



# **IVR Workshop 2019**

## **Accidents in inland navigation**

*Vessel bridge collisions and  
the human element*

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Inland shipping | Insurance | Ship's survey | Related sectors

Hello ☺



CREE Certified human factors professional

**INTERGO** | International Centre for Safety,  
Ergonomics & Human factors

Main focus Transport - IWT

# Content

1. Vessel bridge & lock collisions
2. Human element
3. Understanding vessel bridge collisions



# 1. Vessel bridge & locks collisions

IVR: since 2014 European IWT

- almost 100% increase in collisions
- higher costs claims
- 70% human element

Some quoted premises:

- “Impact of distraction in wheelhouse”
- “Changes in tasks and complexity of tasks”
- “Apparent safety by increase in technology”
- “(More) need for attention in wheelhouse”
- “Need for increased awareness safe(r) sailing”

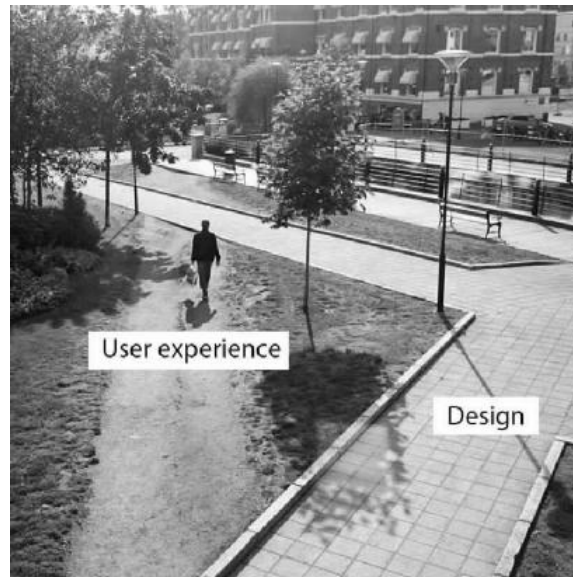
Understanding of ways humans contribute to the outcome before solving

## 2. Human element - Human factors

Humans are complex | interesting

“Systematically taking into account of  
man, machine, environment  
in design  
for optimal € and ♥ “

*Source: International  
Ergonomics Association*



## 2. Human element - Human factors



*“Human factors investigation  
requires a study and analysis*

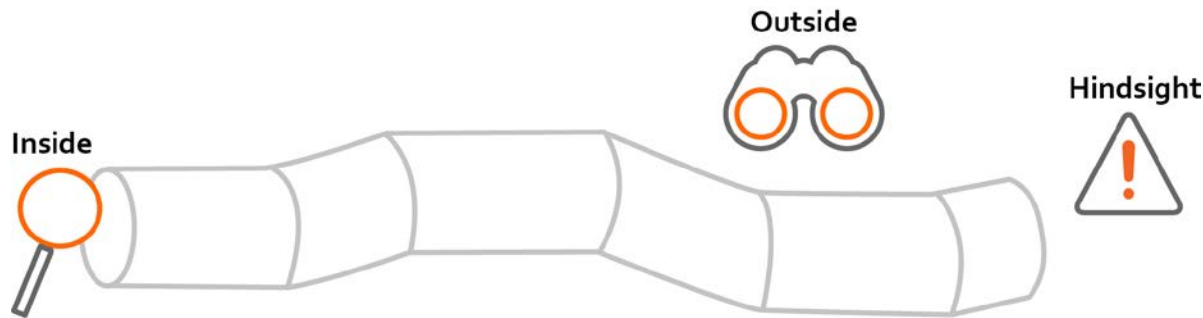
*of the capabilities of the people involved in*

*the design of the equipment,  
the interaction of the human operator with the  
equipment,  
and the effectiveness of the procedures followed  
by crew and management.”*

Source: MAIIF

## 2. Human element - Human factors

Human error = label given in hind sight  
to categorize human behaviour



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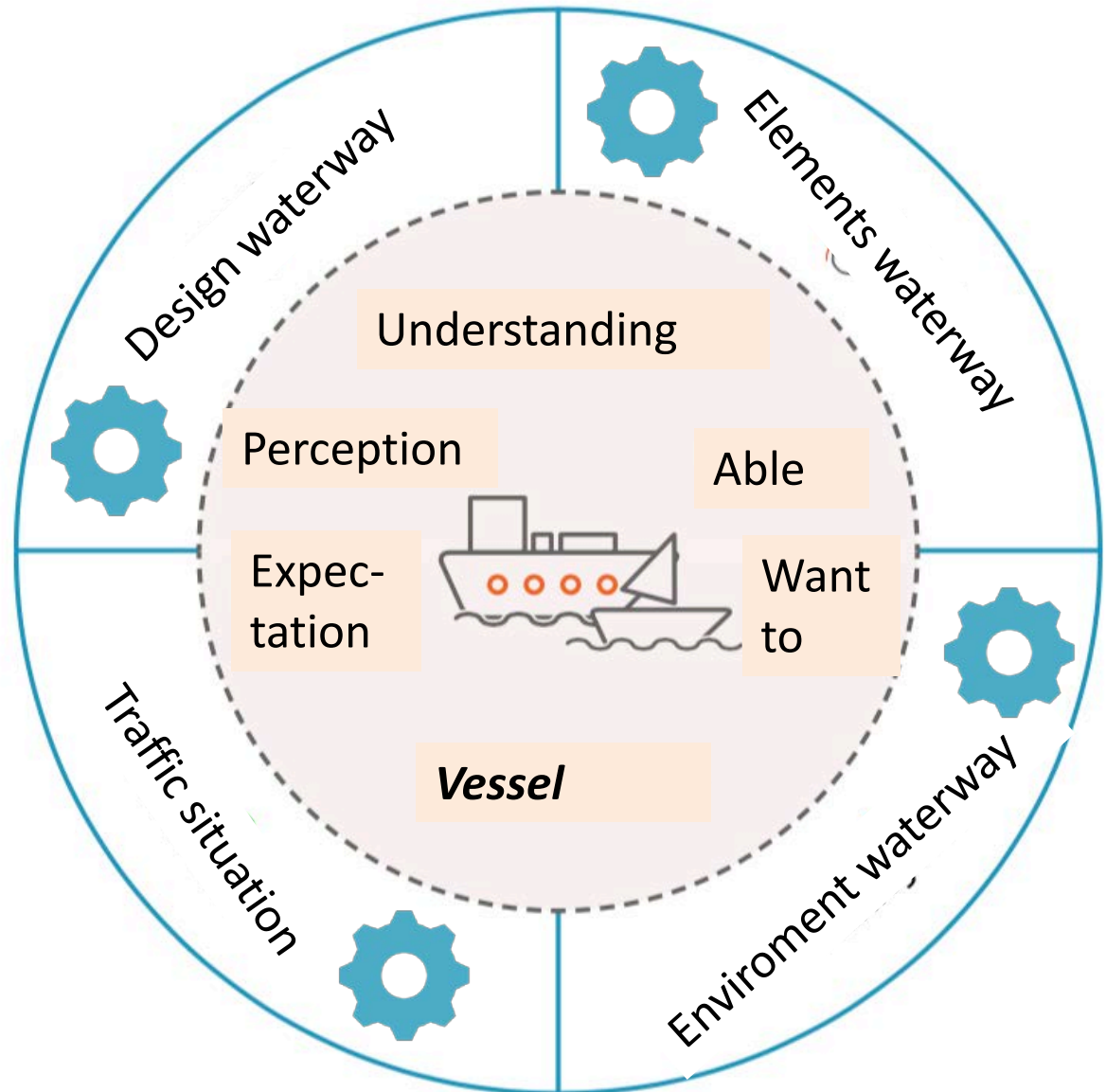
Humans are fallible  
Day-to-day variation  
Source of both success and failure

We should investigate why it was logical to act in  
the way humans did at that moment in time



## 2. Human element - Human factors

*Example*

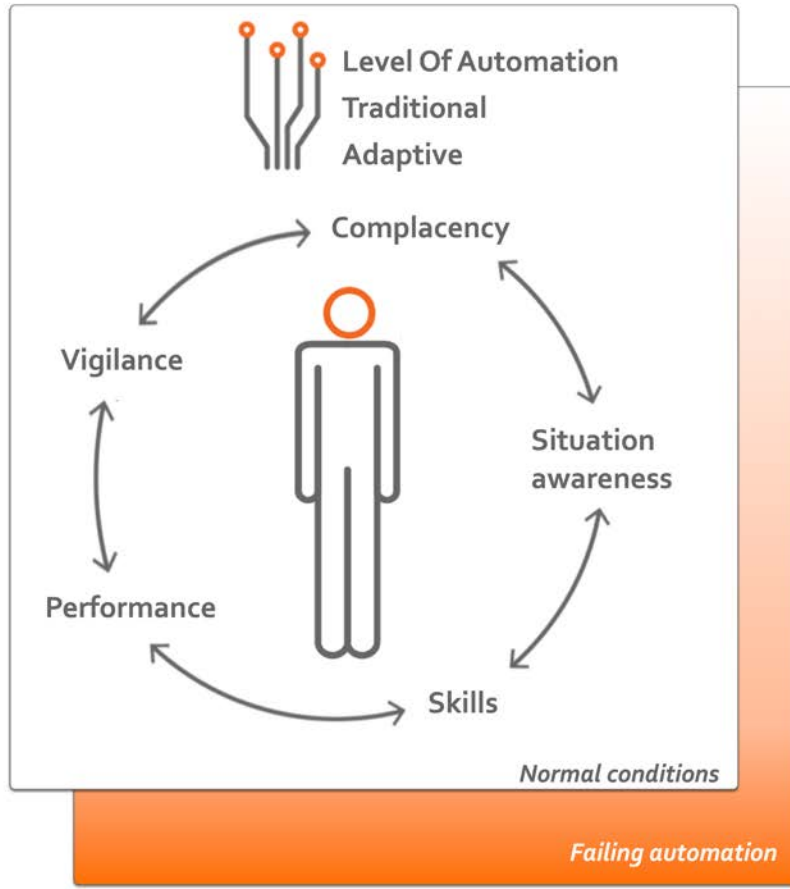




## 2. Human element – Human factors



Time criticality



System robustness

Technology affects:

- (human) tasks
- trust
- performance

Man & technology  
cooperate intensively

What if the system  
fails: what is human  
reaction?



Organisation model



Competences

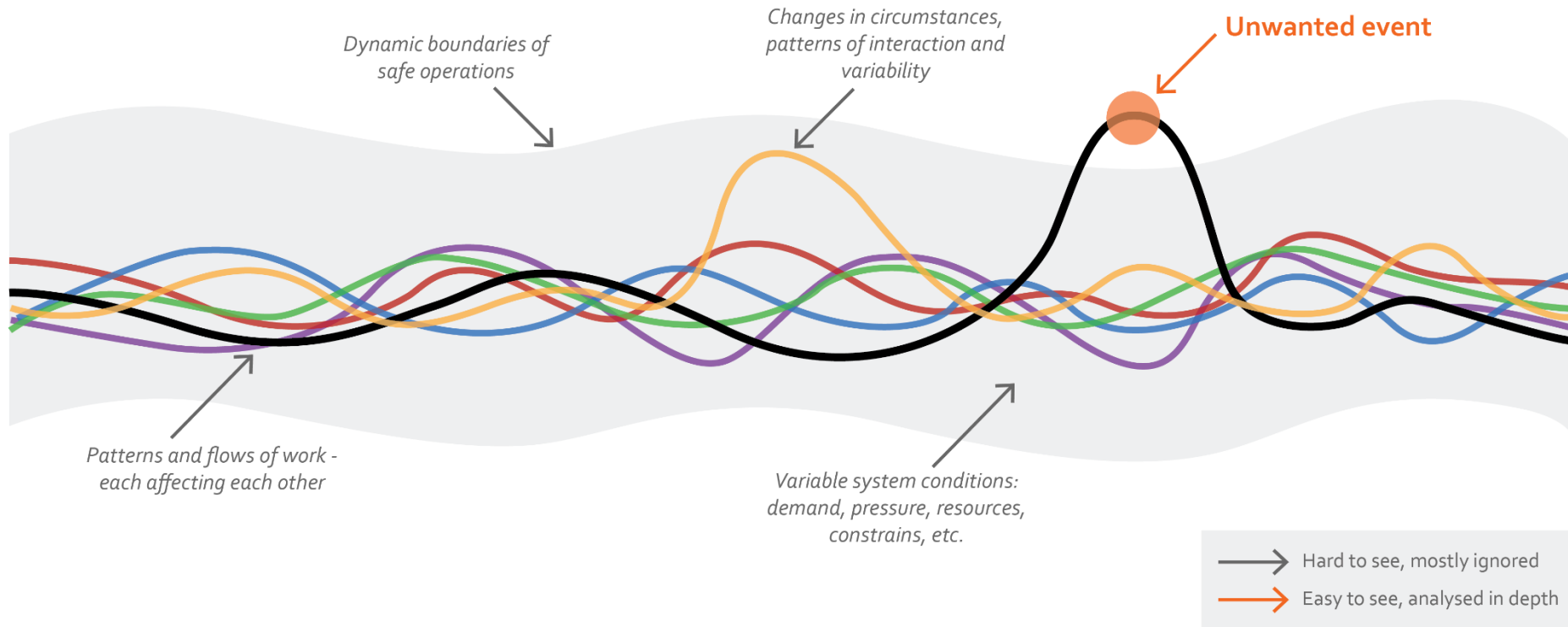
## 2. Human factors - Human error (pre)conditions/-cursors

1. Lack of communication
2. Complacency – tendency to see what you expect
3. Lack of knowledge/ skills
4. Distraction
5. Lack of teamwork
6. Fatigue
7. Lack of resources
8. Pressure
9. Lack of assertiveness
10. Stress
11. Lack of awareness
12. Norms

*Source: George Dupont, 1993*

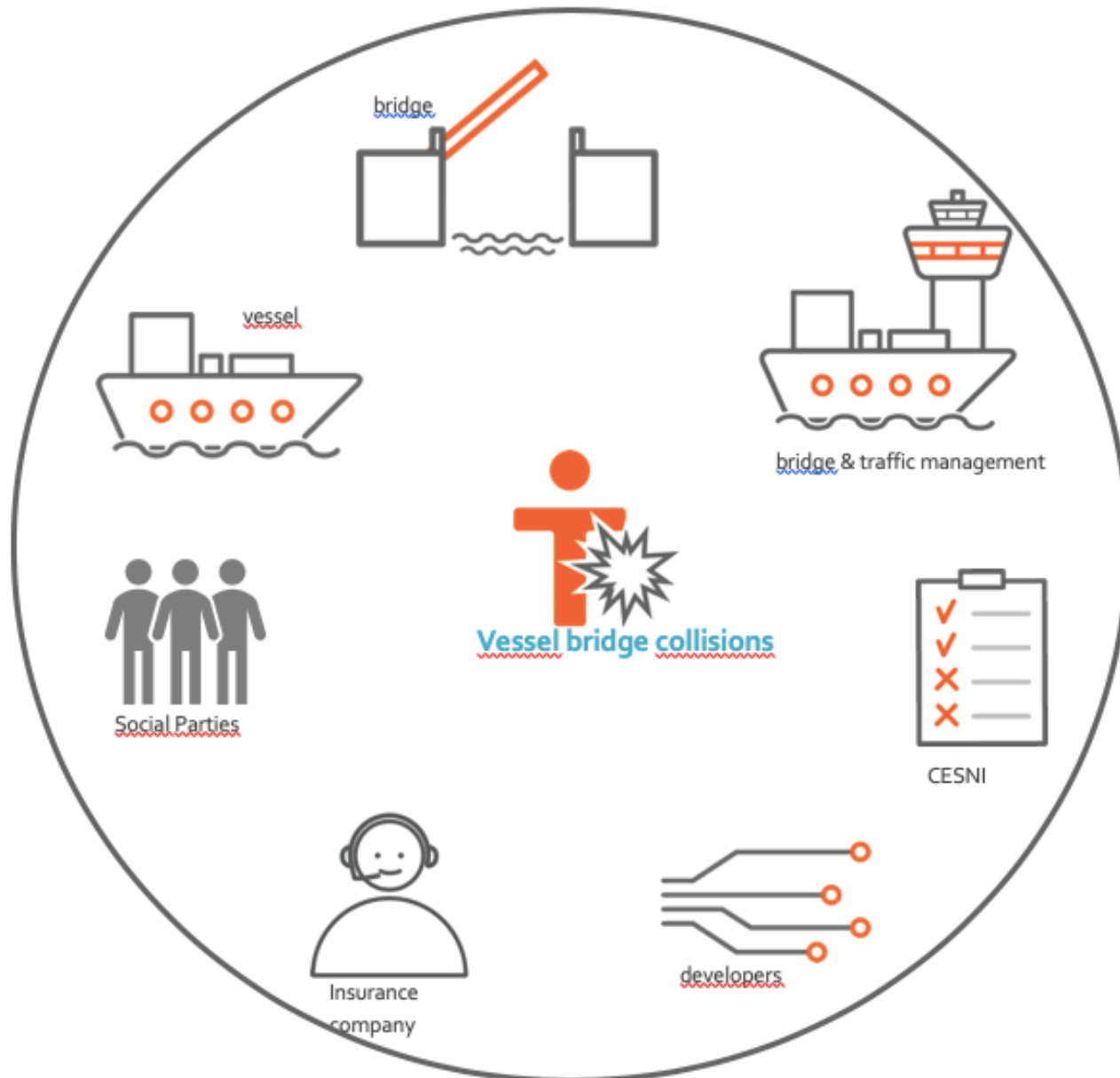


## 2. Human element – Resilience



Adpted from: Hollnagel, 2004

### 3. Understanding vessel bridge collisions



#### **Systems approach**

involved elements of  
vessel bridge  
collisions

to be assessed in  
their context and  
interests

Approach according  
to ISO 31000

## COMMUNICATION & CONSULTATION

  
Problem owner

  
Expert group

  
Expert group

DEFINING CONTEXT

Stop rules

RISK IDENTIFICATION AND  
DATA ANALYSIS

- Data report
- Top 10 incident types

RISK ANALYSIS AND RISK  
EVALUATION

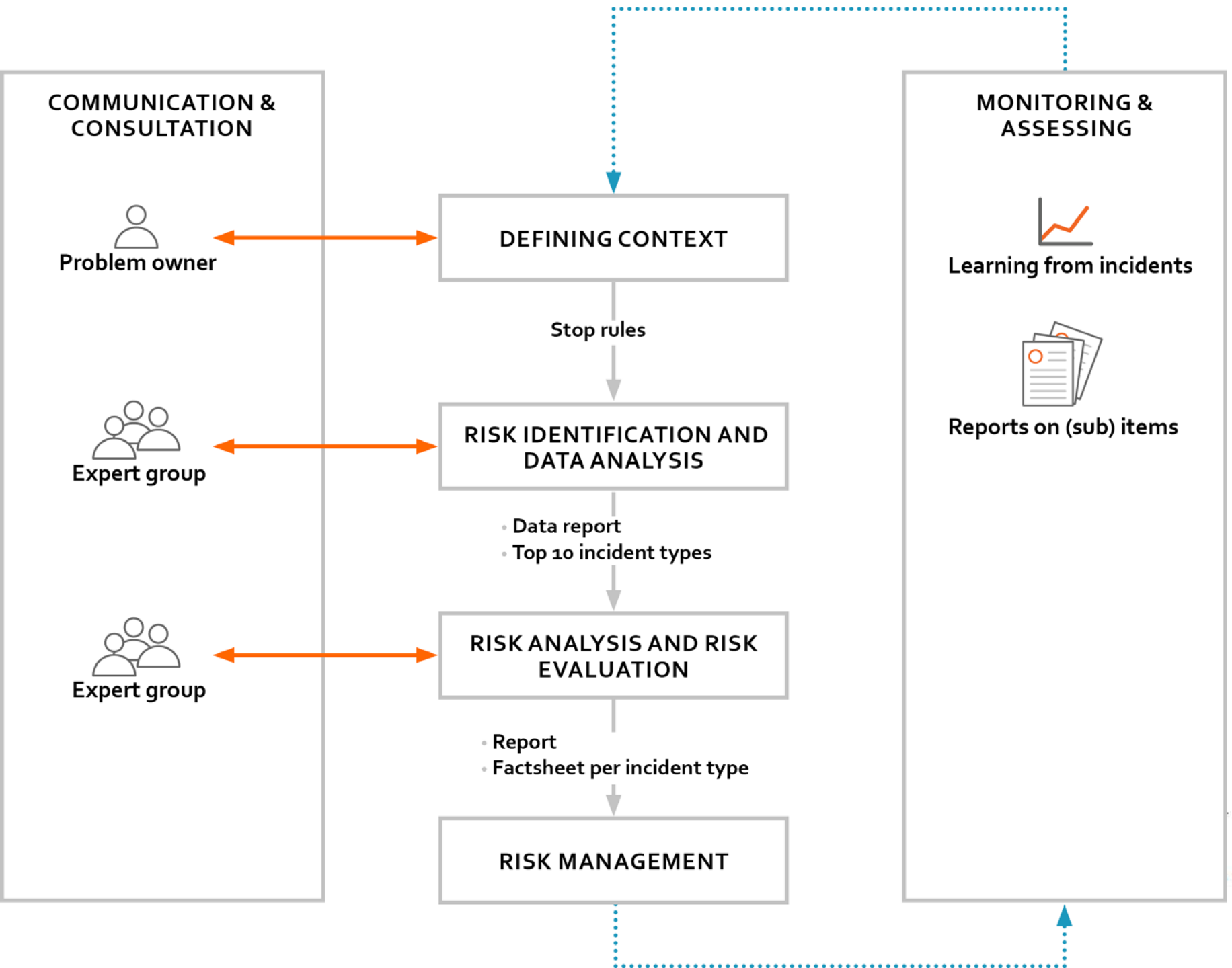
- Report
- Factsheet per incident type

RISK MANAGEMENT

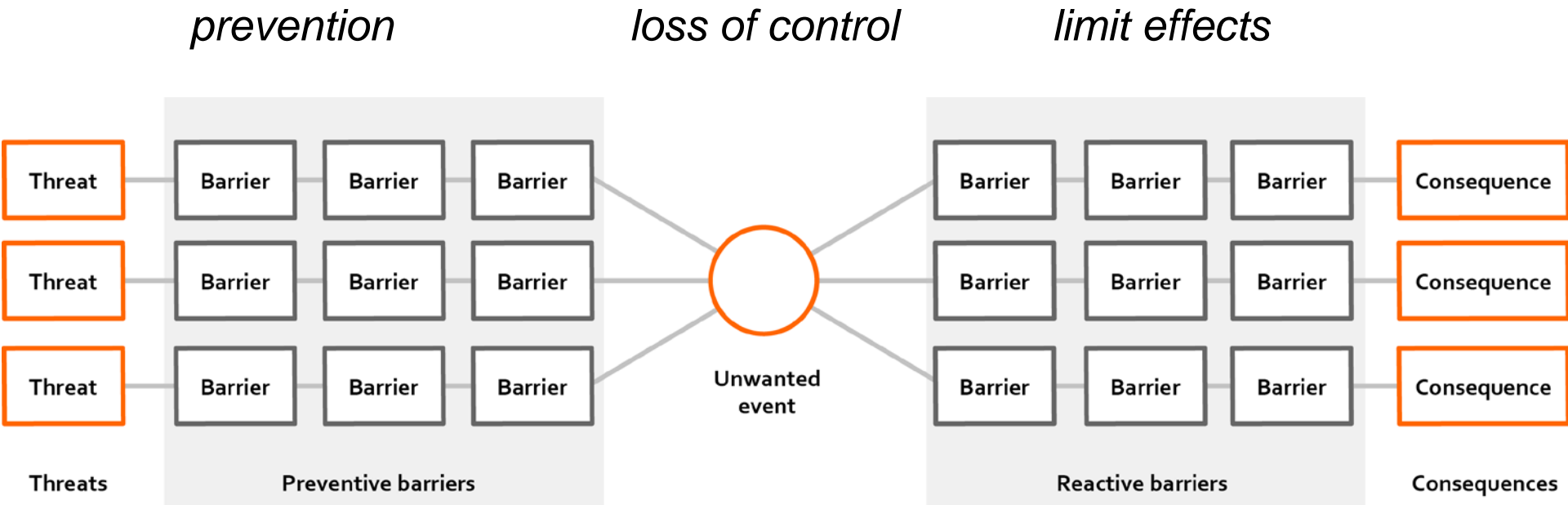
## MONITORING & ASSESSING

  
Learning from incidents

  
Reports on (sub) items



### 3. Understanding vessel bridge collisions



BowTie presents risk scenarios and management



### 3. Understanding vessel bridge collisions - Approach

Need for clear vision and support/ involvement  
for a change before researching

Leadership  
& strategy

Unclear (communicated) vision  
No common sense of urgency  
Insufficient approach

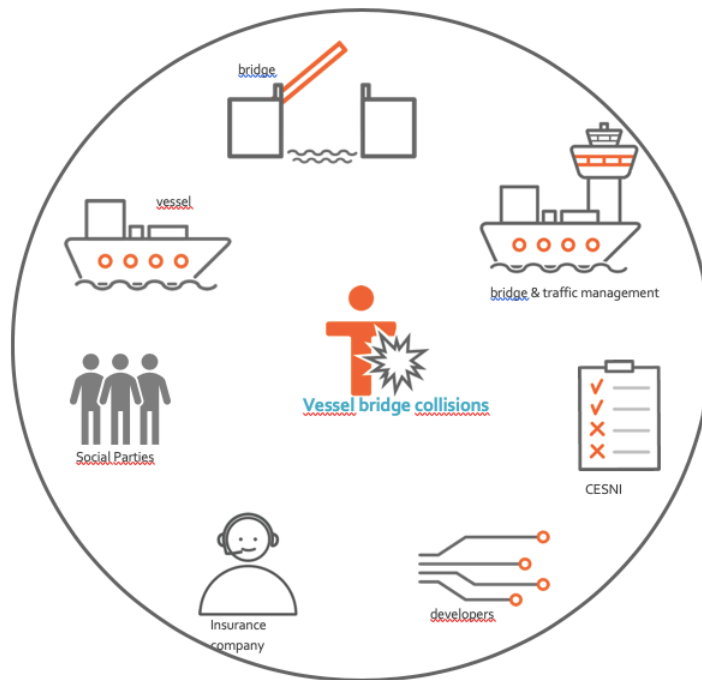
People &  
means

Insufficient knowledge  
Techniques do not fit  
Insufficient capacity

Problem >>  
symptoms

Knoster, 1991

### 3. Understanding vessel bridge collisions



**Step 1:**  
Which stakeholders?

**Step 2:**  
Which research questions?

**Step 3:**  
Which approach?



**Thank you for the  
attention**  
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