



Waterborne Transport



HORIZON EUROPE

Workshop:

“Horizon 2020 Research and Innovation delivering smart, green, safe and competitive waterborne transport”

07/02/2022 | 09:30 – 16:15

Residence Palace (Brussels) and online

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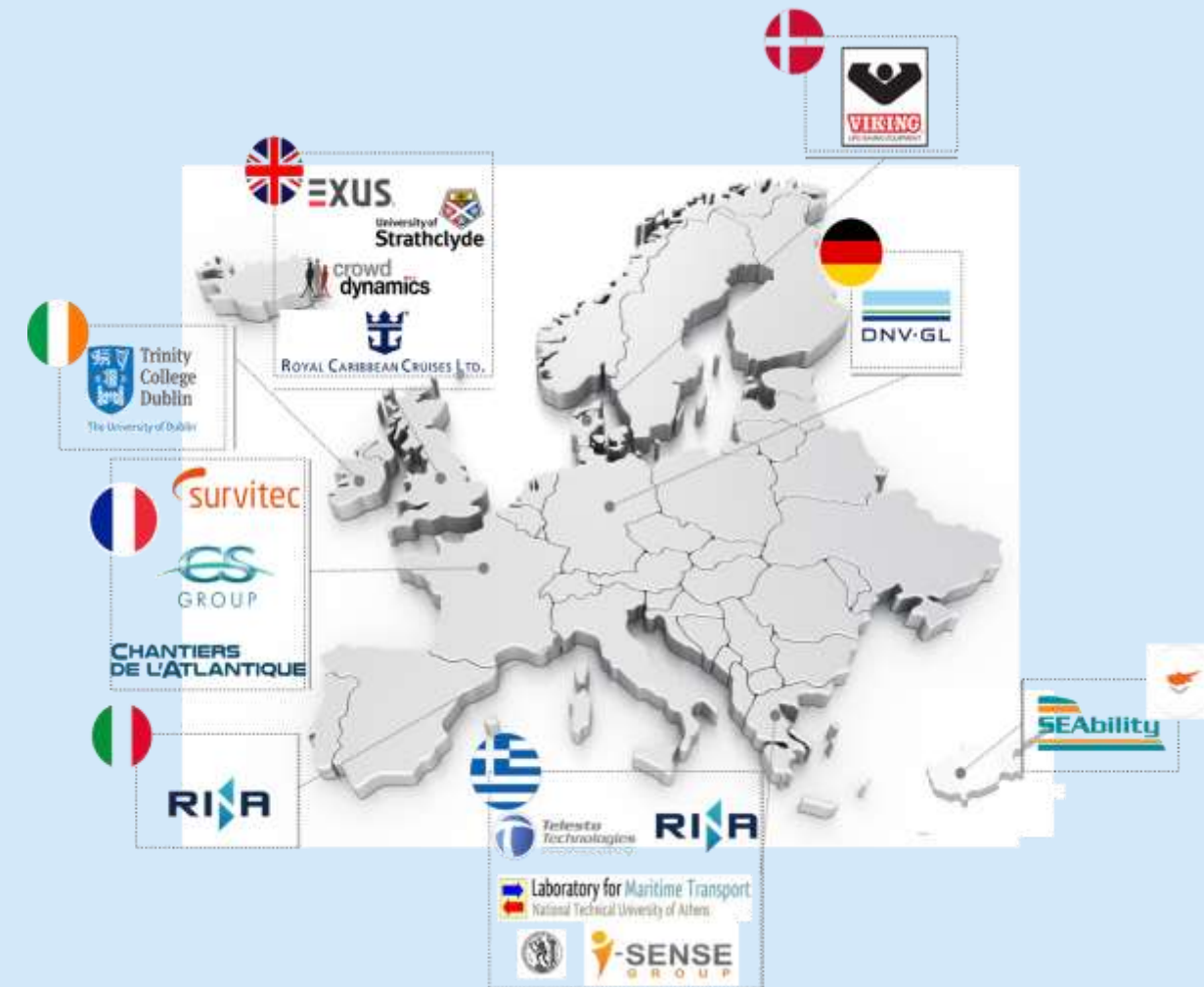
H2020 SafePASS Project

Outline

- Facts and figures
- Consortium
- Objectives and vision
- Main Outcomes
- Main Results:
 - Smart Technologies & Core Platform in a nutshell
 - Prototype Examples
 - Novel LSAs Lifeboats and MES
 - Entrance arrangements, passages, and architectural structures
 - Risk Modelling Tool (RTM)
- Exploitation potential and challenges

SafePASS Facts and Figures

- H2020 Project - Subtopic MG-2-2-2018: Marine Accident Response (subtopic B)
- Research and Innovation Action
- Total Funding: 8,270,366.25 €
- Start 1/09/2019 – 31/08/2022 (36Months)
- Consortium: 15 partners from 8 different EU countries
- Coordinator: National Technical University of Athens



SafePASS Consortium

- **Three** Academic Institutions
- **Two** Classification Societies
- **Five** Innovative SMEs & Industrial partners
- **One** Shipyard
- **Two** LSA manufacturers
- **One** cruise line operator

Consortium Partners	Short Name	Country
1. National Technical University of Athens	NTUA	Greece
2. EXUS Software	EXUS	United Kingdom
3. Maritime Safety Research Centre, University of Strathclyde	MSRC	United Kingdom
4. Telesto Technologies	TEL	Greece
5. Crowd Dynamics International	CDI	United Kingdom
6. CS Group	DXT	France
7. Trinity College Dublin	TCD	Ireland
8. Survitec	SURV S	France
9. Chantiers de l'Atlantique	CdA	France
10. RINA Hellas	RINA	Greece
11. Seability	SEAB	Cyprus
12. Royal Caribbean Cruises	RCL	United Kingdom
13. DNV GL – Germany	DNVGL	Germany
14. RINA Services SPA	RINA S	Italy
15. VIKING Life Saving Equipment	VIK	Denmark



*SafePASS **aim**: To redefine the evacuation processes, evacuation systems/equipment for large passenger ships in all environments, hazards and weather conditions.*

*SafePASS **target**: Significant reduction of the total time required for ship evacuation and improve safety*

*SafePASS **vision**: Making ship evacuation and abandonment of large passenger ships safer, faster and smarter*

SafePASS Main Outcomes

Technology

- Smart technologies for location-based evacuation support for passengers, crew and training
- Common Operational Picture and crowd simulator for enhanced situational awareness, early warnings and evacuation management

LSAs

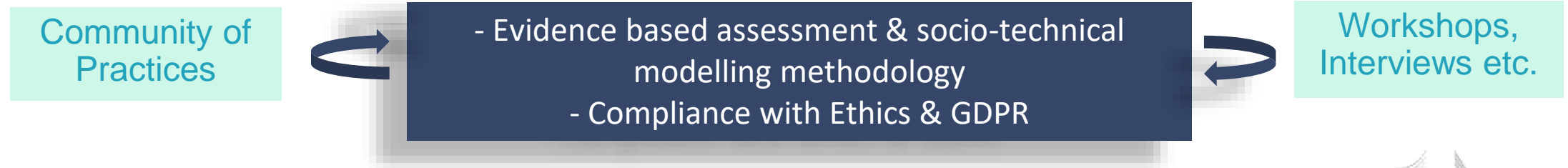
- Novel Life-Saving Appliances (Lifeboats) & Personal Survival Equipment
- Novel Entrance Passage & Architectural Structures for optimizing the LSA embarkation, release and abandonment process

Risk modelling

- Evacuation Risk Modelling Tool for flood and fire scenarios
- Risk mitigation and control options

IMO

- Submission of recommendations to IMO



SafePASS Smart Technologies in a nutshell

Smart Lifejacket and Chatbot

- ✓ Haptic vibration actuators (navigation)
- ✓ Audio instructions for navigation
 - ✓ Indoor localization via UWB technology



Smart Wristband

- ✓ Passenger Association
- ✓ Stress level detection
- ✓ Physiological sensing



Augmented Reality (AR) Applications

HoloLens 2 Headset

- ✓ AR crew training app for LSAs
- ✓ AR maintenance app for LSAs

Mobile Phone and/or Tablet

- ✓ AR crew rescue assistant app
- ✓ AR passenger assistant app

Passenger Mobile App

- ✓ Evacuation plan via indoor localization
- ✓ Group chatting with family members
- ✓ Request for assistance from the crew
- ✓ Indoor localization via BLE technology



SafePASS Prototypes (1/2)



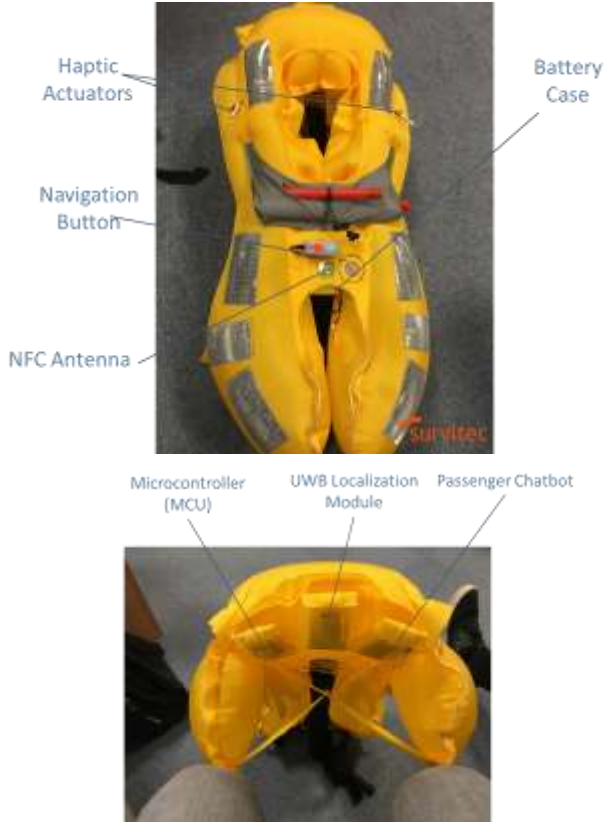
3D and Holographic Common Operational Picture (COP)



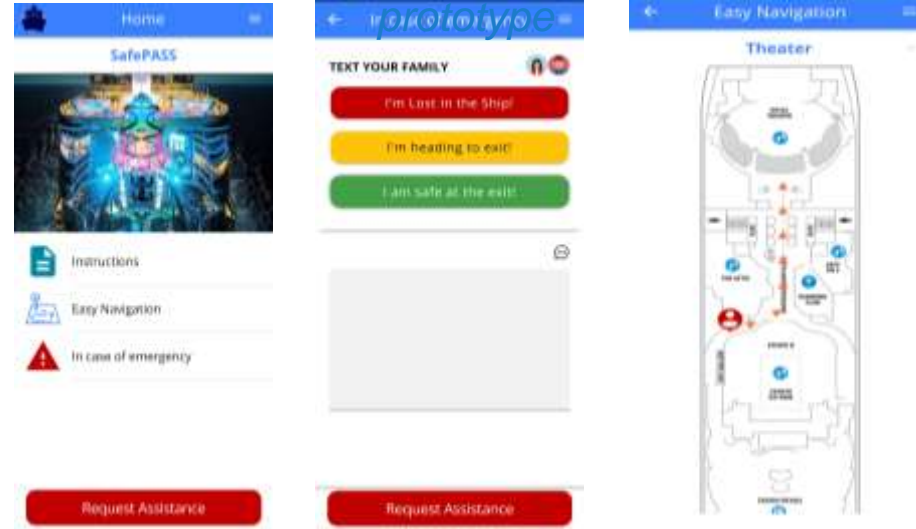
- The **Common Operational Picture (COP)** enables the interactive 2D and 3D maps visualization of alerts, evacuation routes etc.
- The **Crowd Simulator** forecasts crowd movement during an evacuation and calculates a dynamic (near-real time) evacuation route.

SafePASS Prototypes (2/2)

Smart Lifejacket prototype



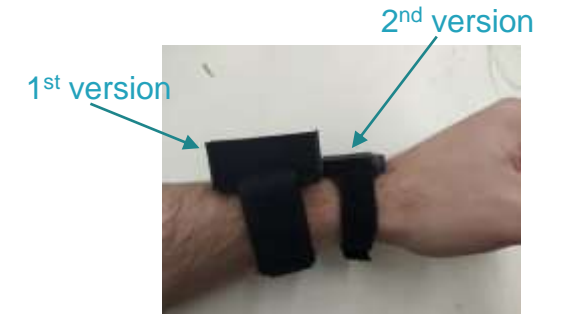
Passenger Mobile app



Dynamic Exit Signs



Smart Wristband



AR Training app for LSA operations



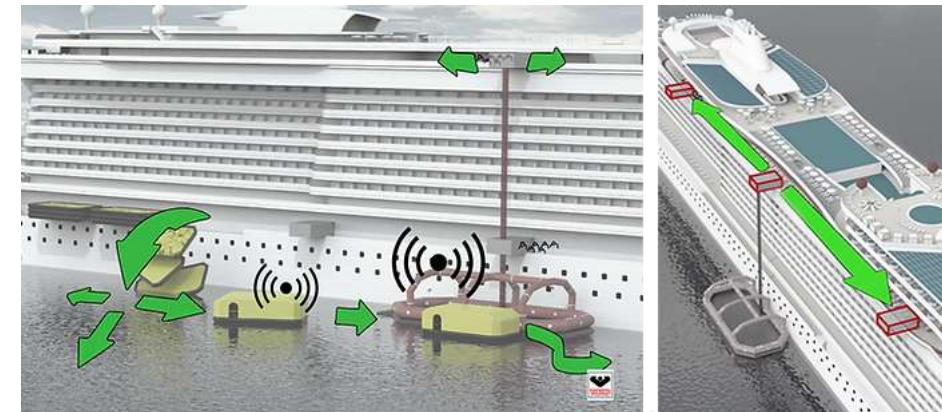
SafePASS Novel LSA Lifeboats and Mass Evacuation Systems (MES)

- Novel **Hardshell LSA lifeboat** design (SafeCUBE)
 - Designed to provide access to the LSA on several decks
 - Design of the launching mechanism using Free-fall launch method
- Novel **Softshell LSA lifeboat** design:
 - Designed to provide flexible location for evacuation
 - Designed to accommodate all persons onboard
 - Automation to reduce crew actions
- Novel **entrance arrangements, passages & architectural structures**
 - Make boarding on LSA more efficient
 - Accommodate motions experienced
 - Improve time for abandonment

Hardshell concept (rigid hull)



Softshell concept (inflatable)



Towing tank tests of novel LSAs and MES



Hardshell LSA
lifeboat model



Extended test
scenarios, sea
states etc.



Softshell, Mass
Evacuation
System (MES)
model - Neoprene
foam



Optimum
launching and
embarkation
scenarios

Risk Modelling Tool (RMT)

- RMT is based on the **high-level event sequence** considering influencing factors in case of flooding and fire
- The RMT can assess the **evacuation and abandonment risk** dynamically, based on real-time data related to the passenger distribution, route, LSA availability, damage propagation etc..
- By the **quantification of risk** to people in evacuation and abandonment process the risk model provides the basis for the identification of main risk contributing factors and the evaluation of **risk control options** (e.g. regulations) by cost-benefit assessment



Exploitation potential and challenges

Exploitable Components & Market

- Identification of commercialization of the SafePASS Solution and IPR management
- Technologies for passengers and crew: Common Operational Picture, Location-based evacuation support (devices & mobile apps), Augmented reality training apps, Risk Modelling Tool – [ICT, SW, Cruise line Industry](#)
- Novel LSA hard and soft shell lifeboats/MES, entrance arrangements/passages – [LSA/PSE Industry, Yards](#)
- Academic/research exploitation

Drivers (+) / Barriers (-)

- Low (-) vs high TRL (+) of technologies
- IMO regulations (e.g. Alternative design and arrangements) (-/+)
- Risk control options and cost-benefit analysis (-/+)
- Societal impact – improvement of passenger safety taking into account human factors (+)
- Demonstration campaigns and validation of system (+)
- Invited by DG Mobility and Transport to Passenger Ship Safety Expert Sub-Group, Planning for IMO submission (+)

Check out our website & social media links



www.safepass-project.eu



[SafePASS_H2020](#)



[SafePASS Horizon2020](#)



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Thank you



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