



Australian Government

Australian Maritime Safety Authority

# Autonomous shipping from a regulatory perspective

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Manager

Systems Safety

AMSA

AMSA | PROFESSIONAL | ACCOUNTABLE  
VALUES | COLLABORATIVE | DEDICATED





# Scope

- What does AMSA do
- Our take on unmanned/autonomous vessels
- The Law in Australia, and how it applies
- Australia's approach



Australian Government

Australian Maritime Safety Authority

safe and clean seas, saving lives



## OUR PLAN ON A PAGE

Everything we do must contribute to the achievement of our vision and mission. Our Plan on a Page helps us to align and identify the contribution our focus areas, core business and change program make towards achieving our strategic goals, meeting our strategic challenges, and ultimately, delivering our vision and mission.

## PURPOSE

Who we serve: The Australian community.  
Vision: Safe and clean seas, saving lives.  
Mission: Ensuring safe vessel operations, combatting marine pollution, and rescuing people in distress.

## VALUES

Professional – We act with integrity and are pragmatic in our approach.  
Collaborative – We value and respect others and work together to achieve our objectives.  
Dedicated – We are committed to AMSA's mission and responsive to the needs of our customers and stakeholders.  
Accountable – We take responsibility for our decisions and actions.

### 1 STRATEGIC CHALLENGE 1 MANAGING RISKS TO SAFETY AND THE ENVIRONMENT

- 1.1 FOCUS AREA 1.1: ENSURING REGULATED VESSELS ARE OPERATED SAFELY AND MEET STANDARDS
- 1.2 FOCUS AREA 1.2: PREVENTING POLLUTION FROM SHIPPING
- 1.3 FOCUS AREA 1.3: SUPPORTING SAFE NAVIGATION
- 1.4 FOCUS AREA 1.4: CONTRIBUTING TO AND IMPLEMENTING INTERNATIONAL CONVENTIONS
- 1.5 FOCUS AREA 1.5: ENSURING SEAFARER COMPETENCY AND WELFARE

#### STRATEGIC GOALS

- 1.1 Ensure safe shipping in Australian waters
- 1.2 Minimise emissions and discharges from ships in the marine environment
- 1.3 Deregulate and streamline without impacting safety
- 1.4 Develop a contemporary regulatory and compliance model
- 1.5 Implement a modernised regulatory scheme for international trading and foreign vessels
- 1.6 Develop a predictive, integrated intervention capability to assure vessel safety
- 1.7 Compliance with international standards for training certification and watchkeeping
- 1.8 Promote a maritime safety culture that leads to positive behavioural change
- 1.9 Influence the standards of international conventions

#### STRATEGIC RISK

- SR2. Failure as a regulator – regulatory scheme or compliance and enforcement arrangements fail to prevent an incident with major or significant consequences

### 2 STRATEGIC CHALLENGE 2 BUILDING THE NATIONAL SYSTEM FOR DOMESTIC COMMERCIAL VESSEL SAFETY

- 2.1 FOCUS AREA 2.1: DESIGNING – OPERATING MODEL, WORKFORCE, TRANSITION
- 2.2 FOCUS AREA 2.2: BUILDING THE SERVICE DELIVERY FRAMEWORK
- 2.3 FOCUS AREA 2.3: BUILDING THE REGULATORY FRAMEWORK
- 2.4 FOCUS AREA 2.4: SUPPORTING THE SYSTEM – INFORMATION TECHNOLOGY AND FUNDING ARRANGEMENTS

#### STRATEGIC GOALS

- 2.1 Prepared to assume responsibility for service delivery as National Regulator by July 2018
- 2.2 Promote continuous improvement in marine safety
- 2.3 Promote public confidence in the safety of marine operators
- 2.4 Ensure the effective identification and management of safety risks
- 2.5 Reduce regulatory burden without compromising safety

#### STRATEGIC RISKS

- SR1. Failure to deliver a national system – that is financially sustainable and delivers the aims and objectives required by government
- SR2. Failure as a regulator – regulatory scheme or compliance and enforcement arrangements fail to prevent an incident with major or significant consequences

### 3 STRATEGIC CHALLENGE 3 PROVIDING INCIDENT PREPAREDNESS AND RESPONSE

- 3.1 FOCUS AREA 3.1: PRE-EMPTIVELY INTERVENING TO ASSURE VESSEL SAFETY
- 3.2 FOCUS AREA 3.2: SAVING LIVES DAILY THROUGH SEARCH AND RESCUE (SAR)
- 3.3 FOCUS AREA 3.3: DELIVERING AN EFFECTIVE MARITIME INCIDENT RESPONSE CAPABILITY
- 3.4 FOCUS AREA 3.4: DELIVERING AN EFFECTIVE MARINE POLLUTION RESPONSE CAPABILITY

#### STRATEGIC GOALS

- 3.1 Prevent incidents occurring through a predictive, integrated intervention capability
- 3.2 Save lives by coordinating aeronautical and maritime search and rescue
- 3.3 Respond efficiently and effectively to maritime casualties and marine pollution incidents

#### STRATEGIC RISK

- SR3. Failure as a response organisation – search and rescue or maritime environmental emergency response arrangements are inadequate

### 4 STRATEGIC CHALLENGE 4 ENSURING A VIBRANT AND PROGRESSIVE ORGANISATION

- 4.1 FOCUS AREA 4.1: WORKFORCE ENGAGEMENT, DEVELOPMENT AND SAFETY
- 4.2 FOCUS AREA 4.2: GOOD GOVERNANCE
- 4.3 FOCUS AREA 4.3: SOUND FINANCIAL MANAGEMENT
- 4.4 FOCUS AREA 4.4: RELIABLE AND RESPONSIVE INFORMATION TECHNOLOGY

#### STRATEGIC GOALS

- 4.1 Have a professional, flexible and engaged workforce that is change ready
- 4.2 Use technology to improve the services we deliver to do business anytime, anywhere
- 4.3 Ensure we can deliver our services with the available funding
- 4.4 Have effective and efficient processes and systems
- 4.5 Be a responsible corporate citizen
- 4.6 Apply the integrated management system across all of AMSA

#### STRATEGIC RISKS

- SR4. Failure to maintain financial viability
- SR5. Failure to maintain a safe working environment
- SR6. Failure to maintain systems of internal control
- SR7. Failure to maintain viable and reliable information technology infrastructure and systems

#### ENABLER GOALS

- EG.1 International standards reflect Australian expectations and international standards are reflected nationally
- EG.2 Improve and promote maritime safety and environmental protection in our region
- EG.3 Have a strong regional voice in international fora
- EG.4 Regional approaches align with agreed international priorities
- EG.5 Informed and engaged community on maritime issues, search and rescue issues, and our role
- EG.6 Effective engagement with communities to promote maritime safety
- EG.7 To be respected and trusted
- EG.8 Increase stakeholders' understanding of their responsibilities under the National System and during the transition to full service delivery
- EG.9 Create opportunities for people to provide relevant information and feedback to AMSA
- EG.10 Increase safety knowledge and practices amongst people that work with commercial vessels

#### STRATEGIC ENABLER (E)

COLLABORATING WITH OUR COMMUNITY

#### FOCUS AREA E1

WORKING WITH INTERNATIONAL ORGANISATIONS AND OTHER NATIONS

#### FOCUS AREA E2

WORKING WITH PARTNER ORGANISATIONS

#### FOCUS AREA E3

DEVELOPING STAKEHOLDER RELATIONSHIPS

#### FOCUS AREA E4

COMMUNITY SAFETY EDUCATION

DATA AND INFORMATION – HELPS US TO TARGET ALL THE SERVICES WE DELIVER

OUR PEOPLE – A PROFESSIONAL, FLEXIBLE AND ENGAGED WORKFORCE IS THE KEY TO SUCCESSFULLY

DELIVERING OUR VISION AND MISSION



# Unmanned and Autonomous Vessels

**DRAFT**

Autonomous and Unmanned vessels

Unmanned

*Always monitored and under positive control*

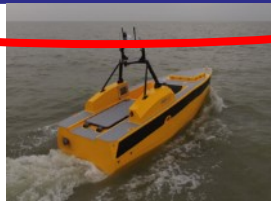
Autonomous

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

Unmanned Underwater Vessel (UUV)



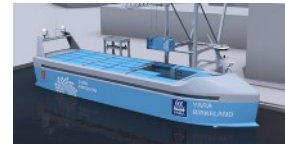
Unmanned Surface Vessel (USV)



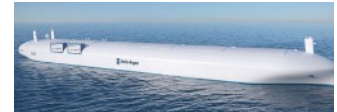
Autonomous Underwater Vessel (AUV)



Autonomous Surface Vessel (ASV)



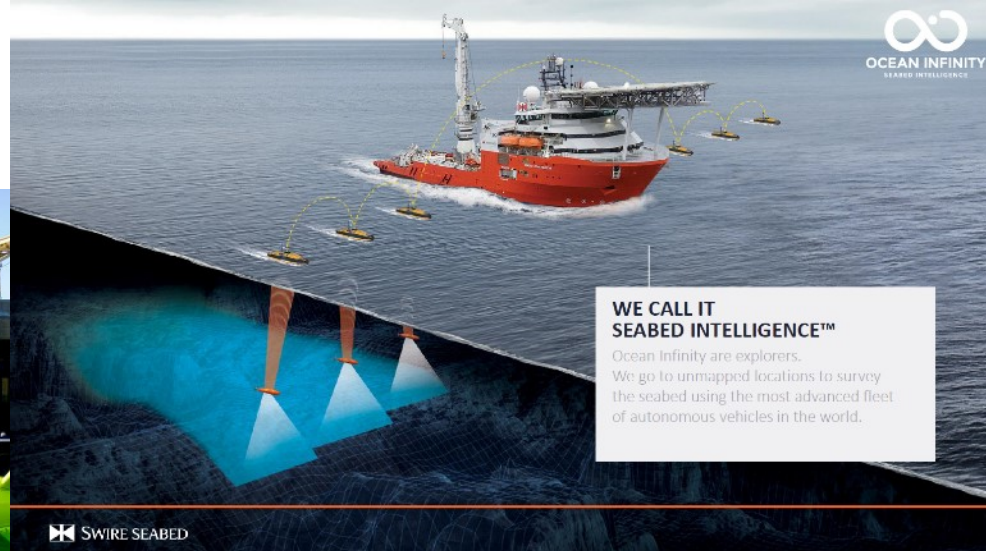
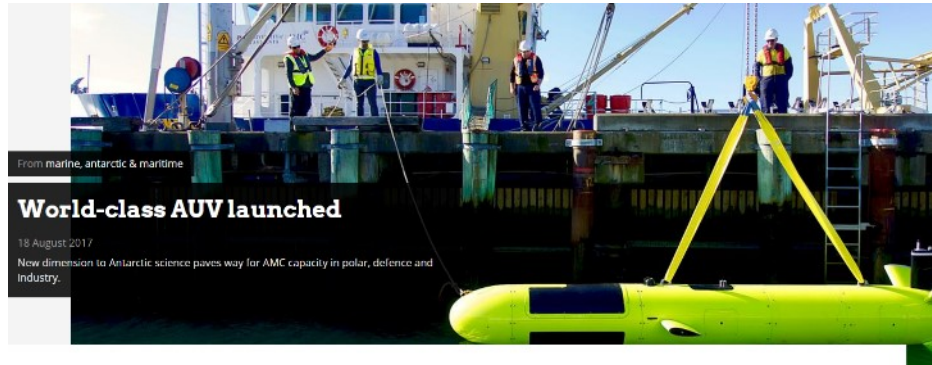
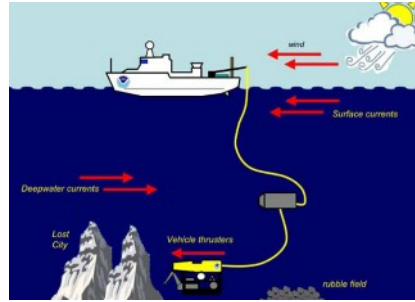
Marine Autonomous Surface Ship (MASS)



Regulated by Domestic and/ or International Law



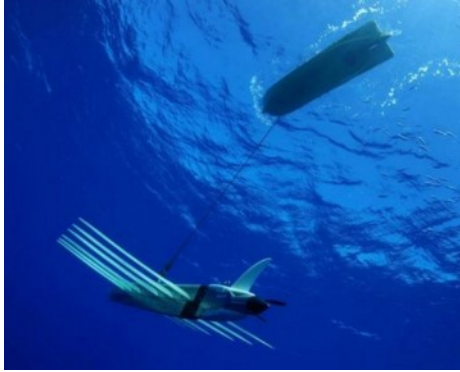
# Sub - Surface





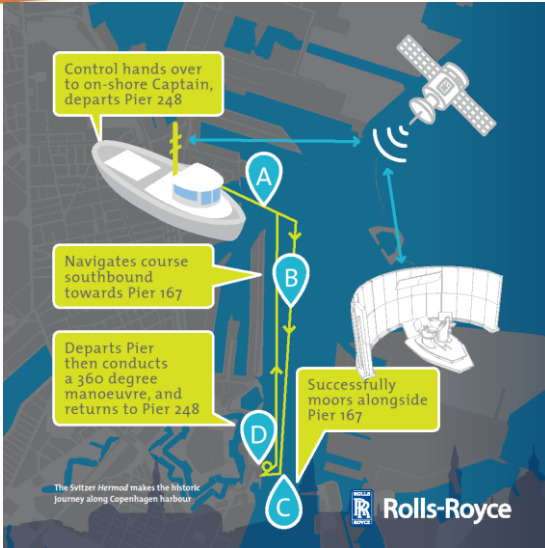
Australian Government  
Australian Maritime Safety Authority

# 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

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## 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.

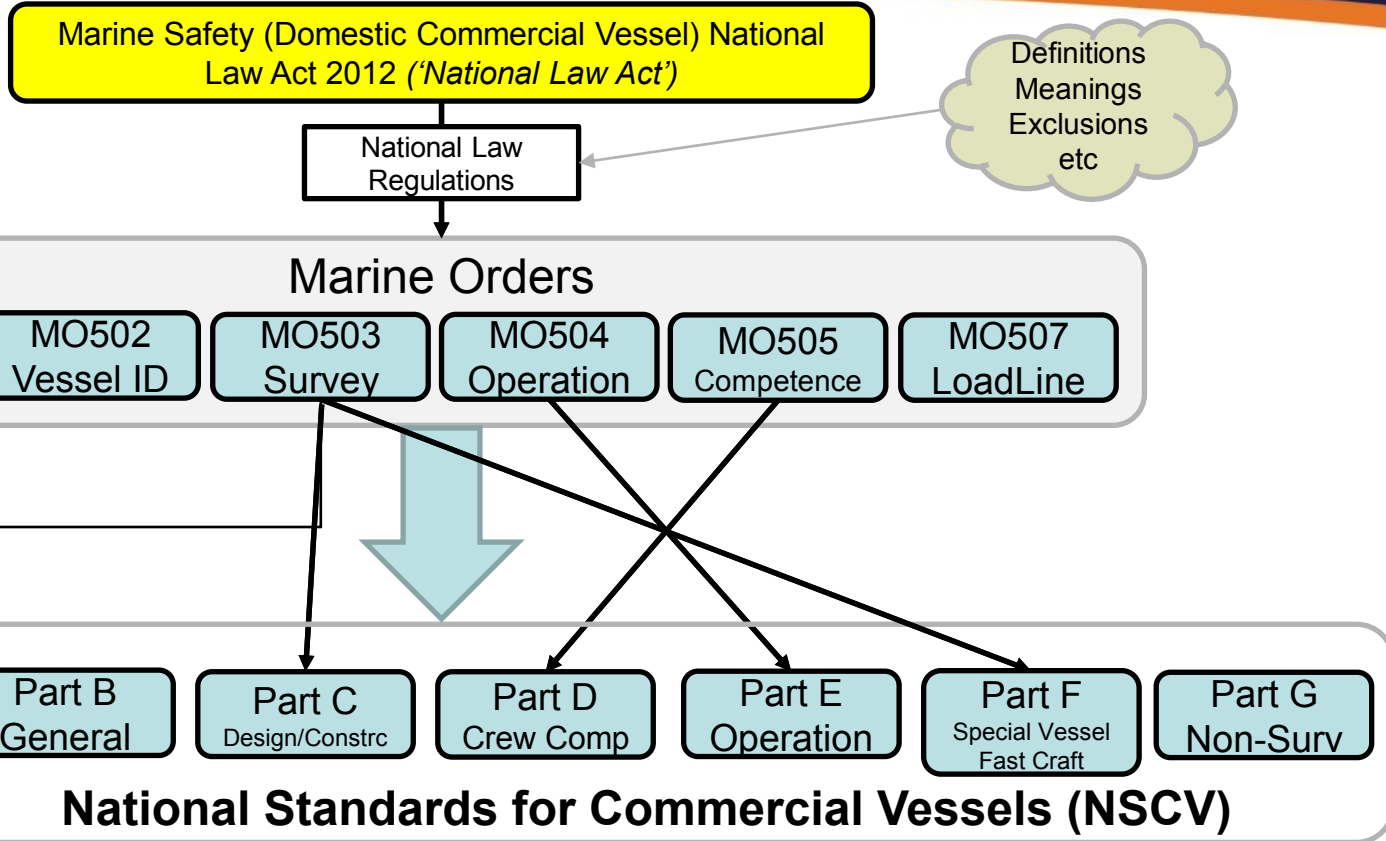
### On this page

- 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





# 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)*

*(Marine Safety (Domestic Commercial Vessel) National Law Act 2012. Part 1, Sect 6)*

- **Master**

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

*(Marine Safety (Domestic Commercial Vessel) National Law Act 2012. Part 1, Sect 6)*



# 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

<http://www.amsa.gov.au/domestic/national-law/>

- 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

<https://www.amsa.gov.au/forms-and-publications/Publications/AMSA655.pdf>



**So does it work????**







# ASV C-Worker 5



## SPECIFIC EXEMPTION

Section 143, *Marine Safety (Domestic Commercial Vessel) National Law Act 2012*

### Particulars of vessel

Name of Vessel CW-77		Unique Identifier 09529	
Measured Length 5.5 m	Service Category 2C	Vessel Type AUTONOMOUS SURFACE VESSEL	

- The Vessel is exempt from the application of sections 8, 10(2)(b) and 12(b) of *Marine Order 503 (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:
  - 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.
- The Vessel is exempt from the application of sections 8, 10(2)(b) and 12(b) of *Marine Order 503 (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:
  - NSCV Section C1 Clause 6.12.2 for provision of fixed guardrails or bulwarks.
  - NSCV Section C3 Clause 3.2.2 and Table 1, to the extent that the hull stiffener terminations and flange widths must comply with AS1799.5.
  - NSCV Subsection C5A Clauses 6.7.3, 6.8.7.3 and 6.8.7.4, for the carriage of an emergency steering system, rudder neck bearing length, and rudder mainpiece length.
  - NSCV Subsection C5B Clause 5.12 for the provision of an emergency power source for electronic navigational aids, navigation lights, and sound signals.
  - NSCV Subsection C7A Clause 5.3 for the carriage of safety equipment.
  - NSCV Subsection C7B Clause 4.3, 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



# Short Term.....

- 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)**



- Education
- Learning.....
- Benchmarking
- Risk Assessing
- Legal Checking
- Contribute IMO work

## Engagement

- Industry
- Class Societies
- Industry groups
  - AAUS
  - Drone Tech Institute
  - Academia
  - International (UK MASRWG)

**Progressing towards a risk based, practical, regulatory solution**



# Our approach

**Is a thing a vessel, and a DCV?**

- Legal checklist
- In progress

*Education  
and  
Information*

**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?

*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



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# Thank You

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