have paid them money to do work for us. We paid them on the MOTS options. So, yes, we have been engaged with them and, yes, we have paid some of their costs.³⁵

6.26 For Rear Admiral Briggs, it was simply a matter of the starting point, the baseline and the chosen partner 'to go forward on the journey to do the design'. He suggested that those factors come together to build a risk. He said:

Every solution will have a different level of risk and a different range of factors in it. Picking the right starting point, picking the right design to do the job is the key question in front of Australia at this point.³⁶

6.27 Dr John White said that the MOTS option—submarines currently in production—had no chance of any success as it was 'well known that no existing submarine design would meet Australia's requirements'. To his thinking, however, a MOTS design, which allowed for modifications to meet minimal essential RAN requirements, held the most promise because:

...it recognised the advantage of evolving a proven MOTS design from a prominent submarine company to include specified RAN requirements.³⁷

³² *Committee Hansard*, 30 September 2014, p. 9.

³³ *Committee Hansard*, 8 October 2014, pp. 17–18.

³⁴ *Committee Hansard*, 14 October 2014, p. 8. See also Mr Hamilton-Smith, Minister for Defence Industries, South Australian Government, *Committee Hansard*, 14 October 2014, p. 1.

³⁵ Senate Foreign Affairs, Defence and Trade Legislation Committee, Estimates *Committee Hansard*, 22 October 2014, p. 100.

³⁶ *Committee Hansard*, 30 September 2014, p. 9.

6.28 Ultimately, Dr White formed the view that there were three plausible overseas contenders. They were:

- the German TKMS design based on the current 214AU and the conceptual design 216AU for Australia;
- the French SMX OCEAN class conceptual design based on a barracuda hull; and
- an updated Japanese Soryu class submarine.

6.29 Witnesses generally referred to four possible bidders, including an evolved Collins. Most of the evidence taken by the committee, however, related to the Collins class and Japanese submarines as the potential basis for future work.

French

6.30 Commander Owen observed that the French both design and build very good submarines and have experience in exporting that technology. He indicated that they were currently exporting a mix of diesel and nuclear submarines to Brazil.³⁸

6.31 Dr White noted that the French SMX OCEAN class conceptual design was the next generation SSN of the French Navy fitted not with a nuclear propulsion system but a conventional propulsion system, SSK, with air-independent propulsion, or AIP, technology. He informed the committee that this development in France seeks an endurance of 14,000 nautical miles and a continuous transit speed of 14 knots for one week utilising its AIP system and fitted with two fuel cells. This concept was to be released at the end of October 2014 in France.³⁹

German

6.32 Commander Owen considered that the Germans, who have vast experience in building and exporting submarines and supporting their export arrangements around the world, build very good submarines. In his view, the fact that countries keep going back to the German submarines would suggest that they build and design good boats. Commodore Greenfield observed, however, that we often hear stories that German submarines can do so many days dived but, when you really do the calculations, it is probably at four knots. He surmised that they are talking about the patrol area but not the transit route. Dr White thought that the German TKMS should be an option open for further consideration offering a MOTS evolution solution.⁴⁰

³⁷ *Committee Hansard*, 13 October 2014, p. 26.

³⁸ *Committee Hansard*, 30 September 2014, p. 7.

³⁹ *Committee Hansard*, 13 October 2014, pp. 26–27.

⁴⁰ *Committee Hansard*, 13 October 2014, pp. 26–27.

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6.33 As noted earlier in this chapter, Australian submarines need to transit great distances— $3\frac{1}{2}$ thousand miles away. To do so, they have to travel that long distance and come back again. In Commander Owen's assessment, none of the other submarines were designed to be able to do that.⁴¹

Collins

6.34 The Australian Submarine Corporation (later ASC) was established in 1985 through a joint venture between Kockums, the Australian Industry Development Corporation, Wormalds International and Chicago Bridge and Australia Iron. It was chosen in 1987 as the prime contractor for the design, manufacture, upgrade and delivery of the Collins class submarines.⁴² This project was one of the most ambitious and highest profile naval shipbuilding projects in Australia.

6.35 The May 1987 decision to award the Collins class contract to ASC established a highly capable prime contractor.⁴³ The decision reflected Navy's view that considerable benefits would accrue from having one organisation build and maintain the vessels. An Australian build with close access to the building yard promised reduced operating and maintenance costs and increased length of service between refits. In addition, it was argued that building the vessels in-country would economise on the high initial capital outlay on the integrated logistics support needed to bring the submarines into military service. As a result of the Collins class project, ASC was the likely choice for the 25-year, A\$5 billion contract for the through-life support of the submarines, announced in 2003.

6.36 The Australian-built Collins class submarine illustrates some of the complexities faced by a modern naval shipbuilder:

Aboard the Collins, we have 108 systems integrated into a pressure hull, one of which we are required to safety certify. It is a safety-critical piece of equipment. That alone makes it an engineering and technical challenge. The shipbuilder, or the submarine builder, in that case, is responsible for integrating those systems into the vessel. The combat system constitutes a system and there are the communications system and other systems. Even by the time we are done with everything that can be construed as a related part of the combat and C3I system, we still have 100 systems that are integrated which work to keep the platform in motion, keep the crew safe at deep-dive depth and a lot of other things.⁴⁴

⁴¹ *Committee Hansard*, 30 September 2014, p. 25.

⁴² ASC Annual Report 2005, p. 2.

⁴³ The Australian Submarine Corporation (later ASC) was formed in August 1985 with Kockums holding a 49 per cent shareholder of ASC when ASC was selected as the prime contractor for the submarines in May 1987.

⁴⁴ Mr Gregory Tunny, Managing Director and Chief Executive Officer, ASC Pty Ltd, Foreign Affairs Defence and Trade Committee, Inquiry into Australia's Naval Shipbuilding Industry, *Committee Hansard*, 4 September 2006, p. 12.

6.37 The Collins class submarine is well known to Australians both for its well-publicised problems but also for its achievements. In his 2012 paper, *Sub Judice: Australia's Future Submarine*, Mr Pacey suggested that the Collins was 'the only available conventional submarine approaching the range and endurance to meet the capability requirement for the Future Submarine'.⁴⁵

Problems

6.38 Witnesses did not deny that the Collins class submarine had experienced problems throughout its construction and service life.⁴⁶ In his submission, Commodore Greenfield noted that while the Collins program was far from perfect it was 'much better than the press would have you believe'. He suggested that Australia was in a much stronger position now than at the time of the last submarine acquisition and, if lessons from the past were learnt,⁴⁷ could build on this to good effect.⁴⁸ In his view the 'least risky pathway was to re-design the Collins—we know what works well and what doesn't'.⁴⁹

6.39 Mr Chris Burns told the committee that many mistakes were made in negotiating and establishing the Collins submarine contract. He then stated:

...but Australian industrial tenacity and innovation turned the project around to the point where we now operate among the most capable conventional submarines in the world. 50

6.40 The Collins class project proved and improved the capacity and productivity of the Australian industrial base to build from scratch, complex warships to a high quality. Indeed, a number of witnesses referred to the enormous challenge confronting Australia's defence industry in building the Collins. Mr Whiley, who joined ASC in 1989, noted that the project started in Osborne as a greenfield site with no production staff, no tools, no infrastructure and no capacity. ASC was completely different from the current hive of activity.⁵¹ He then observed:

Throughout the world's submarine community, the Collins class submarines are considered a world-class conventional submarine with unparalleled capabilities, a sentiment that extends to the team of personnel who built and now maintain them.⁵²

- 48 *Committee Hansard*, 30 September 2014, p. 24.
- 49 *Submission* 18, p. 3.
- 50 Committee Hansard, 14 October 2014, p. 15.
- 51 Committee Hansard, 14 October 2014, p. 21.
- 52 *Committee Hansard*, 14 October 2014, p. 21.

⁴⁵ Kokoda Paper No. 17, Sub Judice: Australia's Future Submarine, January 2012, p. 63.

⁴⁶ See for example, Rear Admiral Brigg who acknowledged that there were design deficiencies in individual equipment. *Committee Hansard*, 30 September 2014, pp. 17–18.

⁴⁷ *Submission 18*, p. 2.

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6.41 Mr Derek Woolner detailed some of the positive results achieved by the Collins class submarine:

- All six vessels, with the exception of the bow of the lead boat, were constructed in Australia to a high standard of workmanship. In terms of poor construction work, the main fault was with welding done in Sweden on the bow of the first ship.⁵³
- The Collins class project achieved 73.5 per cent Australian industry content for the new platforms, exceeding the government's minimum target of 70 per cent.⁵⁴ In so doing, the project promoted the establishment and development of many second and third tier Australian companies.
- The Collins class project greatly enhanced the skill base of the naval construction and design industry. Institutions such as the defence science facility and the local TAFE at Port Adelaide were important in the training process. The project has provided the design and engineering skills that will assist in ASC's development of the three AWDs and will be crucial should Australia commit to a new generation of submarines.
- The project indicated that ASC was more productive than its overseas counterparts. It produced one submarine per year, a faster rate of vessel construction than in Dutch and British yards.⁵⁵

Lessons learned from the Collins-class

6.42 Mr Pacey acknowledged the criticisms directed at the Collins, including 'some straight talking from John Coles himself'. He suggested that:

Few of us would disagree with those criticisms, but what has been overlooked is that the phase 1 report by John Coles stated: 'The scale of the achievement to acquire and build these highly capable submarines is recognised internationally. These achievements give us every confidence that Australia can and will achieve success in owning and operating at a reasonable cost a fleet of sophisticated and capable submarines, fully capable of protecting our maritime interests'.⁵⁶

⁵³ Mr Patrick Walters, 'The Cutting Edge: The Collins experience', Strategic Insights, Australian Strategic Policy Institute, February 2006, p. 6.

⁵⁴ Mr Patrick Walters, 'The Cutting Edge: The Collins experience', Strategic Insights, Australian Strategic Policy Institute, February 2006, p. 5. Derek Woolner noted that the project was 'revolutionary in that it required those companies bidding for the RFT [Request for Tender] to provide detailed information on their plans to involve Australian industry'. Mr Derek Woolner, Procuring change: How Kockums was selected for the Collins class submarine, Research Paper No. 4, 2001–02, Parliamentary Library, p. 11.

⁵⁵ Mr Derek Woolner, Getting in early: Lessons of the Collins Submarine Program for Improved Oversight of Defence Procurement, Research Paper No. 3, 2001–02, Parliamentary Library, p. 14.

⁵⁶ *Committee Hansard*, 30 September 2014, p. 29.

6.43 A study produced by the Kokoda Foundation and authored by Mr Pacey reached the same conclusions. In summary, the study found that Australia had a unique capability requirement that could only be met by an ab initio design or an evolution of an existing design. It found:

Of the options that were available three years ago, an evolved Collins emerged as the lowest risk because it was the only available conventional submarine that came close to meeting Australia's capability requirement in terms of range, endurance and payload. The lessons learned from operating Collins were too valuable to throw away. Any new option will need a comparable level of analysis.⁵⁷

6.44 Mr Pacey informed the committee that, whereas a few years ago he was pessimistic about a successful outcome, during the course of the future submarine study he became increasingly confident that the Collins could be returned to a reasonable level of availability at an affordable cost. He also came to understand that the future submarine program could deliver a boat suited to Australia's unique strategic circumstances at a cost significantly lower than some figures that had gained traction at the time. Mr Pacey argued that a future submarine based on an evolution of the Collins design would be the best way to benefit from the experience of operating a modern submarine fleet in Australia's maritime domain.⁵⁸

6.45 A number of other witnesses referred to the substantial body of knowledge, skills and experience that had been built up over the years through work on the Collins. Commander Owen described Australia's submarine capability as an insurance policy for uncertain times. In his view, the low risk path was to build on Australia's 21 years' experience with Collins. He formed the view that the Collins would provide 'a very much better place to step off from than leaping into the unknown, where we do not have any understanding of the many aspects of building a submarine'.⁵⁹ Commander Owen argued that while Australia's 'regional colleagues smile uncomfortably at the Australian press criticism of the Collins-class submarines, their own experience has told them that the assertions have little substance'. In his opinion:

Australian submarines and the Australian submarine capability are the regional benchmark in the safe conduct of operations and in matters of submarine escape and rescue. 60

⁵⁷ *Committee Hansard*, 30 September 2014, p. 29.

⁵⁸ Kokoda Paper No. 17, *Sub Judice: Australia's Future Submarine*, January 2012, p. 62.

⁵⁹ *Committee Hansard*, 30 September 2014, p. 6.

⁶⁰ *Committee Hansard*, 30 September 2014, p. 2.

6.46 Rear Admiral Briggs and Commodore Roach were of the view that the Collins provided a 'sound starting point for the future submarines'.⁶¹ Indeed, the Collins class experience has produced valuable lessons for the procurement of Australia's future submarines. Commodore Greenfield suggested that 'the least risky pathway was to re-design the Collins—'we know what works well and what doesn't'.⁶²

6.47 Commodore Greenfield argued that the Navy, the DMO and Australian industry now understand the Australian requirements. In his opinion, Australian industry could provide engineering solutions as it did for Collins and was still doing.⁶³

6.48 Rear Admiral Briggs agreed with this assessment. He suggested that 'more went right with Collins than went wrong'. In his view, there was a bit of a national naivety that 'we could start with a patch of sand on the Adelaide River and build this bigger, modern submarine and not have any problems'. He explained that the problems were handled and at the end of the fixed program 'we had two modified, fast-tracked submarines, as they were called, with fixes, hardware in the systems and in the combat system that were able to be sent to sea and sent into harm's way'.⁶⁴

6.49 According to Rear Admiral Briggs, Defence was over ambitious in its specification. He also referred to the contract, which was a black-letter law contract:

'This is what it will do'—when in fact what we were setting off to do was to develop a combat system and we should have had a lot more interaction with the contractors and be prepared to move the requirement as we understood more about the technology. We did not do that; we stood there with lawyers rather than with engineers.⁶⁵

6.50 Commander Owen, SIA, cited the key lessons he wanted to be learnt from the Collins class experience:

- it took time to learn that we were the parent Navy of our submarines;
- we cannot give the responsibility for our sovereignty to another country—to protect our most sensitive secrets, then we must take ownership of them;
- we need ongoing and respectful relationships with suitable suppliers;
- a dedicated program of maintenance and investment is absolutely essential to ensure that Australia's submarine fleet is fully operable, capable and available; and

⁶¹ *Submission 17*, p. 11.

⁶² *Submission 18*, p. 3

⁶³ *Committee Hansard*, 30 September 2014, p. 22.

⁶⁴ *Committee Hansard*, 30 September 2014, p. 16.

⁶⁵ *Committee Hansard*, 30 September 2014, pp. 16–17.

• more than six submarines are required to provide an effective deterrent. While various numbers have been discussed, we calculate that at least 12 submarines are required.⁶⁶

6.51 The SIA underscored the importance of ensuring that Defence has continued access to the submarine technology that is most relevant to the nation's strategic environment. It argued that the government must guarantee that Australia can sustain, maintain and upgrade its submarine capability throughout the next 100 years.

6.52 Acknowledging that the diesels in the Collins were a major source of unreliability, Rear Admiral Briggs explained that Defence adapted a diesel because we needed one of that size and there was not an off-the-shelf one. In his view, Defence and industry learnt a very, very hard lesson—'There is no way in the world that anyone now would do anything except go and buy an accepted, off-the-shelf diesel, and they are there'.⁶⁷

6.53 Despite the valuable lessons to be learnt from the Collins, a number of witnesses were of the view that an evolved Collins was not a preferred course of action. Mr Whiley observed that Collins was almost 30 years old and the design has been moved on. Based on his understanding of the requirements, he thought that the design would have to be changed significantly for the current sets of requirements. Even so, he was of the view that there were many lessons from Collins that 'could be used in the future submarine design and build process'.⁶⁸ Professor Roos also thought that an evolved Collins, was doomed from the start, because the pressure hull diameter was constrained to the current 7.8 metres. He explained that this constraint 'required the hull to be stretched and this would limit a future growth path because you can only stretch a submarine so far before it becomes hydro-dynamically inefficient'.⁶⁹

6.54 As noted earlier, Dr White was of the view that the separate designation of the Collins upgrade as option 3 in 2012 was inappropriate, given that the design was approaching its 30^{th} birthday without evolution.⁷⁰

⁶⁶ *Committee Hansard*, 30 September 2014, pp. 2–3.

⁶⁷ *Committee Hansard*, 30 September 2014, p. 17.

⁶⁸ *Committee Hansard*, 14 October 2014, p. 30.

⁶⁹ *Submission* 25, p. 1.

⁷⁰ Committee Hansard, 13 October 2014, p. 27.

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Conclusion

6.55 Australian submarines are an integral part of Australia's Defence capability and central to promoting the nation's strategic interests. They are, however, highly complex machines that operate in demanding and unique environments that require special features.

6.56 There is no existing submarine that Australia can purchase off-the-shelf that would satisfy Australia's requirements.

6.57 The government should rule out a military-off-the-shelf option for Australia's future submarine fleet.

6.58 As the committee has heard, the government has a number of options to consider for the future submarine project.

6.59 As recommended, the government should test these options through a competitive tender process so that the Australian public has confidence that the government is purchasing the best, most capable submarine, at a competitive price for the taxpayer.

Senator Sam Dastyari Chair

Dissenting Report by Government Senators

1.1 The draft report into the Economics References Committee's inquiry into the Future of Australia's Naval Shipbuilding Industry strikes a discordant note. On the one hand, the report recommends that the Australian Government should conduct a competitive tender process. It makes this recommendation largely based on evidence that an open tender process is required to get the best value for money, and fitness for purpose, for the Australian taxpayer. Yet, on the other hand, the report seeks to limit this tender process to ignore the potential of some options (such as the Japanese Soryu class) and restrict it in favour of Australian shipbuilders regardless of the impact on Australia's defence capability. It is as if the committee has boldly declared that a limited tender process would be the defence of equivalent of having our left hand tied behind our back; only then to declare that we should instead tie our right hand behind our back.

1.2 Coalition Senators support the government conducting a competitive evaluation process but do not support putting arbitrary restrictions on such a process. The restrictions that the committee has recommended are naïve and fail to consider the evidence that the committee received on the complexities of defence contracting in general, and the realities of the Future Submarine contracting process in particular.

1.3 First, defence contracts involve a high level of complexity and are beset by the problems of asymmetric information. In theory a competitive tender process can lead to the lowest price for government and potentially value for money. In practice, the contractor almost always has more information than the government about the costs and risks of a project. In addition, the contractor a strong bargaining position, once the contract is signed. In such an environment, a contractor can bid for a low price *ex ante*, but then claim that there have been cost overruns *ex post*. The government has limited ability but to agree to the overruns given that the government can hardly switch contractors mid-contract. The long history of cost blowouts in defence contracts, both here and overseas, is testament to this point.

1.4 With that in mind before a contract is signed, the government can instead enter into contracts that allow for more of a partnership between contractor and the Defence Department. Sometimes such contracts are known as an *alliance* contract. These contracts create more incentives for the contractor to share information with the Government and help reduce the problem of asymmetric information.

1.5 As a result, having a competitive tender process *before* a contract is signed is not sufficient to ensure a competitive outcome *after* a contract is signed. The committee's focus on the tendering process exclusively is an incomplete consideration of the issues that beset defence contracting.

1.6 Third, Coalition Senators support the Government's position that defence procurement decisions should not compromise Australia's defence capabilities so as to meet economic development objectives. Decisions about this next generation of submarines need to be made on the basis of what is best for our national security, our

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Armed Forces and for the personnel who will serve in them in the future—not what is best for a particular region or what might be best for a particular company in Australia. Of significant concerns is that the committee has not made a clear statement on this crucial principle.

1.7 Fourth, the delays in establishing the Future Submarine project have put time constraints on when decisions must be made without creating a dangerous security and capability gap for Australia's defence forces. It is a matter of record that under the former government, while some work was done on the Future Submarine project, the level of achieved progress was very limited. Over the last six years, Defence spending dropped to levels not seen since 1938 – a cut or deferral of some \$16 billion.

1.8 The delays were clearly a matter of concern. Mr King noted, for example:

I was worried about our lack of progress on Future Submarine over many years. I was worried about how we were going to break the deadlock of progress. I was very worried about how we were going to come up with solutions to meet Australia's needs.¹

1.9 Finally, as a general point, it is notable that the Executive Summary of the report, while containing extensive quotes from various participants to the inquiry, neither quotes nor mentions Mr Warren King the Chief Executive Officer of the Defence Materiel Organisation. To ignore the evidence of so impressive and authoritative a witness in this key section of the report is a serious error and the entire report is weaker for it.

1.10 **Response to recommendation 1.** The draft report calls for a competitive tender limited to between two and four participants.

- A tender process that arbitrarily limits participation on the basis of a quota rather than merit is not consistent with achieving best outcomes for Navy and for the taxpayer.
- A broader examination of the global market is a more reliable method of ensuring decision makers have visibility of the full array of options available and will thereby ensure the best outcomes for Navy and the taxpayer.

1.11 **Response to recommendation 2.** The draft report calls for a competitive tender process for the Future Submarine program to be initiated immediately. It claims that there is enough time to facilitate this process without the threat of a capability gap arising if that tender goes to market immediately. Furthermore, it claims the timeframe only offers the flexibility to do this on account of the work undertaken by the previous government in respect to the Future Submarine program.

• The assertion concerning the work undertaken by Labor is not supported by testimony at the inquiry.

¹ *Committee Hansard*, 30 September 2014, p. 40.

• This is a disingenuous claim for credit in circumstances where the opposite is true. Labor delayed the Future Submarine program by two full White Paper cycles. This leaves the Future Submarine program in a position of heightened urgency than would otherwise be the case.

1.12 **Response to recommendation 3.** The draft report calls for an Australian build at all costs. This could give rise to national security outcomes being compromised by a prioritisation of industry policy over defence policy and it could force the taxpayer to underwrite an economically uncompetitive project.

- While we want to see the Future Submarine contract awarded to Australian shipbuilders, it must also be the result of a competitive tender process and it must be awarded on merit. This will ensure that Navy receives a fit for purpose product of the highest standard while Australian tax payers receive the best possible value for money.
- The committee heard evidence from Dr John White that an open tender was the best way to stress test claims by manufacturers that they are able to meet Navy's requirements while constituting the responsible expenditure of taxpayers' money.
- It is therefore both unwise and entirely unnecessary to compel that special consideration be given to Australian-based tenderers. Recommendation 3 effectively relegates national security policy to second place behind industry policy.
- Recommendation 3 also compels government to commit to an Australian based sustainment programme even though the Prime Minister is already on the record doing exactly that.

1.13 **Response to recommendation 4.** The draft report calls on government to formally and publicly rule out a MOTS option for the future submarine and for government to limit its energies to a new design or a son-of-Collins option and to suspend any investigations elsewhere.

• Being unnecessarily prescriptive by publicly discounting certain options might send signals to the market that reduce price competition in a tender process.

1.14 **Response to recommendation 5.** The draft report calls for Government to take responsibility for cultural reform in the Australian Defence industry so as to 'engender a co-operative environment in which industry is encouraged to marshal its resources in support of Australia acquiring and building a highly capable fleet of submarines'.

• It is my view that Australian shipbuilders must be competitive in their own right. To impose upon Government a responsibility to oversee a program of cultural reform within private sector shipbuilders represents a quasi-nationalisation of the industry.

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• Industry representatives, unionists and interested parties assured the committee that Australian shipbuilders are globally competitive, meet productivity standards and have the capacity to offer world's best practice in the submarine building space. Imposing direct managerial oversight by government would be counter-productive to maintaining these competitive efficiencies.

Senator Sean Edwards Deputy Chair Senator Matthew Canavan Senator for Queensland

Additional Comments by Senator Nick Xenophon

1.1 I welcome the Senate Economics References Committee's report, Part II, into the Future of Australia's naval shipbuilding industry and the Future Submarine project.

1.2 This inquiry was brought about due to serious concerns about the Government's record on Australian naval shipbuilding since coming to office in September 2013.

1.3 Naval shipbuilding in Australia in the past three decades has been a story of overall success, with the construction and delivery of several classes of heavy warships and submarines in Australia to a high standard and within reasonable budget and productivity expectations.

1.4 Much has been learned and much progress has been made in supporting an industry that has become an important strategic and economic asset to the nation.

1.5 When the Government launched a limited tender in June in relation to the \$1.5 billion supply ships procurement it was considered very out of the ordinary and this committee examined that decision in its first phase.

1.6 Before and since the committee reported on the limited supply ships tender debacle on 27 August, it emerged in the media that the Government was apparently starting on a course to consider acquiring the Japanese Soryu Class submarine.

1.7 The committee rightly resolved to focus on this issue and prepare a second interim report and has since conducted four further public hearings, on 30 September in Canberra, 8 October in Newcastle, 13 October in Melbourne, and 14 October in Adelaide, hearings largely focused on the SEA1000 project to acquire Australia's future fleet of submarines.

1.8 The Chair's majority report captures well the breadth and depth of evidence gathered by the committee on key aspects of SEA1000.

1.9 I strongly support all of the Chair's recommendations.

1.10 Additionally, I wish to amplify on some key points that will be crucial if the Government's wish is to properly deliver the Future Submarines.

A process that appears all at sea

1.11 Examining the SEA1000 project and establishing recommendations upon which the Government might proceed has been carried out against a backdrop of often

contradictory and speculative backgrounding of reporters, apparently by well-placed Government and/or Defence sources.

1.12 Based on media reporting in recent months, a number of contradictory positions have emerged from within Government, the bureaucracy and the ADF about how SEA1000 was proceeding. These statements were not only contradictory against one another but contradicted the stated public position of the Government.

1.13 As a result SEA1000 has taken on the appearance of a fraught and mismanaged acquisition and this represents a significant risk to the future of one of Australia's most important military acquisitions in the next half-century.

1.14 For example, on 8 September a news article appeared in some News Ltd publications and reported:

The next generation of Australian submariners will be put to sea in boats made in Japan ... [the Government] will select the Japanese-built Soryu Class submarine to replace locally built Collins Class boats.¹

1.15 On 2 November the Defence Minister gave a speech to the Submarine Institute of Australia conference in Fremantle and ruled out all current Military Off The Shelf (MOTS) options for SEA1000 and again asserted that no final decisions had been made.

1.16 But such stories have emerged regularly, raising questions about the level of reliability Australians can place in the stated position of the Government and the internal processes of Government in relation to SEA1000.

1.17 On 28 October a story appeared in the *Australian Financial Review* reporting that an 'international competition' would be staged to select the design of the Future Submarines,² the source for the story declined to identify themselves and no-one in the Government has since confirmed this on the record.

1.18 Last week at the Submarine Institute of Australia conference the Defence Minister talked about speculation about a competition, but did not commit to one.

1.19 So again, Australian and international industry and thousands of naval ship building workers were left with confusion and anxiety in relation to Future Submarines.

¹ See: http://www.news.com.au/national/new-japanese-submarines-to-cost-abbott-government-20-billion/story-fncynjr2-1227050682205

² See: <u>http://www.afr.com/p/national/blow_builder_local_jobs_as_government_Sf6r98wHZPDJrrIDV_340eK</u>

1.20 The Australian head of German submarine designer TKMS, Philip Stanford, admitted to *ABC AM* in a story broadcast on 24 October that he wasn't aware of the process being followed.³

1.21 Mr Stanford said that he 'believed' a competition was going to be held, however this has not been confirmed by the Government publically and was contradicted in the same story by the reporter, who said she had received background information to that effect from a Government source who declined to be identified.

1.22 Defence Teaming Centre of South Australia chief executive Chris Burns told ABC Online, in a story published on 5 November, that industry remained confused about the SEA1000 process.⁴

1.23 The regular appearance of conflicting and unsourced reports, often with damning 'blind quotes' unfairly critical of Australian industry, purporting to reveal facts about SEA1000 only to be later disputed or ruled out by Government or Defence, has made the work of this committee more difficult than it otherwise might have been.

1.24 But for outside observers among Australian and international defence industry firms, the unions and organisations that represent expertise in the submarine field, the conduct of the Government in this process so far appears highly questionable and most disappointing.

1.25 Just what decisions have been made, by whom, upon what basis and what process is the Government following in relation to SEA1000, remains confused and clouded in needless speculation.

1.26 The Government process appears to be all at sea. Spreading confusion in relation to SEA1000 is not in the national interest and certainly not in the interests of Australian naval shipbuilding or the thousands of people who rely upon it for employment, directly and indirectly.

1.27 This selective leaking in other circumstances may well have triggered an AFP investigation – however this seems most unlikely given the apparent sources of the leaks.

Election promise

1.28 The then Opposition Defence Spokesman David Johnston held that role for about four years and by the time he entered Government was widely considered to be

³ See: <u>http://www.afr.com/p/national/blow_builder_local_jobs_as_government_Sf6r98wHZPDJrrIDV</u> <u>340eK</u>

⁴ See: <u>http://www.abc.net.au/am/content/2014/s4113647.htm</u>

well across the Defence portfolio, particularly on matters to do Australia's current and future submarine capability.

1.29 On a trip to Adelaide on 8 May 2013 he made the position of the Opposition crystal clear to the people of South Australia in relation to the SEA1000 project. After beginning a press conference, the then Opposition Defence Spokesman said, unprompted:

The Coalition today is committed to building 12 new submarines here in Adelaide, we will get that task done, and it is a really important task, not just for the Navy but for the nation. And we are going to see the project through, and put it very close after force protection, as our number [word omitted from transcript] priority if we win the next Federal Election.⁵

1.30 The Defence Minister has since 'nuanced' this statement during Senate Estimates and Senate Question Time and denies he is bound by it.

1.31 However, it is clear that the Coalition did promise to build Australia's next fleet of submarines in Adelaide and are bound by it.

1.32 The people of South Australia and Australia know that the Government promised to build the Future Submarines in South Australia and will judge the Government's level of sincerity accordingly.

Recommendation 1

1.33 That the Government deliver on its election promise to have the Future Submarines built in South Australia.

China-Japan tensions

1.34 It is becoming clear that China is concerned about any moves by Australia to acquire submarines from Japan.

1.35 According to a recent report by the Centre for China in the World at Australian National University, 'A New Australia China Agenda', Chinese military officers had already expressed a concern that Australia's quest for twelve submarines can't easily be reconciled with Australia's Defence White Paper's defence of the homeland security posturing.

1.36 ANU's report, Edited by Geremie R Barmé and Ryan Manuel, states in unequivocal terms:

⁵ See:

http://www.senatorjohnston.com.au/Media/OtherMedia/tabid/71/articleType/ArticleView/articl eId/326/Doorstop--Future-submarine-project.aspx

As Australia has strengthened its alliance with the US, and as frictions and clashes have complicated the external environment for countries in the region, the Australia–China relationship itself is being tested.

1.37 These concerns from China will be escalating since the Government opened the door to military technology cooperation in relation to submarines with Japan.

1.38 According to a report released this month (November 2014) by Professor Nick Bisley of La Trobe University and Brendan Taylor of the Strategic and Defence Policy Centre of ANU:

...a further intensification of this relationship in future will only heighten Tokyo's expectations of Australian support and potentially deepen Canberra's East China Sea entrapment dilemmas. This would be particularly so were Tokyo to acquire the means for exerting leverage over Canberra, as some commentators have argued could potentially occur were Australia to develop any form of technological dependency as a result of acquiring its future submarines from Japan.⁶

1.39 These concerns from China are unsurprising. China has always taken a keen interest in the military acquisitions of countries nearby and especially by Taiwan, which it asserts to be a part of China.

1.40 However, as former Foreign Minister Bob Carr has recently said publicly, Australia should be observing a policy of neutrality when it comes to the escalating disputes between Japan and China.

1.41 By moving closer to the Japanese Defence Ministry and Military, seeking further cooperation and technology sharing in relation to submarines in the absence of a genuine competitive tender process, Australia is inflaming China unnecessarily.

1.42 These strategic considerations are a potentially damaging distraction from normal factors that impact the selection of the Future Submarines.

1.43 China is Australia's number one trading partner. Much of the future prosperity of Australians is directly linked to trade with China. The Government should not be risking this by complicating our submarine acquisition with a move closer to the Japanese military in the absence of a genuinely competitive tender process.

Competitive design tender

1.44 A multi-pass competitive procurement process is considered best practice in defence procurement for large, expensive and complex naval assets.

6 *Conflict in the East China Sea: would ANZUS apply?*, p. 56. <u>http://www.uts.edu.au/sites/default/files/18924-acri-anzus-booklet-web.pdf</u> 1.45 The committee heard this advice repeatedly from some of the nation's most eminent operational naval, naval shipbuilding and submarine construction experts.

1.46 A competitive acquisition process for a Future Submarine design would produce the best offers from potential design partners. It creates a process in which the Government defines its needs, design partners produce plans to meet those needs and estimates what it would likely cost.

1.47 Industry advocate Chris Burns, of the Defence Teaming Centre South Australia, summed up the consensus of many expert witnesses, telling the committee:

You will never know the true potential cost of a project until you get multiple companies to put their names to dollar figures on firm tender bids.⁷

1.48 According to the Defence Capability Development Manual a multi-pass decision making process would be followed for a project such as SEA1000:

The need arises (for more than two decision pass points) particularly in the case of capability proposals of major strategic significance, that have very high costs or that are politically sensitive. Proposals for new combat aircraft or for major surface or subsurface combatants are examples of capability development projects likely to involve additional decision points.⁸

1.49 Typically Multi-pass decision points would be reached by the Government to narrow the field and arrive at a final decision of design partner.

1.50 However, the Defence Minister says the Government is following a two pass process for Future Submarines.⁹

1.51 A non-competitive process would likely produce a sizeable 'premium' to the cost of SEA1000, because the Government would not be able to apply a competitive tension to its sole-source supplier.

1.52 Despite the Government deeming SEA1000 a very urgent project and asserting that a risk of a 'capability gap' was emerging, the Government is yet to commit to a competitive tender process or competitive project definition study.

1.53 Speculation has emerged that suggests Japan may not agree to a competitive process. While this may explain the delay in the Government setting one up, it is an unacceptable requirement for any potential supplier of Australian submarines.

⁷ *Committee Hansard*, 14 October 2014.

⁸ Defence Capability Development Manual, paragraph 3.17. http://www.defence.gov.au/capability/_home/_pubs/dcdm.pdf

⁹ Opinion editorial, *Adelaide Advertiser*, 18 October, 2014, <u>http://www.minister.defence.gov.au/2014/10/18/minister-for-defence-correcting-the-record-on-submarines-opinion-editorial-adelaide-advertiser/</u>
1.54 Further, due to the intense speculation around a Japanese submarine acquisition, any competitive tender process set up in the future may now be suspected of being a token process by other potential suppliers.

Recommendation 2

1.55 That the Government launch a competitive tender process, including a funded competitive project definition study and take adequate measures to ensure transparency and confidence that the process is a real and fair competition for potential suppliers.

Australian submarine build

1.56 This committee has heard no evidence that suggests Australian industry lacks the capability, productivity, track record or know-how that wold prevent it from competently building Australia's next fleet of submarines.

1.57 To the contrary, the committee has heard expert after expert describe in detail how Australia is well placed to deliver these submarines in a timely and efficient manner.

1.58 Moreover, the wider economic and technological benefits for the country were quantified by experts such as Professor Goran Roos of the Advance Manufacturing Council and Professor at UTS Business School (Adelaide) and Dr Peter Brain, Executive Director of the National Institute of Economic and Industry Research.

The conclusions on these very conservative assumptions is that Australia as a country is at least \$21bn better off to build in Australia than to purchase overseas in addition to creating 120,000 man years of additional jobs in the economy over the life of the project as compared to building overseas.¹⁰

1.59 The committee heard evidence from a range of experts that the through-life benefits of engaging local navy shipbuilding industry, including but not limited to:

- (a) The strategic advantage of building and maintaining Australia's essential naval assets in Australia, including and especially during periods of conflict and tension overseas when Australia should not be reliant upon overseas suppliers
- (b) The multiplier effects for the economy of spending defence funds in Australia rather than overseas
- (c) Reductions in through-life maintenance and sustainment costs due to investment in infrastructure and skills during the construction phase

¹⁰ *Submission 25*, p. 17.

- (d) The development of a highly skilled workforce and increased innovation that comes through research and development and knowledge transfer for the wider economy
- (e) The project's contribution to national economic growth and employment. These benefits have been recognised by the Canadian Government in its National Shipbuilding Procurement Strategy (NSPS)¹¹
- (f) The tax revenue advantages to Government of engaging local industry, estimated to be up to a third of the cost of the project, as outlined in a 2012 paper published by the Royal United Services Institute of the UK.¹²

1.60 The importance to South Australia of building Future Submarines in Adelaide has increased due to the impending closure of Australia's car making industry and the flow-on effects in South Australia and Victoria of the expected loss of more than 30,000 manufacturing jobs and many thousands of others in supply and service jobs that support the car-making sector.

1.61 By the Government delivering on its election promise to build Future Submarines in Adelaide it has the opportunity to offset the serious job losses South Australia will suffer in coming years.

1.62 Indeed, the oft-cited 'Valley of Death', which will see navy shipbuilding jobs lost due to lack of engagement from the Federal Government in coming years, is a risk to the nation as a whole, with the potential loss of approximately 7000 naval ship building jobs¹³ and thousands more in supply industries.

1.63 The Valley of Death is already upon us. The Committee has heard that Forgacs laid-off 110 skilled navy maritime jobs from its Newcastle Tomago yard recently¹⁴ due to a lock of continuity in naval ship building work.

1.64 The enormity of the Valley of Death will become clear from next year when work for the Air Warfare Destroyer project in Newcastle and Melbourne comes to an end, and will worsen from 2016 when work in Melbourne on the navy's Landing Helicopter Deck (LHD) ships comes to an end.¹⁵

¹¹ Canadian National Shipbuilding Procurement Strategy (NSPS), <u>http://www.tpsgc-pwgsc.gc.ca/app-acq/sam-mps/snacn-nsps-eng.html</u>

¹² Over a third of UK sourced defence contracts may be recovered by the Treasury in tax revenue, https://www.rusi.org/news/ref:N4F194BF09B370/#.U_v0wvnEJSi

¹³ Mr Glenn Thompson, AMWU, *Committee Hansard*, 21 July 2014, p. 34.

¹⁴ Mr Glenn Thompson, AMWU, *Committee Hansard*, 21 July 2014, p. 35.

¹⁵ Mr Glenn Thompson, AMWU, *Committee Hansard*, 21 July 2014, p. 33.

1.65 The Government has the opportunity, and Australian industry has the capability, to build both the Future Frigates and Future Submarine projects in Australia from the 2020s.

1.66 Carrying out this crucial shipbuilding work in Australia is in the national interest, in the interests of the Navy and of the Defence Force and the wider national economy.

Defence industry engagement

1.67 It has become regrettably clear that the Government is not engaging Australian industry adequately, nor is it engaging potential international design partners in a comprehensive and well-understood procurement process.

1.68 Further context for the Government's decision on the replenishment ships is provided by its decision, also revealed in June, to outsource the construction of 12 smaller navy vessels to Vietnam via a novel commercial arrangement with an Australian bank, and the construction of two ice breakers in Europe.¹⁶

1.69 The committee heard, and I have heard separately outside the committee, that Australian industry is either being kept in the dark or else the Government and Defence appears to be 'going through the motions' with local and international suppliers.

1.70 This goes against the recommendations of the 2012 ANAO report into the C27J project, which required that DMO keep Australian industry appraised of the status of a procurement project and of the process being followed.

1.71 Besides being confused about the process due to Government backgrounding of media in relation to unannounced and disputed decision points, industry has also been confused by the statements of senior DMO executives and the Defence Minister.

1.72 For example, DMO Chief Executive Warren King was questioned about the status of the so-called Option 3 and Option 4, an evolved Collins Class design or an entirely bespoke design for Future Submarines:

Senator KIM CARR: Explain to me what it is. I am particularly interested, given that the Commonwealth of Australia provided \$20 million in January 2012 for the funding of SEA 1000. Has all of that process been put aside so that we can now investigate this question of buying boats from Japan?

Mr King: No, we are still looking at options 3 and 4.

Senator CONROY: So work is still being undertaken on options 3 and 4?

¹⁶ South Australian ship builders cut out of contracts as Federal Government buys overseas, <u>http://www.adelaidenow.com.au/news/south-australia/south-australian-ship-builders-cut-out-of-</u> <u>contracts-as-federal-government-buys-overseas/story-fni6uo1m-1226945174449</u>

Mr King: At this stage, yes.

Senator CONROY: No work has been scaled back?

Mr King: No ...

1.73 Yet in the Senate Estimates hearings in October the Defence Minister described Options 3 and 4 as follows, referring to the doorstop press conference he gave to media on 8 May 2013:

I said in that interview that we will pursue Options 3 and 4 unless they turn out to be fantasy. Senator you and I both know that those two options are fantasy.¹⁷

1.74 This begs the question of why is the DMO carrying out work into design options for SEA1000 that its Minister considers to be fantasy.

1.75 And what is defence industry to make of a process that appears so conflicted at the top of Defence and Government?

Recommendation 3

1.76 That Defence and Government re-engage with Australian and international defence industry positively and fairly, keeping them informed of the state of SEA1000 and the process being followed.

ASC productivity

1.77 The issue of ASC productivity during the AWD project has become a matter of public interest since the release of the ANAO report in 2012 and the Winter-White report in June this year.

1.78 The Defence Minister has repeatedly asserted in the media, and in Senate Estimates and the Senate, variations of:

I inherited a project running several years late and several hundred million dollars over budget; with man hours per tonne running at 150 man hours per tonne when the benchmark internationally is 60 man hours per tonne and the benchmark was set at 80 man hours per tonne, so we've got a problem program.¹⁸

1.79 On 29 July 2014, the Defence Minister said this to the media in Adelaide:

¹⁷ Foreign Affairs Defence and Trade, Senate Estimates, 22 October 2014.

¹⁸ Foreign Affairs Defence and Trade Committee, Senate Estimates, 22 October 2014.

We cannot go forward with 150 man-hours per tonne in the face of a reasonably fluid benchmark of about 80. We are approximately double what we should be – that is not acceptable.¹⁹

1.80 On 27 August the Defence Minister told the Senate:

Hundreds of millions of dollars over budget, it was two years late. With an international benchmark of 60 man-hours per tonne, we set the benchmark at 80 man-hours per tonne—and what were they doing? One hundred and fifty man-hours per tonne. Some of these blocks had to be reworked up to four times. I owe it, we owe it, to the taxpayer to get this right. There are eight ships for Adelaide if we can get this right. So instead of bleating, get onto your mates up there and tell them to lift their productivity. It is that simple.²⁰

1.81 The Defence Minister has promised that no more major naval ship building work will be awarded to Australian industry until 'AWD is fixed'.

1.82 However, the committee heard evidence from ASC that these comparisons in relation to benchmarks by the Defence Minister were misleading.

1.83 Martin Edwards, ASC General Manager for Current Operations for the AWD Project, explained to the committee at the Adelaide hearing the context of these productivity figures and what the current benchmark figure was for the current stage of the AWD project:

There has been much commentary about productivity on the AWD program and its impact on future programs. This has been driven in part by annual reports by First Marine International, or FMI. These are conducted for DMO and are an annual activity benchmarking our productivity. FMI use a productivity measure known as compensated gross tonnage divided by the labour hours, to benchmark productivity between types of ships and different shipyards around the world. Compensated gross tonnage is not a measure of a ship's mass. It is a measure of a ship's volume and complexity and is used to enable comparison between different ships and shipyards.

The measurement includes all production trades and importantly project support staff, such as engineers, planners and other elements of the program. Sixty to 65 hours for compensated gross tonne is highlighted as the core productivity benchmark that we should achieved. However, this is only achieved after a number of ships, usually greater than four or five, of the same class have been built. Of course, we are only currently building three air warfare destroyers, so we will not get to this core level. This

¹⁹ Doorstop press conference, 29 July 2014, http://www.minister.defence.gov.au/2014/07/29/minister-for-defence-doorstop-defenceindustry-conference-2014-adelaide/

²⁰ Senate Question Time, 27 August 2014, <u>http://parlinfo.aph.gov.au/parlInfo/search/display/display.w3p;query%3DId%3A%22chamber%</u> <u>2Fhansards%2F51bf64f5-0da0-45b0-8f27-30816cdb43b4%2F0041%22</u>

learning curve effect means that the first ship in a class always takes more hours to build than the second and the third less than the second—and so it goes on. This is the same for any shipyard building a new class of vessel.

FMI advises this effect can increase the core productivity by about 50 per cent on the first of class. On this basis, the first of class Air Warfare Destroyer would be expected to be built or to achieve in the order of 120 to 130 hours per CGT. Currently, shipyard building is in the order of 150 hours of compensated gross tonne. However, if adjusted for abnormal factors such as issues associated with design and scope transfer from other yards to ASC, we are currently forecasting to achieve somewhere in the order of 132 hours for compensated gross tonne or approximately five per cent higher than the international benchmarks—however, we can do better. The actual achievement will only be known when the first of class is completed and delivered; so, at this time, it is only a forecast. However, based on this, we expect a third Air Warfare Destroyer to achieve around the targeted 80 to 85 hours for compensated gross tonne.²¹

1.84 This evidence to the committee shows that AWD is not running at almost half the productivity that it should, as the Defence Minister has asserted, but that it is only slightly off the productivity expected at this early stage of such a complex project.

1.85 The full explanation of AWD difficulties are many and varied and were covered in detail in the ANAO report of 2012 and the Winter-White report, completed in June this year.

1.86 However, the Government has refused to release the Winter-White report, despite the Senate passing two motions that I moved to have it produce the document.

1.87 Government secrecy in relation to the Winter-White report has damaged the ability of analysts, the media and Parliamentarians to understand the causes of the AWD problems and necessary remedial work required.

1.88 This is unacceptable given the Defence Minister says no further naval shipbuilding will be awarded to Australian industry until the AWD project is remediated.

1.89 The Government has promised a remedial program involving bringing in a number of experienced naval shipbuilding project managers, reportedly from Navantia,²² but there has been no announcement of this program commencing to date and it remains unknown when the Government intends to roll this program out.

²¹ Committee Hansard, 14 October 2014.

²² *The Australian*, 23 September 2014, <u>http://www.theaustralian.com.au/national-affairs/defence/shipbuilders-from-spanish-firm-navantia-called-in-to-salvage-destroyer-program/story-e6frg8yo-1227066999460?nk=60d38d7a4b5bff75c6f04a4dfed3ecab&login=1</u>

1.90 Missing from the Government's repeated attacks on AWD has been any recognition—bar a perfunctory one-page précis of the Winter-White report—that the causes for the AWD project's problems stem from its inception by DMO, which decided to set up a so-called 'Alliance' structure under the leadership of Warren King, now the DMO's Chief Executive.

1.91 The Government appears keen to point the finger of blame at the Australian naval shipbuilders on the AWD project, promising to halt all major naval work awarded to Australian industry as a result, but the truth is much more inconvenient.

1.92 There's a question as to whether the slippage in the schedule was due in part to the structure of the Alliance from the outset.

1.93 I understand that DMO practices may have contributed significantly to inefficiencies at Australian shipbuilders, especially with lead shipbuilder ASC.

Recommendation 4

1.94 That the Government release the Winter-White report immediately, if necessary removing commercial-in-confidence information, so that the debate on the Future Submarines and other naval acquisitions can be properly conducted.

Recommendation 5

1.95 That the Government commission an independent wide-ranging inquiry of the Defence Materiel Organisation as a result of its role in the AWD project becoming a Project of Concern for the Government. Terms of reference should also include a root-and-branch analysis of the DMO and any consequential recommendations for reform.

Senator Nick Xenophon Independent Senator for South Australia

APPENDIX 1 Submissions received to date

Submission Number	Submitter
1	Forgacs
2	Australian Business Defence Industry
3	Mr Wade Noonan MP and Mr Cesar Melhem MP
4	Australian Manufacturing Workers' Union
5	Defence SA
6	The Royal Institution of Naval Architects, Australian Division
7	Australian Industry and Defence Network
8	Adelaide Ship Construction International
9	BAE Systems Australia
10	Defence Teaming Centre
11	Lean Design Australia Pty Ltd
12	Navy League of Australia
13	Victorian Government
14	Department of Finance (including answers to question on notice)
15	Mr Grant Spork
16	Mr Jon Primrose
17	Mr Peter Briggs AO and Mr Terence Roach AM
18	Mr Paul Greenfield AM
19	LeadWest Ltd
20	Hobsons Bay City Council
21	Dr John White
	Supplementary Submission
22	Submarine Institute of Australia Inc.

23	Mr Hank Willems
24	Mr Benjamin Cropley
25	Professor Göran Roos
26	Mr Martin Katschner

Additional information

- Documents provided by the Australian Industry & Defence Network following the public hearing held in Melbourne on 13 October 2014.
- Opening statements from ASC's appearance at the public hearing held in Adelaide on 14 October 2014.
- Report of the Auditor General of Canada into National Shipbuilding Procurement Strategy released in November 2013, provided by the Australian Industry & Defence Network on 20 October 2014, following the public hearing held in Melbourne on 13 October 2014.
- Media release provided by the Economic Development Board of South Australia following the public hearing held in Melbourne on 13 October 2014.
- Notes and talking points provided by the Electrical Trades Union of Australia at the public hearing held in Adelaide on 14 October 2014.

Tabled documents

- Media articles tabled by Senator the Hon Stephen Conroy at a public hearing held in Canberra on 30 September 2014.
- Document tabled by Dr John White at a public hearing held in Melbourne on 13 October 2014.

Answers to questions on notice

- From a public hearing held in Canberra on 21 July 2014, received from the Department of Defence on 12 August and 19 August 2014.
- From a public hearing held in Canberra on 30 September 2014, received from the Department of Defence on 20 October 2014.
- From a public hearing held in Canberra on 30 September 2014, received from the Department of Defence on 21 October 2014.

- From a public hearing held in Canberra on 30 September 2014, received from the Department of Defence on 22 October 2014.
- From a public hearing held in Newcastle on 8 October 2014, received from Forgacs on 27 October 2014.
- From a public hearing held in Canberra on 30 September 2014, received from the Department of Defence on 28 October 2014.
- From a public hearing held in Canberra on 30 September 2014, received from the Department of Defence on 30 October 2014.
- From a public hearing held in Canberra on 30 September 2014, received from the Department of Defence on 31 October 2014.
- From a public hearing held in Melbourne on 13 October 2014, received from the Victorian Government on 11 November 2014.

APPENDIX 2

Public hearings and witnesses

CANBERRA, 21 JULY 2014

BURNS, Mr Christopher, Chief Executive Officer, Defence Teaming Centre Inc.

DUNK, Mr Graeme, Manager, Australian Business Defence Industry

EDGE, Mr John, Acting Deputy Secretary, Business, Procurement and Asset Management, Department of Finance

FLETCHER, Mr Andrew, Chief Executive, Defence SA

HAMILTON-SMITH, The Hon. Martin, Minister for Defence Industries, South Australian Government

KING, Mr Warren, Chief Executive Officer, Defence Materiel Organisation

SHERIDAN, Mr John, Australian Government Chief Technology Officer and Procurement Coordinator, Department of Finance

THOMPSON, Mr Glenn, Assistant National Secretary, Australian Manufacturing Workers Union

THORNE, Mr Col, General Manager Land and Maritime, Defence Materiel Organisation

CANBERRA, 30 SEPTEMBER 2014

BARRETT, Vice Admiral Timothy, AO, CSC, RAN, Chief of Navy, Department of Defence

BRIGGS, Rear Admiral Peter (Retired), Private capacity

GREENFIELD, Commodore Paul (Retired), Private capacity

HALL, Ms Stacie, Branch Manager, Government Business Advice, Department of Finance

JONES, Vice Admiral Peter, AO, DSC, RAN, Chief, Capability Development Group, Department of Defence

KING, Mr Warren, Chief Executive Officer, Defence Materiel Organisation, Department of Defence

NICHOLLS, Commander (Retired) David, Executive Manager, Submarine Institute of Australia Inc

OWEN, Commander (Retired) Frank, Secretary, Submarine Institute of Australia Inc

PACEY, Mr Brice, Private capacity

ROACH, Commodore Terence (Retired), Private capacity

SAMMUT, Rear Admiral Gregory, Head, Future Submarine Program, Defence Materiel Organisation, Department of Defence

THORNE, Mr Col, General Manager, Land and Maritime, Defence Materiel Organisation, Department of Defence

NEWCASTLE, 8 OCTOBER 2014

CUTTELL, Ms Barbara, Communications Adviser, Forgacs

DICK, Mr Ian, Defence Project Director, HunterNet Cooperative

DUNK, Mr Graeme, Manager, Australian Business Defence Industry

HORAN, Mr Benjamin, Delegate, Australian Manufacturing Workers Union

KNIGHT, Mr Jeremy, Delegate, Australian Manufacturing Workers Union

LANE, Mr John, Director of Shipbuilding, Forgacs

PIDGEON, Mr Bradley, Industrial Officer, Australian Manufacturing Workers Union

ROOS, Professor Goran, Private capacity

STRATTON, Mr Lindsay, Chief Executive Officer, Forgacs

THOMPSON, Mr Glenn, Assistant National Secretary, Australian Manufacturing Workers Union

MELBOURNE, 13 OCTOBER 2014

GILLARD, Mr David, Director, Commercial and Procurement, BAE Systems Australia

KANE, Mr Chris, Head of Strategy and Business Development, Maritime, BAE Systems Australia

NICHOLSON, Mr Peter, AO, Head of Government Relations, BAE Systems Australia

SALTZER, Mr William, Director Maritime, BAE Systems Australia

LYNCH, Mr Matthew, Director Aviation, Defence and Aerospace, Trade, Manufacturing and Employment Division, Department of State Development, Business and Innovation

VAN ROODEN, Ms Marion, Deputy Secretary, Trade, Manufacturing and Employment Division, Department of State Development, Business and Innovation

MORRIS, Ms Charlotte, Manager, Submarine Industry, Australian Industry & Defence Network Inc., Victoria

SMITH, Mrs Sue, Executive Officer, Australian Industry & Defence Network Inc.

WHITE, Dr John, Private capacity

BRAIN, Dr Peter, Executive Director, National Institute of Economic and Industry Research

ROWLEY, Mr Craig, Chief Executive Officer, LeadWest

WILSON, Councillor Sandra, Mayor, Hobsons Bay City Council

SLEE, Mr Jeff, Delegate, Australian Workers Union

THOMPSON, Mr Glenn, Assistant National Secretary, Australian Manufacturing Workers Union

VICKERS, Mr David, Delegate, Technical, Supervisory and Administrative Division, Australian Manufacturing Workers Union

WHITE, Mr Leon, Delegate, Australian Manufacturing Workers Union

ADELAIDE, 14 OCTOBER 2014

BURNS, Mr Chris, Chief Executive Officer, Defence Teaming Centre

CARROLL, Mr Alistair, Production Leader, Electrical Controls, AWD Project

DONNELLY, Mr Robert, South Australian Branch Secretary, Communications, Electrical, Electronic, Energy, Information, Postal, Plumbing and Allied Services Union of Australia, Electrical Energy and Services Division, South Australian Branch

EDWARDS, Mr Martin, General Manager, Current Operations, AWD Project, ASC Pty Ltd

HAMILTON-SMITH, Mr Martin, Minister for Defence Industries, South Australian Government

JACKMAN, Mr Malcolm, Chief Executive, Defence SA

KATSCHNER, Mr Martin, Private capacity

LAMPS, Mr Peter, Acting Secretary, South Australian Branch, Australian Workers' Union

PAULUS, Mr Ron, Electrician, Secretary, Communications, Electrical, Electronic, Energy, Information, Postal, Plumbing and Allied Services Union of Australia, Electrical Energy and Services Division, South Australian Branch

SCUDDS, Mr Paul, South Australian Branch Organiser, Communications, Electrical, Electronic, Energy, Information, Postal, Plumbing and Allied Services Union of Australia, Electrical Energy and Services Division, South Australian Branch

SMITH, Mr Brett, Private capacity

STANBOROUGH, Mr Christopher, Private capacity

SUDHOLZ, Mr Andrew, Private capacity

TAYLOR, Mrs Sarah, Membership and Advocacy Manager, Defence Teaming Centre

THOMPSON, Mr Glenn, Assistant National Secretary, Australian Manufacturing Workers Union

WHILEY, Mr Stuart, Interim CEO, ASC Pty Ltd

WOLOWIEC, Mr Stanislaw, Communications, Electrical, Electronic, Energy, Information, Postal, Plumbing and Allied Services Union of Australia, Electrical Energy and Services Division, South Australian Branch

Appendix 3

Background to SEA 1000 Phase 1A—deliver Australia's future submarine capability

Defence's decisions regarding the replacement of the Collins Class submarine with a new fleet of more capable boats have been many years in the making. In this appendix, the committee traces the capability development phases of the future submarines to date, starting with its inclusion in the 2009 Defence White Paper.

White Paper—2009

The Defence White Paper is a key strategic document that presents the government's long-term strategic forecast and commitments for Defence including its future capability. In its 2009 White Paper, the government indicated its intention to replace and expand the current fleet of six Collins class submarine with a more capable class of submarine. It recognised that some decisions on significant aspects of Australia's defence capability must be taken over the next few years, including in submarine forces. This project would be a multi-billion dollar decision requiring very long lead-times for project development, acquisition and entry into service.¹

The White Paper indicated that, through consideration of current and future requirements, a major new direction had emerged with significant focus on enhancing Australia's maritime capabilities. It stated that by the mid-2030s, Australia would have a heavier and more potent maritime force with a more capable submarine, Future Frigate and enhanced capability for offshore maritime warfare, border protection and mine countermeasures.²

Expanded submarine fleet

With respect to the submarines, the government formed the view that Australia's future strategic circumstances required a substantially expanded submarine fleet. The government would double the size of the submarine force to 12 replacing the current fleet of six Collins class submarines. This enhanced capability was:

...to sustain a force at sea large enough in a crisis or conflict to be able to defend our approaches (including at considerable distance from Australia, if necessary), protect and support other ADF assets, and undertake certain strategic missions where the stealth and other operating characteristics of

¹ Department of Defence, *Defending Australia in the Asia Pacific Century: Force 2030*, Defence White Paper, 2009, paragraph 1.14, <u>http://www.defence.gov.au/whitepaper2009/docs/defence_white_paper_2009.pdf</u> (accessed 8 August 2014).

² Department of Defence, *Defending Australia in the Asia Pacific Century: Force 2030*, Defence White Paper, 2009, paragraph 8.39.

highly-capable advanced submarines would be crucial. Moreover, a larger submarine force would significantly increase the military planning challenges faced by any adversaries, and increase the size and capabilities of the force they would have to be prepared to commit to attack us directly, or coerce, intimidate or otherwise employ military power against us.³

The future submarine was to have 'greater range, longer endurance on patrol, and expanded capabilities compared to the current Collins class submarine'.⁴ The boats were to be equipped with 'very secure real-time communications and be able to carry different mission payloads such as uninhabited underwater vehicles'. The White Paper specified the boats capability:

The Future Submarine will be capable of a range of tasks such as anti-ship and anti-submarine warfare; strategic strike; mine detection and minelaying operations; intelligence collection; supporting special forces (including infiltration and exfiltration missions); and gathering battlespace data in support of operations.⁵

The White Paper recognised that the long transits and potentially short-notice contingencies in Australia's primary operational environment demanded high levels of mobility and endurance in the future submarine. The boats needed to be able to undertake prolonged covert patrols over the full distance of Australia's strategic approaches and in operational areas. They would require low signatures across all spectrums, including at higher speeds.⁶

The government placed a priority on broadening Australia's strategic strike options, which would occur through the acquisition of maritime-based land-attack cruise missiles. These missiles would be fitted to the AWD, future frigate and future submarine. The incorporation of a land-attack cruise missile capability would be integral to the design and construction of the future frigate and future submarine.⁷

The government ruled out nuclear propulsion for these submarines.⁸

- 7 Department of Defence, *Defending Australia in the Asia Pacific Century: Force 2030*, Defence White Paper, 2009, paragraph 9.74.
- 8 Department of Defence, *Defending Australia in the Asia Pacific Century: Force 2030*, Defence White Paper, 2009, paragraph 9.5.

³ Department of Defence, *Defending Australia in the Asia Pacific Century: Force 2030*, Defence White Paper, 2009, paragraph 8.40.

⁴ Department of Defence, *Defending Australia in the Asia Pacific Century: Force 2030*, Defence White Paper, 2009, paragraph 9.3.

⁵ Department of Defence, *Defending Australia in the Asia Pacific Century: Force 2030*, Defence White Paper, 2009, paragraph 9.4.

⁶ Department of Defence, *Defending Australia in the Asia Pacific Century: Force 2030*, Defence White Paper, 2009, paragraph 9.5.

Australian industry involvement and assembled in Adelaide

The government understood that the strategic importance of the future submarine's capability was such that Australian industry involvement would 'need to be factored into the design, development and construction phases, and the sustainment and maintenance life cycle' of the boats. It anticipated that the operational life of the boats would extend well into the 2050s and possibly beyond.⁹ The White Paper indicated that the government would give early consideration to the complex capability definition and acquisition issues involved in this substantial undertaking; consider matters such as basing and crewing; and would seek early advice from Defence on those and other issues.¹⁰

The construction program for the future submarines would be designed to provide the government with the option to continue building additional submarines in the 2030s and beyond, should strategic circumstances require it.¹¹

According to the White Paper, the government had decided that the boats were to be assembled in South Australia.¹²

Schedule

The White Paper acknowledged that this major design and construction program would span three decades, and be 'Australia's largest ever single defence project'.¹³ Given the long lead times and technical challenges involved, the White Paper argued that the complex task of capability definition, design and construction must be undertaken without delay. The government announced that it had already directed that a dedicated project office be established for the future submarine within Defence, which would closely oversee this project.¹⁴

- 13 Department of Defence, *Defending Australia in the Asia Pacific Century: Force 2030*, Defence White Paper, 2009, paragraph 9.3.
- 14 Department of Defence, *Defending Australia in the Asia Pacific Century: Force 2030*, Defence White Paper, 2009, paragraph 9.6.

⁹ Department of Defence, *Defending Australia in the Asia Pacific Century: Force 2030*, Defence White Paper, 2009, paragraph 9.7.

¹⁰ Department of Defence, *Defending Australia in the Asia Pacific Century: Force 2030*, Defence White Paper, 2009, paragraph 9.7.

¹¹ Department of Defence, *Defending Australia in the Asia Pacific Century: Force 2030*, Defence White Paper, 2009, paragraph 9.9.

¹² Department of Defence, *Defending Australia in the Asia Pacific Century: Force 2030*, Defence White Paper, 2009, paragraph 9.3.

Overseas partners

To ensure the project's success, the government stated that it would need to engage with a number of overseas partners during the design and development phase. In particular, it noted its intention 'to continue the very close level of Australia–US collaboration in undersea warfare capability', which, in its view, would be crucial in the development and through life management of the future submarine.¹⁵

Collins Class

Turning to the current submarine fleet, the government also agreed to further incremental upgrades to the Collins class submarines throughout the next decade, including new sonars, to ensure they remained highly effective through to their retirement.¹⁶

The White Paper noted that the government was determined to respond decisively to deficiencies in the availability of operationally ready submarines. The Navy would embark on a major reform program to improve the availability of the Collins class fleet and ensure that a solid foundation was laid for the expanded future submarine force. These reforms were intended to change how the Navy attract, remunerate, train and manage the submarine workforce, and improve the deployment and maintenance of the submarines.¹⁷

Defence Capability Plan

Details of the capability Defence was seeking to acquire from the acquisition of 12 submarines specified in the White Paper was then translated into a more concrete proposal in the Defence Capability Plan (DCP) 2012. The DCP is a 'classified and costed 10-year detailed development plan for Australia's military capabilities (including workforce requirements)'. The document:

...lists the rolling program of major capital investment projects that meet the capability objectives and priorities that fall from the Defence White Paper (or subsequent strategic updates) and the DPG [Defence Planning Guidance].¹⁸

¹⁵ Department of Defence, *Defending Australia in the Asia Pacific Century: Force 2030*, Defence White Paper, 2009, paragraph 9.8.

¹⁶ Department of Defence, *Defending Australia in the Asia Pacific Century: Force 2030*, Defence White Paper, 2009, paragraph 9.9.

¹⁷ Department of Defence, *Defending Australia in the Asia Pacific Century: Force 2030*, Defence White Paper, 2009, paragraph 9.10.

¹⁸ Department of Defence, *Defence Capability Development Handbook 2014*, paragraph 2.2.4, <u>http://www.defence.gov.au/publications/docs/Defence%20Capability%20Development%20Ha</u> <u>ndbook%20(DCDH)%202014%20-%20internet%20copy.pdf</u> (accessed 8 August 2014).

Government approval for entry of projects into the DCP provides 'the foundation for subsequent capability work in Defence'.¹⁹ Defence also publishes a public version of the DCP designed to:

...provide industry with a synopsis of the projects including: confirmed scope; background; indicative schedule; Australian Industry opportunities; cost banding; and points of contact. The format of this Public DCP also introduces stakeholders to the concept of Program and Sub-Program management.²⁰

The 2012 DCP included a costed and scheduled plan for the acquisition of the future submarine and its sea-based strike capability, which entered the plan as project SEA 1000. The DCP noted that:

SEA 1000 will provide Australia with a new and more potent Defence capability with greater range, longer patrol endurance and increased capability compared with the Collins Class submarine. Key capabilities will be in the areas of anti-submarine warfare, anti-surface warfare, strike, intelligence, surveillance and reconnaissance, electronic warfare, mine warfare, and support to advance force operations.²¹

The DCP explained that, as part of the 2009 Defence White Paper preparations, significant work had been undertaken to identify and quantify the maritime capability developments that would be required to meet government's expectations. For example, the government had allocated \$15.4 million for early studies and research in relation to the future submarine project of which \$9 million had not been spent by May 2010.²²

In mid-December 2011, the Minister for Defence announced that the government had approved the release of Requests for Information to three overseas submarine designers offering military-off-the-shelf (MOTS) designs. It had also entered into a contract with Babcock to study the establishment of a land based propulsion systems test facility to inform engineering development of the future submarines.²³

¹⁹ Department of Defence, *Defence Capability Development Handbook 2014*, paragraph 2.2.7.

²⁰ Department of Defence, Defence Capability Plan, public version 2012, p. 1, http://www.defence.gov.au/publications/CapabilityPlan2012.pdf (accessed 17 October 2014).

²¹ Department of Defence, Defence Capability Plan, public version 2012, p. 201, http://www.defence.gov.au/publications/CapabilityPlan2012.pdf (accessed 17 October 2014).

²² Senate Foreign Affairs, Defence and Trade Legislation Committee, *Estimates, Committee Hansard*, 31 May 2010, pp. 49–51.

²³ Minister for Defence and Minister for Defence Materiel, 'Progress of future submarine project', 13 December 2011, <u>http://www.minister.defence.gov.au/2011/12/13/minister-for-defence-andminister-</u> for-defence-materiel-progress-of-future-submarine-project-2/ (accessed 7 May 2012).

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Options 1–4 for future submarines

Rear Admiral Gregory Sammut, Head, Future Submarine Program, DMO, explained that initially the submarine program had investigated four broad options:

- Option 1—a MOTS submarine modified to conform to Australian legislative requirements;
- Option 2—a MOTS submarine with a combat system of Australia's choosing that would be aligned pretty much to the combat system methodology used for the Collins class today;
- Option 3—an evolved Collins; and
- Option 4—broadly termed a new design.²⁴

Staged acquisition

The DCP anticipated that a staged acquisition process would be undertaken to acquire this capability. As noted in the White Paper, the project was to be the largest and most complex Defence acquisition yet conducted. It was expected that the government would on multiple occasions consider the project as information was gathered that facilitated government decision-making.²⁵

Phases 1 and 2 of SEA 1000 would entail the design, build and delivery of 12 conventionally powered submarines as well as infrastructure and Integrated Logistic Support requirements. At the time of publication, the DCP indicated that all options from military-off-the-shelf to a new design were being examined. The DCP envisaged that:

...this phase may have multiple decision points identified as the project definition matures. Accordingly, as the project is in a very early stage of development an acquisition strategy has yet to be determined.²⁶

The DCP confirmed the government's intention that the future submarines would be assembled in South Australia.

Planned Schedule

The DCP set out the following schedule for SEA 1000:

First Pass Approval	financial year 2013–14 to financial year 2014–15
Year-of-Decision	financial year 2016–17 to financial year 2017–18

²⁴ *Committee Hansard*, 30 September 2014, p. 35.

²⁵ Department of Defence, Defence Capability Plan, public version 2012, p. 206, http://www.defence.gov.au/publications/capabilityplan2012.pdf (accessed 17 October 2014).

²⁶ Department of Defence, *Defence Capability Plan*, public version 2012, p. 206.

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Initial Materiel Release	financial year 2019–20 to financial year 2025–26
Initial Operational Capability	financial year 2025–26 to financial year 2026–27. ²⁷

In order to deliver the new capability submarines in time to replace the Collins class, preliminary work to prepare first pass approval in late 2013/early 2014 is clearly a demanding priority.

Australian Industry Capability Considerations

An Australian Industry Capability Plan is required for each project procurement where the estimated value of the procurement is equal to or greater than \$20 million or where the procurement will impact on a Priority Industry Capability (PIC). The DCP indicated that it was likely that Phase 1 and 2, the design and construction of the submarines, would require Australian industry capability, priority industry capability, strategic industry capability and global supply chain. It noted further that the project would fully explore and define the priority industry capability requirements such as 'they can be recorded in the Acquisition Strategy'. According to the DCP the exact nature of Australian industry opportunities would be identified as the project definition matured.²⁸

The DCP indicated that through-life support needs would be refined as the capability solution developed but that planning would be based on through-life-support being provided in Australia.²⁹

On 3 May 2012, the then Prime Minister announced that \$214 million would be provided for the 'next stage' of the future submarine project and be directed towards further detailed studies and analysis to inform the government's decisions on the design of the next submarines.³⁰

²⁷ Department of Defence, *Defence Capability Plan*, public version 2012, p. 206, <u>http://www.defence.gov.au/publications/capabilityplan2012.pdf</u> (accessed 17 October 2014).

²⁸ Department of Defence, *Defence Capability Plan*, public version 2012, p. 206.

²⁹ Department of Defence, *Defence Capability Plan*, public version 2012, p. 207.

³⁰ Prime Minister, Minister for Defence, Minister for Defence Materiel—Joint Media Release— 'Next stage of future submarine project announced', 3 May 2012, <u>http://www.minister.defence.gov.au/2012/05/03/prime-minister-minister-for-defence-minister-for-defence-minister-for-defence-materiel-joint-media-release-next-stage-of-future-submarine-project-announced/</u> (accessed 7 May 2012).

Defence White Paper 2013

In May 2013, the government brought forward the delivery of its anticipated Defence White Paper by one year from its original 2014 timetable 'to address a number of significant international and domestic developments influencing Australia's national security and defence posture internationally and domestically'.³¹ The 2013 White Paper recognised the strategic value and importance of Australia's submarine capability and reaffirmed its commitment to replace the existing Collins Class fleet with an expanded fleet of 12 conventional submarines.³²

When releasing the 2013 White Paper, the then Prime Minster, the Hon Julia Gillard MP, noted the government's decision to have the future submarine program focus on two options: an 'evolved Collins Class' design; and new design options likely to best meet Australia's strategic requirements. The White Paper spelt out this intention:

The Government has also taken the important decision to suspend further investigation of the two Future Submarine options based on military-off-the-shelf designs in favour of focusing resources on progressing an 'evolved Collins' and new design options that are likely to best meet Australia's future strategic and capability requirements...³³

The Prime Minister indicated that the government had also directed further detailed work on establishing a land-based test facility in Adelaide. This Submarine Propulsion Energy Support and Integration Facility was intended to 'substantially assist submarine capability design, delivery and sustainment and reduce risk in all stages of the Future Submarine Program'.³⁴

As noted earlier, the government had approved expenditure of over \$200 million to fund design, modelling, analysis and technology studies to examine in detail options for the future submarine capability. A range of studies, which looked at the different technologies in terms of propulsion, whole design and so on, were undertaken to help Defence build-up a base knowledge so it would be an informed customer and able to understand likely future advances in submarine technologies.

According to Rear Admiral Sammut, DMO also conducted various studies into each of the four options. He indicated that DMO was trying to ascertain the capabilities of MOTS submarines; whether further exploration was required; or whether DMO needed to concentrate on other options that may have a chance of coming closer to

³¹ Defence website, <u>http://www.defence.gov.au/whitepaper2013/</u> (accessed 20 October 2014).

³² Department of Defence, *Defence White Paper 2013*, paragraph 8.46.

³³ Department of Defence, *Defence White Paper 2013*, paragraph 8.50.

³⁴ Prime Minister and Minister for Defence—Joint Media Release—Release of the 2013 Defence White Paper, 3 May 2013, <u>http://www.minister.defence.gov.au/2013/05/03/prime-minister-andminister-for-defence-joint-media-release-release-of-the-2013-defence-white-paper/</u> (accessed 19 October 2014).

meeting Australia's capability needs.³⁵ He informed the committee that by the middle of 2013, DMO had reached the point where, as indicated in the White Paper, the program was beginning to focus on options 3 and 4.³⁶ He explained that both options 1 and 2 fell into the 'suspended' category:

We had not done any further work on the options so that we could focus our energies on option 3 and option 4. I do not think that necessarily amounted to a decision to completely eliminate consideration of MOTS submarine at that stage but an ability to focus the resources we had on looking at what would be involved in involving the Collins class as an option and what would be involved in progressing a new design.³⁷

Combined with the various investigations looking at the different acquisition options, the studies involved with modelling and analysing submarine technology formed the bulk of the work undertaken with the allocated funding.³⁸

It should be noted that on 30 September 2014, Rear Admiral Sammut informed the committee that to date total expenditure on phase 1A, for which the \$214 million was allocated, accounted for \$68.4 million. The remaining budget, including contingency, was \$185.3 million.³⁹

Aside from the \$214 million, an additional \$34.2 million was allocated in April 2013 for the Submarine Propulsion, Energy, Support and Integration Facility. According to Defence, first pass approval for this submarine design and test facility was achieved in April 2013 but no construction work has commenced.⁴⁰

The 2013 White Paper reaffirmed the government's intention to have the future submarines assembled in South Australia and again ruled out consideration of a nuclear powered submarine capability to replace the Collins Class fleet. It again highlighted the challenges facing the project:

The Future Submarine Program is a capability design, construction and sustainment challenge of unprecedented scale and complexity, and will span decades. Implementation will require a sustained and coordinated national effort. The Program will harness the knowledge, skills, expertise

³⁵ *Committee Hansard*, 30 September 2014, p. 35.

³⁶ *Committee Hansard*, 30 September 2014, p. 35.

³⁷ Committee Hansard, 30 September 2014, p. 35.

³⁸ Vice Admiral Jones, *Committee Hansard*, 30 September 2014, p. 55.

³⁹ *Committee Hansard*, 30 September 2014, p. 49. In its answer to question taken on notice No. 4, Defence provided the following information 'As at 1 October 2014, \$68.1 million or 32 per cent of the budget (excluding contingency) for planned work has been expended. There has been no expenditure of contingency'.

⁴⁰ Department of Defence, question to answer on notice taken 30 September 2014.

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and lessons learned over the last 50 years of Australian submarine ownership. 41

According to the White Paper, Defence would work with relevant Commonwealth and State Agencies and authorities and Australia's strategic partners along with suitable Australian industrial capacity during all stages of the program. It recognised that such engagement and collaboration would be critical to the project's success. In particular, the government intended to continue close cooperation with the United States on developing undersea warfare capabilities.⁴²

Australian Defence industry

The White Paper also recognised that the future submarine program represented 'a true nation building endeavour' which presented both challenges and significant opportunities for Defence and Australian industry. It argued that to complete the program successfully, the government would need to support the Australian naval shipbuilding industry to develop and maintain a workforce 'skilled in a wide range of specialist activities'. They included 'systems engineering, design, production engineering, construction and project management'. It stated further:

While building new skills within the maritime sector is important, it is equally important to maintain the skill level of the existing maritime workforce. The Government is committed to a program of naval shipbuilding that will ensure that the skills developed during construction of the Air Warfare Destroyers and Landing Helicopter Dock ships will be available to be applied to the Future Submarine Program and Defence's broader long-term needs.⁴³

According to the White Paper, to do otherwise would result in a later delivery of the future submarines at a higher cost than is necessary, thereby resulting in a loss of capability for the ADF.⁴⁴

Election and new government

In the lead-up to the 2013 general election, the now Defence Minister visited ASC and said:

The Coalition today is committed to building 12 new submarines here in Adelaide, we will get that task done, and it is a really important task, not just for the Navy but for the nation.⁴⁵

⁴¹ Department of Defence, *Defence White Paper 2013*, paragraph 8.47.

⁴² Department of Defence, *Defence White Paper 2013*, paragraph 8.47.

⁴³ Department of Defence, *Defence White Paper 2013*, paragraph 12.54.

⁴⁴ Department of Defence, *Defence White Paper 2013*, paragraph 12.54.

⁴⁵ Press Conference, 8 May 2013

As part of its Defence policy, the Coalition announced that any substantial decision on Defence acquisition, including Australia's submarine fleet and capabilities, could only be made responsibly with the advice of the Chief of the Defence Force and Service Chiefs.

It made clear, however, that within 18 months of winning the election it would make the decisions necessary to ensure that Australia would not experience a submarine capability gap. It also gave assurances that the work on the replacement of the current submarine fleet would centre around the South Australian shipyards.⁴⁶

New or evolved design

In April 2014, the Minister for Defence reminded a conference on submarines that before the last election, he gave his support to Defence's charted course for the Future Submarine program—the suspension of investigations into options 1 and 2 and more detailed investigation of options 3 and 4 (a bespoke new design). He concluded 'we are left with options 3 and 4 at this particular time'.⁴⁷

The following month, the minister announced that, as promised before the election, the government would soon consider Defence's plan to progress the future submarine to ensure it was achievable and that it balanced cost, capability and risk. He stated:

We will ensure that Defence is investigating all appropriate options and is drawing on private sector expertise in order to successfully deliver this complex project.⁴⁸

At that same conference, Mr Simon Todd, lead of the Future Submarine Integrated Project Team (ITP), told the audience that one of the key assumptions and derived requirements that underpinned the ITP's work was that Australia's future submarines would be assembled in South Australia. He explained further 'so any design created overseas must be imported and matched to Australian shipyard practices'.⁴⁹

⁴⁶ The Coalition's Policy for Strategic Defence, p. 4, <u>http://www.liberal.org.au/our-policies</u> (accessed 17 October 2014).

⁴⁷ ASPI, *The submarine choice*, Perspectives on Australia's most complex defence project, September 2014, p. 10. The conference, which was called, 'The Submarine Choice' brought together a 'group of distinguished speakers to discuss the reasoning behind, and the options for, Australia's most expensive and complex defence project—the replacement of the Collins class submarine fleet.

⁴⁸ Minister for Defence—Budget 2014–15—Defence Capability, 13 May 2014 <u>http://www.minister.defence.gov.au/2014/05/13/minister-for-defence-budget-2014-15-defence-capability/</u> (accessed 27 September 2014).

⁴⁹ ASPI, *The submarine choice; Perspectives on Australia's most complex defence project,* September 2014, p. 18.

The May 2014 Portfolio Budget Statement confirmed that work would proceed on options 3 and 4. It provided further information on the future submarine acquisition:

During 2014–15, the strategic direction of this project will be reviewed by Government as part of the White Paper process. To assist this review and maintain schedule, work will continue on Option 3 (Evolved Collins Class) and Option 4 (New Design). Consultations with industry will also commence to progress planning for the delivery of the Future Submarine, which is being scheduled to avoid a capability gap as the Collins Class is progressively withdrawn from service. The project will refine proposed arrangements to ensure the roles and functions of the Commonwealth can be fulfilled over the full course of the SEA 1000 Program.

The key risk for this project remains the mobilisation of resources across Government, industry and academia necessary to manage the Future Submarine Program with appropriate international support, informed by our experience and knowledge of similar programs.⁵⁰

In July, at an industry and defence conference, the minister acknowledged that there was significant debate around the future submarine and whether it should be built in Australia. He suggested that this debate must consider the cost, risk and schedule as well as the benefits of the different options. He identified key questions such as:

Where domestic industrial capability is scarce; where ought it be directed? To what priority and to which ADF needs?

The minister concluded that with tens of billions of dollars of new opportunity on the table the government must choose wisely.⁵¹

On 21 August 2014, the minister informed the Australian Business Industry Group that no decision had been made on the future submarines but work was progressing well on options. He gave assurances that there would be no capability gap.⁵² The following day in Adelaide, the Prime Minister stated that the government was going to ensure that Australia has the strongest possible Defence Force:

We are going to ensure that we have the best possible submarines in service for Australia. We have got six Collins-class boats that were built here in

⁵⁰ Portfolio Budget Statements 2014–15, Defence Materiel Organisation, <u>http://www.defence.gov.au/budget/14-15/pbs/2014-2015_Defence_PBS_04_DMO.pdf</u> (accessed 27 September 2014).

⁵¹ Minister for Defence—Defence and Industry Conference 2014, 29 July 2014, Defence+Industry Conference 2014, Adelaide Convention Centre, <u>http://www.minister.defence.gov.au/2014/07/29/minister-for-defence-defence-and-industry-conference-2014/</u> (accessed 27 September 2014).

⁵² Minister for Defence—Australian Business Industry Group, 21 August 2014, http://www.minister.defence.gov.au/2014/08/21/minister-for-defence-australian-businessindustry-group/ (accessed 27 September 2014).

Adelaide; they are good boats. It took us a long time to get them right, but they are good boats. 53

Speculation about Japanese submarine

On 26 August 2014, a delegation of Japanese Defence science technicians visited ASC, Osborne in South Australia, spending two days at Osborne and one day at Henderson, south of Perth. ASC facilitated the visit at the request of DMO. Mr Stuart Whiley, Interim CEO, ASC, informed the committee that DMO wanted to demonstrate to the Japanese the capability Australia had in-country in terms of the ASC facility and workforce.⁵⁴

According to the Minister for Defence, the delegation was to visit Perth, Canberra and Sydney. He also noted that many people from overseas had visited Australia to exchange technical information.⁵⁵

This visit by the 18 Japanese dignitaries sparked speculation about the government's stated intention to build the submarines in Adelaide. Media reports suggested that the visit had heightened fears that the Australian Government was contemplating building the future submarines overseas. The South Australian Defence Industries Minister, the Hon Martin Hamilton-Smith, told journalists that he knew nothing of the trip and wanted answers about the reason behind the Japanese visit. He wanted to know whether the visit 'signalled a back down from the Coalition's election promise to build the submarines in Adelaide' and was urgently seeking an explanation from the Australian Government.⁵⁶

In response to a question without notice seeking clarification on the government's intention with regard to the possibility of buying Japanese submarines, the Minister for Defence, told the Senate on 27 August 2014 that 'We are not ruling in or out anything here'.

⁵³ Prime Minister of Australia, the Hon Tony Abbott MP, Joint Doorstop Interview, Adelaide, 22 August 2014, Adelaide, <u>http://www.pm.gov.au/media/2014-08-22/joint-doorstop-interview-adelaide</u> (accessed 27 September 2014).

⁵⁴ *Committee Hansard*, 14 October 2014, p. 27.

⁵⁵ Questions without Notice, Defence: Submarines, Senate Hansard, 27 August 2014, p. 40 and Minister for Defence—Transcript—Interview with Tony Jones, Lateline, 27 August 2014, <u>http://www.minister.defence.gov.au/2014/08/27/minister-for-defence-transcript-interview-with-tony-jones-lateline-3/</u> (accessed 27 September 2014). Note in his answer to the question without notice, the Minister indicated that some 14 Japanese technicians comprised the delegation.

⁵⁶ ABC News, 'Japanese submarine experts visit Adelaide, sparking fears for shipbuilding future', 27 August 2014, <u>http://www.abc.net.au/news/2014-08-27/japanese-delegates-spark-fears-</u> <u>submarine-future/5699076</u> (accessed 27 September 2014) Evidence taken by the committee suggested that the delegation comprised 18 Japanese visitors. See *Committee Hansard*, 14 October 2014, p. 27.

According to the minister there were only three places that Australia could approach for the design of a new submission—France; Germany; and Japan.⁵⁷

On 3 September 2014, the Senate debated the future submarines, as a matter of urgency. The motion before the Senate was 'the need for the Abbott Government to keep its pre-election promise to design and build Australia's Future Submarine Fleet in Adelaide and to justify why it's planning to destroy Australia's strategically vital shipbuilding capability'.

The following week, the Minister for Defence explained:

Australia has a 3,400 submerged tonne submarine which gives us enough room for lots of battery space and lots of fuel. The Japanese submarine is about 4,200 submerged tonnes, which is bigger than the Collins, it's the biggest diesel electric submarine. But the Germans also produce some very good vessels and the French have got on offer a Barracuda which is almost 5,000 tonnes, so we are canvassing widely across a number of countries...⁵⁸

Even so, speculation continued to mount about the possible decision to purchase the future submarines from Japan.⁵⁹ It was in this context that the committee decided at short notice to hold a public hearing on 30 September and 8, 13 and 14 October 2014 to examine the future submarine project and to report to the Senate on its findings.

Through these public hearings, the Committee has been able to consider:

- the significance of, and messages emanating from, the Japanese visit in August 2014 and subsequent government announcements on discussions with Japan regarding submarines;
- Australian requirements and the future submarine—range, endurance and stealth;
- potential contenders for designing and building the future submarine;
- the capability of Japanese submarines as measured against Australian requirements;
- the tender process and the merits and feasibility of having a funded project definition study, the benefits of undertaking a competitive tender process and

⁵⁷ Questions without Notice, Defence Procurement, *Senate Hansard*, 27 August 2014, p. 41.

⁵⁸ Minister for Defence—Transcript—Interview with Justin Smith, 2UE Drive, 9 September 2014, <u>http://www.minister.defence.gov.au/2014/09/09/minister-for-defence-transcript-interview-with-justin-smith-2ue-drive/</u> (accessed 27 September 2014).

⁵⁹ See for example, Adelaide Advertiser, 'Japanese subs could sink the budget', 10 September 2014; Australian Financial Review, 'Germans undercut Japan subs', 11 September 2014; Daily Telegraph, 'Don't torpedo this strategic industry', 12 September 2014; Adelaide Advertiser, 'Japanese subs deal will leave nation "at risk"', 13 September 2014; and Hugh White, the Age, 'What lies beneath: the real reason for Japan subs', 16 September 2014.

whether there was time to complete such a process while avoiding a capability gap;

- the capacity of Australian shipyards to build submarines onshore, the costs, including through-life-support and the broader economic benefits;
- the strategic importance of the Australian Defence industry and of building the submarines in Australia; and
- recommendations designed to ensure that the future submarine program succeeds in acquiring a world-class, highly capable conventionally powered submarine that meets Australia's requirements and is truly a national endeavour.