

# TRAFICOM

Finnish Transport and Communications Agency

## OpenRisk II project

### Component 3: A Risk Maturity Model for Maritime Authorities

Interreg  
Baltic Sea Region



Co-funded by  
the European Union

SUSTAINABLE WATERS  
OpenRisk II

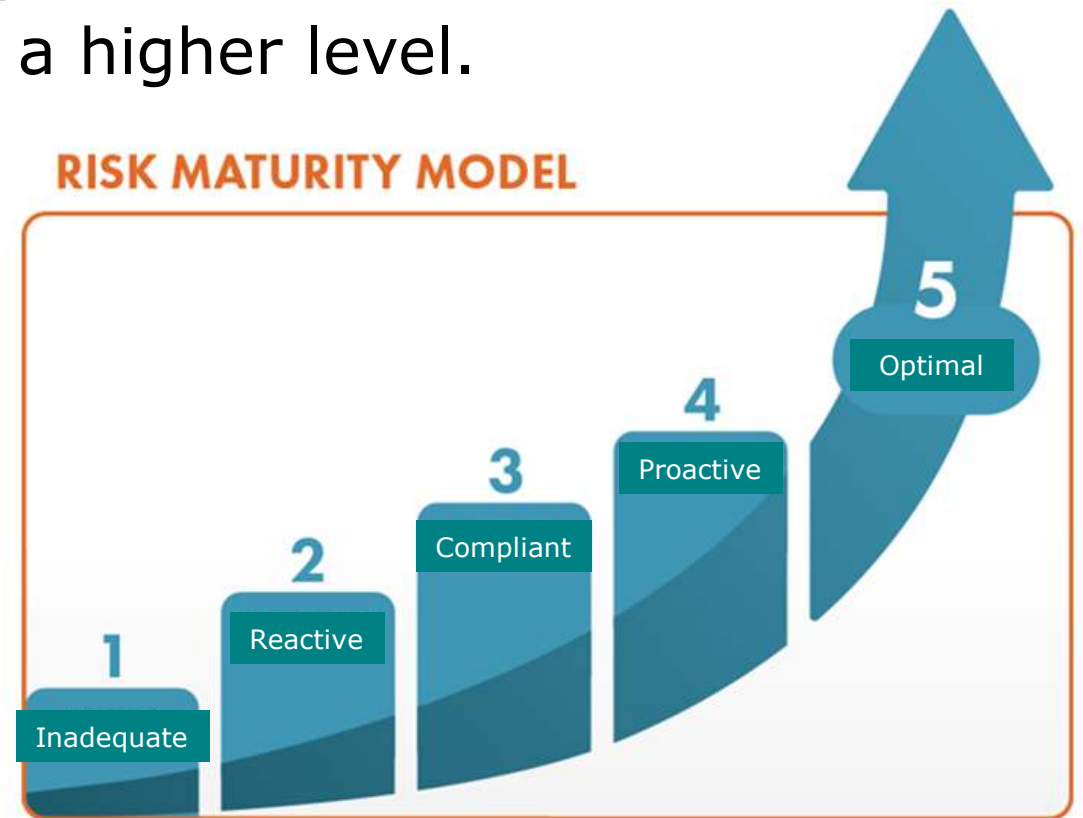


**OP2 Kick Off Conference**  
06.03.2024 Helsinki

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Hydrography and Fairways  
Traficom

# 1. Component 3: Scope of activities

- ▶ The third component will develop a novel tool that can be used to evaluate the current risk management performance of maritime administrations and steering it towards a higher level.
- ▶ Key partners are Traficom, NDPTL and Tartu University
- ▶ The end users of this tool are maritime authorities, as well as other transport authorities and relevant stakeholders.



## 2. R-Mare matrix model

Subject	Specification
1. Objectives	Assist maritime authorities to evaluate their current risk management performance, identify areas for improvement, and develop a plan for achieving a higher risk maturity level
2. Methodology	Delphi methodology for the R-Mare model development
3. Technique	Attributes-maturity level matrix as the R-Mare model technique
4. Maturity levels	Five risk maturity levels for the X-axis of R-Mare model
5. Attributes	17 risk management attributes for the Y-axis of R-Mare model
6. Grids	85 risk maturity grids
7. Input data	Expert judgements
8. Benchmarking	ISO 31000 standard and IMO FSA guidelines focusing on risk management attributes
9. Success criteria	Useful to assist the R-Mare matrix model end-users to evaluate and develop their risk management performance towards a desirable level

# 3. Article: Risk maturity model for the maritime authorities: a Delphi study to design the R-Mare matrix model

WMU Journal of Maritime Affairs  
<https://doi.org/10.1007/s13437-023-00328-z>



ARTICLE



**Risk maturity model for the maritime authorities: a Delphi study to design the R-Mare matrix model**

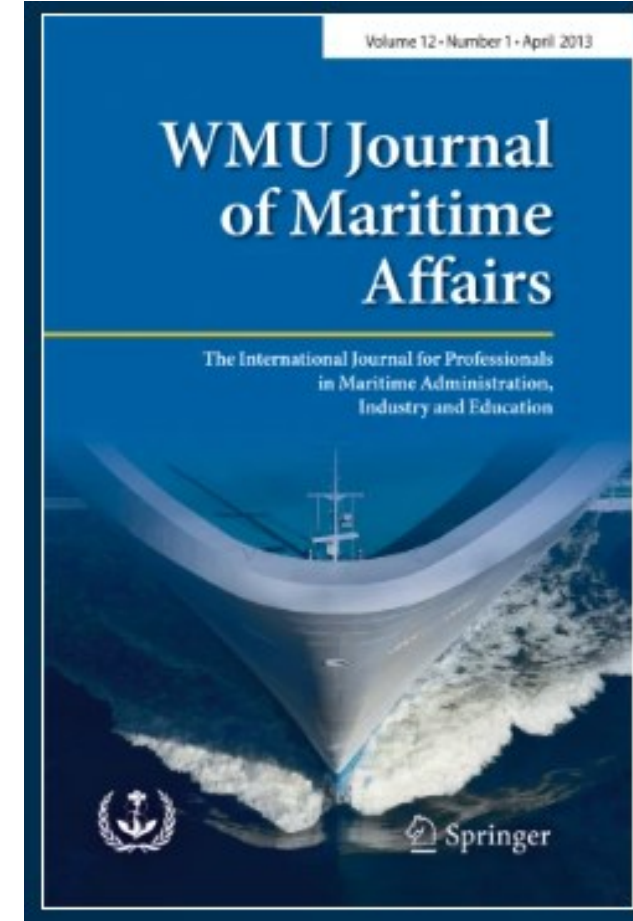
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## Abstract

Maritime authorities have the administrative responsibility for the safety and security of shipping and the prevention of marine and atmospheric pollution caused by ships. This responsibility involves various tasks that can be supported through effective risk management, but currently, there are no models available to evaluate its level of maturity in maritime administrations. To fill this gap and respond to the needs identified by maritime authorities, this article introduces a new risk maturity model called the R-Mare matrix. This model is built on recent scientific knowledge in the field of risk management, and it has been designed in close cooperation with end-users and maritime risk management experts using the Delphi methodology. As a result of this process, the article provides a qualitative risk maturity matrix specifically tailored to support the self-evaluation of maritime authorities. The matrix consists of 17 state-of-the-art risk management attributes, a five-step risk maturity scale, and associated risk maturity grid descriptions. These elements can be used to evaluate the current risk management performance of maritime authorities, identify areas for improvement, and develop a plan to achieve a higher level of maturity. Overall, the R-Mare matrix model represents an important step forward in this field while laying the foundation for further development.

**Keywords** Maritime safety · Maritime sustainability · Maritime administration · Risk management · Risk maturity · Risk maturity model matrix



<https://doi.org/10.1007/s13437-023-00328-z>

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# 4. Description of model elements

Attributes	Maturity levels				
	L-1. Inadequate	L-2. Reactive	L-3. Compliant	L-4. Proactive	L-5. Optimal
1. Ethics and integrity	L1/A1	L2/A1	L3/A1	L4/A1	L5/A1
2. Leadership and commitment	L1/A2	L2/A2	L3/A2	L4/A2	L5/A2
3. Design	L1/A3	L2/A3	L3/A3	L4/A3	L5/A3
4. Integration	L1/A4	L2/A4	L3/A4	L4/A4	L5/A4
5. Resources	L1/A5	L2/A5	L3/A5	L4/A5	L5/A5
6. Communication and consultation	L1/A6	L2/A6	L3/A6	L4/A6	L5/A6
7. Continuous improvement	L1/A7	L2/A7	L3/A7	L4/A7	L5/A7
8. Risk terminology	L1/A8	L2/A8	L3/A8	L4/A8	L5/A8
9. Definition of context	L1/A9	L2/A9	L3/A9	L4/A9	L5/A9
10. Data and information	L1/A10	L2/A10	L3/A10	L4/A10	L5/A10
11. Tools and techniques	L1/A11	L2/A11	L3/A11	L4/A11	L5/A11
12. Hazard identification	L1/A12	L2/A12	L3/A12	L4/A12	L5/A12
13. Risk analysis and evaluation	L1/A13	L2/A13	L3/A13	L4/A13	L5/A13
14. Risk control measures	L1/A14	L2/A14	L3/A14	L4/A14	L5/A14
15. Cost-benefit assessment	L1/A15	L2/A15	L3/A15	L4/A15	L5/A15
16. Recommendations	L1/A16	L2/A16	L3/A16	L4/A16	L5/A16
17. Decision-making	L1/A17	L2/A17	L3/A17	L4/A17	L5/A17
<b>Score</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>

**A.1 - Leadership and commitment**  
 The management aims to ensure that the risk management system is effective, robust and resilient. It is able to adapt to changes in the organization and its environment. The management ensures that the risk management system is integrated with other management systems. The management ensures that the risk management system is accessible to all relevant personnel. The management ensures that the risk management system is updated regularly. The management ensures that the risk management system is reviewed and improved as needed.

**Level 3 - Compliant**  
 The management of the business aims to ensure that the risk management system is effective, robust and resilient. It is able to adapt to changes in the organization and its environment. The management ensures that the risk management system is integrated with other management systems. The management ensures that the risk management system is accessible to all relevant personnel. The management ensures that the risk management system is updated regularly. The management ensures that the risk management system is reviewed and improved as needed.

**A.3/A.3**  
 Leadership and commitment - inadequate  
 The management is not actively involved in risk management and the system is not fully integrated with other management systems. There are gaps in the system and the management does not ensure that the system is updated regularly. The management does not ensure that the system is reviewed and improved as needed.

**A.3/A.3**  
 Leadership and commitment - reactive  
 The management is actively involved in risk management and the system is integrated with other management systems. There are gaps in the system and the management does not ensure that the system is updated regularly. The management does not ensure that the system is reviewed and improved as needed.

**A.3/A.3**  
 Leadership and commitment - compliant  
 The management aims to ensure that the risk management system is effective, robust and resilient. It is able to adapt to changes in the organization and its environment. The management ensures that the risk management system is integrated with other management systems. The management ensures that the risk management system is accessible to all relevant personnel. The management ensures that the risk management system is updated regularly. The management ensures that the risk management system is reviewed and improved as needed.

**A.3/A.4**  
 Leadership and commitment - proactive  
 The management aims to ensure that the risk management system is effective, robust and resilient. It is able to adapt to changes in the organization and its environment. The management ensures that the risk management system is integrated with other management systems. The management ensures that the risk management system is accessible to all relevant personnel. The management ensures that the risk management system is updated regularly. The management ensures that the risk management system is reviewed and improved as needed.

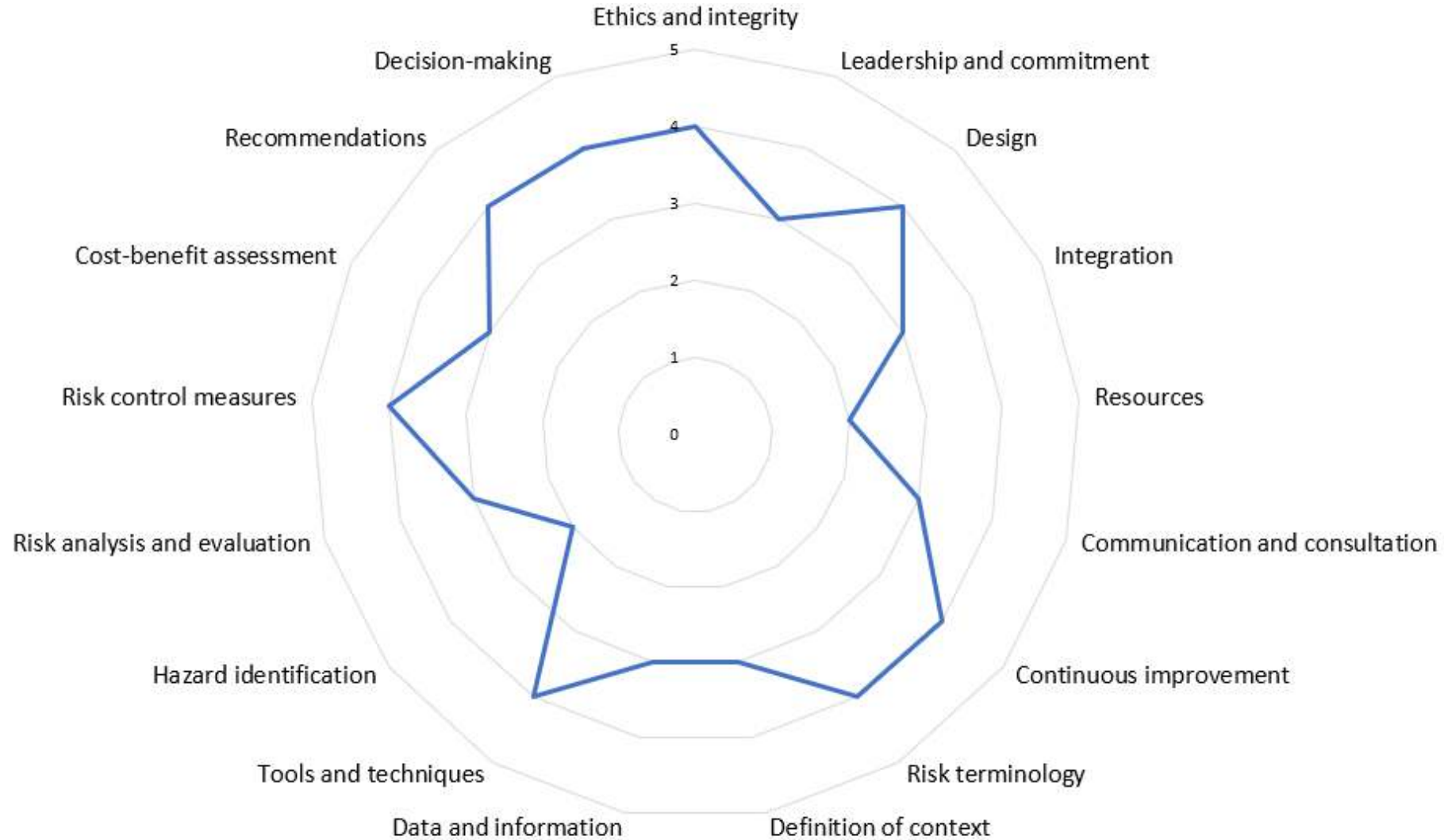
**A.3/A.5**  
 Leadership and commitment - optimal  
 The management aims to ensure that the risk management system is effective, robust and resilient. It is able to adapt to changes in the organization and its environment. The management ensures that the risk management system is integrated with other management systems. The management ensures that the risk management system is accessible to all relevant personnel. The management ensures that the risk management system is updated regularly. The management ensures that the risk management system is reviewed and improved as needed.



# 5. Use of model

Attributes	Maturity levels				
	L-1. Inadequate	L-2. Reactive	L-3. Compliant	L-4. Proactive	L-5. Optimal
1. Ethics and integrity	L1/A1	L2/A1	L3/A1	L4/A1	L5/A1
2. Leadership and commitment	L1/A2	L2/A2	L3/A2	L4/A2	L5/A2
3. Design	L1/A3	L2/A3	L3/A3	L4/A3	L5/A3
4. Integration	L1/A4	L2/A4	L3/A4	L4/A4	L5/A4
5. Resources	L1/A5	L2/A5	L3/A5	L4/A5	L5/A5
6. Communication and consultation	L1/A6	L2/A6	L3/A6	L4/A6	L5/A6
7. Continuous improvement	L1/A7	L2/A7	L3/A7	L4/A7	L5/A7
8. Risk terminology	L1/A8	L2/A8	L3/A8	L4/A8	L5/A8
9. Definition of context	L1/A9	L2/A9	L3/A9	L4/A9	L5/A9
10. Data and information	L1/A10	L2/A10	L3/A10	L4/A10	L5/A10
11. Tools and techniques	L1/A11	L2/A11	L3/A11	L4/A11	L5/A11
12. Hazard identification	L1/A12	L2/A12	L3/A12	L4/A12	L5/A12
13. Risk analysis and evaluation	L1/A13	L2/A13	L3/A13	L4/A13	L5/A13
14. Risk control measures	L1/A14	L2/A14	L3/A14	L4/A14	L5/A14
15. Cost-benefit assessment	L1/A15	L2/A15	L3/A15	L4/A15	L5/A15
16. Recommendations	L1/A16	L2/A16	L3/A16	L4/A16	L5/A16
17. Decision-making	L1/A17	L2/A17	L3/A17	L4/A17	L5/A17
<b>Score</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>

# 6. Output of model



## 7. Objectives of workshop

- ▶ Testing of R-Mare matrix model
- ▶ Obtaining feedback on model
- ▶ End-user needs for user-interface
- ▶ Overview of risk maturity in the BSR region focusing on risk assessment





**Thank you for  
your interest  
and welcome to  
testing session!**

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## **A-2. Leadership and commitment**

- ▶ Top management should ensure that risk management is integrated into all activities of the maritime administration, while considering also the ethical, national, and economic aspects of shipping
- ▶ They should allocate adequate resources for this purpose and establish robust communication channels with internal stakeholders (e.g., ministry and sister organizations) and external stakeholders (e.g., private sector and intergovernmental bodies)
- ▶ They should focus on creating safe working conditions and an environment of trust for the administration and its stakeholders
- ▶ They should demonstrate willingness and commitment to continuously improve the risk management performance of the administration in both the short and long term

## Level-3: Compliant

**The risk management of the maritime administration is *compliant*.**

There is a basic risk management framework in place, and risk assessments are conducted in accordance with the legislative requirements, using the IMO FSA guidelines or corresponding procedures. There is still room for improvements in the quality of risk-related information, processes for continuous improvement, and risk and crisis communication. The Flag State is on the White list or a corresponding rank in the international Port State Control system. The general performance of the administration is compliant with all legal requirements.

## A-3/L-1

### **Leadership and commitment - inadequate**

Top management is not showing interest in risk management and has only a limited knowledge of this area.

They are not trusted among the staff and stakeholders, and set a bad example for everyone.

## A-3/L-2

### **Leadership and commitment - reactive**

Top management is showing interest in risk management after an undesirable event such as a maritime accident leading to acute environmental damage.

They react to the identified problems rather than trying to prevent them.

## A-3/L-3

### **Leadership and commitment - compliant**

Top management aims to ensure that the risk management considers and meets all legal requirements.

They supervise that all mandatory tasks are conducted and aim to provide necessary resources for this purpose.



## A-3/L-4

### **Leadership and commitment - proactive**

Top management aims to ensure that the risk management is integrated across the administration and considers its internal changes.

They supervise that standard procedures are in place for e.g. continuous improvement and risk acceptability.

## A-3/L-5

### **Leadership and commitment - optimal**

Top management aims to ensure that in the risk management, the ethical and financial aspects are balanced in optimal way.

They motivate staff through visible endorsement, create an environment of trust and set a good example for everyone.