

# Challenging wind and waves

Linking hydrodynamic research to the maritime industry

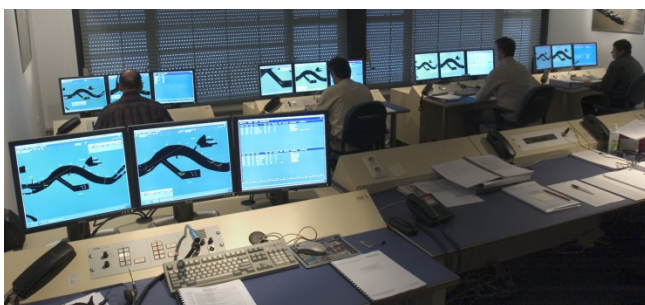
## Maritime Quantification of Emissions & Risks

# MarQER



### Introduction

A marker is a “flag” or point of recognition to draw attention to a specific situation. The MarQER JIP wants to do exactly that for emission and for risk. The main idea will be to *determine a real-time index for the emissions and risks of individual vessels*. This will be based on the AIS-signals together with other characteristics of the area. The idea of a risk index for individual vessels is not new and a first effort has already been made within several EU-projects. Also the coupling between AIS-data and emission factors to “measure” the total emission in an area has been done over the past years. But to combine this gathered knowledge with the simulator expertise into one operational environment is something new and will open doors for many other technical, operational and tactical applications.



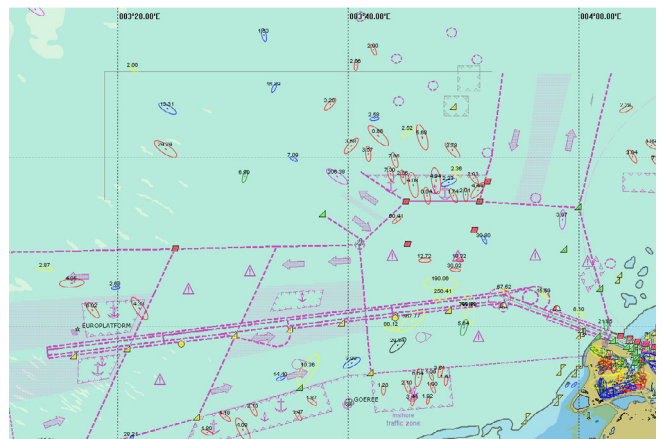
### Objective

The main objective of the MarQER JIP will be to determine a real-time emission and risk index for all vessels broadcasting AIS within a VTS sector. This index can be used for many different purposes, such as

- Real-time monitoring, so it will be of assistance to VTS operators;
- “History” reporting, so it can be of assistance to authorities and policymakers.

### Expertise

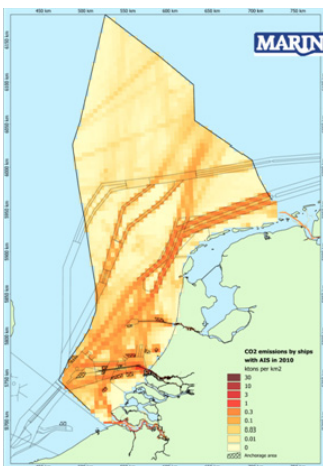
MARIN has over 25 years of experience in risk assessments, using the Safety Assessment Model for Shipping and Offshore on the North Sea (SAMSON). MARIN has participated in a number of EU-projects about risk indexing for ships. Based on the outcomes of these projects, MARIN has developed a first prototype of an individual risk index for ships. A proof of concept for this prototype was shown in an MRCC environment in Milford haven, within the MarNIS project.



Since the introduction of AIS, MARIN has received all AIS data in the Dutch sector from the Dutch Coastguard for purposes of research and analysis. MARIN has thus gained a lot of in-house knowledge on maritime traffic and behaviour at sea. Moreover, these AIS data have been used to “measure” the emission at the North Sea and in port areas. These projects were conducted together with Netherlands Organisation for Applied Scientific Research (TNO), who provided the emission indices.

## Expected results

The main result will be an emission and risk index module. For demonstration purposes, the emission and risk index module will be integrated in a real-time simulator environment, MARIN's proprietary VTS simulator. With the module real-time monitoring of the emission and risks in a maritime area will be possible. Next to the real-time monitoring also a reporting functionality will be developed for monitoring, planning and determining the strategy on the total emissions or risks.



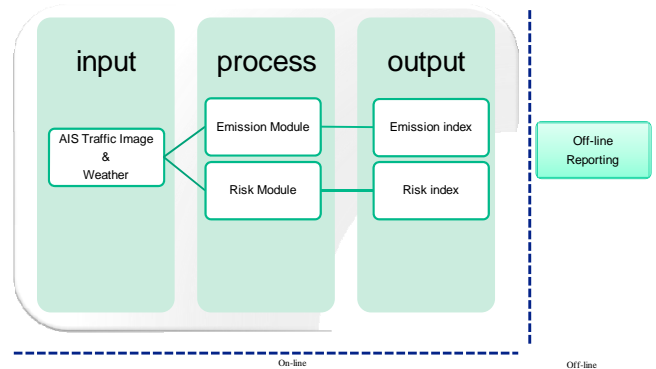
The current proofs of concept for risk and emission index need further development to combine and integrate them into a production environment. To that aim, additional research, verification and validation is necessary. This research will be reported. Also the results and conclusions or recommendations of the testing phase will result in a report.

## Scope of work

The proposal will have 6 work packages:

- WP 1: Creating the interface (both the input and the output)
- WP 2: The Emission Module
- WP 3: The Risk Module
- WP 4: GUI functionality
- WP 5: Reporting functionalities
- WP 6: Test phase

Some of the work packages (1, 2, 5) will have a more technical character and some of the work packages (2, 3) will contain a large research component.



## Possible participants

The quantification of emission and risk is thought to be of interest to operators, decision makers, policy makers, planners working in the field of maritime traffic. One has to think of VTS operators, port authorities, training and education centres, and legislative bodies. The following partners are considered:



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