MIMIC

PA Safe – Steering Group Meeting in Vilnius 13.11.2013

Mia Välimäki

Aims of the project

- To integrate the knowledge from earlier projects and new information on the less studied aspects of accidents
- to study and compare the effect of different management actions to avoid accidents, giving insight to the cost-effectiveness of these measures
- To view the problem both from the point of private companies and the society
- To link safety and securitys issues
- To create an Integrative Probalistic Model for comparing the management actions and SmartResponse Web application for decision analysis and support

Development of traffic flows
WP2

Aims of WP2

- WP`s aim was to produce information about the growth scenarios of maritime traffic especially focus on oil transportation in the Gulf of Finland and detailed information about ships sailing in the Gulf of Finland.
- Total 4 different tasks; Oil transportation volumes in the GoF in 2020 and 2030, Ship particulars, Crew competence and Enhance/integrated AIS interface development.

Results of WP2

- Three different scenarios for 2020 and 2030 were made for estimation of oil transportation in the GoF
- Tankers in the GoF were obtained and analyzed
- Types (oil, chemical, liquefied gas and bunkering), length, depth, DWT, speed, Ice Class were listed.
- Data linked to the AIS database, which contains the paths and speed of the vessels that navigated in the area within the years 2006 till 2012, with the MMSI and IMO numbers of the tankers.
- Crew competence were studied by literary review and survey in Finnish Customs
- 18 different studies were examined about multicultural crews and consist of crew of 453 ships which visited in 15 Finnish ports
- 85 % of surveyed ships had multicultural crew

Published reports/articles/ papers and presentations

- Conference paper: Future development of oil transportation in the Gulf of Finland" TRANSNAV 2013 – On Marine Navigation and Safety of Sea Transportation
- Presentation: "Future development of oil transportation in the Gulf of Finland" 19-20 June, 10 th Jubilee International Conference TRANSNAV 2013 – On Marine Navigation and Safety of Sea Transportation, Gdynia, Poland.
- Conference paper: Changes in oil transportation in 2020 and 2030 – Case Gulf of Finland, IAME 2013.
- Presentation: "Changes in oil transportation in 2020 and 2030 – Case Gulf of Finland" 3-5 July, IAME 2013, Marseille, France.

Published reports/articles/ papers and presentations

- Report: Insight in ships crews – Multiculturalism and maritime safety. Storgård, J., Berg, N. and Brunila, O.-P. IMISS Conference proceedings 2013.
- Conference paper: Insight in ships crews – Multiculturalism and maritime safety. IMISS –seminar 2013, Kotka.
- Presentation: “Insight in ships crews – Multiculturalism and maritime safety”. IMISS –seminar 2013, Kotka, 2013.
- Presentation: "Composition of ships crew” Sailing Chaplains programme 30 years – Seminar 2013, Helsinki.
- Magazine interview: Multicultural work environment at sea. Albatrossi magazine, November issue 2013.

Identification and assessment of security-related risks
WP3

Results of WP3

- List of security threats (materials from literature review, interviews web-based survey, Delphi survey and workshops)
- Study on analysis of threats:
- Methods for security threat analysis: Literature survey for MIMIC –project (Tuominen, 2013).
- Security threat analysis model for the MIMIC-project (Tuominen, 2013).
- Risk management methods

Published reports/articles/ papers and presentations

- Fransas A., Nieminen, E. & Salokorpi M. 2013. Maritime security and safety threats –study in the Baltic Sea area. Publications of Kymenlaakso University of Applied Sciences, Series B Research and Reports. No 92
- Fransas A., Nieminen, E. & Salokorpi M. 2013. Maritime security and security measures –mimic study in the Baltic Sea area / region. Publications of Kymenlaakso University of Applied Sciences, Series B Research and Reports No x.
- Nieminen, E. & Fransas, A. (2013) Itämeri on turvallinen ja valvottu alue, Navigator nro 5, 2013, s. 29-30.
- Tuominen, R. 2013. Methods for security threat analysis: Literature survey for MIMIC-project. Tampere: restricted report by VTT.
- Tuominen, R. 2013. Security threat analysis model for the MIMIC-project. Tampere: restricted report by VTT.

Assessment of environmental and economic risks
WP4

Evidence-based modelling

shows

Contributing factors on grounding accident	Relative Frequency %	Observational Frequency %
Inappropriate communication & cooperation	7.82	45.21
Inappropriate regulations & practices (incl. BRM)	6.87	39.73
Other violation of good seamanship practices	6.87	39.73
Organizational factors & support	5.92	34.25
Inappropriate route planning	4.98	28.77
Persoanl factors	4.98	28.77
Inappropriate ship/bridge system design or equipment	4.50	26.03
Bad visibility	4.27	24.66
Undermanning of necessary stations	4.27	24.66
Ship moving off course	4.03	23.29

Source: Mazaheri et al. (2013), "Comparison of the learning algorithms for evidence-based BBN modeling – A case study on ship grounding accidents"

Where we can affect the risk in maritime accident:

Pre-Accident
- Piloting
- ENSI

Accident
Crashworth-iness

Post-Accident
Smart-response

How Piloting services, and Enhanced Navigational Systems affect likelihood of accidents

Four different designs tested on likelihood and amount of oil outflow after an accident

Predicting the oil trajectories and increasing the situational awareness for spill-response team

MIMIC enhaces safety in maritime oil-transportation by enhacing situational awareness

Likelihood of accident → **Amount of spilled-oil** → **Environmental damage** → **Clean-up costs**

Creating effective measures and maximum interest to decrease impacts of accidents
WP5

- Why does the current safety policy system ensure safety in shipping?

- it is not effective: overlapping and repetitive tasks
- it does not support safety culture
- it does not support compliance with the rules
- it is of a reactive character: rules are revised after accidents

- MIMIC proposes a participatory risk-informed safety governance framework to be developed for the GoF or the whole Baltic Sea
- Identify, assess, evaluate risks, give recommendations for management
- Built around a formal risk assessment using state-of-the-art methods
- Requires establishing a risk database for wide use
- Involves a wide variety of stakeholders
- Can develop safety culture and thus decrease the impact of human error in causing accidents

- Formal cost-effectiveness analyses offer potential for evaluating risk control options but methods need to be further developed.
- MIMIC evaluated the cost-effectiveness of 1) compulsory pilotage, 2) ENSI-system, and 3) improved crashworthiness of ships.
- Risks related to security can, in theory, be linked with safety risks in a formal risk assessment, but in practice this is challenging and may not be feasible.
- In a smaller scale and case by case, it is useful to think how security risks may affect safety.

Baltic Sea Oil Spill Conference

- Final Conference in Kotka, Finland
- 20-21 November
  - More information at www.merikotka.fi/mimic

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CITY BY THE SEA

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