Autonomous shipping from a regulatory perspective

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Manager
Systems Safety
AMSA
Scope

• What does AMSA do
• Our take on unmanned/autonomous vessels
• The Law in Australia, and how it applies
• Australia’s approach
Safe and clean seas, saving lives
Unmanned and Autonomous Vessels

Unmanned
Always monitored and under positive control

- Unmanned Underwater Vessel (UUV)
- Unmanned Surface Vessel (USV)

Autonomous
capable of independent decision making without involvement of a human operator

- Autonomous Underwater Vessel (AUV)
- Autonomous Surface Vessel (ASV)
- Marine Autonomous Surface Ship (MASS)

Regulated by Domestic and/or International Law
World-class AUV launched

16 August 2017

New dimension to Antarctic science paves way for AUV capability in polar, defence and industry.

WE CALL IT SEABED INTELLIGENCE™

Ocean Infinity are explorers. We go to unmapped locations to survey the seabed using the most advanced fleet of autonomous vehicles in the world.
Surface
Known developments
Internationally

MSC 98- New Work Proposal (June 2017)

• Scoping exercise
• IMO Instruments
  • Preclude Autonomous Operations
  • Don’t apply
  • What needs amendment
• 4 x sessions of MSC (approx. 3-4 years)
• Retained at MSC level, all encompassing
National Regulator for Domestic Commercial Vessel Safety Statement of Regulatory Approach

Overview of the regulatory approach
This page explains the regulatory approach of the Australian Maritime Safety Authority as the national regulator for Domestic Commercial Vessel safety.

On this page
• Safety is primary.
• Regulation - and its application - must be flexible enough to address the risks of a highly varied industry in order to support safety, innovation and business and environmental sustainability.
• The National Regulator develops and maintains a collaborative relationship with industry.
• The regulatory scheme is performance-based, not prescriptive.
• The operator has the primary responsibility for ensuring the vessel is safe and operates safely.
• The National Regulator will take a ‘trust and verify’ approach to maintaining safety wherever possible.
• The National Regulator will make use of third-party expertise to bolster its regulatory safety activities.
• The National Regulator will strive to make it simple for people to maintain safety.
• The National Regulator will work together with other safety agencies to reduce the potential for duplication of safety rules and the application of those rules.

• Safety is Primary
• Flexible
• Collaborative
• Performance based
• Operator Responsibility
• Trust and Verify approach
• Simple solutions for the operator

The National Law and standards


National Law Regulations

Marine Orders

MO501 Admin
MO502 Vessel ID
MO503 Survey
MO504 Operation
MO505 Competence
MO507 LoadLine

Definitions Meanings Exclusions etc

National Standard for the Admin of Marine Safety (NSAMS)
S4- Survey of Vessels

Part B General
Part C Design/Constrc
Part D Crew Comp
Part E Operation
Part F Special Vessel Fast Craft
Part G Non-Surv

National Standards for Commercial Vessels (NSCV)
Definitions

- **Vessel** - means a craft for use, or that is capable of being used, in navigation by water, however propelled or moved, and includes an air-cushion vehicle, a barge, a lighter, a submersible, a ferry in chains and a wing-in-ground effect craft.

  *(Marine Safety (Domestic Commercial Vessel) National Law Act 2012. Section 8)*

- **Domestic Commercial Vessel** - [a vessel as above]
  ……conjunction with a commercial, research or government activity

  *(Marine Safety (Domestic Commercial Vessel) National Law Act 2012. Section 7)*

*Excludes what is generally an international seagoing vessel*
Definitions

- **Owner**
  - a person who has a legal or beneficial interest in the vessel, other than as a mortgagee; and
  - a person with overall general control and management of the vessel *(but not the master or pilot)*
    

- **Master**
  - the person who has command or charge of the vessel, but does not include a pilot.
    
Applying the Law

- unique identifier (UI) (MO 502)
- certificate of survey (MO 503)
- certificate of operation (MO 504)
- crewed by persons holding the required National Law certificate of competency (MO 505)
- General safety duties must be complied with (National Law)
- Safety Management System (SMS) (National Law)
  - Owner must implement and maintain an SMS
  - Master must maintain and comply with a SMS
Exemptions

• General Exemptions
  – 39 of them
  – Scenario based
  – Initiated by AMSA
  – Size, area, type, operation, etc

More Information

• Specific Exemptions
  – By Application
  – Specific requirements under the national law
  – Specific requirements related to design, operation, competency, systems and equipment,
  – Type and nature of operations.

AMSA cannot grant an exemption unless it is satisfied that doing so will not jeopardize the safety of a vessel or a person on board a vessel.

More information
So does it work????
ASV C-Worker 5

SPECIFIC EXEMPTION
Section 143, Marine Safety (Domestic Commercial Vessels) National Law Act 2012

Particulars of vessel

<table>
<thead>
<tr>
<th>Name of Vessel</th>
<th>Unique Identifier</th>
</tr>
</thead>
<tbody>
<tr>
<td>CWV7</td>
<td>00529</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Measured Length</th>
<th>Service Category</th>
<th>Vessel Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>5.5 m</td>
<td>2C</td>
<td>AUTONOMOUS SURFACE VESSEL</td>
</tr>
</tbody>
</table>

1. The Vessel is exempt from the application of sections 9, 10(2)(b) and 12(b) of Marine Order 303 (Certificates of survey national law) 2013, to the extent that each requires the Vessel to comply with the following required outcome of the National Standard for Commercial Vessels (NSCV) Part C, Section 1.

2.4 Required Outcome – compliance with COLREGS
A vessel must be arranged to enable the person operating the vessel to comply at all times with the person’s obligations under COLREGS.

2. The Vessel is exempt from the application of sections 8, 10(2)(b) and 12(b) of Marine Order 303 (Certificates of survey national law) 2013, to the extent that each requires the Vessel to comply with a required outcome of the NSCV, and the following deemed to satisfy solutions, or an approved equivalent means of compliance, are not implemented:

a) NSCV Section C1 Clause 5.12.2 for provision of fixed guardrails or bulwarks.
b) NSCV Section C3 Clause 3.2.3.1 and Table 1, to the extent that the hull stifferener terminations and flange widths must comply with AS1796.6.
c) NSCV Subsection C5A Clauses 6.7.7, 6.7.8 and 6.7.9, for the carriage of an emergency steering system, rudder heel bearing length, and rudder mainpiece length.
d) NSCV Subsection C5E Clause 5.12 for the provision of an emergency power source for electronic navigational aids, navigation lights, and sound signals.
e) NSCV Subsection C7A Clause 5.3 for the carriage of safety equipment.
f) NSCV Subsection C7B Clause 4.13, for the provision of radiotelephone and satellite communications equipment.
Specific Exemption

Exemption

• Design and Construction standards
  – Fixed guardrails
  – Requirements for watertight bulkheads, rudder, and emergency steering
  – From requirement to have an Anchoring system
  – Carry fire extinguisher's and a fire bucket...

• Some aspects of compliance with COLREGS

Conditions

• Vessel is unmanned when underway
• Non slip deck surfaces
• Support vessel available, with anchoring system
• Automatic fire fighting system fitted
• Under control of a master
• Proper lookout, using cameras, microphone and sensors
Case by case
Current regulatory framework works
Exemption processes
- Specific
- General
We can regulate unmanned and autonomous vessels under the National Law Act……
But we know that it’s just a bit clunky……….and
a significant admin burden on operator and regulator

Safety of vessels and people, and protection of the environment is our priority
Autonomous Vessels Regulatory Working Group

(AVRWG)
Progressing towards a risk based, practical, regulatory solution
Our approach

**Is a thing a vessel, and a DCV?**
- Legal checklist
- In progress

**The risks?**
- Type of operation
- Nature of operation
- Area of operation
- Redundancies
- Communications
- Confidence
- Specifications
- Competencies
- ………

**Exemptions**
- General- can we use any existing exemptions?
- Do we need different ones?
- Are specific exemptions appropriate?

**Determine regulatory approach**
- Unique Identifier
- Cert of Survey
- Cert of Operation
- Crewing
- General Safety Duties
- Anything else?
- A better process?

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**Education and Information**

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**Potential regulatory change**
To wrap up

• Responsibility as a safety regulator

• Our understanding of unmanned and autonomous

• Australia's laws, rules and regs

• Australia’s approach
Thank You

Nick Lemon
Manager
Systems Safety