



Australian Government  
Department of Defence

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Johnston: MA13-004168  
Ref: SEA1000/OUT/2013/141

**MINISTERIAL ADVICE**

<b>Date for action by:</b> 31 January 2013	<b>Reason:</b> To allow industry consultations by SEA 1000 to proceed on schedule.
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**For Action: Minister for Defence**

Copies to: Secretary, CDF, FASMECC, CEO DMO, CN, CCDG

**SEA 1000 - Future Submarine Program - Immediate and Next Steps**

**Purpose:**

Following the Submarine Seminar you recently convened, the purpose of this advice is to summarise the key issues and decision points discussed in relation to the Future Submarine Program, and to seek your approval to proceed with immediate steps necessary to ensure the timely progression of the Future Submarine Program.

**Key Points:**

1. The SEA 1000 Program continues to develop Future Submarine options that will enable Australia to maintain a regionally superior conventional submarine capability. These options – Evolved Collins and New Design – are both based on Collins-like capabilities. They are also characterised by the range and endurance necessary to provide the Future Submarine with the reach and persistence to fulfil their mission. Additionally, they are shaped by the need to preserve access to sensitive technologies from the US and UK, as well as the sovereign capability Australia requires to operate, maintain, and sustain our Future Submarine capability with appropriate degrees of national independence. This particularly applies to Australia's capacity to progressively incorporate its own stealth technologies into the Future Submarine – technologies that will maintain the capability edge of the submarine capability.
2. As for any major capability replacement program, SEA 1000 is proceeding cognisant of a range of risks, many evident from our experience with the Collins program and the knowledge of submarine development programs shared with our key allies. Among others, these include risks related to operational capability, technology maturity, design capacity, governance arrangements and the commercial construct.
3. We are also focused on the need to manage the transition from Collins to the Future Submarine without a capability gap. This is driving our aim to deliver the first Future Submarine ready for operations in 2031. This will afford us time to implement a measured schedule for the design, build, and test of the first Future Submarine, while operating the Collins class over an achievable extension to their withdrawal dates.
4. Balancing all of these elements, our overarching strategy to progress the SEA 1000 Program is to engage the required level of support from an appropriate submarine design entity that has established design rules, with the aim of growing Australia's design capacity as we design and build the Future Submarine fleet. The leakage of allied and Australian technology back to this design company would need to be prevented, which may limit the extent such technology is incorporated into the initial batch of the Future Submarine. Concurrently, we will contain risks by strict requirements management, a focus on proven technologies, land-based testing of key technologies before installation (e.g. propulsion system), and the evolution of the combat system in Collins as a means to de-risk the Future Submarine combat system.

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5. A high-level schedule, including key decisions we propose to seek from Government is at Attachment A. Briefly, a decision on whether to proceed on the basis of Evolved Collins (Option 3) or New Design (Option 4), along with the agreed governance and commercial constructs will be required in 2015. A decision on the first submarine design and agreed level of capability will be sought in 2016 to allow detailed design to proceed. In 2020/21, a decision to start construction of the first Future Submarine will be required to ensure the submarine is ready for operations in 2031. To meet this broad schedule, the SEA 1000 Program will need to seek additional approved funding from Government. Work to refine further funding requirements remains underway, and we anticipate seeking approval in late 2014.
6. At this point, your approval is sought for SEA 1000 to commence the industry consultations in early 2014 that will shape the commercial construct under which the Future Submarine will be designed, built, sustained, and further developed. This construct is centred on a 'Lead Commercial Entity', which is explained at Attachment B along with a table of some of the companies that SEA 1000 wishes to engage. The eventual composition of the Lead Commercial Entity will depend on the design option and industry participants,<sup>47</sup> [REDACTED] As CEO DMO explained during the Seminar,<sup>47</sup> [REDACTED]  
<sup>47</sup> [REDACTED]  
<sup>47</sup> [REDACTED] These issues are likely to be highlighted during the forthcoming AWD Program Review.
7. The industry consultations we propose will be conducted within an appropriate commercial and probity framework developed by DMO.
8. Alongside industry consultations, SEA 1000 intends to engage an industry advisory group of eminent persons to provide independent advice on the commercial construct under consideration. SEA 1000 will need to formulate an appropriate construct for the Government Client Entity at the same time.
9. SEA 1000 also seeks your approval to consult with other Government Departments on the issue of the commercial construct, including the Departments of Industry and Finance, noting that discussions with Finance need to account for its responsibilities as the owner of ASC Pty Ltd.

### Recommendations:

That you:

- i. **Note** this summary of key issues and decision points relating to the Future Submarine Program.  
Noted / Please Discuss
- ii. **Note** that we anticipate returning to Government in late 2014 for further funding to meet the broad schedule outlined in this advice.  
Noted / Please Discuss
- iii. **Approve** industry consultations with potential participants in the Lead Commercial Entity, including ASC Pty Ltd, commencing in early 2014.  
Approved / Not Approved / Please Discuss
- iv. **Agree** to the engagement of an industry advisory group of eminent persons to provide independent advice on the commercial construct for the SEA 1000 Program.  
Agreed / Not Agreed / Please Discuss

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- v. **Agree** to the development of an appropriate construct for the Government Client Entity.  
 Agreed / Not Agreed / Please Discuss
  
- vi. **Approve** consultations with other Government Departments as necessary to formulate an appropriate construct under which the Lead Commercial Entity can be established.  
 Approved / Not Approved / Please Discuss

<p>Approved By</p> <p><b>D. GOULD</b>                  General Manager Submarines                  17 December 2013</p>	<p>47F [Redacted] (COS)                  For GMSubs</p>
<p><b>Contact Officer:</b> RADM Greg Sammut</p>	<p><b>Phone:</b> 47F [Redacted]</p>
<p>David Johnston                  / /  <b>Comments / Supplementary tasking:</b></p>	

**Resources:**

10. N/A.

**Consultation:**

- 11. CEO DMO - Mr Warren King  
 CN – VADM Ray Griggs RAN  
 CCDG – VADM Peter Jones RAN

**Attachments:**

- A. SEA 1000 High-Level Schedule and Key Decisions
- B. SEA 1000 Design and Commercial Strategies

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## ***SEA 1000 HIGH-LEVEL SCHEDULE AND KEY DECISIONS***

### **High-Level Schedule**

1. The high-level schedule over-page has been developed to avoid a submarine capability gap. It is shaped to assist us manage the Collins life-of-type extension (LOTE) while reducing risks in the delivery of the Future Submarine capability. A copy of this schedule was included in the briefing pack provided during the Submarine Seminar held 5 – 6 December 2013.

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SEA 1000 - HIGH-LEVEL SEA 1000 SCHEDULE SKETCH

2013	2014/15	2015/16	2016	2017	2018	2019	2020
Govt Consideration 3 - Funding to FY17/18 - Acquisition Strategy	Govt Consideration 4 - Funding to FY21/22 on - Commercial Arrangements	Detailed Design - Batch 1					Govt Consideration 5 - Construction of FSM 1
3-4 SMe avail for tasking	3-4 SMe avail for tasking	3-4 SMe avail for tasking	3-4 SMe avail for tasking	3-4 SMe avail for tasking	3-4 SMe avail for tasking	3-4 SMe avail for tasking	3-4 SMe avail for tasking
2021	2022	2023	2024	2025	2026	2027	2028
Govt Consideration 6 - Const. of FSM Batch 1	Construction/T&E of FSM 2 (Batch 1)	Construction/T&E of FSM 2 (Batch 1)	Construction/T&E of FSM 2 (Batch 1)	Construction/T&E of FSM 2 (Batch 1)	Construction/T&E of FSM 2 (Batch 1)	Construction/T&E of FSM 2 (Batch 1)	IOC - FSM 1 ready for ops
Design Improvement - Batch 1 (refining FSM 2, 3, 4)	Detailed Design - Batch 2	Detailed Design - Batch 2	Detailed Design - Batch 2	Detailed Design - Batch 2	Detailed Design - Batch 2	Detailed Design - Batch 2	Govt Consideration 7 - Const. of FSM Batch 2
3-4 SMe avail for tasking	3-4 SMe avail for tasking	3-4 SMe avail for tasking	3-4 SMe avail for tasking	3-4 SMe avail for tasking	3-4 SMe avail for tasking	3-4 SMe avail for tasking	Construction/T&E of FSM 4 - Const. of FSM Batch 2
2031	2032	2033	2034	2035	2036	2037	2038
FSM 1 in service	FSM 2 ready for ops	FSM 3 ready for ops	FSM 4 ready for ops	FSM 5 ready for ops	FSM 6 ready for ops	FSM 7 ready for ops	FSM 8 ready for ops
Construction/T&E of FSM 2 (Batch 1)	Construction/T&E of FSM 3 (Batch 1)	Construction/T&E of FSM 4 (Batch 2)	Construction/T&E of FSM 5 (Batch 2)	Construction/T&E of FSM 6 (Batch 2)	Construction/T&E of FSM 7 (Batch 3)	Construction/T&E of FSM 8 (Batch 3)	Construction/T&E of FSM 9 (Batch 3)
Detailed Design - Batch 3	Detailed Design - Batch 3	Detailed Design - Batch 3	Detailed Design - Batch 3	Detailed Design - Batch 3	Detailed Design - Batch 3	Detailed Design - Batch 3	Detailed Design - Batch 3
3-4 SMe avail for tasking	3-4 SMe avail for tasking	3-4 SMe avail for tasking	3-4 SMe avail for tasking	3-4 SMe avail for tasking	3-4 SMe avail for tasking	3-4 SMe avail for tasking	3-4 SMe avail for tasking
2041	2042	2043	2044	2045	2046	2047	2048
FSM 1 in service	FSM 2 in service	FSM 3 in service	FSM 4 in service	FSM 5 in service	FSM 6 in service	FSM 7 in service	FSM 8 in service
Construction/T&E of FSM 5 (Batch 3)	Construction/T&E of FSM 6 (Batch 3)	Construction/T&E of FSM 7 (Batch 3)	Construction/T&E of FSM 8 (Batch 3)	Construction/T&E of FSM 9 (Batch 3)	Construction/T&E of FSM 10 (Batch 4)	Construction/T&E of FSM 11 (Batch 4)	Construction/T&E of FSM 12 (Batch 4)
Govt Consideration 9 - Const. of FSM Batch 4	Govt Consideration 10 - Const. of FSM Batch 4	Govt Consideration 11 - Const. of FSM Batch 4	Govt Consideration 12 - Const. of FSM Batch 4	Govt Consideration 13 - Const. of FSM Batch 4	Govt Consideration 14 - Const. of FSM Batch 4	Govt Consideration 15 - Const. of FSM Batch 4	Govt Consideration 16 - Const. of FSM Batch 4
4 SMe avail for tasking	4 SMe avail for tasking	4 SMe avail for tasking	4 SMe avail for tasking	4 SMe avail for tasking	4 SMe avail for tasking	4 SMe avail for tasking	4 SMe avail for tasking
2051	2052	2053	2054	2055	2056	2057	2058
FSM 1 in service	FSM 2 in service	FSM 3 in service	FSM 4 in service	FSM 5 in service	FSM 6 in service	FSM 7 in service	FSM 8 in service
FSM 9 in service	FSM 10 in service	FSM 11 in service	FSM 12 in service	FSM 13 in service	FSM 14 in service	FSM 15 in service	FSM 16 in service
7-8 SMe avail for tasking	7-8 SMe avail for tasking	7-8 SMe avail for tasking	7-8 SMe avail for tasking	7-8 SMe avail for tasking	7-8 SMe avail for tasking	7-8 SMe avail for tasking	7-8 SMe avail for tasking

Assumptions: 1. Extended Collins class PWD is 3 years beyond current PWD (under 10+2 UUC). LOTE should provide 5 years of additional certification giving one year contingency (i.e. one half cycle).  
2. 65% availability assumed for FSM.

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**Decisions Required to Meet Government Commitment to Ensure No Capability Gap**

2. Having the first Future Submarine ready for operations in 2030/31 strikes the right balance between minimising a Collins LOTE and delivering Future Submarine as early as possible. It will require an achievable LOTE for Collins of up to 4-5 years beyond current planned withdrawal dates. Furthermore, it may be possible to confine life-of-type extension activities to planned maintenance periods (i.e. potentially no additional dockings to detract from fleet availability).

3. The introduction of a minimal Collins LOTE will also allow an appropriate schedule for construction, test and evaluation of the first Future Submarine if build were commenced in 2020/21. This ten-year period (eight years for construction and two years for test and evaluation) reflects experience with the Collins program and corresponds to other new-build submarine programs. To commence build of the first FSM in 2021, detailed design would need to commence in 2016, having already put in place the commercial arrangements for the design/build phase of the program.

4. If this plan is accepted, the following key decisions would be sought from Government:

Year	Decision	Reason for Decision(s)
Now	Permission to engage potential industry participants on commercial construct models <sup>47</sup> 47 47	Need industry input into the commercial arrangements to be proposed for design/construction of the Future Submarine. Industry will expect engagement, and it will be important for this engagement to be led by the SEA 1000 Program.
	Permission to start consultation on the form of the Commonwealth Client Entity	Need to establish matched Client and Commercial Entities in time to negotiate the Whole Boat Design Contract
Late 2014	Approval of additional funding to support ongoing work SEA 1000 beyond mid-2015.	Continue to grow the IPT ahead of the Government decision in mid-2015, to assure retention of corporate knowledge whilst developing the Lead Commercial and Client entities.
By mid-2015	Whether to proceed on the basis of Option 3 or Option 4, i.e. whether the whole boat design is led by an overseas or Australian entity (albeit with overseas support). <b>Note:</b> Options will remain for the level of capability being sought in the first batch of Future Submarine.	The basis of the option on which SEA 1000 proceeds will fundamentally shape the commercial arrangements, required to put in place prior to commencement of the preliminary/detailed design phase.
	Approval of the commercial arrangements for design/construction arrangements for the Future Submarine, dependant on the Option basis. Approval of the companies that will form the Lead Commercial Entity. Approval of the Client Entity construct.	It would take approximately 12 months to implement the commercial arrangements (and supporting contracts) and establish the Client Entity.
	Approval for long lead items.	Likely to be required for the tools required to commence preliminary design from 2016.
	Approval of the scope of the Collins LOTE activities.	To ensure continuum of submarine capability between Collins and Future Submarine.
	Approval of combat system strategy	Beyond providing more definite design parameters, this decision will ensure combat system adaptation for the FSM can proceed without undue risk.

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Year	Decision	Reason for Decision(s)
2016	Approval to let a whole boat design contract with the Lead Commercial Entity.	Investment during the detailed design phase should focus on the selected design for the first batch of the Future Submarine.
	Approval of the minimum performance and key characteristics of the first batch of Future Submarine.	
	Approval for long lead items.	Will be required for long-lead materials (e.g. steel, etc).
	Approval for SPESIFy R&D Element	To support more detailed assessment of emerging technologies for future batches of the Future Submarine
~2018	Approval for remaining SPESIFy Elements (Equipment, Sub-System, Test and Acceptance / System Integration and Test / Pre-Build and Assembly Test)	To support Future Submarine build program.
2020/21	Approval to commence construction of the first Future Submarine	Required to ensure Future Submarine is ready for operations in 2031.

**Option Decision Points**

5. The decision points detailed above point to consideration of whether SEA 1000 should proceed on the basis of Option 3 or Option 4 from mid-2015 onwards. This is largely driven by the different commercial participants that will be needed to execute either of the two options. The options down-select will enable implementation of commercial and organisational arrangements to be in place for detailed design activities from late 2016.

6. By mid-2015, SEA 1000 is expected to be in a position to present Government with information arising from the assessment of the Option 3 feasibility study. A number of alternatives to progress Option 4 will also be available. This information will form the basis of a Government decision on which SEA 1000 option should proceed. Also included will be an assessment of the commercial factors surrounding each option that will have a direct bearing on “executability”.

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## ***SEA 1000 DESIGN AND COMMERCIAL STRATEGIES***

### **Background and Scope**

1. Australia requires an ongoing submarine capability to operate in Australia's interests. This will be underpinned by a comprehensive capability including design, build and sustainment elements. Although there is extant sustainment capability and capacity, some submarine construction elements have atrophied and design elements are limited and fragmented. Rebuilding Australia's submarine enterprise is therefore a high priority for the SEA 1000 Program to be progressed before commencing design.

### **The Australian Submarine Enterprise**

2. Australia's Future Submarine capability needs arrangements wherein management of design, build and sustainment is by skilled and experienced people. They must be empowered by an organisational construct that appropriately allocates risk and authority in an integrated environment. This requires a client (representing Government) and a provider (a Lead Commercial Entity) of submarine capability, operating in a contract structure that engenders effective and collaborative behaviours.

### **Collins and Future Submarine Sustainment**

3. The Collins Class Submarine (CCSM) is sustained within a developing enterprise arrangement. Importantly, a performance-based contracting regime for CCSM sustainment now exists in a collaborative environment. This is the beginning of an Australian Submarine Enterprise to be leveraged by SEA 1000 for Future Submarine.
4. The strategy for Future Submarine sustainment is to develop and refine the CCSM Submarine Enterprise concept. This would leverage the current sustainment organisation, ASC Pty Ltd and its facilities in Adelaide and Fremantle, as the basis for development of the support element of the Australian Submarine Enterprise. The emergent organisation would deliver sovereign control in sustainment in order to satisfy "Parent Navy" responsibilities for a design not in service elsewhere. This responsibility for the design stems from the need to maintain, manage change, update the design and make engineering concessions where necessary.

### **Future Submarine Construction**

5. The Government has committed to work on the Future Submarine being centered on Adelaide. The infrastructure and personnel, including experienced staff from the original build program, remain engaged in submarine maintenance. Shipbuilding also continues so some capability remains. However, new submarine designs and modern build strategies require updated facilities and other changes. The SEA 1000 Program therefore assumes tacit approval exists to redevelop a submarine construction capability using that which remains at the Techport sites as a basis.
6. The strategy for Future Submarine construction is to renew the dormant capability resident in ASC Pty Ltd and its facilities as a start point. However, as ASC lacks some skills and capital to undertake this large task alone, additional skills and resources should be introduced, ideally from Australian companies to maximise sovereignty.<sup>47</sup>

This will require

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Government approval due to considerations of sovereign control and commercial viability of the industrial construct for the enterprise. Advice for this decision will be developed, cognizant of similar arrangements overseas as discussed below, and presented for Cabinet consideration.

**Future Submarine Design**

7. Australia currently lacks whole boat design capability, but has many important design capability elements. For Australian industry to attain an appropriate level of self reliance, a whole boat design capability is needed. However, as some of the key whole boat design integration capability elements are absent in Australia, assistance will be required to establish or supplement these.
8. The core strategy for a Future Submarine whole boat design capability in Australia is for the SEA 1000 Program to seek overseas assistance from capable partners in the field. A range of approaches offer differing levels of sovereign control. At one end of the spectrum is for Australia to lead the design support by the US and UK and at the other is for a mainland European designer to lead. The SEA 1000 Program strategy is to assess what level of design leadership (read sovereign control) is appropriate for Future Submarine and matches our design capacity.
9. Selection of the design strategy should therefore be based on ability to bring specific capability technologies to the design, opportunities for Australia to exercise sovereignty in design management, and the capacity and capability of the candidates' design resources. A traditional comparison of competing detailed submarine designs and tenderer ability to meet a performance specification is not the intent.

**Develop and Recommend an Industrial Construct**

10. The SEA 1000 Program strategy for procurement of the required submarine capability elements is to assemble them in one entity currently known as the Lead Commercial Entity (LCE). The LCE will therefore be the core of the Australian Submarine Enterprise and ultimate integrator of the Future Submarine.
11. The envisaged industrial construct mirrors that which exists in other western nations. The US, UK, France, Germany, Sweden, Japan and Spain all foster national organisations charged with carriage of submarine design, build and sustainment. This is because there are few opportunities for competition at the top tier levels of industry participation within these countries. Collaborative, enterprise-like arrangements are in place in all cases.
12. In Australia too, the market base is insufficient to support a normal competition for industry participation in the Australian Submarine Enterprise. Therefore, a tailored procurement strategy is needed that reflects this reality. The SEA 1000 Program will consult to find Tier One investors with capability and capital to take several shareholdings in a LCE.<sup>47</sup> [REDACTED] The shareholdings would be in consideration of a long term concession to design, build and sustain Australia's Future Submarine in a monopoly / monopsony relationship.
13. The LCE will be initially formed by key personnel, IP and business and engineering systems from its shareholders, including ASC, and the FSM IPT. New hires will also come from Australia and overseas. Shareholders will inject, top-down, engineering and program competence, business maturity and sound management. Its role is likely to be as an engineering, procurement and construction management (EPCM) organisation in support of the Government.

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14. The SEA 1000 Program seeks to engage the following industrial entities, and possibly others, as potential Tier 1 enterprise participants:

Whole Boat Capability	Engineering Capability	Sustainment Capability	Systems Capability	Assembly Capability
BAE Systems GDEB TKMS AB TKMS GmbH DCNS Navantia	Austal Worley Parsons SKM/Jacobs	Babcock UGL Transfield	Thales Lockheed Martin Raytheon SAAB	ASC

**Industry Advisory Group**

15. In addition to the specialists assisting to formulate the detail of the Lead Commercial Entity, senior political and industry advice would also be very valuable. It is therefore considered beneficial to assemble an eminent persons group to provide independent advice on commercial construct options. This would be particularly important in ensuring that the Australian context is observed as options are developed, bringing appropriate and real experience to bear in the process.
16. This group should include ex-Government (ministerial level – e.g. Robert Hill, etc) and industry experts at senior CEO level. They would need direct access to senior Navy, DMO DSTO and other Government agency personnel and be in receipt of appropriate briefing material. Creation of such an entity could be commenced in 2014 if needed.

**Future Australian Submarine Enterprise Model**

17. A future Australian Submarine Enterprise Model that reflects these design and commercial strategies is pictured below.

### Future Australian Submarine Enterprise Model

