



Thank you Senator for the opportunity to address the committee today.

My name is Stuart Whiley and I have recently been appointed Interim Chief Executive Officer of ASC. I would also like to introduce my colleague, Martin Edwards, who is General Manager – AWD Alliance Operations and ASC's lead on this program.

I have been involved in the Collins Class submarine project for over 25 years and, indeed, consider myself very fortunate to have been, and continue to be, involved in Collins.

In fact, when I joined ASC in 1989 I was the first engineer working inside the main engineering building at Osborne, where you visited this morning. Back then, the area was a 'Greenfields' site, with no production staff, no tools, no infrastructure and no capability. ASC was completely different from the hive of activity you saw today.

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.

Maintaining Australia's submarine fleet requires the specialist skills of more than 250 engineers, 450 technical tradespeople, and a team of high-end skilled project management professionals, predominantly operating across two sites in Osborne, South Australia, and Henderson in Western Australia. Our team of submarine specialists also provide roving support to the submarines while they're on deployment, wherever that may be.

This unique capability is further enhanced by a robust industrial and technical support network, that has been established over the last 15 years to supplement the key skills and services that are required to support an asset as complex as a first-of-class submarine.

By 'first-of-class' I refer, of course, to the fact that Australia is the only country in the world to operate the Collins Class submarines. While this is advantageous in that Australia has the right submarine capability for the nation's unique operating environment, it also meant that during the crucial build and early sustainment stages, we had to figure everything out ourselves.

The intensive maintenance regime we undertake to certify the submarines is necessary, not only for the submarines to operate to their potential in our unique environment, but to also ensure the lives of the crew are not put at risk.

All of us at ASC understand that submariner lives depend on the quality of our work. We accept this responsibility and it's a responsibility we don't take lightly. In order to deliver the best capability we can, we work closely with the Royal Australian Navy, as well as other navies around the world to learn from others' experiences and ensure we're absolutely on top of our game.

When you walked around ASC today, you saw over 25 years of submarine knowledge and experience in action. Today that original build skill and knowledge is being shared with a new generation of engineers and tradespeople.



Australia is part of a small handful of nations around the world that has this technical know-how. The complexity of building a submarine has been likened to building a space shuttle, with the risks to those crewing them not too dissimilar.

When I think about what ASC has achieved over the last 25 years, not only in addressing early problems typical of a new build, but especially typical in a first-of-class build, I can't help but feel incredibly proud and privileged to be a part of it.

Most recently, John Coles's review of submarine maintenance has highlighted a major turnaround in maintenance support, and went so far as to call it "remarkable".

This sentiment is shared across the world, with other countries now seeking ASC's advice in their own submarine maintenance programs.

And so, in my opening address today, there are three key points I'd like to emphasise:

Firstly, we have developed significant in-country submarine knowledge and capability from the Collins experience.

Secondly, submarine availability and capability is significantly enhanced when we all work together to a common aim and in an aligned manner; and

Thirdly, that, ASC as a government-owned asset with unique knowledge and experience can aid the current Future Submarine debate so that it can be undertaken in a fully informed manner.

Coming back to my first point, I want to reinforce just how remarkable Australia's submarine capability is. The knowledge developed over the last 25 years, began with approximately 150 ASC engineers and designers embedded in Kockums, the original Swedish Collins Class designer, designing Australia's first-of-class submarine.

This was the engineering beginning from which ASC developed a through-life support engineering capability for Collins because ASC was intimately involved in the original design and build processes.

Today, our submarine support network includes universities, subject matter experts, a strong capability partnership, ongoing relationships with Government research establishments, like DSTO, and a highly sophisticated network of industry partners.

Our industry partners, include dedicated submarine support businesses, such as Babcock, Pacific Marine Batteries, MacTaggart Scott, approximately 120 small/medium enterprises and more than 2000 other associated companies who supply product or services – in fact, ASC manages one of the largest and most complex supply chains in Australia.

At the start of the Collins Class build, ASC had a mandated 70% Australian-industry content target, with a result of 73% achieved by the end of the build. Today, 92% of ASC's Collins Class sustainment – which is worth approximately \$330 million annually - is reliant on Australian companies. This highlights that this capability and support is maintained in-country and that almost every dollar spent on submarine maintenance today supports the local economy. This is quite an achievement.



But more importantly, having this substantial Australian-based supply chain leads to greater certainty of submarine availability for the Australian Navy.

Electric Boat, the designer and builder of the United States' Virginia class of submarines, has been ASC's capability partner since 2003. Our relationship with Electric Boat has aided the ongoing development of our submarine knowledge and skills-set, plus acts as our third-party assurance in any key engineering decisions we make.

When contemplating options for Australia's Future Submarine, where the debate has been primarily around an in-country build versus an overseas build, one option that could merit exploration is a hybrid approach – one that optimises the level of in-country and overseas build.

This is the way it was done for Collins, to deliver a flexible and 'best for Australia' outcome.

Ultimately, we need to ensure that a critical mass of knowledge and capability is generated here, in Australia, to support Future Submarine sustainment while, at the same time, ensuring the new submarine is delivered to meet Collins' pay off dates.

This hybrid option would also see the continuation of high-end skills across Australia fundamental in the 'Australianisation' of any Future Submarine conceptual design as it transitions into the detailed design, build, supply chain and sustainment phases .

The **second** key point I'd like to make is that, in my experience, performance is enhanced significantly when all parties are aligned and working towards a common goal.

In 2011, the Coles Review saw the birth of the Submarine Enterprise - a generated environment of clear accountabilities, common goals and targets, with decisions being made on a 'best for enterprise' basis.

The alignment delivered by this approach has led to a greater appreciation and understanding for various stakeholders' drivers and constraints, and has created a much better partnership environment and, ultimately, has resonated in a significant improvement in Collins' sustainment and availability.

The positive performance trends delivered to date via our enterprise/relationship approach is an important lesson learned, which should be applied to future projects.

The Future Submarines program must benefit from the lessons learned from Collins.

In particular, sustainment – as identified in the Coles report – needs to be clearly considered and provide for from the outset. Coles identified that the through-life support arrangements for the six Collins boats was manifestly inadequate from the outset.

We don't need to make the same mistakes again.

Which brings me to the **final** point I'd like to make today ASC's experience and know-how, developed over the last 25 years, means we are uniquely positioned to understand how Australia's operating environment translates to an appropriate submarine platform, from the design and



construction stages, to supply chain requirements, operational perspectives and of course to providing in service support and upgrades during the life of the submarine.

It makes logical sense for our knowledge to be harnessed to ensure the selection of Australia's Future Submarine is based on all the information and expertise that is available. To this end, we stand ready to support the Government in its selection process of a Future Submarine capability, and assist in any way we can.

Today, Australia is much better prepared than it was in the 1980s when it was decided we would design and build Collins.

And 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.

We have learned to effectively work together as one team.

And now we are ready to help deliver the submarine solution for the future.

Thank you for the opportunity to address you today.

*Martin now has a few opening comments on the Air Warfare Destroyer build program:*



Thank you, Stuart.

Mr. Chairman, like Stuart I would like to thank you for the opportunity to talk to the committee today.

As someone who has worked in the Submarine, Ship and marine construction industry in for more than 25 years, I am proud of what Australia has achieved as a nation, achieving impressive results in relatively short periods of time.

Continuing with Stuart's three points but with a specific focus on the Air Warfare Destroyer program, I would highlight that Australia has since the start of the AWD program built a world-class facility here at Osborne, in South Australia, and already developed a significant naval ship construction capability.

ASC's own shipbuilding team was seeded with submarine and shipbuilding expertise from the Collins program in combination with our capability partner the US firm, Bath Iron Works. While through the AWD program we have been rebuilding Australia's broader shipbuilding capability along the same lines as the Collins program, to the benefit of naval shipbuilding and sustainment capability well into the future.

The AWD program has been an ambitious program with a number of key risks:

- First, the program is run as an Alliance, which is on a non-traditional commercial arrangement not tested in major Defence acquisition;
- Second, while the ship had been built 4 times previously - further design upgrades were required to accommodate learnings from the newer F105 design (the 5th in class); to implement changes necessary to meet Australian legislative requirements; and to accommodate the Australian configuration of the Combat System;
- Third, the shipyard was a 'start up' raised from a 'greenfield development' that included not only new shipyard facilities, but a new Common User facility and workforce;
- Fourth, a build strategy which involved splitting the ship's 31 major construction blocks among different shipyards in Australia and Spain, each with their own set-ups and practices.
- And lastly fifth – the consolidation of the 31 blocks into each AWD by ASC using the purpose-built Common User Facility, adjacent to ASC's Osborne shipyard, funded by the SA Government under an agreement with the Commonwealth which required the consolidation of these blocks in South Australia.

The AWD program's development has been impressive since the start of Phase 3 in July 2007. Its key achievements include:

- First trades employed - August 2009
- New shipyard opened – January 2010
- SA Government owned Common User Facility opened – March 2010
- Start of construction - commenced at all three Australian Shipyards in April 2010
- First block delivery - August 2011 (the first BAE Keel Block)
- Keel laying of Ship 01 - September 2012



- Keel laying of Ship 02 - February 2014
- Ship 1 hull intergation complete - 28 March 2014; and
- Moving now to float off and the complicated completion phase of Ship 1

Key capabilities developed in Osborne since the start of the program include:

- A total ASC Shipbuilding workforce of more than 1750 people including
  - 154 Engineers
  - 124 Technicians
  - 144 Project Management personnel (including related disciplines)
  - 113 Production management and supervision
  - 957 Tradesmen & 263 Operators and assistants,
- The state of the art State Government - Common User Facility and Ship lift; and
- The creation of one of the most modern land level ship construction capabilities adjacent to the common user facility.

It is fair to say that the AWD program has had to deal with some start up challenges, some of which were anticipated given its ambitious nature as outlined earlier.

These issues have been well documented but examples include:

- reinstating ship construction skills in various locations across Australia;
- transitioning a European production design into an Australian environment; and
- re-establishing a somewhat dormant supply chain from Europe to support the Australian construction.

However, ASC has worked diligently with our other Alliance participants – DMO & Raytheon Australia to overcome and ensure project momentum and ultimately success.

There have also been a number of successes which you would have seen this morning on your shipyard visit.

One has been the ability of the Australian workforce to adapt the overseas design and production solutions and demonstrate Australian ingenuity and learning.

The installation earlier this year of the Vertical Launch System – for firing missiles - and more recently the ship propulsion system – essentially the engines and propeller-shaft installation were praised by our external observers and by our Capability partner. These were all firsts for our workforce and real examples of an active learning culture. However there is more we can do better.

There has been much commentary around productivity on the AWD program and its impact on future programs. This has been driven in part by annual reports from First Maritime International or FMI, for the DMO which benchmark productivity.

FMI use a productivity measure of Compensated Gross Tonnes or CGT divided by labor hours to benchmark productivity between different types of ships and different shipyards.



CGT is not a measure of a ship's mass. It's a measure of a ship's volume and complexity and is used to enable comparison between different ship types and shipyards. The measurement includes all production trades and project support staff such as engineers and planners.

60 - 65 hours per CGT is highlighted as the core productivity benchmark that should be achieved. However, this is only achieved after a number of ships, usually greater than 4 or 5 of the same class have been built and of course we are only currently building three AWDs so we will not get to this core level.

This 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 etc. This is the same for any shipyard building a new class of vessel.

FMI advise this effect can increase the core productivity by around 50% on the first of class ship. On this basis the first of class AWD would be expected to achieve around 120-130 hours per CGT.

Currently Ship 01 is in the order of 150 hours per CGT; however if adjusted for abnormal factors such as excessive design change and scope transfers from other yards to ASC, we are currently forecasting to achieve around 132 hours per CGT or approximately 5% higher than the suggested international benchmarks.

Of course the actual achievement will only be known when the first ship is complete and delivered, so at this time this is only a forecast. However based on this we would expect the third AWD to achieve around the targeted 80 to 85 hours per CGT.

There has also been some commentary around the relative productivity performance of each Australian ship yard. By FMI's own admission the differences in outcomes between the yards is statistically insignificant given the high level nature of the CGT measure used by FMI and the assumptions which surround it.

During the time FMI have been measuring productivity on the AWD program we have seen a downwards productivity trend at Forgacs although we believe this has been corrected during 2014 as a result of direct intervention by our ASC support team. BAE at Williamstown have shown an improving trend, albeit off a low base where there were a number of early quality issues which caused substantial re-work.

ASC has also seen a downwards trend in productivity but as mentioned earlier a significant portion of this can be attributed to external factors such as excessive design changes and scope re-allocations which we largely wear as the lead and consolidation shipyard. However we recognize this is unacceptable and ASC is focused on improving our productivity forecasts with a number of improvement activities including:

- Integrated Work Teams supporting production,
- a Work Readiness focus across all areas of the business impacting on production
- actions to improve labor utilization; and
- design improvements aimed at reducing production hours



Productivity, however, is more than just the workforce effort. World class productivity is achieved when you combine:

- a capable, motivated and qualified production workforce with
- an advanced production design,
- a stable and mature supply chain, and
- an optimised shipbuilding organisation.

This is what we are creating in the AWD program, at Techport and around Australia for the future.

In closing, I would like to make two further points on the concept of 'Military Of The Shelf' for future ship acquisition.

In the majority of cases, future platform options will require modification to meet Australia's unique and demanding requirements. When such changes venture into the area of combat system capability the changes are often widespread, impacting substantial areas and systems of the ship platform – an impact which is very complex and often over simplified.

The resulting ship while nominally of the same class often requires substantial design modification and evolution; thereby undermining the very concept of 'Off the Shelf',

The second point relates to the impact of design products on achieving world class productivity.

While it is possible to acquire concept and functional designs from offshore, it is important when focussing on achieving productivity that the final design products are tailored to the build strategy, the shipyard capability and its environment. For example, a design intended for an incline-way build in a European yard should then be adjusted and optimised for land-level construction occurring in Australia for an Australian sustainment solution.

Therefore in conclusion, the relationship between the platform designer, design products and the construction yard is critical to success.

ASC is working diligently with the Government's AWD Reform team and our AWD partners to improve AWD program performance and to deliver long-term benefits not only to the AWD program but for programs such as SEA 5000 in the near future.

Australia has significant demand for future naval ship construction and sustainment.

Through AWD and ASC we have laid the foundations to enhance Australia's sovereignty not only in underwater warfare but also on the surface.

Thank you, Mr Chairman.