

One Sea – Autonomous Maritime Ecosystem

Vision and roadmap for autonomous maritime transport system

MTEC/ICMASS 2019

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DIMECC

The objective of **One Sea** is to have world's first autonomous maritime system in operation by 2025.

DIMECC is a co-creation ecosystem that combines digitalization, internet, materials and engineering.

A large container ship, the Tsingtao Spirit, is shown from an aerial perspective, sailing on a dark blue ocean. The ship is heavily loaded with multi-colored shipping containers (red, yellow, green, blue, and white) stacked high on its deck. The ship's hull is dark blue with a red upper section. The name 'TSINGTAO SPIRIT' is visible on the side of the hull. The ship is moving towards the right, leaving a white wake behind it. The sky is a clear, pale blue.

Global pioneers of marine industry are leading the business-driven project.

One Sea Partners

ABB
Awake.AI
Cargotec
Ericsson
Finnpilot Pilotage
Inmarsat
MTI (NYK Group)
Kongsberg
Tieto
Wärtsilä



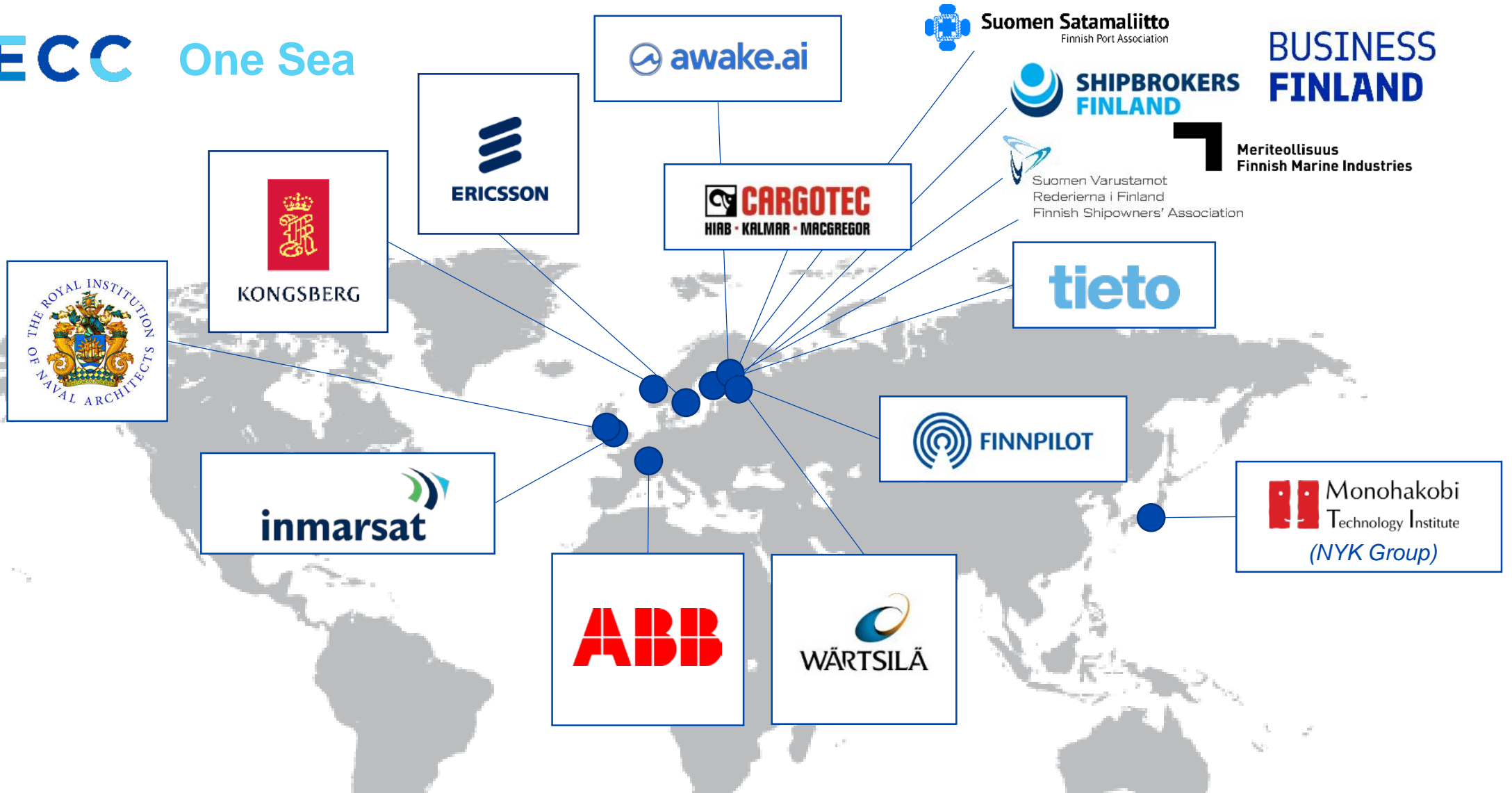
KONGSBERG



tieto



**BUSINESS
FINLAND**



One Sea ecosystem is a collaboration of leading, global, multi-industrial companies, to enable autonomous logistics system.

DIMECC

**Safe
Clean
Efficient**



Image © Wärtsilä

The objective of **One Sea** is to create the world's first autonomous maritime transport system by 2025

autonomous maritime transport system

Fairways



Ports



Ships



Cloud

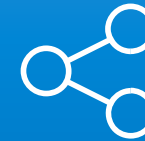


...

Cyber security



Interfaces



...

AI



Satellite



autonomous maritime transport system

New business models



...

Legal



Ethics



Terrestrial



Standards



...

Human factor



...

...

Ecosystem activities

Ecosystem Core Activities	Vision & Strategy	Roadmaps			
Ecosystem Program Activities <i>Open to all parties</i>	Product & service creation				
	Startup ecosystem				
	Pilots, PoC's				
	R&D Programs				
	Rules & regulations				
	Test areas, Labs				

Roadmap published in 2017

Timeline for autonomous ships

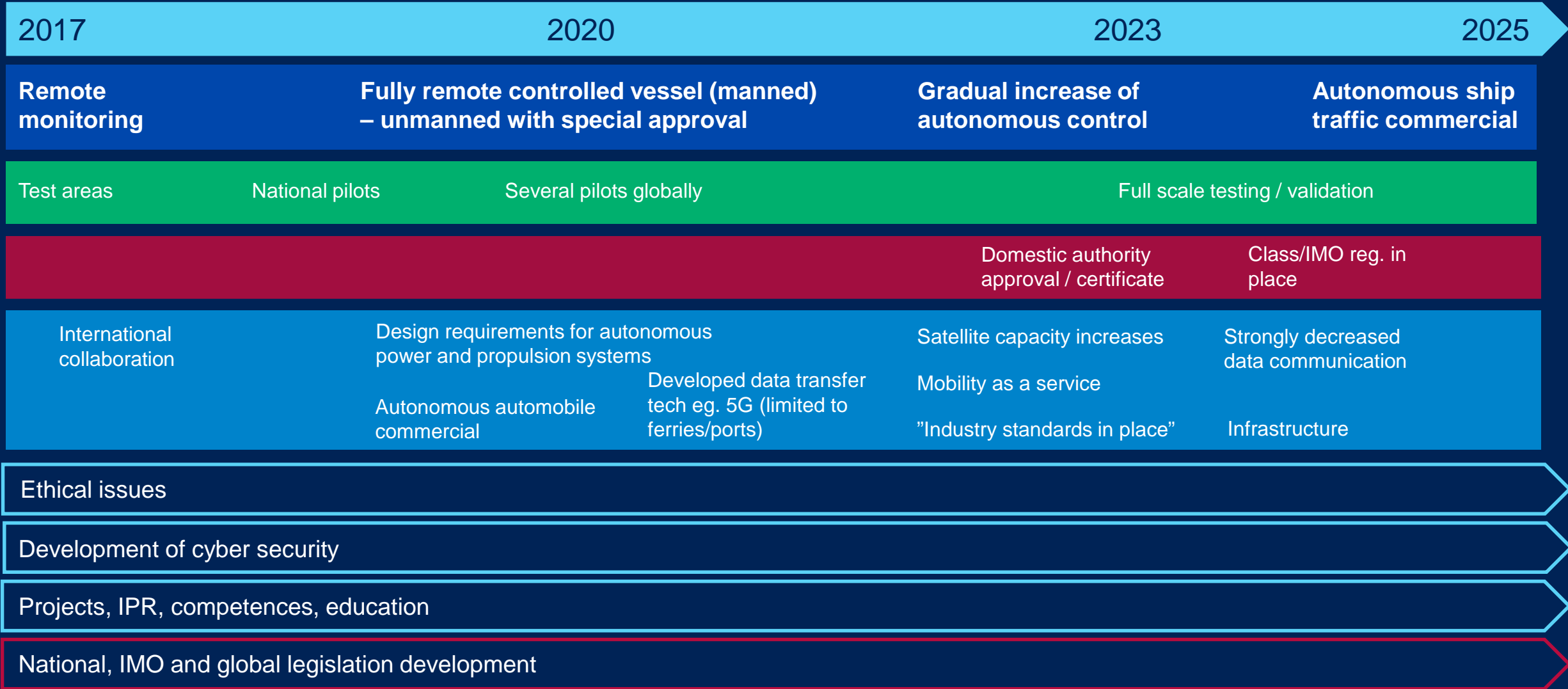
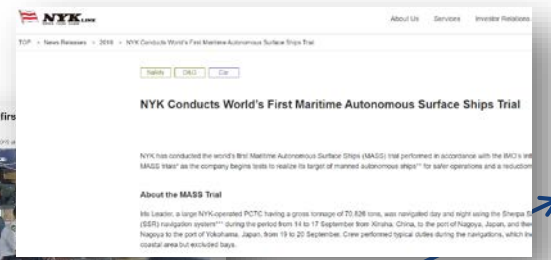
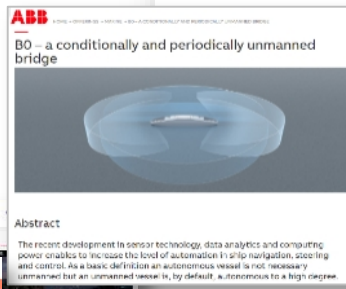
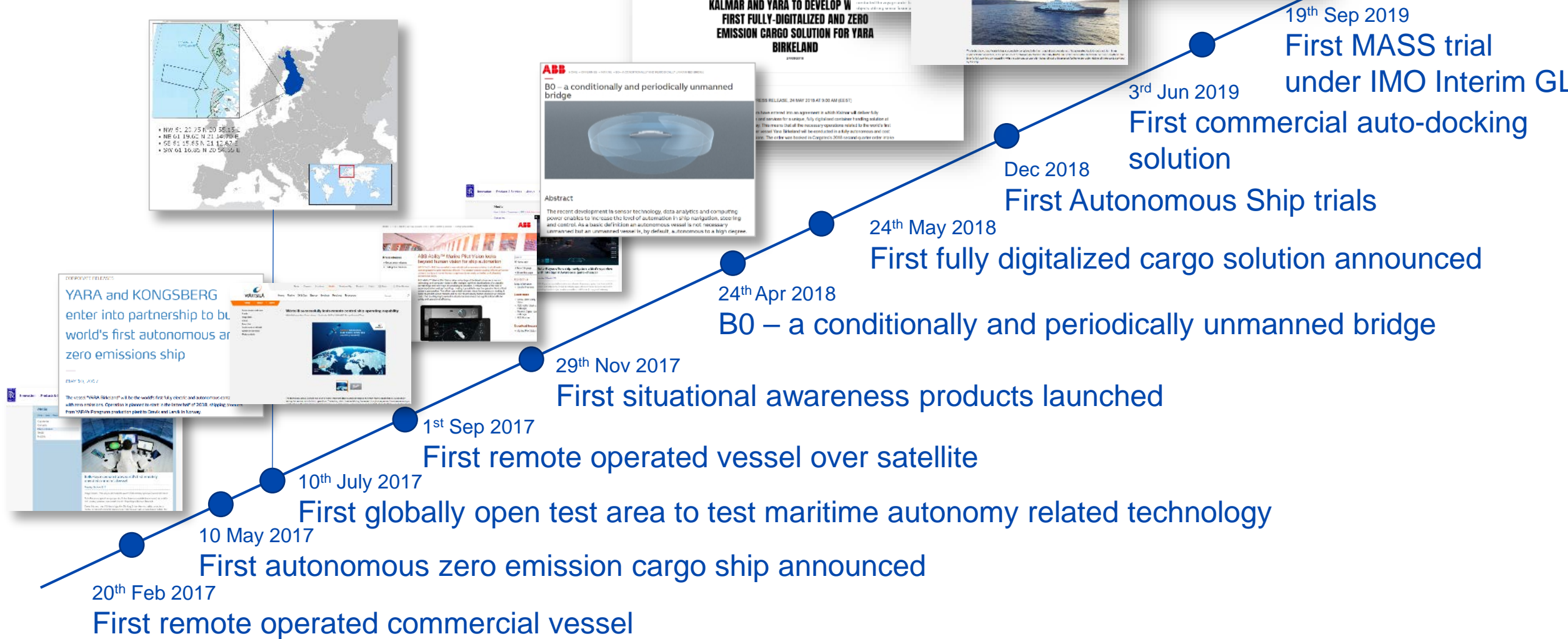




Image @ Kongsberg

One Sea main themes

Recent development



Our Work | Publications | Knowledge Centre

IMO / English / Media Centre / Meeting Summaries / Maritime Safety Committee (MSC) / MSC 98th session

Maritime Safety Committee (MSC), 98th session, 7-16 June 2017

16/06/2017

Scoping exercise on autonomous vessels put on agenda

The MSC agreed to include the issue of marine autonomous surface ships on its agenda. This will be in the form of a scoping exercise to determine how the safe, secure and environmentally sound operation of Maritime Autonomous Surface Ships (MASS) may be introduced in IMO instruments.

The MSC recognises the introduction of touch on an extensive range of the marine environment. The MSC recognises the introduction of touch on an extensive range of the marine environment.

**June 2017
MASS introduced in IMO agenda**

16/06/2017

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MSC 101/WP.8
Annex 3, page 2

ANNEX

INTERIM GUIDELINES FOR MASS TRIALS

1 Introduction

1 June 2019

Interim guidelines for MASS Trials

protection of the environment.

Roadmap published in 2017



• NW 61 20.75 N 70 58.35 E
• NE 61 19.60 N 21 14.70 E
• SE 61 15.65 N 21 12.67 E
• SW 61 16.85 N 20 54.55 E

ABB

B0 – a conditionally and periodically unmanned bridge

Abstract

The recent development in sensor technology, data analytics and computing power enables to increase the level of automation in ship navigation, steering and control. As a basic definition an autonomous vessel is not necessary unmanned but an unmanned vessel is, by default, autonomous to a high degree.

ABB enables groundbreaking trial of remotely operated passenger ferry

Rolls-Royce and Finferries demonstrate world's first Fully Autonomous Ferry

Virtuali achieves notable advances in automated shipping with latest successful trials

NYK

NYK Conducts World's First Maritime Autonomous Surface Ships Trial

NYK has conducted the world's first Maritime Autonomous Surface Ships (MASS) trial performed in accordance with the IMO's MASS trial as the company begins tests to realize its target of manned autonomous ships for safer operations and a reduction in crew costs.

About the MASS Trial

The vessel, a large NYK-operated PCTC having a gross tonnage of 70,026 tons, was navigated day and night using the Ebersol ISSD/navigation system during the period from 16 to 17 September from Kinshu, China, to the port of Nagoya, Japan, and the Nagoya to the port of Kobe, Japan, from 18 to 20 September. Crew performed typical duties during the navigations, which included coastal areas but excluded bays.

Ethical issues

10th July 2017

First globally open test area

Projects, IPR, competences

24th Apr 2018

B0 – a conditionally and periodically unmanned bridge

Dec 2018

First Autonomous Ship trials

Sep 2019

First MASS trials under IMO Interim guidelines



Master of Engineering in Autonomous Maritime Operations

<https://www.novia.fi/degree-students/master-degree-programmes/master-of-engineering-autonomous-maritime-operations/>

§ Amendments to Pilotage Act to allow ePilotage trials

<https://www.lvm.fi/en/-/legislative-amendments-to-allow-remote-pilotage-946792>

Research alliance for Autonomous Systems

<https://www.vttresearch.com/media/news/raas-research-alliance-to-drive-innovation-in-the-automation-of-transport-and-logistics>

§ Regulatory changes in manning and watch keeping

<https://www.lvm.fi/en/-/legislative-amendment-promotes-automatisation-tests-in-maritime-transport-with-regard-to-manning-and-watchkeeping-976729>

Autonomous vessel model tests

<https://akerarctic.fi/en/news/press-release-aker-arctic-demonstrates-autonomous-vessel-model-tests>

Renewed road ferry strategy

https://www.businessfinland.fi/ajankohtaista/uutiset/2018/uudet-maantielauttaliikenteen-kilpailutukset-kannustavat-ymparistoinvestointeihin/?ref=ms_li

Research projects on autonomous vessels & UAV's

<http://techfinland100.fi/category/autonomous-and-collaborative-offshore-robotics-acolor/>

Autonomous maritime test areas in number of countries

<https://www.oneseaecosystem.net/test-area/>

§ IMO Scoping Exercise for MASS

<http://www.imo.org/en/MediaCentre/MeetingSummaries/MSC/Pages/MSC-98th-session.aspx>

Correspondence group on MASS prior to MSC100

**”If you could choose only one word of importance for MASS to happen,
what would that be?”**

”If you could choose only one word of importance for MASS to happen, what would that be?”



EU Digital Transport Days in Helsinki 2019-10-09

Towards Maritime Autonomous Surface Ships (MASS) – Technological and Regulatory Aspects

**DIMECC's co-creation ecosystem
One Sea seeks global partners to join
the leading co-creation ecosystem.**

Join us!

www.oneseaecosystem.net

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