



Submarine  
Institute of  
Australia

# Nuclear-Powered Australian Submarines

## Challenges & Opportunities



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# Western Australian Defence Industry On the frontline



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## WELCOME TO THE 11TH BIENNIAL SIA CONFERENCE 2022 NUCLEAR-POWERED AUSTRALIAN SUBMARINES CHALLENGES AND OPPORTUNITIES.

Increasing geo-political uncertainty, Government decisions to direct an independently led Defence Strategic Review (DSR), and the ongoing work of the Nuclear-Powered Submarine Taskforce (NPSTF) to identify the optimal pathway for Australia to acquire a conventionally armed nuclear-powered submarine all signal a significant shift in Australia's force posture and structure – in which Submarines will be a critical element.

Consistent with the SIA's Objective, this Conference provides a timely opportunity to promote informed discussion on the unprecedented opportunities and challenges associated with acquisition of nuclear-powered submarines.

I trust that delegates will gain valuable insight and take advantage of the opportunity to network with the many people who have joined us for this conference. The SIA's work does not stop when we close this conference. Before our next conference both the DSR and NPSTF reports will be presented to Government. Through a range of programs and initiatives the SIA will remain active in promoting informed debate as these matters progress. I encourage those who are not SIA members to join us and participate in this discussion.

In closing, I would like to thank all of those who made this conference possible. We are delighted to welcome the Deputy Prime Minister and Minister for Defence, The Honourable Richard Marles MP as our keynote speaker. We are honoured to be joined by senior officials and thought leaders from Government, the Military, Industry, Academia, and other sectors who have travelled from near and far to inform and contribute to the debate. I must also thank all our sponsors, our Secretariat, and SIA members without whom we would not be able to conduct this important work.

Michael Fitzgerald - President  
Submarine Institute of Australia



**Michael Fitzgerald**  
President  
Submarine Institute of  
Australia

Michael commenced as the President of the Submarine Institute of Australia in February this year.

Over the past 30+ years, Michael has gained a broad range of experience in both the private and public sectors. This included 15 years' full-time service in the Royal Australian Navy in a range of engineering, operational, and training appointments in surface ships, submarines, and headquarters.

He is currently the Growth and Strategy Director for the Asia Pacific region for Jacobs' Critical Mission Solutions line of business.

Michael has served on the board of the Northern Territory Chamber of Commerce and Industry and led the Top End Region Business Development Centre.

Michael was raised in Melbourne, Canberra, and Bath in the UK. He has studied at UNSW where he successfully completed a Bachelor's degree in Engineering and Master's Degree in Business and Technology.

Michael lives in Canberra. Most of his spare time is devoted to supporting and enjoying the many musical, sporting and other pastimes of his four children.



**Steve Davies**  
Master of Ceremonies

Steve Davies is an independent consultant in submarine capability management. He served for 30 years in the Royal Australian Navy, primarily in the Submarine Force.

He qualified as a submarine officer in 1986, served in Oberon class submarines and commanded the Collins class submarines HMAS Collins and HMAS Dechaineux.

Steve's Navy service culminated in appointments as the Submarine Force Commander in WA and the Director General Submarine Capability in Canberra. Since 2011 he has been a consultant to the submarine industry and a senior consultant and Operations Manager in Nova Systems.

He is currently consulting to the Collins Submarine Program and is a member of Navy's Independent Seaworthiness Management Review team.

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Register your interest for defence and aerospace industry opportunities in NSW.



## Q&A platform

For the 11th Biennial SIA Conference, we will be using Pigeonhole as our Q&A platform, thanks to PMB Defence.

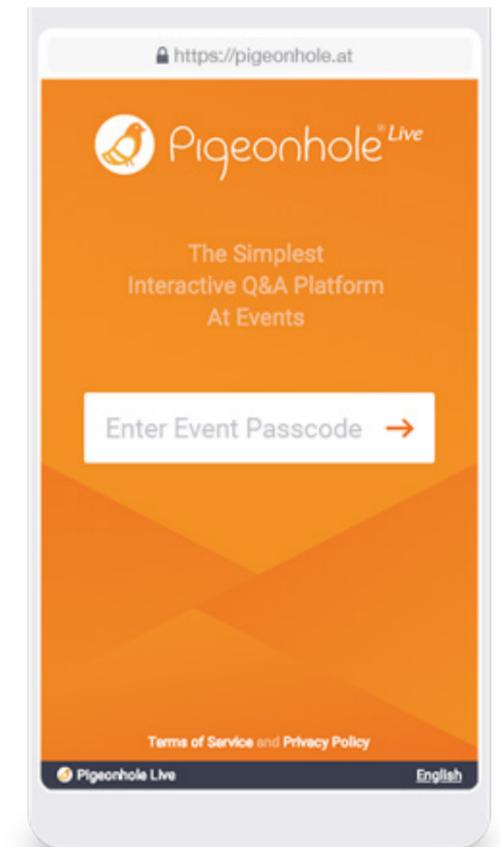
You can login in via:

[www.pigeonhole.at/SIA2022](https://www.pigeonhole.at/SIA2022)

or using the QR Code.

Each part of the conference that is open for Q&A has a space to ask your questions.

These will be moderated by our Master of Ceremonies based on your votes on questions, and also his judgment of what is most important.



[www.pigeonhole.at/SIA2022](https://www.pigeonhole.at/SIA2022)

## Online Program

Our program is also available on our website. Each speaker has a one-page bio should you want to know more, and most have an email address if you would like to get in touch directly.

You can access our program using the QR Code, or by heading to our website.



# SIA 11TH BIENNIAL CONFERENCE PROGRAM

## MONDAY 7th NOVEMBER 2022

07:15 - 18:00 Registration  
 18:00 - 20:00 Opening Reception: Sponsored by MacTaggart Scott Australia

## DAY 1: TUESDAY 8th NOVEMBER 2022

07:30 - 08:25 Registration & Refreshments: Coffee Van sponsored by HTR Group

### SESSION 1 - PLENARY SESSION (1)

08:25 - 08:40 **Opening:** Michael Fitzgerald - SIA President and Commodore Steve Davies RAN (Rtd) - Master of Ceremonies  
 08:40 - 09:10 **Deputy Prime Minister & Minister for Defence in conversation with the SIA President:** Hon Richard Marles MP  
 09:10 - 09:40 **The future Chinese Navy and the value of Australian nuclear-powered submarines for Indo-Pacific security:** Dr Michael Green - CEO United States Studies Centre, Sydney University  
 09:40 - 10:10 **70 years of World-Class Nuclear Capability:** Shaun Jenkinson - CEO Australian Nuclear Science and Technology Organisation - ANSTO  
 10:10 - 10:40 **All Round Look:** Commodore Tom Phillips RAN - Director General Submarines

10:40 - 11:00 **Morning Session Break:** - Sponsored by Blue Zone Group

### SESSION 2 - PLENARY SESSION (2)

11:00 - 11:30 Hon Andrew Hastie MP - Shadow Minister for Defence  
 11:30 - 11:55 **Preparing a jurisdiction for first nuclear build- an initial legislative review of South Australia:** Dr Benjamin Heard - Frazer-Nash Consultancy  
 12:00 - 12:30 **Non-Proliferation Panel:** Ms Sarah DeZoeten - First Assistant Secretary, AUKUS Taskforce, Department of Foreign Affairs and Trade. Ambassador Ian Biggs - Ambassador for Arms Control and Counter Proliferation, Department of Foreign Affairs and Trade. Dr Geoffrey Shaw - Director General, Australian Safeguards and Non-Proliferation Office, Department of Foreign Affairs and Trade. Ms Sophia Blix - Assistant Secretary Non-Proliferation, Nuclear Powered Submarines Taskforce, Department of Defence.

12:35 - 13:25 **Lunch Session Break:** - Sponsored by Acacia Systems

### SESSION 3- PLENARY SESSION (3)

13:25 - 13:50 **Nuclear-powered submarines in WA:** Hon Paul Papalia CSC MLA - Western Australia Minister for Defence Industry  
 13:50 - 14:20 **Insights into the contribution of nuclear submarines to enhancing the security provided by conventional submarines, underwater vehicles and static sensors:** Jonathan Carter MBE - Atlas Elektronik UK  
 14:20 - 14:50 **The Hidden Challenges of Transitioning to Nuclear Submarines:** Dr William Hoeft, Systems Planning and Analysis

14:50 - 15:10 **Afternoon Session Break:** - Sponsored by PGM Environment

### SESSION 4 - PLENARY SESSION (4)

15:10 - 15:40 **The challenge of conducting Collins Class life extension and sustainment in parallel with transition to nuclear power:** John Chandler - First Assistant Secretary, Submarines, Department of Defence  
 15:40 - 16:10 **The Future Nuclear Engineering Discipline in Australia:** Dr Edward Obbard - UNSW Commander, Marine Nationale (French Navy)  
 16:10 - 16:30 **Submarine Institute of Australia Outreach Program and Submarine Museum:** Errika Meades - Vice President Submarine Institute of Australia  
 16:30 - 16:40 **Close of Day 1:** Michael Fitzgerald - SIA President and Commodore Steve Davies RAN (Rtd), Master of Ceremonies

16:40 - 18:15 **Break:**

18:15 - 19:00 **Pre-Dinner Drinks:** - Sponsored by JFD Australia  
 19:00 - 22:00 **Conference Dinner:** - Sponsored by Defence NSW  
**Dinner Wines:** - Sponsored by Lockheed Martin Australia  
**Dinner Speaker:** Hon. Kim Beazley AC KStJ

## DAY 2: WEDNESDAY 9th NOVEMBER 2020

### SESSION 5

07:45 - 08:15 **22nd Annual General Meeting of the Submarine Institute of Australia:** SIA Members only.

### SESSION 6 STREAM BUE - CHAIR: ERRIKA MEADES

08:15 - 08:45 **6B-1**  
**Experiences within the UK nuclear submarine enterprise – the nuclear mindset:** Jim Scott, QinetiQ  
 08:45 - 09:15 **6B-2**  
**Network-centric modelling to enhance supply chain resilience:** Dr Larissa Statsenko - Associate Professor, University of South Australia  
 09:15 - 09:45 **6B-3**  
**FSP Sovereign Systems Integration Capability:** Dr Quoc Do - Group Leader - Submarine Systems Engineering and Advisory, Frazer-Nash Consultancy  
 09:45 - 10:15 **6B-4**  
**Digitally engineering nuclear submarine design acceptance for obsolescence and cyber-resilience: overlaying Virginia Class research with new cyberworthiness policies:** Dr Keith Joiner - UNSW

### STREAM GOLD - CHAIR: SARAH PAVILLARD

**6G-1**  
**Optimising Nuclear Infrastructure - the Safety Case:** Steve Rutledge - Mott MacDonald  
**6G-2**  
**50+ years' experience in nuclear safety and stewardship – Babcock's insights and learnings for Australia:** Dominic Kieran - Babcock  
**6G-3**  
**Strategies for the Effective Management of Safety at Australian Nuclear Submarine Facilities:** Carl Oberg - Coras Solutions & John Abbott - Abbott Risk Consulting  
**6G-4**  
**Delivering SQEP to the UK Nuclear Submarine Enterprise -Submarine Design, Research and Analysis at University College London:** Professor David Manley - University College London

10:15 - 10:40 **Session Break:** - Sponsored by Blue Ocean Marine Tech Systems

### SESSION 7 STREAM BUE - CHAIR: ERRIKA MEADES

10:40 - 11:10 **7B-1**  
**Australian participation in the SSN(X) program:** Christopher Skinner - Nuclear Propulsion Roadmap for Australia  
 11:10 - 11:40 **7B-2**  
**The Australian Future Submarine Multiverse: between myths and realities:** Eric Fusil - University of Adelaide  
 11:40 - 12:10 **7B-3**  
**Nuclear Submarines: the most complex endeavour in defence:** Muir Macdonald - Muirmacdonald.com Ltd  
 12:10 - 12:40 **7B-4**  
**Nuclear-Powered Australian Submarines - Infrastructure Challenges and Opportunities:** Dr Michel Boussemart - IoT Consultants

### STREAM GOLD - CHAIR: SARAH PAVILLARD

**7G-1**  
**A Training Pipeline for Nuclear Submarine Crews:** Neil Howard - L3Harris MAPPS UK  
**7G-2**  
**How might the Skills for Command and Operation of Australian Submarines Change over the Next 50 Years?:** David Nicholls - Submarine Institute of Australia  
**7G-3**  
**Avoiding Career Dead-Ends: Career Design and Sustainment for our future SSN Workforce:** Alan Rose - BMT & Katrina Hosszu - Future Work Institute  
**7G-4**  
**Nurturing a Nuclear SQEP workforce:** Phil Oxley - Mott MacDonald

12:40 - 13:25 **Lunch Session Break:** - Sponsored by Jenkins Engineering Defence Systems

### SESSION 8 – Conference Capstone Plenary Session

13:25 - 13:35 **Sovereignty, Trust, Partners, Jacobs:** Mike Walkington - Managing Director Jacobs Australia  
 13:35 - 14:05 **Building a sovereign AUKUS workforce:** Professor Brian Schmidt AC FAA FRS - Vice Chancellor Australian National University  
 14:05 - 14:35 **An AUKUS enterprise approach to developing an SSN capability:** Dr Marcus Hellyer, Australian Strategic Policy Institute

14:35 - 14:55 **Session Break:** - Sponsored by Randstad

### SESSION 9 – Conference Capstone Plenary Session

14:55 - 15:10 **Rear Admiral Matt Buckley CSC RAN** - Head of Capability Nuclear Powered Submarine Task Force  
 15:10 - 15:25 **Rear Admiral Tim Hodgson CB MBE RN** - Director Nuclear Technology UK Ministry of Defence  
 15:25 - 15:40 **Rear Admiral Richard Seif** - United States Navy, Commander Submarine Group Seven  
 15:40 - 16:20 **Q & A Panel:** RADM Matt Buckley CSC RAN, RADM Tim Hodgson CB MBE RN, RDML Richard Seif USN and CDRE Tom Phillips RAN

16:20 - 16:30 **Closing Remarks:** Michael Fitzgerald - SIA President



The SIA thanks its Conference partners for their ongoing support

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Image courtesy BAE Systems Australia



### SIA PROJECTS

The objective of Submarine Institute of Australia is to promote informed discussion and research in the fields of submarine operations, engineering, history and commercial sub-sea engineering. One of the ways it seeks to achieve this objective is through targeted projects addressing “submarine matters”. There are currently two projects supported by the SIA: UnderSea Outreach (UO) and the Australian National Submarine Museum (ANSM).

### UnderSea Outreach

The UnderSea Outreach Project continues as an approved and funded project within the Submarine Institute of Australia (SIA). The UnderSea Outreach vision is to be a central source of influence and knowledge for submarine and underwater careers in Australia by 2025.

Our endeavours continue to contribute to the mission of the Naval Shipbuilding Plan (2019):

*‘Creating a capable workforce with the capacity to effectively implement the national shipbuilding endeavour will require a national, collaborative approach’*

Formally known as the Subs in Schools Project, in 2020 Undersea Outreach was rebranded to better represent the scope of activities underway as we endeavour to reach our target audience. Undersea Outreach aims to promote discussion and careers in undersea technology and broadens the target audience to all levels of education, employment and learning. A number of activities support this intent.

### Mentoring Programme

Despite the Covid challenges over the past couple of years, UnderSea Outreach continued to progress to plan. Our launch in 2019 outlined our intent to establish connections between SIA members and students of Australia. To facilitate this, we have commissioned commercial software that will automate and professionalise the mentoring programme. Working with our partners The Art of Mentoring and the Australian Defence Magazine we will commence the first cohort of mentor and mentee participants in January 2023. Further collaboration is planned with the Submarine Capability of the Royal Australian Navy.

**ADM Women in Defence Awards 2022.** In our third year of sponsorship, the SIA gifted lapel pins and offered SIA membership to all Finalists.

**ADM STEM Conference 2022** – This Brisbane conference held in September 2022 provided submariner mentoring vouchers to two Brisbane High Schools – Springwood High School and Cannon Hill Anglican College.

**Career Spark** – an initiative of Adelaide University, the SIA is a member of the Advisory Group. We will assist the development of avatars in virtual work environments scripted to illustrate various roles onboard a submarine.

**ANSM** – our close collaboration with the Australian National Submarine Museum will draw upon ANSM’s historical and research repository to help educate and mentor our target audience.

Your involvement is invited and most welcome.

Inquiries can be directed to Errika Meades by email [errika.meades@submarineinstitute.com](mailto:errika.meades@submarineinstitute.com) or mobile 0412 759184.

### The Australian National Submarine Museum

The Australian Submarine Force has made a substantial contribution to the security of Australia and continues to do so. Furthermore, the planned transition to a nuclear-powered submarine force over the next two decades will increase Australia’s influence in our region.

The Submarine Institute of Australia is seeking to better inform the Australian community about its submarines through the development of an Australian National Submarine Museum as a project of the SIA.

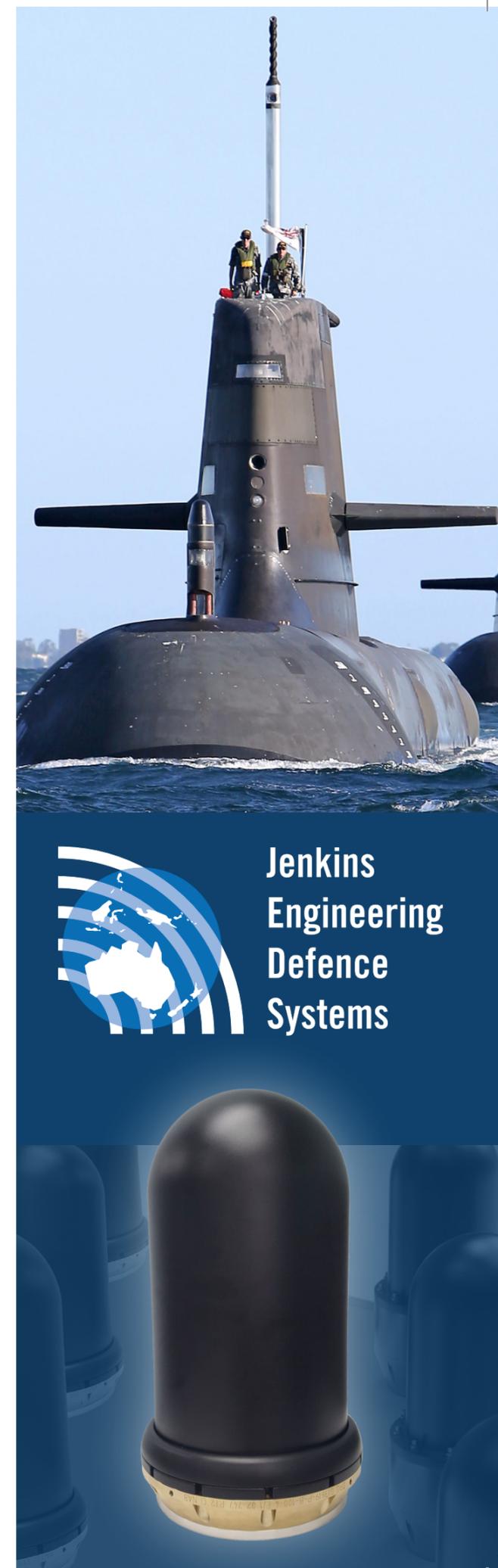
Modern museums are not just about the past, they also show the present and invite us to imagine the future. The ANSM will comprise a network of the existing physical museums linked by a virtual (website) museum.

The Museum is about people, actions, places and imagination as well as physical objects, and it will:

- be a globally significant educational and scientific museum;
- host exhibitions and collections to preserve the knowledge of the past and to share this history with visitors of all ages;
- showcase current submarine activities in an interactive and engaging way to stimulate learning;
- look ahead to consider Australia’s future submarine capability and its role in keeping Australia safe;
- be the centre point for academic research and an educational tool for people keen to understand this critically significant sector of Australia’s defence force; and
- bring to life witness accounts, personal stories, photos, and reflections from the nation’s submarine community in an exciting and stimulating visual format.

The SIA welcomes participation and contributions to the ANSM by way of sponsorship funding, content for the virtual museum, technical support in development and sustainment of the virtual museum, expert support (eg curation, graphic design, web development, ICT support) and management support.

A pilot site has been established for the Virtual Museum at [www.ansmpilot.org.au](http://www.ansmpilot.org.au) or via this QR reader.



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