FLARE
FLOODING ACCIDENT RESPONSE

Webinar on
Numerical flooding simulation tools in realistic large-scale flooding scenarios

The role of Numerical flooding simulations within the FLARE framework

3 March 2022

The project has received funding from the European's Horizon 2020 research and innovation programme (Contract No.: 814753)

Presentation Outline

- EC-funded Research Project FLARE – Goal and Objectives
- FLARE Approach, Framework and Methodology
- Flooding Risk Estimation/Quantification
- Numerical, Time-domain simulation tools
- Concluding Remarks

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FLARE Project Goal and Objectives

The FLARE overriding goal is to develop a novel risk-based methodology, beyond the existing state-of-the-art, for **'live' flooding risk assessment and management** in line with IMO high level goals. Specific objectives include:

- Create a flooding incident/accident database for relevant ship types and damages.
- Use this database, with support from **flooding simulation tools** and expert judgement, to develop a two-level flooding risk model (statistical and **first principles**).
- Account for all hazards, all modes of loss, active and passive measures, with application potential to newbuildings and existing ships.
- Develop and demonstrate real-time flooding risk evaluation models for risk monitoring and effective control in emergencies.
- Address the whole spectrum of flooding risk from susceptibility to emergency response.
- Provide the technical basis and a proposal for the revision/introduction of relevant IMO regulations towards a risk-based approach to contain and control flooding risk.

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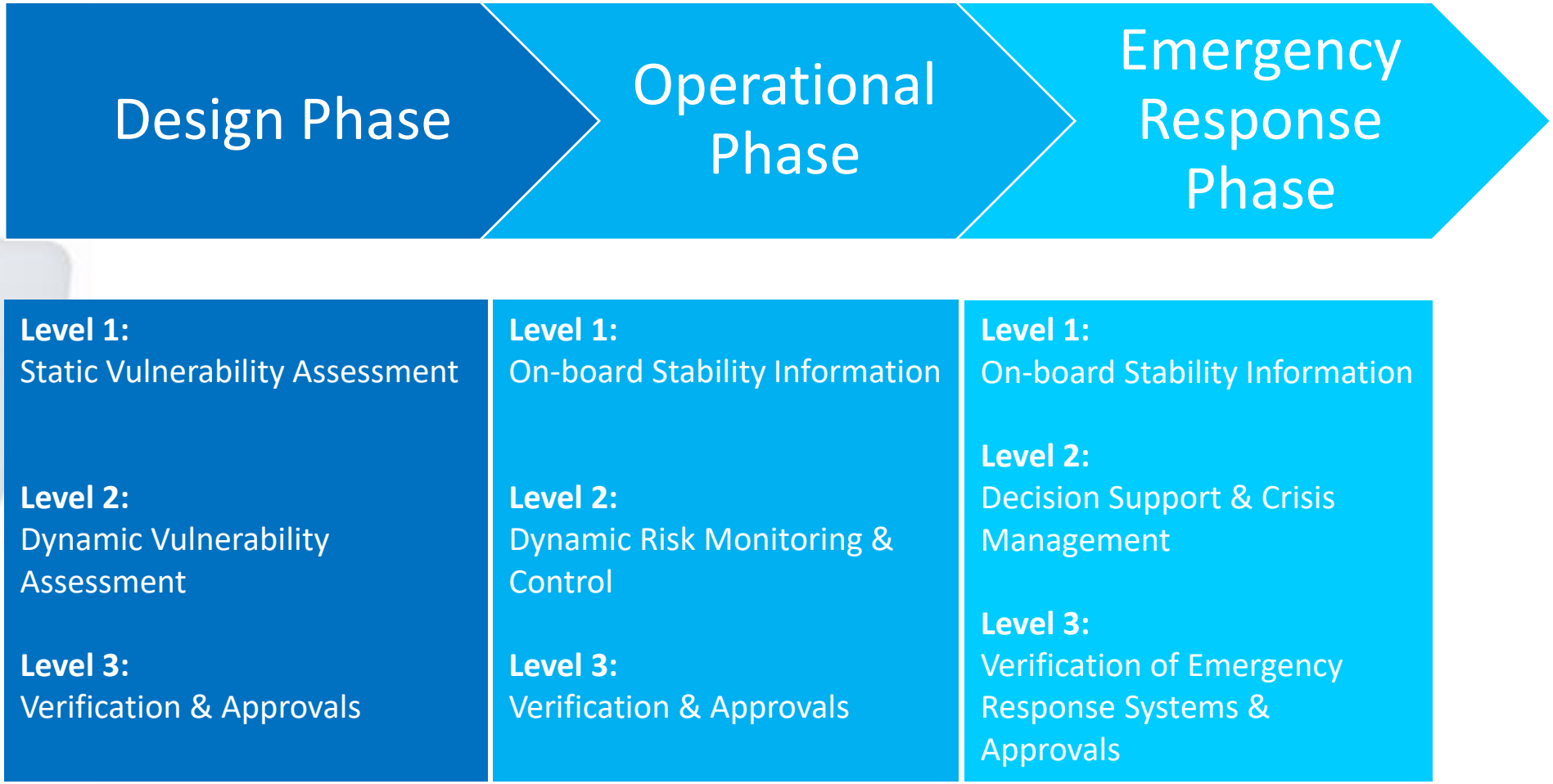
FLARE Multi-Phase/Multi-Level Approach



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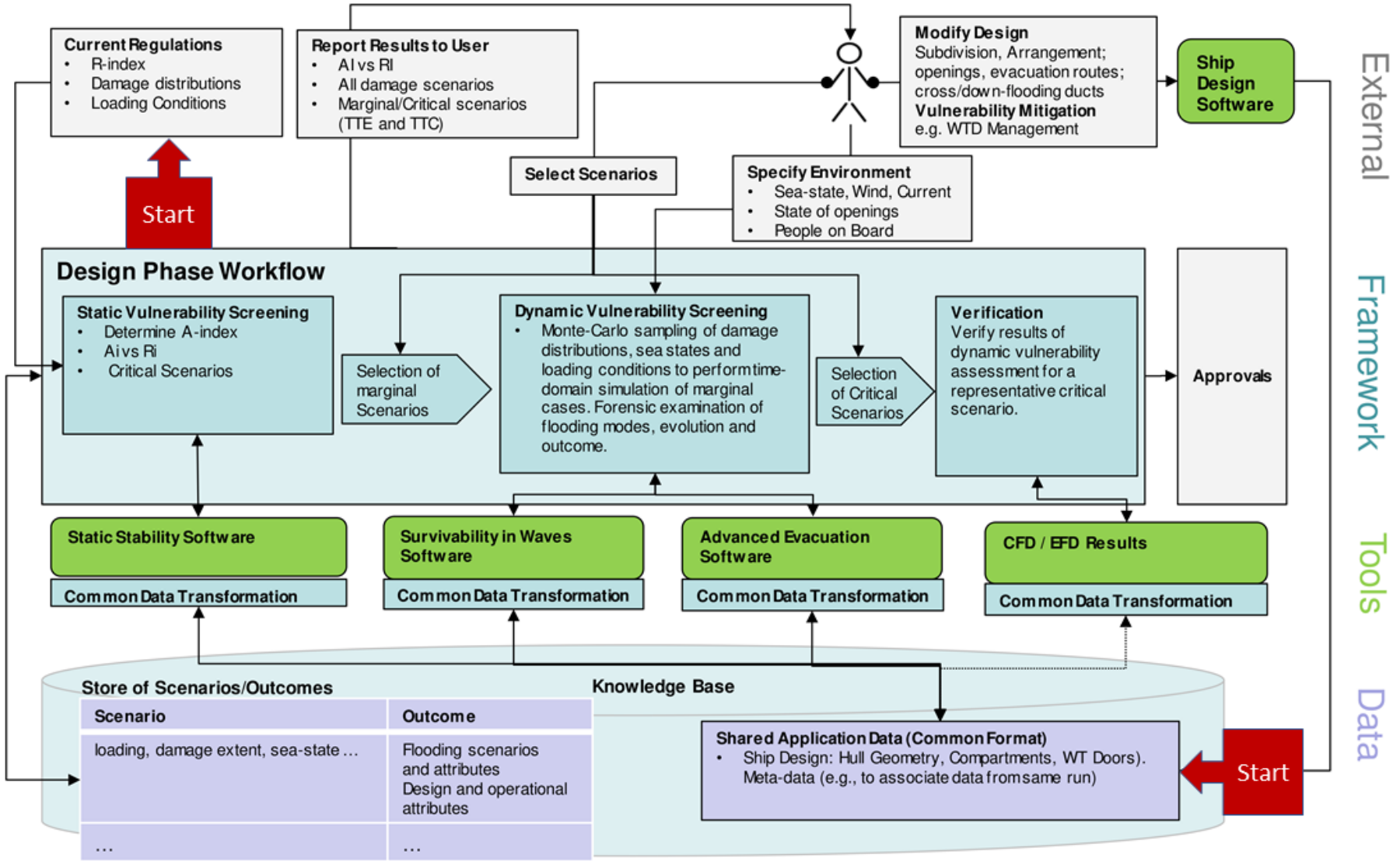
FLARE Framework



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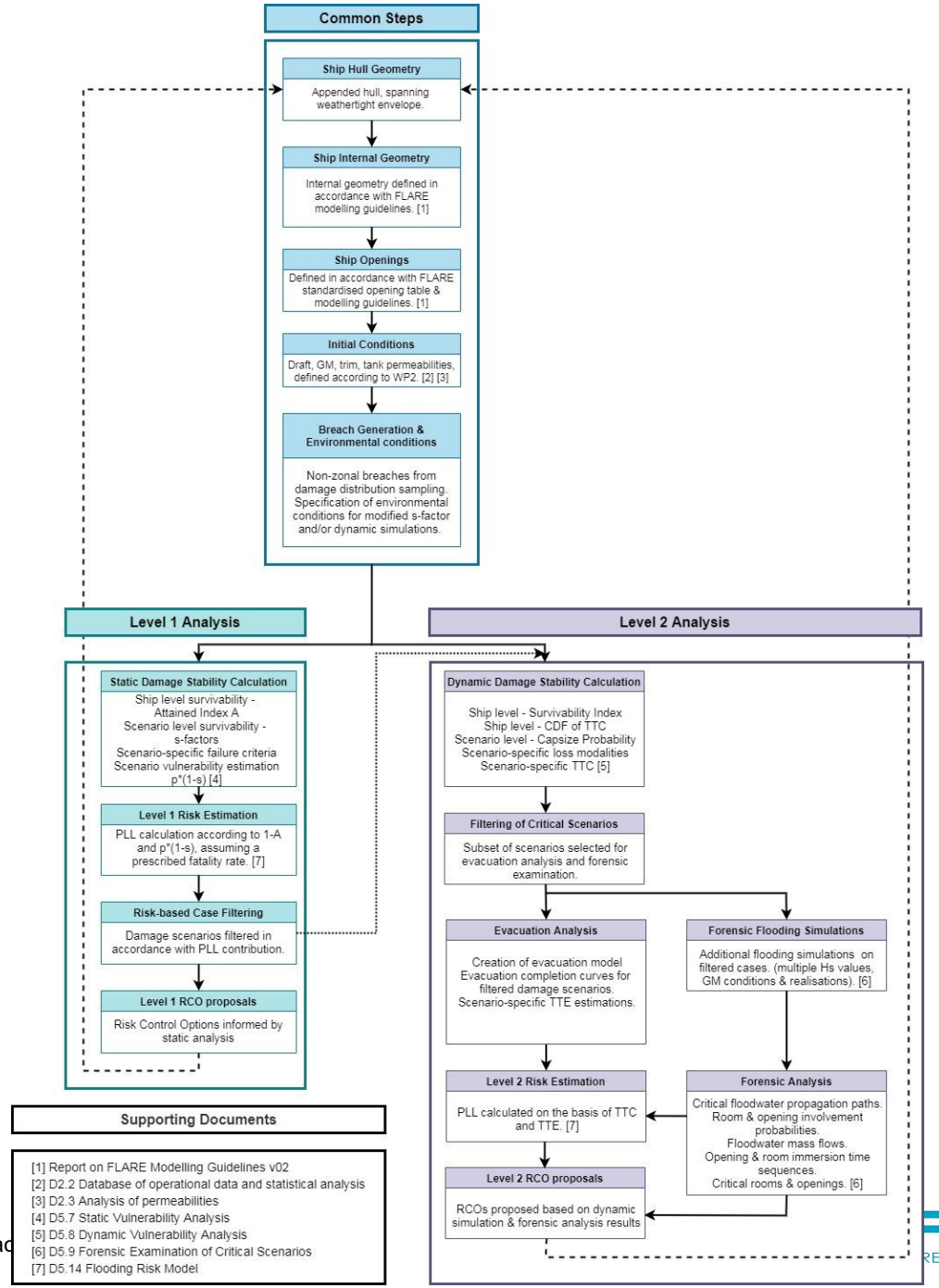
FLARE Methodology

1. Static/dynamic stability assessment
2. Static/dynamic vulnerability assessment
3. Failure/Loss modalities
4. Forensic analysis of loss scenarios
5. RCO selection
6. RCO implementation
7. Impact assessment
8. NTQ



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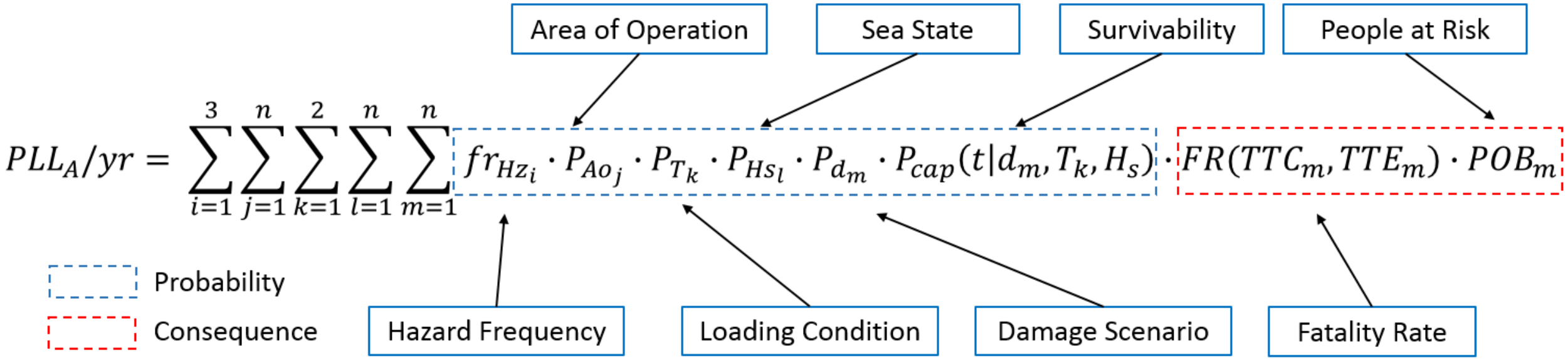
Flooding Risk Estimation/Quantification



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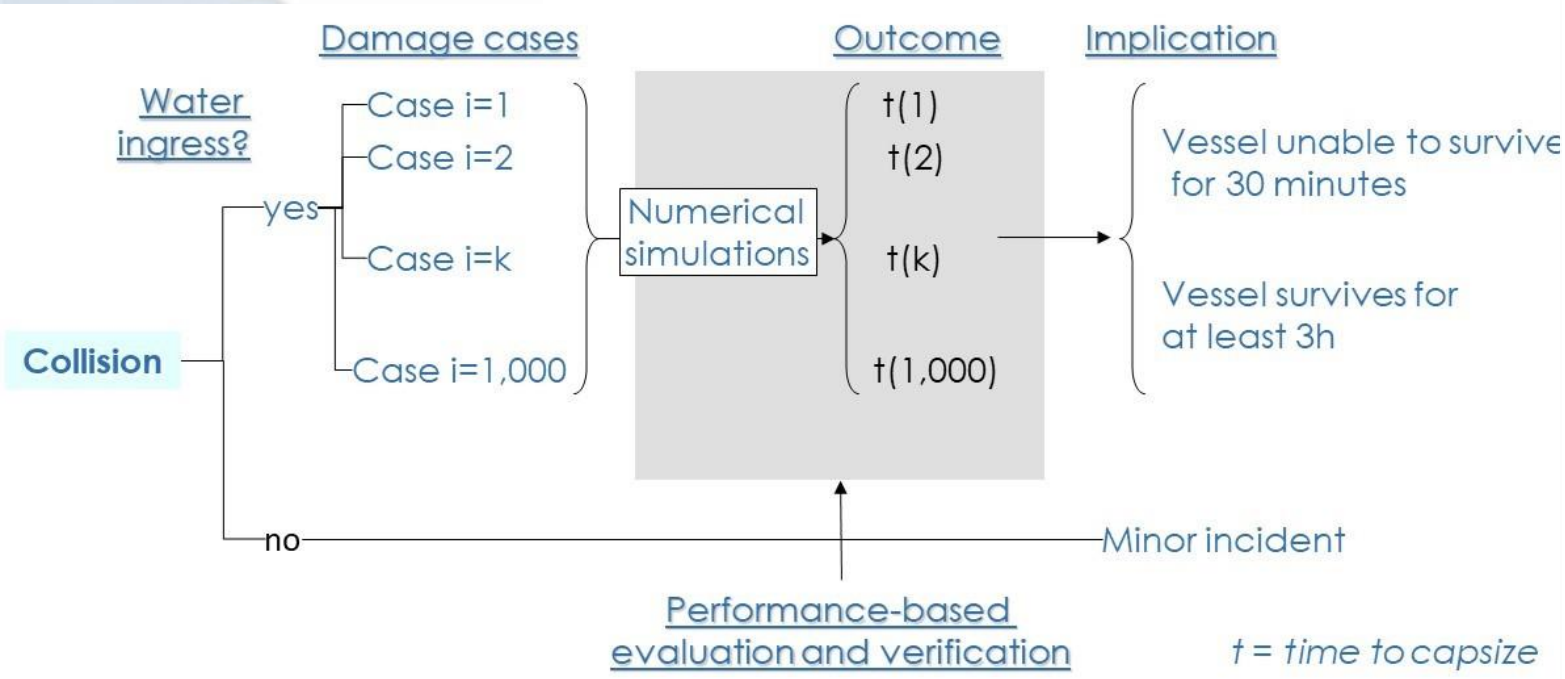
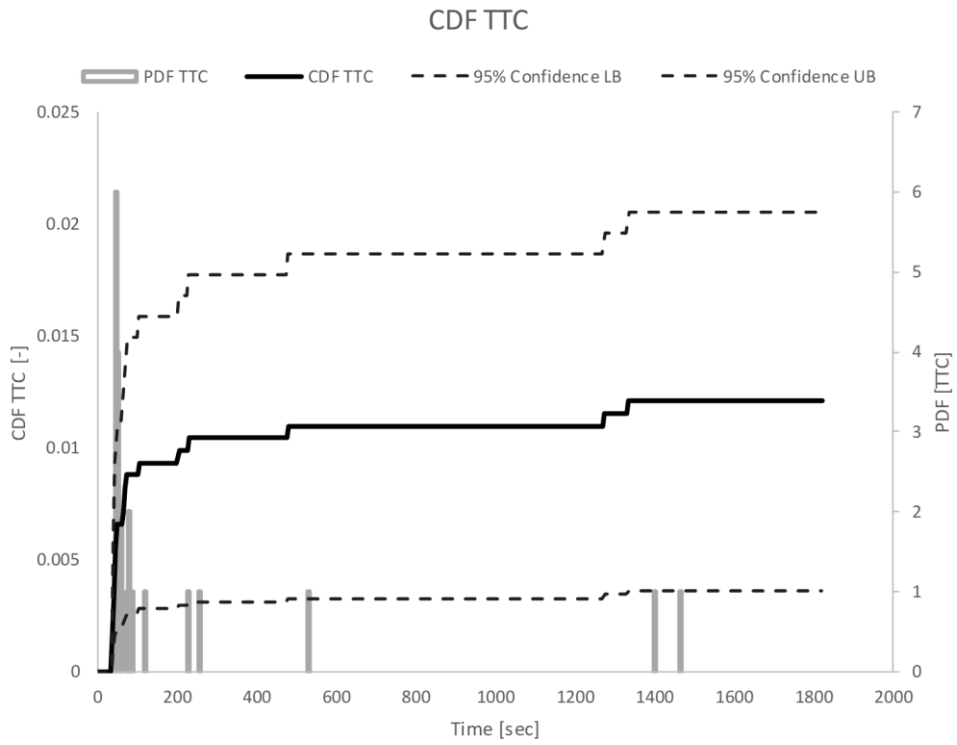
Survivability – Time to Capsize





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Evacuabiity – Time to Evacuate

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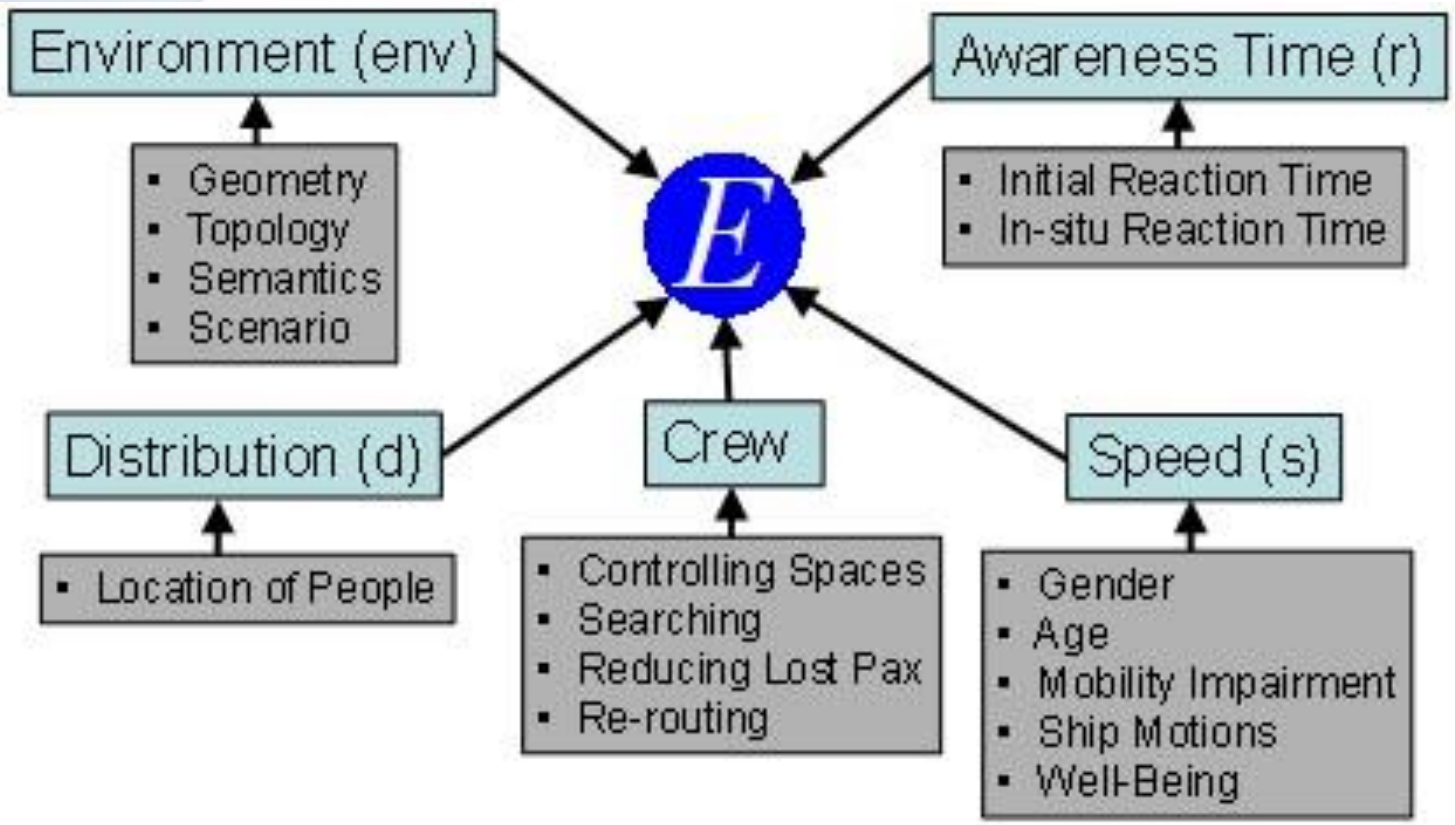

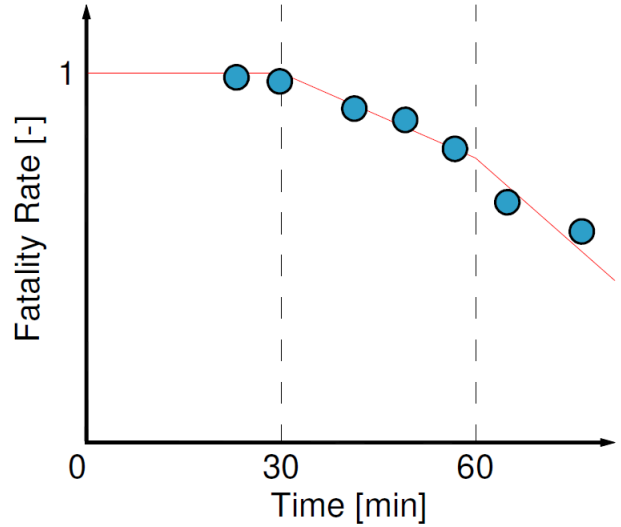

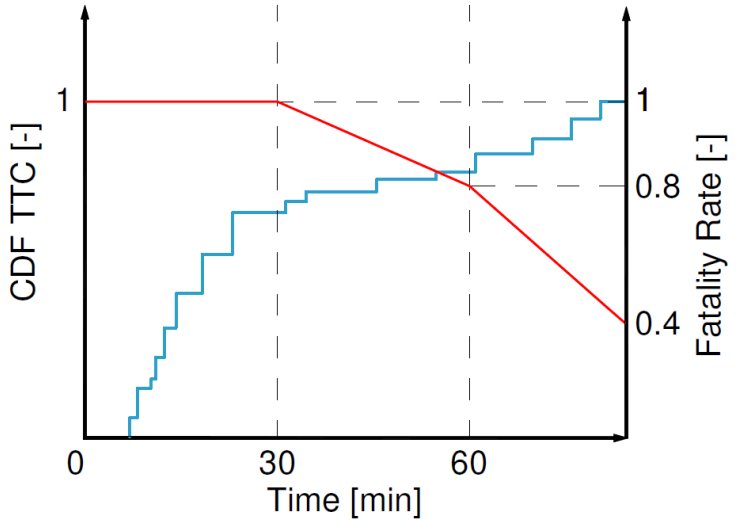

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Concluding Remarks

A monumental effort spanning over three decades, with major support by the European Commission in multi-million funded projects, has nurtured unprecedented collaboration between Industry, Government and Academia. This brought research teams together with varying insights, knowledge, and experience to help transform the landscape of maritime safety, especially passenger ships **through the development of methods, tools, and processes** to support safety enhancement through innovation, a key component of the passenger ship industry.

This effort culminated in Project FARE, with a focus on damage stability and flooding hazards, in a series of unique developments addressing current gaps at IMO (e.g., focus only on the hazard of collision) and paving the way for a new regulatory framework where all hazards are addressed as well as developing design and operational measures to contain, control and mitigate flooding risk with application to new and existing ships.

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THANK YOU

Q&A

Visit our website:

www.flare-project.eu

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