

## **SUBMARINES FOR AUSTRALIA**

### **Media Release**

Four senior retired naval officers, all with substantial submarine related experience, have called on the government to inject some competition into the SEA 1000 acquisition program for Australia's future submarine. Currently the government is negotiating with the French company Naval Group to build 12 Short Fin Barracuda submarines for the RAN at a cost of \$50 billion with delivery extending into the 2050s.

In a letter to the Prime Minister, the Admirals expressed their "profound concern about a lack of submarine capability in the future, as well as the excessive costs and risks of the program".

"We are strongly of the view that the government should evaluate a second option. ... The alternative option, that we believe could be cheaper, quicker, less risky and offer a greater level of Australian industry participation and sovereignty, is to build an evolved version of the *Collins* class," the Admirals said.

Speaking on behalf of the group, Rear Admiral (retired) Peter Briggs AO CSC said that Australia's six *Collins* class submarines are now performing at a very high level but that they are reaching the end of their design lives. "The evaluation of an alternative approach based on an evolved *Collins* platform would come at a low cost without impeding progress with the current project."

"Since 2009 the government has recognised the need to greatly enhance the Navy's submarine capability," Admiral Briggs said. "But on the basis of the present program, the first new submarine won't be operational until the late 2030s. With Australia's strategic circumstances becoming ever more threatening and with the risks involved in the current approach, we need to develop a Plan B while at the same time not doing anything to slow down the existing project."

Admiral Briggs stated that most countries evolve a new class of submarine from an existing platform because of significantly lower risk. "A concept design has already been produced by SAAB Kockums and we believe an Evolved *Collins* submarine could offer a capability comparable to the Short Fin Barracuda. ASC in Adelaide has developed substantial experience in building and sustaining the *Collins* platform with an extensive Australian supply chain and high local content."

"For an outlay of just 0.1% of the program budget for the future submarine, we propose that the government establish a Preliminary Design Study of an Evolved *Collins* platform. As well as providing a serious option at a low cost, this approach would also have the benefit of introducing some much needed competition into what is, by a fair margin, Australia's biggest ever defence project."

"The Study would be undertaken separately from the current process with Defence," Admiral Briggs said. "Within two years, the government could make a fully-informed decision between two options for the future submarine on the basis of the criteria of capability, cost, delivery, risk and the level of Australian content."

Contact: Rear Admiral Peter Briggs, 0401 004 688

The Hon Scott Morrison, MP  
Prime Minister of Australia  
Parliament House  
Canberra ACT 2600

10 December 2018

Dear Prime Minister

The four signatories to this letter are retired naval officers of flag rank, all with a deep and varied experience of RAN submarines. Three of us are former submariners, of whom one was the commanding officer of the Submarine Force. The other signatory directed the Future Submarine acquisition program until 2013.

We are writing to you about the Future Submarine Program, reflecting our profound concern about a lack of submarine capability in the future as well as with the excessive costs and risks of the program. We are strongly of the view that the government should evaluate a second option, at very low cost and without impeding the present approach. The alternative option, that we believe could be cheaper, quicker, less risky and offer a greater level of Australian industry participation and sovereignty, is to build an evolved version of the *Collins* class.

Our main concern relates to the level of submarine capability that Australia will be able to deploy in the 2030s and beyond. Since the need to double the Submarine Force to 12 boats was identified in the 2009 White Paper, Australia's strategic circumstances have deteriorated significantly. The need for an enhanced submarine capability is now greater than ever. Yet at the end of 2018, we are only just finalising a concept design for the Future Submarine, with the first submarine scheduled to enter service in 2035, if all goes well.

Our experience tells us that, as with any new and technologically advanced military design, all is unlikely to go well. By 2040, the RAN may well have only one new submarine in operational service. Indeed, under the present program, all 12 new submarines foreshadowed in 2009 will not be available until the early 2050s.

Because of the extreme complexity of submarines and the high associated risks involved in an *ab initio* design, evolving an existing platform is the approach followed by all other countries with parent nation responsibilities for submarines. The US Navy originally recommended that Australia follow this course. Kockums produced some concept designs for the Evolved *Collins* in 2013-14, with reportedly high quality results.

Our initial analysis suggests that the Evolved *Collins*:

- would have a significantly improved capability compared to *Collins*,
- would be delivered sooner, with the first boat in service by the late 2020s
- based on public source estimates for the SFB, would have a much lower cost—at ~\$20 billion for 12 boats, possibly even half as much as the Short Fin Barracuda
- as an evolved platform rather than an *ab initio* design, would involve substantially lower risks and achieve operational capability more quickly
- would embody intellectual property already covered by protocols enabling Australian ownership

Embargoed until midnight, Wednesday 12 December 2018

- building on an existing Australian supply chain, would have a higher local content than the SFB with more work throughout Australia much sooner
- constructed by ASC, an Australian government enterprise, it would offer a greater sovereign capability than the SFB, which would be built by a majority French government-owned company.

Because of the Future Submarine schedule the six existing *Collins* class submarines will need to continue to embody Australia's deployable submarine capability in operations 'up threat' into the late 2040s, confronting a far more challenging tactical environment than they do today.

There would be major synergies between the *Collins* Life Of Type Extension and a new build program for an Evolved *Collins* class, leading to lower costs and risks for both programs.

We propose that without interrupting or occasioning any delays to the Short Fin Barracuda program, the government should commission a Preliminary Design Study of the Evolved *Collins* option. The Study should involve ASC, SAAB and the major equipment suppliers. It should be managed by a dedicated Submarine Capability Team. It is estimated that the study would cost about \$50 million, or 0.1 per cent of the SEA 1000 program budget. This would appear to offer very good value for money, not least in terms of providing competition for the Short Fin Barracuda.

The proposed study would take about two years. If a contract for the study were issued in a timely way, it would enable the government to choose between two options for the Future Submarine in early 2021.

Further details of our proposed approach are contained in the attachment to this letter. We feel sufficiently strongly about this issue that we intend making our concerns public in the next few days. We will do this because we believe it is in the national interest that this situation be given serious consideration. But we also consider it appropriate that the Government be given an opportunity to prepare a considered response. Therefore, we propose an embargo on the contents of this letter and attachment until midnight on Wednesday 12 December 2018 and would request that the government does the same.

We have copied this letter to the Minister for Defence and the Minister for Defence Industry. We would be happy to meet you and other Ministers to discuss our proposal further.

Attachment:

1. A Discussion of Submarines for Australia, dated 10December 2018

## A DISCUSSION OF SUBMARINES FOR AUSTRALIA

### **Today's situation; Australia has a serious problem.**

Since the French Short Fin Barracuda (SFB) was selected to replace the Collins class submarines, there have been two significant developments that suggest we have a national security problem of consequence:

- our strategic circumstances have become much more challenging, very quickly; and
- media reporting suggests the Future Submarine Program is experiencing challenges.

Regardless of when the issues with Naval Group are resolved, the rate and direction of change in Australia's strategic circumstances means that arrival of the first new submarine and the time it will take to have the full planned fleet of 12 in service are both much too late.

- The first new boat will not be ready for operations until 2038 at the earliest, which is 13 years later than the originally planned end of life of the first of the Collins submarines.
- We will not have 12 submarines in service until the 2050s at best.

This is not intended to be a criticism of the performance of any party. It is simply our analysis of the situation as we understand it.

### **However, the publicly cited cost for this, the largest capital acquisition to be undertaken by a Government in Australia's history, by a substantial margin, appears much higher than we should be willing to pay.**

- The stated total constant price cost of \$50 billion for the 12 new SFB submarines suggests an average cost per boat that is well over what we should pay.

Even if the SFB Program goes very smoothly (which history suggests is most unlikely) we should be very concerned because:

- SFB is a new design being undertaken with a partner with whom we have no submarine related working experience. Global experience, including our own with Collins, shows clearly that there is an elevated risk that the first submarines of a new design will be delivered later than planned, at higher cost and with less capability than sought.
- There is no reason for us to have any confidence that our experience with the French will be any different.
- Being engaged with an unfamiliar partner elevates that risk. Our experience with several major Defence acquisition programs over many decades supports this view.
- An inescapable consequence is that our Collins class submarines will have to be extended in service for a long time. While projects to upgrade some of Collins' systems and address obsolescence issues are funded and underway, preparations for a life of type extension (LOTE), which will be a complex and challenging undertaking seem much less mature.
- In the current plan we believe that all of the Collins class will need to be kept in service until towards age 40, possibly beyond. This is over half again their original design life.

- Some Collins components will be very difficult and expensive if not almost impossible to replace, such as high-power cabling. These may not last the extra time needed.
- In capability terms Collins will be increasingly limited compared with potential adversaries, even if all goes well with planned upgrades and the LOTE.

**The Commonwealth is exposed to extremely high risk in cost, capability and schedule terms for a capability important enough that successive Governments with bipartisan support have, for a decade, been willing to invest vast national wealth to double its size.**

### **We conclude...**

There is an urgent need for Government to examine another option to the current singletrack approach, which lacks any competitive pressure on the French, to see if our increasingly urgent need for new submarines can be met another way.

- This should be done in parallel with the SFB Program but not to interfere with it.

### **Purpose**

This paper proposes an activity of low cost and risk to examine the only alternative, which would reintroduce competition, give Government options and provide insurance against delays and/or cost escalation with the SFB Program. This could be achieved for a cost of around 0.1% of the total budget for that Program, an amount that would be saved many times over by the reintroduction of competitive tension.

### **Identifying the alternative**

- Government has sensibly ruled out submarines with less capability than the Collins class. This eliminates all existing off the shelf conventional submarine designs smaller than Collins, which are those offered by France, Germany, Spain and Sweden.
- Nuclear powered submarines have also been ruled out so there are no alternatives available from the UK or USA.
- Introducing another nation with which we have no experience on submarines makes no sense. Japan and South Korea are not considered.
- Other Government policy objectives should be met, in particular sovereign capability
- and Australian industry involvement.

### **There is only one alternative - evolving the Collins design**

Early in the FSM Program, Australia was strongly encouraged by the US and others to evolve the Collins design:

- This is a philosophy of “building on what you have built so far and know”.
- This is the approach taken by all parent nations of a submarine capability, which we became when we embarked on the Collins program and built unique submarines to meet our particular needs.

- History shows clearly that in submarines, evolution is cheaper, less risky and more successful than revolution.

### **Our proposal – the “what”?**

- Engage a small team to conduct a Preliminary Design Study (PDS) for an evolved and modernised version of the Collins class submarines;
- Which would involve the Swedish designers of Collins (now SAAB), builders of those submarines in Australia, ASC Pty Ltd, and other selected companies in Australia’s existing submarine supply chain;
- With the objective being to understand the capability an evolved Collins submarine would give us, when delivery could begin and at what rate, and the average price we might expect to pay per submarine.

### **The “why”?**

Apart from the deteriorating strategic situation we face, difficulties with France so early in the SFB Program emphasise the need to reintroduce competition. Australia’s interests are best served by doing so.

- The French have the whip hand;
- The capability risk lies solely with the Commonwealth;
- The looming Federal election would embolden them to hold on for the very best deal they can get; because
- They have little to lose while the Commonwealth has no alternative option in play.

Building evolved Collins submarines instead of SFB is not being suggested now. That decision is for later, based on the results of the PDS.

- The objective of the proposed PDS is to get accurate answers on whether the evolved Collins is as attractive as it appears; and
- To provide Government with options that do not exist today.

### **Other important considerations**

- **We have already started**
- Australia engaged Kockums (now SAAB Kockums) in 2013 to investigate evolving the Collins class, through contracts valued at just under \$10m.
  - This was in addition to work examining extending the life of the six Collins boats.
  - The products delivered are reported to have been of high quality; and
  - the collaboration with Sweden was apparently excellent.
- Importantly, agreement on **intellectual property rights** was reached with Sweden before that work started (but apparently not with France).

### **Comparison of Risk**

The Head of the Future Submarine Program in 2013 deliberately imposed a restriction on the work undertaken by SAAB, being that the existing Collins hull diameter was not to be changed.

- This was done to determine whether an evolved Collins was different from undertaking a new design.

- The results showed an evolved Collins would be a new design in terms of budget, schedule and contingency (according to an ANAO report).

We contend that ANAO's comment on budget, schedule and contingency, which are based on Defence's opinion at the time, are very subjective and not entirely correct. Widespread and experienced advice from the US and other countries emphasised to us that an evolutionary approach is far less risky than a major step change (which SFB most certainly is) and therefore likely to be more certain and require less contingency.

Our contention is that while SAAB's advice is that an evolved Collins is a new design, our history with and deep knowledge of it makes it:

- Of considerably lower risk for Australia than any other new design;
- With a shorter schedule and lower cost being very likely to be achievable; and
- Very likely to deliver a significantly better sovereign outcome in terms of investment in Australia.

The main reason risk would be lower with evolved Collins is our thirty years of hard won experience and knowledge.

- We have deep understanding of the submarine's foibles, strengths and shortcomings, its design philosophy and its designer, all accrued from having built them as well as operating, maintaining, modifying and solving their problems.
- This is a basis for a much more comprehensive and accurate understanding of the likely cost and capability than is possible with the SFB that is an unknown entity to everyone, including France.

Such lower risk enhances confidence in achieving the outcome chosen with less likelihood of cost and/or schedule blow out;

- Which reduces the risk of having to compensate for schedule slippage by extending the old submarines in service even longer than currently necessary, with all the risk and cost associated with that.

### **Evolved Collins and SFB – a comparison of capability**

The evolved Collins design appears to compare quite favourably on paper with the capability of SFB. The PDS would provide more certainty.

- It would have a somewhat smaller weapons load capacity but in other respects could be expected to have comparable performance; including
- Improved stealth characteristics over the existing Collins boats, taking advantage of the improvements in stealth for Sweden's latest A26 class boats.
- The proposed evolved design is 6m longer than the existing Collins, the design of which was sufficiently flexible to be inherently capable of being made longer even during its service life (the Swedes have done such extensions to their own in-service submarines).
- This modest extra length would deliver improved endurance but would probably not demand a larger crew to operate the submarine.
- There would however be some extra capacity compared with Collins (but less than SFB) to carry more people, such as Special Forces, other specialist mission teams or submariner trainees which is vital for Navy growing the submariner work force.

## Comparison of Schedule

Estimates suggest that evolved Collins submarines could be delivered sooner and possibly more quickly than SFB, for the same reasons that the risk is lower. The PDS activity would test this.

- Delivering the first boat might be possible by the late 2020s – much earlier than the SFB.
- Based on the rate of delivery ASC achieved with the Collins class, four or five new evolved boats could potentially be delivered by the time the first SFB completes test and evaluation.

## Comparison of Cost

Estimates based on figures in the public domain suggest the average cost per submarine should be significantly less for an evolved Collins than for SFB. For a start, the evolved Collins is a smaller submarine than SFB. The proposed PDS would test this.

To further illustrate the point:

- Public comment by Defence suggests a global western benchmark submarine cost of \$450,000 per tonne. The average cost of an evolved Collins at under 3,700 tonnes dived displacement should therefore be expected to be no more than \$1.7b.
- Assuming ASC continued to match the cost of building the Collins submarines, 12 Evolved Collins submarines could be delivered at a total cost of around \$20 billion (excluding sustainment costs).
- SFB at around 4,700 tonnes dived displacement should therefore be well under \$2.5b per submarine.
- That makes the total cost for 12 SFB submarines \$30b, a huge difference from the budget of \$50b, which has also been stated publicly as excluding sustainment costs.
- Allowance for efficiencies in build from learning over time are applied in both cases.
- Sensible costs for design fees, project management, new infrastructure, training systems, weapons and so on would be in addition to these estimates; but
- Such costs could not reasonably add \$20b to the total.
- This suggests that the planned average cost of each SFB is significantly more than \$2.5b.
- Much of that will be paid to a foreign owned company.

## What our analysis suggests

To summarise, an evolved Collins submarine looks very likely to be distinctly better in terms of overall risk, schedule and cost than SFB, while delivering a capability that is only marginally less.

## Sources of our information

The information for our analysis for SFB comes from publicly available sources only.

Estimates for evolved Collins are based on public information and the deep knowledge and experience of several people who have been involved in submarine

capability and construction in Australia going as far back as the Oberon class boats, who are very concerned about how things are unfolding with the SFB Program.

Wider public analysis done by the ANAO, ASPI and the Kokoda Foundation has also been drawn on.

### **ANAO's analysis and the distraction of hull diameter**

The ANAO examination of the Program in 2017 is instructive. Report No.48 of 2016–17 “Future Submarine—Competitive Evaluation Process” highlights the matter of hull diameter, something that has become a ‘red herring’.

To quote from page 20 of that report: *“The external review concluded that an enhanced Collins design would require the same budget, schedule and contingency as a new design, and would have significant engineering constraints such as hull diameter. On this basis, Defence determined that a new design was the preferred option for the Future Submarine.”*

There is no doubt that Australia needs a replacement for the Collins class that should be a new design. This does not rule out an evolved Collins – far from it.

- The investigation done on an evolved Collins concept in 2013/14 was specifically designed to determine whether it would amount to a new design in terms of overall project management considerations.
- Simply put, we needed to know whether to plan for a project that would buy and build a submarine design off the shelf, one that evolved what we had, or execute a new design and in each case whether a new partner nation would be involved. In project management terms, the differences were considerable.
- The artificial constraint of not changing the hull diameter was imposed not by any engineering consideration but deliberately and consciously by the Head of the Program.
- The reason was simple. All international advice received to that point, especially drawing on lessons learnt from the UK's very troubled Astute program, agreed that when evolving a design, changing the hull diameter meant you had a new design, with everything that went along with it.
- The work with SAAB on evolved Collins was designed to test the question – if we evolved Collins, would we have to build a project management arrangement doing a new design?
- The answer was clear. An evolved Collins would be a new design and would need to be managed accordingly.
- The constraint on hull diameter ceased to have any relevance at that point.
- SAAB offered an unsolicited bid in response to the tasking in 2013, in addition to answering the primary question. This offer suggested a design with an increase of the existing Collins hull diameter by 20cm. This allowed for various developments and advances including in stealth technology. There was no other impact that would not be addressed in the design stages.

### **The conclusions we draw from the discussion so far**

- The estimates and comparisons with evolved Collins look attractive. The proposed PDS is worthwhile doing in the face of all the circumstances, especially strategic

developments.

- That prospect alone makes it worth doing this PDS, in the national interest, for the modest cost of less than 0.1 per cent of the total project cost.
- Even if the only benefit lay in reintroducing competition into a national undertaking of such enormity and importance, it's worth doing and would deliver significant savings from the reintroduction of competition alone.
- There are important potential benefits too from an evolved Collins when measured against the other policy objectives stated by successive Governments:
  - Using ASC to lead the construction program would build on existing industrial knowledge, trained Australian labour force and the existing national supply chain;
  - Achieving in the process up to twice the level of local industry content, and deliver it more quickly, than could be achieved with the SFB; while also
  - Achieving greater sovereign capability sooner; and
  - Lower through-life support costs, quite probably much lower;
  - While also potentially using some existing infrastructure, and saving on reinvestment costs.
- Commonality in an evolved Collins design with systems being upgraded now, and those systems that will need to be replaced in future to extend the life of the existing Collins boats, could be carried over more easily into an evolved Collins design;
- Which would reduce risk, cost and schedule and maximise value for money in both programs; and
- Minimise the challenges and risk for the Navy of training its people for the new submarines (note the next section on submariners).

#### **What about the "Dud Subs"?**

- Unquestionably Collins' history is problematic - but it is history. Circumstances are very different now. We have learned a great deal and have good reason to back ourselves.
- Honesty and facts should be the foundation; much has changed since we embarked on the Collins program that should give us confidence.
- The starting point might be our changed strategic circumstances to which our response, in the national interest, is to investigate speeding up the increase in our submarine forces.

This discussion begs the question; why did we not allow Sweden to participate in the FSM Competitive Evaluation Process? This is discussed in the final section of this paper but the vital question of our submariners must be the first consideration.

#### **Submariners – the critical element that we must not lose sight of.**

- Increasing dramatically the number of submariners, as rapidly as feasible, is urgently required no matter what new submarines we acquire or when they are delivered.
- This is a very challenging task for Navy and takes a very long time to achieve.
- New submariners must be recruited, trained and given experience at sea - in submarines.
- For example, growing one competent submarine Captain takes a minimum of 15 years, with only one in eight who start on that pathway being successful.

- The situation is similar for the equally important Engineering Officers.
- Navy's achievements in recent years are exceptional and commendable but we contend that this progress is still fragile.
- Avoiding any reduction in submarine availability is vital.
- The clear need is for more submarine sea days than are achieved now, growing sooner and more quickly than the SFB schedule will enable.

Regardless of how well planned, efficiently executed and successful it is, the considerable work needed to extend the life of Collins boats will be lengthy, challenging and complex. The risk of reduced submarine sea days and therefore training capacity is high.

Growing more submariners is the critical path for the larger submarine fleet regardless of the submarine that is acquired.

### **The "how" of our proposal**

- The proposed PDS needs only a small team, between 15 and 20 people.
- We estimate the task should be completed within two years; and
- Should cost less than \$50m – that is less than 0.1 per cent of the budgeted cost of \$50b for the SFB.

The PDS would aim to answer these questions:

- How would the capability of an evolved Collins compare with the requirements specified by Australia in the CEP, the SFB forecast performance and the existing Collins boats?
- Assuming a collaborative design effort with SAAB, and ASC leading the build program, when could new submarines start being delivered to Navy and at what rate?
- What would be the estimated average cost per submarine?
- What would be the extent of synergies between Collins LOTE and evolved Collins and how could they be optimised.

The PDS would be best undertaken so as not to distract from, delay or impede Defence's current activity on SFB; ie, it should be undertaken separate from that.

- Defence's submarine project workforce is fully employed now and there is insufficient suitably skilled capacity in Defence to devote to this additional task.
- Our strategic situation makes it vital that we avoid anything that slows down that SFB Program.
- The PDS Team would require only a small amount of dedicated Defence APS support.
- The few people with specialist submarine skills needed can be contracted from among the suitably skilled and experienced Australians who are no longer working in Navy, CASG, Naval Group or ASC.
- This would help minimise the risk of impact on any current submarine activity.
- Some skilled and experienced industrial advice from outside Defence to guide the team would be valuable.

This team should arguably be responsible to the Secretary of the Department of Defence rather than the Deputy Secretary CASG, to avoid it being slowed down by process.

### **Why did we exclude Sweden from the Future Submarine competitive process?**

Excluding Sweden may have been justified in 2014 although we would argue differently. In any case, it is not justified now.

- The publicly stated reason for excluding Sweden in 2014 was that their capabilities and capacity had declined since they designed Collins and they were no longer capable of doing the job.
- This assessment was inaccurate.
- Much has changed to show it is not valid now.

There were almost certainly other reasons for Sweden's exclusion that were not stated publicly.

- Memories and lingering dissatisfaction over the Collins experience and its political fallout would be among them.
- There are probably other reasons but we may never know.

The situation today is very different from 2014 in important respects.

- Sweden's submarine company, formerly known as Kockums, is now owned by Swedish firm SAAB.
  - For the fifteen years between 1999 and 2014, much of our Collins program, it was owned by German company TKMS who acquired it to neutralise a competitor, among other reasons no doubt.
  - The change of ownership back into Swedish hands – a key strategic objective of enormous challenge for Sweden - is understood to have taken several acrimonious years that involved both Governments, the EU Parliament and the Swedish Royal family.
- Since the change of ownership to SAAB, construction of the first of two completely new design submarines for the RSwN has started and is well progressed.
- SAAB has just returned to service one of the RSwN's older submarines after a major upgrade that included inserting a hull extension 'plug'. They plan to do the same with other submarines and will take less time to do it than our submarines spend in full cycle dockings (currently two years).
- SAAB is bidding against the Germans to design new submarines for the Dutch, which will be built in the Netherlands. The design they are offering is evolved from Collins.
- SAAB is still very much involved in Australia's submarine capability as the original designers of Collins. They have also recently engaged ASC's expertise in submarine sustainment.

These facts suggest very strongly that Sweden certainly does have the capability we need for examining an evolved Collins submarine program. The question of their capacity in the timeframe we require it is less clear. Both questions would be tested during the proposed PDS.

We should remember too that Australia now has a long standing, very productive and

cordial relationship with SAAB in Australia. The company provides combat and other vital systems for the Navy's ANZAC Class frigates, LHDs, and Collins submarines. They will be providing core combat and command system elements for the Hunter Class Frigates and the OPVs, which will make them one of two major combat system providers to the Navy for decades to come.

### **Summary**

- Deterioration of our strategic circumstances gives rise to very serious concerns that the Future Submarine Program will deliver new submarines much later than we may need them;
- As well as growing the submarine force much more slowly than we would want;
- At a cost, in the absence of any competition, which appears much higher than we should be willing to pay.
- There is a consequent necessity to extend the lives of our existing six submarines for a very long time;
- Which will come at considerable cost, risk and capability impact;
- And likely reduce Navy's ability to manage the critical need to grow more submariners.
- There is an alternative that should be investigated urgently; an Evolved Collins class.
- This should be done without interrupting or interfering with the current program.
- This investigation, a PDS, would cost less than 0.1% of the program budget, which represents good value for an insurance policy at this stage of the largest capital value Commonwealth acquisition in Australia's history.

10 December 2018