Introduction:
H2020 Project MOSES

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On Thursday 28th of September 09:30 – 15:00

MOSES and AEGIS demonstrate the Robotic Container Handling System

A system developed by MacGregor, TNO and Bromma.

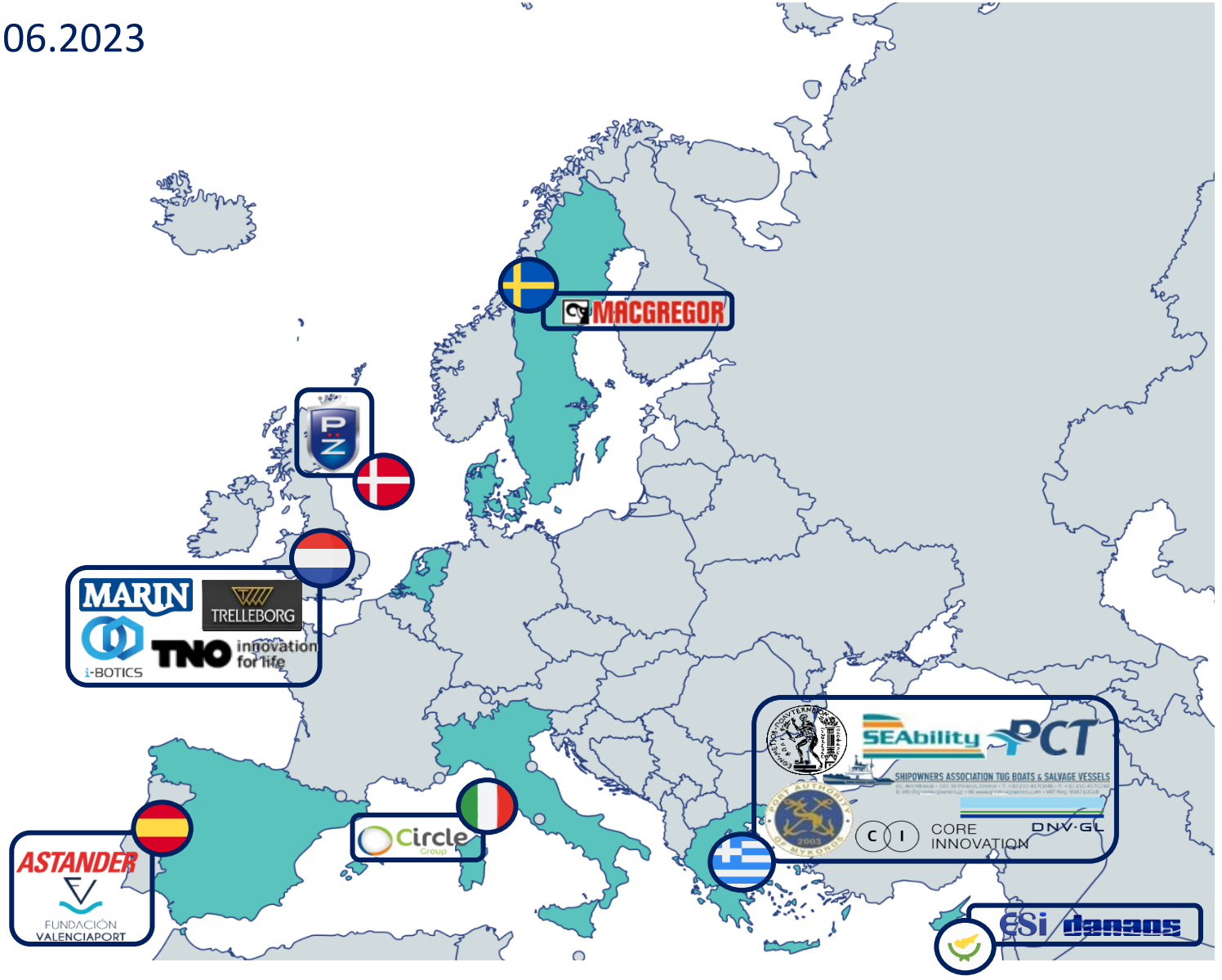
You are very welcome to join the demonstration at TNO in Soesterberg, The Netherlands; MacGregor in Örnsköldsvik, Sweden; or online.

This project has received funding from the European Union's horizon 2020 research and innovation programme under grant agreement No. 861678.

September 28, 2023

Facts about the MOSES project

- **Duration:** 01.07.2020 - 30.06.2023 (36 months) – *extension 31.12.2023 (42 months)*
- **Budget:** 8 million €
- **Consortium:** 17 Partners
- **Coordinator:** NTUA



MOSES aims to…

Containerised cargo

Create sustainable feeder services from large container terminals to **small ports with no infrastructure to replace trucks on Ro-Ro ships**

The MOSES concept

The MOSES Use Cases

Northern Case

MOSES Open Call

Submit by 31-Aug-2023 (05:00:00 PM CEST)

SUBMIT HERE

Western MED-Spain

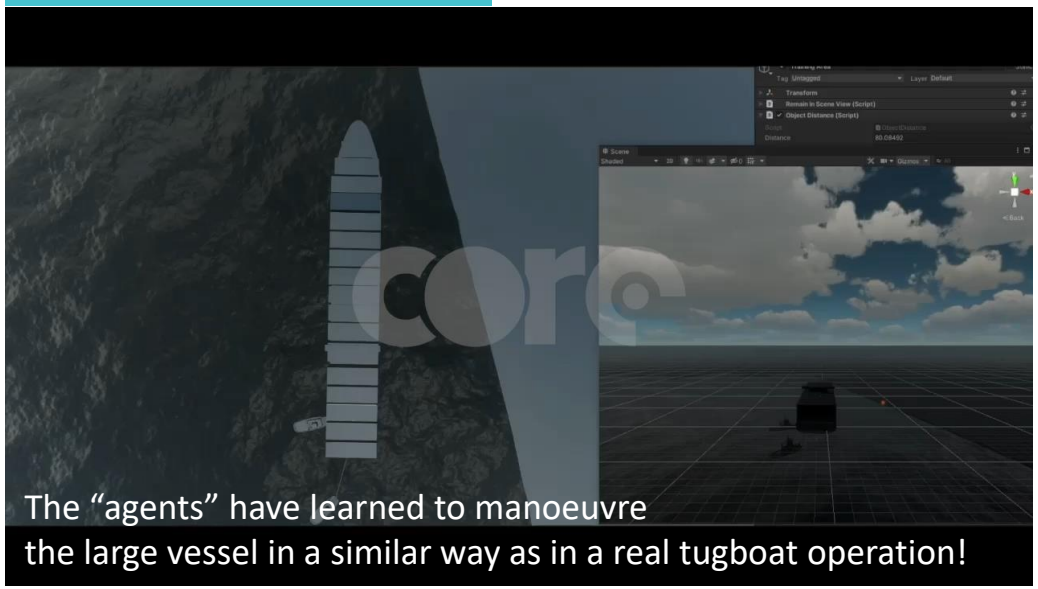
Decongest truck transport traffic in Valencia port and connect it to Sagunto and Gandia satellite ports

Eastern MED-Greece

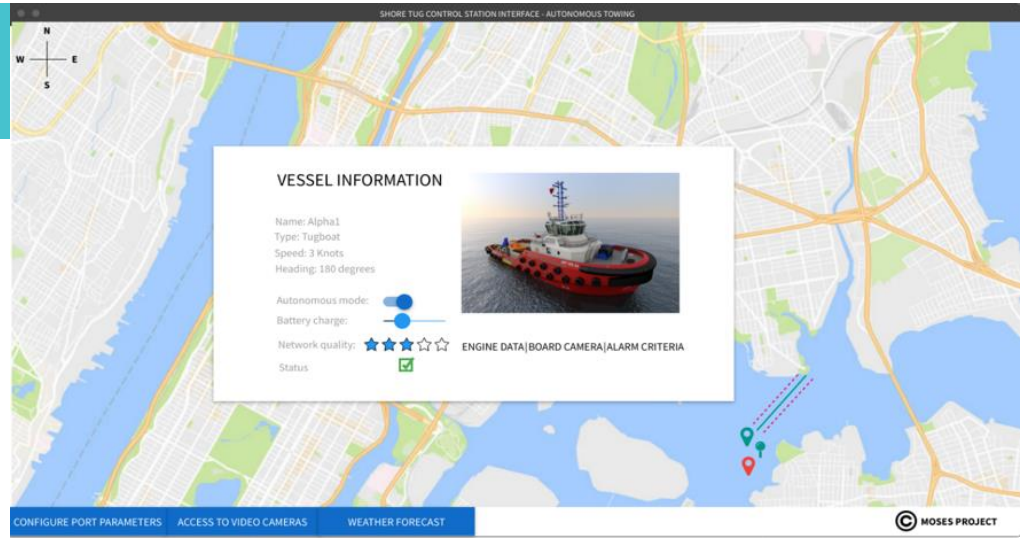
Decongest Piraeus container terminal and integrate small Greek ports into the container supply chain

MOSES AutoDock System

Autonomous tugboats



Shore Tugboat Control Station

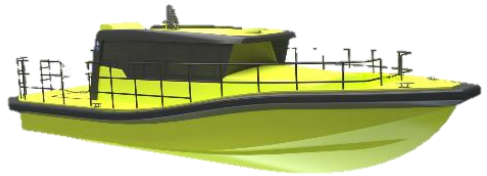


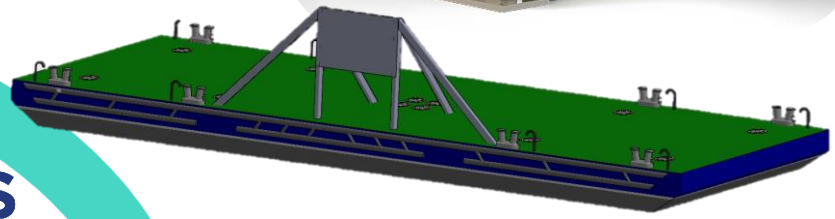
Automated Mooring

Prototype innovations:

- Small-scale
- Surge motion control
- Energy harvesting
- Communication with tugboats

MOSES AutoDock System – Demonstration





3rd week of October 2023

- Showcase the automated maneuvering, docking, and mooring scheme for large ports

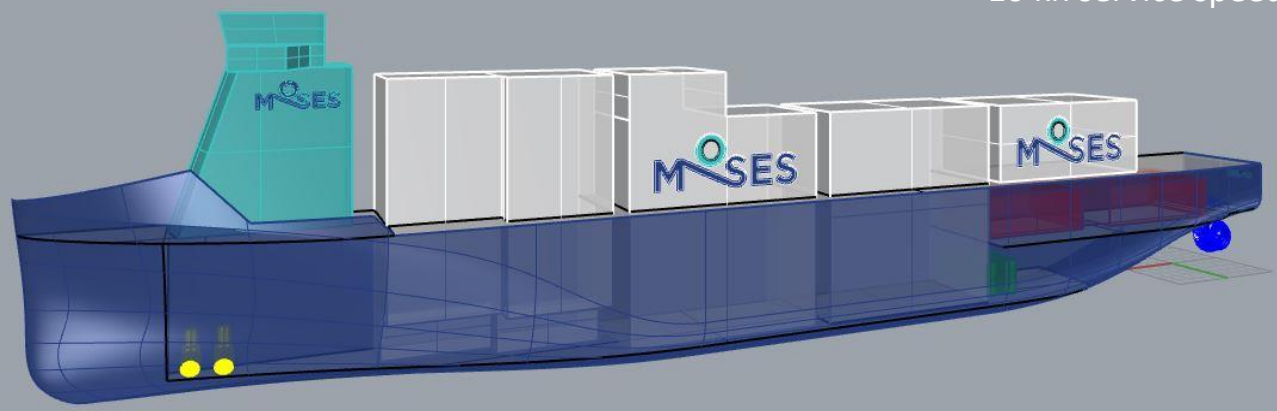
- Two workboats will simulate a swarm of autonomous tugboats
- They will guide a floating vessel towards a berthing spot
- The re-engineered AutoMoor prototype will safely moor and secure the floating vessel at berth

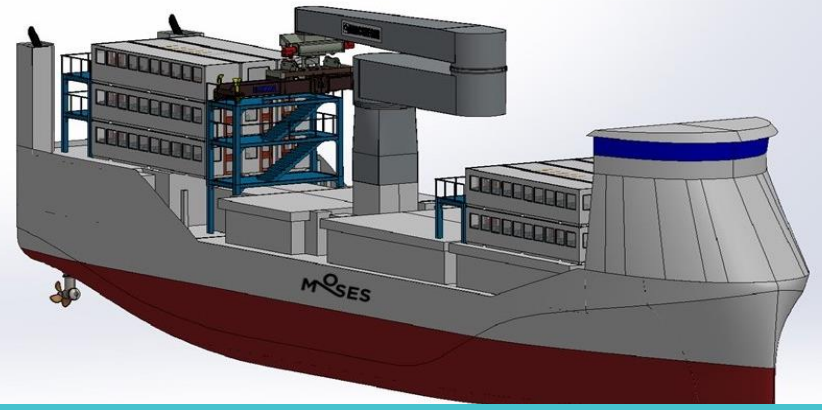
- Faaborg, Denmark

MOSES Innovative Feeder

Greek concept I

- L_{BP} = 80 m
- 180 TEU
- 10 kn service speed

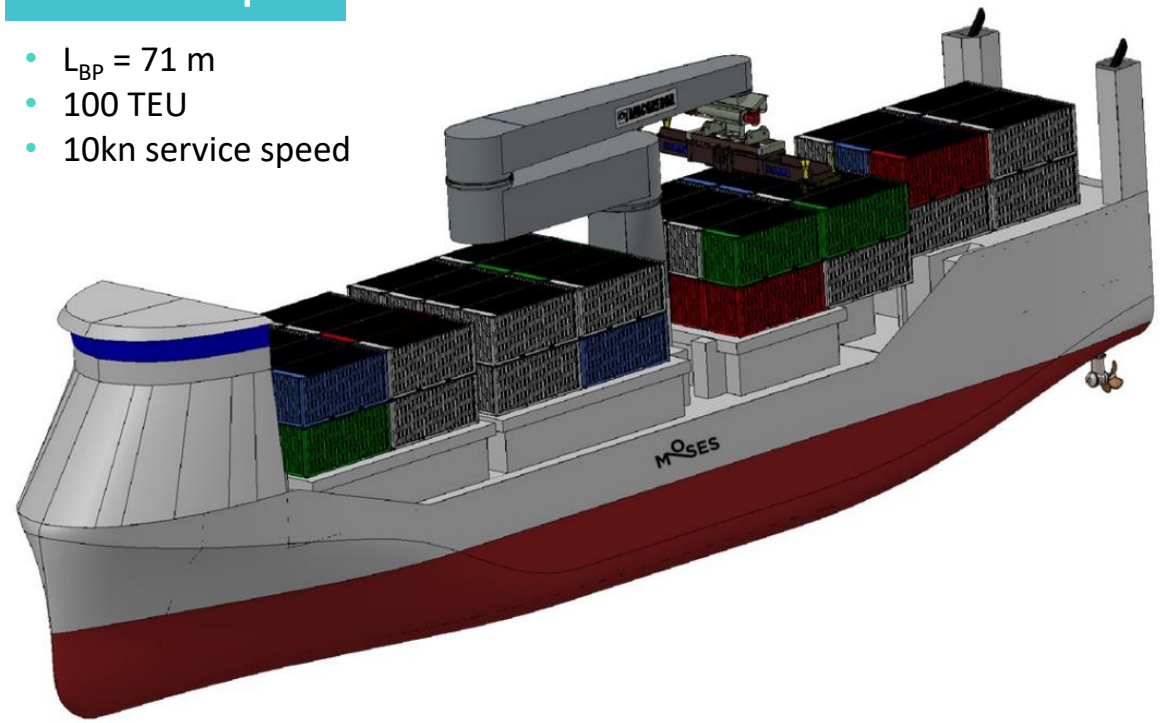




***Modular* concept design** for pax transport

Greek concept II

- L_{BP} = 71 m
- 100 TEU
- 10kn service speed



Innovations:

- Sustainable propulsion (Hybrid – methanol ICE + batteries, Full electric)
- Azimuth thrusters for enhanced manoeuvrability
- Automated cargo-handling, *as first step towards higher autonomy*

MOSES Innovative Feeder Vessel – Demonstration

September 14, 2023

Demonstrate **port-to-port autonomous operation** of the MOSES Innovative Feeder vessel in a Seakeeping and Manoeuvring Basin (SMB)

Wageningen, the Netherlands

Free sailing, **1:17 scale ship model** of Greek II concept design

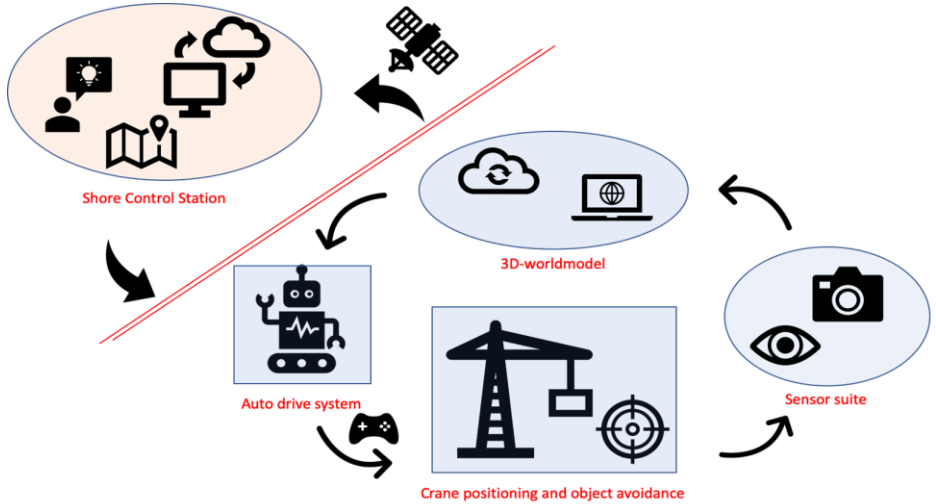
Round-trip between two ports, including autonomous docking and undocking

MOSES Robotic Cargo Handling System

Automated Crane

- Compensation of pendulation (ship motions, weather conditions)
- Identification of container to load

Intelligent Operator Support System (IOSS)



- Enabling local situation awareness – anomaly detection
- Robot self awareness in problem detection
- Control Intelligence
- Dynamic task allocation (One-to-many)
- Risk assessment for problem solving

MOSES Robotic Cargo Handling System – Demonstration

Today's pilot demonstration

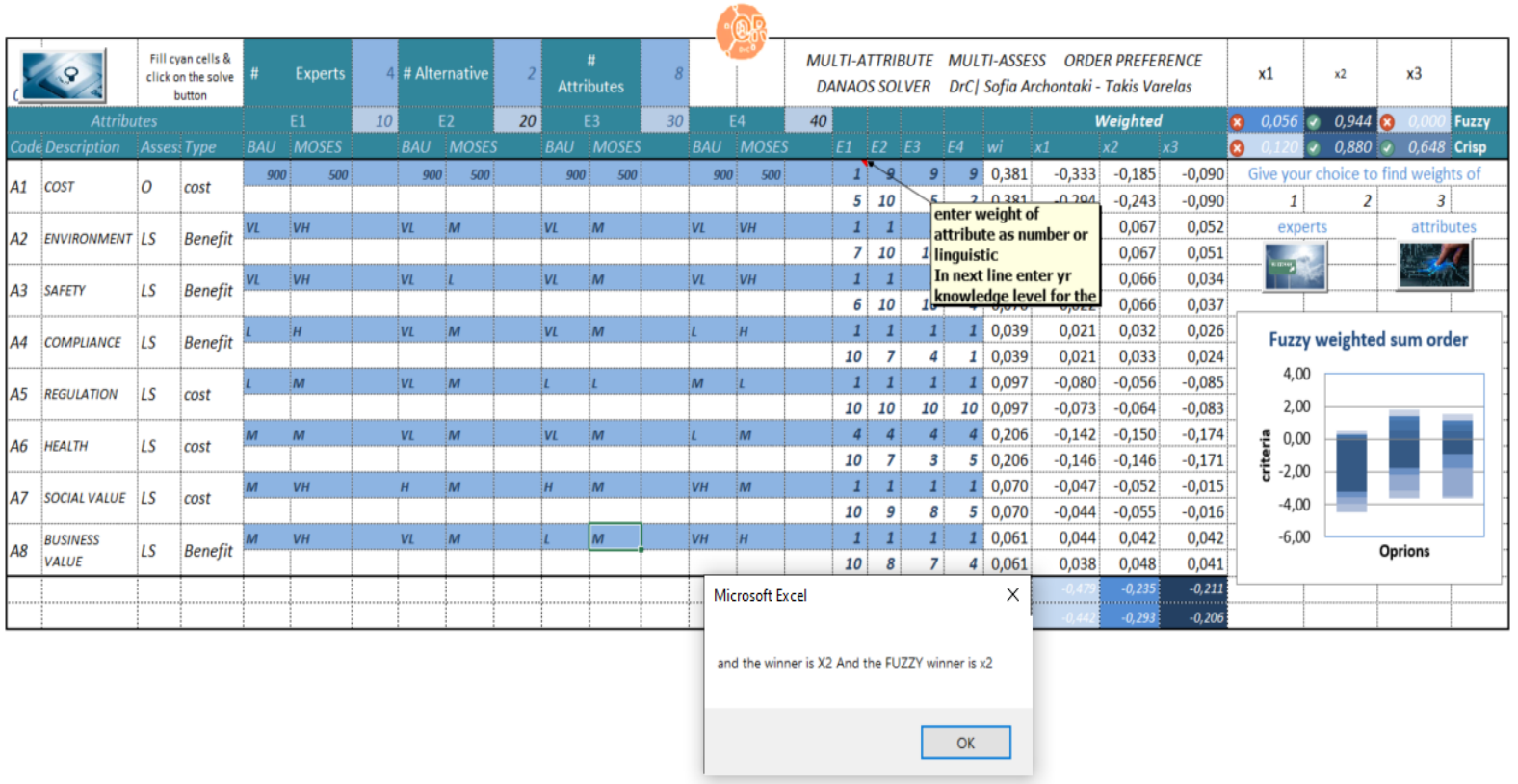
Demonstrate the **automated operation for (un)loading containers** from the MOSES Innovative Feeder with the Robotic Container-Handling System

- A **full-scale crane** (*located at MacGregor's test site*) will be outfitted with a sensor package and control systems to enable remotely controlled and autonomous operation
- A remote operator (*located at TNO's facilities*) will monitor the operation through the **Intelligent Operator Support System (IOSS)**

Örnsköldsvik, Sweden and Soesterberg, the Netherlands

Pilot Demonstration results

- The pilot demonstration results will provide input to the ***sustainability framework*** developed by MOSES
- The objective is to evaluate the ***sustainability and added value to SSS of the MOSES Innovations,*** *based on specific criteria (incl. cost, environment, safety etc.)*



MOSES making waves…

MOSES was ***awarded*** by the Institute of Logistics Management of Greece (ILME) with the Logistics Excellence Award ***"Alexander the Great – Project of the Year 2022"***

One more thing…an interesting event

www. moses-h2020.eu

MOSES project2020

@mosesproject20

MOSES Project

Thank you for your attention!

If you have any questions or require further information, please contact me:

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National and Technical University of Athens - NTUA

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