SAFECO
Safety of Shipping in Coastal Waters

Funding: European (4th RTD Framework Programme)
Duration: Jan 1996 - Dec 1997
Status: Complete with results

Background & policy context:

Marine accident risk levels in highly frequented coastal waters like the North Sea have not been comprehensively addressed by traffic studies. International maritime rules are nowadays not uniform in their application by port and flag states, with a tendency towards further divergence, thus causing competitive disadvantages to quality operators. The majority of shipping accidents and related environmental damage can be attributed to operational procedures and human factors. To improve this situation, maritime policies, rules and regulations have to be reconsidered in order to ensure a uniform safety level.

Objectives:

SAFECO aimed to increase the safety of shipping in European coastal waters by analysing the underlying factors that contribute to the maritime accident risk level. The project's goal has been to supply policymakers, regulators and actors in the shipping community with a modelling framework to allow the comprehensive evaluation of potential shipping risks and the measures supporting total quality operation of ships.

The main objectives of SAFECO have been to:

- investigate improved Vessel Traffic Management Systems (VTMS), improved crew competence through simulator training and improved ship management (complying with ISM codes);
- consider improved propulsion system reliability, improved hull design and maintenance for vessels;
- examine improved manoeuvring capabilities (complying with IMO codes) and improved bridge equipment, e.g. the implementation of collision avoidance systems on all vessels.

Related Projects:

- SAFECO II - Safety of shipping in coastal waters: demonstration of risk assessment techniques for communication and information exchange.

Parent Programmes:
FP4-TRANSPORT - Specific research, technological development and demonstration programme in the field of transport, 1994-1998

Institute type: Public institution
SAFECO has contributed to:

- the development of a radar-based Collision Avoidance Advisory System (CAAS) that has been tested in simulator exercises and on-board vessels during test trials;
- the development of a Simulator Exercise Assessment system (SEA);
- the development of the Marine Accident Risk Calculation System (MARCS) to quantify risk levels and the effect of risk control options in defined geographical areas;
- the development of a risk model for maritime propulsion systems, which allows the identification of critical components in the context of enhanced maintenance strategies;
- the development and analysis of databases for marine casualties which help to understand and model the causes and conditions resulting in ship accidents;
- the further development of structural integrity models for reliability assessment of ship design and maintenance strategies;
- the development and implementation of a risk model for the port of Rotterdam area;
- the development of a numerical model for navigator performance that has been validated in test cases, resulting in the provision of sailing trajectories to defined ports as a function of parameter variations;
- the further development of models and data to quantify the effects of ship manoeuvring capabilities;
- the development of a model to assess the effects of personal and organisational factors in the light of the International Safety Management Code (ISM).

SAFECO performed a detailed evaluation of a range of safety critical functions and risk reduction measures. This assessment involved the construction of a risk evaluation methodology and the implementation of a risk model. The risk reduction measures analysed cover management, training schemes, communication with VTMS, navigational aids (in particular, a collision avoidance advisory system), manoeuvring capabilities and the technical status of ships. The risk modules were developed following a proactive approach, focused on accident prevention and with less focus on consequence reduction. The analysis of the model results has allowed the identification of the most important influences on ship safety for European coastal traffic.

Policy implications

SAFECO provides a modelling framework for comprehensive evaluation of potential shipping risks. The results from this framework illustrate both the reduced risk levels associated with quality ships and how the model may be used to assess the impact of possible policy options and decisions on overall risk levels. Nevertheless, a common European and international approach is essential in shipping matters. In the case of safety, this approach should be proactive, rather than reactive. Success is most likely if there is a defined link to previous standards and the shipping industry is included in the development. The SAFECO project contributes to all these elements towards improved maritime safety.
SAFECO has been followed by the SAFECO II project. This aimed to define improved technologies and organisational steps for internal and external communication, and to apply risk analysis methods in order to assess economic benefits and safety improvements for quality operations.

Documents:

- safeco.pdf (Final report)

**STRIA Roadmaps:** Network and traffic management systems
- Water transport (sea & inland)

**Transport policies:** Safety/Security