



Maritime and Coastguard Agency

MIN 353 (M+F)

Research Project 595: Tracking and Predicting the Behaviour of Submerged and Sunken Oils

Notice to all Shipowners, Masters etc

This MIN expires 05 June 2010

PLEASE NOTE:-

Where this document provides guidance on the law it should not be regarded as definitive. The way the law applies to any particular case can vary according to circumstances - for example, from vessel to vessel and you should consider seeking independent legal advice if you are unsure of your own legal position.

Summary

The MCA commissioned a project to look into the processes that can lead to sinking and submergence of oils, how we might predict this and how we can respond to it. The project was organised into 3 discrete tasks:

1. To identify key parameters and their comparative significance essential to devise algorithms to develop realistic modelling of the behaviour of partially submerged and sunken VHFOs in seawater.
2. Develop a methodology to incorporate such algorithms into existing modelling capability.
3. To determine appropriate and realistic oil recovery techniques for submerged and sunken oils.

1. Background and Methodology

- 1.1 Carriage of Very Heavy Fuel Oils (VHFOs) continues to increase in UK waters. There is growing concern since incidents such as the PRESTIGE and the ERIKA that available monitoring and recovery technology is not adequate and this is supported by an MCA risk assessment. The behaviour of VHFOs in a major spill is not understood and recovery is thwarted by poor surveillance capabilities and a lack of efficient techniques for recovering sunken oil.
- 1.2 The project collected information from literature reviews; interviews and a sunken oils workshop, and looked in to processes and key characteristics that can lead to spilled oil sinking or submerging. Techniques previously applied to monitor, detect and recover sunken and submerged oils were gathered, as well as techniques that are in the research or development phase, and methods from related activities (e.g. dredging).
- 1.3 This study has reviewed the available information and has developed an approach to modelling the behaviour of oils that could sink or become submerged. This will enable the potential problems to be understood in more detail and allow the development of more effective response technologies.

2. Summary of results

- 2.1 Processes leading to spilled oil sinking or submerging were identified as: oil sinks – the oil is inherently more dense than the water; oil submerges - density increases as a result of weathering; oil floats, then sinks - density increases as a result of attached suspended sediment; oil floats, strands, is remobilised and sinks - density increases as a result of incorporating shoreline substrate; oil burns and residue sinks – light distillates consumed and residue has high density. An assessment is made of the most important properties in these processes.
- 2.2 The proposed protocol for modelling sunken or submerged oils uses a ‘traffic light’ system and text based alerts to responders highlighting the risk, and predicts the potential pathway of the oil should it become partly or wholly submerged.

3. Conclusions and recommendations

- 3.1 Five processes are identified as leading to spilled oil sinking or submerging at sea. Algorithms for decision supporting outputs are provided for the addition to existing models.
- 3.2 Eight recommendations are made including further studies, practical testing, training of response personnel, contingency planning and better assessment and records of effectiveness of monitoring, detection, containment and recovery strategies at future sunken and submerged spills.

4. Final Report

- 4.1 A full report and executive summary can be downloaded from the MCA website:
http://www.mcga.gov.uk/c4mca/s_mca_019_sunken_and_submerged_oils_final_report_270209.pdf

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