### Maritime Prospectus



## DEFENCE TASMANIA







### From the Minister



With a long and proud maritime heritage, Tasmania has a highly impressive array of capabilities across the maritime domain.

Tasmania's maritime industry and institutions have supplied advanced products, systems and

services to navies worldwide for decades.

Our products and services have contributed to the design, introduction into service, and sustainment of the Royal Australian Navy's fleet of ships and submarines and are delivering vital functions on all of Australia's new major naval platforms.

As a recognised provider of world-class maritime solutions, Tasmania can deliver the vessels, maritime systems and services future defence forces and maritime security agencies require.

I trust this prospectus will promote an understanding of why Tasmania is the first place to look for solutions to your maritime challenges and requirements.

PAULA

#### The Hon Jeremy Rockliff MP

**Deputy Premier** Minister for Advanced Manufacturing and Defence Industries

### From the Defence Advocate



Bounded by the sea. excellence in maritime industry, research, education and training comes naturally to Tasmanians.

Our maritime companies and institutions are trusted partners and have the experience, workforce

and infrastructure to supply products and services to some of the largest and most advanced military forces around the globe.

Tasmania's maritime systems and services are relied on by navies and maritime security forces in New Zealand, across Pacific nations, parts of South-East Asia, India, Hong Kong, Japan, Turkey, the United Kingdom, Italy, Spain, the United States, Canada and South America.

With such an extensive industry and research base, Tasmania can reliably deliver military operators the world-class solutions they need to solve their maritime challenges.

Rear Admiral (Rtd) Steve Gilmore AM, CSC

Tasmanian Defence Advocate and Strategic Adviser - Maritime

### Tasmania's maritime story

The Southern Ocean is a place of risk and adventure, a dangerous place of cold wind, rain, and giant seas. Good enough, in turbulent Tasmanian waters, is never good enough. If we fail in the Southern Ocean or Bass Strait, it isn't a setback. It's deadly.

For thousands of years, the first Tasmanians were isolated by Bass Strait, so they focused on invention and trade. Tasmanian Aboriginals were the early boat builders, the early researchers, the early problem solvers.

In the 19th century, more ships were being built in Tasmania than in the other Australian colonies combined, with many of the ships large enough to be used on the Australia-England route.

In the 20th century, Tasmania joined the national war effort, constructing patrol vessels, cargo vessels and hospital launches for the armed forces during the Second World War.

These ships were different to others being built at the time. Tasmanians used native timbers ideal for shipbuilding like Huon and King Billy pine, to make something uniquely of this place, a craft and tradition that continues today.

Out of this tradition, in the second half of the 20th century, a new generation of Tasmanians grew up sailing together. They competed. They cooperated. They developed an obsessive passion for the sea.

#### HARBOUR DEFENCE MOTOR LAUNCH BUILT BY PURDON AND FEATHERSTONE, HOBART IN 1943

Image courtesy of Royal Australian Navy



These unstoppable maritime entrepreneurs changed everything.

They started small, working together, connecting with experts, and pushing one another to be better. They didn't build the most ships, but they worked hard to create the strongest ships, the safest ships and the fastest ships, the toughest equipment, and the safest, most sophisticated systems.

Adopting the finest materials and technologies, they developed the confidence to test themselves – to take Tasmanian ingenuity across every ocean, to ports and military bases around the world.

We also attracted ingenuity. Today, Tasmania has the highest concentration of maritime and marine researchers and scientists in the southern hemisphere. They come from everywhere, inspired by our craft and our traditions, enhancing and enriching our maritime culture.

It's tougher in Tasmania. We can't import solutions because they often won't work here. We can't be complacent. Because of where we live, everything we do and make has to be better, more durable, more reliable, more advanced.

In Tasmania, we design, we research, we educate, we cooperate, and we build with quiet mastery. It's who we are.

### Tasmania's advantages

- Capability as Australia's only island state, we have capabilities across the whole maritime sector. These include ship and watercraft construction; port development and ship operations; systems, engineering and professional services; and research, education and training.
- Collaboration our shipbuilders, maritime companies and institutions work together and are represented by the Tasmania Maritime Network, which provides strategic direction and support to the maritime industry.
- Innovation our maritime industry inherently partners with research and scientific institutions to solve problems and innovate. As a result, we are a centre for excellence in product development and advanced design.
- Research excellence we lead key maritime and marine research and scientific initiatives through several world-renowned institutions, organisations and clusters.
- Infrastructure we have extensive and modern maritime industry infrastructure, including major shipyards, slipways, maritime industry precincts, deep water ports and research and training facilities.
- Global supply many of our major maritime manufacturers supply to global markets and are connected to international supply chains. Local supply chains are well established and provide fabrication and manufactured products and services for the maritime industrial base.
- Education and training we have best practice vocational education and training and university facilities in maritime operations, maritime engineering, ship operations, port operations, and fabrication, welding and maintenance.
- Workforce we have a reliable and skilled maritime workforce complemented by a broader advanced manufacturing sector with extensive experience in heavy industry maintenance and operations.
- Energy sources our natural and established advantages place us in the enviable position of having over 90 per cent of our energy produced from renewable sources.



TAYLOR BROS MARINE INTERIOR FITOUT OF HOBART CLASS AIR WARFARE DESTROYERS

Image courtesy of Taylor Bros Marine

#### Tasmania's capabilities

### Shipbuilding and watercraft construction

The design, manufacture and fit-out of a range of vessels – from small, specialised watercraft through to high-speed ferries over 120 m long – takes place at a number of shipyards across the state.

Four shipyards are located at a Maritime Defence Industry Precinct 20 minutes north of Hobart and one shipyard is located just south of the city.

In total, our shipyards have over 84 770 m<sup>2</sup> of undercover production hall space.

We have extensive experience constructing vessels in aluminium, steel and high-density polyethylene for defence and maritime security markets, Antarctic and Southern Ocean operators and for commercial markets such as ferries and tourism, aquaculture and oil and gas.

We are renowned for building high-speed and lightweight catamarans. Our smaller catamarans are in use by operators the world over, while our larger wave piercing catamarans are some of the world's fastest, most efficient and environmentally clean ships.

We build tailored boats and specialised watercraft to meet the specific needs of customers and markets. We produce small harbour patrol boats, fast response vessels and transport craft, coastal landing craft, harbour maintenance craft, rigid hull inflatable boats, and other small vessels for use in inshore areas.

#### Port development and ship operations

Tasmanian companies and institutions have been involved in the design and development of some of the world's largest and most complex port development and ship operations projects.

Our capabilities and services include ship and port modelling, real-time maritime simulations, scientific and environmental data collection and analysis, port construction services, and port operations training and software development.

#### Specialised systems and equipment

Tasmanian companies and institutions provide a range of highly specialised, advanced design and often world leading maritime and marine systems that contribute to vessel design, manufacture, operations and safety for military and commercial markets.

#### These include:

- accommodation and habitability systems and equipment such as
  - » modular accommodation outfitting
  - » marine anti-glare blinds and screens
- autonomous maritime systems
- automation and control including ship information management systems
- communication systems and equipment including antenna systems
- deck and bulkhead equipment
- digital network systems and equipment
- electronic and electrical systems and equipment such as
- » anchoring and chain management systems and mooring equipment
- » lightning protection systems
- industrial systems design and upgrade
- internet of things, artificial intelligence, smart software and data solutions

- safety and evaluation systems and equipment such as
  - » marine evacuation systems and high capacity life rafts
  - » thermal insulation and passive fire protection systems
  - » hazardous materials storage solutions
  - » underwater retrieval, sensing and marking systems
- simulation systems, services, research and consultancy.

#### Engineering, fabrication and construction services

We provide a range of general and high-spec engineering, fabrication and construction services to meet defence maritime requirements. These include:

- advanced composites
- castings (small, medium and large scale)
- engineering, design (including CAD / CAM and 3D modelling) and prototyping
- hydraulic systems design and manufacturing
- industrial blasting, painting and coating
- laser cutting
- machinery repair and sustainment
- machining
- metal manufacturing, fabrication and construction
- polymer fabrication.



MUIR ENGINEERING GROUP HORIZONTAL WINDLASS HR 22 BUILT FOR HIGH STRENGTH 38MM CHAIN ON BOARD HMAS MELVILLE

Image courtesy of Muir Engineering Group



CBG SYSTEMS EXHAUST JACKET INSTALLED IN HMAS HOBART ENGINE ROOM Image courtesy of CBG Systems

#### Professional and consultancy services

Tasmanian companies and institutions provide a range of professional and consultancy services for defence maritime and commercial markets. These include:

- consultancy services in maritime simulations, offshore and coastal engineering, hydrodynamics testing, cavitation testing, ship and port operations, environmental seabed mapping and marine energy systems
- design services and naval architecture

- environmental analysis, assessment and management services
- hydrographic surveying
- lease of high speed and offshore support vessels and marine crew
- marine safety, emergency and sustainment services
- marine surveying and assessment
- out of water vessel repair.

#### Research, education and training

Tasmania is home to several world-leading institutions and centres of excellence that provide specialist maritime domain support to defence forces and their industry supply chains via unique and distinctive expertise and facilities.

The Australian Maritime College (AMC), within the University of Tasmania, is the national maritime institute specialising in the areas of Maritime Engineering and Hydrodynamics, Seafaring, and the Operations and Management of Ports and Shipping.

The AMC is a key partner of both the Australian Government's Defence Science and Technology Group (Maritime Division) and the Naval Shipbuilding College, consistently earning top annual rankings within the International Association of Maritime Universities.

AMC's curriculum spans the entire Australian Qualifications Framework, and the development and delivery of all programs is industry focused with the Maritime Engineering and Seafaring programs fully accredited by industry regulators. AMC Search, the institution's commercial division for training and consultancy, complements this curriculum with an extensive portfolio of short courses that are either industry mandated and accredited, or purpose designed for specific customer requirements.

The AMC emphasises applied learning and practical experience supported by industry and enabled by an extensive array of facilities including the Maritime Simulation Centre, the Emergency Response Centre, the Model Test Basin and Towing Tank, the Cavitation Research Laboratory, the Underwater Collision Research Laboratory, the High Performance Computing System, the Autonomous Maritime Systems Laboratory and a fleet of ships, watercraft and autonomous vessels.

These facilities and specialist expertise provide the cornerstone of the University of Tasmania's newly established *Defence and Maritime Innovation and Design Precinct* in the greater Launceston area. The Precinct will enable collaboration with industry and other research organisations in applied research and consultancy services focused on:

- supporting and assuring the design, operation, survivability, and supportability of surface vessels, submarines, autonomous vehicles, and maritime infrastructure
- the physical and cognitive ability, survivability, and health of human operators, in remote, isolated and hazardous maritime environments.

The Precinct is the University of Tasmania's portal for connecting industry with academia across its Defence Network. The Network's collective areas of maritime domain expertise include:

- modelling and analysis of vessel stability, seakeeping, motion dynamics, and manoeuvring performance, and the durability of marine structures, in open and confined waters
- viscous flow studies around vessel hulls and protrusions, and the characterisation of resultant cavitation and wake, to inform vessel and propulsor design
- investigation and analysis of the structural survivability of submarines and underwater vehicles, and sub-surface structures, and assessment of vessel shock and impact damage
- assessment of maritime asset operational life expectancy, reliability, inspection regimes and maintenance requirements, with respect to material degradation in marine environments
- analysis of fuels, spray dynamics and emissions of internal combustion engines, and improving fuel efficiencies of diesel generators
- simulation, modelling and analysis of energy and power systems applications
- assessment of port designs, through examination of simulated pilotage and ship-handling utilising variable digital ship and locational model permutations
- maritime trade and supply chain studies
- experimental investigation, modelling, and simulation of cognitive processes for optimisation of individual and team performance, especially in high risk activities such as vessel pilotage and ship-handling
- identifying psychological factors that influence adaptation, performance, decision-making and resilience in extreme environments, and the development of interventions
- development of processing and packaging technologies to make and test fresh-like, shelf-stable foods, and the development, testing and evaluation of specialised foods for high performance activities
- nutritional modulation and supplementation, and physical training manipulation for enhanced health and human performance, in varying environmental conditions.

AMC's training and marine science support vessel, *MV Bluefin*, and its large and small autonomous underwater vehicles, are available for commercial charter for the conduct of hydrographic survey and marine science missions and support of at sea trials – such as mine countermeasures systems.

The University of Tasmania's *Institute for Marine and Antarctic Studies (IMAS)* delivers three core research programs - Fisheries and Aquaculture, Ecology and Biodiversity, and Oceans and Cryosphere. Physical oceanography is a key activity of IMAS' Oceans and Cryosphere Centre. In this area, IMAS is a crucial partner in the operation of Australia's *Integrated Marine Observing System* and has expertise in deploying remote instrumentation, moorings, autonomous surface, underwater and aerial vehicles, and in undertaking shipbased measurements and ocean modelling.

The Centre for Antarctic Remote and Maritime Medicine (CARMM) delivers operational medical services, training, and research for polar, maritime, space and other remote and extreme environments. CARMM is based at the Australian Antarctic Division, part of the Australian Government's Department of Agriculture, Water and the Environment, and is a collaborative partnership between the Australian Government, the Tasmanian Government and the University of Tasmania.



AUSTRALIAN MARITIME COLLEGE CAVITATION RESEARCH LABORATORY Image courtesy of VEEM Ltd

The Tasmanian Health Service's Department of Hyperbaric and Space Medicine at the Royal Hobart Hospital is part of CARMM and houses the southern hemisphere's only hyperbaric/hypobaric recompression chamber facility. The department also has specialist expertise in underwater medicine treatment and research.

TasTAFE provides vocational education and training to support the training requirements of our major shipbuilders and the broader maritime industry. TasTAFE's facilities include the Metal Engineering Training Facility, located in the Maritime Defence Industry Precinct at Prince of Wales Bay.

The Tasmanian Minerals, Manufacturing and Energy Council (TMEC) Manufacturing Centre of Excellence provides facilities, training spaces and equipment to develop skills in advanced manufacturing. TMEC facilities utilised by the shipbuilding industry include a Simulated Work Environment that provides lean manufacturing and continuous improvement training, and an Advanced Welding Training Centre with portable virtual reality simulators that are compatible with live welding equipment.

### Maritime capability matrix

	Ship and watercraft construction	Port development and ship operations	Specialised systems and equipment	Engineering, fabrication and construction	Professional and consulting services	Research, education and training
APCO Engineering Pty Ltd www.apcoengineering.com			$\checkmark$	$\checkmark$		
Australian Maritime College (AMC) and AMC Search www.amc.edu.au www.amcsearch.com.au		$\checkmark$	$\checkmark$		$\checkmark$	$\checkmark$
Castings Tasmania Pty Ltd www.castingstas.com.au				$\checkmark$		
CBG Systems Pty Ltd www.cbgsystems.com			$\checkmark$	$\checkmark$	$\checkmark$	
Centre for Antarctic, Remote and Maritime Medicine www.carmm.org.au						$\checkmark$
CPT Engineering Pty Ltd www.cptengineering.com.au				$\checkmark$		
Crisp Bros. & Haywards Pty Ltd www.crispbroshaywards.com.au	$\checkmark$			$\checkmark$	$\checkmark$	
Cromarty (WA Cromarty & Co Pty Ltd) www.cromarty.com.au			$\checkmark$			
Definium Technologies Pty Ltd www.definium.net			$\checkmark$			
Direct Edge Defence www.directedge.com.au				$\checkmark$		
Fiomarine Industries Pty Ltd www.fiomarine.com			$\checkmark$			
Fortifyedge Pty Ltd www.fortifyedge.com			$\checkmark$			
Incat Tasmania www.incat.com.au	$\checkmark$		$\checkmark$	$\checkmark$	$\checkmark$	
Imbros Pty Ltd www.imbros.com.au					$\checkmark$	
Isotech Engineering (Harcor Industries Pty Ltd) www.iso-tech.com.au				$\checkmark$		
Liferaft Systems Australia Pty Ltd www.lsames.com			$\checkmark$			
Lightning Protection International Pty Ltd www.lpi.com.au			$\checkmark$			
Marcom Watson Pty Ltd www.marcomwatson.com.au		$\checkmark$	$\checkmark$			

	Ship and watercraft construction	Port development and ship operations	Specialised systems and equipment	Engineering, fabrication and construction	Professional and consulting services	Research, education and training
Metocean Services International Pty Ltd www.metoceanservices.com					$\checkmark$	
Muir Engineering Group Pty Ltd www.muir.com.au			$\checkmark$			
Norfolk Blinds Pty Ltd www.norfolkblinds.com.au			$\checkmark$			
Offshore Unlimited Pty Ltd www.offshoreunlimited.com.au					$\checkmark$	
Penguin Composites Pty Ltd www.penguincomposites.com.au				$\checkmark$		
PFG Group Pty Ltd www.pfg-group.com.au	$\checkmark$		$\checkmark$	$\checkmark$	$\checkmark$	
Pivot Maritime International Pty Ltd www.pivotmaritime.com		$\checkmark$	$\checkmark$		$\checkmark$	$\checkmark$
Richardson Devine Marine Constructions Pty Ltd www.rdm.com.au	$\checkmark$		$\checkmark$	$\checkmark$		
Royal Hobart Hospital's Department of Diving and Hyperbaric Medicine www.outpatients.tas.gov.au/clinics/diving_and_ hyperbaric_medicine						$\checkmark$
Storemasta www.storemasta.com.au			$\checkmark$			
Tamar Engineering Tasmania (a division of Tamar Hydro Pty Ltd) www.tamarengineering.com.au			$\checkmark$	$\checkmark$		
TasTAFE www.tastafe.tas.edu.au						$\checkmark$
Taylor Bros Marine Pty Ltd www.taylorbros.com.au	$\checkmark$		$\checkmark$	$\checkmark$	$\checkmark$	
Tidetech Commercial Marine www.tidetech.org		$\checkmark$			$\checkmark$	
TMEC Manufacturing Centre of Excellence www.tasminerals.com.au						$\checkmark$
University of Tasmania Defence Network www.utas.edu.au/defence-network			$\checkmark$		$\checkmark$	$\checkmark$
Veris Australia Pty Ltd www.veris.com.au					$\checkmark$	

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CRISP BROS. AND HAYWARDS MARGATE SHIPYARD Image courtesy of Crisp Bros. and Haywards

# Industry directory, networks and associations

Tasmanian Defence Industry Strategy, Industry Directory and Defence Tasmania hub www.stategrowth.tas.gov.au/business/sectors/defence

AIDN – Tasmania www.aidn.org.au

Tasmania Maritime Network www.tmn.org.au



AND BUILT FOR THE DEFENCE ENVIRONMENT Image courtesy of Pivot Maritime International

Tasmanian Minerals, Manufacturing and Energy Council www.tasminerals.com.au www.tasmanianmanufacturing.com.au (manufacturing portal)

Tasmanian Polar Network www.tasmanianpolarnetwork.com.au



RICHARDSON DEVINE MARINE BUILT VESSEL 'OUTER LIMIT' OWNED AND OPERATED BY TASMANIAN COMPANY OFFSHORE UNLIMITED. THIS VESSEL IS BEING UTILISED FOR THE ROYAL AUSTRALIAN NAVY'S HYDROSCHEME INDUSTRY PARTNERSHIP PROGRAM

Image courtesy of Offshore Unlimited

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#### Cover

TOP LEFT: TAYLOR BROS MARINE DESIGNED AND BUILT 16.3 M LANDING BARGE FOR 'RSV NUYINA'

Image courtesy of Australian Antarctic Division

TOP RIGHT: LIFERAFT SYSTEMS AUSTRALIA MARINE EVACUATION SYSTEM INSTALLED ON THE ROYAL NAVY'S (UK) FLEET AUXILIARY VESSEL 'RFA ARGUS'

Image courtesy of Liferaft Systems Australia

MIDDLE: PFG GROUP HIGH DENSITY POLYETHYLENE TACTICAL WATERCRAFT 'THE SENTINEL'

Image courtesy of PFG Group

BOTTOM: CBG SYSTEMS MOONRAKER HF, VHF AND UHF ANTENNA SYSTEMS PROVIDING HIGH QUALITY COMMUNICATIONS CAPABILITY ON-BOARD CANBERRA CLASS LANDING HELICOPTER DOCK

Image courtesy of CBG Systems



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