



One Sea – Autonomous Maritime Ecosystem

MASS Trials – observations

INAS Workshop on test strategies and
guidelines for tests of autonomous ships
Trondheim, 12th Nov 2019

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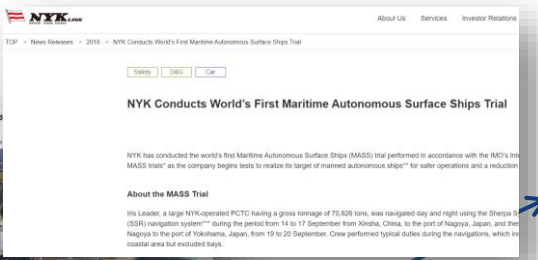
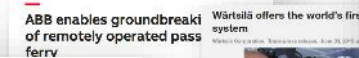
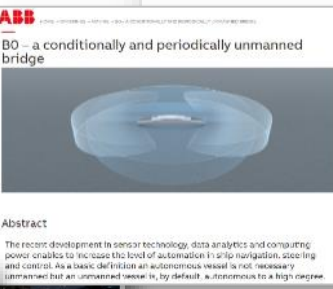
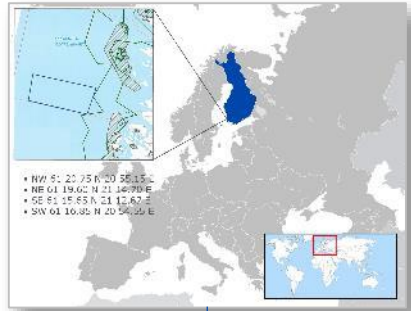
DIMECC

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

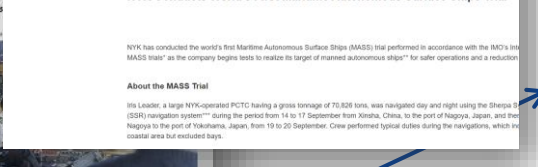
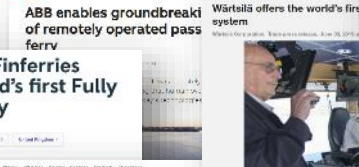
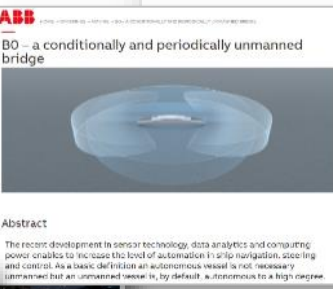
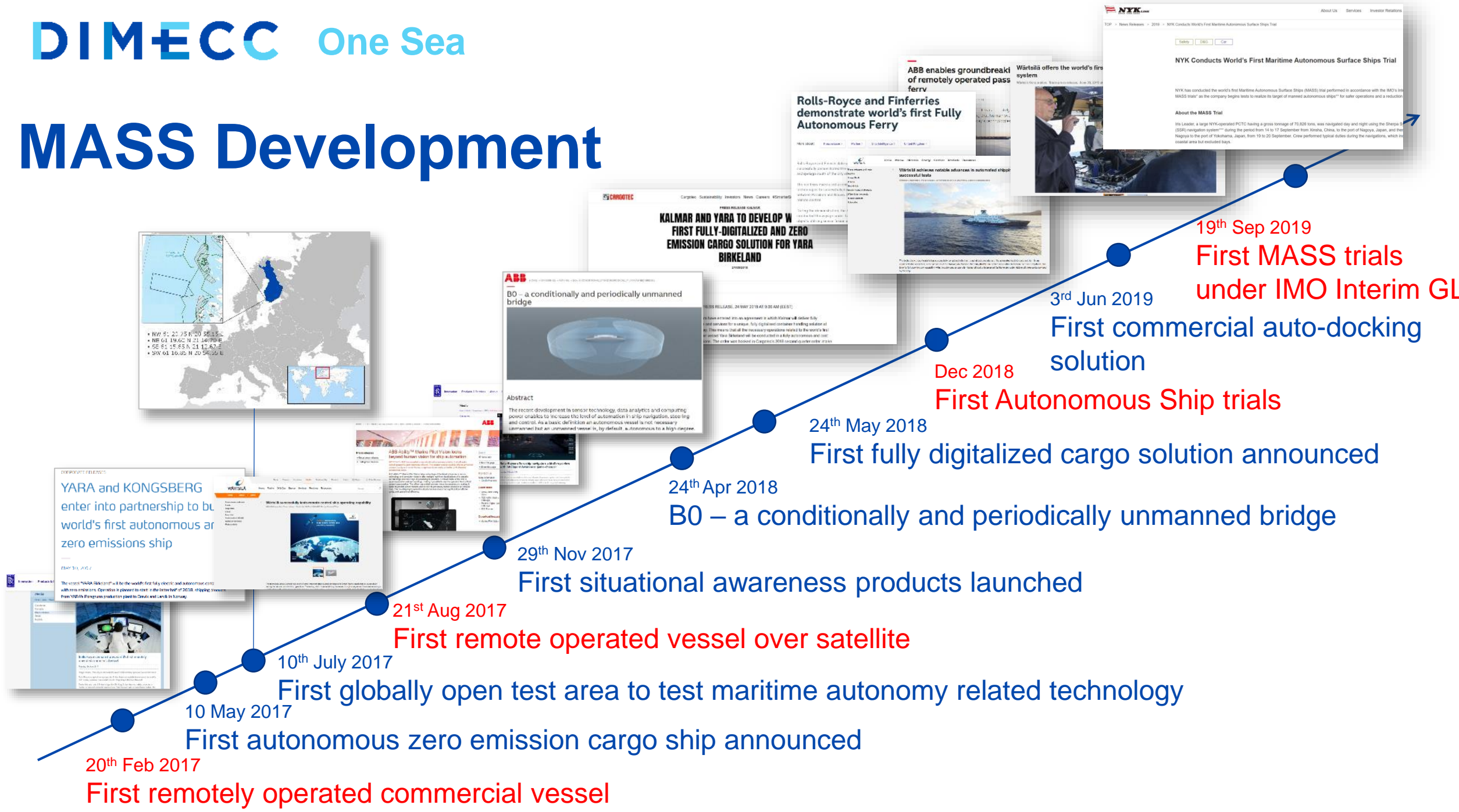
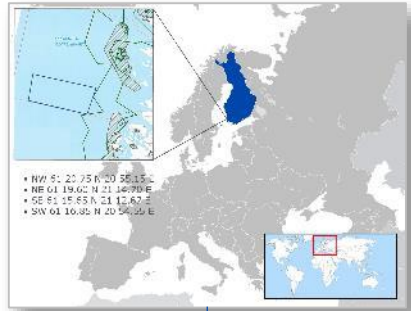


Image @ Kongsberg

MASS Development



MASS Development



20th Feb 2017

First remotely operated commercial vessel

Svitzer Hermod tug boat Copenhagen harbour, Denmark

The vessel features a range of sensors which combine different data inputs using advanced software to give the captain an enhanced understanding of the vessel and its surroundings.

The data is transmitted reliably and securely to a Remote Operating Centre (ROC) from where the Captain controls the vessel.



Rolls-Royce demonstrates world's first remotely operated commercial vessel

More about: [Press release >](#) [Marine >](#) [Automation and control >](#) [Global >](#)

20 June 2017

Rolls-Royce and global towage operator Svitzer have successfully demonstrated the world's first remotely operated commercial vessel in Copenhagen harbour, Denmark.

Earlier this year, one of Svitzer's tugs, the 28m long *Svitzer Hermod*, safely conducted a number of remotely controlled manoeuvres. From the quay side in Copenhagen harbour the vessel's captain, stationed at the vessel's remote base at Svitzer headquarters, berthed the vessel alongside the quay, undocked, turned 360°, and piloted it to the Svitzer HQ, before docking again.

The companies have also signed an agreement to continue their cooperation to test remote and autonomous operations for vessels. The primary systems involved will be autonomous navigation, situational awareness, remote control centre and communication.

21st Aug 2017

First remotely operated vessel over satellite

Ship North Sea coast of Scotland, Remote operations done from San Diego, California 8000 km away

Testing the remote control of ship operations. The testing involved driving the vessel through a sequence of manoeuvres using a combination of Dynamic Positioning (DP) and manual joystick control

Testing was carried out using only standard bandwidth onboard satellite communication. No land-based technology was used for the communications between the vessel and the remote operator work station.



Dec 2018

First Autonomous Ship demonstrations

Helsinki, Finland

ABB enables groundbreaking trial of remotely operated passenger ferry

Group press release | Zurich, Switzerland | 2018-12-04

Ice-class passenger ferry Suomenlinna II was remotely piloted through test area near Helsinki harbor, proving that human oversight of vessels from anywhere is achievable with today's technologies



<https://new.abb.com/news/detail/11632/abb-enables-groundbreaking-trial-of-remotely-operated-passenger-ferry>

Turku, Finland

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

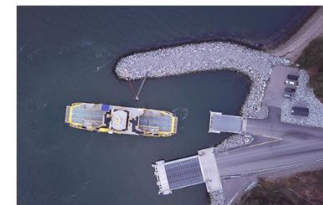
More about: [Press release >](#) [Marine >](#) [Ship Intelligence >](#) [United Kingdom >](#)

03 December 2018

Rolls-Royce and Finnish state-owned ferry operator Finferries have today successfully demonstrated the world's first fully autonomous ferry in the archipelago south of the city of Turku, Finland.

The car ferry *Falco* used a combination of Rolls-Royce Ship Intelligence technologies to successfully navigate autonomously during its voyage between Parainen and Nauvo. The return journey was conducted under remote control.

During the demonstration, the *Falco*, with 80 invited VIP guests aboard, conducted the voyage under fully autonomous control. The vessel detected objects utilising sensor fusion and artificial intelligence and conducted collision avoidance. It also demonstrated automatic berthing with a recently developed autonomous navigation system. All this was achieved without any



<https://www.rolls-royce.com/media/press-releases/2018/03-12-2018-rr-and-finferries-demonstrate-worlds-first-fully-autonomous-ferry.aspx>

Norway

Wärtsilä achieves notable advances in automated shipping with latest successful tests

Wärtsilä Corporation, Press release, 28 November 2018 at 2:00 PM E. Europe Standard Time



<https://www.wartsila.com/media/news/28-11-2018-wartsila-achieves-notable-advances-in-automated-shipping-with-latest-successful-tests-2332144>

19th Sep 2019

First MASS test under IMO Interim Guidelines

Iris Leader, a large NYK-operated PCTC having a gross tonnage of 70,826 tons, was navigated day and night using the Sherpa System for Real ship (SSR) navigation system during the period from 14 to 17 September from Xinsha, China, to the port of Nagoya, Japan, and then from the port of Nagoya to the port of Yokohama, Japan, from 19 to 20 September

IMO's Interim Guidelines for MASS trials

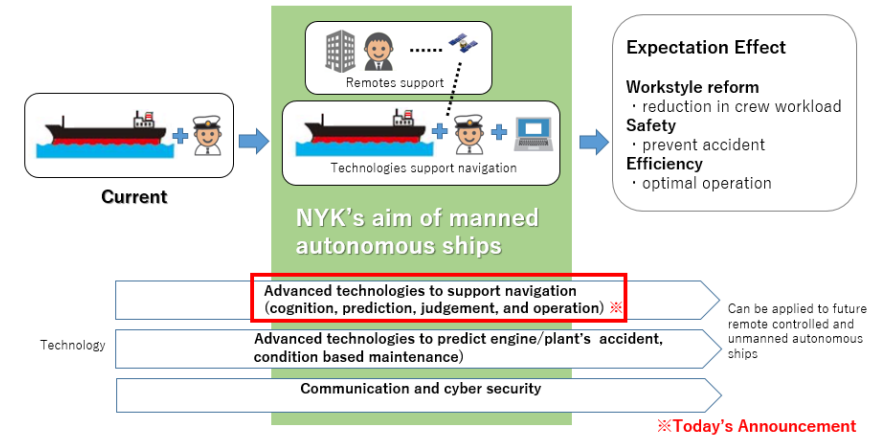
IMO outlines autonomous ship trial guidelines in June, 2019. This trial follows the guidelines.



https://www.nyk.com/english/news/2019/20190930_01.html

** Manned autonomous ships

NYK's aim of manned autonomous ships that will make use of advanced technologies and remote support from office to support ship operation and enhance safety.



NYK Conducts World's First Maritime Autonomous Surface Ships Trial

Sep. 30, 2019

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

About the MASS Trial

Iris Leader, a large NYK-operated PCTC having a gross tonnage of 70,826 tons, was navigated day and night using the Sherpa System for Real ship (SSR) navigation system*** during the period from 14 to 17 September from Xinsha, China, to the port of Nagoya, Japan, and then from the port of Nagoya to the port of Yokohama, Japan, from 19 to 20 September. Crew performed typical duties during the navigations, which included Japan's coastal area but excluded bays.

> Xinsha, China ~ Nagoya, Japan ~ Yokohama



MASS Tests/Trials observations

- Flag state is always involved in MASS trials. Class and Customer are typically also participating in test/trial project in addition to technology providers
- MASS development is incremental
- MASS tests/trials are often conducted in areas not dedicated as test areas
- MASS tests are organized where its most feasible (also in "urban" areas)

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www.oneseaecosystem.net

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