EUROPEAN MARITIME SAFETY AGENCY (EMSA) IN THE WAY TO ENHANCE SAFETY AT EU SEAS

ABSTRACT

The seas surrounding the European Union contain some of the busiest shipping areas in the world. As well as handling around 90% of EU external trade and around 35% of trade between EU countries, the sea lanes also handle a huge amount of through traffic. In particular, oil tanker traffic is rapidly growing as more and more oil is progressively being brought to the global market place via EU waters. The consequence of this significant growth in tanker traffic, in addition to the existing level of hazardous goods traffic in general, is a corresponding growth in environmental risk to the European Union in most of its main sea areas. Specifically, these are the Mediterranean area and the Black Sea, the Baltic Sea, the North Sea, the Northern channels between Sweden, Denmark, Germany, the Netherlands, Belgium, France and the UK and the Atlantic arc sea area. Subsequently, the growth of all terrorist related threat is a second factor to be taken into consideration when debating safety and security at sea.

The paper presents the main tasks of EMSA given to this organization in order to build European better understanding of all aspects related to vessel traffic monitoring and information sharing systems. The ships in EU waters, and their cargoes should be monitored more effectively than in the past, and it must be a more consistent approach across all EU sea areas.

INTRODUCTION

Much of the growth in future maritime traffic could also occur as a result of the EU drive to move goods transport off the roads. In addition, there is also growth in passenger traffic from the present 350 million passenger journeys per year, and
this is spread around the EU\textsuperscript{1}. Added to the growth in traffic, in many EU sea areas, weather conditions, geographical restrictions, tidal conditions and other factors ensure that the danger of accidents will increase unless improved safety and environmental risk reduction procedures are set in place\textsuperscript{2}. At the core of the required procedural improvements are traffic organisation measures which involve the monitoring of ship movements, with the aim of preventing the development of dangerous situations.

EMSA is the EU level provider of technical support in implementing Directive 2002/59, and this includes the following responsibilities\textsuperscript{3}:

\begin{itemize}
  \item Provision of support to the European Commission in the development of the SafeSeaNet project, which is a pan-European electronic information system which deals with ship movements and cargoes;
  \item Monitoring of developments in IMO and IALA on long distance Automatic Identification Systems (AIS);
  \item Participation in the work of the IMO ad-hoc working group on the engineering aspects of Long Range Identification and Tracking of Ships (LRIT);
  \item Access to the Shore based Traffic Monitoring Infrastructure Database (STMID).
\end{itemize}

SAFESEANET SYSTEM

Following the loss of the tanker M/V Erika off the French coast in 1999, the European Union has adopted several directives aimed at preventing accidents at sea and marine pollution. Directive 2002/59/EC adopted by the Parliament and the Council on 27 June 2002 aims at establishing, within the Community a vessel traffic monitoring and information system ‘with a view to enhancing the safety of efficiency of maritime traffic, improving the response of authorities to incidents, accidents or potentially dangerous situations at sea, including search and rescue operations, and contributing to a better prevention and detection of pollution by

\begin{itemize}
This Directive requires Member States and the Commission to co-operate to establish computerised data exchange systems and to develop the necessary infrastructure.

The implementation of Directive 2002/59/EC, as well as provisions contained in other EC legislation, requires the collection and distribution of various kinds of data. It concerns vessel traffic monitoring, dangerous cargo details, results of ship inspections and information related to ship waste and cargo residue. SafeSeaNet has improved data exchange with better standardisation and a profusion of transfer mechanisms — from phone or fax to electronic messages (often via EDIFACT). SafeSeaNet will contribute to the efficient implementation of the EU maritime safety legislation.

In addition, SafeSeaNet has been designed to allow, as necessary, additional services to be provided for a large community of users with the objective of contributing to the implementation of other community policies such as environmental protection, the security, immigration, etc.

The SafeSeaNet System relies on a distributed architecture made of three levels:

— Local Competent Authorities (LCA);
— National Competent Authorities (NCA);
— The central index.

The system is a network/Internet solution based on the concept of a distributed database. Once fed into the SafeSeaNet system, data does not have to be transferred, copied or duplicated.

The SafeSeaNet system keeps track of the data location, through a so-called Central Index which stores pointers (references) to the actual data location. Access is provided to the authorized persons via well-defined messages. Whenever access to the data is needed by one of the participants, this data can be requested through a well-defined message, and the SafeSeaNet system will locate it. The system will then retrieve the data from wherever it is stored and present it to the requester, again in a well-defined message. (see Fig. 1).

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Bezpieczniejsza żeglugą i czystsze morza w UE, Urzad Oficjalnych Publikacji Wspólnot Europejskich, 
Fig. 1. SafeSeaNet basic architecture

Source: http://www.emsa.europa.eu/end185d007d003d001.html

Basic Technical Requirements:

— System available 24h/day — 365 days/year;
— Capable of providing a rapid reply to any request;
— Based on Internet Standard Technology (web server);
— Support message implementation in XML;
— Ability to include new requirements stemming from EC legislation, new messages, new members in the network, etc.;
— User-friendly;
— Shall ensure a high level of security of communications.

7 http://www.emsa.europa.eu/end907d001.html
**AIS SYSTEM**

The Automatic Identification System (AIS)\(^8\) is a specific picture giving special information about shipping. It is a shipboard radar display, with overlaid electronic chart data, that includes a mark for every significant ship within radio range, each as desired with a velocity vector\(^9\). Each ship ‘mark’ could reflect the actual size of the ship, with position to Global Positioning System (GPS) or differential GPS accuracy. By ‘clicking’ on a ship mark, you could read the ship name, course and speed, classification, call sign, registration number (IMO number), Maritime Mobile Service Identity (MMSI)\(^10\), and other information. Maneuvering information such as: Closest Point of Approach (CPA), Time to Closest Point of Approach (TCPA) and other navigation information, more accurate and more timely than information available from an automatic radar plotting aid, could also be available\(^11\). Display information previously available only to modern Vessel Traffic Service (VTS) operations centres could now be available to every AIS-equipped ship (Fig. 2).

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\(^9\) It indicates speed and heading.

\(^10\) MMSI are formed of a series of nine digits transmitted over the radio in order to uniquely identify ship stations, ship earth stations, coast stations, coast earth stations, and group calls.


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Fig. 2. AIS system information flow

*Source: [www.busse-yachtshop.de/pic/ais-system-grt.gif](http://www.busse-yachtshop.de/pic/ais-system-grt.gif), 04.05.2007.*
Having this information, we could call any ship over Very High Frequency (VHF) radiotelephone by name, rather than by ‘ship off my starboard’ or some other imprecise means. We could dial it up directly using Global Maritime Distress and Safety System (GMDSS) equipment. We could send to the ship, or receive from it, short safety-related email messages\(^\text{12}\).

The AIS is a shipboard broadcast system that acts like a transponder, operating in the VHF maritime band, that is capable of handling well over 4,500 reports per minute and updates as often as every 2 seconds. It uses Self-Organizing Time Division Multiple Access (SOTDMA) technology to meet this high broadcast rate and ensure reliable ship-to-ship operation\(^\text{13}\).

**LRIT SYSTEM**

The Long Range Identification and Tracking of ships had been debated by the 2002 IMO SOLAS Conference which had adopted Conference resolution 10 on early implementation of LRIT.

The initial purpose of long-range identification and tracking of ships is to enhance security for Contracting Governments, without undue impact to the security of ships, by providing ship identity and current location information in sufficient time for a Contracting Government to evaluate the security risk posed by a ship off its coast and to respond, if necessary, to reduce the risk\(^\text{14}\).

A robust international scheme for long-range identification and tracking of ships is an important and integral element of maritime security. An active and accurate long-range identification and tracking system also has potential safety benefits, most notably for maritime search and rescue. Accurate information on the location of the ship in distress as well as ships in the vicinity that could lend assistance will save valuable response time to affect a timely rescue\(^\text{15}\).

At the 79th Maritime Safety Committee the purpose and scope of LRIT was extended ultimately to include safety and environmental protection applications.

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\(^{13}\) http://www.navcen.uscg.gov/enav/ais/default.htm, 04.05.2007.


\(^{15}\) MSC 81/25/add.1, op. cit., pp. 2–6.
The Committee recognized that for the LRIT system to become operational it was necessary to establish the International LRIT Data Centre and the International LRIT Data Exchange as well as to carry out tests and confirm the functioning of the system as envisaged in the LRIT architecture. The Committee also noted that certain milestones in the establishment of the LRIT system were also requiring certain decisions of the Committee. As a result the Committee agreed that the provisions of the SOLAS regulation on LRIT should start to become effective, with respect to the transmission of LRIT information by ships, as from 31 December 2008.

The Long-Range Identification and Tracking (LRIT) system provides data for the global identification and tracking of ships as indicated in Fig. 3.

![LRIT System Architecture](http://www.emsa.europa.eu/end185d007d003d001.html)

The LRIT system consists of the ship borne LRIT information transmitting equipment, the Communication Service Provider(s), the Application Service Provider(s), the LRIT Data Centre(s), including any related Vessel Monitoring System(s), the LRIT Data Distribution Plan and the International LRIT Data
Exchange. Certain aspects of the performance of the LRIT system are reviewed or audited by an LRIT Coordinator acting on behalf of all Contracting Governments.\textsuperscript{16}

LRIT information is provided to Contracting Governments and Search and rescue services entitled to receive the information, upon request, through a system of National, Regional, Co-operative and International LRIT Data Centres, using where necessary, the LRIT International Data Exchange.\textsuperscript{17}

Each Administration should provide to the LRIT Data Centre it has selected, a list of the ships entitled to fly its flag, which are required to transmit LRIT information, together with other salient details and should update, without undue delay, such lists as and when changes occur. Ships should only transmit the LRIT information to the LRIT Data Centre selected by their Administration.\textsuperscript{18}

The obligations of ships to transmit LRIT information and the rights and obligations of Contracting Governments and of Search and rescue services to receive LRIT information are established in regulation V/19-1 of the 1974 SOLAS Convention.

\textbf{STMID}

The Shore based Traffic Monitoring Infrastructure Database (STMID) will be the tool for EMSA to regularly update and disseminate relevant information on traffic monitoring infrastructure (eg VTS, AIS, SAR). It will also assist the Agency in verifying the accuracy of EU related data contained in nautical publications.

The general aims of the STMID development project are to:\textsuperscript{19}

\begin{itemize}
  \item provide EMSA and Member States (MS) with an overview of authorities and coastal stations which have been designated by MS in accordance with Article 22 of Directive 2002/59/EC and with the requirements of the SafeSeaNet system;
  \item assist MS in the collection of the required information on the authorities and coastal stations;
  \item centralise the information in the STMID to enable access by authorised parties and eventually by the public.
\end{itemize}

\textsuperscript{16} MSC 81/25/Add.1, op. cit., pp. 5–6.
\textsuperscript{18} MSC 81/25/Add.1, op. cit., pp. 7–15.
\textsuperscript{19} http://www.emsa.europa.eu/end185d007d003d001d001.html
CONCLUSION

To meet the threats of the global security environment it needs a strong and enduring partnership between civilian and military authorities. This approach would build on separate initiatives already in place and the respective strengths of countries, NATO and the EU as well as any other relevant body such as the IMO.

Of course, there are numerous hurdles to overcome in bringing such an approach to fruition such as gaining agreement on the perception of the threat, the scope of MSO activities, the willingness to share information and the international jurisdictional arrangements required for effective action.

However, the timely fusing of maritime information, much of which is unclassified, would be the initial priority. Incremental gains in information sharing could allow operational co-operation to develop in slower time as mutual confidence building. For an inter-agency approach to work it must draw together the strengths of the numerous organisations involved in addressing maritime security. The output would need to be seen as a valuable data to Governments, the commercial sector and the public. It must enable better use of limited resources to address the omnipresent, multi-national threat in the maritime domain. Thus, EMSA seems to be the best solution to enhance safety at EU seas.

BIBLIOGRAPHY

STRESZCZENIE

Akweny otaczające terytorium UE zawierają jedne z najbardziej intensywnie wykorzystywanych tras komunikacji morskiej na świecie. Około 90% wymiany międzykontynentalnej i ponad 35% wymiany handlowej w ramach rynku europejskiego odbywa się drogą morską. Zagrożenie bezpieczeństwa pływania wzrasta wprost proporcjonalnie do wolumenu ładunków przewożonych drogą morską, a w szczególności surowców strategicznych i materiałów niebezpiecznych.

Niniejszy artykuł przedstawia ideę europejskiego podejścia do systemowych rozwiązań mających na celu podniesienie poziomu bezpieczeństwa na najbardziej uczęszczanych akwenach otaczających państwa UE. Powołanie do życia organizacji EMSA oraz postawienie jej zadań z zakresu rozwoju systemów monitoringu ruchu żeglugowego oraz wymiany informacji bezpieczeństwa żeglugi jest jednym z europejskich rozwiązań prowadzących do osiągnięcia tego celu.

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