European Maritime Safety Agency

EMSA's Pollution Response & Detection Service

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1. Introduction

The European Maritime Safety Agency (EMSA) is a European Community body established in the aftermath of the *Erika* accident for the purpose of ensuring a high, uniform and effective level of maritime safety within the Community. The Agency has not a legislative role but provides the Member States (MS) of the European Union (EU) and the European Commission (EC) with the technical and scientific assistance and the high level expertise needed to implement the EU maritime safety and maritime security legislation.

Since 2004, the Agency plays an active role in the field of prevention of and response to marine pollution. Following the *Prestige* incident, the Agency was tasked to:

- Provide MS and the EC with technical and scientific assistance in the field of accidental or deliberate pollution by ships;
- Support with additional means, in a cost efficient way, the MS pollution response actions in case of accidental or deliberate marine pollution caused by ships.

Accordingly, EMSA provides operational support to the MS and the EC in the field through the following additional means:

a. A European network of oil recovery vessels.
b. Setting up a network of chemical experts for assisting the national efforts in responding to Hazardous and Noxious Substances (HNS) spills.
c. A Satellite Monitoring and surveillance service the so-call *CleanSeaNet.*
d. EMSA experts service to second the MS and the EC during the marine pollution response operations as part of the central response co-ordination centre, on board the EMSA contracted oil recovery vessel and/or through co-ordinating and gathering information either from the EMSA premises in Lisbon or on site.

2. Marine Transport and Oil Spills in Europe

In terms of volume, merchant shipping is the most important mode of transport to Europe and the rest of the world. More than 90% of European Union external trade travels by sea and more than 1 billion tonnes of freight a year are loaded and unloaded in EU ports. However, this does not come without risk and significant effort is being applied to ensure that, following recent initiatives, tanker accidents continue to decrease within an environment of significantly increasing volumes transported.

The *Torrey Canyon* (UK, 1967) accident marked the real beginning of public awareness of the adverse impacts of oil pollution disasters in Europe, but not only there. The *Amoco Cadiz* (France, 1978) later reminded people of the significant exposure of the EU coastline to pollution, and since then, numerous accidents (see table below) have demonstrated the continued risk of major oil pollution in European waters.

Table 1: Major European Oil Spills >10,000 Tonnes since 1989

Year	Name of the Vessel	Tonnes spilled	Countries affected
1989	*KHARK 5*	80,000	Portugal/Morocco
1989	*ARAGON*	25,000	Portugal
1990	*SEA SPIRIT*	10,000	Spain/Morocco
1991	*HAVEN*	144,000	Italy
1992	*AEGEAN SEA*	73,500	Spain
1993	*BRAER*	84,000	United Kingdom
1994	*NASSIA*	33,000	Turkey
1994	*NEW WORLD*	11,000	Portugal
1996	*SEA EMPRESS*	72,360	United Kingdom
1999	*ERIKA*	19,800	France
2002	*PRESTIGE*	63,000	Spain

The environmental and socio-economic damage caused by an oil spill is determined by a range of factors including the type of oil spilled; the amount and rate of spillage; the weather and sea conditions; the physical, biological and economic characteristics of the spill location and the effectiveness of response operations. Oil contamination can seriously affect mariculture, wildlife, amenities and the coastline in general. The overall socio-economic cost of oil pollution disasters is difficult to assess, but runs into billions of euros.

3. EMSA's Oil Spill Recovery Service

The environmental impact caused by marine oil spills is often very significant in both the short and long term. Consequently, mitigating the environmental and socio-economic damage caused by such events is a fundamental objective of marine pollution response operations. Minimising the amount of the oil hitting the shoreline by recovery of the spilled oil at sea is the most obvious solution to this challenge and therefore it is in this area that EMSA provides its main support.

3.1 EMSA "Top-Up" Pollution Response Resources

The primary responsibility to react to, and to co-ordinate the response to, an oil pollution incident rests with the affected European Union Member State(s). As major spills frequently concern more than one country, various regional arrangements like the Bonn Agreement (North Sea), the Helsinki Convention (Baltic Sea), the Barcelona Convention (Mediterranean Sea) and the Bucharest Convention (Black Sea) have been set in place to

cover co-operation and assistance in such cases. EMSA provides an additional "top-up" tier to these arrangements and to the Member States.

Pollution disasters on the scale of those in the table, including the most recent cases of the *Erika* (1999) and the *Prestige* (2002), illustrate that individual coastal states can not reasonably be expected to have sufficient resources to mount an appropriate response by themselves. Co-operation and mutual assistance is definitely required to deal with such a challenge as it is to respond to a major oil spill. Consequently, within this framework EMSA provides its service and assistance. For major spills, generally the most appropriate response is to recover the oil at sea before it reaches the coastline, as this significantly reduces the environmental damage.

3.2 EMSA contracted Pollution Response Vessels

Experience acquired during previous major oil spills has shown clearly that mechanical at-sea oil containment and recovery is the most appropriate technique for removing spilled oil from the marine environment. To provide support for this type of activity, EMSA has established contracts for at-sea oil recovery services around the European coastline with commercial vessel operators. Given that the EMSA service is to "top-up" available resources for major spills and for cost efficiency reasons, it was not seen as appropriate to build or buy dedicated vessels to be on permanent stand-by.

The contracted vessels will, under normal circumstances, carry out their usual commercial activities. However, in the event of an oil spill, and following a request for assistance from a Member State, the nominated vessel will cease its usual activities and, at short notice, be transformed into and operate as a certified oil recovery vessel.

Appropriate modification/pre-fitting to the vessels has been carried out in order to ensure that the specialised oil spill response equipment can be installed rapidly onboard and be operated safely by the crew.

Each arrangement has the following common characteristics:

- The vessel will operate as an oil recovery vessel on the basis of a pre-agreed model contract with fixed fees and conditions as developed by the Agency in consultation with Member States for this purpose.
- The contractor is obliged to react positively to all requests for assistance to respond to an oil spill, regardless of the spill location.
- The primary oil recovery system is based around the "sweeping arm" concept with an alternate "ocean going boom and skimmer" system also available. The requesting Member State can select the equipment in accordance with the incident characteristics.
- Each vessel has a speed over 12 knots for prompt arrival on site.
- Each vessel is equipped with a oil slick detection radar system to facilitate the positioning of the vessel in the thicker oil slicks.
- Each vessel has the manoeuvrability required to carry out oil recovery operations.
- Each vessel is able to decant excess water thus maximising the utilisation of the onboard storage capacity.
- Each vessel has the ability to heat the recovered cargo and utilise high capacity pumps in order to facilitate the discharging of heavy viscous oil mixtures to shore side facilities as designated by the Member State concerned.

The individual oil storage capacity of the EMSA contracted vessels ranges from 1,800 m^3 to 10,475 m^3 and they provide a total increase in capacity across the EU network of nearly 50,000 m^3. The basic technical figures could be gained from Table 2.

Table 2: EMSA contracted Oil Recovery Vessels

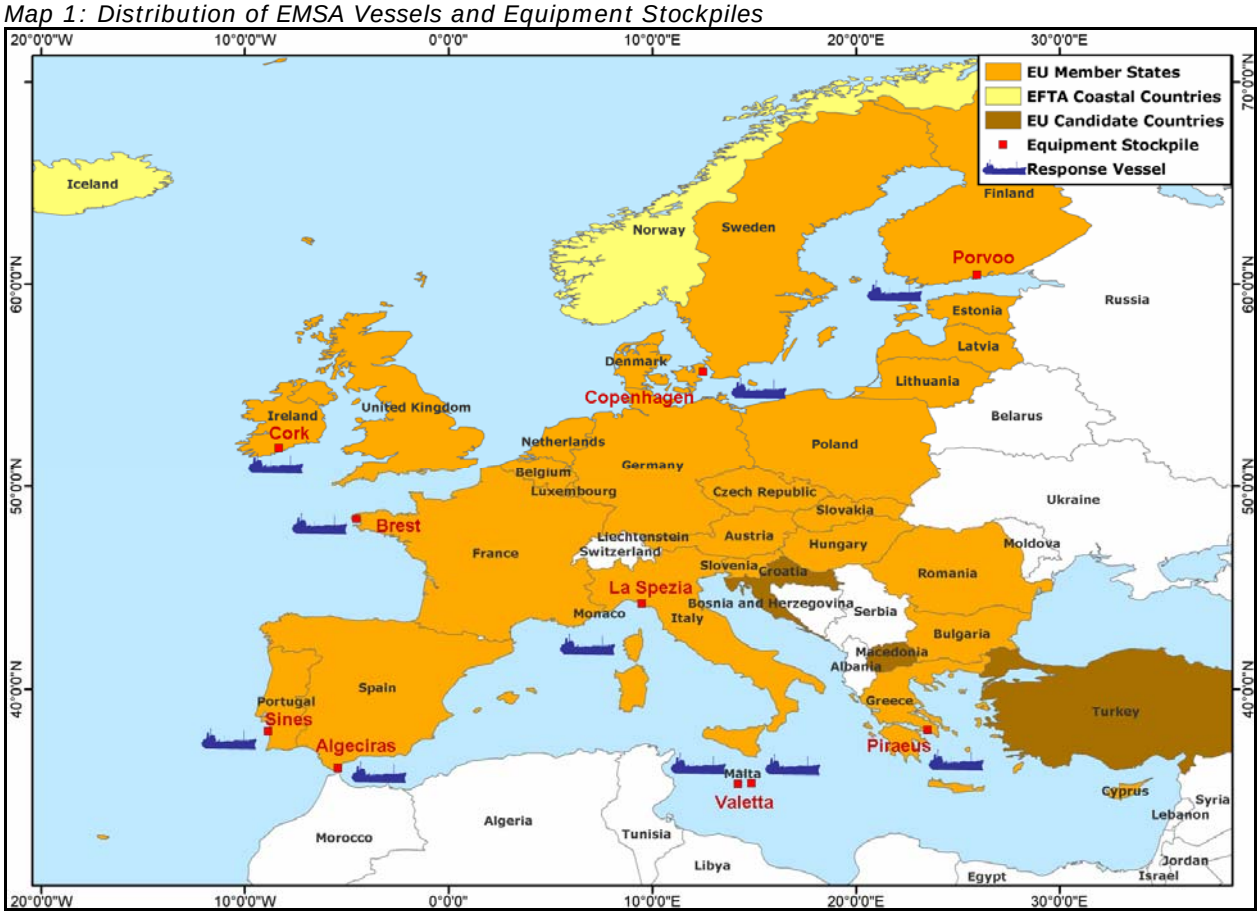
Name of the Vessel	Type of the Vessel	Commercial Operation Area & Equipment Depot	Tank Capacity (m^3)	L.O.A. (m)	Breadth (m)	Draught (m)	Oil Spill Response Equipment
Tinka	Bunker Tanker	**Baltic Sea** Porvoo /Finland & Copenhagen / Denmark (Max 2 vessels can be mobilised)	1,800	84.05	13.72	5.30	4 Flex. Sweeping arms 2 Brush skimmers 2 Arctic skimmers 2 Booms (400m/500m) 2 Slick detection systems
Breeze	Bunker Tanker		2,005	74.90	14.00	5.70	
Ophelia	Oil Tanker		6,936	106.20	15.99	7.17	
Otilia	Oil Tanker		9,889	105.00	18.00	7.92	
Tellus	Product Tanker		10,475	124.50	18.10	7.60	
Ile de Brehat	Cable Repair Vessel	**Atlantic Coast and Channel** Brest / France	4,000	123.90	23.40	8.01	2 Rigid sweeping arms 1 Weir skimmers 1 Boom (500m) 1 Slick detection system
Galp Marine	Oil Tanker	**Atlantic Coast** Sines / Portugal	3,023	82.98	12.50	5.00	2 Rigid sweeping arms 1 Brush skimmer 1 Booms (500m) 1 Slick detection system
Forth Fisher	Product Tanker	**Atlantic Coast** Cork / Ireland (Max 2 vessels can be mobilized)	4,754	91.00	15.58	5.10	2 Rigid sweeping arms 2 Weir skimmers 2 Booms (250m each) 2 Slick detection systems
Galway Fisher	Product Tanker		4,754	91.00	15.58	5.10	
Mersey Fisher	Product Tanker		5,028	91.40	15.50	6.02	
Bahia Tres	Oil Tanker	**Mediterranean Sea** Algeciras / Spain (Max 1 vessel can be mobilised)	7,413	99.80	18.00	7.00	2 Rigid sweeping arms 1 Brush skimmer 1 Boom (500m) 1 Slick detection system
Bahia Uno	Bunker Vessel		3,800	71.01	15.60	5.80	
Salina Bay	Bunker Vessel	**Mediterranean Sea** La Spezia / Italy	2,800	74.70	13.10	5.53	2 Rigid sweeping arms 1 Weir skimmer 1 boom (500m) 1 Slick detection system
Mistra Bay	Bunker Vessel	**Mediterranean Sea** Valletta / Malta	1,805	86.03	13.04	5.19	2 Rigid sweeping arms 1 Weir skimmer 1 Boom (500m) 1 Slick detection radar system
Santa Maria	Bunker Vessel	**Mediterranean Sea** Valletta / Malta	2,421	93.1	14.5	6.82	2 Rigid sweeping arms 1 Weir skimmer 1 Boom (500m) 1 Slick detection system
Aktea OSRV	Oil Tanker	**Aegean Sea** Piraeus / Greece	3,000	78.78	12.60	4.87	2 Rigid sweeping arms 1 Weir skimmer 1 Boom (500m) 1 Slick detection system

3.3 Additional Response Capacity for Europe

The EMSA service network now has resources based in the Baltic Sea, along the Atlantic coastline and in the Mediterranean Sea. It is important to note that, independent of their area of commercial operations, all vessels are available to respond to a spill anywhere in European waters.

In order to maintain the quality of the at-sea oil recovery service, all vessels and crews undergo regular equipment drills under the supervision of the Agency. To be able to work under an international command and control structure, which is the most likely scenario during a major spill, each vessel is available to participate in regular at-sea spill response exercises. In the near future, it is expected that the network will be extended to the Black Sea. The completed network will provide an effective "European tier" of pollution response vessels for the protection of the European coastline. The map below provides an overview of the available vessels and the geographical location of the associated equipment stockpiles.

Map 1: Distribution of EMSA Vessels and Equipment Stockpiles



4. EMSA's HNS Response Activities

The level of preparedness and response capabilities to marine spills of hazardous and noxious substances (HNS) differs between States. In addition, a general desire for more information on HNS pollution response was identified among MS of the EU. Consequently, the Agency prepared the EMSA "Action Plan for HNS Pollution Preparedness and Response" and implemented from 2007 and on.

EMSA's activities are focused on ship-sourced pollution involving the release or threat of release into the sea of HNS and initially concentrate on chemicals carried in bulk. Re-

sponse actions to HNS carried in packed form will be addressed later. The planned activities and their implementation are a direct result of the analysis of the current status and are implemented in close cooperation with the EU Member States. The following topics are being addressed in 2008:

- Analysis and dissemination of statistical information regarding seaborne transportation of HNS in European waters. Further analysis of this information will provide a clearer picture of the current situation.
- Establish and maintain a network of specialised HNS experts for advising and supporting the MS and the EC during the response to an HNS incident.
- Provision and facilitation of substance-related data during an accident. The chemical industry in Europe is currently providing information on chemicals transported on land to most MS in the event of spills free of charge. EMSA is coordinating the extension of this service to marine spills and to all MS.
- Develop a study to determine the minimum technical requirements for a "safe platform", which has the capability of entering a hazardous zone for monitoring and recovery operations. Key to such a "safe platform" is the protection of the responders and preventing an escalation of the incident.
- EMSA contributes to the International Maritime Organisation (IMO) forum for oil and HNS preparedness and response, namely the OPRC-HNS Technical Group by hosting the newly developed IMO model training course on preparedness for and response to marine HNS pollution incidents (entitled *HNS Supervisor*).

The proposed and current actions undertaken by EMSA cover a wide range of activities, mainly focusing on the provision of HNS-related technical information and expertise. Future implementation will be developed in partnership with Member States to ensure effective implementation of HNS preparedness and response across the EU and in collaboration with our neighbours.

5. The EMSA CleanSeaNet satellite service

EMSA has set up a high-performance satellite monitoring system for marine oil spill detection and surveillance in European waters to locate illegal discharges and to mitigate the impact of accidental spills. The CleanSeaNet service works on the basis of near real time analysis of ENVISAT and RADARSAT radar satellite scenes.

SAR (Synthetic Aperture Radar) "illuminates" the ocean surface and processes the back scatter signal. This signal contains information on the level of roughness of the sea surface. The dampening effect of floating oil films enables SAR sensors to detect oil slicks. There are limitations to this process as sea roughness is driven by the local wind speed and direction. Despite these limitations, satellite SAR imagery has proven to be an effective tool to detect oil spills at sea as it has the capacity to cover large areas (up to 400 Km wide swaths) day and night and is almost unaffected by cloud cover.

Oil spill alerts and clean sea reports are delivered to competent authorities in the Member States and to EMSA in less than 30 minutes from satellite overpass. The short delay between detection and alert is essential for a rapid response of the Member States and to catch a polluter in the act. Images and results of oil spill analysis are available through a customer tailored web-browser.

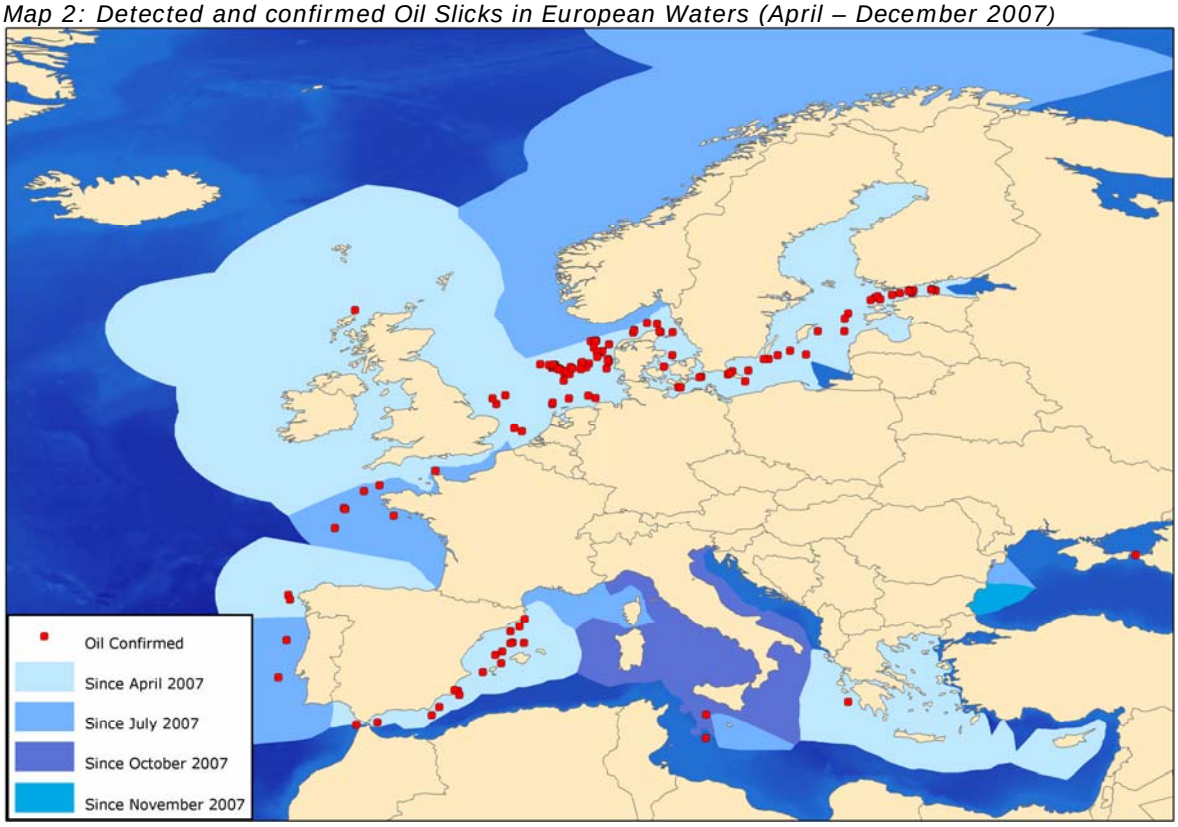
The CleanSeaNet service started operations on 16 April 2007 with 15 EU Coastal States, most of which had earlier experience in oil spill satellite surveillance and thus were ready to join the service from the beginning. During the following months more States joined the CleanSeaNet service and by December 2007 all 22 EU Coastal States and Norway use CleanSeaNet for combating illegal discharges and monitoring accidental spills. The scenes are provided to users free of charge.

5.1 Routine Surveillance for Illegal Oil Spill Discharges

From 16 April until 31 December 2007 a total number of 1513 SAR satellite scenes were ordered for participating EU Member States and Norway. A total of 1731 possible oil slicks were detected in the delivered satellite scenes. In average 1.3 oil spills were detected in each scene.

How CleanSeaNet is incorporated in the national operational chain differs between Coastal States. Some use aerial or vessel support each time a scene covers their waters, some make a case-by-case evaluation of the need to send resources on site. Planning aerial or vessel support for ordered scenes is part of the national response chain and this decision is taken independently from EMSA.

Map 2: Detected and confirmed Oil Slicks in European Waters (April – December 2007)



The sea areas displayed in different intensity of blue are showing when the Coastal States joined CleanSeaNet. By the end of 2007, most European waters are covered. The red dots indicate each time a CleanSeaNet detection has been checked by national authorities and confirmed as being oil.

5.2 Support to Aerial Surveillance Operations and incident monitoring

In 2007 CleanSeaNet provided satellite monitoring support to three Aerial Surveillance operations that had specific coverage requirements and therefore entailed special satellite planning. The duration of these pollution detection operations varied between 36 hours and 10 days.

EMSA CleanSeaNet service provided satellite scenes also for four different marine oil spill accidents in 2007. These included monitoring of two sunken vessels in Spanish waters, one oil rig accident in Norway and the monitoring of the oil pollution cased by sinking of several ships in Black Sea area during severe weather conditions.

5.3 Future development of the CleanSeaNet Service

The next major technical development for CleanSeaNet is the integration of data on possible oil spills with ship detection and vessel traffic information for polluter identification. This has been partially achieved in 2007 and implementation will continue in 2008. Evaluation of numerical drift models to help locate the source of the spills detected by CleanSeaNet also began in 2007.

6. EMSA's Pollution Response Expert Service

EMSA provides MS and the EC with technical and scientific assistance in the field of accidental or deliberate pollution from ships and supports on request, through the Community Mechanism, the pollution response mechanisms of MS.

The provision of expertise by the Agency can be characterised on the following basis:

- On-site personnel providing support across a range of issues including equipment selection and response coordination,
- Personnel providing support as part of the central response coordination of the MS.

A request for assistance from a state affected by an at-sea pollution incident may include requesting personnel with specialist expertise. The Agency is able to provide experts to go to the site of the incident to assist the requesting state. The state affected by a major spill can request the secondment of one or several EMSA experts. The types of secondment will be established on a case by case basis depending of the kind of assistance needed. EMSA experts will provide technical support to the affected State(s) either on site or from EMSA's premises in Lisbon. Experts may also act as "liaison officers" to arrange, if necessary, for additional assistance to be provided by EMSA i.e. vessels or satellite imagery.

Any country affected by a major disaster, inside or outside the European Union, can launch a request for assistance through the Monitoring and Information Centre (MIC) of the EC.

Further Information

Further information on this and all the other activities of the Agency is available at http://www.emsa.europa.eu.