

Improving oil spill detection in the North Sea - NW Europe

1. Policy Objective & Theme

- ADAPTATION TO RISK: Preventing and managing natural hazards and technological (human-made) hazards
- SUSTAINABLE USE OF RESOURCES: Preserving coastal environment (its functioning and integrity) to share space
- SUSTAINABLE ECONOMIC GROWTH: Developing Europe's regional seas sustainably
- SUSTAINABLE ECONOMIC GROWTH: Improving competitiveness

2. Key Approaches

- Knowledge-based
- Ecosystems based approach

3. Experiences that can be exchanged

A system for identification of oil spills from offshore installations has been developed which, through use of a sensor, will enhance the information available for decision-making for corrective action and also provide opportunities for efficient clean-up operations.

4. Overview of the case

The case illustrates an Oil Spill Identification System which has been developed to detect oil spills from ships. The technology has been tested and adopted under the OSPAR Convention and is particularly useful in environmentally sensitive areas. It was done as part of a Life+ project (2002-05).

5. Context and Objectives

a) Context

Europe is the world's largest market in crude oil imports, representing about one third of the world total. A very high percentage of oil and refined products are transported to, and from, Europe by sea. Inevitably, some of this oil makes its way into the marine environment. Accidents that had massive environmental consequences, such as the "Prestige" or "Erika", powerfully illustrate the devastation that can be caused by ship pollution. However, even routine ship operations pollute the sea through ballast water, tank washings and engine room effluent discharges. Every day, large amounts of oil are deliberately pumped into the sea by ships along almost the entire coastline of Europe. Together with ships, offshore oil installations are the most common sources for the more than 500,000 tons of oil spilled annually into the marine environment. Such pollution constitutes a major threat to the environment and places enormous demands on national authorities responsible for rapid response and clean-up operations.

Tackling this environmental threat is the 1992 Convention for the Protection of the Marine Environment of the Northeast Atlantic, the OSPAR Convention. It entered into force in March 1998 and includes the participation of the EU. The Convention is responsible for developing new programmes and measures required to identify, prioritise and monitor the emissions, discharges and losses of substances to the marine environment. OSPAR designated special environmental areas where tough emission limits for oil pollution are in place. Effectively controlling oil pollution has, however, proved difficult. Airborne Surveillance Systems currently used to monitor oil discharges are too expensive to be utilised efficiently against the large number of offshore installations. The lack of monitoring systems means that offshore installations have not yet been included in the strict OSPAR rules governing oil pollution in designated special areas.

b) Objectives

The project, which began in January 2002, aimed to demonstrate the technology required for the implementation and enforcement of programmes and measures adopted under the OSPAR strategy. It would also provide a tool required to implement Community environment policy and legislation concerning the marine environment, and as specifically stated in Danish national law from 1998.

6. Implementation of the ICZM Approach (i.e. management, tools, resources)

a) Management

OSIS International, a privately owned Danish SME led the work partnered by the Danish agencies for trade and industry, environmental protection and energy.

b) ICZM tools

In the late 1990s, OSPAR called for Oil Spill Identification System technologies (OSIS) to be developed so that they could enforce a new type of regulation in designated special areas. The project team thus sought to demonstrate a potential solution to this widespread problem of international concern by developing online remote monitoring of offshore installations in any location based on new sensor technology. The innovative system is using a new generation of communication satellites and the Internet. Over a three-year period, numerous tests were conducted including missions with the Danish Environmental survey ship as well as with German and Dutch oil combat services in the North Sea. The OSIS sensor is able to identify oil-films from a thickness of 0.01 to 1.5 mm on the water surface. It can estimate the leaked volumes with +/-25% accuracy in normal weather conditions and with some +/-50% accuracy on rough seas. The extension of the leak can be monitored up to a distance of 5 kilometres from the sensor. Data gathered by OSIS is also transferred via satellite to onshore decision-makers and can be used in conjunction with geographical information systems (GIS). This provides further information about the leak and helps the planning of corrective actions.

Additionally, the OSIS team carried out awareness-raising activities directed at decision-makers. In 2003, the technology was presented to the OSPAR/Helsinki Convention ministerial meeting, the IMO Marine Environment Protection Committee and a GIS Remote Sensing Symposium. In 2004, OSIS contributed to the OSPAR technical working group meeting, InterSpill2004 Conference and Exhibition and the Offshore Northern Seas Conference. Finally, OSIS attended the EU Management Committee on Marine Pollution (MCMP) in Brussels where all parties involved in national pollution prevention were present. These activities were supplemented by a media campaign that led to numerous articles in relevant trade publications.

7. Cost and resources

The total budget was €3,359,000.

8. Effectiveness (i.e. were the foreseen goals/objectives of the work reached?)

The OSIS new surveillance system is helping to identify leaks and plan corrective action and it is already improving oil spill detection in the North Sea providing 24-hour online surveillance. The project fully achieved its objective of demonstrating the viability of a permanently mounted sensor system to identify oil discharges from offshore installations in those parts of the North Sea designated as 'special areas' by OSPAR. The OSIS system allows improved and continuous monitoring that is more effective and less costly than the current use of aerial surveillance. OSIS is also cheaper and more accurate than systems based on conventional satellite imagery. This demonstration project, which closed in April 2005, was able to post impressive results from tests for the detection of spills surrounding oils rigs in the North Sea and was selected as one of Life's best projects in 2006.

9. Success and Fail factors

Together with the Danish Navy and their response vessel Gunnar Seidenfaden, OSIS have successfully carried out the final offshore tests of their new generation oil spill sensors. 4.000 litres of oil was discharged into the sea and subsequently identified and quantified using the proprietary OSIS Oil Spill Detection module.

10. Unforeseen outcomes

The OSIS oil spill detector sensor is now being developed for use on ships. A LIFE project, launched by the same beneficiary in 2004, "Oil Spill Identification System for Marine Transport" (LIFE04 ENV/DK/00076) is currently adapting the OSIS sensor and transmission system for ships.

11. Prepared by

A. H. Pickaver, Coastal & Marine Union (EUCC), The Netherlands

12. Verified by

It has not been possible to verify this case.

13. Sources

- Best LIFE-Environment projects 2005-2006 (2006) Luxembourg, Office for Official Publications of the European Communities
- Energy Information Administration <http://www.eia.doe.gov/emeu/ipsr/t31.xls>
- Global Marine Oil Pollution Information Gateway <http://oils.gpa.unep.org/facts/sources.htm>
- <http://www.ospar.org/eng/html/welcome.html>
- <http://www.osis.biz>



Europe-Life Best Projects 2006 (1.61 MB) 