

MASS Trials in Singapore

MASS Pilot Projects – Harbour Tugs



**Smart Maritime
Autonomous Vessel**
with ST Engineering Marine, POSH,
ABS, M1, MPA



IntelliTug
with Wartsila, PSA Marine, Lloyd's
Register, TCOMS, MPA



Project MINERVA
with Keppel, ABB, ABS, TCOMS, MPA

IntelliTug

Wartsila, PSA Marine, Lloyd's Register, TCOMS, MPA

- Supervised autonomous control with on-board Master
- Autonomous navigation with optimised passage planning
- Real-time collision detection and collision avoidance



On-board Tug Master monitoring on-board console for how the smart navigation system manoeuvres the harbour tug during sea trials

**Picture provided by Wartsila and PSA Marine*

Smart Maritime Autonomous Vessel

ST Engineering Marine, POSH, ABS, M1, MPA

- Shore command centre capable of:
 - Remote control
 - Health monitoring of shipboard systems
- Autonomous waypoint navigation
- Real-time collision detection and collision avoidance



Set-up of shore command centre

**Picture provided by ST Engineering Marine*

Project MINERVA

Keppel, ABB, ABS, TCOMS, MPA

- Shore command centre capable of:
 - Remote control
 - Monitoring of vessel's engine and thruster



Set-up of shore command centre

**Picture provided by Keppel Offshore and Marine*

What Comes Next

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ERIC MILLER | BUSINESS | 10:30:2020 00:00 AM

The Robot Ships Are Coming ... Eventually

As the pandemic fuels demand for less contact and fewer sailors, shipping companies turn to AI-assisted navigation.



China's first autonomous cargo ship makes maiden voyage

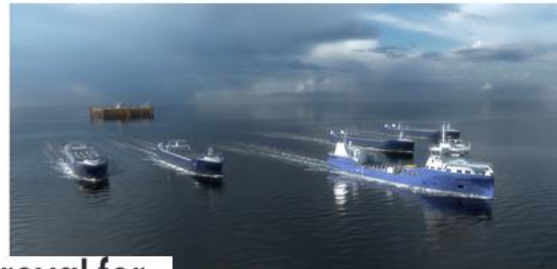
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Automated shipping coming to Europe's waters

30 June 2020

by Tom Cassauwers

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 Jason Jiang • May 15, 2020

Eight nations join hands to align standards for autonomous ships

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