**Response to**

**Senate Economics References Committee**

**Australian Sovereign Naval Shipbuilding Inquiry - Questions on Notice**

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1. Your submission says that technological change means that autonomous systems are rapidly evolving and "… *will have proliferated in our region well before the first Attack class submarine enters service in the mid-2030s*". Given the original intention was for the Future Submarines to be operational from the mid-2020s, what impact has their delay until the mid-2030s – and possibly longer if there are further delays – had on their potential superiority vis-à-vis other competitors and technologies over their life?

Putting aside the fact that the 2025 schedule was never achievable (certainly once a Son of Collins solution was no longer pursued), it would have been preferable to have a new submarine rather than put the Collins through a third full-cycle docking to give it a life of type extension (LOTE). There is perhaps some analogy to the Joint Strike Fighter, whose delays meant its users were denied for nearly a decade the capability advantages it would have provided and potentially provided opponents with a window to catch up.

But it's not a good analogy. The future submarine was never going to be the generational leap forward in capability that the JSF was. The future submarine program has already said it is only going to use existing technologies in the first batch of submarines (other than the pump jet propulsor, which has never been used on a conventional submarine), so all of these technologies are already on the Collins (e.g. AN/BYG-1 combat system, Mk 48 torpedo), or will be after its LOTE (e.g. optronic periscopes).

The problems with the future submarine program are inherent in virtually any program that would seek to design and build a new conventional submarine

- They take a long time to design. Then they take a long time to build. In an age of rapidly developing technology this presents huge risk.
- They are very expensive to acquire and they are extremely expensive to operate. Between construction and sustainment costs, the Attack class submarine fleet could cost around $4 billion per year.
- Manned conventional submarines are towards the end of the technology curve, requiring huge investment for further performance improvements. Autonomous systems are developing far more quickly and provide greater performance improvement in return for the technology investment
- Conventional submarines have fundamental inherent limitations. The value for money they represent compared to alternative or complementary systems has not be demonstrated

recently, but is assumed by their proponents to continue (e.g. an analysis of alternatives on strike might find B-21 bombers could be a more capable strike platform in different scenarios).

This does not necessarily mean we should not proceed with the Attack class program. Virtually any conventional submarine program would have the same issues to a large degree. But we do need better analysis of alternatives and an ability to look at the big assumptions driving decisions to ensure they remain valid as a basis for decision. And we also need to be investing in hedging capabilities, such as autonomous systems, and potentially long-range strike platforms and weapons. It is very likely that the even the most capable conventional submarine will need to operate with a complementary set of semi-autonomous and autonomous under seas systems to remain effective in the undersea environment of the 2030s. The most capable potential adversaries are almost certainly going to be operating combined systems like this.

2. In the section of your submission addressing Australian industry capability, you have argued for several steps to be taken, including that "*the primes need to actively foster innovative Australian content rather than defaulting to their existing subsystems*". Could you please expand on this with particular reference to the naval shipbuilding programs? How and why are the primes defaulting to existing suppliers of subsystems rather than selecting Australian content – and what can be done to address this?

Again, this is inherent in the nature of these programs. It is not necessarily a criticism of Naval Group or BAE per se (although we are aware that they have been criticised for preferring their established overseas suppliers to Australian industry, but not knowing the internal government detail of the issues we can't provide comment). There's only so much you can do in programs of this kind. Australian industry does not make many of the major subsystems of warships – engines, generators, etc. It is unreasonable to require the primes to source them from Australian companies and that would significantly increase the cost, schedule and risk of the programs, which are already at a tipping point. Moreover, using foreign suppliers in the first batch of vessels and then Australian suppliers in later batches will lead to configuration problems and bifurcated supply chains.

The government's recent policy announcements about enforcing the primes' Australian Industry Content plans is a welcome one, but the key issue is to get the primes to include Australian industry in the first place. There are areas of technology where Australian industry and academia is competitive and even world leading, such as sensors, weapons mounts, materials, and so on. In those areas, it is reasonable to expect the primes to seek Australian solutions from the start, given the Attack class is a new design.

There is room for the government and Defence to mandate a particular Australian solution where there is strong evidence that it will meet the capability requirements. The government's decision that Saab's combat system will be used across the surface fleet sets a strong precedent for this.

This early selection of Australian subsystems should be integrated into Defence's innovation programs, i.e. where there is a promising Australian concept it should receive accelerated innovation funding to ensure it is ready in time to be incorporated into the vessel's design.

But perhaps a better way to increase Australian content is to focus on the design and acquisition of emergent technologies where the primes and their existing suppliers do not necessarily have such a built-in advantage. This is particularly the case where technological change is rapid and the 'incumbent' advantage is lesser. If we are building submarines, we will always be dependent

on overseas suppliers for key subsystems. If, however, we are designing and building innovative new systems, including complementary capabilities that can be operated from or operate with submarines, there is much greater room for local technologies to compete. An example might be an Australian variant of a undersea unmanned vehicle, like the Boeing ORCA that could be jointly developed by Australia and the US, or which could carry Australian weapons and sensors (this would be an undersea equivalent of the Loyal Wingman project now underway for the RAAF).

We would also note that the funding model outlined in the 2020 Defence Strategic Update presents Australian defence industry with a $10 billion elephant to eat: if the government is to be successful in increasing Australian industry's share of Defence's acquisition budget from around one-third to around one-half of the total spend, the amount spent in Australia will grow from $2.6 billion to $10 billion per year by the end of the decade.

To achieve this, we need to be investing in high-value Australian technologies right now: Defence's innovation funds must be increased in size; its capability acceleration program needs to be accelerated; and clear links from innovation funding into the very large funding streams in the investment program need to be identified (it has proven difficult to get technologies funded by Defence's innovation programs into the large acquisitions project to date). Merely supplying steel into shipbuilding projects or locally assembling foreign designs consisting largely of foreign-made components will not get us close to that $10 billion spend. Nor will it deliver enduring sovereign industry capability.

3. Your submission is primarily focussed on the trajectory of warfare and its intersection with technology and the impacts that might have on the capabilities we need to acquire. The Committee would also be interested in your views on the major naval acquisitions currently underway. On 14 August 2020, ASPI representatives made some comments about the risks associated with the Future Submarine project. In relation to the Future Frigates, how would you describe the current state of that project and what do you see as the main risks and challenges to it?

   a. In June, the Executive Director of ASPI, Mr Jennings, told The Australian newspaper with respect to the Future Submarines that: "*Unless there is a concerted effort to retake the high ground of explaining what the project is about, then frankly the project could be at risk*". He is also quoted as saying that "*If all future governments see is a deeply unpopular ugly duckling, it will clearly become vulnerable*". Beyond simply making the public case for the submarines, are there any fundamental issues ASPI sees with the management and implementation of this project that are contributing to this crisis of confidence and must be addressed?

The fundamental issue is not with the management or implementation of the project, but with the nature of the capability itself and with manned submarines as a standalone capability given the rate and type of technological change underway. See our response to Question 1 above.

4. ASPI's submission to this inquiry noted that:

   "*We should be seeking to increase automation in the shipyards (and the 'digital shipyard' for the frigates at Osborne seems to enable this), even if that means fewer jobs are created than ministers have previously announced.*"

Could you please elaborate on 'digital shipyards' and how you think staffing numbers will be effected by increasing automation? What do you think will be the main differences in skills requirements for digital shipyards as opposed to traditional shipyards?

We are not ship designers or builders so can't speak to numbers of jobs. By raising digital shipyards, we are trying to make two points.

The first is that the focus of discussion of shipbuilding has moved too far towards an obsession with job numbers and local spend. We need to refocus on ensuring the efficient, cost-effective delivery of capability.

Digital shipyards have the potential to drive down the cost of designing and building ships by doing both with fewer people. If this reduces job numbers, this is a good thing as it also reduces costs, freeing up funds either to deliver ships more quickly, or to acquire other capabilities. A constant focus on increasing job numbers runs the risk of creating perverse outcomes, such as encouraging shipbuilders to employ more workers for no good reason, not adopt newer, more efficient technologies, or to use them in inefficient ways. If, once the Attack and Hunter classes are in production, they require fewer workers than Defence or industry predicted, this is actually a good thing.

The bottom line is that China is currently out-building Australia, the US and our allies in naval construction as it can build quickly and affordably, potentially tipping the balance of power in the western Pacific. To match this, our shipbuilding industry needs to be driven by a ruthless quest for efficiency to reduce cost and schedule.

The second point is that digital production enables Defence and industry to get newer capability solutions produced and fielded faster than has been possible with less advanced shipbuilding techniques and facilities – witness the [recent announcement](#) that the USAF's (anonymous) industry partner has designed, built and flown a prototype of its sixth-generation fighter. It also potentially allows for greater flexibility in design and construction. Not only does that mean that a vessel's design can be quickly modified to include new weapons and sensors, but new kinds of vessels can be designed and built in the existing digital shipyards without all the physical retooling and change that previous approaches would have required – changes can be made more easily and quickly that flow through from the design to production stage.

One of the inherent limitations, and potentially a fatal flaw, in the current shipbuilding plan is that the surface combatant yard in Osborne is locked in to building one design of frigates until well into the 2040s. Australia needs a shipbuilding capability that can quickly build new classes of ships – or indeed platforms that may not be ships as we currently know them, such as unmanned surface or underwater vessels. Digital design and construction can contribute to this flexibility.  Limited runs of different vessel types are likely to be more effective ways of taking advantage of emerging technologies and producing a more diverse fleet.  It may also make exports more viable by being able to tailor systems to different requirements.

5.  The last section of ASPI's submission makes a strong case for better transparency and scrutiny with respect to the shipbuilding plan. In terms of appropriate disclosure, how do the 2016 Integrated Investment Program and 2020 Force Structure Plan compare with their forebears or similar reporting in comparable countries? How would you address these issues around transparency?

There is a serious lack of transparency both around the future investment plan and around projects currently in delivery. This is not just an issue for the naval shipbuilding program but goes to transparency more broadly.

The 2016 Integrated Investment Program and the 2020 Force Structure Plan represent a decline in the level of information provided compared to the earlier Defence Capability Plan. The IIP and FSP no longer even use basic information such a project names and numbers. This makes it difficult to compare activities between iterations of the investment plan. The IIP and FSP provide only high-level, impressionistic descriptions of future projects/capabilities. This may be acceptable for capabilities that are a decade or more away, but not for ones that are scheduled to go to tender in the next few years.

Defence has said that this information is supplemented by more detailed information provided to industry at engagement activities such as Environmental Working Groups. However, it is difficult for many interested parties to attend them, such as SMEs, or indeed, think tanks such as ASPI. Defence does not make the briefings publicly available on its website (unlike the US Department of Defense). Because this information is available to some, but not to all, it further increases the confusion and incoherence in public discourse around Defence capability and projects. It also provides an unfair advantage to players with large teams and budgets such as the primes. The fact the US Defense Department can make large amounts of data public on analogous programs to those within Australia's Defence organisation indicates that rationales for lesser transparency here can be questioned.

- Defence should include project names and numbers in it is public investment program.
- Defence should include more complete descriptions of the capability it is seeking.
- Unclassified briefings on its projects and programs that Defence provides to industry should be made public on Defence's website.

There is a serious lack of transparency around projects in delivery. Defence releases total approved budgets and annual spends for its Top 30 projects in the PBS and its annual report. The 'cut off' for the Top 30 is currently around $50-60 million. That means there is no public information about projects with an annual spend of below that. These could be projects with a total approved budget of half a billion dollars. Yet they may as well not exist for all the public reporting on them. These projects are not covered by the ANAO's Major Projects Report; it covers only around 25-30 projects and there is substantial duplication between its projects and the Top 30. Nor is there any reporting on agreed schedule milestones or Defence's progress towards them.

- It would be very straightforward for Defence to publish every year the total approved budget, spend to date, and annual cash flow of all projects with a total approved budget down to, say, $50 million. There is no technical or logistical reason why it could not do that.
- Defence should make public its historical data on project budgets, including annual spends.
- Defence should make public key schedule milestone for all projects.

There is no public reporting at all on Defence's ICT projects. Even though Defence's combined ICT acquisition and sustainment spend is around $2 billion per year, there is no way for parliament or the public to know what it is being spent on, whether it is being spent well, or what the risks around the ICT program are. ANAO occasionally reports on individual ICT projects, but never on the entire program.

- Defence's public reporting should include ICT projects. They should not be treated differently from major capital projects delivered by Capability Acquisition and Sustainment Group. ICT forms part of the enabling structure or 'backbone' of Defence that historically has been an area most criticised for not performing as the operational elements do (including by Secretaries of the Department), which would indicate that increased transparency could be beneficial to its performance.

It is impossible to tell what Defence is paying for equipment. Even when total project budgets are made public, they include many things in addition to the platform itself. We will never know the unit cost of any equipment that Defence purchases from boots to submarines. Therefore, it is impossible to know whether Defence is paying an appropriate price or getting value for money.

In contrast, the US Department of Defense makes public the unit cost of every system it purchases, as well as their subsystems. These are made public in its justification books. It is very easy to find what the US DoD is paying. In fact, when cost analysts here develop an estimate for a system, the first place they look for cost data is the US DoD justification books. Publishing the unit cost of equipment would also encourage greater accountability from industry to deliver at the tendered cost and demonstrate it was delivering at a cost that is competitive with its sales to other customers.

- Defence should make public the unit cost it is paying for military equipment.

Defence and its members feel they have to contend with a high burden of reporting. In some senses this feeling is justified. That is because there is a long legacy of reporting imposed on the Department by legislation, parliamentary and other reviews, directions from ministers, and so on. This means there is a lot of reporting in documents in the annual report. But it is not clear that all of this is any longer relevant or useful. So, compliance with the current legal and policy framework for reporting may be both onerous and not all that useful. It would be consistent with the First Principles Review of Defence to re-examine Defence's current reporting obligations and determine what information should be reported. Some of the current overhead could be dispensed with, freeing up time and resources to report information that is more useful today.

- The Senate should conduct a review of Defence's reporting obligations to confirm that it is reporting useful and necessary information.