



European Maritime Safety Agency

**PRELIMINARY DISCUSSION  
PAPER**

**IMPLEMENTATION OF DIRECTIVE  
2005/35/EC ON SHIP SOURCE  
POLLUTION AND ON THE  
INTRODUCTION OF PENALTIES  
FOR INFRINGEMENTS**

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## 1. EXECUTIVE SUMMARY

Member States are in the process of implementing the Directive 2005/35 on ship source pollution and on the introduction of penalties for infringements. Following its entry into force, the Commission will monitor compliance of national legislation, with the assistance of EMSA as appropriate. In order to be fully effective, the rules relating to the prohibition of pollution and their enforcement need to be accompanied by measures of a practical nature. The assistance of EMSA is also required for the development of these measures, the Agency being able to offer services in support of MS' activities (particularly at the beginning of the response chain). Preparatory work has to take place in line with Article 10, paragraph 1 which provides for accompanying measures to ensure proper enforcement:

*"For the purposes of this Directive, Member States and the Commission shall cooperate, where appropriate, in close collaboration with the European Maritime Safety Agency and taking account of the action programme to respond to accidental or deliberate marine pollution set up by Decision No 2850/2000/EC (1) and if appropriate, of the implementation of Directive 2000/59/EC in order to:*

*(a) develop the necessary information systems required for the effective implementation of this Directive;*

*(b) establish common practices and guidelines on the basis of those existing at international level, in particular for:*

*— the monitoring and early identification of ships discharging polluting substances in violation of this Directive, including, where appropriate, on-board monitoring equipment,*

*— reliable methods of tracing polluting substances in the sea to a particular ship, and*

*— the effective enforcement of this Directive."*

**The purpose of this paper is to stimulate discussion and exchange of ideas, especially by providing a summary of the existing and future anticipated technical accompanying measures and thereby enabling a consideration of any necessary initiatives to enhance those measures.**

In this respect, a number of technical measures are available and are planned or anticipated for the future.

**A.** Satellite imagery is an ideal tool for the initial monitoring of large sea areas and contributes mainly to improved direction of aerial surveillance resources. During 2007 the satellite oil spill monitoring service CleanSeaNet offered by EMSA can provide a range of information including:

- Oil spill alerts to Member States and rapid delivery of all available satellite images over the area of interest,

- Slick position/extent/pattern/shape,
  - Assimilated meteorological wind and wave data,
  - Local wind and wave data derived from the synthetic aperture radar image.
- B.** SafeSeaNet is available as an important information system. The satellite images available at EMSA and AIS message data available through SSN could begin to provide possible indication of polluters.
- C.** EMSA will support MS in identifying and developing guidelines on best practice in surveillance (in the framework of the Super CEPCO exercise under Bonn agreement). An inventory of national resources for such being:

[http://ec.europa.eu/environment/civil/marin/cis/cis\\_index.htm](http://ec.europa.eu/environment/civil/marin/cis/cis_index.htm)

- D.** Systems for storage of information being developed for accident investigation may also in future, act as tools providing evidence for use in enforcement; principal among the new information systems envisaged is Voyage Data Recording. Electronic logging and e-log books (Oil/water separation systems, electronic logging of overboard valve opening/closing etc.) are other future possibilities. However, with a division maintained between safety related investigation measures and offence prosecution related processes practised by some Member States, differing views can be expected on such usage. Such systems are now mandatory (SOLAS and Directive 2002/59/EC) on board most merchant ships. The use of VDR information as evidence for enforcement outside the scope of accident investigation will be very challenging and at this stage could only be encouraged on a voluntary basis. However, with research projects such as MarNIS and the deployment of e-maritime systems, and EMDM looking at developing new functionalities for vessel data management systems, onboard integrated tools providing evidence for enforcement could be envisaged.

In all cases, MS obtaining necessary proof (evidence from various sources) linking discharges to cargo, fuel or waste oil on board is fundamental. Different means and experiences exist among the MS (Bonn Agreement) e.g. in France, Germany, Sweden and others. In some cases, specific national legislation (and coordinated national strategies) exist (e.g. France).

The elements for consideration are to include:

- Information systems
- Monitoring and identification
- Methods of tracing pollution
- Any other common practice and guideline for the effective enforcement of the Directive

An action plan in 3 phases is proposed.

In the **present and near future** (3 – 6 months and up to the mid-term), EMSA's satellite oil spill monitoring service CleanSeaNet will be available.

Satellite pictures will contribute to improved direction of aerial surveillance resources. AIS message data available through SSN could begin to provide possible indication of offenders. EMSA will support MS in identifying and developing guidelines on best practice in surveillance and in the gathering of information prior to, during and after a port of call in the delivery of waste. Agreement at COSS on the waste message is anticipated for use in SSN.

In a future, **mid-time scale** (3 - 5 years), use of satellite imagery will evolve and improve as will the tools associated. With the minimum range of AIS at approximately 30 Nmiles, LRIT will provide an expanded picture of up to 1000 Nmiles. Correlating (as in the STIRES concept), AIS short range information with the LRIT long range data and further linking these (as additional information layers) with the satellite pictures (visual, infra-red and synthetic aperture radar) meteorological information and sea state, will enable (through hindcasting of the traffic imagery and computer modelling) better detection, linkage of the offenders with spillages.

The **long term**, (5 – 10 years or more), includes the product of current EU research programmes. Systems for storage of information being developed for accident investigation may also act as tools providing evidence for use in enforcement; those new information systems envisaged being Voyage Data Recording and e-log books. DNA tagging could provide the identities of offenders reducing the importance (and pressure upon resources) of obtaining on-site evidence. As these may introduce new shipboard carriage requirements and are global issues, the eventual applications may need to be considered in an IMO e-navigation context. To achieve or foster greater progress, advantage should also be taken of European research, especially by encouraging projects within the area of information society technologies.

## 2. BACKGROUND

Currently, to detect and verify pollution with the Directive entering into force, two leading forms of activity are available, with MS as the principal actors:

- Inspections in port, (oil record books, tank inspections, discharges in port etc.), but with inspections for Port Waste Reception Facilities in addition to those for Port State Control.
- To a limited extent operational satellite and aerial surveillance of and receipt of reports, depending upon jurisdiction as; Internal waters, Territorial waters, International straits, EEZs and High seas (areas as identified under Directive Article 3).

The identification of offenders through checking of records should necessarily lead to an improved joined-up approach and intelligent correlation between the oil cargo/fuel oil held on board, consumed and disposed of ashore as waste and the vessels movements and quantities notified as carried on board. Hence, the close relationship between Directive 2005/35/EC and Directive 2000/59/EC should be recognised.

For best results, MS' operations should be connected by a system where the "mission control centre" links aerial surveillance with maritime patrol, including operations teams ready to board ships when necessary. In turn, these are supported and linked with:

- (a) a legal system able to enforce eventual penalties; and
- (b) an ability to proceed with other follow-up sanctions including sending reports to the flag State and/or detain the ship, or to compel ships into port (e.g. France).

Maritime MS should each designate a NCA, with contact points and 24/7 operation etc. In any case, "information systems" must be implemented to distribute information according to Articles 6 and 7. The current SSN alert message is a definitive tool, now exercisable, (the alternative being a combination of telephone, facsimile, e-mail etc.).

Response will take the form of identifying the pollutants, tracing and tracking likely offenders through EU waters and notifying the Administrations of coastal States and the next port of call. Tracking will also be important for intervention while ships are still at sea, as this may also be an action considered. As much evidence as possible must be gathered from all sources during follow up operations.

Due consideration should be given to activities carried out and ongoing in this field, particular reference being made to:

- documents circulated by the IMO such as individual submissions to the MEPC under the heading "promotion of implementation and enforcement of MARPOL" (e.g. submission by the United States, MEPC 52/16/1);
- ongoing activities of regional agreements should be considered, e.g. OSPAR North Sea Manual on maritime oil pollution offences, the Bonn Agreement Manual on Oil Pollution at Sea, the activities of the North Sea Network of Prosecutors and Investigators and of the Network of Prosecutors General in the Baltic States; and
- existing initiatives at EU level under the DG ENV marine Strategy such as the European Concerted Action Plan to Foster Prevention and Best Response to Accidental Marine Pollution<sup>1</sup>, or under the DG REGIO Interreg programme such as the Maritime Safety Umbrella Operations<sup>2</sup> concerning mostly the recovery and clean-up of pollutants are not covered in this paper, though there are clear additional benefits to such operations created through the accompanying measures indicated.

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<sup>1</sup> <http://www.cid.csic.es/ampera/index.php>

<sup>2</sup> <http://www.maritime-safetyy.org>



Some of the accompanying measures are presented below in detail. Draft sample questions (provided for discussion) are included within the following text at the end of each section.

### 3. SATELLITE OIL SPILL MONITORING SERVICE: CLEANSEANET

EMSA intends to provide MS a pan-European operational system for marine oil slick detection and surveillance, to improve the response to accidental spills and detection of illegal discharges of oil and to assist to identify possible polluters. Specific applications for the satellite information service in the field of marine oil pollution will include:

- Monitoring of Illegal Discharges on a regular basis
- Monitoring and Surveillance of Illegal Discharges upon request
- Surveillance of Accidental Spills

The basic service elements should start to be operational in the first half of 2007 and will consist of a planning and first alert system, which shall provide information on the location of possible oil slicks, the confidence level of interpretation, and the satellite image to the Member States.

Alerts to MS will be delivered by e-mail or phone SMS within 30 minutes after satellite overpass. Delivery of the satellite images and reporting of information will be available through the EMSA web interface directly to the operational pollution control authorities in MS and the Commission. Support for image interpretation is available from experienced image analysts. EMSA will offer additional services upon request.

Although the needs for routine operational surveillance and emergency situations are different, satellite imagery complements other remote sensing resources such as dedicated aircraft. A common information infrastructure between EMSA and the MS' pollution control authorities, eventually integrating Automatic Identification System (AIS) and subject to a decision by MS, LRIT information and numerical modelling for drift forecast and hindcast, will improve information sharing and operational means for tracing polluters and supporting further prosecution, fully organised and executed by MS.

*Q: Should harmonised methods and resources be applied within MS, in particular as regards modelling on the basis of satellite imagery? Is there a need to continue exchanges on the different types of proof and on new technologies such as sampling buoys, modelling software, etc, and also for the training of people likely to use and interpret the results obtained with these new resources?*

*Q: Should and how Member States anticipate utilising satellite-based resources in general and the services provided by EMSA in particular in*

*support of aerial surveillance and for meeting the goals identified in Article 10(1)?*

#### **4. INFORMATION SYSTEMS**

##### **A. SAFESEANET**

Information systems are required for enforcement of Directive 2005/35/EC in order to make “optimum use of information” including information notified from detection and from traffic monitoring. The use of information on ships such as the quantities of bulk liquid hazmat waste to be deposited ashore can be optimised, if the Competent Authority or PSC inspector has immediate access to electronic records of the hazmat carried and previously deposited ashore. He/she is then able to check whether any balance has been lost at sea and from samples in conjunction with tagging technology, to compare those polluting liquids held on board with pollution detected at sea.

The above can be expanded in the context of the generation of waste oil, its notification and the delivery of waste ashore. This can be seen in the context of an information system used to facilitate the identification of polluting or potentially polluting ships and enforcement of Directive 2000/59/EC. The generation, storage and transfer ashore of waste oil should be consistent with those quantities:

- recorded in the oil record books;
- notified prior to delivery ashore; and
- actually delivered to the port reception facility.

Irregularities can trigger and the quantities verified during PSC or targeted inspections. However, in order to take immediate, concerted and collaborative action, the verification process should wherever possible be aided by the remote, electronic exchange of data between the authorities of the Member States. An alert generated by such a system would therefore enable further action during or at the next port of call. It may also trigger the gathering of further recorded details of a suspect vessels current and previous activity that could be used as legal evidence.

There should be a correlation made between the quantities of waste oil declared (via SafeSeaNet notification).

Support by SSN could take at least four forms:

(a) Notification – SSN can provide information on a ship’s current location; as well as access to relevant information on the ship, including port and ship notifications with AIS data and the Hazmat cargo manifest can be obtained electronically. Discussions are ongoing to extend SSN to include the waste notification.

(b) Alerts – SSN already supports the communication of information between the Competent Authorities (CAs) of MS on the basis of Articles 16 and 17 of Directive 2002/59/EC. This includes a waste alert, to inform the

relevant competent authorities and coastal authorities where there is some identified irregularity at the point of delivery of ships' waste ashore. However, MS do not currently apply this facility in practice. The strategy to identify non-delivery of waste must work in parallel with the system identifying polluters as a symptom of one may help identify the other.

(c) AIS/LRIT – Part of AIS data received by MS is included in the information received by SSN. The EMSA project (STIRES) has identified a concept for the exchange of MS' AIS data up to regional and EU levels. This has and will, if fully implemented, provide benefits, several of which will improve implementation of the Directive 2005/35. A European integrated AIS/LRIT traffic image database would amongst other benefits, support satellite-based tools for pollution detection (a layer with traffic information on a SAR image).

(d) Database – Effective maintenance and cross-checking of records is an essential part of any future enforcement of the Directive, (especially as pollution by MARPOL Annex II cargoes can be much more difficult to detect by the means used to detect oil pollution). The information and discoveries made through SSN will be made more efficient and effective if in several measured areas, the structure of SSN core is transformed into a database rather than an index server.

(e) Other – Current or planned versions of SSN (based on Directive 2002/59/EC requirements) do not support details of ships' fuel or bunkers, (except in the ship notification message, when bunkers exceed 5000 tons).

## **B. OTHER INFORMATION TOOLS**

Systems for storage of information being developed for accident investigation may also be considered to act as tools providing evidence for use in enforcement; those new information systems envisaged being Voyage Data Recording and e-logging. Some Member States maintain a clear separation between systems originally developed for safety related investigation from offence prosecution related processes. New exploitation of systems that were originally developed for accident investigation (without an intention to apportion liability or blame) should be carefully evaluated and differing views can be expected.

*Q: Are there other tools or technologies that could be used to trace the discharges and polluters?*

*Q: How far are we from developing an automated operational tool, to prove in real time, pollution discharge by a ship?*

*Q: Are current and planned means for exchange of information between MS adequate? Could the exchange of information be improved through standardisation (such as those used by Bonn Agreement States) across*

*the EU as best practice? Should this be regularly exercised between countries with mutual agreement?*

*Q: Could Member States facilitate the planned developments e.g. agreement on the content of the waste message for SSN?*

*Q: Are there longer term consequences for the IMO e-navigation concept?*

*Q: Could opportunity be taken of European Research in order to encourage greater progress?*

## 5. COMMON PRACTICE AND GUIDELINES

In the anticipation of the effective use of SSN by MS and the necessary extension of SSN to support implementation for enforcement of Directive 2005/35/EC, a variety of other systems are and will continue to be applied by the competent authorities. These include whatever is available to the competent authorities of the MS for implementation of MARPOL 73/78, including national information systems, Sirenac, *ad hoc* record keeping and various means for exchange of information between the authorities of the MS, including telephone, fax, e-mail, etc.

Enforcement measures for ships within port or for ships in transit within coastal areas are given in Article 6 and 7 respectively. In cases of ships within port the cause identified to initiate an "appropriate inspection" are "irregularities or information" giving "rise to a suspicion". This includes the verification of the data on the waste oil generated, carried and transferred ashore prior to, during and after each port of call in accordance with Directive 2000/59/EC with the action taken and raising of alerts should such irregularities be discovered.

In all cases, information systems (the ready availability exchange information being a critical part of effective enforcement), monitoring and identification and methods for tracing pollution are necessary to support effective implementation.

The evidence for "irregularities" or "suspicion" can take two forms:

- Actual discovery (through detection and/or reporting) of actual deliberate pollution, in which new technologies will have an increasing role.
- Irregularities in the on board equipment or in the recorded quantities of polluting cargo (shore and ship records). This could as examples, be unaccounted for shortfalls in the residue of fuel or cargo disposed or

ashore; or the actual disposal of a lesser amount of waste residue than the quantity declared by the ship.

Aerial and maritime surveillance is and will continue to play an important part in the detection of oil pollution and in the gathering of evidence to pursue prosecutions.

In 2007, EMSA will support MS in identifying and developing guidelines on best practice in surveillance (Super CEPCO under Bonn agreement). The results from this project will be of interest to all of the maritime MS.

*Q: Would it be useful to create European standards and guidelines for the training and certification of aerial observers and analysts of satellite imagery (visual expertise by trained observers being the main evidence in most countries).*

*Q: How much importance should be attached to Paris MOU requests for Port State Control inspections to be carried out on vessels suspected of illegal discharge?*

*Q: Should MS be strongly encouraged to institute proceedings and prosecute vessels that commit offences in their waters, rather than relying upon the forwarding of information on the case on to the flag state for their prosecution?*

*Q: Should contact information be enhanced and promulgated for use by investigation and prosecution practitioners in all other EU MS, such as that already held by the North Sea Network?*

*Q: Should an inventory of the relevant policies in the MS be made?*

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## **ANNEX I. DRAFT INITIAL PLAN OF ACTION**

### **In the presence or near future (3 – 6 months and up to the mid-term)**

EMSA provides satellite images and with AIS message data available through SSN, this could begin to provide possible indication of offenders. Satellite pictures will contribute to improved direction of aerial surveillance resources.

EMSA will support MS in identifying and developing guidelines on best practice in surveillance and as applied by the coastal and PSC Administrations in terms of the tools used for monitoring (e.g. satellite, aircraft, visual, I-R etc.). How reports are recorded, stored, exchanged and encouraging voluntary reports from third parties? The verification of the quantities of cargo/fuel oil loaded, consumed and the residue discharged as waste. How are these quantities verified from port to port and what action is taken upon detection of irregularities (e.g. inspection)? What information is required for the legal follow-up in terms of identifying the offenders and the compilation of evidence?

Implementation of SSN by MS in accordance with Directive 2002/59 due dates is very important in this respect.

There should be agreement through COSS on the content of the waste message based on Article 12 Directive 2000/59 including actual delivery (verification of type and quantities) of waste (not only estimates) for support through SSN.

To ensure MS' full application of SSN message facilities including (i) waste messages and (ii) waste alert messages and thereby ensuring fuller integration of SSN into the procedures applied by MS' Administrations.

Ensure development and availability of MS' own coastal monitoring systems (AIS) in accordance with Article 9 of Directive 2002/59. This should include provision for relay and exchange as identified by the "STIRES" concept. This will not only enable improved vessel identification and tracking but will prepare for later fuller integration of AIS as a SSN module.

### **In the mid-term (3 - 5 years)**

LRIT may be implemented through an EU data centre, enhancing and in effect extending the range of MS' coastal monitoring systems. LRIT data integrated with AIS potentially creating composite traffic image data for the whole of EU waters. This will enable use of and exchange of traffic data with notified/reported data and other central databases at the EU level, to deliver benefits to MS identified during the STIRES project.

Modifications to enable SSN to act directly as source of data (rather than an index server) will enable improved system efficiencies and improved ability to detect "irregularities" in ship records.

Further modifications of SSN include modification of and implementation of additional messages including the waste message and inclusion of fuel oil figures. On-line, EU-wide access to figures for Hazmat cargoes, fuel oil quantities (all ships) and waste figures verified by inspection, will provide an ability to detect offending “irregularities” and to forward such information by using Alerts to relevant authorities in MS (and cooperating third countries).

Implementation of intelligent alerts distribution within SSN will provide more effective monitoring, tracking (and more effective pursuit?) of potentially offending vessels within EU waters.

### **In the long term (5 – 10 years or more)**

Though satellite monitoring and information systems will continue to evolve and the use of tracking of AIS/LRIT data can be developed to a higher degree of effectiveness; the long term also can be considered a period when the benefits of research could be developed and acquired.

In addition to the SSN improvements already identified, a number of separate technical proposals if implemented would be applied to improve the initial automated detection and traceability of bulk liquid pollutant cargoes and ships’ fuel oils. Such initiatives could include DNA tagging<sup>3</sup>, Voyage Data Recording and e-log books including data logging (some developed for purposes of data storage in accident investigation). As these will ultimately require introduction of new shipboard carriage requirements and are global issues, the results of research will need to be considered in an IMO (and likely an e-navigation) context.

With improved communications and shore-based data storage systems under the umbrella of the e-navigation concept, recordings of ships’ activities can be accessed through remote monitoring and therefore by inspection from the shore or by data logging using systems similar to those used in the field of nuclear security. This can be used to target potential offenders or as additional evidence for use in follow up court cases.

To achieve or foster progress, advantage should also be taken of European research, especially by encouraging projects within the area of information society technologies (6<sup>th</sup> Framework Programme) and cooperation in relation to information and communication technologies and transport (7<sup>th</sup> Framework Programme) and of supporting projects in related fields within the common European initiatives like Maritime Safety Umbrella Operation Programme (under the European Regional Development Fund).

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<sup>3</sup> Reference to the submission to the IMO Sub-committee on bulk liquids and gases in April 2002 (BLG 7/INF.5) the UK informed about an ongoing research project into DNA tagging of oil. The BLG decided to consider this item further when the results would be available (see outcome BLG 8 document BLG 8/24).