



TRUSTED AUTONOMOUS SYSTEMS

Submission in response to the Independent Review of Domestic Commercial Vessel Safety Legislation and Costs and Charging Interim Safety Report – Phase 1

30 November 2022

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About Trusted Autonomous Systems (TAS)

Trusted Autonomous Systems Defence Cooperative Research Centre (TAS) is Australia's first Defence cooperative research centre and is uniquely equipped to deliver world-leading autonomous and robotic technologies to enable trusted and effective cooperation between humans and machines. Our aim is to improve the competitiveness, productivity, and sustainability of Australian industry.

Supporting Australia's defence capability

TAS, together with its participants and the Department of Defence, is focused on developing the capacity of Australia's defence industry to acquire, deploy and sustain the most advanced autonomous and robotic technology through:

- delivering world-leading autonomous and robotic defence technologies
- building innovative IP through targeted research and technology programs
- assisting Australian industry to develop new, improved and competitive autonomy technologies
- evaluating the utility of autonomous systems through capability demonstrations.

Supporting assurance and accreditation of autonomous systems

In addition to specific industry-led projects, TAS is undertaking two 'common-good' activities that have broader, non-defence applications. Through these activities TAS will:

- foster ethical and legal research including value-sensitive design
- develop policy pathways for projects and participants
- support development of Queensland air, land and marine ranges for trusted trials, test and evaluation
- establish independent, world-class certification pathways for global industry.

How we work

Trusted Autonomous Systems fosters collaboration between Australia's defence industry and research organisations and aims to increase small and medium enterprise (SME) participation in its collaborative research to improve capabilities of Australia's defence industry. Established under the Next Generation Technologies Fund, with \$50 million invested over seven years, and a \$15 million co-investment from the Queensland State government, TAS aims to deliver trustworthy smart-machine technologies for new defence capabilities based on advanced human-machine teaming.

For additional information on TAS, [click here](#).

VIA ONLINE SUBMISSION

[Review of Domestic Commercial Vessel Safety legislation | Department of Infrastructure, Transport, Regional Development, Communications and the Arts](#)

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To whom it may concern,

Trusted Autonomous Systems (TAS) welcomes the opportunity to make this further submission in response to the Independent Review of Domestic Commercial Vessel Safety Legislation and Costs and Charging Interim Safety Report – Phase 1 (the interim report).

We have closely reviewed the interim report and were pleased to see the diverse range of viewpoints represented, including from TAS' initial submission. TAS welcomes, and is broadly supportive of the findings and recommendations in the interim report in relation to new and emerging technologies.

However, there is opportunity for greater focus on regulatory preparedness and future-proofing to ensure that

- legislation is suited to the regulation of autonomous systems and other emerging technologies that are being developed and deployed by an increasingly diverse range of industries and stakeholders;
- regulation is truly risk-based and premised on transparent and quantifiable approaches to risk that allow for co-regulation; and
- AMSA as a regulator is empowered to, and capable of, regulating autonomous systems in a nimble manner, including conducting regulatory experimentation and agile use of flexibility mechanisms. Amendments to the National Law regulatory framework will be of limited benefit to the regulated community if they are not accompanied by corollary service delivery improvements.

Given that Phase 2 of the review contemplates cost recovery matters necessitated by changes to the National Law regulatory framework, it is important that Phase 1 report adequately encompasses the total extent of the amendments required so that implications for cost recovery are fully captured.

TAS also respectfully suggests that

- the Panel consider a more ambitious approach to the treatment of autonomous and emerging technologies that goes beyond definitional matters that have already been extensively articulated. This should include consideration of whether - as TAS raised in our initial submission – that in order to appropriately address the different risks and requirements of vessels with autonomous systems, a separate regulatory framework and regulator may be required;
- the Panel further examine the adequacy of the National Law (and Navigation Act) defence vessel 'carve-out', and address this in its recommendations. There are clear national security implications associated with not having adequately mature defence technologies available to Australia when it is needed. The current Australian maritime regulatory framework is impeding the maturation of this technology by placing limitations on agile experimentation, testing and

evaluation. This is because, among other things, the exclusion of vessels under construction from the definition of 'defence vessel' (or 'naval vessel' in the Navigation Act) creates confusion as to the regulatory status of a vessel, and the systems of control or solutions required; and

- given the significant program of regulatory work that the interim report recommendations involve for both the Department of Infrastructure, Transport, Regional Development, Communications and the Arts (the Department) and AMSA, which could take some years to implement, the Panel recommend that the Department and AMSA to seek short term wins by implementing common sense relief through changes to regulations, exemptions and policy instruments. These are outlined in our submission below.

Background

Through our common good activities, specifically [Activity 2: Assurance of Autonomy](#), TAS is working to enhance Australian capacity for building and employing ethical and trusted autonomous systems across the land, air and maritime domains. The use of maritime autonomous technology in Australia is growing, with an increasing number of surface and subsurface vessels in use for a range of scientific, commercial and defence purposes such as hydrographic surveying, reef monitoring, hull inspection, surveillance, and mine countermeasures.

Around the world, autonomous vessels of increasing size and complexity are being developed, tested and deployed in a variety of diverse operations. However, progress on the development of an appropriate international standards framework has been slow. For autonomous vessels to be used safely and ethically, and for investment and research to continue, the Australian regulatory framework must be fit for purpose. This means that it must be capable of addressing and anticipating changes to the maritime ecosystem in Australia.

For convenience, a summary of TAS' initial submission is set out at **ANNEX A**. A summary of TAS' completed regulatory tools and initiatives are at **ANNEX B**.

As previously stated, TAS is eager to remain engaged with AMSA and the Panel during this review process. The author is TAS' Assurance of Autonomy Activity Lead (Rachel.Horne@tasdcrc.com.au), and the primary contact for this submission.

Yours sincerely,

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Overarching comments

TAS agrees with the interim report's **Key Finding** that while the National Law framework has **improved safety outcomes**, the legal framework has introduced **unnecessary complexity and regulatory burden** and is **not responsive to innovation and change**. However, TAS respectfully submits that this opportunity provided by this review to examine and future-proof marine safety legislation in Australia warrants further consideration of regulatory preparedness when it comes to autonomous and other emerging technologies. The recommendations that relate to overall improvements to the regulatory framework – such as allowing marine orders to specify when certification is required – will be resource-intensive and take time to implement, with new and emerging technologies likely to join a lengthy 'queue' of issues to be addressed. This does not necessarily provide a short or medium term solution to providing an appropriate regulatory framework for autonomous and remotely operated vessels and systems, and therefore the certainty required for planning, acquisition and investment by Defence and defence industry.

Accordingly, TAS wishes to highlight opportunities for greater specificity in the recommendations:

- the establishment of **general exemptions for 'trusted partners'** such as Defence and other Commonwealth statutory authorities with appropriate risk management arrangements in place. This may include an exemption to give effect to a 'national testing and trialling' framework for autonomous and emerging technologies that allows defence industry projects to undergo testing and evaluation using appropriate standards. We note that our longer term view – as outlined in our initial submission - is that the definition of 'defence vessel' should be amended
- the establishment of **quantifiable approaches to risk management**, particularly in relation to the inclusion or exclusion of vessels within the National Law framework and the treatment of vessels and systems being "more risky" or "less risky"
- leverage off **existing industry standards and codes** of practice rather than having an entrenched starting point that AMSA will develop all codes of practice ab initio
- **broadening the terms of reference of the proposed taskforce** to enable it to facilitate regulatory experimentation – such as regulatory sandboxes; enabling it to identify alternative standards or codes that operators and vessels developing or deploying using new and emerging technologies can comply with 'as of right'; and consider alternative models for best practice regulation of autonomous and other emerging technologies, including a separate regulator for autonomous systems

Finding 1: Much of the complexity and regulatory burden would be reduced if the general safety duties in the National Law, supplemented by codes of practice developed by AMSA in consultation with industry, were used as the primary regulatory tool for the less risky segment of the DCV fleet. This would also allow AMSA to concentrate on the riskier segments.

Finding 2: The requirement for all DCVs to have Certificates of Survey and of Operation is unnecessary to achieve safety outcomes and has resulted in a complex and burdensome array of exemptions for less risky operations.

Recommendation 1: The law should be amended to better reflect a risk-based regulatory model that is flexible and able to adapt to innovation and emerging technologies by:

- retaining general safety duties on all parties that have a duty under the current law;
- removing the universal requirement for all DCVs to have Certificates of Survey and Operations;
- providing that vessels of a type or class specified in the regulations (or Marine Orders) be required to comply with

Support in principle.

TAS supports **Findings 1 and 2**, and **Recommendation 1**.

With respect to **Finding 1**, TAS notes that

- AMSA should identify priority areas for the developments of codes of practice, including in industries or sectors where mature industry codes already exist to avoid significant unnecessary delay. For example, under the Heavy Vehicle National Law, codes of practice are developed by industry organisations funded by government grants. In the autonomy space, TAS has developed the Australian Code of Practice for Autonomous and Remotely Operated Vessels. It would not be consistent with the principles of co-regulation for AMSA to ‘start from scratch’ on its own code of practice in this respect; and
- the general safety duties – beyond the requirement to implement and maintain a safety management system - are poorly understood not only in some parts of the domestic commercial vessel regulated community, but amongst the diverse range of industry stakeholders involved in the development and operation of autonomous systems. It should also be made clear that the role of a code of practice is to provide the regulated community with one voluntary means of complying with a primary safety duty. However, the emphasis should be on the availability of risk-based regulatory pathways, with AMSA providing guidance and exemplars to this end. It will be important that AMSA clearly communicates the legal effect of codes of practice to the regulated community.

With respect to **Finding 2**, TAS notes that

- it is likely that exemptions will continue to be an important flexibility mechanism in the short to medium term. Currently, autonomous and remotely operated vessels are not able to be developed or operate without an exemption, and generally comply with a pastiche of standards;
- AMSA should publish and consult on a proposed pathway for incorporation or revocation of exemptions into the standing regulatory framework; and
- AMSA should adopt a policy that allows for the expeditious issue of general exemptions for organisations designated as ‘trusted partners’ with a demonstrated history of rigorous safety

NSCV Standards and/or hold a Certificate of Survey or Certificate of Operations; and

- requiring higher risk vessels to comply with the Navigation Act and associated international standards, including the International Dangerous Goods Code and the Standard of Training, Certification and Watchkeeping.

and risk management processes and arrangements. These may include, for example, Defence and other Commonwealth statutory authorities such as the Australian Institute of Marine Sciences. We note that Navy is seeking to develop a Common Control Environment, including common standards, that defence industry projects will need to adhere to through the capability life cycle (i.e. including testing and evaluation); while AMSA is seeking to facilitate deeper and more meaningful testing and experimentation at its ReefWorks autonomous testing facility.

With respect to **Recommendation 1**, TAS notes that

- to the extent that the requirement for vessels and operators to hold certification will be set out in regulations or marine orders, the Department and AMSA should undertake consultation on a high level plan for the implementation of these changes. Specifically, AMSA should develop a risk framework that sets out its proposed approach to when certification is required, and what, if any, measures vessels and operators will be required to meet instead;
- in order to support these changes, it will be important that AMSA provides a timeline for implementation, and identifies any enabling changes or measures that will be required – including amendment of the National Standard for Commercial Vessels, and/or developing or allowing the use of alternative standards and codes; and
- any consequential changes required to the *Navigation Act 2012*, including requiring vessels currently treated as domestic commercial vessels to comply with requirements imposed by the *Navigation Act*, be identified and consulted on. Simply because vessels are seemingly ‘different’ or ‘complex’ does not necessarily mean that requiring them to comply with class rules is an appropriate or proportionate regulatory solution. Not only is the risk profile of many autonomous vessels significantly lower than – for example – grandfathered fishing trawlers and other vessels that have been subject to minimal regulatory requirements for many decades, but this approach assumes that regulation of the entirety of an autonomous vessel, including its control systems, is best done under the auspices of maritime safety regulation.

Finding 9: There is an opportunity for the Department of Infrastructure, Transport, Regional Development, Communications and the Arts and AMSA to improve the marine surveyor accreditation scheme to ensure it is up to date, fit for purpose and flexible.

Support in principle.

TAS supports **Finding 9** and **Recommendation 10**. TAS reiterates the importance of close consultation with expertise in autonomous and emerging technologies, particularly in relation to providing greater flexibility as to who can be accredited as a marine surveyor, and expanding categories of accreditation.

Recommendation 10: The marine surveyor accreditation scheme should be reviewed to make it fit for purpose. As part of that review, consideration should be given to introducing (among other matters):

- a tiered accreditation scheme according to size and complexity of the vessel;
- a formal continuing professional development program;
- regular random audits of surveyor approvals and subsequent standards applied;
- increasing the approval powers for accredited marine surveyors;
- greater flexibility in who can be accredited as a marine surveyor, and expanding categories of accreditation to adequately cater for new and emerging technologies; and
- a formal rulings program to provide certainty for surveyors and operators.

The review should consider a reasonable timetable for implementation of the proposed reforms.

Finding 10: The current requirement that changes to regulations made under the National Law be agreed by all States and the Northern Territory is a barrier to flexibility and responsiveness to innovation.

TAS also notes that

- there may be a role for risk-based self-verification or self-certification approaches to maximise flexibility for industry. For example, under proposed arrangements for a national law for the regulation of autonomous driving system entities (ADSEs), Australia will incorporate a self-certification approach for autonomous driving systems (ADS) into existing Commonwealth vehicle regulations. ADSEs will need to self-certify against specified safety criteria and obligations before they are granted a type approval to supply their ADS into the market for the first time. This will involve submitting a statement of compliance for approval before the ADS can be introduced into the market. Continuing safety assurance – which involves the ADSE ensuring that the ADS continues to comply with the safety requirements – will be a matter for the new AVSR; and
- consideration should be given as to whether – where new and emerging technologies are concerned - accreditation as a marine surveyor is required for certain persons to perform functions and duties in relation to a vessel or system, or whether the regulations can recognise other industry qualifications.

The recommendation that “the review should consider a reasonable timetable for implementation of the proposed reforms” should apply to all of the interim recommendations.

Support in principle.

TAS supports **Finding 10** and **Recommendation 11**.

We note that the regulations in question deal with the definition of what is a vessel or a domestic commercial vessel for the purposes of the National Law; the accreditation of marine surveyors; and charging of fees.

<p>Recommendation 11: The current requirement that changes to certain regulations be unanimously agreed by the States and the Northern Territory be removed.</p>	<p>In relation to the definition of what is a vessel or a domestic commercial vessel for the purposes of the National Law, the implementation of this change would remove a barrier to the Department amending the regulations to state that a certain kind of vessel will or will not be a vessel. This may provide greater flexibility to deal appropriately with emerging technologies, including when they are being used in a certain way. To the extent that the Department and AMSA propose to amend these provisions</p> <ul style="list-style-type: none"> • in line with Recommendation 12, the Department should undertake careful consultation with a diverse range of industry stakeholders to determine how any changes to the definition of what is a vessel or domestic commercial vessel, or the list of things that are/are not vessels and domestic commercial vessels. While TAS supports certain vessels and activities being ‘carved out’ of the National Law regulatory framework, it will be important for the Department and AMSA to contemplate alternative or new schemes that will exist to take the place of the National Law framework – for example, under Defence Seaworthiness, or a new autonomous system regulator; and • waterways management, environmental management and workplace health and safety, will, among other things, remain with the states and territories. The role of states and territories to limit or prevent the operation of certain vessels and systems in state and territory waters – including those involving new technologies - will continue to impact the effective operation of the National Law in relation to autonomous and emerging technologies, particularly when it comes to testing and trialling.
<p>Finding 11: There is a need to further consider how the National Law framework can be future ready</p> <p>Recommendation 12: AMSA should set up a taskforce to consider how to optimise and future proof the National Law framework to regulate new and emerging technologies.</p> <ul style="list-style-type: none"> • The taskforce should consider whether definitions in the National Law remain fit for purpose in the context of 	<p>Support in principle.</p> <p>TAS supports Finding 11 and Recommendation 12.</p> <p>However, the process for revising definitions, and the implications of definitional changes in the National Law and National Law Regulations should be carefully considered and consulted upon with organisations like TAS that have extensive expertise in relation to the operation of these definitions. We also respectfully note that</p> <ul style="list-style-type: none"> • given that key definitions are contained in the National Law and National Law regulations, an AMSA taskforce would not be empowered to amend the regulations in accordance with any findings it made, but only to make recommendations to the Department;

development, deployment and operation of new and emerging technologies.

- the establishment of a taskforce to consider definitional issues that have already been extensively ventilated in a range of documents and settings may not go far enough, and may delay or 'hold back' progression of work done under the auspices of **Recommendation 1** to develop marine orders and standards that provide an adequate regulatory environment in the short to medium term; and
- the taskforce should also be empowered to engage with industry stakeholders for the purpose of facilitating regulatory experimentation, including regulatory sandboxes and pursuing opportunities for national testing and trialling guidelines for autonomous and emerging technologies. It should also have a remit consider broader issues around best practice regulation of autonomous and emerging technologies, including consideration of the model provided by the National Transport Commission's Automated Vehicle Program.

ANNEX A

Submission to the Independent Review of Domestic Commercial Vessel Safety Legislation (National Law)

Summary

This submission sets out the key issues with the National Law in relation to autonomous maritime technology, and TAS' recommendations:

Issue 1: The National Law is not equipped to regulate systems

Recommendation: The Panel consider whether a separate regulatory framework – including a separate regulator – is required to effectively regulate autonomous systems.

Issue 2: The National Law lacks the flexibility to accommodate autonomous vessels and other emerging technologies

Recommendations: The Panel consider

- amending the National Law to enable marine orders to determine when a vessel requires a certificate, and which standards apply to the vessel (regardless of whether it requires a certificate)
- amending the National Law to enable marine orders to determine how vessel owners can demonstrate compliance with requirements, and
- amending the National Law Regulations to create greater flexibility in who can be accredited as a marine surveyor, and expanding categories of accreditation in which a surveyor may be accredited to undertake surveys and inspections.

Issue 3: Key National Law definitions are outdated

Recommendations: The Panel consider

- amending the National Law to update the definition of crew and master to more clearly allow for remote operation and supervision of vessels
- amending the definition of 'vessel' in the National Law, and/or
- amending the National Law Regulations to 'carve out' very small vessels

Issue 4: The National Law defence vessel carve-out is not fit for purpose

Recommendation: The Panel consider:

- directly engaging with Warfare Innovation Navy to better understand the issues associated with the National Law approach to ‘defence vessel’, and the impact on Australia’s Defence capability
- alternative approaches to the existing ‘carve-out’ which would ensure vessels being constructed and tested for defence purposes are captured, and
- seeking advice from AMSA and Office of International Law.

Autonomous vessels – both surface and subsurface - are being used in a range of defence, commercial and research settings. This will continue, likely at an enhanced pace. Where vessels are being operated within Australia’s Exclusive Economic Zone, the National Law applies and autonomous vessels will generally be domestic commercial vessels. However, the consequence of the four issues outlined in our submission is that all autonomous vessel owners must seek an exemption to operate. This process is inefficient, opaque, and uncertain, and leads to increased financial and opportunity costs for both vessel owners and for AMSA. It does not recognise or allow for the importance of appropriate mechanisms for conducting testing, nor does it reflect or support the strategic, regulatory and operational agility that modern defence forces – working closely with diverse industry stakeholders - require. TAS has sought to work in a collaborative manner with government and industry alike to overcome these challenges, including developing regulatory initiatives and tools such as the [Australian Code of Practice for Autonomous and Remotely Operated Vessels](#) and the [COLREGS Operator Guidance Framework](#). However, change is needed at a legislative level to recognise the benefits of autonomous technology, and ensure that it is deployed safely, now and in the future.

Note:

- *This submission is focussed on the National Law. It does not address issues with AMSA marine orders, the National Standards for Domestic Vessels (NSCV) or AMSA policies and guidelines, other than to highlight that changes to the National Law may allow AMSA to more effectively use those mechanisms to regulate autonomous vessels and other emerging technology.*
- *The primary author worked on the legislative reform package of work with the Department in 2020, which outlined the substantive issues related to the National Law and how it treats emerging technology—where possible this submission avoids replicating that work which should be available to the Investigation Panel.*

ANNEX B

Overview of TAS regulatory tools and initiatives

TAS has sought to respond constructively to the absence of a fit for purpose regulatory framework for autonomous vessels in Australia. Below is a description of some of the key tools and initiatives that TAS is leading to overcome limitations in the National Law. These are designed to both aid stakeholders in identifying the requirements that apply to their vessel and operation, and how they can demonstrate compliance with those requirements.

Project	Outcome	Impact
Australian Code of Practice	Introduce tailored standards for autonomous vessels suitable for the Australian operating environment Available at Australian Code of Practice for the Design, Construction, Survey, and Operation of Autonomous & Remotely Operated Vessels – Defence CRC Tas Limited (tasdcrc.com.au)	<input type="checkbox"/> Create clarity, consistency and efficiency for operators and AMSA, lowering time spent on regulatory processes and the associated resource burden
Guidance Materials for Australian Code of Practice	Assist industry to understand how to apply the Australian Code of Practice, and how to work through regulatory processes Available at Australian Code of Practice for the Design, Construction, Survey, and Operation of Autonomous & Remotely Operated Vessels – Defence CRC Tas Limited (tasdcrc.com.au)	<input type="checkbox"/> Support innovation and technology development and uptake in Australia <input type="checkbox"/> Support the development of Australian sovereign capability
COLREGs Operator Guidance Framework	Make it easier to understand COLREGs, which rules apply for specific vessels and operations, the capabilities required to comply, and how to demonstrate compliance	<input type="checkbox"/> Support the development of improved regulatory frameworks, approaches

	Available at COLREGs Operator Guidance Framework (rasgateway.com.au)	and processes for autonomous technology
RAS GATEWAY	Provide an online portal for autonomous vessel stakeholders to access regulatory information, resources, and support Available at rasgateway.com.au	