



Members' Working Group and Forum (MWGF 1)

15 October 2025

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Agenda

- 1. Introduction to the MWGF**
- 2. IMPA in international forums (IMO, IALA)**
- 3. Update on IMPA's work related to the safety of pilots on duty**
 1. Next steps with SOLAS regulation V/23 and the new mandatory performance standards
- 4. Update on IMPA's work related to the purpose of pilotage**
 1. The International Study on Remote Pilotage
 2. Pilotage as a complex system
- 5. Emerging opportunities and challenges affecting Members**
- 6. Opportunities for Members to contribute to IMPA's work**
- 7. Arrangement for the next MWGF**



IMPA at IMO

Committees		Files							
		Purpose of Pilotage	Safety of Pilots on Duty	Human Capital	Ship-Shore Interface	MASS and Digitalisation in Navigation	Energy Efficiency and GHG Emissions from Ships	Port State Control	Maritime Safety Investigations
Maritime Safety Committee	MSC	✓	✓			✓			
Marine Environmental Protection Committee	MEPC						✓		
Facilitation Committee	FAL				✓				



IMPA at IMO

Sub-Committees		Files							
		Purpose of Pilotage	Safety of Pilots on Duty	Human Capital	Ship-Shore Interface	MASS and Digitalisation in Navigation	Energy Efficiency and GHG Emissions from Ships	Port State Control	Maritime Safety Investigations
Navigation, Communications and SAR	NCSR		✓			✓			
Human Element, Training and Watchkeeping	HTW			✓					
Implementation of IMO Instruments	III							✓	✓
Ship Design and Construction	SDC		✓						

IMPA at IALA

Committees		Files		
		MASS	Digitalisation of Waterways	Remote Pilotage
Digital Technologies Committee	DTEC	✓	✓	✓
VTS Committee	VTS	✓		✓
Aids to Navigation Requirements and Management Committee	ARM			
Engineering and Sustainability Committee	ENG			

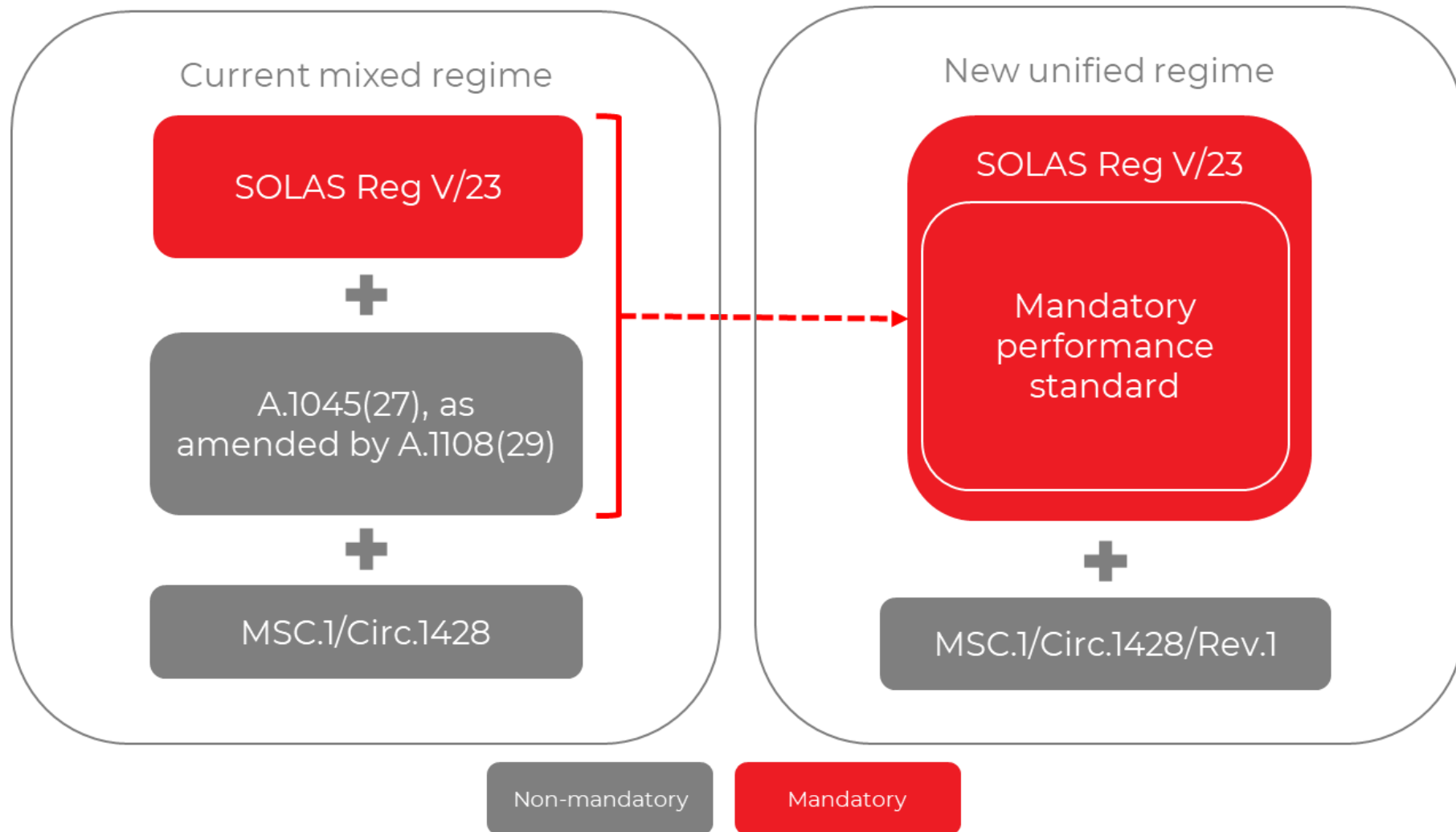


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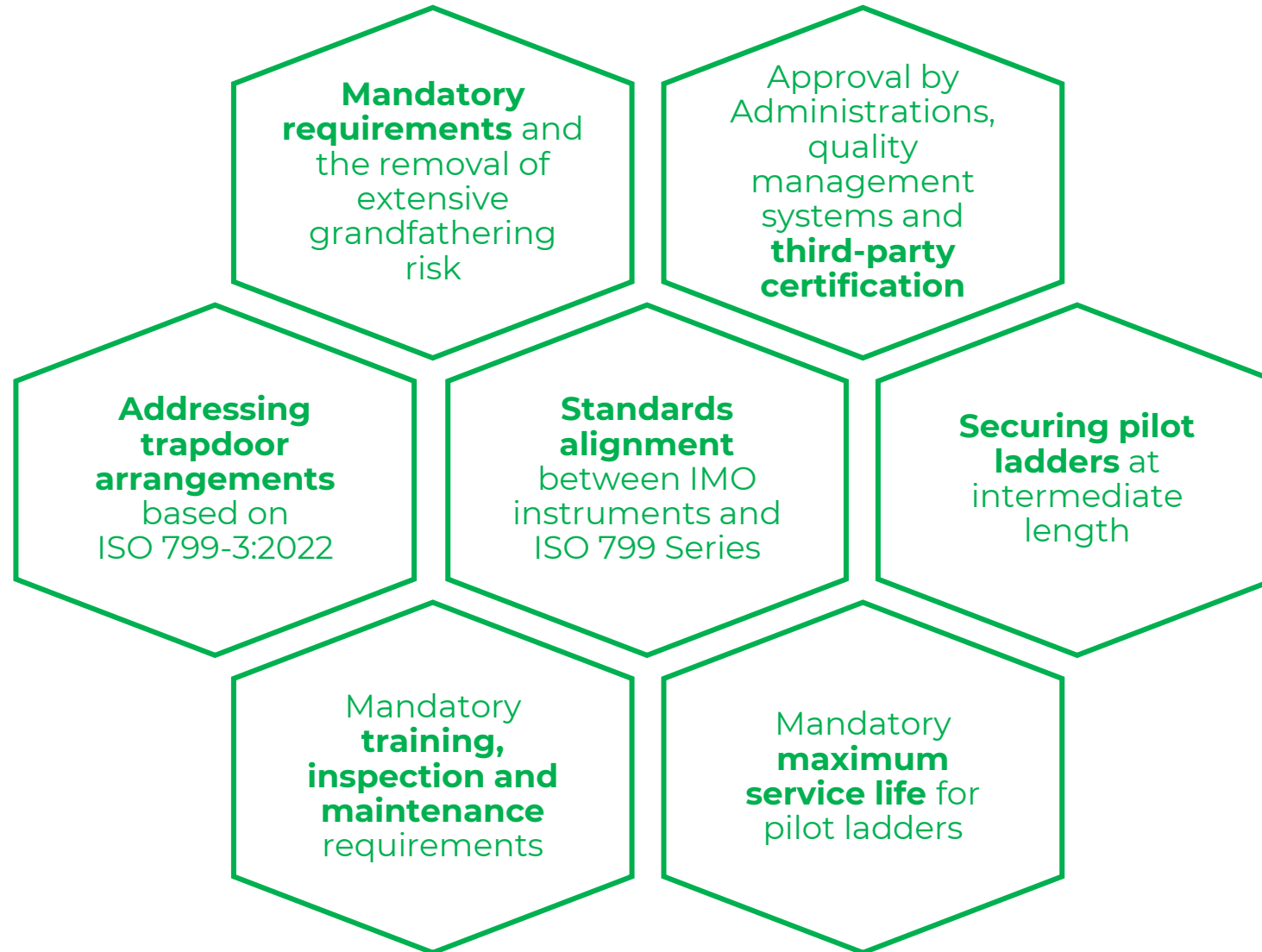
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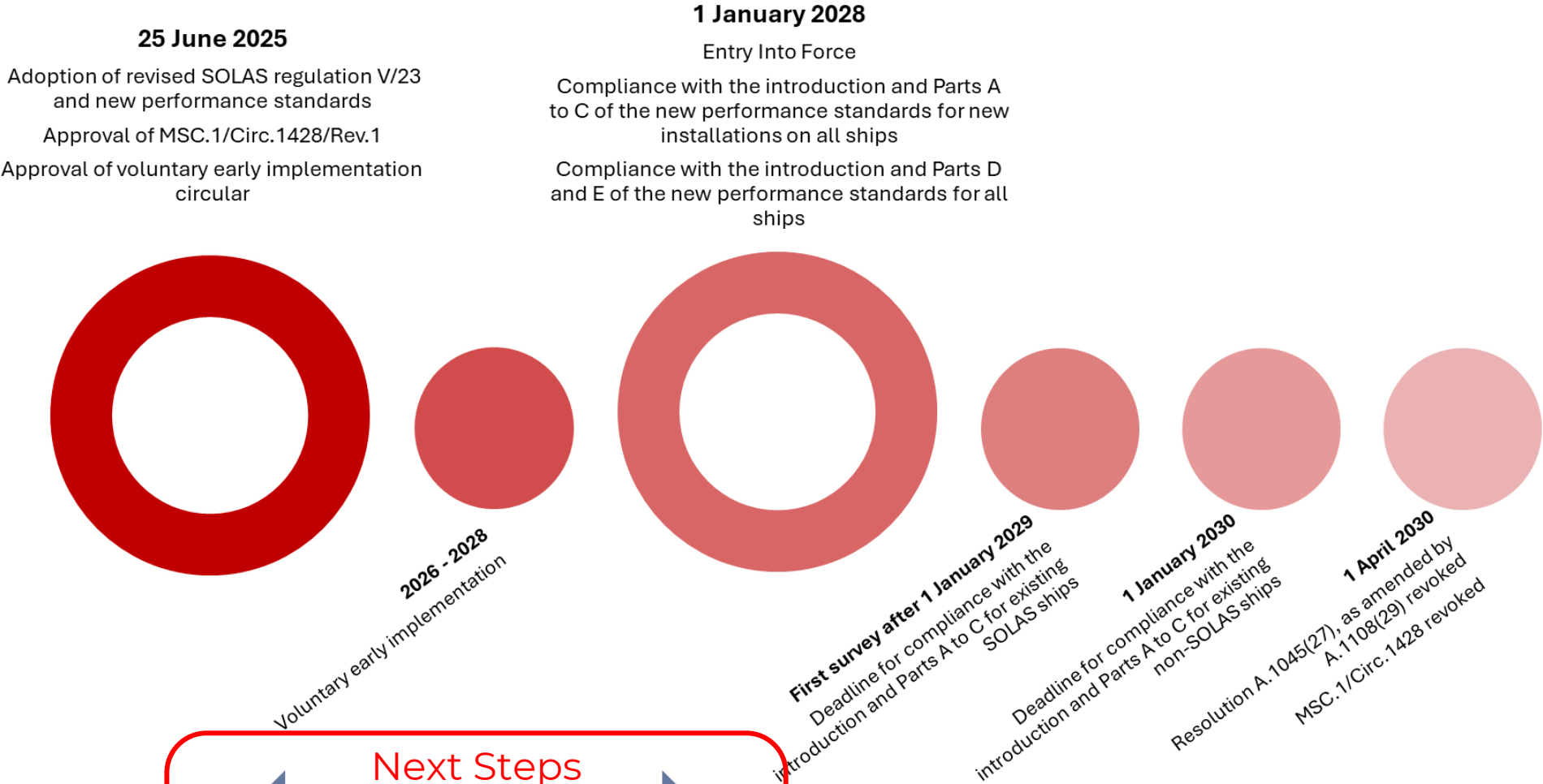
SOLAS regulation V/23



Specific Outcomes



Timelines



Next Steps

← Updates to ISO 799 standards to support consistent global implementation of new requirements →

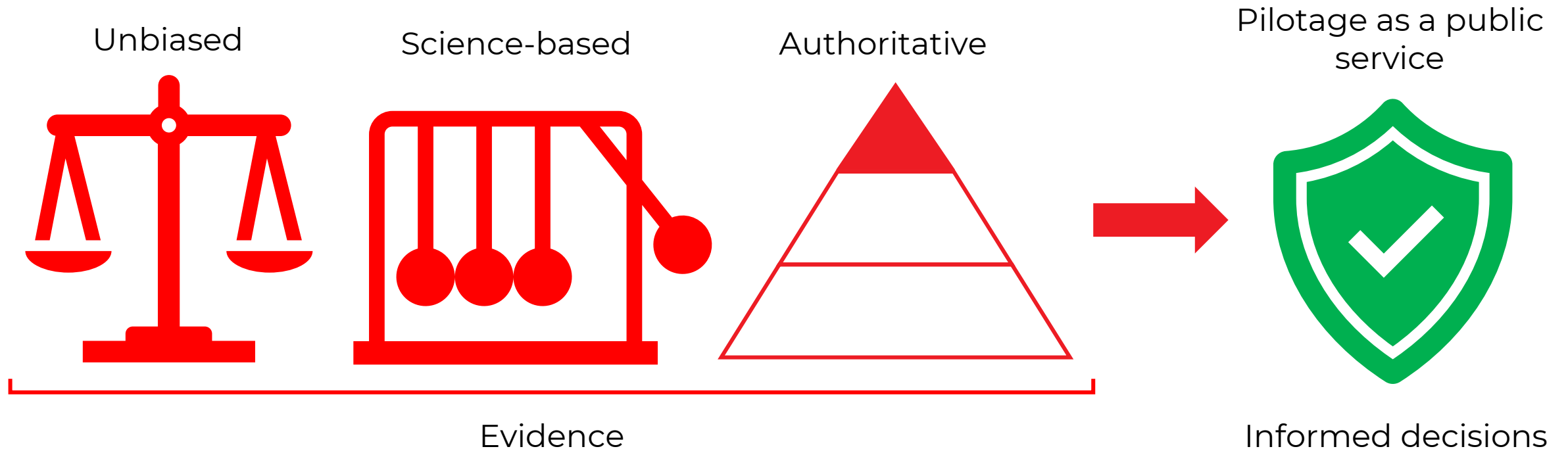


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Why ?



Who?

Project sponsor



Supporting partners



Canadian
Coast Guard

Garde côtière
canadienne

Local Stakeholders Advisory Group (LSAG)



Key Assumptions

Planning Assumptions

- Qualified, licensed pilots
- Mandatory pilotage waters
- Established performance benchmarks
- Trials within current legal framework

Outputs

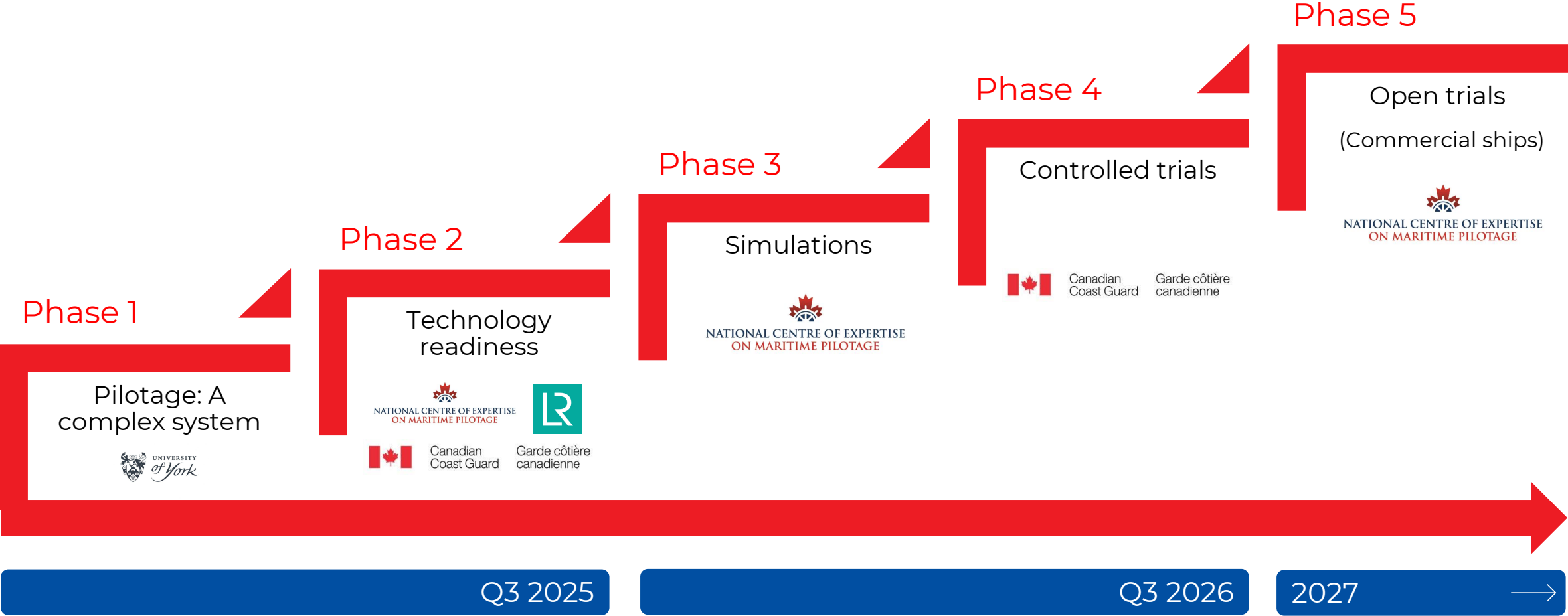
- Quantitative and qualitative observations
- Public reports
- Reusable methodology

Out of Scope

- Remote navigation
- Navigation assistance provided by VTS
- Transit, deep-sea and recommendatory pilotage
- Technology qualification and certification



Methodology and Timeline



Phase 1: Pilotage: a complex system

- **Document maritime pilotage as a complex system**
 - Primary and secondary legislation, and regulation
 - Management, tasks and technical characteristics of the system
 - Controls required to manage the consequences of complexity
- **Four major activities in the context of remote pilotage**
 - A model of pilotage “as is”
 - Hazard and risk assessment of transition from “as is” to “remote pilotage”
 - Identification of controls required to manage complexity arising from the introduction of remote pilotage
- **Reusable methodology beyond remote pilotage**



UNIVERSITY
of York

Phase 2: Technology Readiness Assessment

- **Identification of candidate remote pilotage solutions**

- First Request for Information (RFI) – November 2024
- Three formal proposals (AD Navigation, Dryad Global and DanPilot/Danelec)

- **Assessment of candidate remote pilotage solutions**

- Extensive desk-top assessment with proponents in April and May 2025
- Evaluation of proposals based on pilotage workflows, compatibility, scalability and security
- AD Navigation solution based on their current offering for SPM and FPSO mooring
- DanPilot/Danelec solution was the system being trialled for parts of the transit pilotage routes in the entrance to the Baltic
- Neither solution sufficiently capable to provide confidence that the Study will be able to achieve its objectives



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TRA Snapshot – AD Navigation

Strengths

- Simplicity of the system and utilisation of proven PPU sensors, providing RTK
- Demonstrably effective in single SPM and FPSO applications
- Resilience to jamming and spoofing provided by the XR2 PPU
- UHF, WLAN and 4G/5G support for data exchange
- Not reliant on shore-based infrastructure

Opportunities

- Line-of-sight applications for maritime pilots leading ships from another vessel in mandatory pilotage areas in accordance with national legislation

Weaknesses

- Supports voice-only communications for the continuous MPX
- Pilot has no access to radar for relative navigation and collision avoidance
- Reliant on AIS for collision avoidance
- Reliant on predicted rather than actual depth beneath the keel
- Pilot unable to immediately verify the execution of helm and telegraph orders
- Capabilities are limited to those tasks where the pilot requires PPU decision support only

Threats

- Not designed to support over-the-horizon applications where the PPU is more than a decision support tool
- Pilot is compromised in their ability to demonstrate compliance with the COLREGs (lookout by radar, reliance on AIS)
- Does not support shared situational awareness between the Master and bridge team (using shipboard sensors and ECDIS), and the pilot (using PPU sensors and software)
- The pilot's instructions are not recorded by the ship's VDR



TRA Snapshot – DanPilot/Danelec

Strengths • NCC Communicator as a means of conducting a continuous MPX • Under trial as an over-the-horizon remote pilotage solution in recommended pilotage areas in the entrance to the Baltic • The pilot is provided with a wide range of data and information necessary for pilotage, and there are opportunities for maritime pilots and Masters and bridge teams to develop and maintain situation awareness	Weaknesses • No day/night optical component • Encourages significant reliance on GNSS • Pilot is reliant solely on a VDR and the data it collects from shipboard sensors • Pilot is reliant on radar images captured by the VDR with no ability to use it independently for navigation or collision avoidance. • No RTK data for manoeuvring large vessels and to provide an independent PNT source • Requires Masters and bridge teams to be vetted to be able to use the system, where vetting is a standard below a PEC • Only communications made using the chat are recorded by NCC Communicator • Use of VHF as a redundancy measure for communications requires a coastal station radio licence
Opportunities • Utilisation of existing onboard data collection infrastructure • Enables remote pilotage use cases in mandatory pilotage waters where a pilot or PEC holder is on board the ship	Threats • Not designed to support port pilotage with gaps in the ability to conduct closed-loop communications with tugs and mooring personnel • Single points of failure in communications and data exchange (VDR, VRS), presenting a risk of ships navigating in mandatory pilotage areas without a pilot or PEC holder directing the navigation • Pilot is compromised in their ability to demonstrate compliance with the COLREGs (lookout by sight and radar) • Potential bridge manning implications in mandatory pilotage waters where there is a high volume of communications between the pilot and the bridge team

Next steps

- **Phase 1: Pilotage as a complex system**
 - Workshop with the University of York to explore the initial “as is” model for pilotage
 - Workshop with worldwide maritime pilotage experience to validate conclusions (TTBC)
 - First report expected in 2026.
- **Phase 2: Technology Readiness Assessment**
 - Second RFI with more detailed goal-based high-level specifications planned for Q4 2025
 - More detailed specification of requirements in a goal, claim, and evidence formulation
 - The more detailed specifications are anticipated to allow us to find a system for Phases 3 – 5 of the Study
- **Phases 3 to 5: Trials Phases**
 - Trial phases originally planned to begin late 2025/early 2026 will be shifting to late 2026/early 2027.



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Thank you

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