REQUIREMENTS

3 USE CASES
Voyages with three ship types:

FERRY
1 HOUR
VOYAGE

FEEDER
SHORT SEA
VOYAGE

BULKER
LONG
DISTANCE

14 MAIN PROCESSES IDENTIFIED
6 Core Processes:

PORT	SEA	PORT
1. VOYAGE PLANNING & CONTROL		
2. CARGO OPERATIONS		
3. NAVIGATION		
4. ENGINEERING OPERATIONS		
5. MAINTENANCE		
6. MALFUNCTIONS & EMERGENCIES		

4 Management Processes:

M.1. ORGANISATION
M.2. GENERAL MANAGEMENT
M.3. RISK MANAGEMENT
M.4. QUALITY MANAGEMENT

4 Support Processes:

S.1. HUMAN RESOURCES
S.2. LEGAL ASPECTS
S.3. AUTOMATION SYSTEMS
S.4. ECONOMIC ASPECTS

OVER 40 EXPERTS IN WORKSHOPS AND INTERVIEWS
> International Shipping companies
> Maritime Industry
> Sciencists in the field
> International Universities

38 PROCESS DESCRIPTIONS

with competence requirements

PROPOSED OPERATIONAL MODEL

38 TASK ANALYSES
By DCoS Models:
DCoS – Distributed Cooperative Human-Machine System

> ANALYSIS OF ALL RELEVANT AGENTS
> ANALYSIS OF ALL RELEVANT PROCESSES, TASKS AND FUNCTIONS
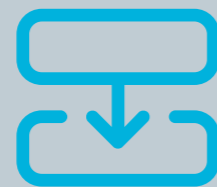> ANALYSIS OF REQUIRED RESOURCES AND INFORMATION

4 CORE TASKS
Monitoring
Direct Control
Emergency Response
Planning

5 ROLE DEFINITIONS

ROC – Remote Operation Centre

OPERATIONAL LEVEL	MANAGEMENT LEVEL
NAVIGATOR/ ENGINEER/ SYSTEM - ADMINISTRATOR	SENIOR NAVIGATOR/ SENIOR ENGINEER

5 COMPETENCE TABLES

for ROC Operators

5 STCW TABLES CHECKED

for required competences

COMPETENCE-BASED CURRICULUM

MASS Operators - Basic Program	
FOR ALL OPERATORS (NAVIGATORS / ENGINEERS / SYSTEM ADMINISTRATORS)	
Module	**Fields of Competences** (Levels 3-4)
MASS Operation 1	Understand MASS system. Operate and interpret the performance.
MASS Safety & Security 1	Contribute to the specific safety and security demands of a MASS system.
MASS Management & Administration 1	Work as MASS operator within legal requirements.
Practical Training 1	Understand the equipment and operations in ROC and on board of a MASS.
FOR NAVIGATORS	
MASS Navigation	Take responsibility on navigation of a MASS.
MASS Monitoring	Conduct a safe monitoring watch for a fleet of MASS.
MASS Cargo & Mission Operations 1	Monitor cargo and mission operations and seaworthiness of MASS.
FOR ENGINEERS / SYSTEM ADMINISTRATORS	
MASS Engineering Operations 1	Operate all technical systems and remote maintenance.
MASS Automation and Control	Operate all automation and autonomy systems and remote maintenance.
MASS Operations Monitoring	Monitor the operations of a fleet of MASS.

MASS Senior Operators - Advanced Program	
FOR ALL SENIOR OPERATORS (SENIOR NAVIGATORS / SENIOR ENGINEERS)	
Module	**Fields of Competences** (Levels 4-5)
MASS Operation 2	Manage a MASS system. Optimize MASS performance.
MASS Safety & Security 2	Develop safety and security systems. Maintain safe and secure operations of a MASS system.
MASS Management & Administration 2	Develop and improve the entire MASS system within legal and economic demands.
Practical Training 2	Evaluate performance and critical conditions in a ROC and on board of a MASS.
FOR SENIOR NAVIGATORS	
MASS Navigation & Control	Manage MASS voyages. Take direct control under any condition.
MASS Cargo & Mission Operations 2	Plan and manage operations with cargo, passengers or on missions. Control seaworthiness of MASS.
FOR SENIOR ENGINEERS	
MASS Engineering Operations 2	Manage all technical systems and automation. Improve reliability, availability, performance and resilience.
MASS Operations Control	Manage a fleet of MASS. Take direct control on demand.

18 MODULE DESCRIPTIONS

resulting eight Operators Modules and five Senior Operators Modules

HSB
Hochschule Bremen
City University of Applied Sciences

HUMATECTS

DLR Deutsches Zentrum für Luft- und Raumfahrt