CASE STUDY: MARITIME TRANSPORT

SAFETOW (Strategic Aid for Escort Tugs at Work)

SAFETOW is a 36 month FP6 project with a total cost of €2.24 m and an EC grant of €1.25 m.

Objectives

The overall objective of SAFETOW is to provide:

- Masters of vessels with tools to help them control their vessels if they become disabled and
- Masters of salvage and escort tugs with tools, which will enable them to take decisions in real-time with the best available information regarding the consequence of their actions.

The project will encompass an experimental programme, which will collect the manoeuvring data, including collaborative manoeuvring with more than one tug. This data will then be analysed and used as a basis of validation for the simulation software. The software will then be integrated with the vessels' bridge systems to provide real-time help and decision support, training capability and monitoring.

Project Description

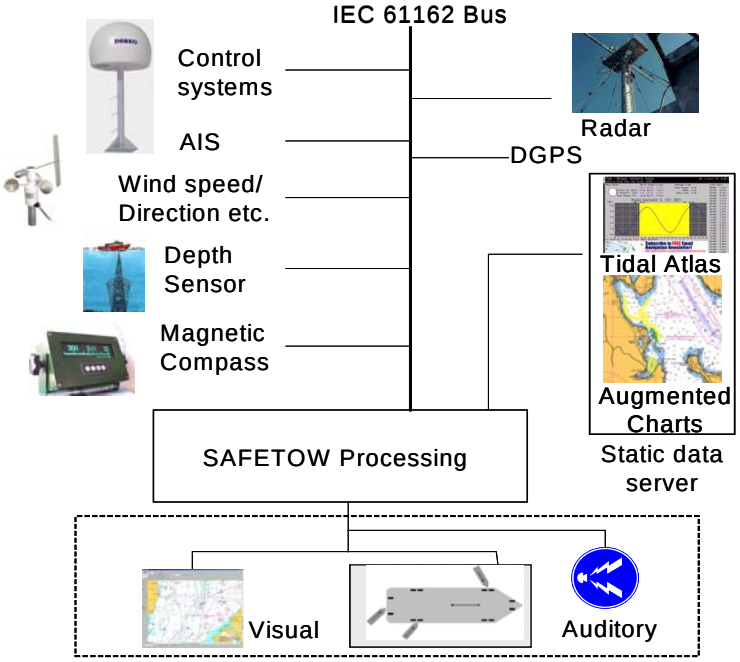
SAFETOW will build on innovative technologies to develop easily parameterisable modular solutions for

- A Manoeuvring Aid
- A Towing Aid
- A Lines Monitor
- An on-board Manoeuvring Simulator
- An on-board Towing Simulator

The **Manoeuvring Aid** is aimed at tankers. It will advise the disabled ship on the likely results of any manoeuvre (or lack of). Even when a ship is disabled there are a few actions available to it, which will have an effect on the way it is drifting. Such actions may include operating the engine (forward or astern), the deployment of the anchor or of a sea anchor or using a small tug or the help of a nearby ship. In some cases, even a few degrees of change in the tracking head, provided they are taken in good time, are all that is necessary to avoid a headland or a dangerous obstruction (e.g. an oil rig). It is however essential to forecast accurately the consequences of any such action to be sure of taking the appropriate decision. The manoeuvring model will have information about the drift characteristics of the ship, its load condition, tides, currents, wind conditions etc and it will be able to predict the drift mode (tracking head and speed) accurately. It will also make suggestions about the most advisable course of action. Finally it will be possible to run this manoeuvring model as an **on-board Manoeuvring Simulator** for training and for the purpose of gathering data about the drift characteristics of the ship.

The **Towing Aid** is aimed at escort and salvage tugs. It will have a full model of the tug plus configurable and easily parametrisable models of the towed vessel and other involved tugs. This will allow the manoeuvring model of the whole tugs plus disabled tanker system to be put together in real time out of pre-existing models and a few basic parameters: size of vessels, load, etc. (Of course, should the tanker and the other tugs be deploying a SAFETOW system, the accurate manoeuvring models for the tanker and other tugs will simply be downloaded. However, we shall not depend on the general availability of such models.)
The software will also be parametrisable to allow the assembly of manoeuvring models for specific tugs and configurations of control equipment (thruster, propellers, rudders etc). It will be modular to allow for the inclusion or exclusion of any data that is available. For example, up to date detailed information may or may not be

available for the towed vessel in question, so the system will be able to use the information if it is available and not if it is not.



SAFETOW ARCHITECTURE

The towing model can also be used as **on-board Towing Simulator** for on-board training and for exploring what-if scenarios in advance of engaging a tow.

The **Lines Monitor** will assist the tug crews in determining whether the towing equipment is being stressed, which is usually a sign of problems in the towing configuration.

The accuracy of these models will depend to a great extent on the quality of the data. To collect high quality data we will run an **Experimental Program**. To do that will require a clear idea of the **Accident Scenarios** to cover.

Participants

The consortium includes a ship owner association (CONSAR), a Port Authority (Gijon), one of the world's major salvors (SMIT Salvage), a supplier of shipboard navigational systems (ATLAS Marine Electronics), a salvage association and supplier of manoeuvring simulators (BMT) a classification society (Bureau Veritas), and an academic institution (The University of Glasgow and Strathclyde).

Commercial benefits

Between January 1992 and March 1999 a total of 593 merchant ships were lost. In many of these cases the project consortium claim that, if SAFETOW had been available, there is quite a good probability that the accident would have been avoided. For instance, in the AMOCO CADIZ accident, if action had been taken early enough to control the drift this would have prevented the grounding of the ship and the spilling of 227,000 tons of crude oil, with a cost of about €282 million. If SAFETOW is able to prevent even one such disaster in future it will have paid back many times over the investment that is being proposed.

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