



Maritime Innovation Update



M. Sc. Rachit Shrivastava

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SIM-TWIST:  
A Simulation Study Focusing  
on Automated Twistlock Handling  
Operations at Terminals



Fraunhofer CML

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# Agenda

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# SIM-TWIST

## Project details

### SIM-TWIST:

*The project focuses on studying available automated twistlock handling technologies and their impacts on automated terminal operations through simulation experimentations.*

- Project sponsor: Bundesministerium für Digitales und Verkehr (BMDV)
- Project partners:
  - Eurogate Container Terminal Wilhelmshaven GmbH & Co.KG
  - Fraunhofer Center for Maritime Logistics and Services CML
  - Bremer Institut für Produktion und Logistik GmbH (BIBA)



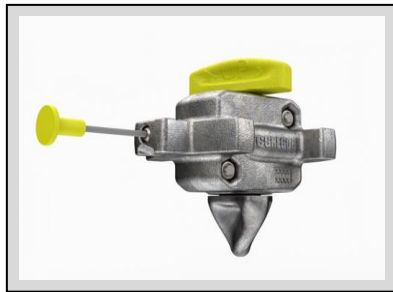
01.01.2025 – 31.12.2026



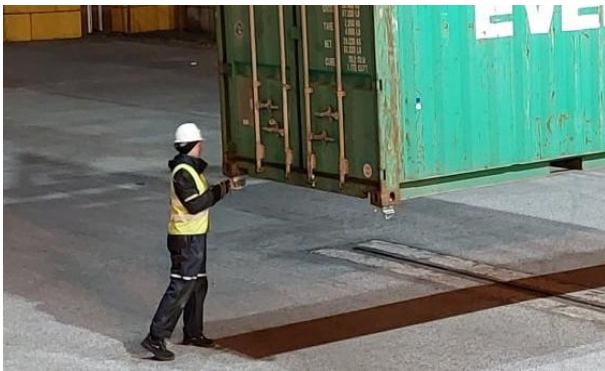
# SIM-TWIST

Introduction:

What is a twistlock and where it is used?



Manual Twistlock Handling Operation



Automated Twistlock Handling (ATH) Systems

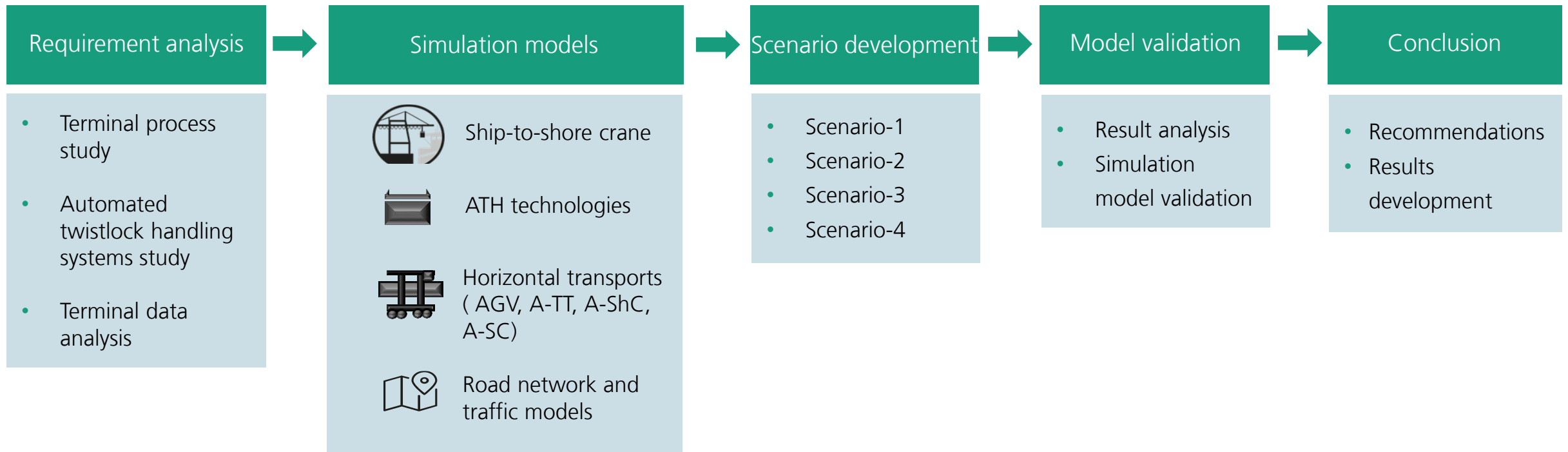


Pic1,2- <https://rothschenk.de/en/episode-15-how-does-a-twistlock-work/> , Pic-3 <https://stock.adobe.com> , Pic-4 <https://www.macgregor.com> , Pic-5 <https://www.kalp-gmbh.eu/>



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## Methodology



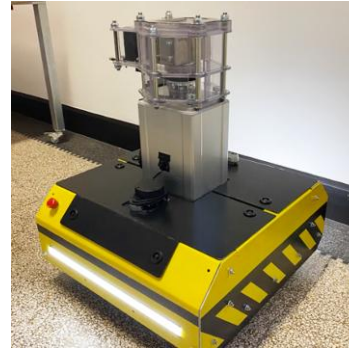
# SIM-TWIST

## Technology based classification of ATH Systems

*ATH systems with robotic arms*



*ATH systems with mobile robot systems*



*ATH systems without robotic arms*

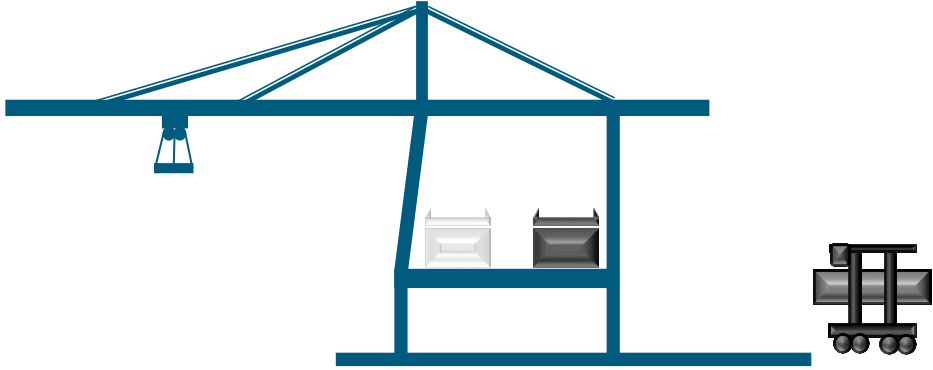
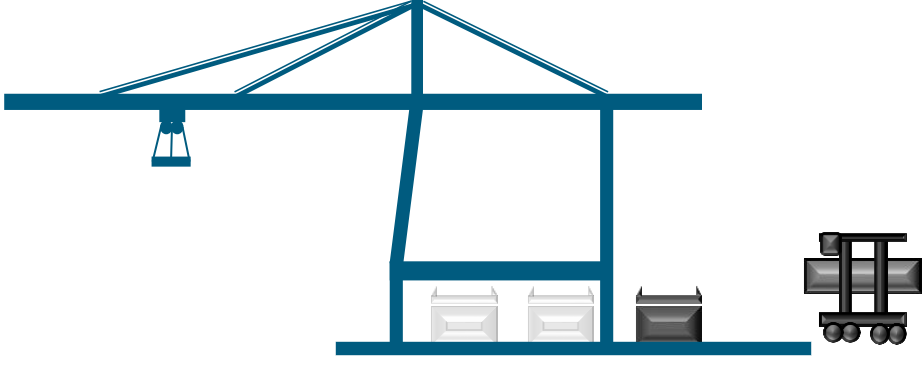
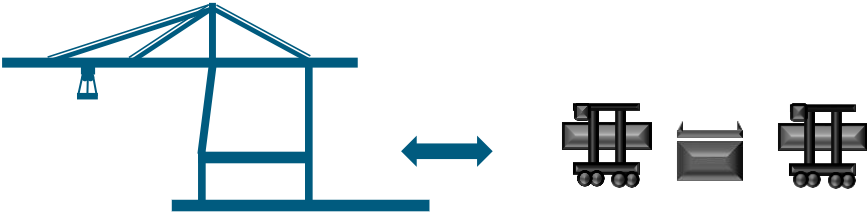
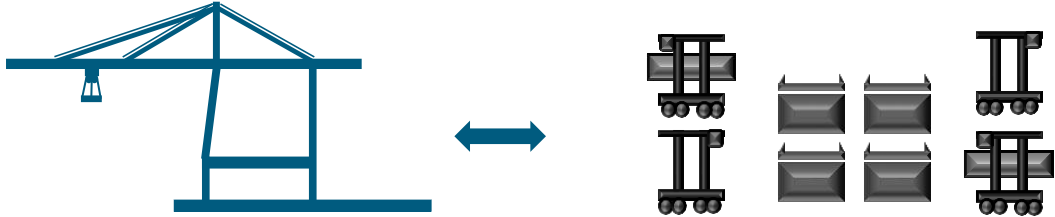


*ATH systems with drive through systems*



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## Scenario definitions

<p><b>Scenario-1</b> On Crane ATH Operations</p>	<p><b>Scenario-2</b> Off Crane ATH Operations</p>
	
<p><b>Scenario-4</b> Drive through ATH Operations</p>	<p><b>Scenario-3</b> Dedicated ATH Operation Zone</p>
	

# SIM-TWIST

What to expect?



- Simulation models for automated terminal concepts with the use of ATH systems
- Classification of available ATH systems present globally
- Recognition of risks associated with the process integration of ATH technologies
- Impacts of ATH technologies on terminal productivity, process and expected financial benefits
- Development of recommendations for the utilization and integration of ATH technologies



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Dr. rer. nat. Valeria Bartsch

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Positionierung mit dem Erdmagnetfeld  
in maritimer Umgebung



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