SAFEMODE

Strengthening synergies between Aviation and Maritime in the area of Human Factors towards achieving more efficient and resilient MODES of transportation.

WORLD MARITIME UNIVERSITY

Data quality and trust for Safety Learning Culture

Transport Maritime Hub. Psychology and Safety

New Zealand, 24 August 2022

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This project has received funding from European Union's Horizon 2020 Research and Innovation Programme under Grant Agreement N°814961.

Agenda

1. WMU in a nutshell

2. Safety Learning Culture-SAFEMODE H2020 EU Project

3. Data quality is important & trust is fundamental

4. Conclusions & way ahead

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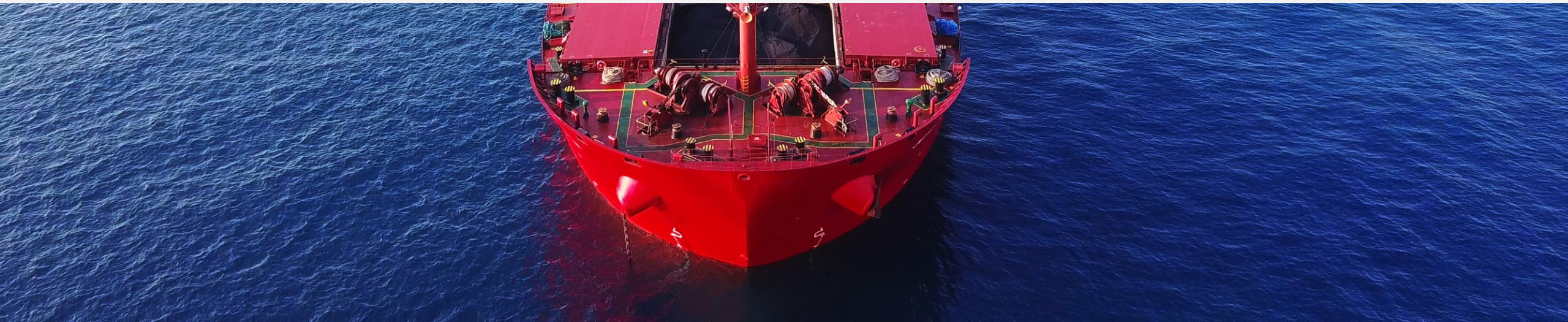
1- WMU in a nutshell



About WMU

Established in 1983 within the framework of the International Maritime Organization (IMO), a Specialized Agency of the United Nations

MISSION

To be the world centre of excellence in **postgraduate maritime and oceans education**, **professional training and research**, while **building global capacity** and promoting sustainable development

VISION

To inspire leadership and innovation for a sustainable maritime and oceans future

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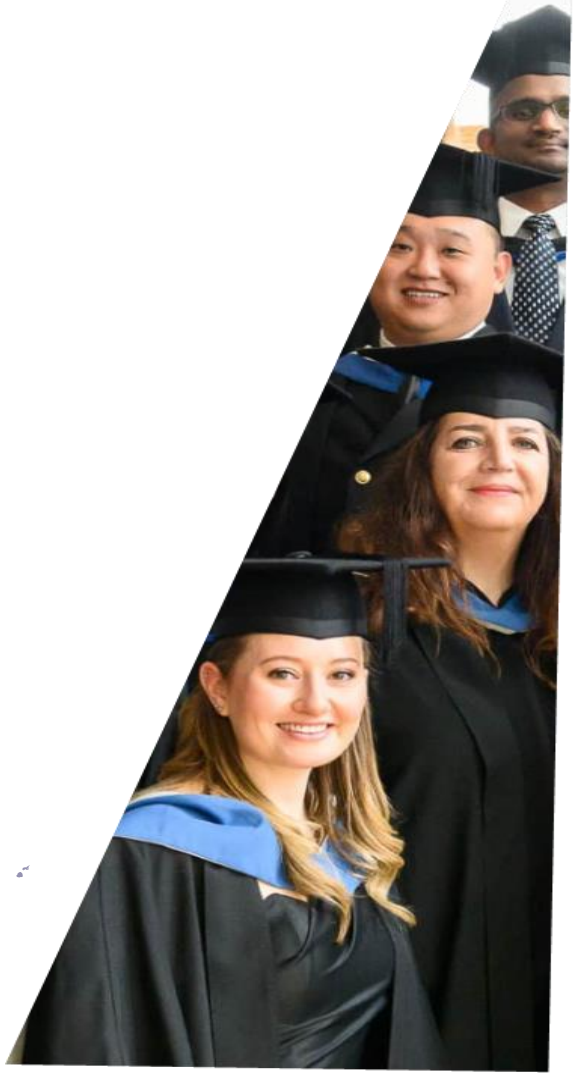
Global Impact

5,634 Alumni

171 Countries and Territories

1,254 Female Graduates



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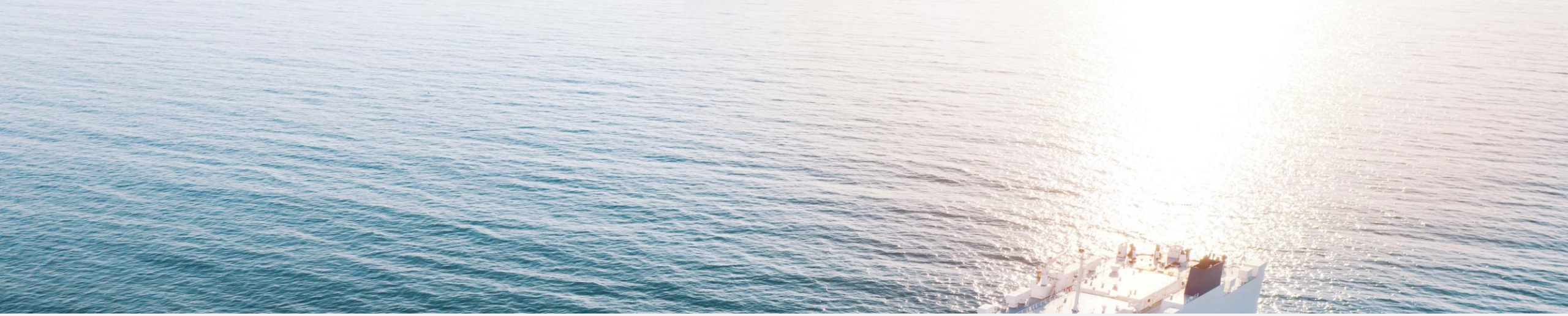
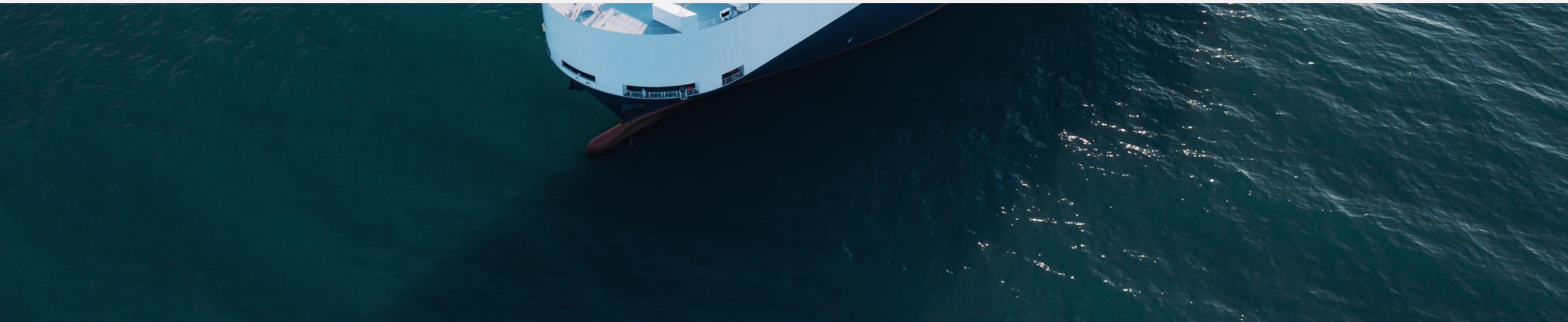
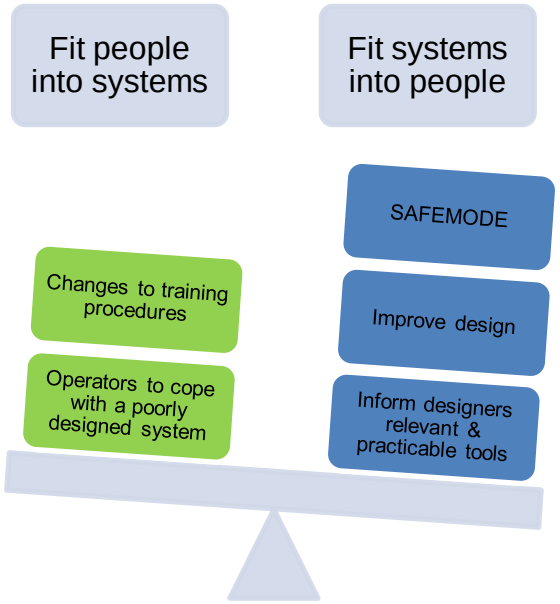


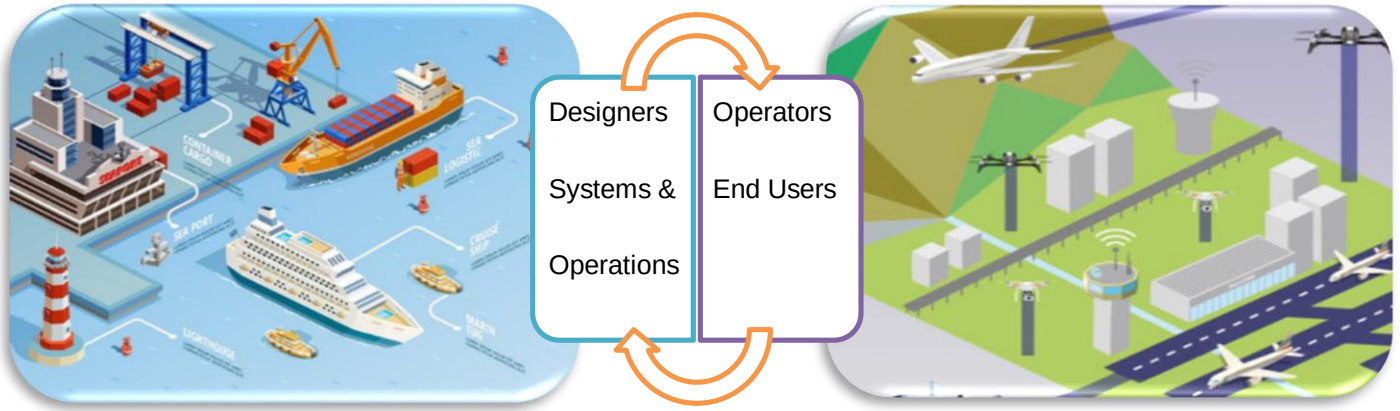
2- Safety Learning Culture. SAFEMODE H2020 EU Project



Data driven & Tools & Feedback

- Scarcity of HF & organizational data derived from the investigation of safety events
- Data and available techniques are rarely applied at the design and safety assessment stages
- Need of effective feedback loops from operators/end users back to designers





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SAFEMODE

Towards a Safety Learning Culture

SAFEMODE Project Consortium

Leaders & participants of the safety learning culture work

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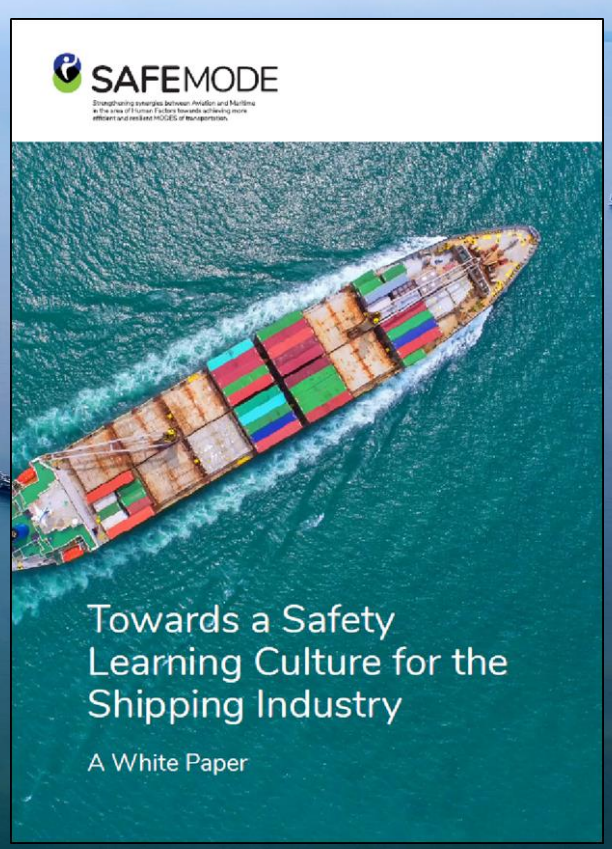
Towards a Safety Learning Culture

What does Just and Learning Culture look like in Shipping?

There needs to be a **Culture** framework put in place in Maritime to facilitate **reporting**, and thus **learning**

Guidance might be based on leading edge work ongoing in the aviation domain



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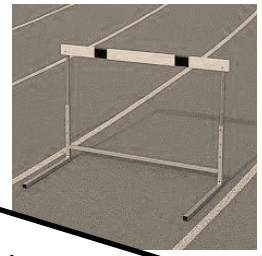
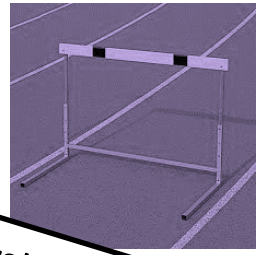
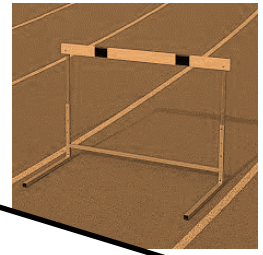
Cultural change to overcome barriers



Investigation



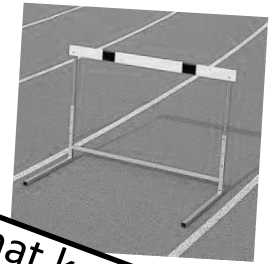
Understanding Human Element



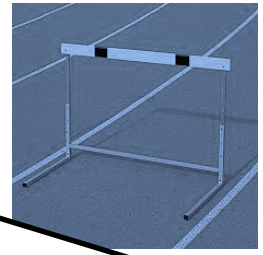
Reporting

Near miss Reporting

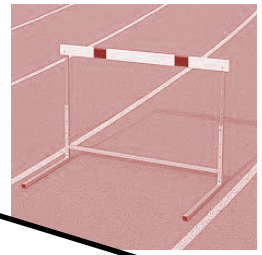
Investigator and Seafarer interviews & maritime leaders discussions



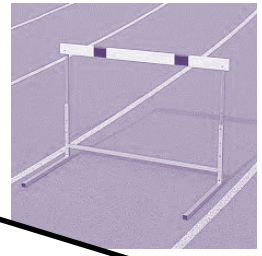
What keeps ship safe



Safety Management System



Just Culture



Safety Learning

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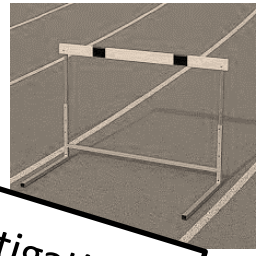
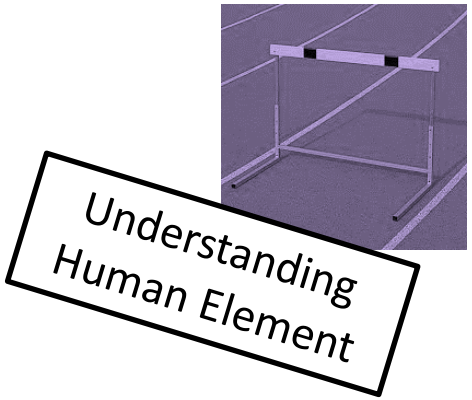


- Conflicting objectives in accident investigation (e.g., learning or prosecuting)
- Lack of **trustful relationship** (e.g., investigators vs. seafarers)
- Organizational and structural issues scarcely investigated



- Insufficient knowledge in Human Factors
- Focus on individual not on the system
- Too much focus on procedural compliance

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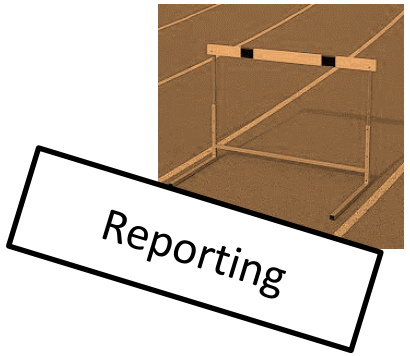

- Difficulty in making reports
- Unfavorable mindset to reporting
- Reporting purpose (e.g., blaming or learning?)
- **Mistrust** shore-ship

- Negative **feedback** on near miss reporting
- Focus on satisfaction of indicators more than **quality of reporting**
- Reporting system itself: easiness, use of information
- Lack of tools and resources to analyse reporting

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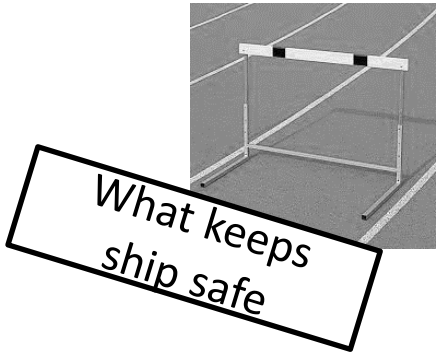
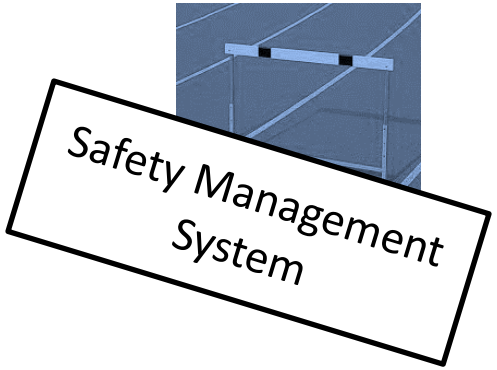


- Professionalism of crew and training of individual
- Resilience and flexibility
- Balance between experience (crew) and procedures (company)
- Procedures do not take into account the **realities** of the **operation context**



- Lack of positive **feedback**, seen as burdensome
- Too **generic**, does not properly integrate operational demands
- Gap in **understanding** between onshore departments (SMS) and ship (operational context)
- Learning processes do not mean Learning Culture

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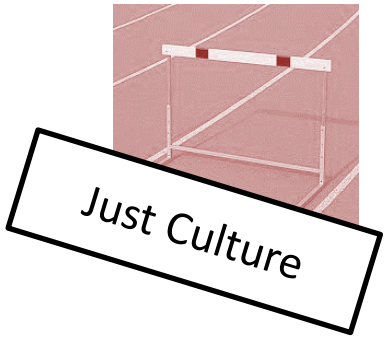
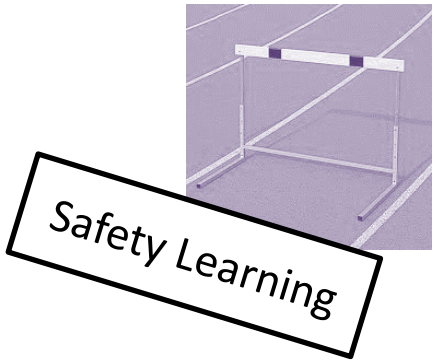


- **Blame** and **punishment** hinders learning
- Unstable working conditions
- Need for a systems perspective
- Need for **trust** and **cooperation**



- Investigator provides facts to learn from
- Investigations recommendations not sufficiently applied
- Reluctance to consider **organizational factors**

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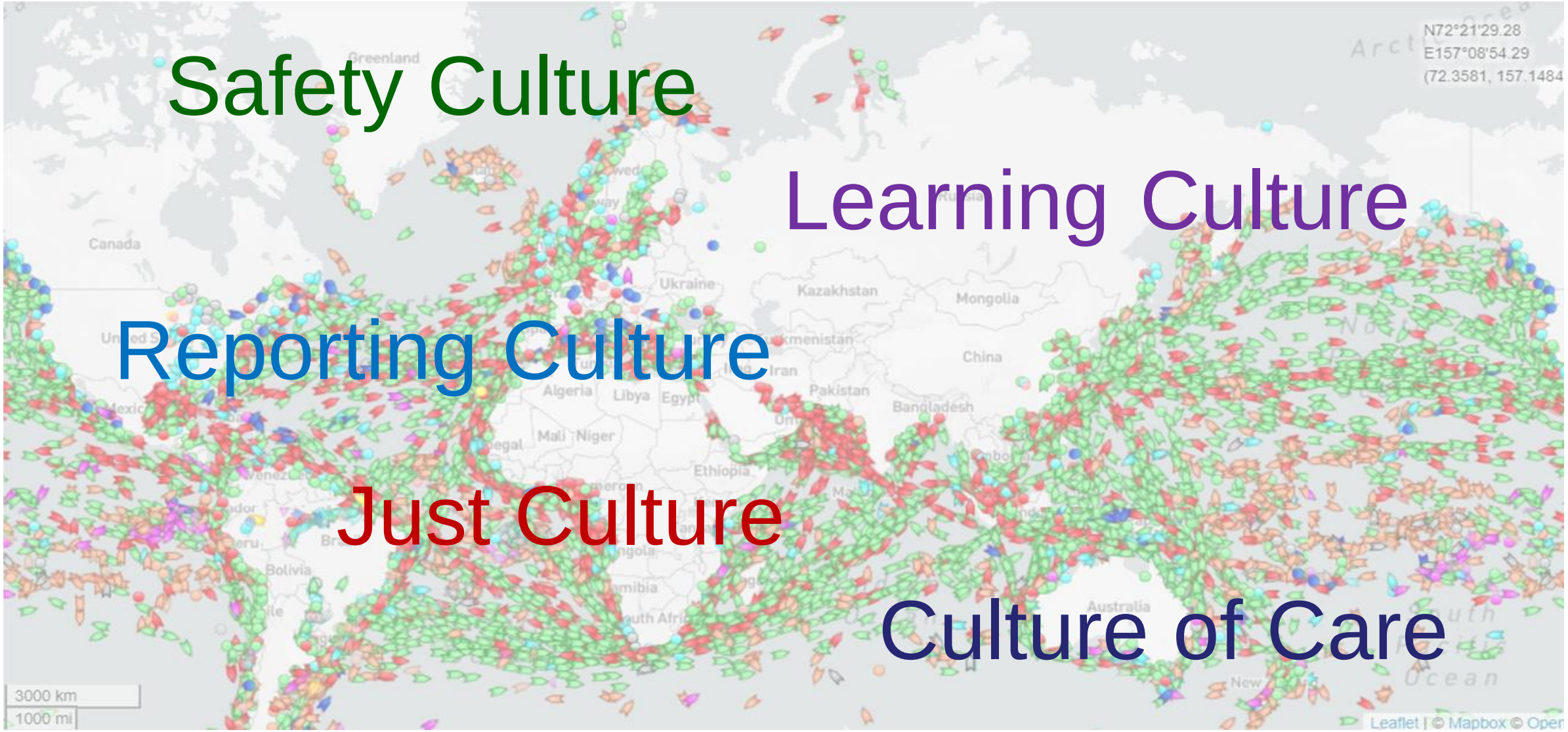
Next Destination



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Source: Marine Traffic

Safety Learning Culture in Maritime and Aviation

Based on the original SAFEMODE Safety Learning Cycle, 10 ways of learning has been developed, that can be applied equally to both aviation and maritime systems.

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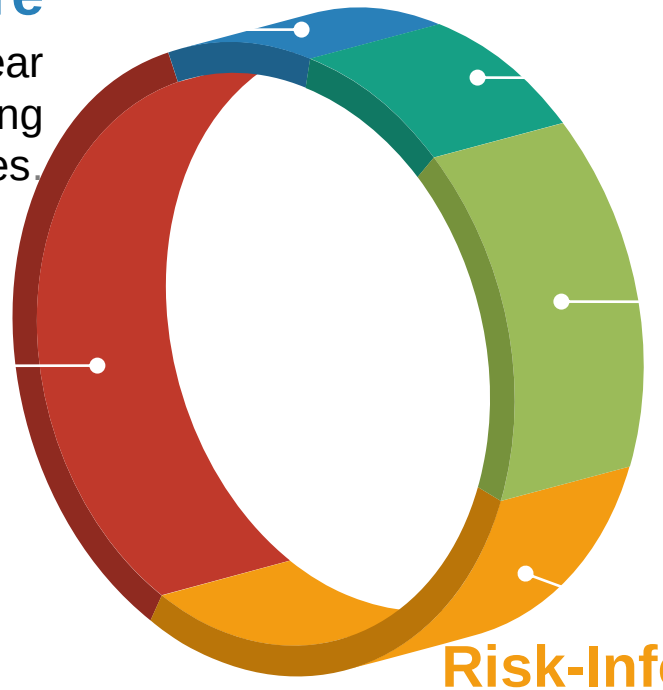
The SAFEMODE Safety Learning Cycle

Data Capture

Any events, incidents, accidents and near misses are reported and investigated using effective systems, language and processes.

Data Analysis

Data are analysed to determine causes, contributions, and remedial measures to prevent recurrence



Operation & Maintenance

Normal and abnormal operations are monitored constantly for performance variations and safety exceedances

Safety Learning

Specific and generic lessons are drawn to improve safety, including via job and interface design, automation, and improved risk assurance processes

Risk-Informed Design / Deep Learning

Designers and risk assessors are able to use the lessons learned to make future systems more resilient.

Organizational and systemic Human Factors issues are addressed

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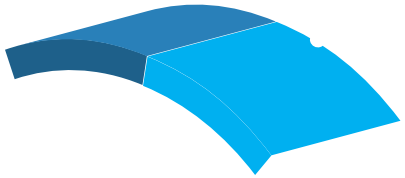
Ten Safety Learning Approaches

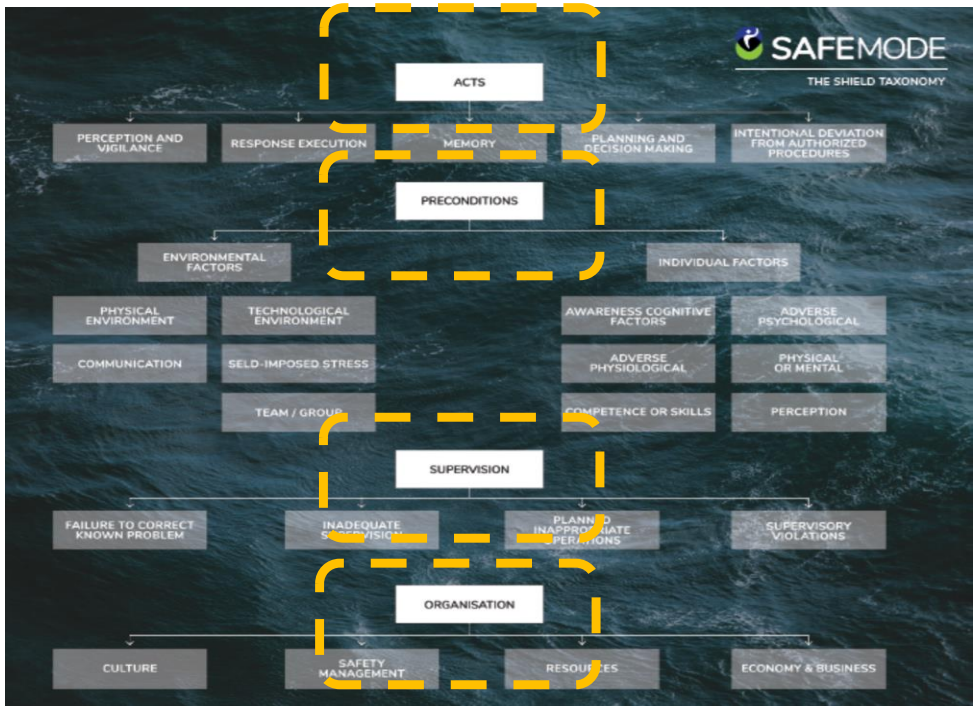
Data Capture

1. Common Language (Taxonomy)
2. Investigating Differently



Data Analysis

3. Evidence Base/Learning Platform
4. Ten Most Wanted



Investigating Differently

- *People deserve confidentiality*
- *People deserve to be heard out*
- *People deserve to be involved in the process*
- *Learning comes from a two-way dialogue*
- *People should be treated fairly, irrespective of how much the damage cost*
- *Investigators need to understand 'how the job is done around here'*

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Ten Safety Learning Approaches

Data Capture

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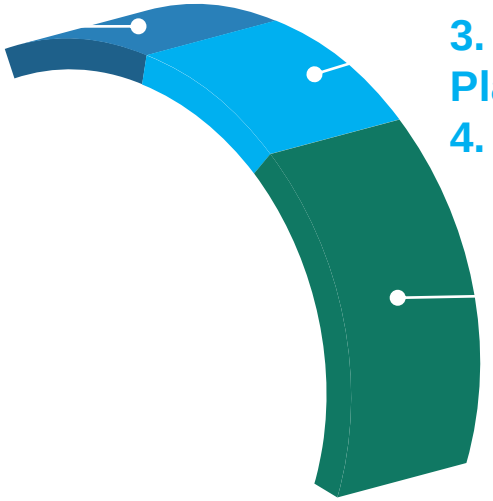
2. Investigating Differently

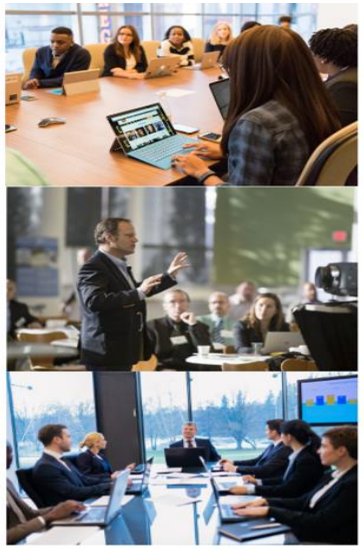


Data Analysis

3. Evidence Base / Learning Platform
4. Ten Most Wanted

Safety Learning

5. Group Learning Review
6. Deep Dives
7. Safety Intelligence Sharing
8. Safety Alliances/Safety Forums



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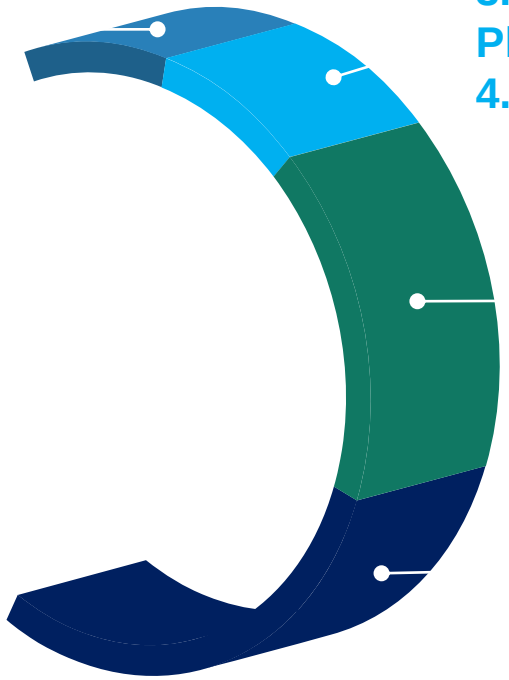
Safety Deep Dives

- Explore a specific accident or incident trend
- Examine the basis for safety
- Which barriers are still working?
- Which barriers are no longer working?
- What are the key Human Factors involved (both positive and negative?)
- Have any external factors changed?
- Have internal factors changed (staffing, competency, etc.)?
- Are the procedures still fit for purpose?
- What are the deep systemic factors?
- Where are the hotspots in the fleet?
- Where are there best practices in the fleet?
- What can be shared across the fleet?

Ten Safety Learning Approaches

Data Capture

1. Common Language (Taxonomy)
2. Investigating Differently



Data Analysis

3. Evidence Base / Learning Platform
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Deep Learning

9. Reverse Swiss Cheese Theory
10. Human Factors Toolkit

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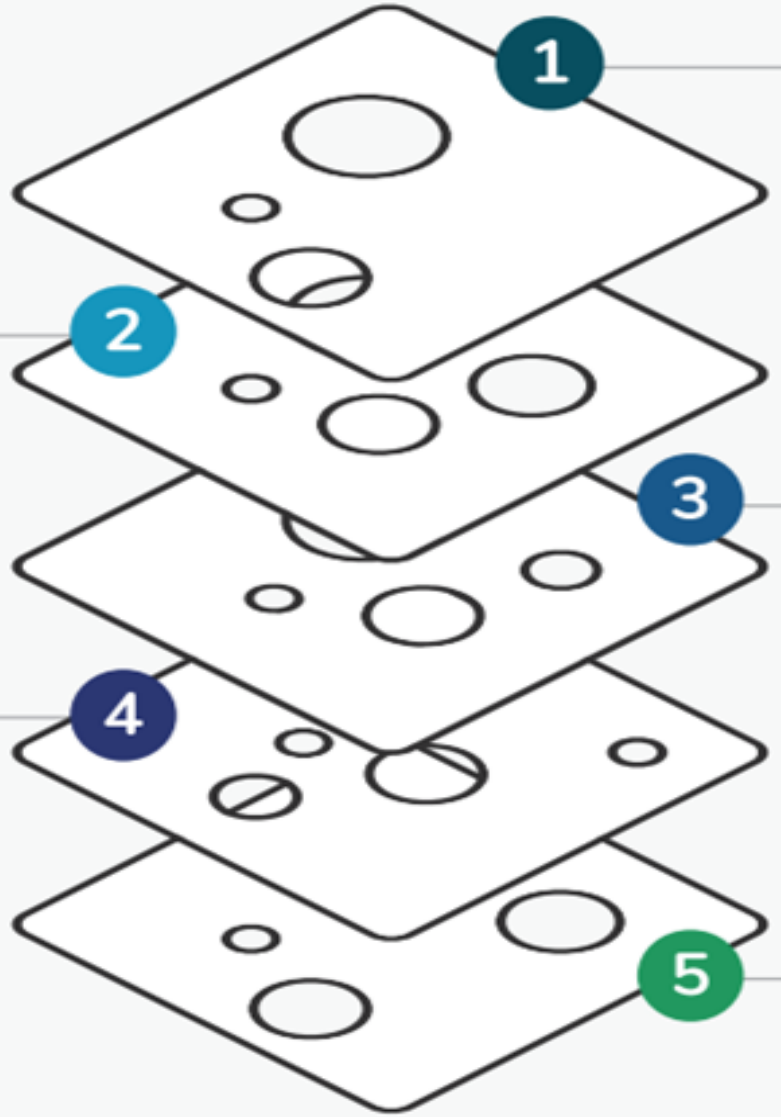
REVERSE SWISS CHEESE – MARITIME

Where are the holes in my organization's Swiss Cheese?

Economy, Pressures, Laws, Regulations, Societal Trends

Upstream

Downstream



Organisation

Strategy & Policy
Resources
Communications
Culture
Safety Management & Learning
Regulatory Compliance

Design

Concept Requirements
Naval Architecture
Standards
Human Factors & Ergonomics
Safety Margins
Operational Feedback

Fleet Support

Crewing & Certification
Training & Procedures
Safety Management System
Investigation & Learning
Maintenance Planning System
Defect Reporting & Management

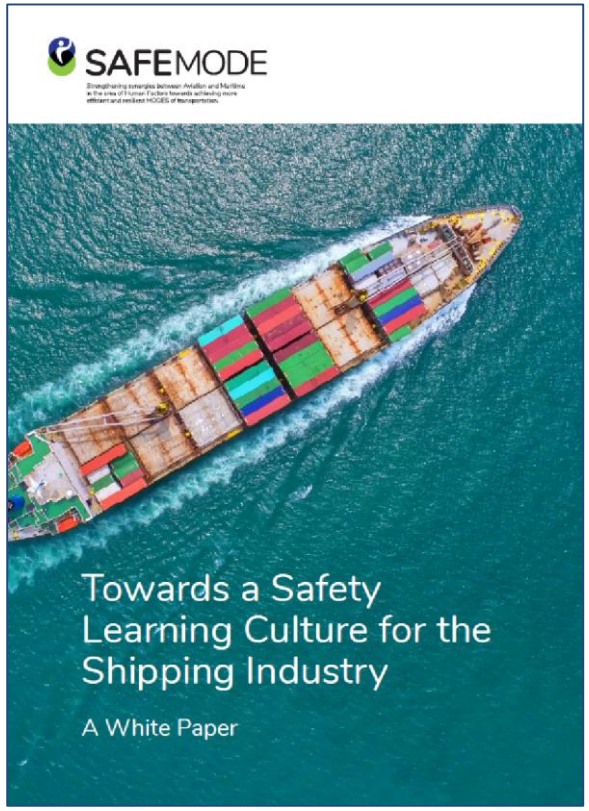
Vessel Operations

Master's Leadership
Professionalism
Teamwork
Speaking Up / Just Culture
Health & Wellbeing / Fitness for Duty
Onshore-Onboard Collaboration

Providence (luck)

Need for Safety Learning Culture

- To choose **learn over blame**
- To build **trust** and improve **operational safety**
- To obtain more **accurate and consistent understanding** of the critical factors leading to incidents and accidents
- To avoid incidents and accidents via more **systemic accident prevention strategies** that go beyond isolated events
- To ensure **learning occur at all levels**, whether on the ship, onshore, across the fleet, across a segment of the industry, or throughout the industry as a whole



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3- Data quality is important and Trust is fundamental

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Data flow. Feedback and Quality

- From **accident investigations**. Reactive and based on accident reports (feedback)

  Systematic collection and analysis of HF data from safety events, its categorization through a **HF taxonomy**, and use for **new human factors risk models**

  How investigations are conducted, investigation focus on “who” or **“why”, data quality and reliability, work realities**

Post

Pre

- From **near-misses & incidents reporting**: Proactive and based on feedback from reporters (feedforward)

  Development of a **Culture framework** in which operators are not punished for their honest mistakes and accountability exists but **encourages anticipation by sharing**

  Trust, reporting is not an artefact but a reality, a **participatory approach**, reporting culture oriented to optimize interfaces, correcting and detecting dangerous environments

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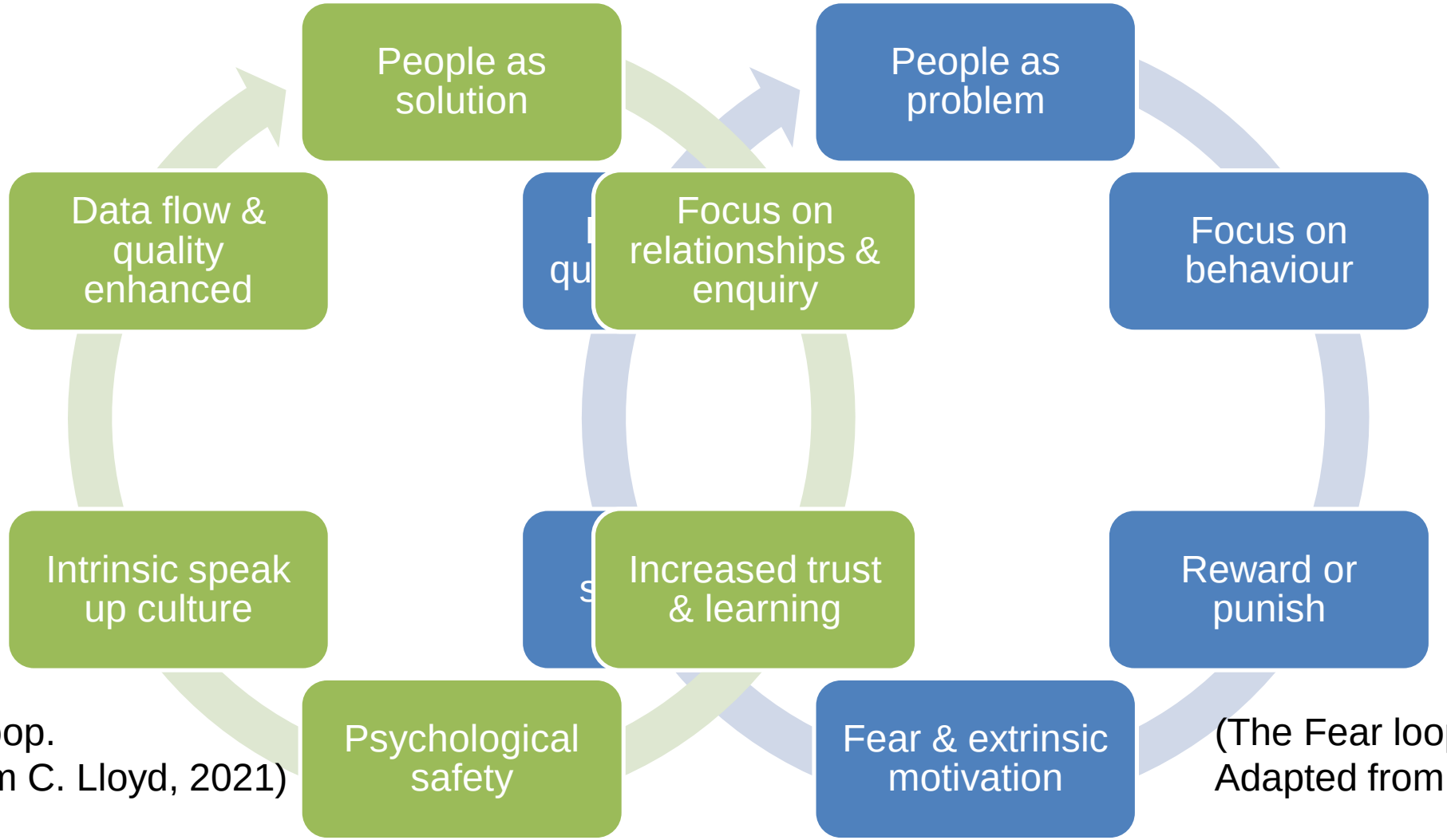
Trustful relationships



(The Trust loop.
Adapted from C. Lloyd, 2021)

(The Fear loop.
Adapted from C. Lloyd, 2021)

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4- Conclusions & way ahead

- ✓ Focus on **workplace realities experienced**
- ✓ Search for **data quality,** validity, reliability
- ✓ Support **qualitative research** to complement numbers
- ✓ Choose **learning** over blaming
- ✓ Build **trust** (ability, honesty, care) and enhance **cooperation** (seafarers/shore-management/authorities) for quality feedback
- ✓ Develop **systemic approach** (feedforward)
- ✓ Learning is everywhere: participation based on **trust** and a **caring** environment!

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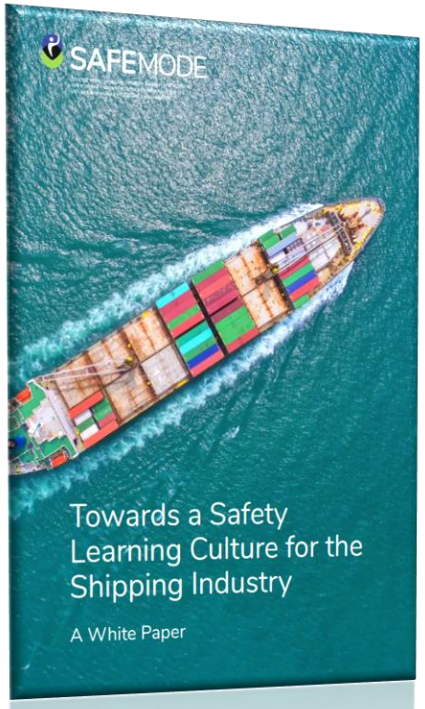
Next steps



2022
Public release event

2022
Industry forums, capacity building training, research publishing

2022
Paper submission to IMO

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‘For the common goal of improving safety at sea, we must cast aside our competitive instincts and share knowledge and experience on safety performance’

Knut Ørbeck-Nilssen, DNV Chief Executive Maritime
(Lloyd’s List 19 December 2021

Thanks for your attention

Maria Carrera | *mca@wmu.se*

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