Automated cargo handling for autonomous ships: The MOSES project

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Introduction

Cargo handling
- Time- & cost-consuming process
- Increased risk potential
- Significant environmental impact

Automation/Autonomy
- Great potential but limited adoption (focus on remote operation & optimization)
- Promotion of efficiency and competitiveness

Small ports & Short Sea Shipping (SSS)
- Valuable alternative but with low integration
- Ideal testbed for automation
- Modal shift from land-based transportation
The aim of MOSES project is to enhance the Short Sea Shipping (SSS) component of the European supply chain by addressing the vulnerabilities and strains related to the operation of large containerships.

DSS ports efficiency
- Technological solutions for improving DSS ports inefficiencies
- Berthing time reduction
- Safety improvement

SSS feeder services
- Ship design for sustainable services
- No infrastructure requirement
- Logistics solution for balancing demand-supply
MOSES Facts & Figures

- **Project Title:** AutoMated Vessels and Supply Chain Optimisation for Sustainable Short Sea Shipping
- **Call identifier:** H2020-MG-2.6-2019
- **Topic:** “Moving freight by Water: Sustainable infrastructure and Innovative Vessels”
- **Duration:** 36 months
- **Funding scheme:** Research and Innovation Action
- **EU contribution:** € 8.122.150
- **Coordinated by:** National Technical University of Athens (NTUA), Greece

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MOSES Objectives

Societal

- Improve efficiency and end-to-end delivery times of SSS mode
- Reduce the environmental footprint for SSS and ports
- Promote smart port development with minimal investment
- Develop concrete business cases

Technical

- Design innovative, hybrid electric feeder vessel outfitted with a robotic container-handling system
- Develop an automated manoeuvring and docking system for DSS ports
- Develop and promote a logistics matchmaking platform to boost SSS

Market

- Improve efficiency and end-to-end delivery times of SSS mode
MOSES Automation & Autonomy (1/2)

Autonomous Vessel Maneuvering & Docking
- Autonomous Tugboat Swarm operation
- AI algorithm

Automated Mooring
- Vacuum-based system for hands-free mooring and automated berthing (AutoMoor)
**Autonomous Navigation**
- Innovative Feeder Vessel
- Hybrid electric propulsion
- Improved energy performance

**Autonomous Container Handling**
- Self-sufficient Robotic Container Handling System
- Onboard crane for container (un)loading
- Shared control between human operator and system
MOSES Impact

- Increased situational awareness
- Reduction of docking time
- Reduction of port emissions
- Improved efficiency and delivery times
- Increased safety of port processes
- Enhancement of SSS
- Economic development for small ports with minimum investment
- Increased reliability of waterborne transport
- High market opportunities