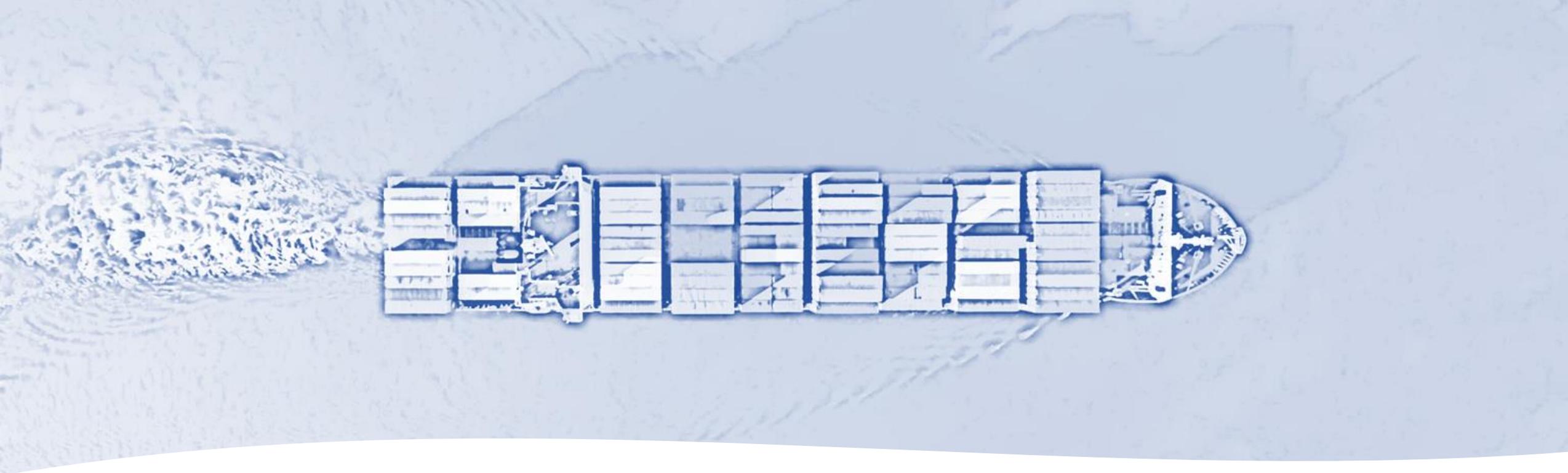


An aerial photograph of a large, rectangular iceberg floating in the ocean. The water is a deep blue, and the iceberg's surface is textured with various shades of blue and white, showing its jagged edges and internal structure. The text is overlaid on the right side of the image.

Remotely operated and autonomous ships: *New issues for the law of the sea?*

Professor Aldo Chircop, JSD
Marine & Environmental Law Institute
Dalhousie University, Halifax, NS, Canada



1. Introduction

- Technology has always been a principal driver of the law of the sea:
 - *Law of the sea* (e.g., cannon shot rule/TS; submarines/ transit passage; oil and gas drilling/continental shelf; scientific research technologies/MSR; etc.).
 - *Generally accepted rules and standards (GAIRAS) for shipping* (e.g., steel hulls, steam engine, bulkers, tankers, refrigeration, containerization, polar class, etc.)
- What does MASS mean for the United Nations Convention on the Law of the Sea, 1982 (LOSC)?
 - LOSC was intended to address ‘all issues relating to the law of the sea’ [preamble]: context and purpose for interpretation.
 - LOSC was intended to address international navigation and shipping.
 - What might be the law of the sea consequences of MASS, given the emerging characteristics of this technology and the LOSC assumption of humans crewing ships?

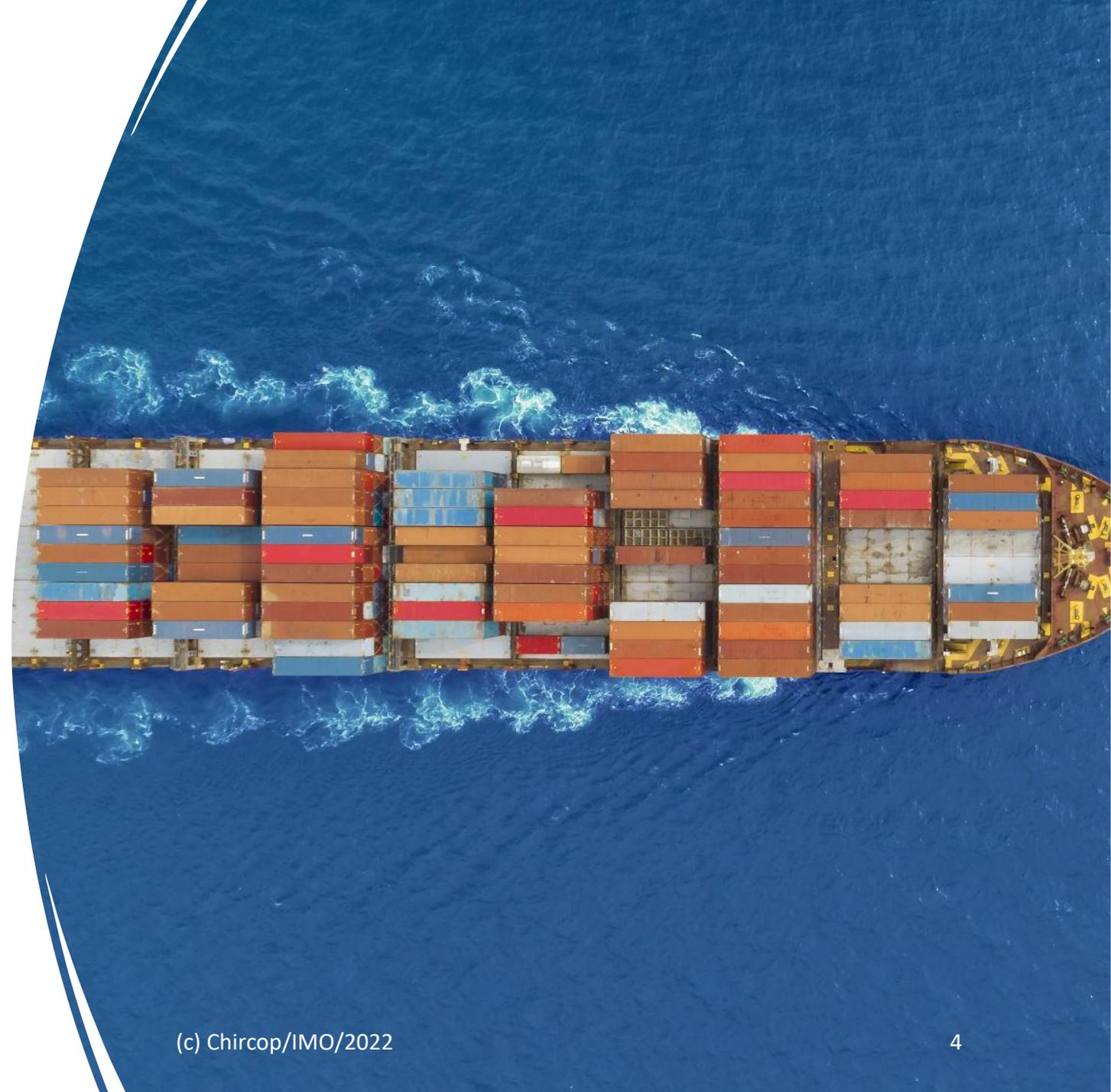


Degrees of autonomy (IMO, 2018)

1. Ship with automated processes and decision support: Seafarers are on board to operate and control shipboard systems and functions. Some operations may be automated.
2. Remotely controlled ship with seafarers on board: The ship is controlled and operated from another location, but seafarers are on board.
3. Remotely controlled ship without seafarers on board: The ship is controlled and operated from another location.
4. Fully autonomous ship: The operating system of the ship is able to make decisions and determine actions by itself.

3. Law of the sea considerations

- Definition of ship:
 - 'Ship' and 'vessel' are not defined in LOSC.
 - MASS as 'ship' or 'vessel' is not likely a legal issue.
 - Reliance on definitions in generally accepted international rules and standards (GAIRAS) adopted by IMO under LOSC is sufficient.
- Jurisdictional questions?
 - Flag State: jurisdictional responsibilities.
 - Coastal State: navigational rights and regulation of passage.
 - Port State: port entry and PSC inspections.



Flag State

Right to register any class of ship (91).

Registered ships enjoy navigation rights irrespective of class (90).

Flag State enjoys a mixture of exclusive/primary and concurrent jurisdiction over its ships depending on their location.

Flag State has a due diligence duty to exercise effective jurisdiction and control (administrative, technical, social matters) (94; *SRFC Adv Op*).

Flag State due diligence responsibilities (Arts 94, 98, 211, 217, etc.)

To assume jurisdiction over its ships and take measures 'as are necessary' to ensure safety at sea [94(2)(b); 94(3)].

To ensure ships are in the charge of properly qualified master and officers [94(4)(b)].

To ensure ships are crewed in accordance with their class [94(3)(b); 94(4)(b)].

To ensure the master and crew are conversant/required to comply with international safety, collisions avoidance, pollution prevention, radio communications rules [94(4)(c)].

To ensure conformity with generally accepted international regulations, procedures and practices and take steps to secure their observance [94(5)].

To require master to offer assistance to persons in distress at sea [98].

To ensure compliance with international rules and standards and provide for effective enforcement, including to prevent operation of ships not in compliance with manning requirements [211; 217].

Interpretational issues

Documents and navigational equipment on board [94(4)(a)]:
'as are appropriate'

Manning requirement [94(4)(b)]: is 'in the charge of' limited to an onboard crew or could this be constructively interpreted to include a shore-based team?

Qualification requirements [94(4)(b),(c)]: do these extend to shore-based personnel?

Crewed according to ship's class [94(4)(b)]: includes temporary crews? Shore based team?

Radio communications/ reporting on board [94(4)(c)]: would a shore based-crew be able to discharge this requirement?

Provision of assistance at sea [98]: can a crewless vessel discharge this duty?

Flag State jurisdiction over master and crew [94(1)]: how can it be exercised when the vessel is fully autonomous or remotely controlled from another jurisdiction?

Coastal State



- Coastal State enjoys sovereignty over its internal waters (e.g. ports).
- Coastal State sovereignty over the territorial sea is subject to the regime of innocent passage regulation ([21].
 - Must not apply 'design, construction, manning or equipment [standards] unless they are giving effect to generally accepted international rules or standards.'
 - Until the IMO regulates MASS, can the coastal State require the crew to be on board, e.g., in heavy traffic areas?
 - Arts. 41-42 (straits): coastal State likely cannot impose a manning requirement. Safety regulation focuses on sea lanes and TSS. Non-discrimination.

Port State

- Potential PSC inspection issues (e.g., 218)
 - Boarding.
 - Can inspection of MASS vessel/equipment be extended to other onshore equipment, processes, etc.? Who should the inspector interview?
 - Communication of findings to person responsible for the vessel.

4. Conclusion

- LOSC should be regarded as a living instrument whose context and purpose are responsive to new technologies.
- Importance of contextual, pragmatic and functional interpretation of LOSC.
- IMO is the competent organization for the development of GAIRAS under LOSC.
- LOSC rules on shipping are nourished by GAIRAS: MASS is not an exception.
- GAIRAS already play an important role in LOSC interpretation and will continue to do so with MASS.
- MASS issues can be likely addressed through GAIRAS.

