EMSA

European Maritime Safety Agency

Pollution Preparedness and Response Activities

October 2010

EMSA's Contribution to the
Mid-term Report 2007-2009 regarding
Regulation No. 2038/2006/EC
on the Multi-annual Funding of the Agency's Marine
Pollution Preparedness and Response Activities

EUROPEAN MARITIME SAFETY AGENCY

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EXECUTIVE SUMMARY

In accordance with the Regulation on the Multi-annual Funding of the Agency's pollution preparedness and response activities, a Mid-term Report will be submitted to the European Parliament and the Council by 31st December 2010 by the Commission on the basis of information provided by the Agency. This Mid-term Report covers the period 2007-2009. The information contained herein constitutes EMSA's provision to the Commission.

The European Maritime Safety Agency has undertaken a wide range of activities in the field of marine pollution preparedness and response during the period 2007-2009. The activities are presented in detail under the three main themes of operational assistance, co-operation & co-ordination, and information. It should be noted that previously published individual Annual Reports are also available for the years 2007, 2008 and 2009 through the Agency website.

As can be expected, the main expenditures relate to the operational services, in particular the Network of Stand-by Oil Spill Response Vessels and CleanSeaNet, the oil spill satellite detection and monitoring service.

Analysis has been undertaken on the cost-efficiency of the approaches implemented to provide these two main operational services at the European level. The conclusion of the analysis is that the Agency has set-up and maintained these services in a cost efficient manner at the European level. This conclusion is supported by the various evaluations of EMSA activities in this field as well by stakeholder feedback. The added (operational) value of such a framework has been confirmed. The technical specifications of the at-sea oil recovery service provided through the Network of Standby Oil Spill Response Vessels have been recognised as being fit for purpose.

It must be highlighted that the purpose of the Network is to "top-up" Member States' response capacity when affected by a spill. The primary responsibility to respond to an incident is, and remains, with national authorities. Accordingly, the Agency provides a "European" tier of response capacity that is aimed at assisting coastal States.

As shown in the map on next page, the Network currently provides a level of operational coverage that is broadly similar across Europe.

The time needed for the vessels to be "ready to sail" varies between contracts. Accordingly, a mobilisation time of up to 24 hours, for discharging any cargo and for loading specialised response equipment, should be kept in mind before the vessel is "ready to sail".

With regard to more general feedback from stakeholders, primarily Member States and their marine pollution experts, the conclusion is that there has been a positive evolution of their perception with respect to the scope of activities undertaken by the Agency. EMSA has implemented complex and challenging projects in an effective manner. Whilst there is always room for improvement, the overall sense is that the Agency provides added value to the pollution preparedness and response mechanisms of Member States.

The 2004 Action Plan for Oil Pollution Preparedness and Response identified a number of assumptions regarding oil spill risk factors around European waters. This analysis remains valid with certain exceptions. The main conclusion is that the risk factor overview across Europe is complex. Each area has its own profile wherein different specific elements are more or less significant. Additional issues that need to be considered include the following:

- The potential threat posed by the relatively high concentration of single hull tankers trading in the East Mediterranean and Black Sea areas;
- The increase in ship to ship transfers of oil and the general lack of detailed information on the scale of these activities;
- The development of the Arctic in general and the increase in shipping and oil/gas exploration activities in particular;
- Particularly in the wake of the Deepwater Horizon incident, the potential threat posed by offshore oil facilities;
- The increasing importance to make EMSA pollution preparedness and response resources and activities available to neighbouring countries in adjacent seas.

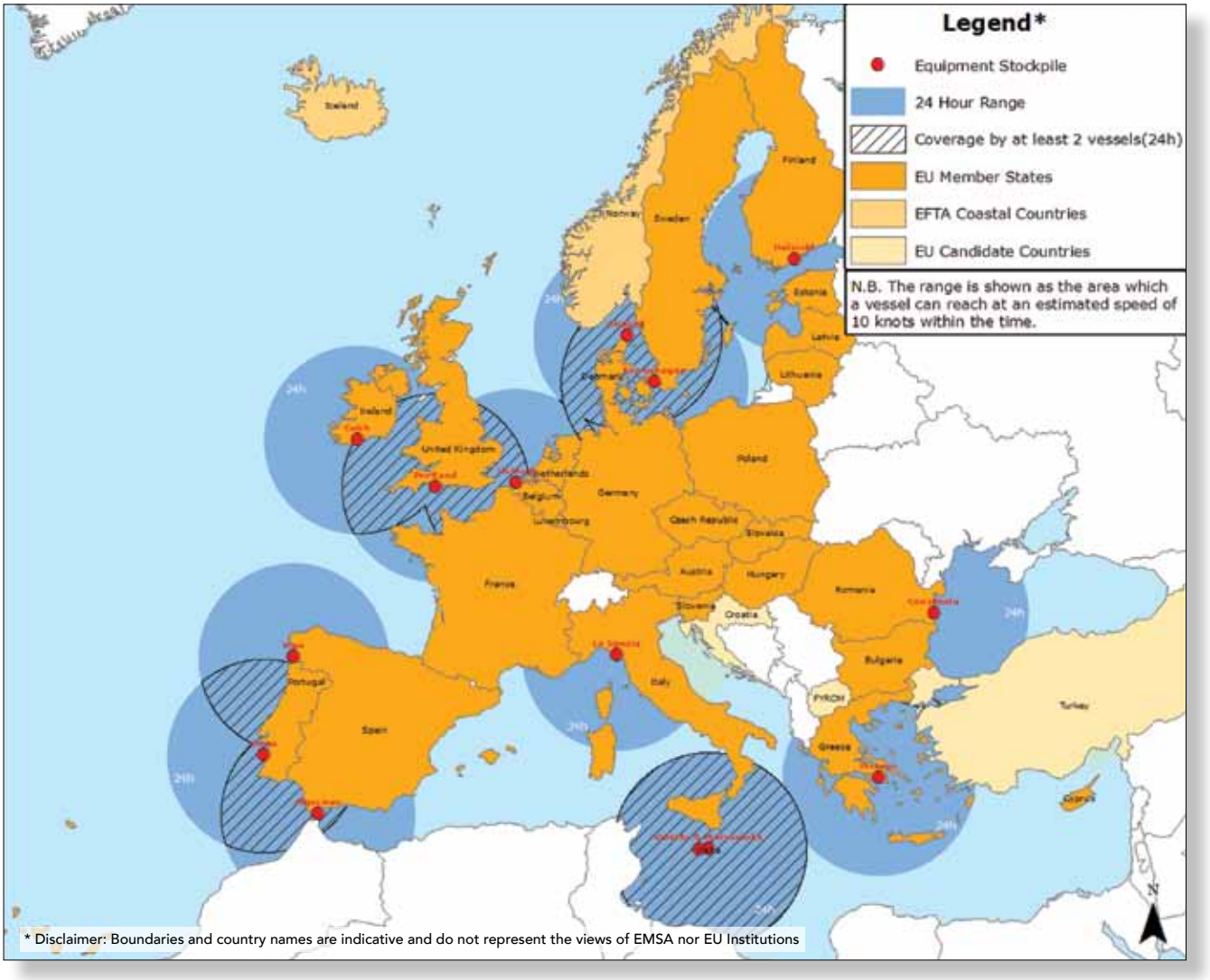


Figure 1.1 - Network of Standy Oil Spill Response Vessels: Coverage from "Ready to Sail"**
(** As of 17th June 2010, Iceland is an EU Candidate Country in addition to being an EFTA Contracting Party)

With the aforementioned issues in mind, the Agency intends to continue the broad line of activities that it has undertaken to date, adapting where appropriate. CleanSeaNet is, as of 2011, already in a phase of service upgrading whilst Co-operation & Co-ordination and Information activities will continue in the same vein.

Such actions will have to be carried out within the existing financial envelope, as provided by the EU Budget Authorities. It is worth noting that given the utilisation of budget appropriations to date, there is very limited scope for any major new activities to be implemented within the remainder of the financial envelope available through the existing Multi-annual Funding Regulation.

The Multi-annual Funding (MAF) Regulation itself has proven to date to be a very useful tool for enabling the Agency to implement its activities in the field of pollution preparedness and response. The complex nature of some of these activities, combined with the need to have multi-annual contracts with industry allowing, for example, the Agency to benefit from one-off investments in pre-fitting vessels for oil recovery services and to create economies of scale for satellite based services, has been greatly facilitated by the MAF Regulation.

The (cost efficient) sustainability of the operational services, which is a key factor in their added value, is only possible through the budgetary framework provided by the MAF

Regulation. **Accordingly, it is strongly recommended that the financial envelope be renewed beyond its expiry date in 2013.**

Based on the continuation of the services described at the level indicated it is possible to estimate the overall utilisation of the Multi-annual Funding financial envelope of EUR 154 million over the period 2007-2013. The table below shows results of the projected utilisation.

Whilst the utilisation rate for Commitment Appropriations is very good, the projected utilisation of Payments Appropriations is lower. A number of factors influence the rate of payments. For example, with respect to the Network of Standby Oil Pollution Response Vessels, if there is a delay regarding a new contract entering the operational phase of the service, there is a reduction in payments for that year. Similarly, if a satellite image provider does not deliver the product in a timely manner then there is a reduction in payment.

In addition, 4-year contracts signed (committed) in 2013 will trigger payments up to 2017 which will fall outside the current Financial Perspectives. The "rolling" effect of renewed or replacement contracts could even out such effects. The balance could only be achieved if the aggregated value of contracts running into 2007 were the same at the end of 2013. Clearly, this is not possible as the Agency was in the "building up" phase in 2007 compared to a significantly more mature structure expected by the end of 2013. It is worth noting that in 2005 the Agency started making commitments and initial payments in relation to the first set of 3-year Standby Oil Spill Response Vessel contracts. 2006 saw similar actions with respect to setting up the CleanSeaNet service, also based on 3-year contracts. Accordingly, payments for these two main activities are spread over a number of years, some of which fall into the period covered by the Multi-annual Funding Regulation.

TABLE 1.1 - EXPECTED UTILISATION OF MAF REGULATION FINANCIAL ENVELOPE

	EXPECTED UTILISATION OF MAF FINANCIAL ENVELOPE	
	Utilisation compared to - Actual amounts for 2007-09 - Amount projected for 2010 - Amount requested for 2011 and - Amount estimated for 2012-13	
	Commitments	Payments
2007	23,979,706	15,314,262
2008	17,094,428	15,452,978
2009	18,766,800	17,302,982
2010	20,241,742	13,332,883
2011: Requested	23,000,000	20,000,000
2012: Est.	21,000,000	21,000,000
2013: Est.	25,600,000	20,000,000
TOTAL	149,682,676	122,403,105
MAF Envelope	154,000,000	154,000,000
Difference	4,317,324	31,596,896
Utilisation (%)	97.20	79.48

1. REPORT OBJECTIVES

In accordance with the Regulation on the Multi-annual Funding of the Agency's pollution preparedness and response activities, a Mid-term Report will be submitted to the European Parliament and the Council by 31st December 2010 by the Commission on basis of information provided by the Agency. This Mid-term Report covers the period 2007-2009. The information contained herein constitutes EMSA's provision to the Commission.

At the November 2009 meeting of the Agency's Administrative Board, it was agreed that the Multi-annual Funding Mid-term Report should:

- Provide an appropriate level of information to support the Commission submission to the European Parliament and the Council;
- Be primarily a review of activities undertaken during the period 2007-2009 with appropriate financial analysis including, where pragmatic, cost-efficiency aspects;
- Consider the actual (and potential future) situation with respect to the initial assumptions identified when setting-up various Agency activities e.g. CleanSeaNet and the Network of Stand-by Oil Spill Response Vessels;
- Consider the "added value" to date of EMSA's operational services and other activities to the Member States and the Commission;
- Identify, where relevant, any refinements/improvements to the activities in order to bring them into line with the evolving pollution preparedness, detection and response environment;
- Identify, where appropriate and in line with Article 8 of Regulation 2038/2006, any potential recommendations or modifications to the budgetary/legal framework keeping in mind any evolutions in the pollution preparedness, detection and response field.

2. GENERAL FRAMEWORK

2.1. EMSA'S POLLUTION PREPAREDNESS AND RESPONSE TASKS

The European Maritime Safety Agency (EMSA) was established[1] to address a wide range of maritime issues with the overall purpose of ensuring a high, uniform and effective level of maritime safety, maritime security (limited role), prevention and detection of pollution and response to pollution by ships within the European Community.

In 2004, the Agency was given tasks[2] in the field of marine pollution preparedness and response. The initial framework for these activities was described in the 2004 Action Plan for Oil Pollution Preparedness and Response[3] (2004 Oil Action Plan). This Action Plan is updated annually as part of the annual Work Programme, given that both documents follow the same procedure and are approved by the EMSA Administrative Board. With the adoption of Directive 2005/35/EC on ship-source pollution[4], the task of detecting and monitoring spills was elaborated and incorporated into the Action Plan.

On the basis of a Commission proposal, the European Parliament and the Council adopted Regulation 2038/2006/EC which reserves a financial envelope for the implementation of these tasks for the duration of the 2007-2013 Financial Perspective. As part of the provisions of this multi-annual financing framework, the Commission, on the basis of information provided by the Agency, will submit a Mid-term Report to the European Parliament and the Council by 31st December 2010. Activities of the Agency are presented, and described in more detail, in three main categories, namely:

- Operational assistance;
- Co-operation and co-ordination;
- Information.

1 See Founding Regulation 1406/2002/EC, Article 1 (Objectives).

2 See Regulation 724/2004/EC, Article 1 amending the Founding Regulation.

3 EMSA Action Plan for Oil Pollution Preparedness and Response as adopted by the Agency's Administrative Board in October 2004. It can be downloaded from the EMSA website: www.emsa.europa.eu.

4 Directive 2005/35/EC of the European Parliament and of the Council of 7 September 2005 on ship-source pollution and on the introduction of penalties for infringements (OJ L 255, 30.09.2005, p. 11).

2.2. EMSA'S ACTION PLANS, WORK PROGRAMMES AND 5 YEAR STRATEGY

The 2004 Action Plan for Oil Pollution Preparedness and Response

To implement the tasks given, as introduced in the previous paragraph, the Agency developed a framework of actions as presented in the 2004 **Action Plan for Oil Pollution Preparedness and Response**. When developing this Action Plan, Member States' pollution response experts were consulted through a dedicated workshop in June 2004.

The Oil Action Plan was subsequently approved by the Agency's Administrative Board, comprised of representatives from the EU Member States, EFTA coastal States, the European Commission and the industry sectors most concerned, at its meeting in October 2004. As previously described the Oil Action Plan is updated as part of the Agency's annual Work Programmes and adopted by the Administrative Board.

The Oil Action Plan described the existing structures and activities in Europe for pollution response at Member State level and in the context of co-operation by means of the Regional Agreements. In addition, it outlined the marine pollution risk in European waters by identifying the main tanker routes and the growing density of seaborne traffic. It identified the "top-up" philosophy behind developing operational pollution response activities at an EU level, and highlighted the need for added value. It is worthwhile repeating the underlying principles[5]:

- EMSA should not undermine the prime responsibility of Member States for operational control of pollution incidents, nor should it replace existing capacities of coastal States. The Agency feels strongly that Member States have their own responsibilities regarding response to incidents;
- EMSA's operational tasks should be a "logical part" of the oil pollution response mechanism of coastal States requesting support and should "top-up" the efforts of coastal States by primarily focussing on spills beyond the national response capacity of individual Member States;
- EMSA's equipment should be channelled to requesting states through the existing Community mechanism in the field of civil protection;
- The requesting state will have the equipment at its disposal under its command and control;
- EMSA's operational role should be conducted in a cost-efficient way;
- EMSA's activities should respect and build upon existing co-operation frameworks and regional agreements. In addition, EMSA should strengthen existing arrangements and should create coherence within the European Union.

The pollution preparedness and response activities of the Agency are intended to cover large accidental spills. However, since the very beginning, the Agency was also tasked to provide **assistance in addressing illegal or deliberate discharges**:

"The Agency will also assist the Commission and the Member States in their activities to improve the identification and pursuit of ships making unlawful discharges[6]".

With the adoption of Directive 2005/35/EC on ship-source pollution[7] this task was further elaborated and technical assistance "such as tracing discharges by satellite monitoring and surveillance" was explicitly added.

The 2007 Action Plan for HNS Pollution Preparedness and Response

Initially the Agency concentrated its activities on tasks related to oil pollution. It was also recognised early on that further actions would be necessary to address marine pollution caused by hazardous and noxious substances (HNS). This issue had already been identified in the 2004 Oil Action Plan. Accordingly, and following the first HNS Workshop with experts from the Member States and the Commission in February 2006, the Agency developed the **Action Plan for HNS Pollution Preparedness and Response** (2007 HNS Action Plan), which was adopted by EMSA's Administrative Board in June 2007.

The 2007 HNS Action Plan provides:

- A concise overview of existing available information in the field of preparedness and response to HNS marine pollution, including information on: seaborne transportation of HNS, past HNS incidents, challenges and impacts of HNS marine pollution, existing HNS

5 *EMSA Action Plan for Oil Pollution Preparedness and Response, October 2004, p.55-56.*

6 *Regulation 1406/2002/EC, Article 2(f).*

7 *Directive 2005/35/EC of the European Parliament and of the Council of 7 September 2005 on ship-source pollution and on the introduction of penalties for infringements (OJ L 255, 30.09.2005, p. 11).*

pollution preparedness and response mechanisms, and options and limitations of response methods to such incidents;
- A framework document defining the Agency's role and activities in this field in order to make an "added value" contribution at European level and strengthen existing HNS preparedness and response capabilities.

The 5 Year Strategy

More recently, in March 2010, the Administrative Board adopted the EMSA 5 Year Strategy. It indicated that a review of the marine pollution preparedness, detection and response activities will be undertaken on the basis of a new risk assessment, updating that conducted for the 2004 Oil Action Plan, and based in part on the experience gained and insights acquired over recent years. The 5-Year Strategy indicates that, in order to be able to make an educated decision regarding the optimal size of the Network of Stand-by Oil Spill Response Vessels, the following information needed to be available:

a. *The costs of the system; in particular those of increasing or decreasing the density of EMSA contracted response vessels along the EU coastline;*
b. *The benefits of the system; in particular the performance that can be expected – in terms of tonnes of pollutant substance recovered at sea – of the present network of contracted response vessels in case of a large accidental spill?;*
c. *The chance of occurrence and what are the consequences of a large accidental spill in the various sea basins that form the EU coastline?*

As regards combating the effect of accidental spills of Hazardous and Noxious Substances, the Administrative Board, following the adoption of the 2007 HNS Action Plan, has already implemented the policy line that EMSA should continue to focus on developing a deeper knowledge of "what to do and what not to do" in case of marine chemical incidents. EMSA shall thus serve as a knowledge-tool providing technical assistance to Member States in case of a chemical emergency.

By setting up CleanSeaNet, the European satellite based oil detection and monitoring service, in 2007, the Agency met the requirements of Article 10.2.a) of Directive 2005/35/EC. The good performance of the service could be strengthened by increasing follow-up actions at national level with regard to enforcement. A number of polluters remain unchallenged.

The 5-Year Strategy includes the objective that EMSA should further support the strengthening of the illegal discharge enforcement chain. To that effect, the Agency could develop, in close collaboration with the enforcement community in the Member States, new actions in the areas identified by Article 10 of the Directive (for example, common practices and guidelines).

2.3. MULTI-ANNUAL FUNDING REGULATION AND FRAMEWORK

Already in the early days of implementing its legal task in the field of ship-sourced pollution and the execution of its 2004 Oil Action Plan for setting-up its operational assistance, the Agency was confronted with limitations of budget and budget structure. The "annuality" of the European Community/EMSA budget was difficult to reconcile with the need to conclude multi-annual contracts with industry. Such contracts are needed in particular for stand-by oil spill response vessel arrangements and for organising CleanSeaNet.

The European Commission recognised that the Agency should be able to enter into long-term financial commitments in order to offer adequate and sustainable operational support to the Commission and the Member States, using services provided by industry. Therefore, in 2005, the Commission proposed[8] the creation of a multi-annual financial framework for the pollution response activities of the Agency, reasoning that "the development and extension of anti-pollution activities will require long-term investments and adequate financial security".

On the basis of a Commission proposal, the European Parliament and the Council adopted Regulation 2038/2006/EC, which reserves a financial envelope for the implementation of these tasks for the duration of the current 2007-2013 Financial Perspectives. As part of the provisions of this multi-annual financing framework, the Commission is requested to present a Mid-term Report on EMSA's financial execution of its plan and the status of all funded actions, covering the years 2007-2009.

8 COM(2005) 210 final/2: Proposal for a Regulation of the European Parliament and of the Council on a multiannual funding for the action of the European Maritime Safety Agency in the field of response to pollution caused by ships and amending Regulation (EC) No 1406/2002.

In 2010 and in accordance with the Regulation on the Multi-annual Funding of the Agency's pollution preparedness and response activities, a Mid-term Report will be submitted to the European Parliament and the Council by 31st December 2010 by the Commission on the basis of information provided by the Agency. The Mid-term Report covers the period 2007-2009. The information contained herein constitutes EMSA's provision of information to the Commission as mentioned above.

2.4. OPRC 1990 AND THE ASSOCIATED HNS PROTOCOL 2000: TIERED RESPONSE

For many countries, the international legal framework for marine pollution preparedness and response begins with the International Convention on Oil Pollution Preparedness, Response and Co-Operation, 1990 (OPRC 1990). To date, the Convention has been ratified by more than 100 countries through the International Maritime Organization (IMO). The IMO is the specialised agency of the United Nations with responsibility for safety and security at sea and the prevention of marine pollution from ships.

In the field of marine pollution response, the "tiered response" approach founded on co-operation / mutual support was outlined in OPRC 1990. A similar approach is adopted in the associated OPRC-HNS Protocol 2000 regarding so called chemical spills. The OPRC Convention was initially established (following the Exxon Valdez incident in 1989) and entered into force on 13th May 1995. The HNS Protocol entered into force on 14th June 2007.

The chart below illustrates a timeline of ratifications of the OPRC Convention and HNS Protocol by European coastal States with reference to major incidents. It is clear that the Erika and Prestige incidents accelerated the ratification of both legal instruments.

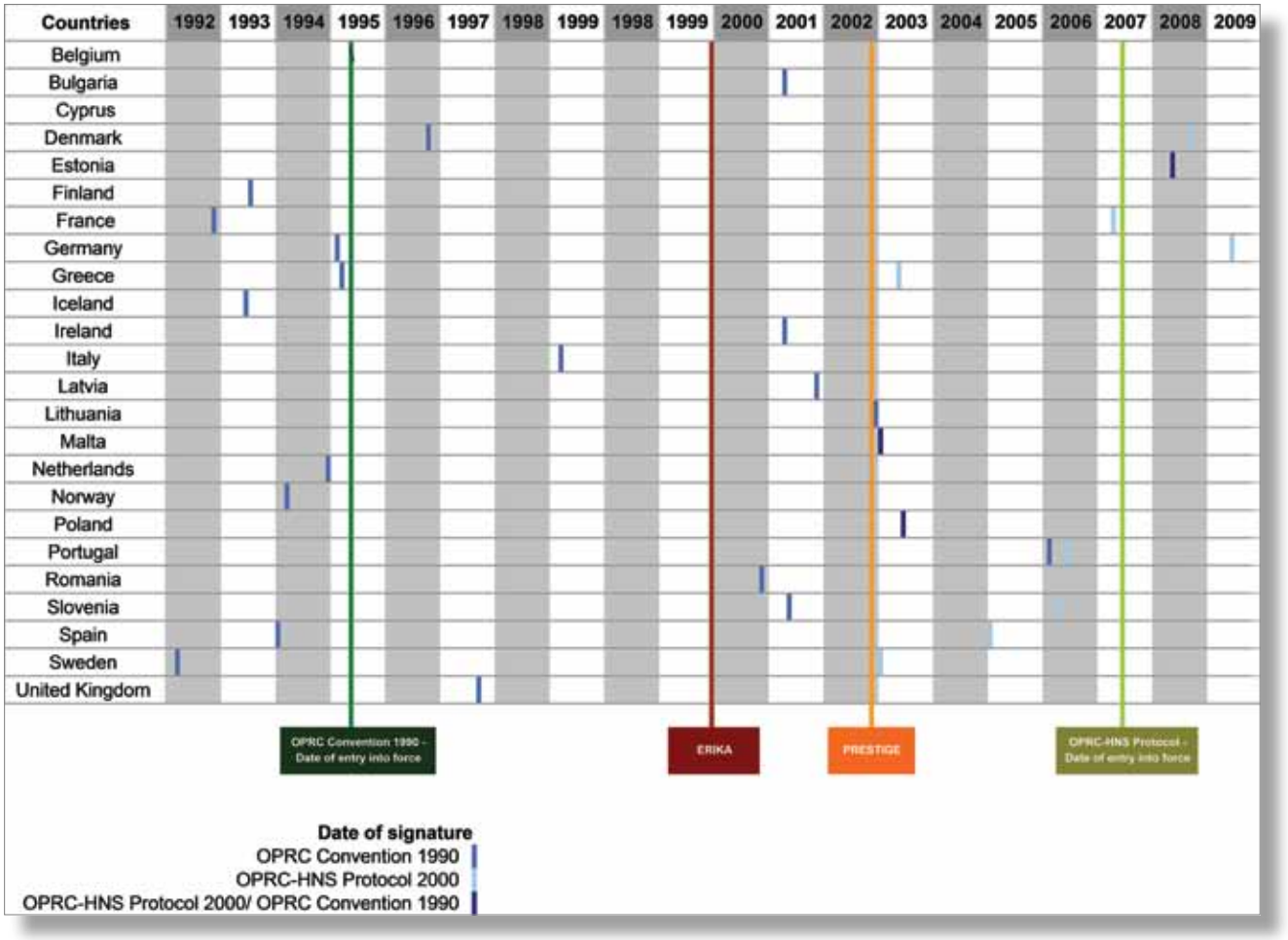


Figure 2.1 – Overview of OPRC 1990 and HNS Protocol 2000 Ratification by Coastal States

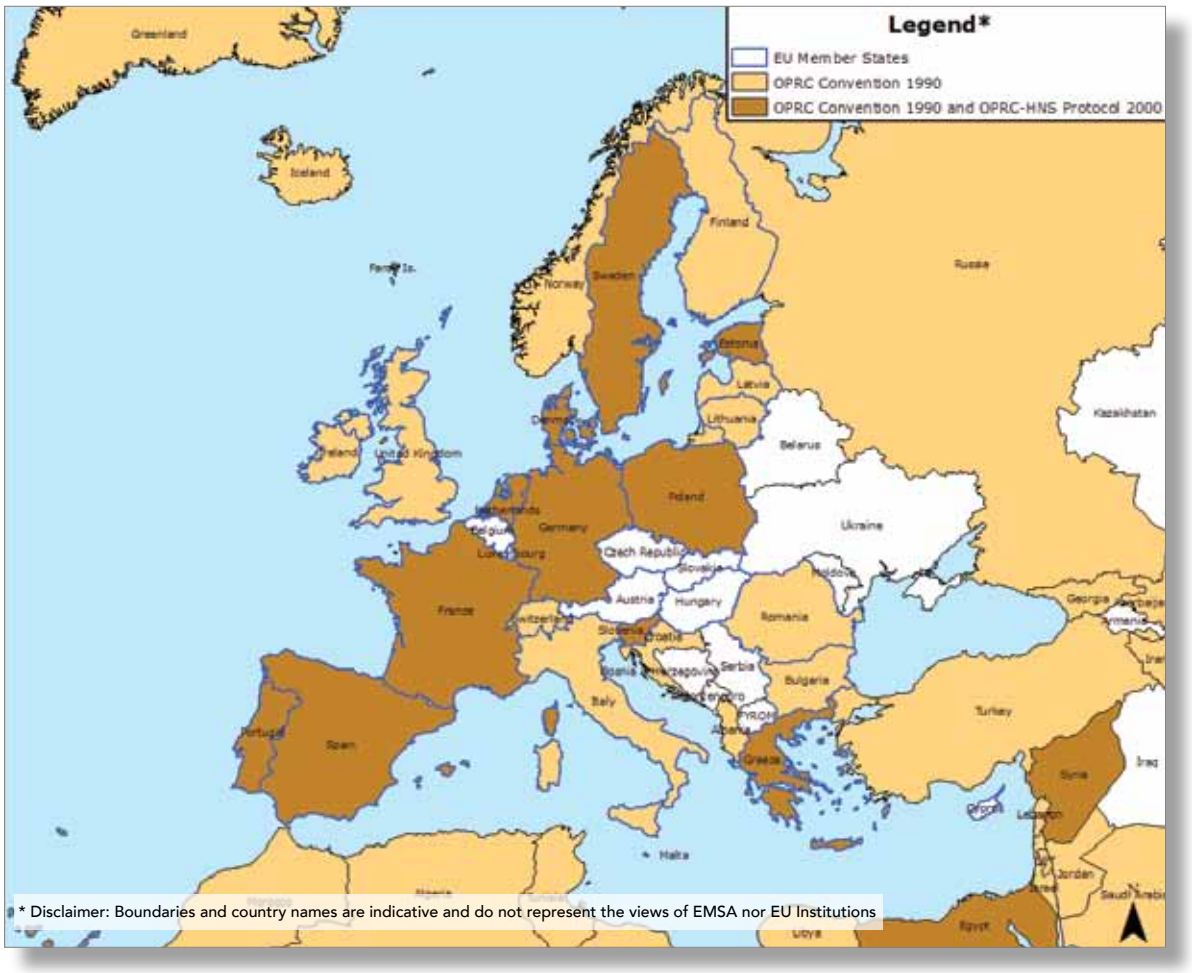


Figure 2.2 - OPRC 1990 and OPRC-HNS Protocol 2000: Ratification across Europe: September 2010**
(** Malta has ratified both OPRC 1990 and the HNS Protocol 2000)

The map above indicates the status of ratification of OPRC 1990 and the OPRC-HNS Protocol 2000 across Europe. For reference, by the end of 2009, most countries had ratified OPRC 1990 and 12 had ratified both legal instruments.

Both legal instruments provide a framework for the development of national and regional capacity to respond to incidents involving oil and/or HNS. It should be highlighted that such requirements do not exist in EU legislation. Parties to the conventions are required, amongst other elements, to establish measures for dealing with pollution incidents, either nationally or in co-operation with other countries.

The OPRC convention calls for the establishment of stockpiles of oil spill combating equipment, the holding of oil spill combating exercises and the development of detailed plans for dealing with pollution incidents.

More specifically, Article 6 of the OPRC 1990 Convention relates to national and regional systems for preparedness and response. It details that parties to OPRC 1990 will establish a national system for responding promptly and effectively to oil pollution incidents including the designation of a competent national authority and the establishment of a national contingency plan.

This Article also indicates that countries will, within their capabilities, establish a minimum level of pre-positioned oil spill combating equipment commensurate with the risk involved. Unfortunately, OPRC 1990 does not define a minimum standard nor does it indicate an appropriate methodology to be used in determining equipment levels on a case by case basis. The Convention provides a great deal of flexibility regarding its implementation by Contracting Parties. It does not provide any mechanisms to verify that it has been implemented appropriately.

As described later in the Report, these are key points that need to be considered when defining the activities of the Agency in providing additional means of support to Member States affected by an oil spill.

Both the OPRC Convention and the OPRC HNS Protocol facilitate international co-operation and mutual support. Parties to either are required to provide assistance to others in the event of a pollution emergency and provision is made for the reimbursement of any assistance provided. One modality for such co-operation frameworks are the Regional Agreements e.g. the Bonn Agreement. There are also a number of sub-regional agreements on a bilateral (or multilateral) basis. Some of these Regional Agreements were established a long time ago, predating the OPRC 1990. Some countries, due to their geographical location, have become Contracting Parties to two or more of Regional Agreements.

The map below shows individual countries cross referenced with the most relevant European Regional Agreements[9,10]. Countries that are part of the European Neighbourhood Policy (ENP) are also indicated.

Such co-operation between countries is reflected through the tiered response approach whereby resources/means are utilised in proportion to the scale of an incident.

From a contingency planning perspective, there are three tiers reflecting the scale of incident. Based on these the corresponding quantity of resources needed to mount an appropriate response are identified. By way of an example, a small spill in a location lacking sensitive economic or environmental resources and amenable to clean-up operations would be classed as a Tier 1 incident. In the same vein a significant incident threatening large scale damage would fall into the Tier 3 category.

9 The Lisbon Convention has not entered into force yet.

10 The European Union is not (yet) a Contracting Party to the Bucharest Convention.

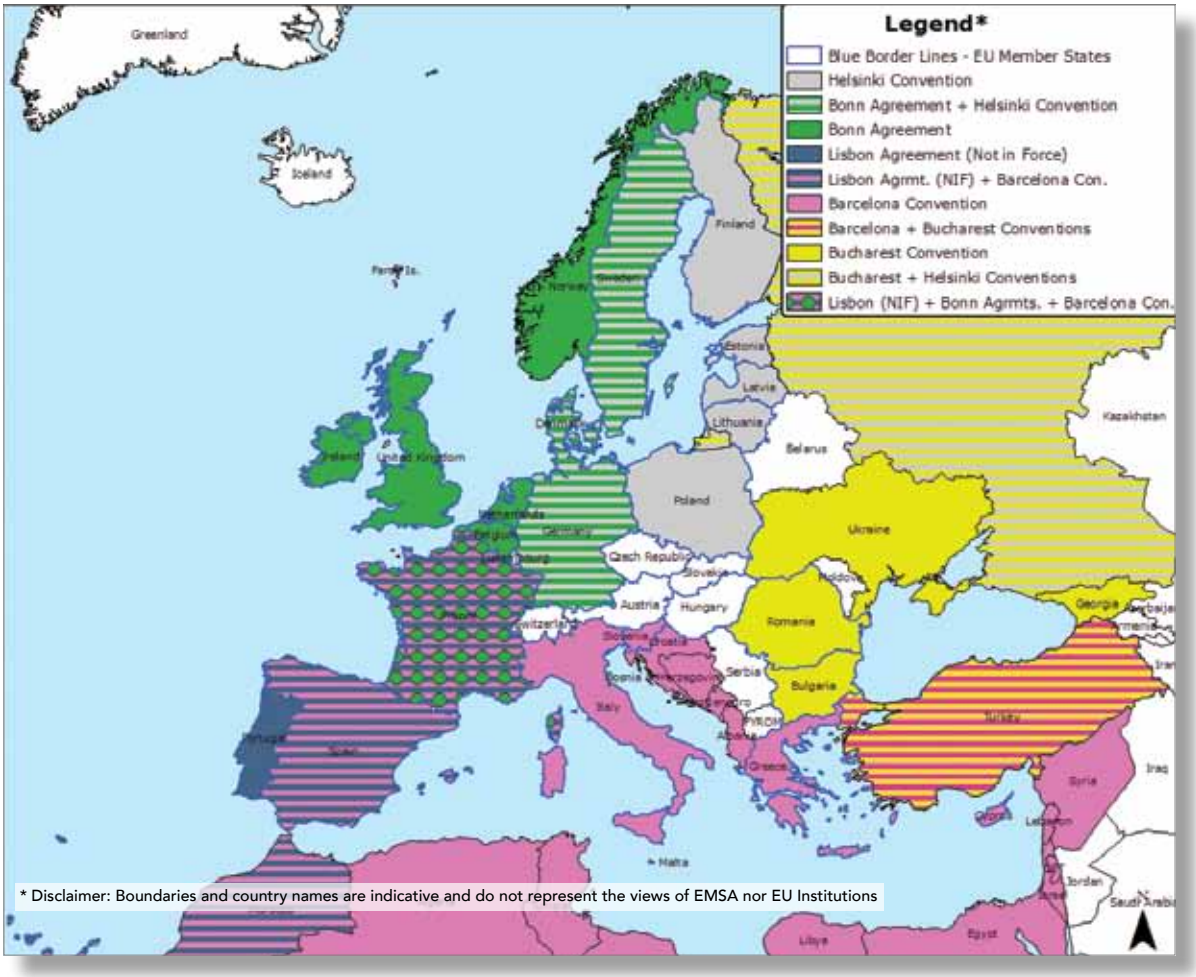


Figure 2.3 - Overview of the Regional Agreements: 2009**

(** Malta is a Contracting Party to the Barcelona Convention)

Tier 1 incidents require a rapid "on the spot" reaction, e.g. using dispersants or at-sea oil recovery, to mitigate the potential socio-economic and environmental damage. Taking into account the need to react quickly and the relatively small scale of Tier 1 incidents, it is clear that the affected Member State should provide the operational response. Reacting to larger scaled Tier 2 & 3 incidents reasonably entails the mobilisation of and coordination of other resources, by the affected Member State, from further afield.

2.5. THE FATE AND BEHAVIOUR OF OIL IN THE MARINE ENVIRONMENT

Crude oils vary widely in their physical and chemical properties, whereas many refined products such as gasoline and diesel tend to have well-defined properties. Residual products such as intermediate and heavy fuel oils, which contain varying proportions of non-refined components, blended with lighter refined components, also vary considerably in their properties.

When oil is spilt in the marine environment a number of physical and chemical effects can be noted. Commonly known as "weathering" of the oil, one of the key issues to consider is that the more volatile compounds will evaporate during the initial phase of the incident. These volatile components are often also the more toxic compounds present in an oil (for example, aromatic compounds like benzene) and they may be present in substantial quantities in refined products like kerosene and gasoline. Heavier oils and products (for example, heavy fuel oils used by ships) have little volatile components, undergo little evaporation and are likely to persist for extended periods in the environment.

In parallel, the oil slick will have a tendency to spread as well as emulsify. Due to the mixing effect of the sea, water becomes suspended in the oil increasing dramatically the volume of pollutant by a factor of three and four. The emulsion is often referred to as "chocolate mousse" of account of its appearance. As a very viscous substance, it is more persistent in the marine environment than oil which has not emulsified. It also poses threats with respect to economic and environmental resources and can be difficult to clean-up, both at-sea and on the shoreline. The diagram below illustrates the fate and behaviour oil in the marine environment.

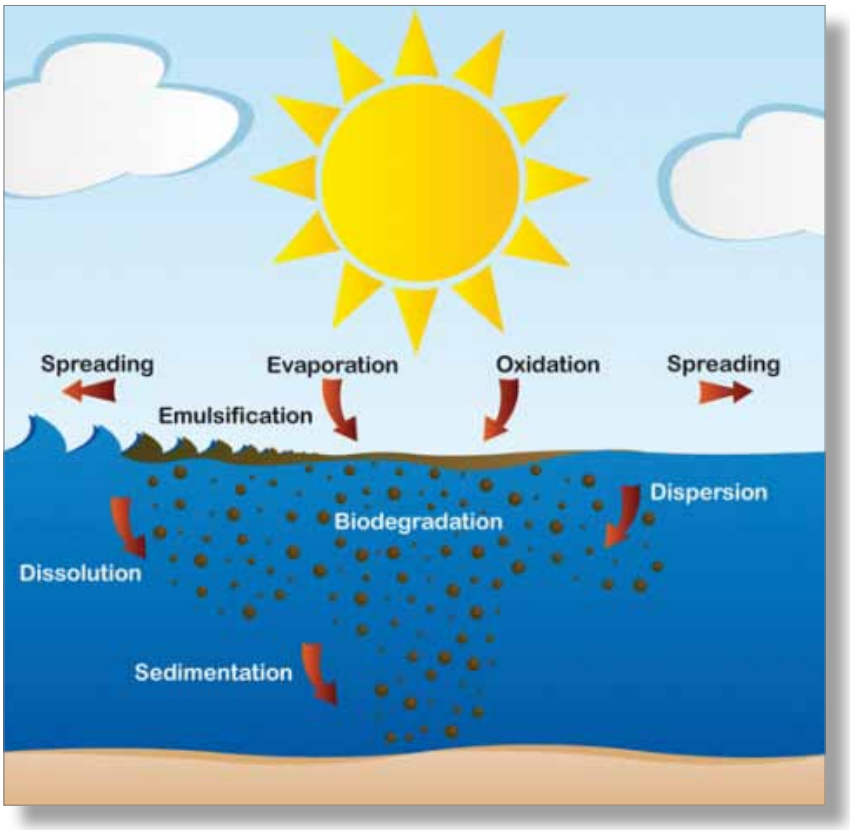


Figure 2.4 - Fate of Oil Spilled at Sea showing the Main Weathering Processes (Source ITOPF)

The fate and behaviour of oil spilt in the marine environment, and the associated operational implications, have to be considered by Member States when determining their response approach, as reflected in their national contingency plans. The Agency has also taken into account these, and other issues, when designing the framework for the provision of additional response means in support of Member States.

Keeping in mind the concepts of tiered response, the sharing of responsibilities between Member States and the support to be provided by the Agency as well as the legal framework of its task, it is logical that EMSA:

- Should provide a "European" tier of response resources available as a "reserve for disasters". The Agency should assist Member States responding to an incident beyond national capabilities;
- The Agency's operational support should be a logical part of the oil pollution response mechanisms of Member States and should primarily "top-up" the resources of Member States when responding to incidents. Resources should be a "second line" of response; Member States should provide the "first line defence" of their own coastlines.

EMSA resources should:

- Be under the operational command of the affected Member State;
- Take into account "state of the art" at-sea oil recovery technology;
- Be provided in a cost efficient manner relative to the task.

2.6. 2004 OIL ACTION PLAN: EVALUATION AND ASSUMPTIONS

In the 2004 Oil Action Plan, a number of factors were considered when assessing the risk of accidental oil spills and the potential impacts that might arise. Key to that review were: the location of major historical spills; the stationing of Member State response vessels; and tanker trading patterns around Europe. The following maps show the status of these factors at the time the Action Plan was written.

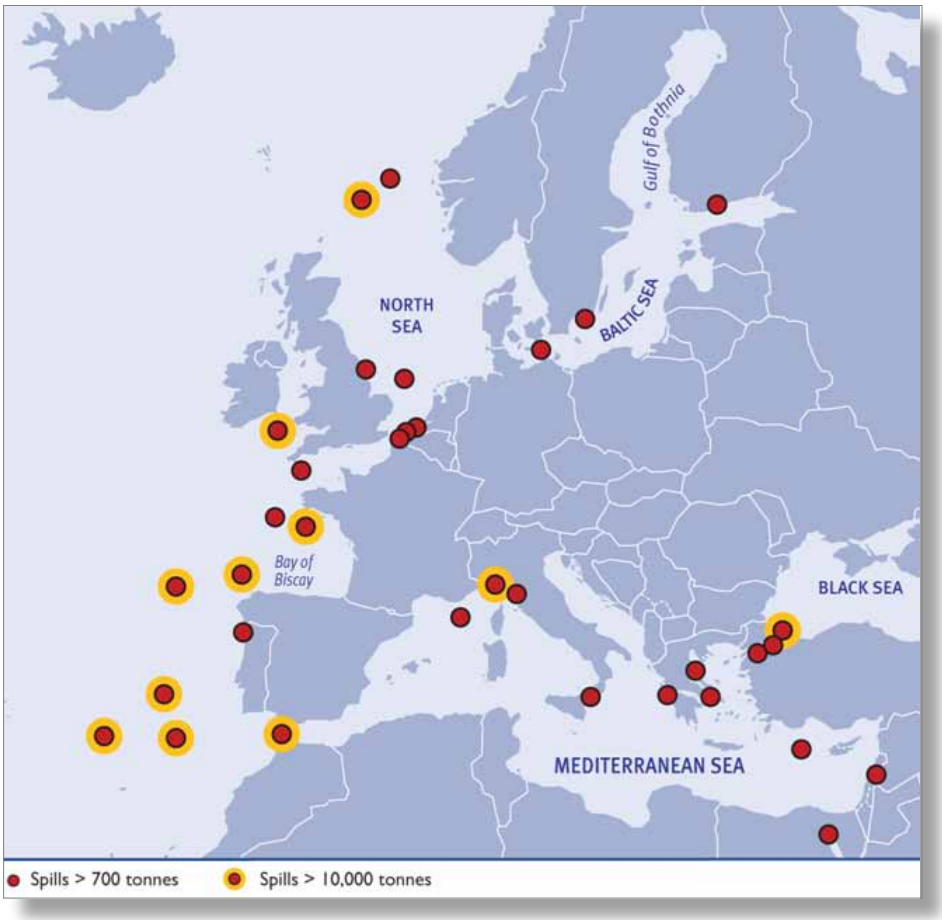


Figure 2.5 - 2004 Oil Action Plan: Large Tanker Spills 1984 – 2004 (Source ITOPF)

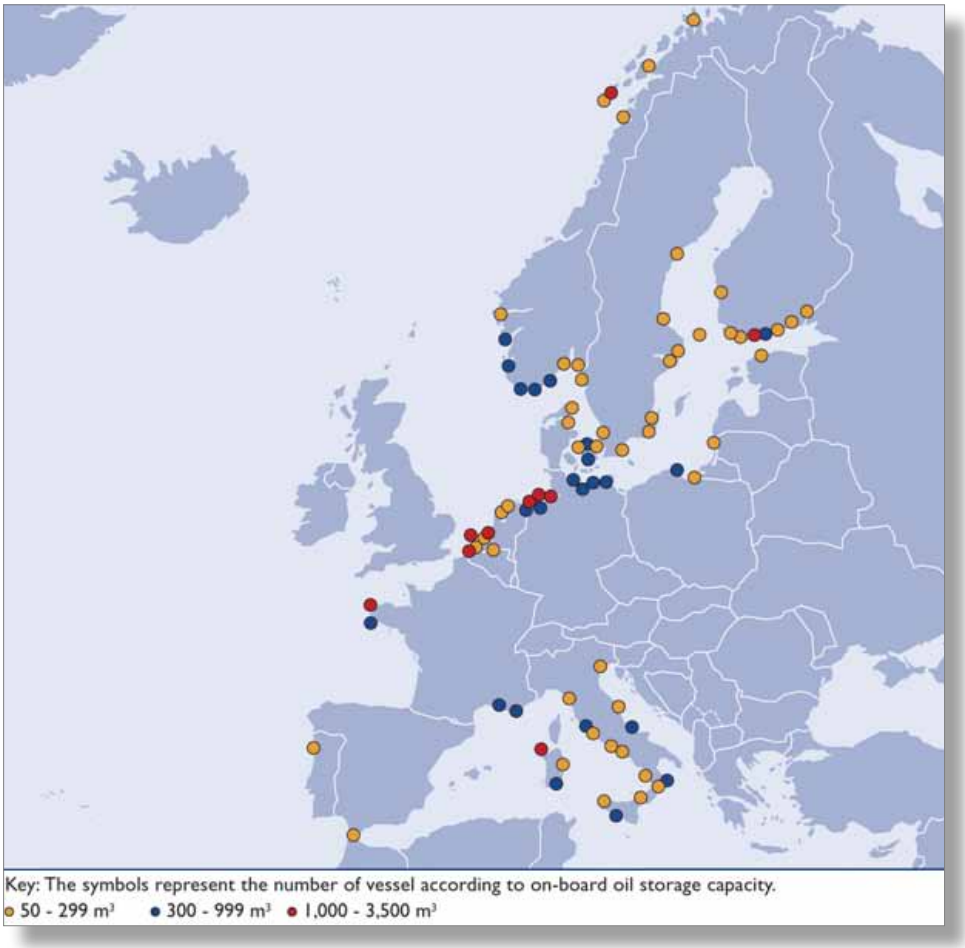


Figure 2.6 - 2004 Oil Action Plan: Indicative Distribution of At-Sea Response Vessels in Member States: 2004

The map (figure 2.5) on the previous page indicates that historically there has been a high concentration of major incidents in the Atlantic sea area. The North Sea and Eastern Mediterranean have had a number of large spills. The Baltic Sea has seen infrequent large spills. Based on the 2004 Inventory of Member States Oil Pollution Response Capacity, as compiled in cooperation with the individual countries, the map above (figure 2.6) indicates that the main concentrations of national spill response vessels, categorised by recovered oil storage capacity, are in the North and Baltic Seas. It should be noted that a number of small response vessels with low recovered oil storage capacity are not shown.

Regarding tanker routes, the map on next page (figure 2.7) shows the relative differences in tanker trading patterns across Europe at the time, revealing vessel traffic concentrations along the North Sea and Atlantic European coastline. The southern Mediterranean, from Suez to Europa point, was also a significant route. Within the framework of the 2004 Oil Action Plan, this information helped determine the prioritisation of Agency activities.

The designation through the International Maritime Organisation (IMO), from an environmental perspective, of certain areas as Particularly Sensitive Sea Areas (PSSAs), was also taken into account in the 2004 Oil Action Plan. These are internationally agreed European scale designations.

In their national contingency plans for marine pollution incidents, Member States normally have a more developed approach reflecting national importance of different aspects of their coastlines. These are usually presented in coastline sensitivity maps. Such detailed prioritisation of a Member State's coastline is the clear responsibility of the country concerned and is beyond the mandate of the Agency.

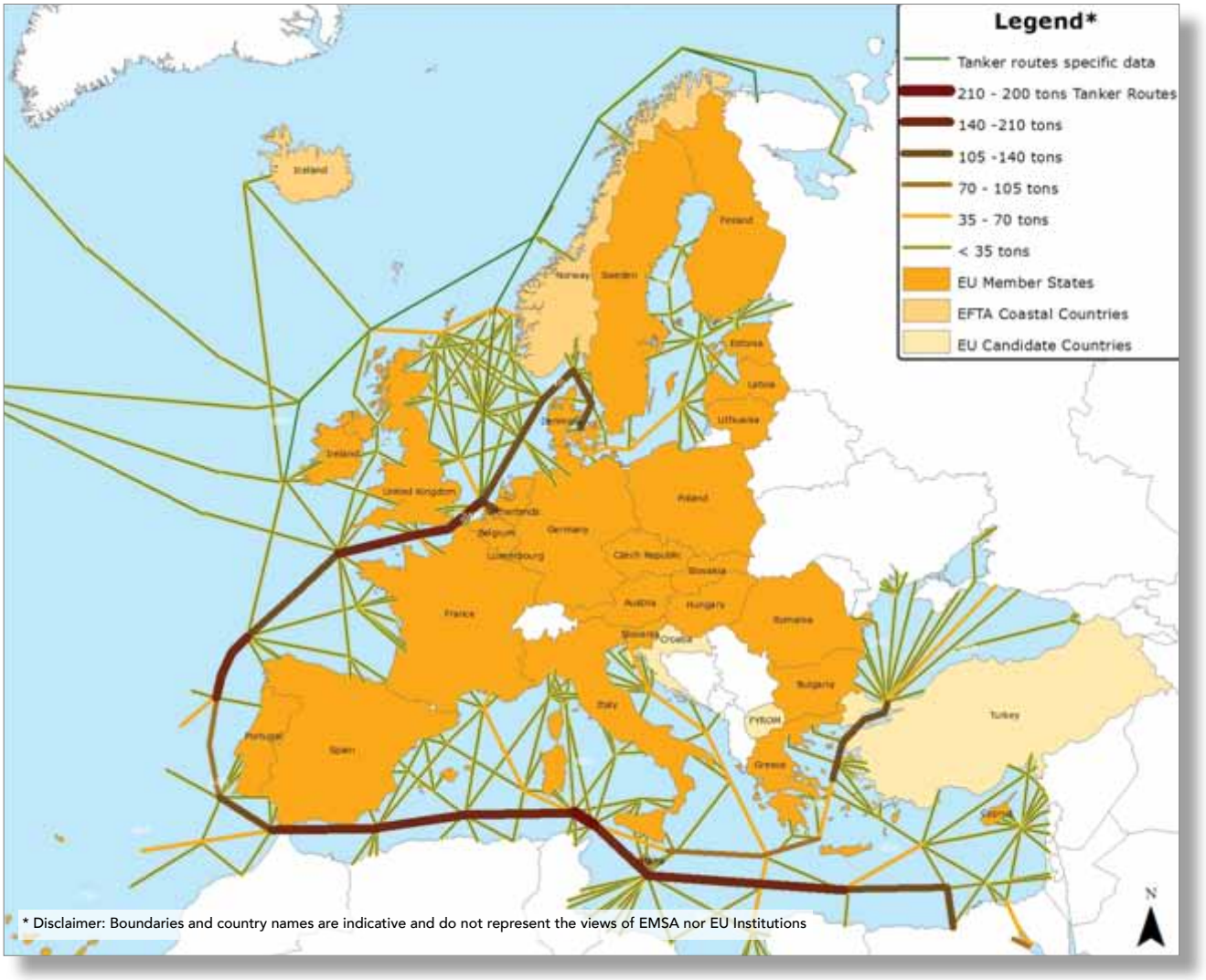


Figure 2.7 - 2004 Oil Action Plan: Indicative Tanker Trading Patterns (Source ITOPF)

2.7. SUMMARY OF GENERAL FRAMEWORK

Based on the EMSA Regulation as amended in 2004, the associated 2004 Oil and 2007 HNS Action Plans as well as the elaborated legal basis for oil spill detection and monitoring, the Agency has implemented a wide range of activities in recent years.

When initially determining these activities the general principles of marine pollution preparedness and response have been taken into account. These stem from OPRC 1990, as ratified by the majority of Member States, and HNS Protocol 2000 and include the concept of "tiered response". Both legal instruments provide general concepts for response capacity at national and/or regional levels. It was also identified that such requirements, detailed or otherwise, do not exist in EU legislation. The role of Regional Agreements was also kept in mind. Other key considerations included the technical issues such as the fate and behaviour - the "weathering" - of oils spilled at sea, the historical frequency of large spills, Member States' at-sea response capacity and the trading patterns of tankers across Europe.

Accordingly, and reflecting on the concepts of tiered response, the sharing of responsibilities between Member States and the support to be provided by the Agency as well as the legal framework of its task, it is clear that EMSA:

- Should provide a "European" tier of response resources available as a "reserve for disasters". The Agency should assist Member States responding to an incident beyond national capabilities;

- The Agency's operational support should be a logical part of the oil pollution response mechanisms of Member States and should primarily "top-up" the resources of Member States when responding to incidents. Resources should be a "second line" of response; Member States should provide the "first line defence" of their own coastlines.

Additionally, EMSA resources should:

- Be under the operational command of the affected Member State;
- Take into account "state of the art" at-sea oil recovery technology;
- Be provided in a cost efficient manner relative to the task.

Consequently, three main categories of activity have been undertaken, namely: Operational assistance, Co-operation & Co-ordination and Information. As regards the Multi-annual Funding Regulation, and required the Mid-term Report, the next chapter describes in more detail the activities undertaken during the period 2007-2009.

3. POLLUTION PREPAREDNESS AND RESPONSE ACTIVITIES: 2007-2009

3.1. OPERATIONAL ASSISTANCE

Under the umbrella of operational assistance to coastal States with regard to marine pollution preparedness and response activities, EMSA provided the following services in this field:

- The Network of stand-by oil spill response vessels distributed along the European coastline;
- CleanSeaNet: the satellite based oil spill monitoring and detection service covering European waters;
- Experts and expertise in support of EU Member States, coastal EFTA States and the European Commission;
- The MAR-ICE Network providing information in cases of marine chemical spills.

3.1.1. Network of Stand-by Oil Spill Response Vessels

As indicated earlier a key task for the Agency has been to make available an at-sea oil recovery service to support Member States during a large oil spill. Consequently, the Network of Stand-by Oil Spill Response Vessels has been built up and maintained through annual procurement procedures starting in 2005. The service supplements the resources and arrangements that have already been set up at national and regional levels. EMSA resources can be seen as a "European tier" to provide assistance to coastal States on the basis that the Agency resources are:

- A "reserve for disasters" to assist Member States responding to an incident beyond national capabilities;
- Under the operational command of the affected Member State;
- Provided in a cost efficient manner;
- Utilise "state of the art" at-sea oil recovery technology;
- Tailored to spills of heavy grades of oil.

Given the general framework for EMSA to support the Member States during large scale incidents and the important consideration of cost efficiency, the Agency has applied a public-private partnership approach in co-operation with the shipping and spill response industries. Such an innovative approach had never before been undertaken at the European level.

Bearing in mind the aspect of cost-efficiency and the "top-up" mandate of the Agency, it is very important to note that EMSA has not bought nor built dedicated (first line) oil spill response vessels. The Agency has sought to balance its operational role with that of Member States and cost efficiency. Chapter 4 provides a more detailed analysis of the Network's cost efficiency.

The main concept is to ensure - at short notice – the availability of commercial vessels to carry out at-sea oil recovery services following a request for assistance from a Member State. Such vessels are adapted for operational aspects of response operations, so called "pre-fitted", and certified for oil recovery operations by an appropriate Classification Society (Recognised Organisation in accordance with Directive 94/57/EC as amended). Following an oil spill, and the associated request for assistance from an affected coastal State, the vessel ceases its normal commercial activities and is transformed rapidly into a fully operational spill response vessel. The vessel is then placed under the operational command of the coastal State requesting assistance.

For this purpose, the Agency has developed a two contract system as described below.

- **A "Vessel Availability Contract"**:
  This contract is concluded between the Agency and the ship operator and it ensures the availability of the vessels at any time. In particular, under this Contract, the ship operator is obliged to respond positively to a request for assistance transmitted by EMSA. Failure to do so would result in financial penalties.

  In addition, it addresses technical modifications made to the vessels with respect to pumping, heating and any oil recovery equipment as well as organising drills and participating in exercises.

- **An "Incident Response Contract":**
  This contract is to be concluded between the ship operator and the affected State. This pre-established model contract addresses the actual oil recovery operations. It covers the terms and conditions of the service and includes the associated daily hire rates.

  It should be highlighted that, following a request for assistance, EMSA will activate or even pre-mobilise the vessel to facilitate the operation. The command and control during an incident rests with the coastal State using the vessel.

Given the number of complex issues that needed to be addressed from the operational, technical and financial framework perspectives, making available, in a short period of time and with relatively limited resources, a high specification operational service has been a major challenge for the Agency.

Within the framework of the rules governing the Agency's procurement procedures, each tender process launched to establish these contracts was in reality a yearlong project involving staff from across the Agency. As projects, the process starts with the adoption of the Annual Work Programme towards the end of the year. The awarded contracts are usually signed in the weeks approaching the following year's November Administrative Board meeting.

Typical steps in between include publication of Prior Information Notices and Information Meetings to raise the profile and explain the framework of the contracts to potentially interested parties. Such events have proved worthwhile, particularly as regards the general shipping community, which is not necessarily familiar with the task but nonetheless able to provide an appropriate service.

Subsequent steps include launching "calls for applications", a preliminary filter of the application, launching "invitations to tender", clarification meetings with the shortlisted candidates, reviewing offers, improving the technical and financial aspects of these offers through negotiation and visiting of ships that could potentially be contracted. The last stages involve the formal evaluation of the offers and the awarding of contracts.

It is important to note that the procurement approach used, a "Negotiated Procedure following Publication of a Contract Notice in the Official Journal of the European Union", is open to any interested party and, as experience has shown, delivers the best technical and financial results for the Agency.

With regard to the Agency contracted vessels, they are all, as a minimum, certified by an appropriate Classification Society[11] as (occasional) oil recovery vessels. This means that they are "second line" vessels capable of operating with materials that have a flashpoint above 60°C. This fits the objective of "topping-up" Member State resources in the event of a large scale incident.

A few Member States have a similar approach. At the operational level, such countries have one or more "first line" vessels available to respond to an incident at (very) short notice. Additional "second line" resources can be mobilised if required and arrive onsite after a certain delay. This is compatible with the fate and behaviour of oil in the marine environment. It should be noted that some of the EMSA contracted vessels can operate with materials that have a flashpoint below 60°C. This is a result of the Agency maximising its tendering activities to enhance the operational strengths of the Network.

Vessel arrangements have the following main common characteristics:

- Each vessel will operate as a certified oil recovery vessel on the basis of a pre-agreed incident response contract with fixed fees and conditions as developed by the Agency, in consultation with the Member States, for this purpose;
- The contractor is contractually obliged to respond positively to all requests, as channelled to EMSA through the Monitoring and Information Centre (MIC), from Member States or Candidate Countries wherever in Europe the assistance is needed by the requesting party;
- They will be able to provide the service on a 24 hour per day basis;
- The primary oil recovery system is based around the "sweeping arm" concept with an alternative "ocean going boom and skimmer" system also available. The requesting coastal State can select which system to use in accordance with the incident characteristics;
- All the specialised oil spill response and associated equipment is containerised in order to facilitate rapid installation on board the vessels;
- Each vessel has a speed over 12 knots for prompt arrival on site;
- Each vessel is equipped with an on board radar based oil slick detection system;
- Each vessel has a high degree of manoeuvrability required to carry out oil recovery operations;
- Each vessel is able to decant excess water so maximising the utilisation of the on board storage capacity;
- Each vessel has the ability to heat the recovered cargo and utilise high capacity screw pumps in order to facilitate the discharging of heavy viscous oil;
- The crew have been trained regarding the appropriate use of the specialised equipment and carrying out operations under an international command and control structure;
- Each vessel is available for participation in at-sea spill response exercises (minimum one per year).

More technical and operational specifications of the contracted services are available from the Agency website: http://www.emsa.europa.eu.

3.1.1.1. Building up the Network of Stand-by Oil Spill Response Vessels

The Network of EMSA contracted Stand-by Oil Spill Response Vessels began in 2005 with 3 contracts covering 7 vessels, of which 4 could be mobilised simultaneously. During the period of the Multi-annual Financing, additional "arrangements" have been contracted bringing the active total to 13 by the end of 2009. The table on next page illustrates the number of contacts awarded per year with some general information regarding the types of ships involved.

EMSA currently maintains contracts for 13 fully equipped oil recovery vessels, which are available, upon request, to assist coastal States in oil spill operations. Two additional contracted vessels are currently in the preparatory phase and are expected to be operational by mid-2010. The average storage capacity for recovered oil of the EMSA contracted vessels is around 3,000 m^3, which is significantly higher than typical response vessels operated by national authorities. This fits with the objective of providing a "European" Tier of resources available as a "reserve for disasters".

The current network (end of 2009) provides at-sea oil recovery services from vessels based in all the regional seas of Europe. The vessels are at the disposal of all Member States regardless of their actual area of operation. The next map (Figure 3.1) shows the distribution of vessels and stockpiles around Europe.

11 *Recognised Organisation in accordance with Directive 2009/15/EC.*

TABLE 3.1 - NUMBER OF CONTRACTS AWARDED PER YEAR

Year	Area	No. of Contracts Awarded	Contract Phase at the end of 2009	Company Awarded	Vessel Type	Vessel Name	Recover Oil Storage Capacity (m^3)
2005	Baltic Sea	1	Operational	Lamor AB	Tanker	OW Aalborg & OW Copenhagen	2 x 4360
	Western Channel/ Atlantic	1	Expired	LDA	Cable Layer	Ile de Brehat	4000
	East Med	1	Operational	Tankship	Tanker	Mistra Bay	1805
2006	Atlantic	1	Operational	Lamor AB	Tanker	Galp Marine	3023
	East Med	1	Operational	Falzon	Tanker	Santa Maria	2421
2007	Atlantic	1	Operational	James Fisher	Tanker	Forth Fisher, Galway Fisher & Mersey Fisher N.B. Maximum 2 of 3 tankers can be mobilised simultaneously	2 x 4754
	West Med	2	Operational	Mureloil & Tankship	Tanker	Bahia Tres & Salina Bay	3800 & 2421
	Aegean / Black Sea	1	Operational	EPE	Tanker	Aktea OSRV	3000
2008	Black Sea	1	Operational	GSP	Supply Ship	GSP Orion	1334
	North Sea	1	Operational	DC Industrial	Dredger	DC Vlaanderen 3000 & Interballast III	2744 & 1886
	Atlantic	1	Operational	Remolcanosa	Supply Ship	Ria de Vigo	1522
2009	Baltic North	1	Preparatory	Arctica Icebreaking (Ex-Finstaship)	Ice Breaker	Kontio	2033
	Atlantic / Channel	1	Preparatory	Aegean Bunkers At Sea	Tanker	Sara	6658
SUMMARY		14 contracts have been awarded since 2005	1 contract has expired 11 contracts are in the Operational Phase 2 contracts are in the Preparatory Phase			14 vessels can be mobilised simultaneously	42,184 m^3 of Storage Capacity can be mobilised simultaneously
						2 additional vessels will be available following completion of Preparatory Phase	Additional 8,691 m^3 of Storage Capacity will be available

Regarding actual mobilisation of one or more of the vessels, it should be highlighted that coastal States have been informed in advance of any incident of the terms and conditions (including information on daily hire rates for the vessels) of utilising vessels from the Network. As mentioned earlier, the model incident response contract was developed by the Agency in consultation with the Member States.

Such information is distributed once a vessel enters into the stand-by phase of the contract and is available to respond to an incident. The vessels should be ready to sail fully equipped to the spill site within 24 hours from the time of mobilisation. The mobilisation procedure is formally triggered by the signing of an Incident Response Contract by the coastal State requesting assistance.

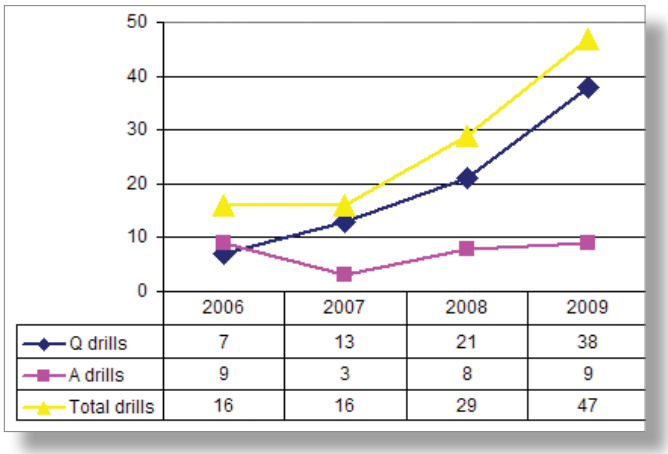
Figure 3.1 - The EMSA Network of Stand-by Oil Spill Response Vessels in 2009**

(** As of 17 June 2010, Iceland is an EU Candidate Country in addition to being an EFTA Contracting Party)

More technical and operational specifications of the contracted services are available from the Agency website: http://www.emsa.europa.eu.

3.1.1.2. Maintaining the Network: Drills and Exercises

In order to maintain the appropriate level of service during the Stand-by Period of the contracts, the companies and vessels concerned carry out a range of different types of activities. The primary tools are the vessel/crew drills, which take place on a quarterly basis. Each drill verifies that the basic capability of the vessel, specialised equipment and crew is at an appropriate level in accordance with criteria developed by the Agency. The number of drills has increased from 16 in 2007 to 47 drills (including 5 Acceptance Drills) in 2009 in line with increase in vessels under contract. These



	2006	2007	2008	2009
Q drills	7	13	21	38
A drills	9	3	8	9
Total drills	16	16	29	47

Figure 3.2 - Number of Acceptance Drills (A Drills) and Quarterly Drills (Q Drills) per Year

drills are observed by EMSA staff in order to ensure that the contracted service is being provided. By the end of 2009, a "Drill and Exercise Attendance Policy" had been established in order to best use Agency resources in the management of the Network and associated contracts. To date, 2 Acceptance Drills have had to be repeated, whilst all quarterly drills have been undertaken satisfactorily.

In addition, a range of notification, desktop and at-sea operational exercises were conducted. These types of exercise are, aside from being a useful method of maintaining pollution response skills, an important tool for identifying potential areas that could be improved. International exercises in particular greatly assist the integration of EMSA's resources with the response mechanisms of Member States, improving the necessary coordination and cooperation of the "EMSA" vessels with the Member State response units. The international exercises carried out for the period 2007-09 are summarised in the table below.

The map (Figure 3.3) on next page shows the geographical distribution of EMSA participation in international exercises for the period 2007-2009. A general remark would be that the Agency has been able to be involved across Europe with the notable exception of the North Sea area, where EMSA contracted vessels only became operational towards the end of 2009.

TABLE 3.2 - INTERNATIONAL EXERCISES PERFORMED FOR THE PERIOD 2007-2009

Exercise and Location	Month / Year	Participating Countries	N° of Vessels	EMSA Vessel and Contractor
Malta/EMSA, Malta	May 2007	Malta	6	Mistra Bay, Tankship Management
Gascogne, France	June 2007	France and Spain	8	Ile de Brehat, Louis Dreyfuss armateurs
Balex Delta, Estonia	Sept 2007	8 HELCOM Countries	21	Otilia and Tinka, Lamor
Ramogepol, Italy	Sept 2007	Italy	14	Santa Maria, Falzon Service Station
Greece/EMSA, Greece	Nov 2007	Greece	9	Santa Maria, Falzon Service Station
Blue Waters, Portugal	Nov 2007	Portugal	3	Galp Marine, Lamor
Mediterraneo, Spain	June 2008	France, Italy and Spain	13	Santa Maria, Falzon Service Station
Polmar Manche, France	June 2008	France	5	Ile de Brehat, Louis Dreyfuss Armateurs
Balex Delta, Russia	Aug 2008	8 HELCOM Countries	14	Otilia, Lamor
Dargue, Portugal	Sept 2008	Portugal	6	Galp Marine, Lamor
Malta, Malta	Oct 2008	Malta	10	Mistra Bay, Tankship Management Santa Maria, Falzon Service Station Aktea OSRV, Environmental Protection Engineering
Austral, Portugal	Nov 2008	Portugal	4	Galp Marine, Lamor
Euronyme, France	May 2009	Italy, France and Spain	17	Salina Bay, Tankship Management Bahia Tres, Mureoil
Mero, Madeira	June 2009	Portugal	5	Galp Marine, Lamor
Polmar, France	June 2009	France and Spain	4	Ria de Vigo, Remolcadores Nossa Terra Mersey Fisher, James Fischer Everard
Balex Delta, Latvia	Aug 2009	8 HELCOM Countries	11	OW Copenhagen, Lamor
Rodelta, Romania	Aug 2009	Black Sea Commission Countries	10	GSP Orion, Grup Servici Petroliere Aktea OSRV, Environmental Protection Engineering
Espadarte, Portugal	Oct 2009	Portugal	5	Galp Marine, Lamor
Maltex 2009	Nov 2009	Malta	10	Mistra Bay, Tankship Management Santa Maria, Falzon Service Station Aktea OSRV, Environmental Protection Engineering

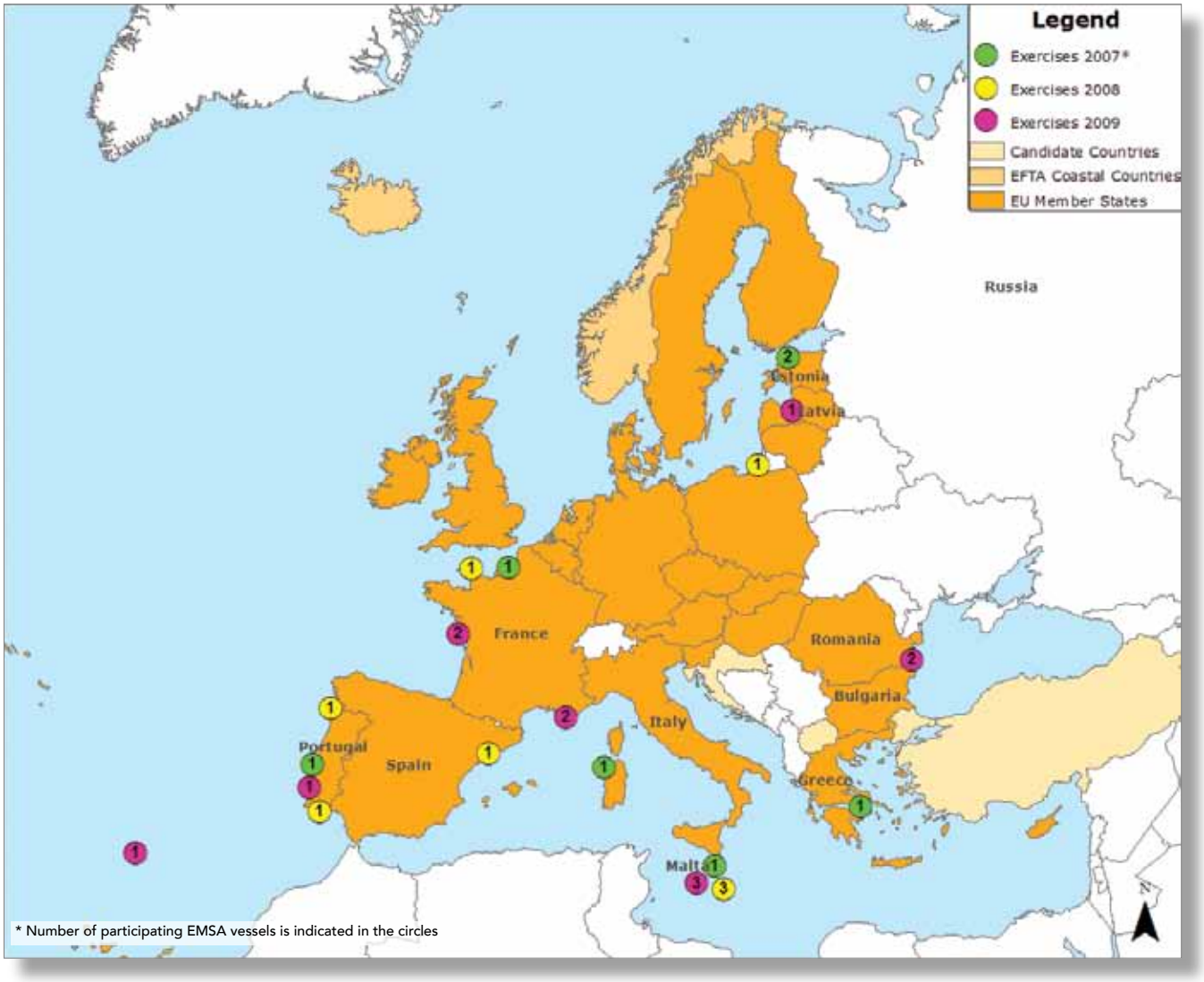


Figure 3.3 - Number of EMSA Vessels Participating in At-sea Response Exercises: 2007-2009**
(** As of 17 June 2010, Iceland is an EU Candidate Country in addition to being an EFTA Contracting Party)

3.1.1.3. Improvements to the Network Service

Based on the experience gathered during the first years of running the Stand-by Oil Spill Response Vessel service, options were explored to achieve a higher level of performance in terms of oil recovery capacity and cost efficiency. With this in mind, the Agency undertook specific actions in the period 2007-2009 to, firstly, improve the technical capacity of the contracted vessels and, secondly, address issues associated with the at-sea oil recovery response chain, namely contingency lightering. It should be noted that the scale of actions varies widely depending on the margin for improvement of an individual vessel/ equipment. Given the range of different vessels types and equipment combinations, each potential action had to be analysed to be "fit for purpose". After exploring, in close co-operation with the contractors, the feasibility for the different technical proposals, a range of actions were implemented. The major projects are summarised in the table on the next page.

TABLE 3.3 - SUMMARY OF IMPROVED PROJECTS

EMSA Contractor and Vessel	Improvement Modification
Lamor Corporation Ab. Baltic "pool" of Vessels	• Increasing, by more than 100%, the oil recovery pumping capacity. • Modification of the decanting system and installation of additional Oil in Water Monitors.
Louis Dreyfus Armateurs Vessel: "Ile de Bréhat"	• Increasing, by more than 100%, both the oil recovery and discharging pump capacities. Piping modifications. • Modification on the decanting system.
Lamor Corporation Ab. Vessel: "Galp Marine"	• Increasing, by more than 100%, the oil recovery pumping capacity. • Modification of the decanting system. Installation of drop lines -loading on top- and additional Oil in Water Monitors.
Tankship Management Ltd. Vessel: "Mistra Bay"	• Additional self-inflatable boom to improve crew safety conditions during booms operation. • Modification of the decanting system. Installation of drop lines - loading on top - and additional Oil in Water Monitors.
Falzon Service Station Ltd. Vessel: "Santa Maria"	• Additional remotely operated multi-skimmer (brush & weir). • Modification on the decanting system. Installation of drop lines -loading on top- and additional Oil in Water Monitors.
GSP Vessel: "GSP Orion"	• Increasing oil recovery rate of "boom and skimmer" system twofold through addition of heavy duty multi-skimmer
Remolcanosa Vessel: "Ria de Vigo"	• Increasing oil recovery rate of "boom and skimmer" system twofold through addition of heavy duty multi-skimmer

3.1.1.4. Summary of Network Coverage

As the vessels are stationed all around the European coastline, the Network provides a reasonably consistent basic level of coverage to all coastal States apart from the western Mediterranean, the Adriatic and the far eastern Mediterranean. This latter area is subject to an on-going tender in 2010 for an additional vessel. It is for individual Member States to determine for themselves the response capacity they require to provide adequate protection for their coastlines. When assessing the required capacity, the resources available through the Agency should be considered appropriately i.e. as "top-up" response capacity.

The following map shows those maritime areas where at-sea oil recovery services can be provided by the Agency, taking into account certain factors:

- Following the signature of the Incident Response Contract by the requesting Member State, the vessel required a certain amount of time to be ready to sail fully equipped from the "home" port;
- The estimated vessel speed has been set at 10 knots. It should be noted that all vessels are able to reach a speed of at least 12 knots;
- One EMSA vessel would arrive on site within 24 hours.

The 2004 Oil Action Plan included an overview of tanker trading patterns of the time and reproduced on the next page (figure 3.4). The darker/thicker lines reflect the more important cargo routes. The overlap of Network coverage with tanker routes is shown.

Significant gaps remain with regard to western and eastern Mediterranean. Along the Atlantic coastline, the Bay of Biscay is insufficiently covered, though this area is subject to an on-going tender in 2010 for an additional vessel.

The potential considerations regarding the way forward for the sustainability of the Network and its level of assistance to support Member States responding to an incident are addressed in more detail later.

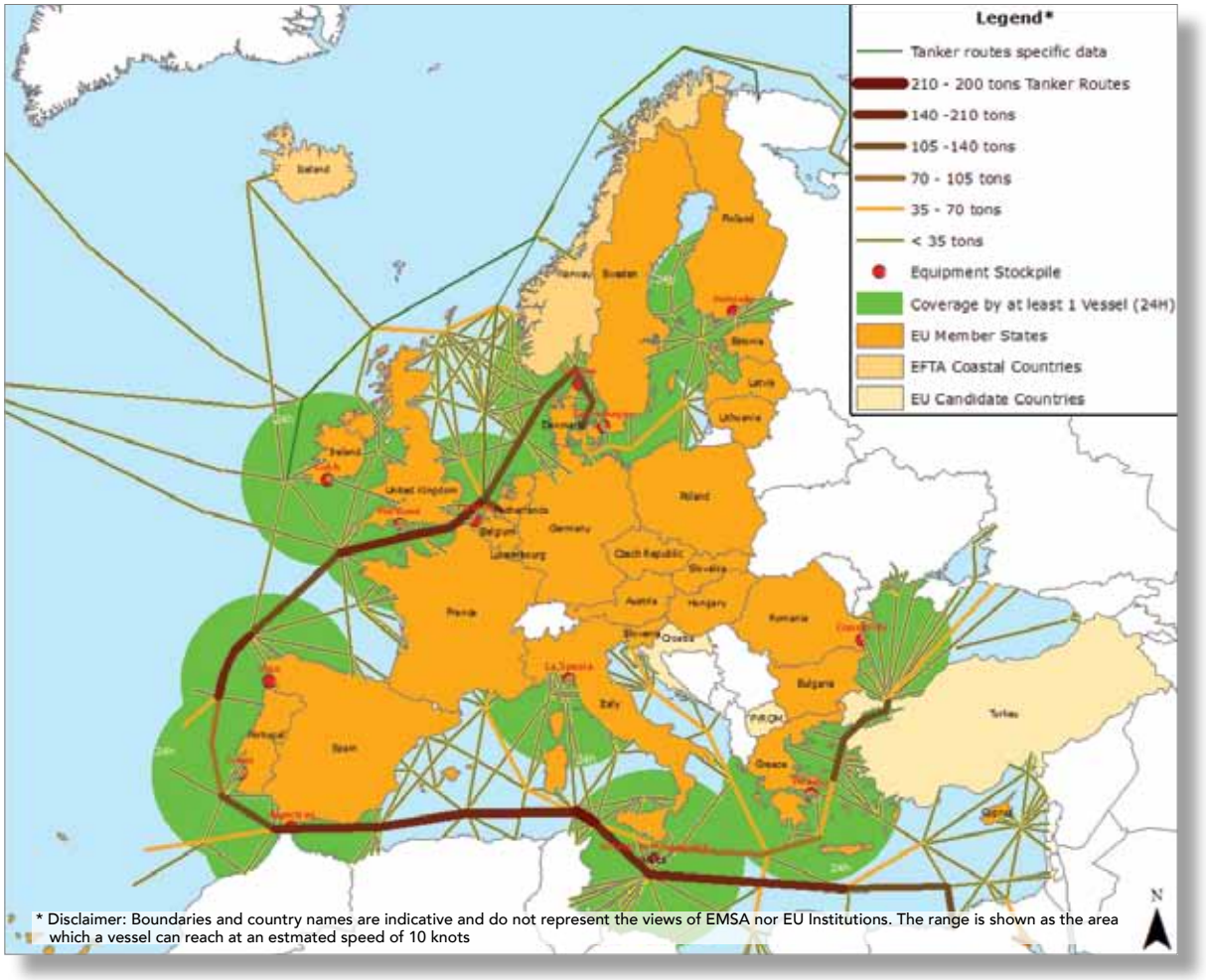


Figure 3.4 - Network of Stand-by Oil Spill Response Vessels: Estimated Coverage of 2004 Oil Action Plan Tanker Trading Patterns**

(** As of 17 June 2010, Iceland is an EU Candidate Country in addition to being an EFTA Contracting Party)

3.1.1.5. Network of Stand-by Oil Spill Response Vessels: Financial Summary

TABLE 3.4 - NETWORK OF STAND-BY OIL SPILL RESPONSE VESSELS: FINANCIAL SUMMARY 2007-2009

2007-2009	Commitments (€)	Payments (€)
Network of Stand-by Oil Spill Response Vessels	46,363,654.42	34,559,298.86
Exercises	1,157,500.00	1,082,555.37
Improvement Projects	5,324,730.86	4,547,630.50
Subtotal	52,845,885.28	40,189,484.73

3.1.2. CLEANSEANET SATELLITE SERVICE FOR OIL SPILL MONITORING

A considerable proportion of oil entering the marine environment originates from ship activity. Of this, operational discharges are estimated to make up 45% and shipping accidents 36%[12]. Nevertheless, large oil spills generate considerable media attention as well as having a strong impact on public opinion and socio-economic and environmental resources. Many of the regulations aimed at preventing marine pollution were created as a result of major oil spill accidents. They often include provisions to combat illegal discharges from ship operations.

Accordingly, the 2004 Oil Action Plan addressed both accidental and deliberate ship-source pollution with the aim of supporting European Member States measures against deliberate pollution at sea. The Action Plan identified the use of radar satellite imagery as a cost-effective tool to identify and monitor possible spills at sea, including its use for operational support to maximise the efficiency of national oil recovery operations by enabling response vessels to be directed areas where larger and/or thicker slicks are observed.

In 2005, the European Parliament and the Council adopted Directive 2005/35/EC, which incorporates international standards for ship-sourced pollution into Community law, in order to discourage illegal discharges through the application, by Member States, of adequate penalties to polluters. The Directive, which entered into force in 2007, tasked EMSA to "work with the Member States in developing technical solutions and providing technical assistance in actions such as tracing discharges by satellite monitoring and surveillance."

Through CleanSeaNet, EMSA provides a state-of-the-art oil spill monitoring service, which is part of the national oil spill response chains, supplements existing surveillance systems at national or regional level, strengthens Member States response to illegal discharges and supports response operations to accidental spills.

CleanSeaNet offers all EU Member States, candidate countries and EFTA Member States (hereafter referred to as coastal States) a Near Real Time (NRT) marine oil spill detection service using radar satellite imagery acquired by synthetic aperture radar (SAR) satellites. The service is free of charge to all coastal States and it covers all European waters.

Member States require reliable, clear and timely information on pollution incidents. For monitoring and surveillance purposes, oil spills have to be detected and located across a wide sea area within a very short timeframe, during day and night and independently of the weather conditions. Once a pollution incident has been identified, it has to be classified and quantified by Member States authorities as accurately as possible in order to decide on most appropriate response activities.

Remote sensing of the sea surface can be performed from aircraft and from earth observation satellites. Due to their wide area coverage, satellites are a cost efficient way to complement and optimise the more cost intensive surveillance by aircraft. Aircraft can be sent to investigate possible spills detected on satellite images, thereby improving the efficiency with which sea areas are patrolled.

Satellite imagery from SAR sensor technology is capable of wide area monitoring and is suitable for maritime surveillance to support the detection of oil films on the sea surface. Even very thin oil films, some measuring just micrometres [13], can be visible from space, but identifying the type and thickness of pollution requires on-site verification. SAR sensors detect the dampening effect of oil on the sea surface. A smooth surface will appear as a black pattern on the SAR image. This process is largely independent of weather and visual conditions and allows the detection of oil pollution day and night and through cloud cover. Furthermore, SAR imagery allows vessel detection in the images due to the radar reflection of metallic elements on the vessels. This, combined with detected oil slicks, can help identify polluters in the act of polluting.

The CleanSeaNet service uses three polar orbiting SAR satellites: the European Space Agency's ENVISAT, and the Canadian Space Agency's RADARSAT1 and RADARSAT2, These provide images covering areas of 300 x 300 to 405 x 405 km. Having access to three satellites via a network of

12 Ref.: Joint Group of Experts on the Scientific Aspects of Marine Environmental Protection (GESAMP) 2007 – Report No.n° 75 Estimates of Oil Entering the Marine Environment from Sea-Based Activities, Page 61. This 45% rate includes legal discharges below 15 parts of oil per million parts of waters (i.e. ppm) per nautical mile.

13 One micrometre is one thousandth of a millimetre.

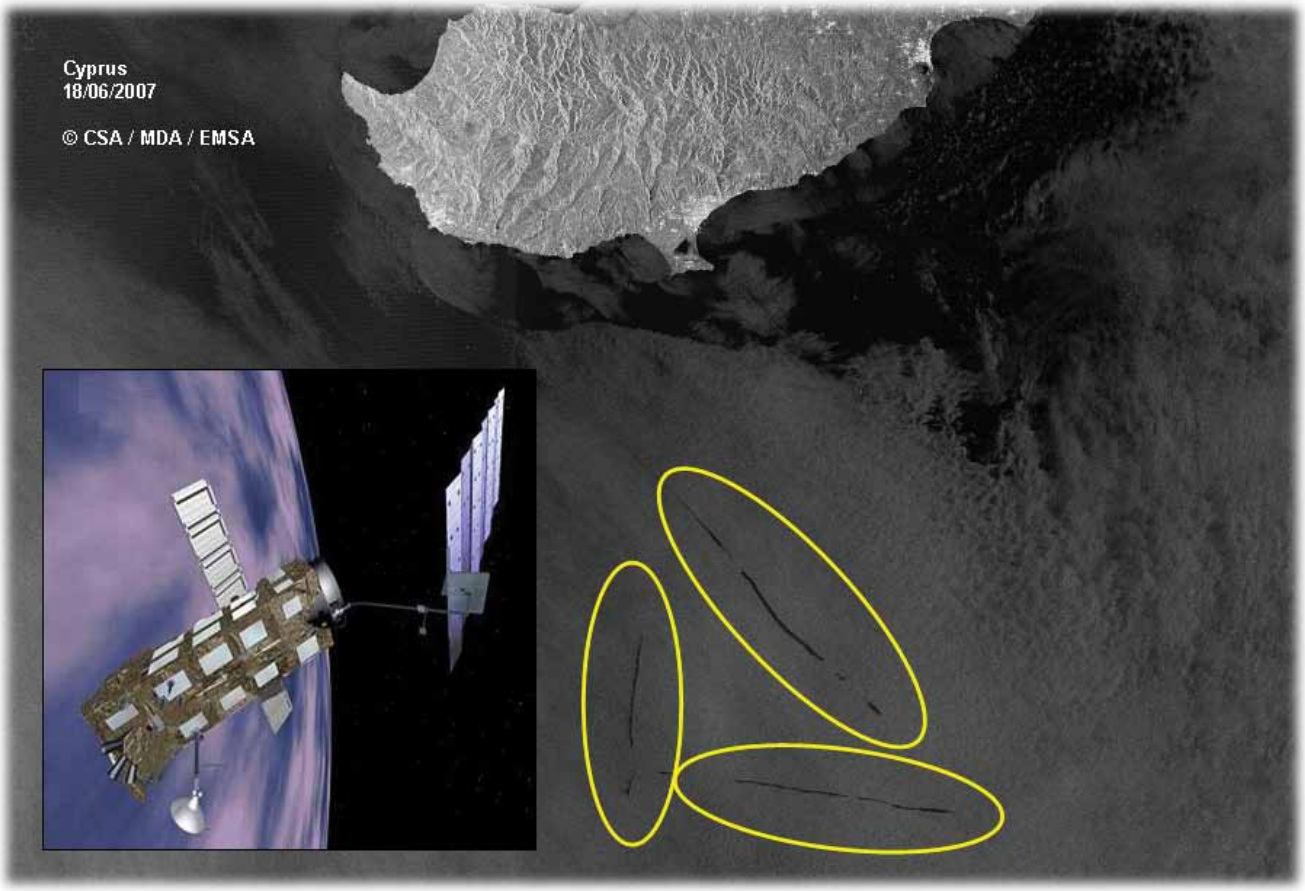


Figure 3.5 - Three possible Oil Spills South of Cyprus detected by CleanSeaNet on 18/06/2007

5 receiving ground stations throughout Europe (in Norway, Italy and the Azores), the service is able to monitor wide areas at regular time intervals in a cost efficient way. By having access to several satellites, the main disadvantage of polar orbiting satellites – that they cannot provide a permanent coverage - is somewhat compensated. In general, each point in the Mediterranean can be monitored every second day (with an increasing frequency towards higher latitudes).

Member States define their national coverage requirements in terms of areas to be monitored and number of images to be received each month. Coastal States' requirements for monitoring take into account national knowledge of sea areas where illegal oil discharges are known to take place, areas of high traffic density, environmentally sensitive areas, and other factors which influence national monitoring requirements and planning. European waters have been divided in 10 planning regions.

As time is critical for confirming a possible spill and catching polluters in the act, the shortest possible delay between satellite detection and alert is essential for a rapid response by coastal States. CleanSeaNet detection results are therefore reported to the affected country in Near Real Time (NRT), which was successfully reduced in CleanSeaNet to less than 30 minutes after satellite image acquisition. EMSA and industry partners in collaboration met the challenge of developing a complex processing and analysing chain capable of meeting this time requirement. It is of utmost importance that coastal State administrations are immediately informed of any potential spill with the aim of increasing the likelihood of catching a polluter red-handed. Each coastal State has access to the CleanSeaNet service through a web based application which disseminates all the CleanSeaNet data and products to the users.

In the case of a detected oil spill, an alert is delivered to the relevant coastal State operational contact point responsible

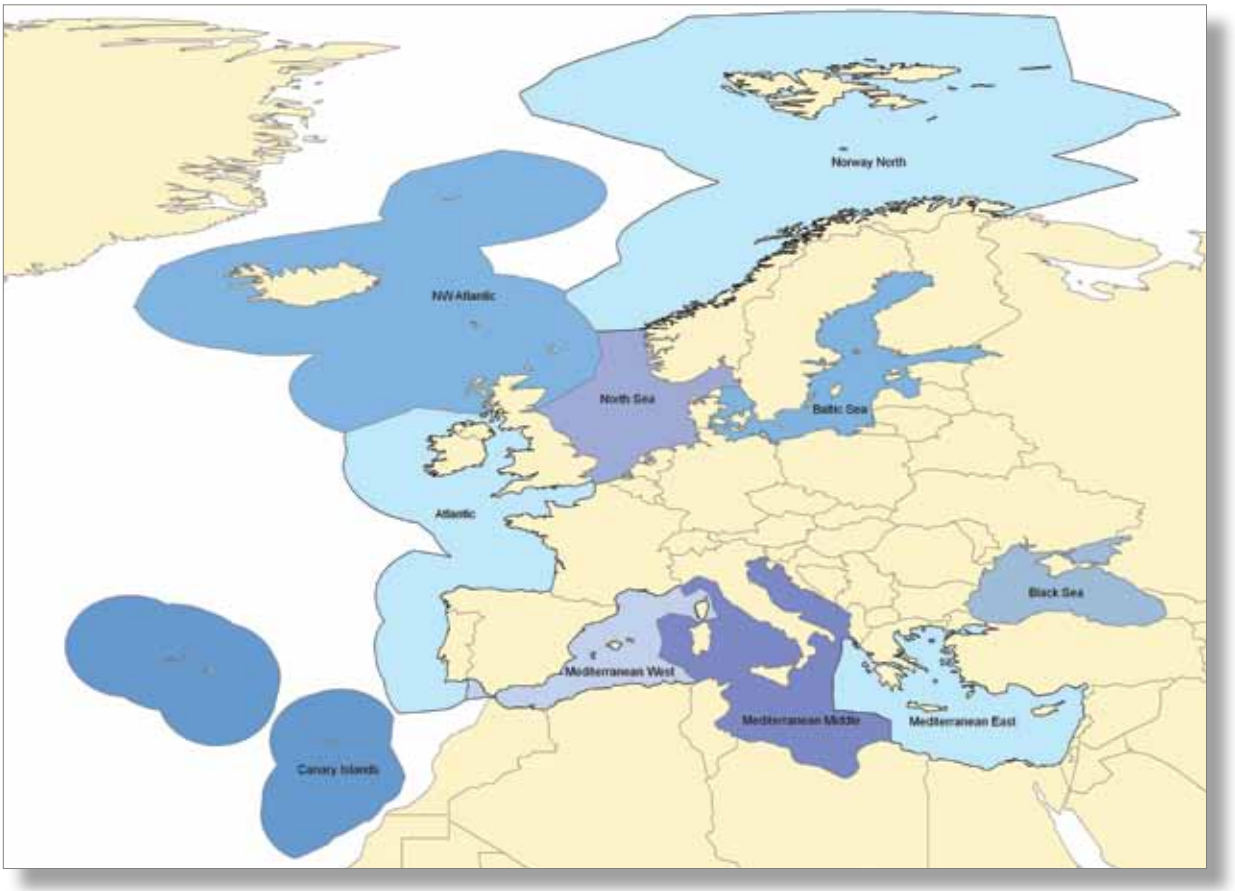


Figure 3.6 - CleanSeaNet: Planning Regions

for monitoring of ship sourced pollution at national level. The alert message can be transmitted via phone call, email, fax or SMS.

To date EMSA delivers the CleanSeaNet service to 24 European coastal States: Belgium; Bulgaria; Croatia; Cyprus; Denmark; Estonia; Finland; France; Germany; Greece; Ireland; Italy; Latvia; Lithuania; Malta; the Netherlands; Norway; Poland; Portugal; Romania; Slovenia; Spain; Sweden; United Kingdom. The service may expand to other countries in the future.

3.1.2.1. CleanSeaNet: Service Implementation and Improvements

In 2006, EMSA consulted industry and the national authorities of the EU Member States and coastal EFTA States in order to collect information on existing operational surveillance resources and further requirements for oil pollution monitoring. Based on feedback received during the consultation as well as from other relevant organisations, such as the European Space Agency, EMSA launched a procurement process in April 2006.

As a result of the procurement process, EMSA agreed a number of contracts for a three year period. There are two different types of contract which underpin the CleanSeaNet service:

1) for the acquisition of satellite image licences;
2) for the provision of oil spill monitoring services[14].

- The following contracts were agreed for satellite image licenses:
  - Contract for licenses for the European Space Agency's ENVISAT satellite was signed on 18 December 2006 between EMSA and Eurimage S.p.A.[15];

14 Services include the provision of the telecommunications network and of the service chain, including acquisition of images through a ground station, processing, analysis, and alerting.

15 This contract also allows the acquisition of images from ESA's ERS-2 satellite, though in practice this option has not been implemented.

- Contract for licenses for the Canadian Space Agency's RADARSAT-1 and RADARSAT-2 satellites was signed on 2 February 2007 between EMSA and MDA Geospatial Services Inc.

- The following contract was agreed for the provision of oil spill monitoring services:
  - A contract for the provision of oil spill monitoring services was signed on 18 December 2006 between EMSA and a consortium of 3 companies: Kongsberg Satellite Services AS, Telespazio S.p.A and Edisoft.

Due to intensive use of CleanSeaNet by Member States, additional commitments and payments were made in 2008 and 2009 to meet the operational demand. The service has been extended several times. Some of the key developments include: the delivery of RADARSAT 2 images launched in December 2007; the entry into service of the Azores ground station; the provision of vessel traffic information (initially from regional AIS servers and now via SafeSeaNet); the provision of vessel detection information, and the link to backward and forward propagation oil spill models. As a result, CleanSeaNet is the most comprehensive oil spill monitoring service in Europe today.

The CleanSeaNet public procurement processes for a sustainable service stimulated competition in the European market. The number of ground stations capable of providing the requested service has doubled since the CleanSeaNet definition phase in 2005. The NRT requirement (30 min. service delivery time) was a key driver for the further technical development of the European ground-stations. With this, EMSA set a new benchmark for the NRT delivery of satellite based services worldwide.

While in 2007 the priority was to set up the service, in 2008 priority was given to strengthening the service and improving its quality. In 2009 the 2nd generation of the CleanSeaNet system and contracts were designed. The updated CleanSeaNet service will be phased-in towards the end of 2010 and fully operational as of February 2011. The new system is based on a review of the "operational user needs" in order to improve the efficiency, quality and usability of the service. The 2nd generation CleanSeaNet data system will be hosted in-house, linked with other EMSA services like SafeSeaNet and LRIT, and will provide the backbone for future services and data integration to provide coastal States with enriched and comprehensive information from a single access point.

More specifically, the main improvements for the 2nd generation of CleanSeaNet will be the capacity to acquire flexible images, from 200 km up to 1,400 km long, instead of fixed frames. The improved web interface offers a spill centric approach in parallel to the existing image centric one. The NRT requirements will depend on the length of the segment to be acquired, the reference remaining 30 minutes for delivery to the end user following satellite overpass for a 400 km long acquisition. In addition, each time a recent or on-going spill is detected with a potential source connected to it or in its vicinity, the users will be informed immediately without waiting for the detailed analysis of the image done.

3.1.2.2. The Operational Use of CleanSeaNet

CleanSeaNet entered into operation in April 2007. At this time 12 coastal States already had experience with using satellite images for oil spill detection and about 1200 images were ordered by the individual coastal States administrations. Today 24 coastal States are using the CleanSeaNet service, which provides around 2300 images per year to the combined users. Only Norway supplements the satellite oil spill monitoring service with own images, all other coastal States rely on the CleanSeaNet service for their national needs. In most cases, each satellite scene covers the waters of more than one country. Therefore, by ordering 6,391 images between 16 April 2007 and 31 December 2009, EMSA was able to fulfil 11,886 national requests. 5,816 scenes (91% of the 6,391 ordered images) were successfully delivered. These 5,816 satellite scenes (3,286 ENVISAT and 2,530 RADARSAT) acquired and analysed more than 839,400,000 km2 of sea surface. To cover the same area with aerial surveillance would have required more than 50,000 flight hours.

It should be noted that less images were delivered in 2009 compared to 2008. This is due to Member States, based on their experience, fine-tuning their requests for images bringing it more in line with their follow-up capacity.

TABLE 3.5 - NUMBER OF IMAGES DELIVERED PER SATELLITE

Satellite	2007	2008	2009	Total
ENVISAT	739	1309	1238	3286
Radarsat 1	568	958	476	2002
Radarsat 2	0	130	398	528
Total Delivered images	1307	2397	2112	5816

Detection of Illegal Oil Spill Discharges

From 16 April 2007 until 31 December 2009, a total of 7,193 possible oil slicks were detected on the delivered satellite scenes. On average 1.24 possible oil spills were detected on each SAR image. Comparing 2009 with 2008, the number of possible spills detected per image has decreased from 1.4 to 1.0.

Two of the possible reasons for the decrease are:

- In some areas, there may have been a deterrent effect resulting from intensive aerial and satellite surveillance activity. It is important to highlight that the Agency's oil pollution monitoring service should not be considered as a stand-alone service, but as a means of reinforcing national operational response chains;
- EMSA and the CleanSeaNet service providers have worked together to improve methods of discriminating between oil spills and look-alikes and reducing the number of false alarms. This is one of the outcomes of the regional workshops organised by the Agency in 2008 and 2009.

The chart below indicates the number of possible spills detected in 2008 and in 2009 per planning region.

It is important to note that CleanSeaNet detections are not "oil spills" but "possible oil spills"[16]. Discrimination between

16 *A SAR sensor "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 oil slicks to be detected. Other products or natural phenomena, such as very low wind speeds, are detected as well.*

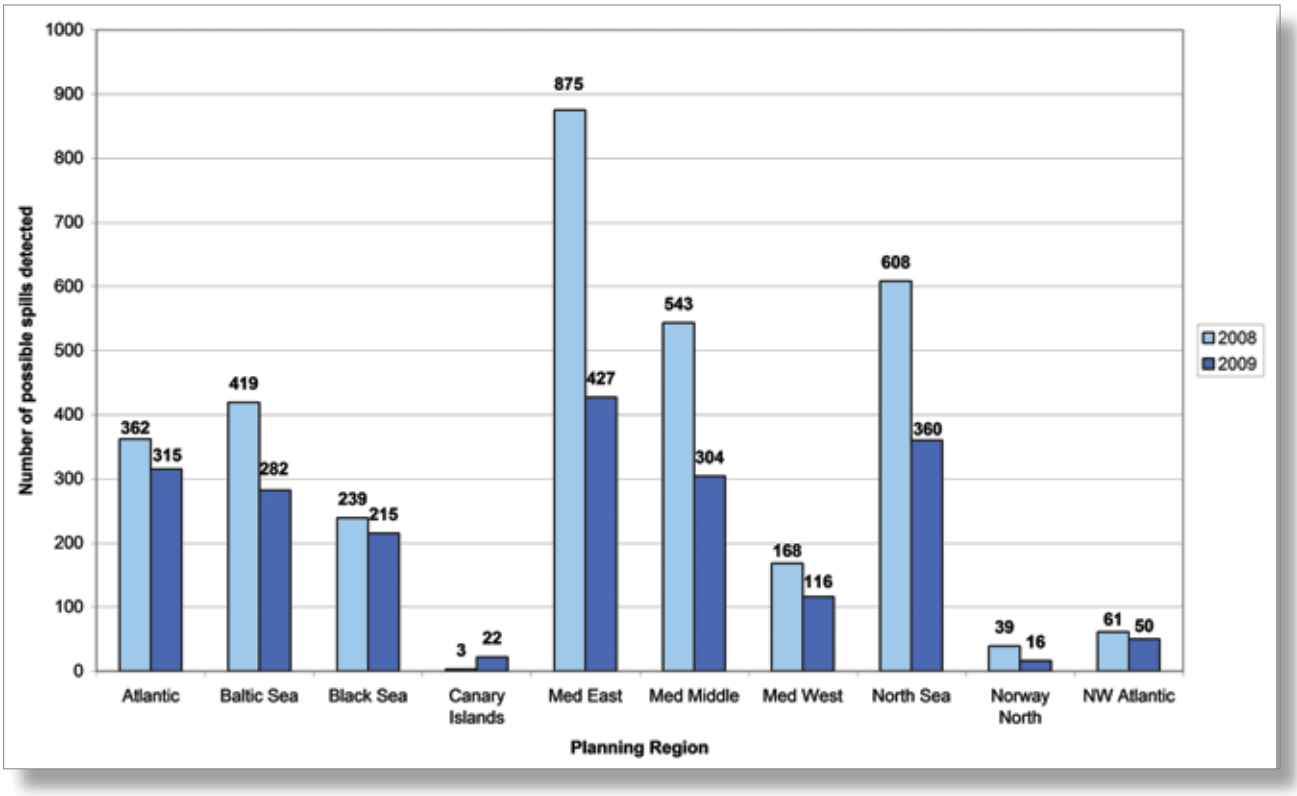


Figure 3.7 - Number of Possible Spills Detected per Planning Region: 2008-2009

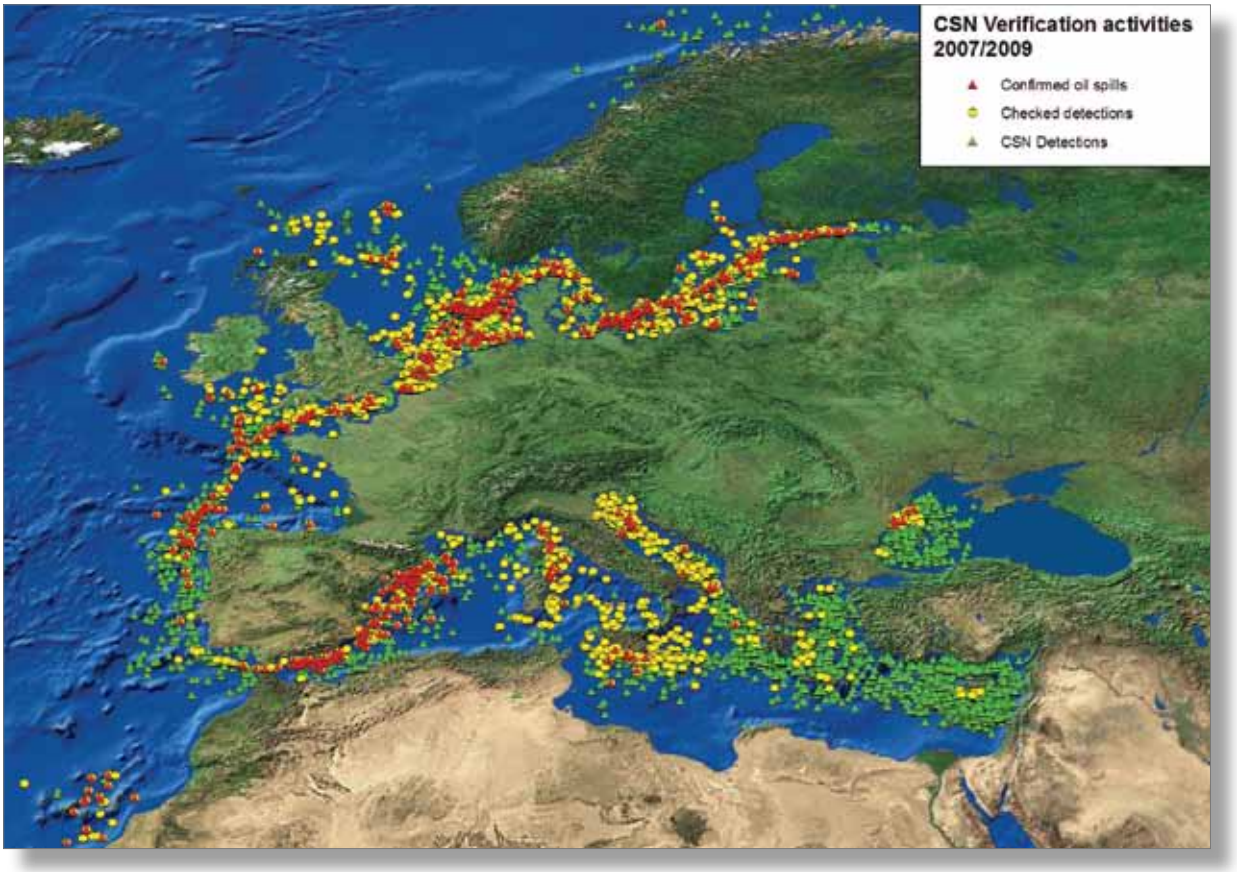


Figure 3.8 - CleanSeaNet verifications - From 16 April 2007 until 31 December 2009

oil spills and look-alikes requires more information and most often on site verification. Therefore, on site verification by the Member States is necessary in order to measure the performance of the service.

Throughout the first three years of operations, the rate of confirmation, i.e. the number of spills confirmed against the number of possible spills checked on site, has remained steady at 27%. Nevertheless, the overall confirmation rate hides significant variations between those planning regions where aerial surveillance[17] is important and those employing other means of verification. The highest confirmation rate (65%) was observed in the Western Mediterranean Sea, and demonstrates the potential of the CleanSeaNet service when used in combination with aerial surveillance.

The way CleanSeaNet is implemented in each national operational chain differs. Some coastal States plan aerial or vessel support each time a scene covers their waters, while 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 is done by coastal States independently of EMSA.

Administrative or judicial follow-up

The analysis of feedback provided by the Member States on individual possible spills detected by CleanSeaNet indicates that the service is effective for the detection of oil and the identification of possible polluters[18]. In particular, when a linear potential spill is connected to a vessel, and when AIS information or vessel traffic monitoring systems allow a clear identification of the vessel, there are sufficient grounds to trigger a Port State Control inspection. Some Member States have successfully fined the polluters based on evidence collected during such inspections.

Nevertheless, Directive 2005/35/EC on ship source pollution does not establish any legal obligation for reporting administrative or judicial follow-up. Therefore, figures on Port State Control inspection and/or prosecution of identified polluters as a result of CleanSeaNet detections are not available.

17 Fixed wing aircraft appear to be the most suitable assets to observe oil spills at sea. In 2009, the overall rate of confirmation reached 37% for verifications by aircraft and was only at 6% for verifications by merchant vessels.

18 AIS information from SafeSeaNet directly available within CleanSeaNet allows the identification of possible polluters.

Monitoring accidental spills and emergency operations

In case of accidental pollution, emergency satellite support to national response operations can be triggered via direct tasking of the EMSA CleanSeaNet emergency procedures or, for major oil spills in European waters, via the "International Charter on Space and Major Disasters"[19] for which EMSA acts as project manager.

During the reporting period 2007-2009, CleanSeaNet provided support for eight accidental spills. In cases where no pollution was visible on the satellite image, this enabled decision-makers to re-prioritise aerial surveillance to target other areas, thereby reducing the need for unnecessary flights. In one case, the Agency support was provided through the activation of the Charter.

It is interesting to note that in areas regularly covered by the service, significant pollution is likely to be noticed. Consequently it becomes more and more risky for ship masters not to report accidental spills that they may have caused. The detection by CleanSeaNet of an unreported spill during a ship-to-ship operation off Ireland in February 2009, and subsequent cooperation with the Irish authorities, is a good illustration (Figure 3.9).

Support to Aerial Surveillance Operations of Member States and Regional Agreements

The Agency supports dedicated surveillance operations organized by Member States and Regional Agreements in European Waters. Examples include CEPCO (Coordinated Extended Pollution Control Operations) and SuperCEPCO operations. These consist of intensive campaigns of aerial surveillance flights over a given maritime area. Since the entry into operations of CleanSeaNet, the Agency has supported eight operations (two in the North Sea, five in the Baltic Sea and one in the Mediterranean Sea).

19 The International Charter was established and became operational in 2000. It "aims at providing a unified system of space data acquisition and delivery to those affected by natural or man-made disasters through Authorized Users". Space agencies of nation states sign up to the Charter on a voluntary basis. For more information, see: http://www.disasterscharter.org/

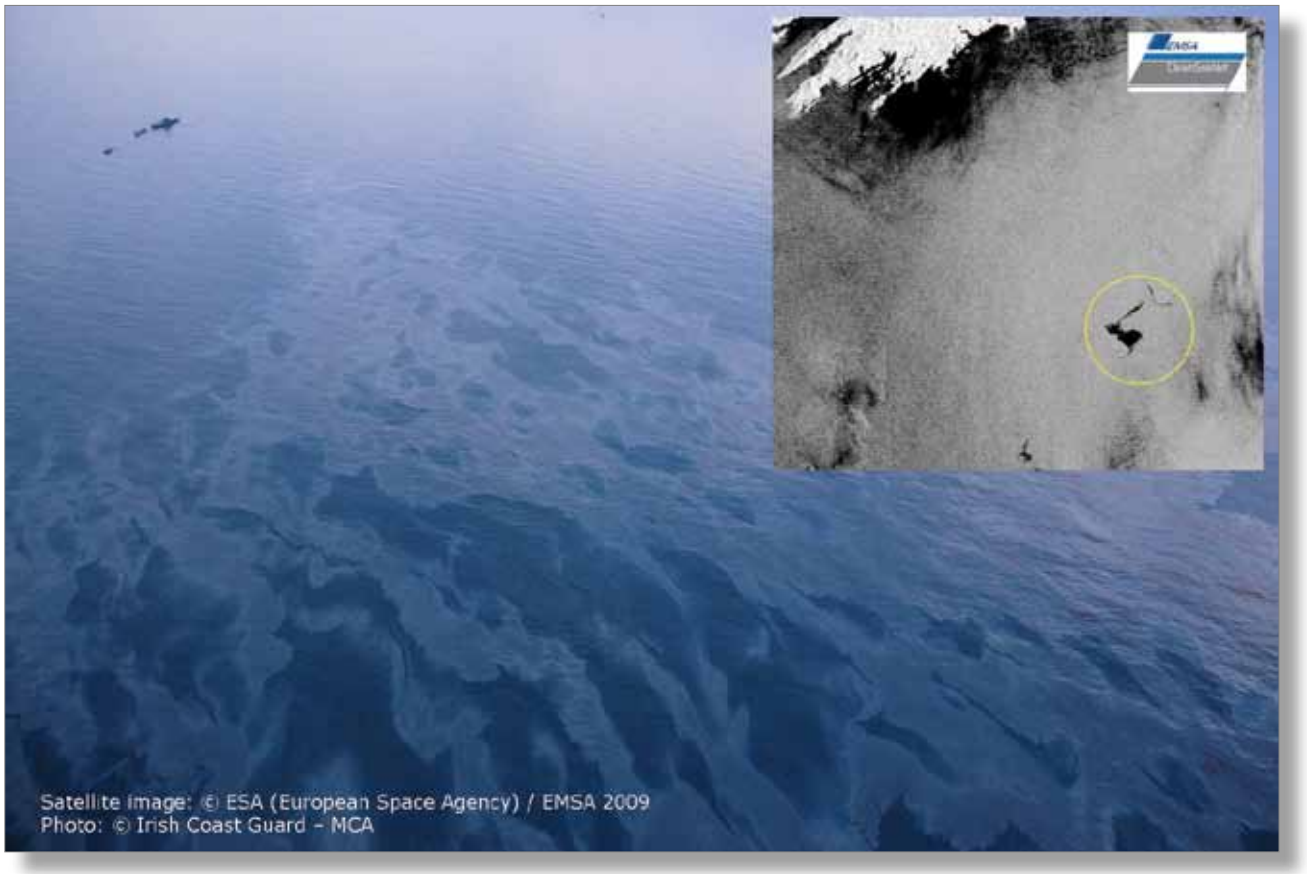


Figure 3.9 - CleanSeaNet Detection of an Unreported Spill, Ireland, 2009

3.1.2.3. Support to CleanSeaNet Users

The CleanSeaNet User Group

CleanSeaNet aims to contribute to and improve the efficiency of national and regional response chains by strengthening operational pollution response. EMSA therefore set up the CleanSeaNet User Group with the purpose of:

- Establishing a strong link with experts and operational users in the coastal States;
- Fostering cooperation between the Member States, sharing of experience and disseminating best practices.

User Group meetings are held back to back with the European Group of Experts on Satellite Monitoring of Sea-based Oil Pollution (EGEMP). At CleanSeaNet User Group meetings, EMSA and the Member States have the unique opportunity to define jointly, based on the recommendations from the experts, the future improvements and developments of the CleanSeaNet service.

Training and Workshops

In 2007, EMSA provided initial CleanSeaNet training to enable coastal States to begin using the service operationally. The same year, the Agency also organised two workshops: one on the implementation of Directive 2005/35/EC on sanctions for ship-source pollution and one on the exchange of best practices in dealing with illegal discharges and the gathering of evidence.

For 2008 and 2009, the training plan was defined jointly with the Member States in the framework of the User Group. The CleanSeaNet training plan was twofold:

- A training course "Introduction to CleanSeaNet for duty officers". The aim was to provide a basic introduction to CleanSeaNet. The 89 participants in the five training sessions organised in 2008 and 2009 were typically officers who receive CleanSeaNet alert reports, who use the CleanSeaNet web browser and/or who provide feedback on verification activities to EMSA;
- Regional workshops on "Image Analysis and Ancillary Data for Improved Spill Detection". The aim was to improve the reliability of CleanSeaNet satellite image analysis for oil spill detection by taking into account the marine environment and other local conditions in the analysis. EMSA organised three workshops in 2008 and 2009: one for the Mediterranean Sea and the Black Sea, one for the Atlantic and North Sea, and one for the Baltic Sea.

Figure 3.10 - Introduction to CleanSeaNet for Duty Officers

3.1.2.4. Co-operation with External Organisations

Strategic co-operation with external organisations allowed EMSA to draw on the best available new technologies in Europe for the development of improved information products in CleanSeaNet.

In 2007 EMSA and the European Space Agency (ESA) signed an agreement to support each other in the field of exploitation of satellite data for maritime safety and security. This agreement was renewed and extended in July 2010. Close cooperation between the two Agencies has been essential to the successful development and continuous improvement of the service. Since 2009, CleanSeaNet has been recognised as an operational GMES[20] service and, as such, it receives the licences for ENVISAT data free of charge from ESA. As a GMES service, CleanSeaNet benefits from the GMES Space Component Data Access Grant (GSCDA) which provides satellite data free of charge to GMES services (equivalent to approximately EURO 150,000/year). ESA has become a key partner for CleanSeaNet emergency acquisitions in response to accidental spills.

In 2007, the Institute for Protection and Security of the Citizen (IPSC) of the European Commission Joint Research Centre (JRC) and EMSA signed a Memorandum of Understanding. Under this framework, the JRC conducted, between 2007 and 2009, research and development on new methods and technologies in support of CleanSeaNet. Work included the development of an automatic oil spill detection algorithm, a feasibility study on the operational use of the MODIS optical satellite images for oil spill detection, and the development of main maritime traffic routes and maps of ancillary marine data maps for the European Seas in order to improve the satellite oil detection reliability.

3.1.2.5. CleanSeaNet Summary

The existing integrated remote sensing capabilities from satellite and aircraft allow reliable and efficient monitoring and detection of oil spills. The combination of the early alerts by SAR satellite surveillance with in depth analysis of the potential spills by the different aircraft sensors provides the necessary information for the decision making process on response operations by the coastal States. However, this requires a well-coordinated surveillance strategy between the partners.

With the CleanSeaNet service of the European Maritime Safety Agency and the national response activities, a harmonised pan-European system is in place which efficiently detects spills and identifies potential polluters. However future developments for linking models and vessel tracking information has the potential to ultimately improve the collection of evidence and therefore will, with its deterrence effect, lead to a reduction of illicit oil spilling in European waters.

In summary, the EMSA CleanSeaNet service provides sustainable and cost efficient oil spill monitoring services needed by coastal States to support their oil spill response activities and to undertake follow up actions against polluters.

3.1.2.6. CleanSeaNet: Financial Summary

It worth noting that in 2006, i.e. before the Multi-annual Funding Regulation came into effect, the Agency made the commitments and initial payments in relation to the 3-year contracts that established the CleanSeaNet service. Payments for these contracts were spread over a number of years, some of which fall into the period covered by the Multi-annual Funding Regulation.

TABLE 3.6 - CLEANSEANET: FINANCIAL SUMMARY: 2007-2009

2007-2009	Commitments	Payments
CleanSeaNet Operations	2,859,946.40	4,671,731.14
Support to CleanSeaNet Users	358,270.53	223,995.50
CleanSeaNet Service Development	2,673,615.53	2,283,212.01
Subtotal	5,891,832.46	7,178,938.65

20 The EC and ESA are developing the GMES (Global Monitoring for Environment and Security) initiative. The objective of GMES is to provide Europe with reliable, timely information on environmental and security issues on a sustainable basis, in support of public policy-makers' needs. The development of the GMES Space Component co-ordinated by ESA will ensure that EMSA will have guaranteed long term access to appropriate satellite observations. The new Sentinel-1 satellite in particular should ensure the continuity of the Envisat radar observations, a primary source of CleanSeaNet satellite scenes.

3.1.3 MAR-ICE Network: Information Service for Chemical Emergencies

The establishment of a network of experts, who can support and advise the Member States during the response to a chemical spill, was outlined in the 2007 HNS Action Plan as a priority activity for the Agency. EMSA undertook a careful analysis to determine the best approach to implement this task. Based on this analysis and in close cooperation with the European Chemical Industry Council (CEFIC) and the Centre of Documentation, Research, and Experimentation on Accidental Water Pollution (Cedre), the MAR-ICE service was developed by the Agency in 2008. The MAR-ICE Network is based on CEFIC's voluntary ICE (Intervention in Chemical transport Emergencies) network, which provides similar assistance for land-based chemical spills through experts from chemical companies who are familiar with the chemical substances involved in the incident.

Following the signing of a MoU by CEFIC, Cedre and EMSA and the approval of the MAR-ICE Implementation Plan in late 2008, the MAR-ICE Network became operational in January 2009. The 24/7 service is provided free of charge to the EU Member States and coastal EFTA States.

The MAR-ICE service can advise and support Member States upon request with timely information on scientific, technical, and operational aspects of an HNS spill, by providing remote product specific information on chemical substances, as well as information on the fate of a substance in the marine environment, where available. The MAR-ICE Network aims to strengthen the rapid information transfer regarding chemical substances involved in marine pollution emergencies, and address a common gap in this field identified across the EU.

The service has been used successfully five times to date for exercises and real incidents. EMSA monitors and evaluates the operation of the service on an annual basis. These reviews underpin modifications to the service.

Figure 3.11 - The *BG Dublin* lost a container with HNS in heavy seas
(The diagram shows a screen shot of the CHEMMAP simulation provided through MAR-ICE)

3.1.4. Support provided to Coastal States and the Commission for Accidental Spills

In accordance with the EMSA Regulation as amended, the Agency can provide, following requests from a Member State or the Commission, operational spill response assistance for oil pollution accidents in terms of:

- At-sea oil recovery services mobilising the network of EMSA contracted oil spill response vessels;
- Satellite imagery using the CleanSeaNet service and
- Pollution response expertise available through Agency staff.

Such assistance can be requested through the Monitoring and Information Centre (MIC) of the European Commission or, when just using CleanSeaNet to cover smaller accidents, directly from the Agency. Additionally and through prior agreement, in the event of a major spill in European waters and/or adjacent high seas the MIC, as an Authorised User, can activate the International Charter for Space and Major Disasters, In such a case, EMSA will be nominated as the Project Manager with responsibility for co-ordinating the emergency delivery of satellite images to affected coastal State(s). This co-operation ensures fast delivery of satellite images. CleanSeaNet can also supplement coverage with additional images. The costs of these emergency activities for EMSA, aside from staff missions, are covered by existing running contracts.

It should be noted that for accidental incidents involving tankers there is an international compensation regime in place for the victims, be they governments or individuals, of such spills. The regime is structured through three main legal instruments: CLC 92[21], Fund 92[22], and Sup. Fund 2003[23]. Respecting the ceilings identified in these legal instruments, financial compensation is available, on a "pay to be paid" basis, for actions deemed technically reasonable within the context of the tanker spill.

Short descriptions of incidents involving significant assistance provided by the Agency in the period 2007–2009 are shown in the table on the next page.

21 Protocol of 1992 to amend the International Convention on Civil Liability for Oil Pollution Damage, 1969.

22 Protocol of 1992 to amend the International Convention on the Establishment of an International Fund for Compensation for Oil Pollution Damage, 1971.

23 Protocol of 2003 to the International Convention on the Establishment of an International Fund for Compensation for Oil Pollution Damage, 1992.

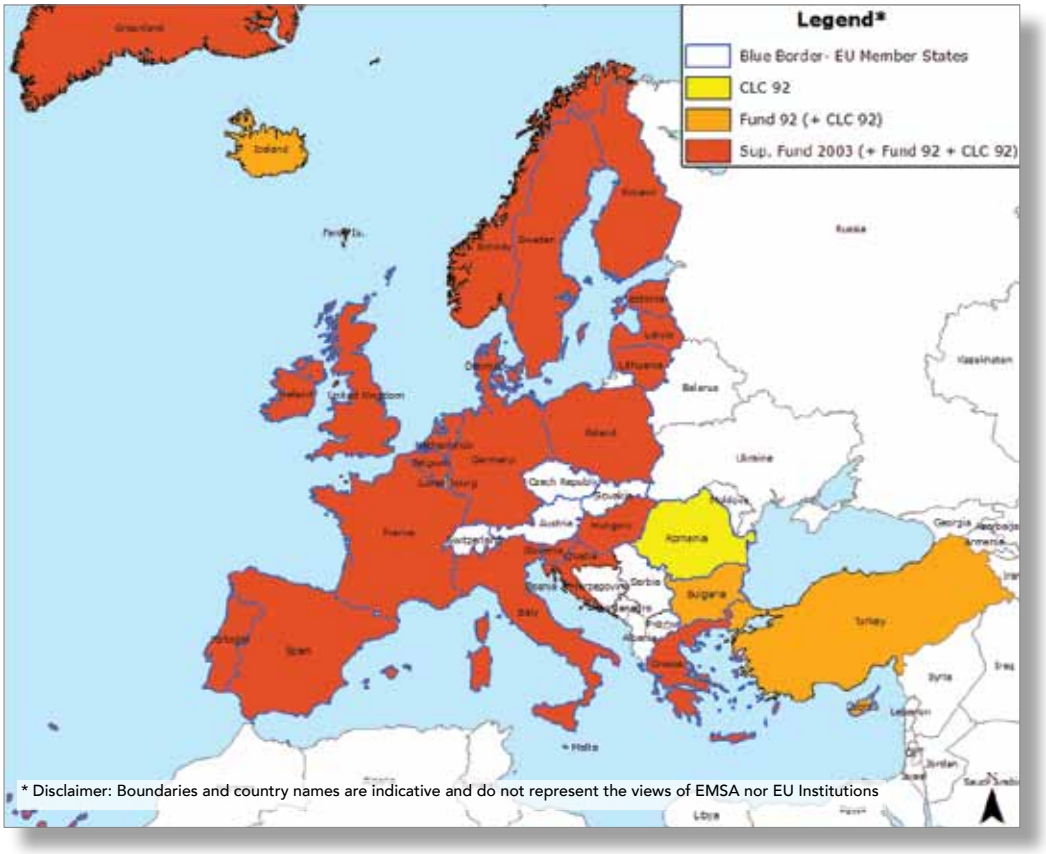


Figure 3.12 - Ratification of CLC 92, Fund 92 and Supplementary Fund 2003 at end of 2009

TABLE 3.7 - INCIDENTS INVOLVING EMSA ASSISTANCE (2007-2009)

Incident, Date and Location	Assistance provided by Agency Services: • Network of Stand-by Oil Spill Response Vessels; • CleanSeaNet; • Expertise (onsite or remotely)
M/V Don Pedro **Sinking / oil spill, 11 July 2007, off Ibiza, Spain**	• 2 SAR satellite scenes acquired to support the response by the Spanish authorities.
M/V New Flame **Sinking / oil spill, 12 Aug 2007, Gibraltar**	• M/T Mistra Bay: Sept 2007 – July 2008 on standby and monitoring. • 11 SAR satellite scenes acquired in August 2007. Additional scenes to monitor the area during dismantlement operations in August 2008.
Numerous vessels **4 sunk, 6 grounded, oil and chemical spill, 11 November 2007, Kerch Strait**	• 11 SAR satellite scenes acquired over the area.
M/T Heibei Spirit **7 December 2007, South Korea**	• Onsite provision of expertise.
Statfjord A oil platform **Oil spill, 12 December 2007**	• International Charter: Space and Major Disasters activated. EMSA appointed as project manager. • 5 SAR satellite scenes acquired.
M/V Fedra **Sinking / oil spill, 10 Oct 2008, Gibraltar**	• M/T Bahia Tres, 12 – 15 Oct 2008 Oil recovery operations. • 6 SAR satellite scenes acquired.
Fish Factory Vessel Topaz A **Sinking, 12 January 2009, 250 Nautical miles off Northern Norway**	• 8 SAR satellite scenes acquired.
Aircraft carrier Admiral Kuznetzov **Oil spill,14 Feb 2009, Celtic Sea**	• Initial detection and alert of the Irish authorities by CleanSeaNet duty multi-skimmer. • 15 SAR satellite scenes acquired between 14 February and 8 March 2009 to monitor the spill. • Galway Fisher, 17 -18 Feb 2008, mobilisation and standby.

3.2. CO-OPERATION AND CO-ORDINATION

During the period under review, the Agency has continued its co-operation and co-ordination activities with the pollution response experts of Member States and with the main Regional Agreements (as described in an earlier chapter). At the request of the European Commission, the Agency has taken over some of the activities of "The Community framework for co-operation in the field of accidental or deliberate marine pollution". These are now carried out under the umbrella of the Consultative Technical Group for Marine Pollution Preparedness and Response as detailed below.

3.2.1. Consultative Technical Group for Marine Pollution Preparedness and Response

In December 2000, the European Parliament and the Council established, through Decision No. 2850/2000/EC, the Community framework for co-operation in the field of accidental or deliberate marine pollution for the period 1 January 2000 to 31 December 2006. It set the legal basis for the role of the European Community in the field of preparedness and response to marine pollution.

The role of the Community Framework for Co-operation was to:

- Support and supplement Member States' efforts at national, regional, and local levels for the protection of the marine environment;
- Contribute to improving the capabilities of the Member States for response in case of incidents involving spills;
- Strengthen the conditions for and facilitate efficient mutual assistance and co-operation between Member States in this field;
- Promote co-operation between Member States in order to provide for compensation for damage in accordance with the polluter-pays principle.

The Community Framework for Co-operation expired at the end of 2006 and in 2007 the Agency took over, at the request of the European Commission, some of the activities of the Community framework for co-operation in the field of marine pollution preparedness and response[24].

Following the end of the Community Framework for Co-operation, the associated Management Committee on Marine Pollution (MCMP) could not continue in its existing form. Given the significant contribution of such a forum of experts to the improvement of marine pollution preparedness and response at European level through the exchange of good practice, a new Consultative Technical Group for Marine Pollution Preparedness and Response (CTG MPPR) was established by the Agency in 2007. The CTG MPPR comprises marine pollution response experts from the EU Member States, coastal EFTA and EU Candidate States, as well as representatives from the European Regional Agreements, the Commission and EMSA.

One of the main considerations of the group was to build upon the results of activities carried out in the preparedness and response field in the past. The main objective of the CTG MPPR is to provide a Community level platform for Member States, contributing to the improvement in preparedness for and response to accidental and deliberate pollution from ships. The CTG MPPR provides Member States with the opportunity to present initiatives for consideration by the group as well as making active contributions to issues most appropriately addressed at a European level. At its first meeting in 2007, the CTG MPPR Rules of Procedure and the CTG MPPR Rolling Work Programme were adopted, according to which the group meets once a year at the EMSA offices and decides upon and implements priority actions and projects identified by the group. CTG MPPR projects include workshops, reports, technical studies and trainings.

3.2.1.1. CTG MPPR Activities

Between 2007 and 2009, the main activities under the umbrella of the CTG MPPR were meetings, workshops and the preparation of studies, reports and inventories. The following provides a brief summary:

Workshops:

- Communications during a "Tier 3" marine pollution incident;
- Mastering Marine Pollution Response – Exercise planning, implementing and evaluating;
- Joint Workshop between EMSA and DG Environment: "Co-ordinated at-sea and shoreline pollution response";
- Claims Management and Cost Recovery: EU Guidelines on Claims Management (to be finalised in 2010).

Reports, Studies, Inventories:

- Summary Report on the Response to Heavy Fuel Oil (HFO) Spills;
- Summary Report on the Occupational Health and Safety of Responders during Marine Pollution Response at Sea;
- Report on the Facilities for Discharge of Oil Recovered at Sea in Europe;
- Inventory of Pollution Response Training Centres;
- Common Assessment Framework for Lessons Learned (on-going).

EMPOLLEX: EMSA Marine Pollution Experts Exchange Programme

In June 2008, EMSA launched its Marine Pollution Experts Exchange Programme (EMPOLLEX). The EMPOLLEX programme has been developed under the umbrella of the CTG MPPR and is similar to the previous dedicated marine pollution exchange of experts programme, EUMAREX (Exchange of Experts in the field of marine pollution), which was co-ordinated under the Community framework for cooperation.

EMPOLLEX is on-going, subject to Member States needs and available budget, and aims at enabling national experts from participating States to travel to other EMPOLLEX countries, in order to gain or share professional experience in the field of marine pollution preparedness and response. During the period from EMPOLLEX start-up to the end of 2009, seven exchanges took place.

24 Communication from the Commission to the Council and the European Parliament, to the European Economic and Social Committee and to the Committee of the Regions "Co-operation in the field of accidental or deliberate marine pollution after 2007", 22 December 2006, COM(2006)863 final.

3.2.2. Regional Agreements and the International Maritime Organization

With respect to the European Regional Agreements, e.g. Helsinki Convention, Bonn Agreement and Barcelona Convention, the Agency also provides technical support to the European Commission, as part of the Community delegation, during the relevant technical meetings. For example, EMSA regularly participates in the HELCOM Response Group and the Working Group on Operational, Technical and Scientific Questions concerning Counter Pollution Activities (OTSOPA) meetings. EMSA contributes to these meetings by preparing papers, participating in discussions and also being involved in the various operational exercises organised around Europe. Prior to the accession of the European Union to the Bucharest Convention, the Agency is also participating in the upcoming relevant Black Sea Commission meetings.

A similar approach is also implemented with regard to the International Maritime Organization's OPRC-HNS Technical Group.

In parallel, the operational services of the Agency i.e. the Network of Stand-by Oil Spill Response Vessels and CleanSeaNet participate in the relevant exercises and at-sea operations as described earlier.

Within the framework of the 2007 HNS Action Plan, EMSA continued its co-operation with the IMO on issues of common interest. The Agency regularly participates and contributes, as part of the European Commission delegation, to the Marine Environment Protection Committee (MEPC) OPRC/HNS Technical Group meetings, which are the main technical IMO forum on marine pollution preparedness and response. These meetings are held approximately every 9 months at the IMO headquarters and EMSA has regularly prepared relevant papers to these meetings.

In addition to contributing to the MEPC OPRC/HNS technical meetings, EMSA hosted a training session in early 2008 for the coastal EU Member States on the newly organised IMO model courses on HNS marine pollution. Participants and EMSA provided feedback to IMO, which was appreciated and greatly contributed to the improvement of the final version of the HNS model courses.

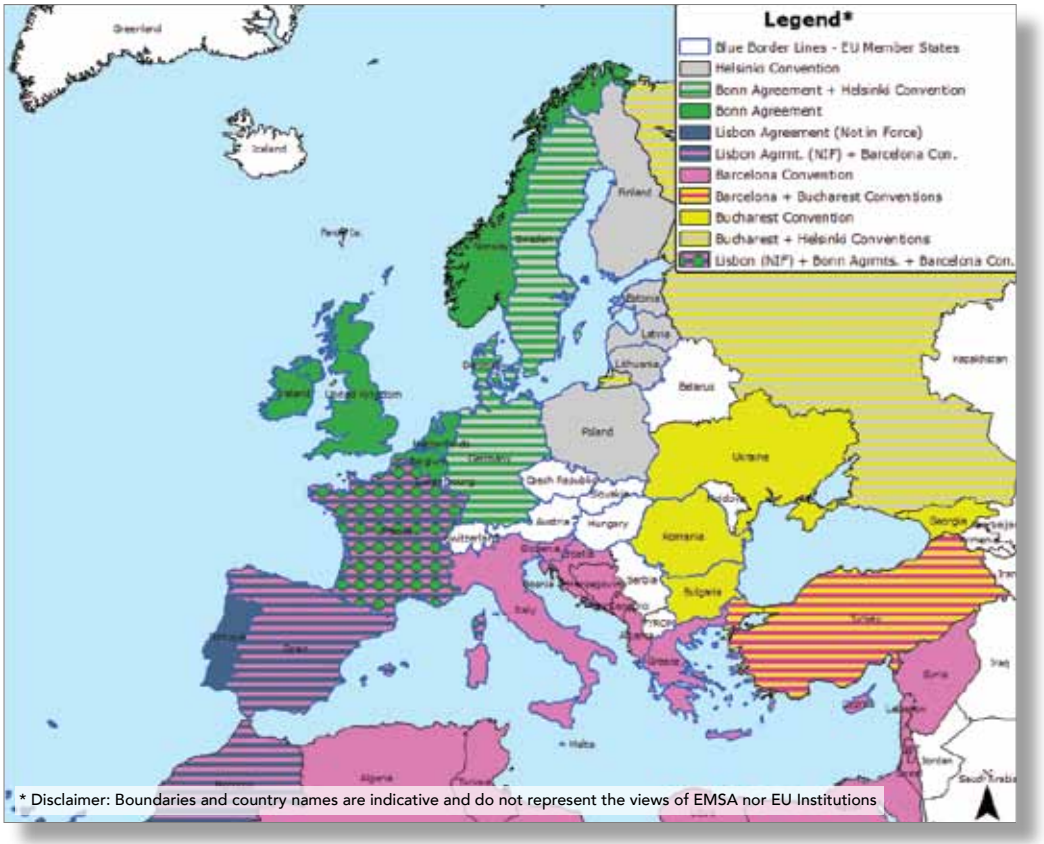


Figure 3.13 - Overview of the main Regional Agreements and ENP Countries at end of 2009**

(** The Lisbon Convention is not yet in force. The European Union is not (yet) a Contracting Party to the Bucharest Convention. Malta is a Contracting Party to the Barcelona Convention.)

3.2.3. Inter-Secretariat Meetings: EMSA, Regional Agreements and DG Environment

The initiative of holding informal meetings with the Secretariats of the various Regional Agreements and the European Commission continues. These meetings have taken place once a year since 2005 and alternate between EMSA's headquarter in Lisbon and a host country from the Regional Agreements. These meetings aim at exchanging information among the different parties regarding on going activities linked to marine pollution preparedness and response, as well as to identify common activities to be undertaken in this field.

3.2.4. Collaboration with Industry

When identifying activities to be undertaken in collaboration with industry bodies in the field of pollution preparedness and response, it is necessary to keep in mind the role of EMSA in other maritime fields, especially where the Agency provides support to the Commission and Member States on regulatory issues.

In 2007 through to 2009, the Agency, recognising the importance of sharing spill response experience and disseminating best practice, continued to support the major marine pollution conference and exhibition event in Europe, namely INTERSPILL. EMSA is a member of the event's Steering Committee together with the main European Oil Spill industry trade associations (NOSCA, UKSpill, SYCOPOL, SRGH) and the International Petroleum Industry Environmental Conservation Association (IPIECA). Through an MoU, the Steering Committee members have agreed to organise the conference and exhibition on a "not for profit" basis. The Agency continued its active role in the Conference Programme Committee with the aim of promoting EU and EFTA Member States' issues and representation at the event. The 2009 INTERSPILL conference was held in Marseilles, France and, in addition to providing information on the Agencies' activities at a conference stand, the staff presented five papers including a keynote speech by EMSA's Executive Director at the opening ceremony.

In 2007, the Agency approached the Chemical Industry, through the European Chemical Industry Council (CEFIC), in order to explore issues of common interest regarding marine pollution from chemicals (HNS). In 2008, CEFIC and EMSA cooperated closely in identifying the best way to establish the MAR- ICE Network, as previously described in more detail above.

Figure 3.14 - EMSA's Executive Director Willem de Ruiter at the 2009 INTERSPILL Conference

3.3. INFORMATION

Within the framework of its two Action Plans (the 2004 Oil and the 2007 HNS Action Plans), the Agency aims to collect, analyse and disseminate information on best practices, techniques and innovation in the field of marine pollution preparedness and response.

The Agency's work under this heading includes activities undertaken in the period between 2007 and 2009 in the areas of:

- HNS (chemical) marine pollution preparedness and response;
- The use of oil spill dispersants;
- The publication of inventories of Member States preparedness and response resources;
- Information dissemination.

3.3.1. EMSA Activities in the Field of Oil Spill Dispersant Use

In accordance with the 2004 Oil Action Plan, the Agency is to address the issue of the usage of oil spill dispersants and their implications. Once oil has been spilled into the sea, the primary goal of any response actions is to mitigate the socio-economic and environmental impact by removing the spilled oil from the water surface as fast as possible. The purpose of oil spill dispersants is to transfer the oil from the sea surface, in the form of very small droplets, into the water column where there is a significant dilution effect. When used in an appropriate and timely manner, dispersants can remove a significant amount of oil from the water surface with a consequent benefit of reducing the risk of oiling of sea birds and mammals as well as shorelines.

With regard to oil spill dispersants, EMSA focuses on supporting Member States with relevant information and support tools (e.g. software) to allow for science based decisions to be taken by the responders/authorities as appropriate in the respective country or region.

In 2007, the Agency distributed to the EU Member States and EFTA countries the *Operational Manual on the Applicability of Oil Spill Dispersants*. This included a decision support software 'tool' as well as an Overview Report on the Applicability of Oil Spill Dispersants, which provided useful information on the use of dispersants. This Operational Manual was well received and after a period of utilisation, feedback was received from users in the Member States and from the Commission. This feedback was considered in a public procurement procedure to update and improve the EMSA dispersant 'tool'. The new EMSA software, called *Dispersant Usage Evaluation Tool (DUET)*, was completed in 2009 and a dedicated training was provided to Member States and coastal EFTA States experts in early December 2009. The Report on the Applicability of Oil Spill Dispersants was also updated in 2009. Subsequently, DUET will be distributed to the Member States and EFTA coastal State Maritime Administrations in 2010.

Following the 1st EMSA Dispersants workshop in 2005, a desire for standardisation and harmonisation among Member States with respect to dispersant testing and approval methods had been emphasised. EMSA, in close cooperation with experts from the UK (CEFAS), Norway (Sintef), France (CEDRE) and an independent consultant, prepared a discussion paper summarising in detail the current status of dispersant testing and approval procedures in the EU. The document's findings were discussed in detail at the 2nd EMSA workshop on Dispersants, which was held in May 2008 in Lisbon. The main outcome of this workshop was the agreed way forward towards a more harmonised approach for dispersant testing and approval procedures through setting-up a Technical Correspondence Group (TCG Dispersants) facilitated by the Agency. Nomination of experts by the Member States to the TCG Dispersants has been completed and the terms of reference were agreed upon in 2009. Work on this issue will continue in 2010.

3.3.2. Inventories of MS Policies and Operational Response Capacities

In accordance with Regulation (EC) No 2038/2006, the Agency is tasked to "draw up on a regular basis a list of the private and state pollution response mechanisms and response capabilities in the various regions of the European Union".

The following inventories have been published by the Agency in fulfilling this requirement:

- In 2007, EMSA published the revised "Inventory on Member State policies regarding the use of oil spill dispersants", which was first compiled in 2005;
- In 2008, EMSA published the "Inventory of capacities for responding to pollution incidents involving hazardous and noxious substances (HNS)";

- In 2009, EMSA published the revised "Inventory of EU Member States Oil Pollution Response Vessels", which was first compiled in 2004 and updated in 2006.

These inventories are based on Member States' responses to questionnaires and are intended to provide a general description of the status of preparedness and response capacities of all coastal EU Member States and EFTA Contracting Parties (Iceland and Norway) to marine spills of oil and HNS. They include descriptions of response equipment, the competent authorities, the policies, and the preparatory arrangements of each Member State in the field of marine pollution preparedness and response.

3.3.3. *Information Dissemination*

Other activities promoting the dissemination of marine pollution specific information include the development by the Agency of an "Inventory of R&D projects relevant to marine pollution preparedness, detection and response" in November 2009. This provides brief information on 256 European research and development (R&D) projects linked to marine pollution preparedness, detection and response, as well as information on European Community financial instruments that provide funding opportunities for R&D projects and activities in this field. This inventory has been published on the pollution preparedness and response section of the Agency's website, which is updated regularly with relevant documents and links in this field to assist experts and public alike.

EMSA regularly participates in relevant conferences and exhibitions. Participation in such events is an important tool for the Agency in the context of disseminating information on its tasks and activities, as well as facilitating the understanding of its work by the general public. For example, the Agency participated in the World Fishing Exhibition (WFE) in September 2009. This is one of the most important exhibitions in the fishing sector and attracts tens of thousands of visitors from around the world. The event was organised by the Municipality of Vigo, Spain, from 16-19 September. EMSA shared an exhibition stand with the Community Fisheries Control Agency (CFCA) and the European Commission's DG-MARE. During a special Europe Day on 18 September, the Executive Director made a presentation on the Agency's activities and the fishing industry.

In conjunction with exhibitions and oil spill exercises, when possible, "open ship" days and tours are held on board the EMSA chartered oil spill response vessels. Visitors are given the opportunity to go on guided tours of the vessel (from deck to the bridge) and see demonstrations of oil spill response equipment (booms and sweeping arms).

3.3.4. *EMSA Informational Video*

EMSA produced two informational videos in 2009, one covering the Agency's overall tasks, and one presenting its oil spill response services. The latter provides a comprehensive overview of the Network of Stand-by Oil Spill Response Vessels. The focus is on the operational aspects of the program. It gives a brief overview of the concept (new capacities, cost efficiency, "top-up" philosophy, and activation upon request by Member State, under MS direction) and introduces the contracted vessels.

Figure 3.15 - EU Member States Oil Pollution Response Vessels: 2009 Inventory

TABLE 3.8 - PARTICIPATION IN EXTERNAL EVENTS BY THE AGENCY: 2007 TO 2009

Name of Event	Location	Date
EURISY Workshop	Tallin, Estonia	17-18 September 2007
DG TREN Day	Brussels, Belgium	20 September 2007
SaferSeas Conference	Brest, France	10-12 October 2007
Civil Protection Forum	Brussels, Belgium	22-23 November 2007
SeaSAR conference	Frascati, Italy	21-25 January 2008
Brest Maritime Festival (in cooperation with DG TREN)	Brest, France	11-17 July 2008
Italian Coast Guard Forum	Genoa, Italy	6-7 May 2009
INTERSPILL	Marseilles, France	12-14 May 2009
Symposium Earth Observation Business	Paris, France	10 September 2009
World Fishing Exhibition	Vigo, Spain	15-19 September 2009
Introducing Community Agencies to Candidate Countries	Sintra, Portugal	25-27 November 2009

3.3.5. Co-operation & Co-ordination and Information Activities: Financial Summary

TABLE 3.9 - CO-OPERATION & CO-ORDINATION AND INFORMATION: FINANCIAL SUMMARY: 2007-2009

2007-2009	Commitments	Payments
Co-operation and co-ordination	564,458.95	347,445.45
Activities in the field of HNS response	79,100.00	37,564.23
Information Dissemination	50,054.79	61,138.64
Related missions	475,052.70	379,498.10
Subtotal	1,168,666.44	825,646.42

3.4. SUMMARY OF ACTIVITIES IMPLEMENTED DURING 2007 -2009

The marine pollution preparedness and response activities of the Agency during 2007-2009 have been presented in the three categories of Operational Support, Co-operation & Co-ordination and Information along with an indication of their cost in terms of commitment and payment appropriations.

By way of information, it should be noted that in 2009, the Internal Audit Service (IAS) of the European Commission undertook a specific audit of the EMSA Stand-by Oil Spill Response Vessel Network. The overall objective was to provide the Agency's Executive Director and Administrative Board with an independent assurance on the adequacy and effectiveness of the internal control system regarding the network of contracted vessels. The overall finding of the AS is that the internal control system in place provides *reasonable assurance*[25] regarding the achievement of the business objectives set-up for the vessel network.

The next chapter undertakes, in line with the EMSA Regulation as amended, to analyse the cost efficiency of the main expenditure activities i.e. the Network of Standby Oil Spill Response Vessels and CleanSeaNet.

25 IAS Explanation: "Even an effective internal control system, no matter how well designed and operated, has inherent limitations - including the possibility of circumventing or overriding of controls - and therefore can provide only reasonable assurance to management regarding the achievement of business objectives and not absolute assurance."

3.4.1. *All Activities: Financial Summary 2007-2009*

TABLE 3.10 - EMSA POLLUTION PREPAREDNESS AND RESPONSE ACTIVITIES: FINANCIAL SUMMARY: 2007-2009

2007-2009	Commitments	Payments
Network of Stand-by Oil Spill Response Vessels	46,363,654.42	34,559,298.86*
Exercises	1,157,500.00	1,082,555.37
Improvements	5,324,730.86	4,547,630.50
CleanSeaNet Operations	2,859,946.40	4,671,731.14**
Support to CleanSeaNet Users	358,270.53	223,995.50
CleanSeaNet Service Development	2,673,615.53	2,283,212.01
Co-operation and co-ordination	564,458.95	347,445.45
Activities in the field of HNS response	79,100.00	37,564.23
Information Dissemination	50,054.79	61,138.64
Related missions	475,052.70	379,498.10
Total	59,906,384.18	48,194,069.80

* These payments were also used to execute contracts launched in previous years:
2005: 3 contracts - EUR 16,400,594 commitment appropriations
2006: 2 contracts - EUR 7,128,294 commitment appropriations

** These payments were also used to execute contracts launched in previous years:
2006: 3 contracts - EUR 3,963,610 commitment appropriations

The figure below shows the relative utilisation of commitments and payments by major activity for the period 2007-2009.

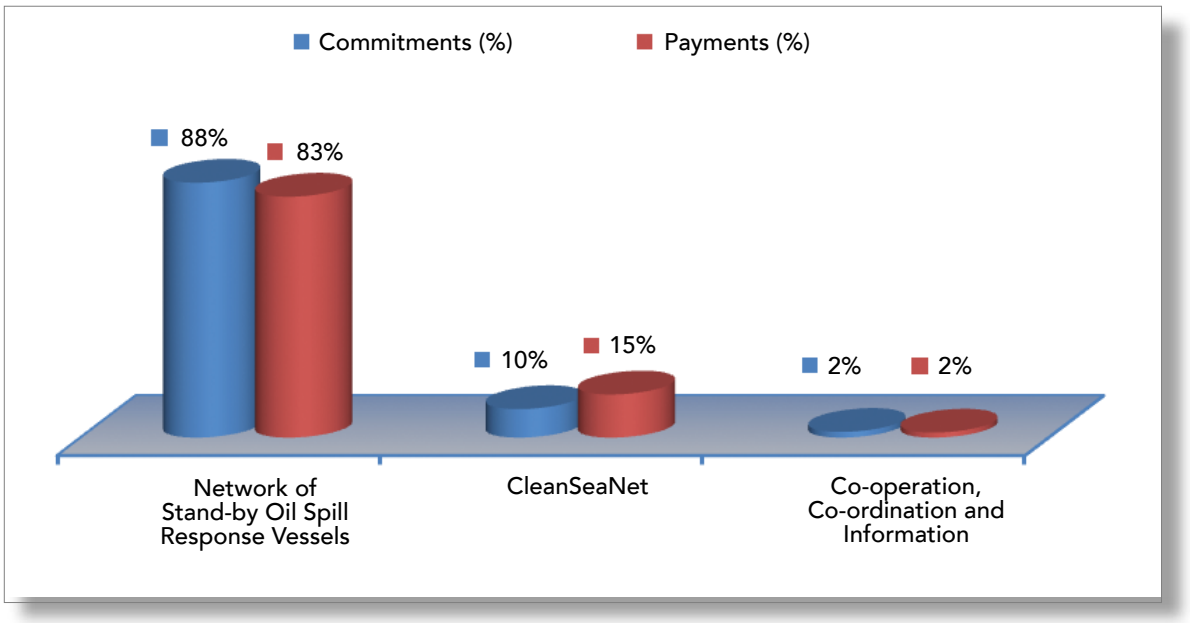


Figure 3.16 - Relative Utilisation of Commitments and Payments by Major Activity: 2007-2009

4. COST EFFICIENCY AND ADDED VALUE OF EMSA ACTIVITIES

EMSA activities should be provided in a cost efficient way and bring added value. This section explores in more detail these two important aspects as regards the marine pollution response operational services provided through the Agency in support of Member States. As the Network of Stand-by Oil Spill Response Vessels and CleanSeaNet account for more than 95% of expenses under the Multi-annual Funding Regulation, they are reviewed in depth from a cost efficiency and added value perspective.

With regard to Network of Standby Oil Spill Response Vessels, two main themes of analysis have been undertaken. The first theme looks at the cost of setting up and maintaining the service within the framework of such a service being provided at the European level. The results of the analysis indicate that the service has been set-up in a cost efficient manner and that the operational support would also be financially positive for most Member States in most major spill scenarios.

The second theme of analysis is that of the potential cost benefit due to the operational intervention of the EMSA vessels during an incident i.e. the effect of collecting oil at-sea and the associated reduction in financial impact on the affected coastal State.

4.1. NETWORK OF STANDBY OIL SPILL RESPONSE VESSELS: COST ANALYSIS

4.1.1. Setting-up and Maintaining the Service

In order to establish the Stand-by Oil Spill Response Vessel Network throughout European waters the Agency has launched, since 2005, annual procurement procedures for suitable vessels/equipment arrangements. As a result to date, with a relatively small budget, the European regional sea basins are covered by this service with only relatively small areas not included e.g. the Adriatic.

Through the abovementioned procurement procedures, the Agency has sought appropriate response arrangements from the commercial shipping market. In general the associated Vessel Availability Contracts are for three years (renewable once) and have a value of about EUR 4 million. There are two contracts which cover two geographical areas (instead of one) and they have larger values (EUR 7.2 - 8.5 million).

Each Vessel Availability Contract has three main elements, namely:

- Prefitting:

  The key objective with respect to pre-fitting is to have efficient heating, pumping, decanting and discharging systems on the vessels. This means adapting the vessel to be fit for purpose. The investment in vessel pre-fitting covers all modifications made in order to install oil recovery systems including foundations on the deck and, if necessary, modifications to the vessel pumping and piping systems as well as to the oil storage tanks.

  Should the contract not be renewed, the amount paid cannot be recovered by EMSA. For the majority of contracts the investment in pre-fitting the vessels (non-recoverable direct investment in the vessel) was low, ranging from 5 % to 20 % of the total contract value. There were only two contracts significantly above the average ratio (26 % and 42 % respectively). In both these two cases, they were the only suitable technical offers in their respective tender rounds for the given geographical areas. Such a situation limits the negotiation framework for the Agency.

  The lowest necessary investment in pre-fitting to achieve an efficient pollution response configuration is for oil tankers and, in principle, hopper dredgers. Highly specialised vessels, e.g. offshore supply vessels, require higher investment in pre-fitting particularly due to the tank storage capacity and heating issues.

- Equipment:

  Specialised equipment is needed for optimum recovery of oil from the sea surface. For most contracts the investment in the specialised oil recovery equipment exceeded 40 % of the total contract value. It should be highlighted that the Agency has the contractual right of a "transferable call option" on the equipment. Accordingly, the equipment is recoverable at the cost of EUR 1 when a contract expires or is terminated. The equipment can then be transferred to a new Contractor. This mechanism has already been implemented on the only occasion where the call option was applicable i.e. the specialised equipment was "recycled" for use by a new contractor.

The average value of equipment per contract was around EUR 2 million with slight differences between contracts. Under some contracts two vessels can be mobilised and therefore they have higher equipment costs (double set of equipment or two separate equipment stockpiles).

In terms of ratio of the recoverable assets (equipment) with respect to the total value of the contract the most advantageous contracts are those with oil tankers, hopper dredgers and those supply vessels with appropriate storage capacity. The majority of vessels in the Network are of these types. The only exception is an icebreaker contracted at the end of 2009 to provide services in the Northern Baltic.

- Vessel Availability Fee:

This is the amount paid to secure the vessel's availability within a given mobilisation timeframe for at-sea oil recovery operations to support a Member State affected by an oil spill.

Additional costs relate to the participation of vessels in at-sea exercises. The main aim of participating in such events is to facilitate the integration of the EMSA vessels in national pollution response mechanisms as well strengthen, at the operational level, the coordination of the EMSA vessels with those of Member States. Regarding costs, the daily payment rate for exercises is addressed in the Vessel Availability Contract whilst expenditure on fuel is paid based on actual consumption and the applicable market price.

During the period reviewed in the study a number of improvements, e.g. increasing the oil recovery rate significantly by the addition of a high specification multi-skimmer, have been made to certain contracts. Improvements to the oil recovery capacity of the vessels completed in 2007 and 2008 were executed at a reasonable cost. In almost all cases over 90% of the costs were related to the purchase of additional equipment (pumps, skimmer, "oil in water" monitors) and as such are recoverable investments for the Agency through the implementation of the previously mentioned "call option".

4.1.2. Cost Efficiency of Approach to Set-up the Network

The implemented approach of investing European Union/ Community funds to make available the at-sea oil recovery service through mobilisation of 3rd party vessels avoids in principle significant investments in buying or building a dedicated vessel and its associated running/operating costs. It also addresses the issue of frequency of use. The Agency is tasked to provide a service that is a "reserve for disasters" which by its definition should not be expected to be activated frequently. Dedicated pollution response vessels are more appropriate where the expected activation is more frequent. If the Agency had bought or built dedicated vessels there would always be issue of what the vessels and crews should do when not responding to an incident. Participation in at-sea exercises would only occupy a limited amount of time. For the remaining period of the vessel and crew would be "idle", however there would still be regular expenditure on crew and on keeping the ship itself operational.

From such a perspective, the most obvious cost efficient approach is that implemented by the Agency. Nonetheless, an estimated comparison of the EMSA model versus buying/building dedicated vessels is presented in Table 4.5.

The Network has evolved on a continuous basis since 2005 through the addition of new vessels and even to the extent that a (small) number of individual contracts have been reconfigured. For the purposes of the comparison, the following arrangements are considered for the period 2007-2009. It should be noted that it does not take into account the exact month when an arrangement was accepted into the Stand-by Phase (i.e. became available to assist a Member State) of a contract. Such acceptance varies between arrangements and such a level of detail is not necessary for this particular analysis.

TABLE 4.1 - NETWORK VESSELS AND CONTRACTS OPERATIONAL DURING 2007-2009

Year Contract Awarded	Area	Vessel Name	Recover Oil Storage Capacity (m^3)	Operational in 2007	2008	2009
2005	Baltic Sea	*OW Aalborg & OW Copenhagen*	2 x 4360	2	2	2
	East Med	*Mistra Bay*	1805	1	1	1
2006	Atlantic	*Galp Marine*	3023	1	1	1
	East Med	*Santa Maria*	2421	1	1	1
2007	Atlantic	*Forth Fisher, Galway Fisher & Mersey Fisher*	2 x 4754	0	2	2
	West Med	*Bahia Tres & Salina Bay*	3800 & 2421	0	2	2
	Aegean / Black Sea	*Aktea OSRV*	3000	0	1	1
2008	Black Sea	*GSP Orion*	1334	0	0	1
	North Sea	*DC Vlaanderen 3000 & Interballast III*	2744 & 1886	0	0	2
	Atlantic	*Ria de Vigo*	1522	0	0	1
				2007	2008	2009
Vessels operational				5	10	14
Storage Capacity: m^3				15, 969	34,698	42,184
Average Storage Capacity per Vessel: m^3				3,194	3,470	3,013

The table below is focused on the period 2007-2009 showing the average number of vessels operational for the period and the average storage capacity per vessel.

TABLE 4.2 - AVERAGE NUMBER OF OPERATIONAL VESSELS & THEIR STORAGE CAPACITY: 2007-2009

Average for period 2007-2009	
Average Number of Operational Vessels per Year	9.7
Average Storage Capacity per Vessel (m^3) per Year	3,201

Key to the comparison is the cost of the above-mentioned vessels. The table below is shows the breakdown of the three main cost elements over the period 2007-2009.

TABLE 4.3 - EMSA NETWORK COSTS: AMOUNTS PAID: 2007 - 2009

Cost Element: Amount Paid (€)	2007	2008	2009	Total: 2007-2009	3 Year Average	Average per Vessel per Year
Equipment	7,608,234	4,180,369	2,945,270	14,733,873	4,911,291 *	
Pre-Fitting	1,974,466	2,220,998	1,955,619	6,151,083	2,056,361 **	
Vessel Availability Fee	2,891,201	4,224,835	5,916,158	13,032,194	4,344,065	
Exercises (Vessel hire & fuel consumption)	749,649	365,075	609,980	1,724,704	574,901	
Improvements	461,660	1,739,523	2,346,448	4,547,630	1,515,877	
Total	13,685,209	12,730,800	13,773,475	40,189,485	13,396,495	€ 1,381,082

* The specialised response equipment is expected to be used for renewed contracts. Accordingly, renewed contracts incur no additional equipment expenses.

** There are no additional pre-fitting costs when a contract is renewed as the vessels are already adapted for the specialised oil pollution response equipment.

Based on the previous tables, the average cost per vessel per year and associated storage capacity can be estimated for the period 2007-2009.

The estimated equivalent cost for a dedicated pollution response vessel might be calculated as follows. It must be appreciated that the information below is based on best efforts regarding the cost of building new vessels. It can be expected that different Member States could have different perspectives on the costs estimations. The table below summarises the essential estimated costs for building a new dedicated pollution response vessel.

TABLE 4.4 - NEW POLLUTION RESPONSE VESSEL: ESTIMATED COST

Cost Element	
Price of acquisition	€ 36,000,000
Capacity	2,000 m^3
Operational yearly costs	€ 1,800,000
Amortization period	25 years
Total Cost over 25 years	€ 81,000,000
Average cost per vessel per year	€ 3,240,000

The table below compares the estimated costs of the two approaches to providing an at-sea oil recovery at the European level.

TABLE 4.5 - COMPARISON OF EMSA NETWORK APPROACH VS. BUYING NEW POLLUTION RESPONSE VESSEL

Estimated Average per Vessel	Dedicated Vessel Approach	EMSA Approach	Difference	Comparison
All investment and running costs per year	€ 3,240,000	€ 1,381,082	- € 1,858,918	EMSA approach costs almost 60% less per year
Average storage capacity per vessel	2,000 m^3	3,201 m^3	+ 1,201 m^3	EMSA approach provides approx. 60% more storage capacity per year

Whilst it should be kept in mind that the figures shown above are estimates it can still be concluded that the approach implemented by the Agency is more cost efficient on a yearly basis as well providing more storage capacity per vessel. An additional advantage of the stand-by contract template is the weaker economic commitment required. In line with any Agency policy objectives, the number of ships in the Network can be adapted reasonably quickly. The increased efficiency of prevention policies and the political wish to decrease the dependency on hydrocarbons as energy source are the main factors that could contribute to such a scenario.

A recognised weakness of the EMSA model is its dependency on the availability and location of commercial vessels. By way of comparison, a dedicated vessel of a Member State can in principle be stationed wherever the relevant authority wishes. The Member State can, more or less, place the vessel in an optimum position in light of its national contingency plan. The EMSA approach is more broad-brush as it is dependent on suitable vessels operating in suitable areas. The importance of this effect is diluted when considering that the overall task for the Agency is to provide "top-up" resources to support Member States.

In addition, it should be noted that a dedicated response vessel should have a quicker mobilisation time, as it is, in principle, permanently "ready to sail". The EMSA approach has established contracts with a 24 hour period for the vessel to cease its commercial activity load the specialised oil response equipment and be "ready to sail". Such a step fits well with the concept of providing a "European Tier" of resources to top-up the resources of Member States responding to an incident.

4.1.3. Summary of Setting up and Maintaining the At-sea Oil Recovery Service

Setting up the Network of the Stand-by Oil Spill Response Vessels throughout European waters has been achieved on the basis of relatively small budget, certainly within the context of merchant shipping. In general the values of the majority of the contracts were between EUR 3.5 million and EUR 4 million for a single vessel for a 3 year period.

The total value of the contract is a result of tendering in a free market. Offers cover a range of different types of vessels in various technical conditions and oil tank storage capacities. Financial conditions of the contracts also depend on the type of commercial activity of the bidding company, its economic condition and realities of the local shipping market. The Agency, applying strictly the EU procurement regulations, awarded the contracts to those companies which presented the most suitable offers in terms of the technical and financial conditions.

One particular point of competition during procurement procedures is the vessel's daily hire rate for at-sea oil recovery operations. This is also the rate that the Member State requesting assistance would pay to the contractor. As the EMSA contractor rates are competitive at the "point of use" the Member State could expect to be reimbursed by the polluter/Protection & Indemnity (P&I) Club for reasonable use.

Based on the analysis above it can be concluded that the Agency is meeting the challenge of providing an at-sea oil recovery service at the European level in a cost efficient manner.

4.2. OPERATIONAL EFFECTIVENESS OF THE NETWORK

Arguably, the most important aspect for consideration is the operational effectiveness of the Network in relation to its objective of providing a "reserve for disasters" of at-sea oil recovery capacity to support coastal States during an oil spill. This should be analysed with respect to the potential cost benefit of such a Network. An appropriate analogy would be that of an insurance premium (the annual expenditure on the Network) providing coverage in the event of accident (the financial benefit to the affected coastal State resulting from reduced impact due to oil recovered at sea by EMSA vessels).

It is worth noting that the main aim of recovering oil at sea is to reduce shoreline impact. A traditional "rule of thumb" is that one tonne of oil recovered at sea equates to a reduction of 10 tonnes of shoreline waste. This is turn reduces the socio-economic and environmental shoreline impact as well as remedial measures required to clean-up and restore the affected areas.

4.2.1. Scenario Analysis

As part of understanding the potential operational effectiveness of the Network during an incident, an internal study has been carried out with respect to different spill scenarios. The objective of this study is to analyse the benefits and limitations of the Network. A description and summary of the study's findings are presented below.

With regard to scenarios, both past and new spills have been analysed. For past spills, some of the most significant incidents that occurred in EU waters were included. Additionally scenarios have been developed based on the new pipelines that are expected to be operational in the next few years as well as for hypothetical accidents that have not occurred to date e.g. a large spill in the Baltic Sea. With respect to the analysis results two specific incidents (Erika and Prestige) are presented in more detail along with the overall results of all the scenarios. The table on the following page summarises the scenarios analysed.

TABLE 4.6 - SUMMARY INFORMATION REGARDING THE SCENARIOS ANALYSED

Area	Incident	Date	Incident area	Pure oil spilled (tonnes)	Distance from shore (nm)	Length of coastline affected (km)	Type of oil
Atlantic Coast	*Prestige*	13 Nov 2002	Cape Finisterre, Galicia, Spain	63,000	140	1,900	IFO 650
	Aegean Sea	3 Dec 1992	La Coruna, Galicia, Spain	15,000	0	300	Brent Blend, (Light crude)
	Erika	12 Dec 1999	Brittany, Bay of Biscay, France	19,000	60	400	HFO
Baltic Sea	Baltic Carrier	29 Mar 2001	Kadet fairway, Jutlans islands, Denmark	2,700	16	50	HFO
	Hypothetical Scenario Copenhagen	Dec 2008	Copenhagen, Denmark	50,000	60	57	HFO No.6
Mediterranean Sea	Haven	11 Apr 1991	Genoa, Italy	144,000	2	110	Iranian crude oil
	Hypothetical Scenario Alexandroupoli	Dec 2008	Alexandroupoli, Greece	50,000	25	34	HFO No.6
Black Sea	Nassia	13 Mar 1994	Bosporus Strait, Turkey	33,000	0.3	No info available	Crude oil
	Hypothetical Scenario Burgas	Dec 2008	Burgas, Bulgaria	50,000	60	171	HFO No.6

The main methodological considerations are described below.

To carry out this analysis, the performance of the EMSA Network has been measured in the different spill scenarios using three main indicators:

- Amount of pollutant (oil/water mixture) recovered at sea;
- Net economic value (financial benefit to the requesting Member State).
  Although not all the negative effects of a spill can be measured in Euro (i.e. social and environmental aspects), the economic value for the Member States has been estimated for the cases where data was available using the following formula:

  Net Economic value to affected MS =

  Cost saved for MS due to EMSA Response Contribution – EMSA Investment– MS Charter Cost

  As it is impossible to know precisely when the next large spill will occur, the investment by the Agency of Community funds has been estimated using the maximum duration of a Vessel Availability Contract as the basic timeframe, i.e. 6 years;
- Reduction in length of coastline polluted.
  The pollutant recovered at sea by EMSA vessels could, under certain circumstances, reduce the length of coastline polluted. In order to estimate the potential reduction, trajectory modelling software was run with and without EMSA intervention and the length of polluted coastline measured in both cases.

  It should be noted that modelling has been carried out only for the new scenarios. For past spills, it has proven not to be feasible to recreate the circumstances of the spill with sufficient accuracy in the model environment.

Operational Limitations of the Network

When considering the results of the analysis certain elements should be kept in mind, these include:

- EMSA vessels, although they have large on board storage capacity, are of relatively deep draught and accordingly cannot operate in shallow waters;
- If weather conditions are extremely poor (above Beaufort 5-6) the at sea oil recovery systems do not function efficiently. If these weather conditions were to last for the whole "window of opportunity" no vessel would be able to recover oil at sea;

- EMSA vessels will, during an incident, be under the operational command of the requesting Member State. Effective deployment and tasking of EMSA vessels, and the associated efficiency and recovered amount, will largely depend on the decisions of the Member State personnel appointed to implement and coordinate response operations;
- The availability of discharging facilities is currently out of EMSA control and could be a bottleneck. It would appear that the (un)availability of discharging facilities is a common problem around Europe. Appropriate arrangements to ensure access to sufficient and technically suitable discharging facilities should be established before the incident[26].

26 In the event of an emergency, Member States often have the possibility to use any facility needed to deal with a disaster through various civil protection mechanisms. However, it is obvious that if all the necessary steps to prepare the appropriate facilities are taken before the incident this potential bottleneck could be overcome more easily.

4.2.2. Operational Effectiveness: Erika and Prestige Scenarios

Two incidents, the Erika and Prestige, are presented in more detail due to their particular relevance to the history of tasks assigned to the Agency in the field of marine pollution preparedness and response.

Based on the study, the results of the Erika and the Prestige scenarios are compared below.

From the analysis, a number of conclusions can be identified as detailed below:

TABLE 4.7 - COMPARISON OF THE ERIKA AND PRESTIGE SCENARIOS

	Erika	Prestige
Oil Spilled	20,000 tonnes	63,000 tonnes
Pure oil recovered by EMSA	5,854 tonnes (26%)	33,177 tonnes (53%)
Window of Opportunity	11 days	>21 days
Daily hours recovering oil	Oil spread over a large area in small patches (more time chasing than recovering)	Oil slicks more concentrated
Average Individual Storage capacity of EMSA vessels mobilised	2,775 m3	3,546 m3
Average Recovery rate	192 tonnes/day	557 tonnes/day
Solid waste avoided onshore	33%	83%
Net Economic Value to the Affected Member State	€ 96 million	€ 584 million

- The results indicate the positive net benefit that the EMSA vessels would have made in contributing to the mitigation of the financial impact of the two incidents;
- With regard to the Erika incident, the combination of negative circumstances would clearly decrease the efficiency of the at-sea oil recovery by EMSA ships. These circumstances include:
  - Reduced window of opportunity due to the winds and currents;
  - Extremely bad weather spreading the oil into small patches over a very large area;
  - Limited efficiency of oil tracking systems (slick detection systems or satellite) in poor weather conditions;
  - Despite the fact that none of these negative (natural) circumstances can be altered the operational contribution of the EMSA vessels would still have a significant positive financial impact. This net benefit is projected to be EUR 96 million;
- With regard to the Prestige, the conditions for at-sea oil recovery were generally good. This is reflected in high daily oil recovery rates and the relatively long "window of opportunity" to undertake operations. Clearly such conditions build towards a very positive outcome with regard to the amount of pollutant recovered;
- The projected net financial benefit of EUR 584 million is significant.

It should be noted that the very positive result that could be achieved for an incident such as the Prestige is partly due to the fact that the EMSA Network was designed considering specific lessons learnt from the Prestige, as indicated in the 2004 Action Plan. In this case, the at-sea mechanical recovery was the best response option in view of the "window of opportunity" available.

4.2.3. *Operational Effectiveness: Overall Results*

The extensive analysis carried out for each of the scenarios produced a large amount of data and lessons learnt. All the information gathered is very valuable but needs to be rationalised, organised and presented appropriately if strategic decisions are to be made. Accordingly the most relevant results of each scenario have been extracted and summarised in table 4.8.

It is worth mentioning that oil recovery at sea is not an exact science where there is only one solution to one problem. Accordingly, the different values estimated for the above mentioned indicators should be taken as an order of magnitude of the potential that the Network has and not as an exact figure.

The three main indicators of the performance of the EMSA network indicated at the beginning of this study i.e., pollutant recovered, economic value and reduction of polluted coastline, are included together with other relevant data like the potential capacity that could be mobilised by EMSA and the relevant Member States. The window of opportunity is also indicated as it helps to put in perspective the indicators analysed.

4.2.4. *Indicator Analysis*

Keeping in mind the three major indicators mentioned at the beginning of this section, a more detailed view of the results is presented below.

Pollutant[27] Recovered at Sea

There was sufficient data for all scenarios to apply the methodology and arrive at projected results regarding the effect of the EMSA vessel intervention and the associated increase in oil recovery at sea.

27 The word "pollutant" refers to the mixture of oil and water that is floating in the sea following the spill of pure oil. Accordingly, readers familiar with the incidents analysed will notice that the amount of pollutant at sea indicated in this report is greater than the amount of pure oil spilled due to the emulsification effect.

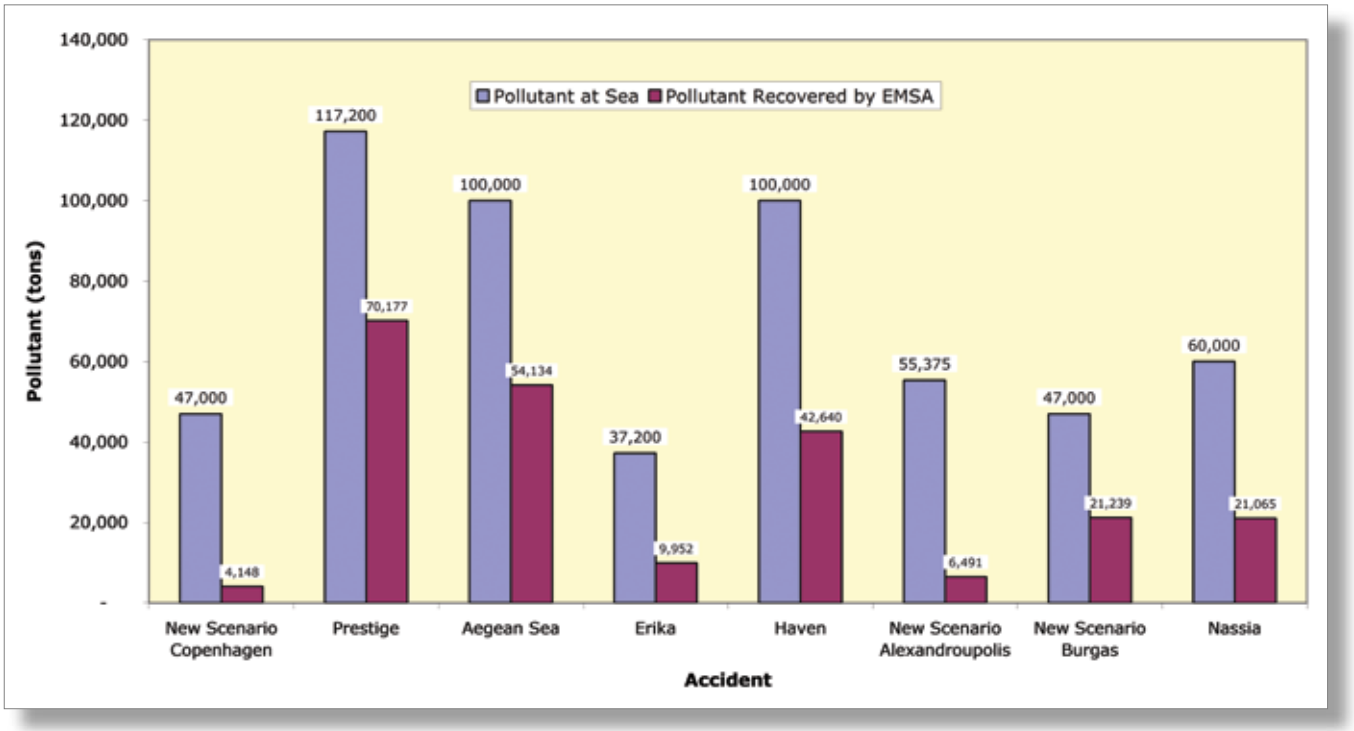


Figure 4.1 - Theoretical Amount of Pollutant Recovered by EMSA Vessels

From the chart on previous page the following conclusions can be made:

- EMSA vessels are expected to recover between 10% and 60% of the pollutant at sea in the scenarios studied. This wide range reflects the different circumstances that affect the efficiency of the oil recovery operation, especially the "window of opportunity" available to recover oil at sea;
- The intervention of EMSA vessels can avoid a substantial amount of pollutant washing ashore or affecting the water column resources e.g. fisheries. For example in the Erika incident, it was estimated that each tonne of pollutant which reached shore produced 11 tonnes of solid waste. Therefore, the intensity of the pollution and its associated environmental damage will be significantly reduced;
- Where there is a limited "window of opportunity" (Alexandroupoli and Copenhagen scenarios) or there are extremely bad weather conditions (Erika) the efficiency of the at-sea oil recovery operation would drop significantly;
- The most efficient EMSA contribution would take place in the Prestige scenario. This reflects the fact that the EMSA network was designed taking into account the lessons learnt from this incident. The six EMSA vessels mobilised, with a combined storage capacity above 20,000 m^3, would recover up to 70,000 tonnes of pollutant. The performance of the EMSA vessels in this incident was adjusted to ensure equivalency with that of comparable vessels that actually participated in the real incident.

Economic Value

This indicator analysis is restricted to those incidents where cost data was available.

From the chart below the following conclusions can be made:

- In addition to the beneficial social and environmental effect, the EMSA network would also be economically valuable for the Member States;
- The economic value would be significant for most of the cases, in the Prestige case alone reaching almost EUR 600 million;
- In the Erika case, where the bad weather conditions decreased the efficiency of the oil recovery operation, the economic value would still approach EUR 100 million;
- In the Aegean Sea case where the claimed amount was relatively low for this scale of incident, the economic value would still be positive;
- From these results it can be concluded that, even when the efficiency of the operation is affected, at-sea mechanical recovery not only limits the environmental damage but also the economic loss. This conclusion reinforces the general concept behind the EMSA service and most EU countries' oil pollution response mechanisms.

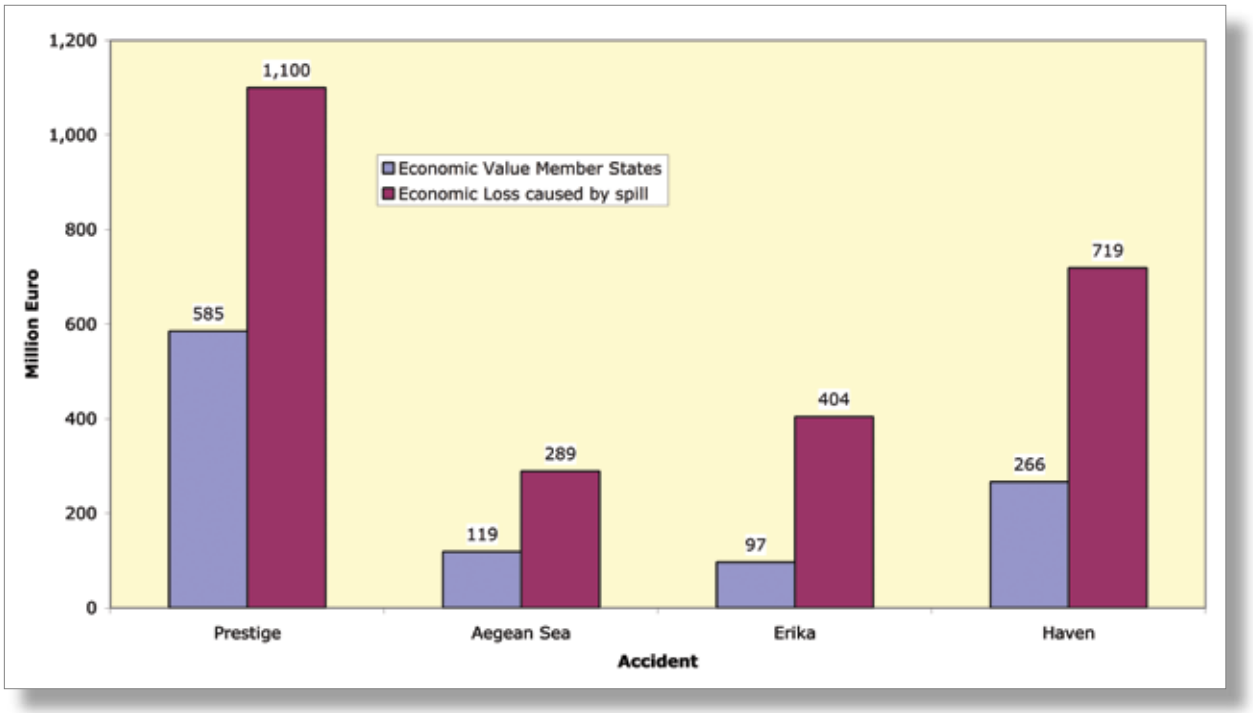


Figure 4.2 - Theoretical Economic Value of the EMSA Network to Individual Member States

Reduction of Length of affected Coastline

This indicator analysis is restricted to the identified hypothetical scenarios. It has not proven to be feasible to model actual incidents with sufficient precision.

The chart below shows the theoretical length of coastline affected without EMSA intervention (blue). The theoretical effect of EMSA intervention is shown by the percentage of oil recovered resulting in the final length of coastline affected (red).

From the chart the following conclusions can be made:

- No general rule can be provided with regard to the effect of the at-sea oil recovery operation in the length of affected coastline. Any change in one of the dynamic variables affecting the length of polluted coastline would significantly alter the result regardless of the amount collected at sea;
- For two of the cases studied (Burgas and Copenhagen), the reduction of length in percentage is higher than the percentage of pollutant recovered. For example, in the Burgas scenario, where 45% of pollutant is recovered, the reduction of polluted coastline is 60% ((171-69)/171);
- In the two cases indicated in the point above, the coastlines concerned have shaped irregularly. Burgas has an important bay and Copenhagen is in the middle of an archipelago with many different pieces of land of different shapes interfering with the drifting of the oil;
- In the case of Alexandroupoli with a straight coastline and the current directing the oil to the coast, the reduction would be insignificant although the intensity of pollution would be reduced. Once an area was cleaned, the pollutant would tend to spread in order to fill the cleaned area;
- It appears from these three cases that the more regular the shape of a coast is, the less important the reduction in length of coastline polluted will be. This is a tentative conclusion, and should not be taken as a general rule.

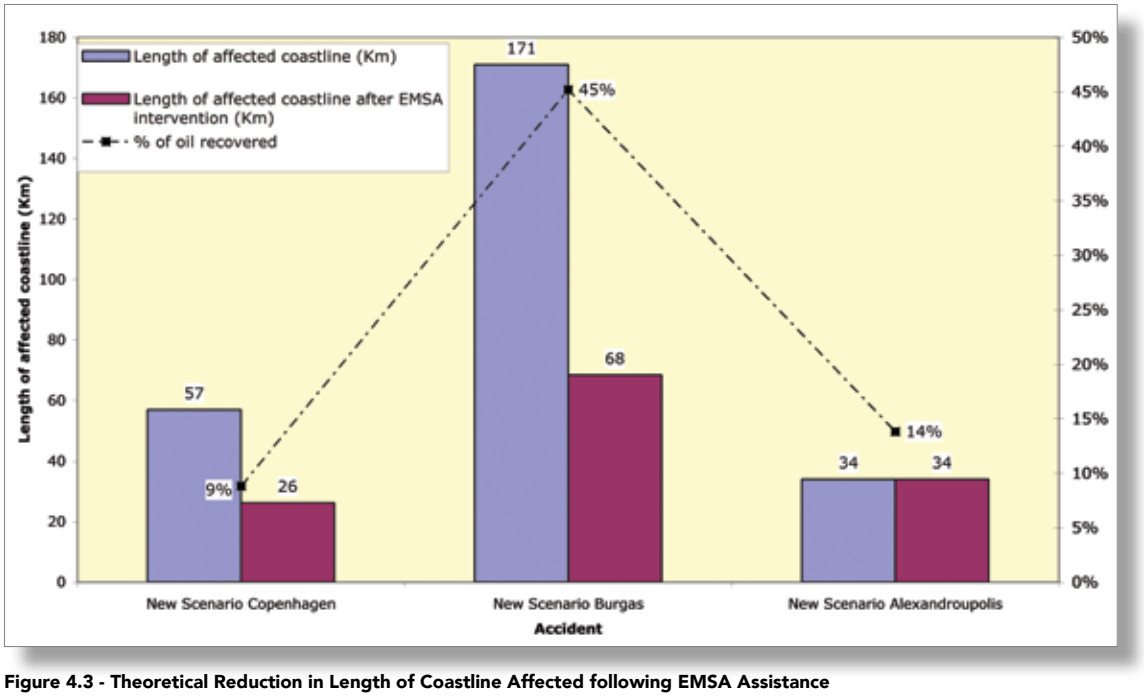


Figure 4.3 - Theoretical Reduction in Length of Coastline Affected following EMSA Assistance

4.2.5. Summary of the potential EMSA contribution for each Scenario

The table below shows the analysis results for each scenario. It is important when considering these results to keep in mind the complexity (number of range of variables/ assumptions) that have been covered. This, by its very nature, creates a level of uncertainly within the calculations. Accordingly, a prudent approach is to interpret the values by order of magnitude as opposed to their precise value e.g. the positive financial benefit of the EMSA intervention during the Erika would have been at the scale of EUR 100 million as opposed to precisely EUR 97 million.

It is clear for those scenarios where there is cost data for analysis, that the EMSA Network would make a positive overall financial benefit to the affected Member State. With a range of approximately EUR 100 million to EUR 600 million, the specific characteristics of an incident (e.g. weather conditions, window of opportunity, location, oil type and quantity spilt) have a major influence on the operational effectiveness of the EMSA vessels undertaking at-sea oil recovery operations and the associated financial benefit.

EMSA intervention in the incident with the least favourable conditions, i.e. the Erika, would still have resulted in an overall positive financial benefit to the affected Member State. The length of coastline affected would be reduced except in circumstances where the spill occurred very close to shore and the associated window of opportunity is very short.

TABLE 4.8 - SPILL SCENARIOS – THEORETICAL RESULTS OF EMSA CONTRIBUTION

Incident	Capacity Mobilised by EMSA (m^3)	Capacity Mobilised by MS (m^3)	Pollutant at Sea (tonnes)	Pollutant Recovered (tonnes)	Length of affected coastline (km)	Reduction in length of affected coastline (%)	% of pollutant recovered by EMSA	Window of Opportunity (days)	Economic value with a 6 year investment timeframe (€ m)
New Scenario Copenhagen	8,720	5,550	47,000	4,148	57	54%	9%	3	No info***
Baltic Carrier	N/A	1,490	1,100**	N/A	50	N/A	N/A	3	No info***
Prestige	21,275	19,825	117,200*	70,177	1900	N/A	60%	21	585
Aegean Sea	25,975	19,825	100,000*	54,134	300	N/A	54%	14	119
Erika	13,875	12,495	37,200*	9,952	400	N/A	27%	11	97
Haven	17,426	3,050	100,000	42,640	110	N/A	43%	14	266
New Scenario Alexandroupoli	8,526	1,500	55,375	6,491	34	0%	14%	5	No info***
New Scenario Burgas	18,726	0	47,000	21,239	171	60%	45%	12	No info***
Nassia	11,326	0	60,000*	21,065	No info	N/A	35%	10	No info***

* This amount of pollutant (oil/water mixture) following emulsification of the oil. The amount excludes any oil that evaporated, burned, dispersed or the part of the cargo that remained on board. Additionally, the maximum amount recoverable by specialised vessels at sea would be lower due to the oil sinking or drifting to shallow waters.

** All the pollutant recoverable in open sea was contained by specialised national vessels.

*** For these incidents, no cost data was available for comparative analysis.

4.2.6. *Operational Effectiveness: Conclusions*

EMSA vessels will be under the operational command of the requesting Member State. The efficiency and recovered amount will largely depend on the decisions of the appointed personnel responsible for the operation.

In general, the type, size and location of the EMSA vessels are suitable to deal with major oil spills where at-sea oil recovery is possible. All the lessons learnt in past spills have been considered when designing the Network. The estimated operational performance in the new scenarios confirms the suitability of the design concept.

With regard to the equipment specifications, this has been designed to cope with high viscosity oil and bad weather conditions (up to Beaufort 5 approximately) keeping mind the experience of past spills. The two shortcomings that could be addressed are the replacement of the flexible sweeping arms in the Southern Baltic by rigid arms and the addition of a set of rigid sweeping arms to the arrangement based in Cobh (Ireland).

The availability of discharging facilities for oil recovered at sea is out of EMSA control and could be a bottleneck. It seems that the availability of discharging facilities is a common problem around Europe. EMSA has already partially addressed this issue by including a "Lightering Clause" in the vessel contracts. It indicates that the Contractor, if requested by the affected Member State, would try to find a suitable lightering vessel. Appropriate arrangements to have sufficient receiving tankers/barges with appropriate capacity to discharge the recovered oil should be in place before the incident[28]. Consideration could be given to the establishment of an arrangement to guarantee the availability of discharging facilities in sufficient number and capacity in order to mitigate one of the potential bottlenecks that may appear during a large-scale incident.

The analysis shows that the distribution of the vessels along the EU coastline shows some gaps in the Northern Baltic, Bay of Biscay, Eastern Mediterranean and Black Sea. However, as indicated, the new vessels that will be operational this year and the new procurement procedure launched in 2010, if successful, will contribute to minimise these gaps.

In general, the average individual capacity that could be mobilised is quite regular across the regions. The EMSA Network has an average individual storage capacity considerably higher than other response vessels in Europe. This allows them to spend more time recovering oil at sea.

In addition to the social and environmental beneficial effect, the EMSA network would also be economically valuable for the Member States. The estimations made for the cases analysed show values of at least EUR 100 million reaching more than EUR 500 million in one of the scenarios.

The amount of Community funds that have been invested to date in setting up and maintaining of the service and the expected potential benefits to affected Member States compares favourably with the "insurance coverage" analogy identified at the beginning of the analysis of operational effectiveness.

Considering the environmental, social and economic benefits identified for most of the scenarios analysed, it can be concluded that the Network of stand-by oil spill recovery vessels is a powerful tool in the hands of the Member States to combat large oil spills. In all the areas analysed EMSA would be able to mobilise, upon request, a higher capacity than that available from national resources. Accordingly, EMSA is meeting the challenge to "top-up" Member State oil pollution response capacity in a cost efficient manner. This European tier of response resources serves as a valuable reserve for disasters both from the environmental and economic point of view.

4.3. CLEANSEANET: COST AND OPERATIONAL EFFICIENCY

The Agency has set up and operates a state-of-the-art satellite oil detection and monitoring service covering all European waters for an overall cost of EUR 2.7 million per year including development, implementation and maintenance of the service, satellite image licence prices, processing and analysis of the images and the yearly fixed costs.

It is unfortunately not possible to compare the cost-efficiency of CleanSeaNet to national pre-existing services as when CleanSeaNet entered into operations in April 2007, only 12 Member States had prior experience with the use of SAR satellite imagery to detect marine oil pollution and few had contracted services with the industry.

28 In case of emergency, Member States have normally the possibility to use any facility needed to deal with a disaster. However, it is clear that if all the necessary steps to prepare the appropriate facilities are taken before the incident this potential bottleneck could be overcome easier.

In addition, most of these 12 national administrations were using satellite-based oil detection services either through European Research Framework Programmes (FP5, FP6 and FP7) or through ESA's Global Monitoring for Environment and Security (GMES) projects such as Marcoast. In addition to being highly subsidised by public money, these precursors of CleanSeaNet benefited from private industry R&D investments. Furthermore, the Near Real Time performance was much lower.

Consequently, the entry into operation of CleanSeaNet set a new quality and price benchmark for satellite based near real time oil pollution detection and monitoring. With CleanSeaNet, the results of the investments in European industry by the European Commission in the framework of research programs and by ESA were consolidated and carried forward successfully. The overall budget allocated and used for the CleanSeaNet activities between 2007 and 2009 is presented in the table below:

TABLE 4.9 - CLEANSEANET ACTIVITIES: OVERALL BUDGET

2007-2009	Commitments*	Payments
CleanSeaNet	2,859,946.40	4,671,731.14
Support to CleanSeaNet Users	358,270.53	223,995.50
CleanSeaNet Service Development	2,673,615.53	2,283,212.01
Subtotal	5,891,832.46	7,178,938.65
% of total APM	9.84 %	14.90 %

* Contracts were committed in 2006

Looking more in detail, the cost of the CleanSeaNet service can be divided as follows: image acquisition, processing and analysis account for half the costs. The rest is shared between licence, service set-up and maintenance costs.

Satellite monitoring and aerial surveillance are complementary. Satellite monitoring is the most economic tool to cover wide areas and/or areas remote from aircraft bases. To cover the same surface area, satellite monitoring is 10 times cheaper than aerial surveillance. Monitoring the area covered by the 5,816 CleanSeaNet images using aerial surveillance assets would have required more than 50,000 flight hours. Therefore, with a typical minimum price for one flight hour of 2,000 to 3,000 EUR, monitoring the same area with aircraft would have cost a minimum of EUR 100 million.

By ordering a large amount of images and data via a few contracts placed by the Agency, significant economies of scale could be achieved on licence costs and service costs as well. All contracts that have been signed by the Agency for either the purchase of SAR satellite image licences or for the acquisition, processing, oil detection analysis, include a price reduction mechanism for bulk purchasing. As explained above, ENVISAT licences are granted free of charge to EMSA. Therefore, the reduction in licence price due to mass ordering applies only to RADARSAT-1 and RADARSAT-2 images ordered to cover Member States' operational requirements.

Overall economies of scale achieved by setting up and running a service at European level can be estimated at 20 % of the accumulated costs of similar national systems.

EMSA put in place a rigorous quality control system in order to check the timeliness, completeness and quality of the service delivered by the CleanSeaNet Consortium. The associated financial penalty system ensured that the full price was paid only when all technical specifications were met. As this is an essential element to catch polluters in the act, emphasis was put on the near real time performance. The reduction in price for late deliveries varied from a minimum 25 % (delivery > 30 minutes and ≤ 45 minutes after satellite acquisition) up to 100 % when delivery time exceeded 90 minutes. It acted as a strong incentive for the Consortium to take corrective actions. As a result, the Near Real Time performance of the service has been constantly improving from 73 % images delivered within the required 30 minutes when the service started in 2007 to 85 % in 2009. By way of information, in 2009 94 % of images were delivered within 45 minutes after acquisition.

In addition, it is important to note that the operational impact of these delays on the Member State end user is much less as many of these delays concern the transfer of files to EMSA. The delays do not affect the transmission of the alert to the national authorities in the Member States when a possible spill has been reported. Nevertheless, these delays have had a financial impact.

One satellite scene is able to monitor huge areas (16,000 km2 for one single ENVISAT image, 90,000 km2 for a RADARSAT image). On average, one CleanSeaNet image overlaps with the alerting area of 2.8 Member States. Planning at the European level allows utilisation of the same scene for a number of countries thus optimising the use of satellite resources. EMSA and satellite operators have agreed on flexible licence conditions that enable the coastal States to share images for oil pollution detection and monitoring purposes.

6,391 satellite scenes were ordered (5,816 were successfully delivered) to fulfil the 11,886 requests issued by the Member States to monitor their national areas. It means than on average, one scene acquired covers the needs of nearly 2 coastal States. To achieve the same level of surveillance through individual national contracts would have required 5,495 additional orders.

TABLE 4.10 - CLEANSEANET: SUMMARY OF ECONOMIC ADVANTAGES

16/01/2007 – 31/12/2009	Cost Reduction
Economy of scale	~ 20 %
EMSA quality control procedures	~ 5 %
Shared use of satellite images by the Member States	~ 90 %

The added value of running the CleanSeaNet service on a European level goes beyond solely economic advantages. As already mentioned the CleanSeaNet service provides several advantages when compared to the implementation of similar services by individual coastal States. The provision of the EMSA hosted oil pollution detection and monitoring service at a European level ensures:

A capacity to monitor all European waters:
It should be noted that a number of European Member States do not have aircraft specially equipped for oil pollution detection and monitoring. The map on the next page, displaying the 2,105 possible oil spills detected by CleanSeaNet in 2009 and, highlighted in yellow, the spills checked by aircraft, gives a clear representation of where aerial surveillance is available to address illegal discharges.

It should be noted that fewer than half of EU coastal States were using satellite surveillance before the entry into operation of CleanSeaNet and wide European sea areas were not monitored.

With CleanSeaNet, all Member States could access, free of a charge, a state-of-the-art remote sensing oil pollution detection and monitoring service. Operations started in April 2007 with 15 coastal States using the service. This number has grown rapidly. With Croatia becoming a user in May 2008, 24 coastal States had access to CleanSeaNet by the end of 2009.

It should be emphasised that, for a number of European Member States, CleanSeaNet remains the only remote sensing tool available to detect and monitor oil spills at sea. EMSA and the Member States are continuously working at improving the effectiveness of the service for the benefit of all users. In parallel, the Agency is fostering the use of aerial surveillance as the ideal complement to satellite detection.

A harmonisation of the quality of satellite oil spill services throughout Europe:
EMSA, the CleanSeaNet Consortium and the Member States have worked together in order to minimise the rate of false alarms and to ensure that the same level of service is delivered for all areas independently of which service provider acquires and processes the image. Local marine environment and maritime traffic conditions have to be taken into consideration for oil spill detection analysis. To address some of the more challenging issues linked to regional variation in conditions, EMSA organised three regional workshops gathering experts from across Europe and service provider operators in order for them to share experiences and reflect on methodologies for improving the reliability of the analysis. The quality control system defined between EMSA and the Consortium also included a mechanism to ensure a harmonised and highly reliable service.

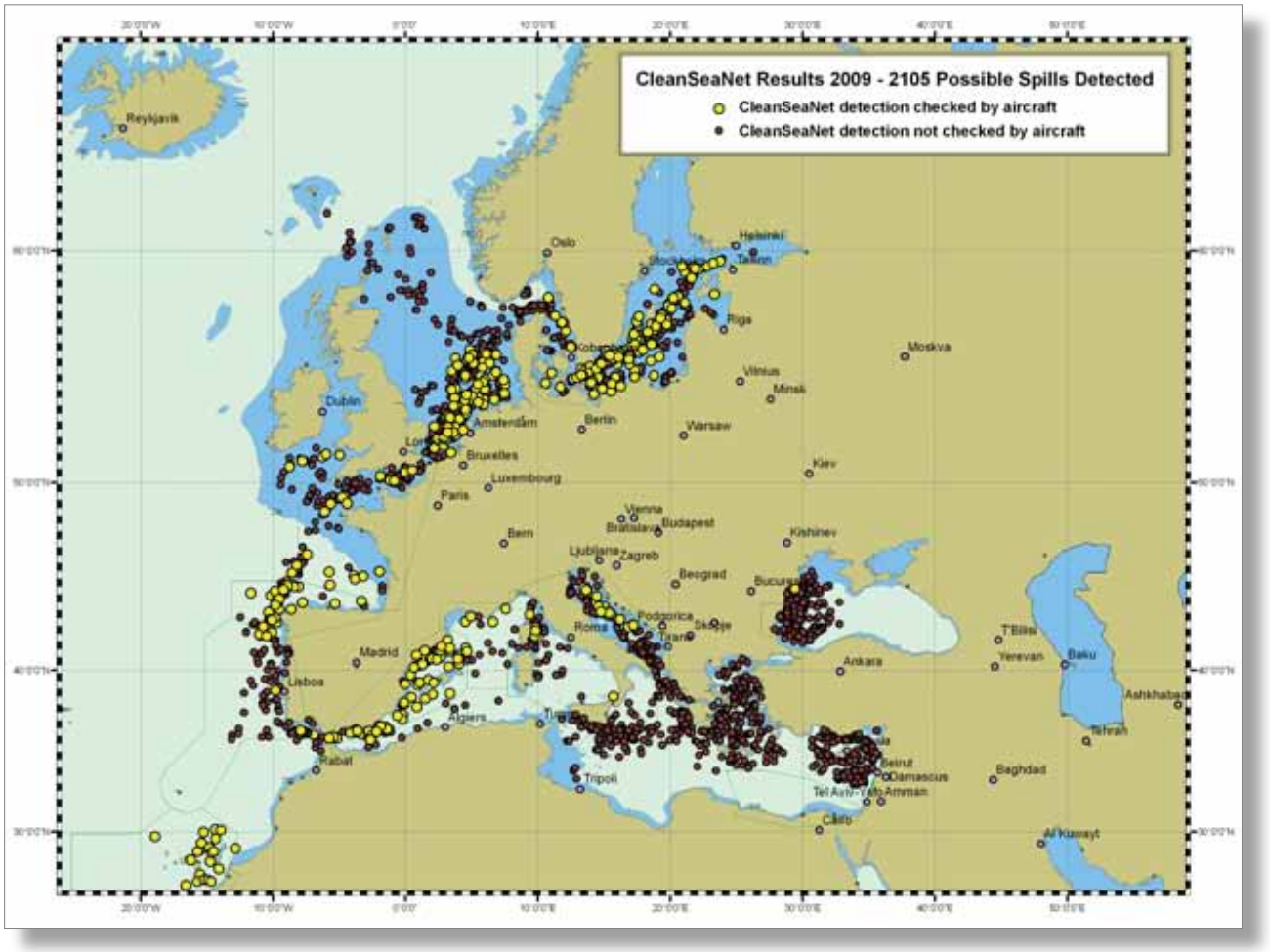


Figure 4.4 - CleanSeaNet Results 2009

Enhanced cooperation between coastal States:

As most satellite images cover the waters of more than one Member State, the best use of the EMSA's satellite oil detection and monitoring service naturally leads to increased cooperation between neighbouring countries in a number of areas. This includes planning aerial surveillance activities, exchanging information on pollution events and with respect to implementing follow-up actions. The CleanSeaNet system has been designed to facilitate this cooperation e.g. through the use of a common view of planned satellite acquisitions and alerts. This allows Member States to take appropriate actions for illegal discharges as they are reported.

In parallel, the CleanSeaNet User Group provides a forum to share experience and build relations between operational users with the objective of increasing service efficiency.

A global picture of the level of pollution in European waters:

For the first time, through CleanSeaNet, an oil pollution detection and monitoring service is capable of covering all European waters. Accordingly, the service is able to produce statistics on the level of pollution, and analyse the trends thus measuring the real impact of actions aimed at tackling ship-sourced pollution. A critical input for reliable statistics is adequate feedback from Member States on their follow-up actions. By accepting the service Conditions of Use, CleanSeaNet users are obliged to enter into the system the result of their verification activities. Member States have been providing feedback since the start of the service in April 2007. It appeared that the initial feedback mechanism implemented needed to be improved in order to produce reliable statistics. A major up-grade of the feedback mechanism occurred in 2008. The production of advanced statistics still require further developments but necessary data are now available in the EMSA database for further use.

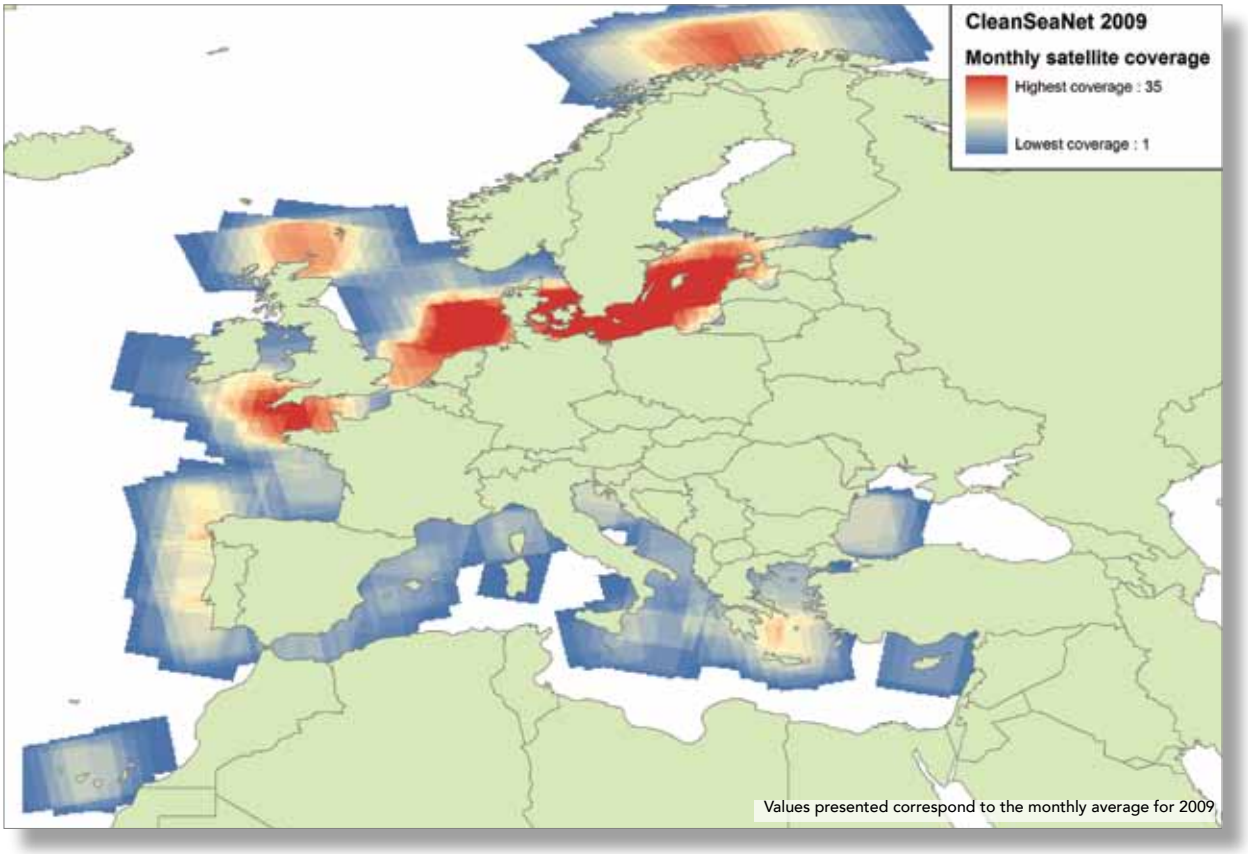


Figure 4.5 - CleanSeaNet Monthly Satellite Coverage: 2009

4.4. SUMMARY OF COST EFFICIENCY AND ADDED VALUE OF EMSA ACTIVITIES

Through the analysis above the Agency has endeavoured to provide a transparent and credible review of the operational activities and their added value.

With regard to the Network of Stand-by Oil Spill Response Vessels, a review of alternative cost approaches to setting-up and maintaining the at-sea oil recovery service (Network of Stand-by Oil Spill Response Vessels) has been undertaken. The results indicate that the approach implemented by EMSA is cost efficient for this type of service at the European level. Keeping in mind that the purpose of the Network is to "top-up" Member State response capacity during an incident, the approach implemented is on a per year basis cheaper than buying/building dedicated vessels as well as providing, on average, more on board storage capacity per vessels. At the same time, it is important to note the advantages of a dedicated vessel. In principle, these are the ability to position the vessel stand-by in an exact location as per the national contingency plan as well as quicker mobilisation time as the vessel would be permanently "ready to sail".

Regarding the potential operational and financial benefit to an affected Member State mobilising EMSA vessel(s), an extensive study has been undertaken of which the main results are presented. The study demonstrates that in principle for most major spill scenarios the EMSA Network would have an overall positive socio-economic and environmental benefit for the affected Member State. Without prejudice to inherent uncertainty in any such study, the Network provides cost efficient operational support to top up Member State response mechanisms.

The CleanSeaNet service strengthens, in a cost-efficient way, the mechanisms set up in Member States to address illegal discharges and to support Member States response to accidental pollution. A collective system at EU level gives advantages by offering economies of scale and an efficient use of resources by sharing and supporting the pooling of aerial surveillance resources, as is the case at least in some parts of the European Union.

5. FEEDBACK FROM USERS / INTERESTED PARTIES

5.1. EVALUATIONS OF THE IMPLEMENTATION OF THE TASKS GIVEN TO THE AGENCY IN THE FIELD OF POLLUTION PREPAREDNESS AND RESPONSE

As can be expected, the Agency has been subject to a number of evaluations, audits and feedback from stakeholders during the period 2007-2009 in relation to its marine pollution preparedness, detection and response activities. Those of particular relevance include:

- Dedicated Audit by the Internal Audit Service (IAS) of the Commission in 2009 regarding the Network of Stand-by Oil Spill Response Vessels;
- The Evaluation of the Agency of April 2008 as required by Regulation EC 1406/2002 as amended. The evaluation was undertaken by an external consultant (COWI A/S);
- Stakeholder Consultation March 2010.

The 2008 Evaluation of the Agency, combined with the 2010 Stakeholder Consultation, demonstrate the positive evolution in Stakeholders' perspective of EMSA's capacity to implement complex projects that bring added value to the marine pollution activities of Member States.

5.2. INTERNAL AUDIT OF THE EMSA STAND-BY OIL SPILL RESPONSE VESSEL NETWORK

In 2009, the Internal Audit Service (IAS) of the European Commission undertook an audit of the EMSA Stand-by Oil Spill Response Vessel Network. The overall objective was to provide the Agency's Executive Director and Administrative Board with an independent assurance on the adequacy and effectiveness of the internal control system regarding the network of contracted vessels. The overall finding of the IAS is that the internal control system in place provides reasonable assurance[29] regarding the achievement of the business objectives set-up for the vessel network.

29 *IAS Explanation: "Even an effective internal control system, no matter how well designed and operated, has inherent limitations - including the possibility of circumventing or overriding of controls - and therefore can provide only reasonable assurance to management regarding the achievement of business objectives and not absolute assurance".*

5.3. EVALUATION OF THE AGENCY – FINALISED APRIL 2008

The overall objective of the evaluation was to assess the relevance of the Regulation and the effectiveness and efficiency of EMSA in fulfilling its objectives and tasks. The Final Report is available through the EMSA website.

The overall conclusion from the Final Report was that the establishment of EMSA has filled a gap in the maritime safety area in the European Union. The Agency had quickly grown in terms of its tasks and importance to become a significant actor in the maritime safety area. The Agency had added value to the sector in general, and, in particular, to its two main stakeholders, the Member States and the Commission.

Established in 2002, the Agency had rapidly delivered useful outputs to its stakeholders. In general, EMSA's stakeholders are therefore also satisfied with its performance.

EMSA developed the Action Plan for Oil Pollution Preparedness and Response in 2004. This plan summarised the situation at the time in Europe with regards to pollution preparedness and response. It also served to establish specific action items to be implemented. More specifically the Final Report also indicated, amongst other comments, that:

- *The Action Plan contains a thorough analysis of the existing situation with respect to existing structures, risk, lessons learnt, and operational capacities in Member States;*
- *The Action Plan clearly states that EMSA's capacity should be based on a "top up" philosophy (i) focusing on spills beyond the national response capacity and (ii) not replacing existing capacities of coastal States. This philosophy can be seen as part of a "tiered response system", which is also advocated by the International Convention on Oil Pollution Preparedness, Response and Co-operation (OPRC), 1990. In this view, EMSA's capacity can be seen as a European tier "on top of" the national tier, the national tier being the first line of response. Another perspective on the top up philosophy expressed by stakeholders is "gap filling", i.e. that EMSA should fill a gap in terms of the existing national and private capabilities compared to some benchmark for when the overall capacity can be considered "complete". The Action Plan is not very specific with regard to benchmarks and the operational*

implications of the "top-up" philosophy;

- *EMSA developed a contractual framework consisting of a vessel availability contract and an incident response contract which was considered a pragmatic and well devised scheme;*
- *The section on EMSA's activities in the Action Plan contains information on areas of priority, general criteria and regional requirements. However, the Action Plan is not clear regarding the longer term priorities and targets and how they may be implemented over time. Rather, the Action Plan, updated annually in the work programmes, has provided the implementation plan for the following year, which has then been approved by the Administrative Board. This is in line with the applicable planning and budgeting procedures. However, the combination of uncertainty about the operational implications of the "top-up" philosophy and the lack of long term priorities provides a weak basis for assessing annual plans and activities of EMSA as an actor in this complex environment. Long-term planning would serve to clarify roles and expectations and would be well in line with the multi-annual budgeting framework, which was established in 2006.*

With regard to above-mentioned point, it should be noted that the 2004 Oil Action Plan established specific targets to be implemented in the near term. Annual updating of the Work Programme and its approval by the Agency's Administrative Board assures the adaptation of EMSA's actions in the field of pollution preparedness, detection and response to the evolving needs. In addition, such "annuality" is in line with the applicable planning and budgeting procedures.

The Final Report also provided some stakeholders feedback associated with a questionnaire as follows:

- *In response to the following question in the questionnaire: "To which extent has EMSA contributed to reducing the effects of potential oil spill accidents?" almost one quarter of Member States regarded EMSA contribution as low/non-existing. On the other hand, more than one third assess EMSA's contribution to be high or very high. It is fair to say that Member States are divided on this issue;*
- *The Member States are generally in favour of EMSA taking on a coordinating and advisory role at the EU level;*
- *The Member States are generally very positive towards EMSA conducting the task of providing satellite imagery through CleanSeaNet. Most Member States have indicated that EMSA has been very effective in performing this task and that this has led to cost-savings in national administration and, in some cases, also to better quality of satellite images procured.*

With regard to stakeholder feedback, the Final Report continued:

- *Following international conventions, protection of the national shorelines is a national responsibility and not a task for EMSA.*

It should be noted that the prime responsibility for pollution response is, and remains, with the Member State. The Agency only "tops up" and is able to put additional resources under the operational command of the Member State affected by the oil spill.

The Final Report continued:

- *There are no agreed standards at the EU level on how much an individual Member State is required to have in terms of own capacity, which makes it difficult to establish a benchmark from which EMSA can "top up" the efforts. The current system invites countries to take a "free ride" relying on EMSA to fill the gap;*
- *Most Member States find that, given the task, EMSA has dealt with it in an effective way. … the oil pollution response vessels is one of the EMSA activities, which are rated highest by Member States in terms of overall effectiveness gains at EU level. However, a few Member States question the way that EMSA operational measures have been implemented, i.e. the contracting of stand-by vessels, and think it is not the best operational solution.*

The concern expressed by a few Member States relates primarily to the operational task of providing additional oil response capacity in specific areas, where Member States have heavily invested in national resources. This situation applies particularly to the Northern countries and differs greatly from the Southern countries. Especially, the countries surrounding the Baltic Sea Basin questioned the relevance of carrying out this task at EU level in this area.

- *Those in favour of having an EU-financed oil spill response capacity organised by EMSA argue that no Member State has the sufficient means to combat a major oil spill and additional capacity is necessary to avoid major disasters.*

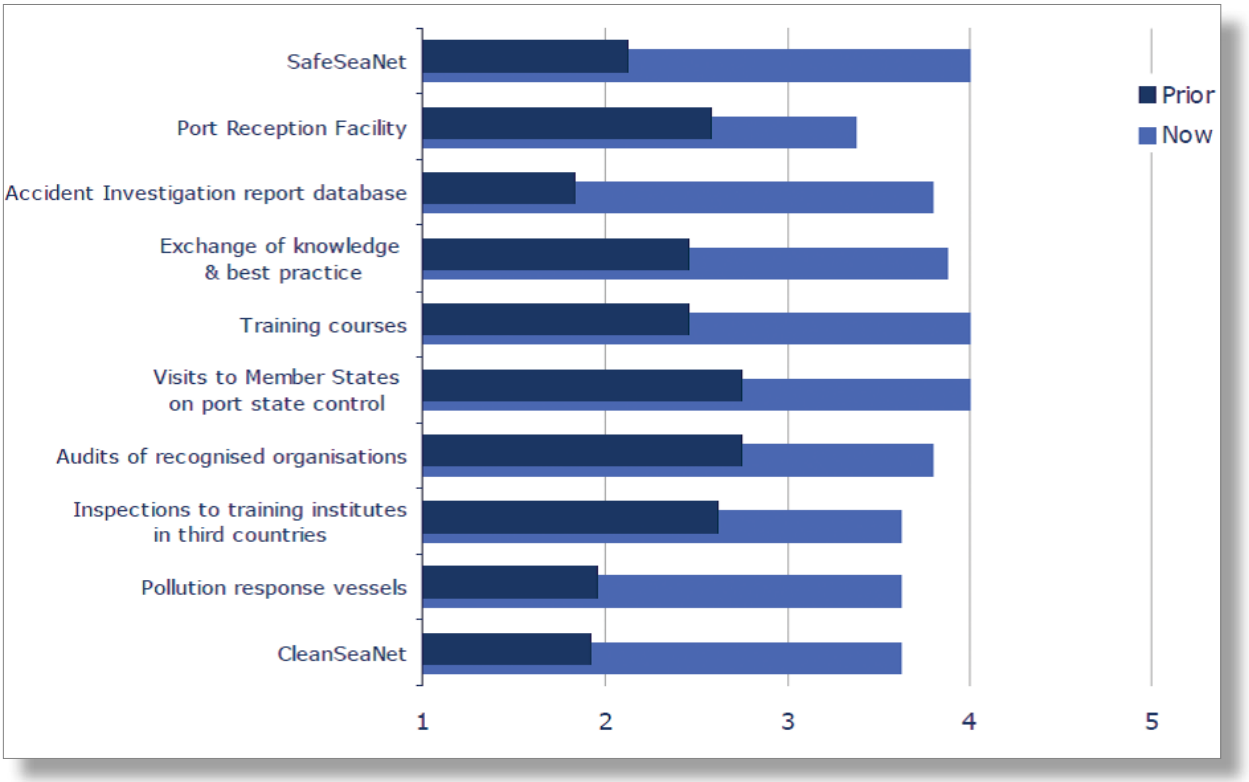


Figure 5.1 - Member States' assessment of overall EU effectiveness prior to and after EMSA (Source: 2008 Evaluation of the Agency)

Source: COWI's questionnaire survey. Total Member States = 27. N = 24. Response rate = 89%
Note: 1 = Very low effectiveness; 2 = Low effectiveness; 3 = Average effectiveness; 4 = High effectiveness; 5 = Very high effectiveness.V

5.3.1. Summary of the Evaluation of the Agency - 2008

The findings of the Final Report are summarised below. It is worthwhile to compare these with more recent feedback from stakeholders.

- Member States had different opinions regarding the relevancy of the task.
- Most indicated that the Agency had adopted the correct operational/contractual/financial approach to setting up marine pollution response services.
- The marine pollution response services were rated by the Member States as some of the activities in which the Agency had been most effective. The chart shows the results of the questionnaire carried out in 2008.

5.4. STAKEHOLDER CONSULTATION IN PREPARATION OF THE MULTI-ANNUAL FUNDING MID-TERM REPORT - MARCH 2010

As outlined in the Roadmap for the preparation of the MAF Mid-term Report regarding Article 8 of Regulation (EC) No 2038/2006 on the actions of the Agency in the field of pollution preparedness and response to ship-sourced pollution, EMSA consulted its key stakeholders on the implementation of its tasks. The focus of this consultation was to obtain feedback on the way EMSA has implemented these tasks during the period 2007-2009, as well as to receive comments regarding the outlook for EMSA's work in this field beyond 2013.

Within this framework, a consultation paper[30] was developed and distributed to all stakeholders, informing them of the implementation of EMSA's tasks in the field of pollution preparedness and response in the period of 2007-2009. This consultation paper presented a summary of the tasks assigned to the Agency in this field and their implementation. In addition, a feedback form with specific questions regarding the implementation of EMSA's tasks was distributed for comments in writing to be returned to EMSA.

In order to present the consultation paper and discuss the feedback provided by the stakeholders, two separate stakeholder consultation meetings were hosted by EMSA:

30 *Titled "Consultation on EMSA's Pollution Preparedness and Response Activities", distributed Feb 2010.*

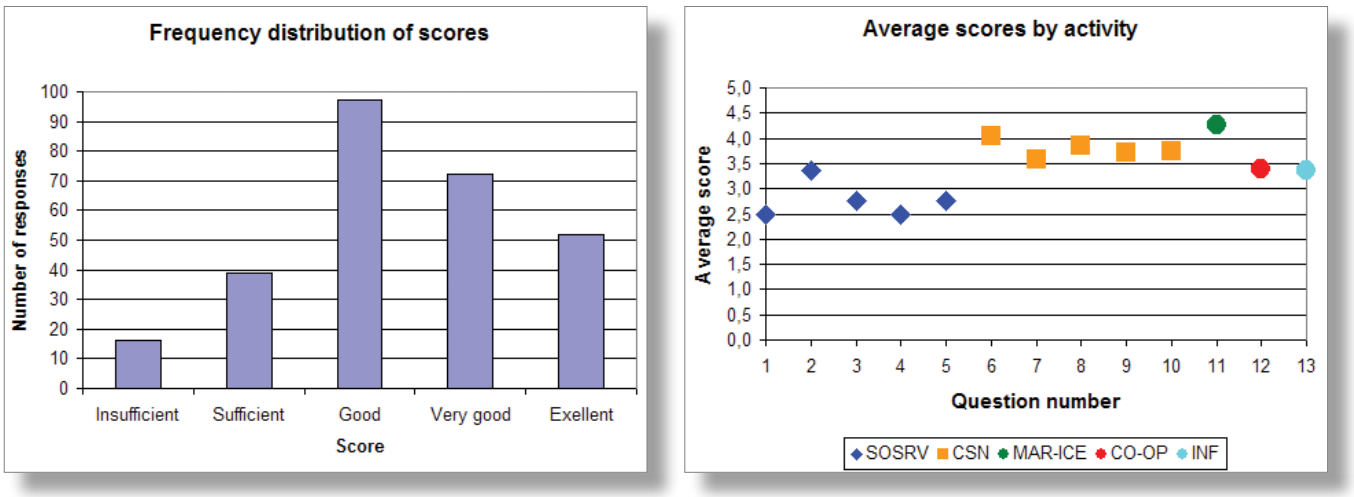


Figure 5.2 - Consultation Paper: Scoring* of Activities by Stakeholders (Scores: 1= insufficient, 2=sufficient, 3=good, 4=very good, 5=excellent)

** SOSRV = Standby Oil Spill Response Vessels, CSN = CleanSeaNet, MAR-ICE = Marine Intervention in Chemical Emergencies Network, CO-OP = Co-operation and co-ordination, INF = Information.*

- On 4 March 2010, a meeting was held with the Members of the Consultative Technical Group for Marine Pollution Preparedness and Response (CTG MPPR), including representatives from the EU Member States, EFTA coastal countries, EU Candidate Countries, the European Regional Agreements and the European Commission (DG Environment);
- On 5 March 2010, a meeting was held with other key stakeholders (industry, NGOs and other organisations) relevant to the work of the Agency.

The following is a brief summary and analysis of the feedback provided by the stakeholders to the consultation paper's questions. It is based on the written feedback received as well as on the discussions during the two consultation meetings. It should be noted that all comments and recommendations received have been taken into account, regardless whether they fall within or outside of EMSA's current mandate.

5.4.1. Summary of Feedback from the 2010 Stakeholder Consultation

The main points from the abovementioned process are detailed below. It should be noted that the feedback reflects different approaches and considerations. As such the feedback covers a broad range of aspects, some of which are not necessarily within the mandate of the Agency or within the present policy of the EMSA Administrative Board. Per activity the following points were made:

The Network of Stand-by Oil Spill Response Vessels:

- The technical and operational capabilities of the EMSA contracted vessels are very good, especially in addressing Heavy Fuel Oil (HFO) and Very Heavy Fuel Oil (VHFO) pollution;
- A Member States' expert group for consultation on technical and operational issues of the Stand-by Oil Spill Response Vessels Network could be established by EMSA (similar to the CleanSeaNet User Group);
- The need has been identified for a new risk assessment at EU level, covering the existing marine pollution prevention, preparedness and response capacities of the Member States and also addressing new risk factors (e.g. large cargo ships) in addition to tanker traffic;
- It was recognised that the lack of a minimum standard for national response mechanisms represents a challenge for EMSA with regard to its "topping up" task of Member State response capacity. Nonetheless, many Member States consider that there should not be any "European Standard/Approach" for national response capacities;
- Some Member States would like the Agency to provide emergency ship-to-ship transfer services (lightering from casualty or from recovery tanks of other response vessels in the area) possibly using the EMSA contracted Stand-by Oil Spill Response vessels;
- Some Member States, particularly Baltic countries, further developed the range of potential services to include emergency towing and fire fighting. It should be noted that these types of activities are beyond the current mandate of the Agency and that such activities run counter to earlier statements that the protection of national shorelines is a national responsibility.

CleanSeaNet Service:

- The pan-European monitoring and surveillance operational capability and role of EMSA is considered as very efficient and providing added value;
- Most Member States emphasised the complementary use of aerial surveillance and satellite monitoring regarding illegal discharges, which is strongly advocated by the Agency.

HNS and the MAR-ICE Network:

- EMSA should strengthen its HNS-related activities. There is a growing concern about chemical spills and this type of service/information is very important;
- The MAR-ICE Network and EMSA's other work in the field of HNS/chemical marine pollution could be further developed and could also cover HNS operational response capability in the future;
- In the future the EMSA vessels could also have HNS response capability (currently only Sweden, Finland and Germany have or are investing in developing dedicated vessels for HNS spill response and they support the development of EMSA HNS vessels).

Cooperation, Coordination and Information:

- EMSA has established good relations with the Member States and the Regional Agreements;
- The role of the CTG MPPR in the field of accidental or deliberate marine pollution is regarded positively. A good example of work on issues of common interest is the Claims Management Guideline, which was developed for the benefit of all Member States. Work on this topic should continue;
- EMSA could work closer with the MPPR scientific and technical community and stakeholders and should have a role in MPPR-related R&D coordination, evaluation and/or funding;
- Bilateral meetings with industry associations are appreciated and could be further developed;
- EMSA could further develop its role in training activities.

5.5. EVOLUTION IN STAKEHOLDERS PERSPECTIVES OF EMSA'S POLLUTION PREPAREDNESS AND RESPONSE TASK

It is worthwhile reviewing the perspectives of stakeholders regarding the Agency pollution preparedness and response task and its implementation.

Regulation 724/2004 tasked the Agency to "Provide Member States and the Commission with technical and scientific assistance in the field of ship-sourced pollution" and "Support on request with additional means in a cost efficient way the pollution response mechanisms of Member States". The implementation of these new tasks was addressed in the 2004 Oil Action Plan, the development of which included consultation with Member State technical experts.

EMSA's technical expertise was soon recognised, but some Member States questioned the Agency's ability to actually implement the programme identified in the 2004 Oil Action Plan. The first major activity identified was the setting-up and maintaining of the Network of Stand-by Oil Spill Response Vessels. The approach of converting commercial vessels to oil spill response vessels formed the basis for the development of a European Tier of response capacity for all Member States. It is fair to say that the Network has been built up and managed successfully over a number of years and this has been recognised by the stakeholders.

CleanSeaNet became operational in 2007 and the initial scepticism of this free of charge EMSA service quickly disappeared and it was soon well received. Its technical sophistication and quick response times have clearly filled a gap in European marine pollution surveillance. The Member States are actively contributing to the continuous improvement of the service through the CleanSeaNet User Group.

In general it is worth noting that EMSA's activities in pollution preparedness, detection and response have become widely appreciated and supported since the inception of the Agency. This is due to three main reasons. Firstly, after 6 years, EMSA's role in this field has been developed on a step by step basis in consultation with and the approval of Member States through the Agency's Administrative Board. Secondly there are now well established relationships between EMSA and EU Member States, EFTA coastal States and EU Candidate Countries either at the individual or Regional level. Lastly, and arguably most importantly, the Agency has repeatedly demonstrated its ability to implement complex operational programmes in the field of pollution preparedness, detection and response. Looking to the future, it is also clear that the challenge for the Agency is to continue to identify and implement added value activities in accordance with evolving needs.

6. EUROPEAN RISK EVALUATION AND IMPLICATIONS FOR EMSA ACTIVITIES

In accordance with the Multi-annual Funding Regulation Mid-term Report Roadmap, as adopted by the EMSA Administrative Board, the Report should also:

- Identify, where relevant, any refinements/improvements to the activities in order to bring them into line with the evolving pollution preparedness, detection and response environment;
- Identify, where appropriate and in line with Article 8 of Regulation 2038/2006, any potential recommendations or modifications to the budgetary/legal framework keeping in mind any evolutions in the pollution preparedness, detection and response field.

In order to achieve these objectives, it is necessary to have information on any contextual changes that have occurred since the publication of 2004 Oil Action Plan. Such issues are addressed in the text below beginning with an overview of Member State response vessels, environmental considerations, accident patterns and merchant shipping traffic patterns.

6.1. DISTRIBUTION OF MEMBER STATE OIL SPILL RESPONSE VESSELS

Based on information from the Inventory of EU Member States Oil Pollution Response Vessels as published in 2009 and developed in conjunction with Member States, the map below shows the distribution of response vessels around Europe. It should be noted that the UK uses chemical dispersants as its primary response option whilst Greece has a significant number of vessels which have a storage capacity less than 50 m3. These are not shown in the map.

From the map it is clear that there is a high concentration of large and medium sized response vessels in the southern North Sea. With regard to the Baltic and the central Mediterranean area, there are a significant number of smaller vessels and some medium sized vessels are also available.

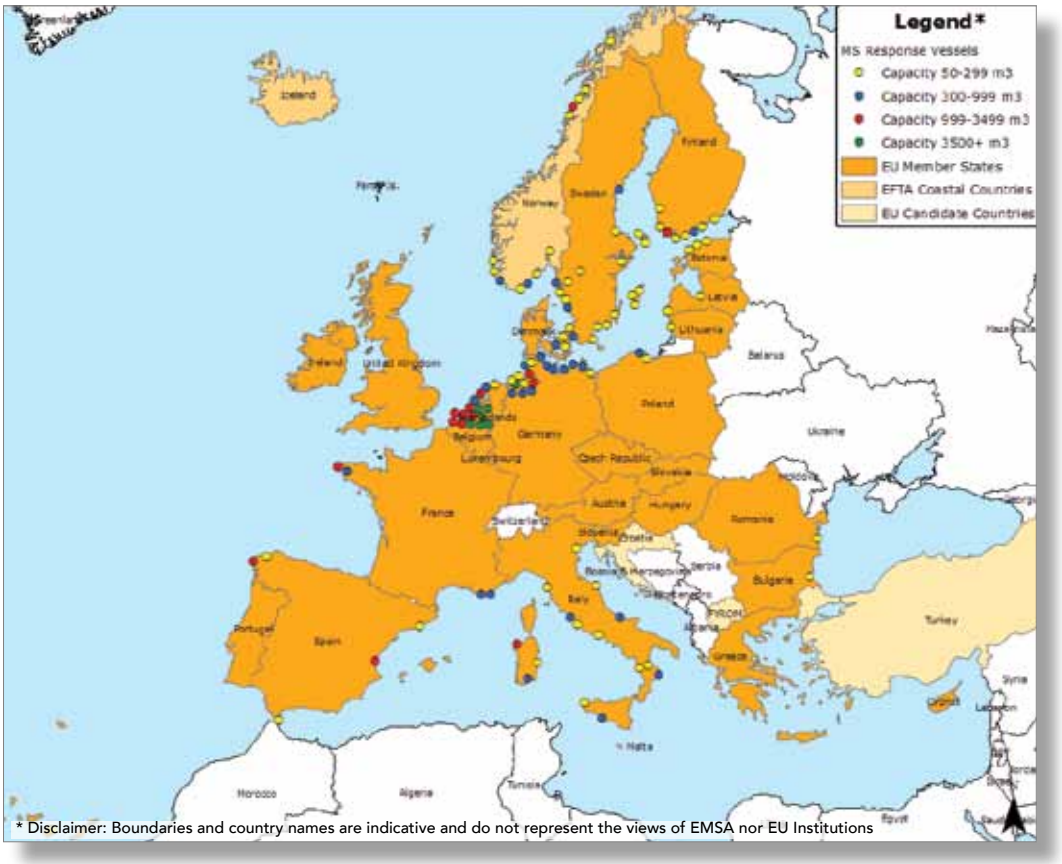


Figure 6.1 - Indicative Distribution of National Oil Spill Response Vessels in 2009*

** As of 17 June 2010, Iceland is an EU Candidate Country in addition to being an EFTA Contracting Party.*

6.2. ENVIRONMENTAL ASPECTS

In the event of an oil spill from any type of source, various socio-economic and environmental resources will be put at risk through contamination. The individual importance of such resources and the associated prioritisation for their defence during an incident is clearly within the competence of the affected Member State and maybe detailed their national contingency plan.

At the European scale there are a limited number of environmental classifications that can be considered namely Particularly Sensitive Sea Areas (PSSAs) and Natura 2000 sites. PSSAs, as designated by the International Maritime Organization (IMO), are areas that need special protection through action by IMO because of their significance for recognised ecological, socio-economic or scientific reasons and which may be vulnerable to damage by international maritime activities. The following PSSAs area of relevance:

- The Baltic Sea;
- The Wadden Sea which is adjacent to the North Sea with responsibility for it shared between the Netherlands, Germany and Denmark;
- The Western European Waters which encompasses an area to the south of Portugal along the Atlantic Coast and as far north as the Shetlands Isles in the United Kingdom. It also includes the Channel and its approaches;
- The Canary Islands.

Natura 2000 is the centrepiece of EU nature and biodiversity policy. It is an EU-wide network of nature protection areas established under the 1992 Habitats Directive. The aim of the network is to assure the long-term survival of Europe's most valuable and threatened species and habitats. It includes Special Areas of Conservation (SACs) designated by Member States under the Habitats Directive. SACs provide rare and vulnerable animals, plants and habitats with increased protection and management. It also incorporates Special Protection Areas (SPAs) which they designate under the 1979 Birds Directive. SPAs help protect and manage areas which are important for rare and vulnerable birds for breeding, feeding, wintering or migration. The establishment of this network of protected areas also fulfils a Community obligation under the UN Convention on Biological Diversity. All EU Member States contribute to the network of sites in a Europe-wide partnership from the Canaries to Crete and from Sicily to Finnish Lapland. This reflects public sensitivity and concern regarding the protection of the environment.

The map below shows PSSAs in Europe as well illustrating the relative density of Natura 2000 sites.

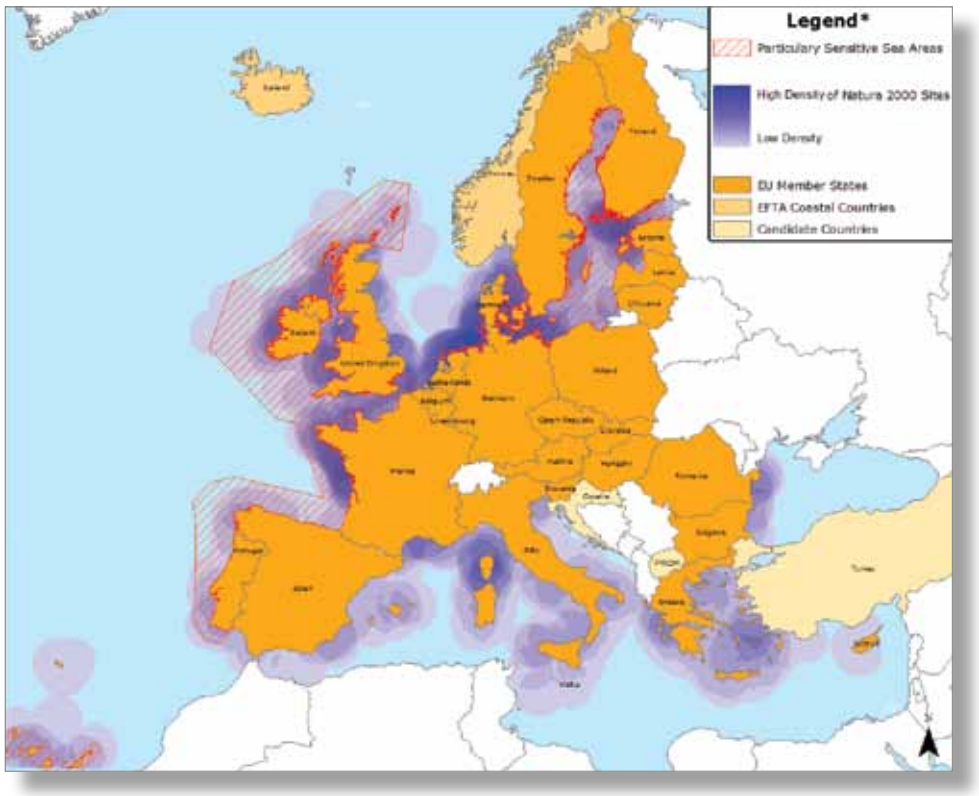


Figure 6.2 - Distribution of Particularly Sensitive Seas Areas (PSSAs) and Natura 2000 Sites*

** As of 17 June 2010, Iceland is an EU Candidate Country in addition to being an EFTA Contracting Party.*

At the European scale it is clear that the bulk of PSSAs cover the Baltic Sea, the Atlantic coast and the Channel. As can be expected, Natura 2000 sites can be found all along the European coastline. Higher concentrations of such sites are in the North East and South West Baltic, in the southern North Sea and along the Atlantic coast.

6.3. MERCHANT SHIPPING: ACCIDENT PATTERNS

Each year the Agency produces a Maritime Accident Review which provides selective and aggregated information on EU maritime accidents (the term EU includes Norway and Iceland for the purpose of this review). The aim is to make both the EU maritime community and EU citizens aware of the accident situation in and around EU waters.

The 2009 figures show that the total number of ships involved in accidents, and also loss of life, were substantially down in comparison to the market boom years of 2007/2008, although the number of accidents was still significantly higher than in 2006. Given that accident numbers fell off significantly from late 2008, it appears that there may be a correlation with the global financial crisis and the associated slump in shipping demand. At the same time, it is also possible that heightened activity by the EU and Member States to counter accidents and pollution may have had some effect.

Accidents often happen when ships and seafarers are being worked harder, and during the shipping boom times in 2007 and 2008, accidents increased substantially, while since then, the opposite has been the case. Supply overcapacity, high levels of ship scrapping, lower operating speeds and generally less pressure to meet tight deadlines in the economic downturn are seen to be the main reasons for the significant reduction in overall accident numbers. However, slow steaming is predicted to result in increasing numbers of engine failures, and deferred maintenance and repairs due to decreases in the income of ship owners and operators may also cause problems. Therefore, developments in these areas must be watched closely.

Looking forward, given the relatively low accident numbers towards the end of 2009, if the trend continues, 2010 could also be another year with lower accident figures, although a look at the figures for early 2010 suggests that this is unlikely to be the case. They show that the presently stuttering economic upturn, possibly led by the domestic Chinese economy and the country's demand for raw materials, may already be contributing to an increase in accident numbers.

What is clear is that any relaxation of standards resulting from an improved accident situation in 2009 could lead to greater problems when traffic volumes return to, or exceed, the levels in the recent past. Consequently, it is very important that the maritime community continues to

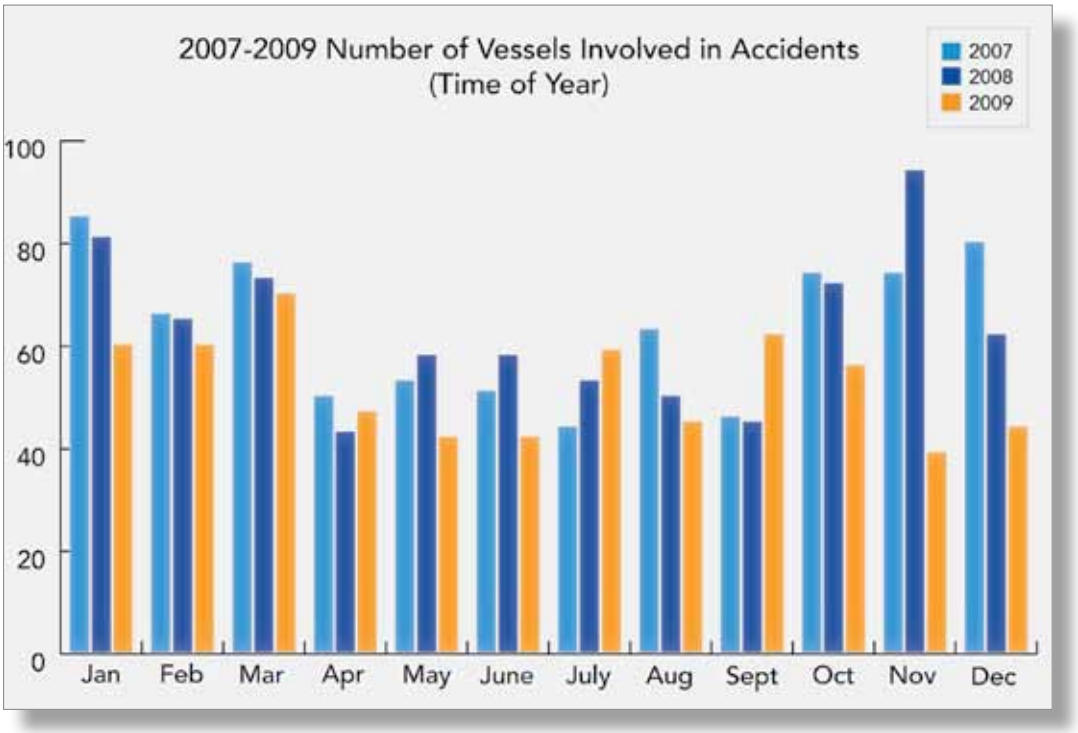


Figure 6.3 - Numbers of Shipping Accidents: 2007-2009 (Source: EMSA Maritime Accident Review)

pursue initiatives aimed at improving ship/cargo/pollution monitoring, accident response and maritime safety in general.

When looking at the month-by-month picture, a number of interesting points can be noted. When looking at the winter months, it can be seen that, as reported in the 2008 review, following the accident high point in November 2008, the two following months (December 2008 and January 2009) saw a significant reduction in the number of vessels involved in accidents in comparison to the previous two years. However, the numbers for November and December 2009 saw a far greater decrease, to the extent the numbers almost halved in comparison to the corresponding months in 2008. As mentioned previously, an early look at the January 2010 figures shows that this downward trend is showing definite signs of reversing.

The figures for September 2009 showed a significant increase over those for September 2008, with the main increases associated with general cargo ship collisions and contacts. However, following an in-depth analysis, no clear pointers emerged as to the reason for the increase, and there was no significant regional bias.

To give a little perspective to the accident picture, it should be borne in mind that 20,644 merchant vessels were recorded as calling at EU ports in 2009 (down almost 10% from 2008), and that these ships were involved in 593,207 port movements (down by almost 15% from 2008). The map below indicates the distribution of accidents across Europe. The relative density of accidents is also shown with the aim of understanding which areas of Europe have higher concentrations of such events.

From the map, the highest concentration of accidents occurred:

- In the Baltic: Finland (South-East), Sweden (Central-East), Germany and Denmark;
- In the North Sea: Norway (Central and South-West), UK (Scotland and Central East England), the Netherlands, Belgium and the Channel;
- Along the Atlantic coast: UK (Western Scotland) and Ireland (South);
- In the Mediterranean: South-East Greece.

These accident "blackspots" reflect to a certain degree the overall merchant shipping traffic pattern around European waters.

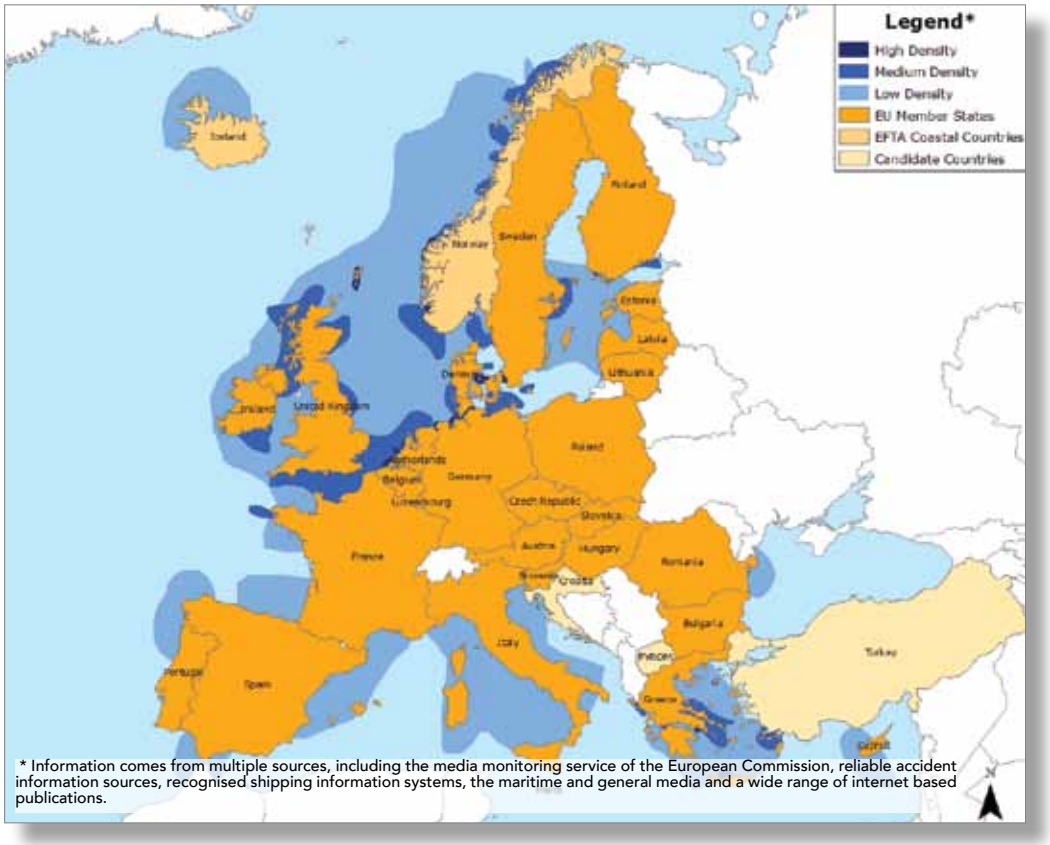


Figure 6.4 - Indicative Distribution of Accidents: 2009 (Source: EMSA Maritime Accident Review)*

** As of 17 June 2010, Iceland is an EU Candidate Country in addition to being an EFTA Contracting Party.*

6.4. ACCIDENTAL OIL SPILLS

Based on data collated by the Agency, as part of preparing the Annual Maritime Accident Review, the map below shows the main oil spills that occurred during the period 2007-2008 from all sources i.e. shipping and oil/gas offshore facilities.

Most of the incidents have occurred in Northern Europe with most spills in 100-1000 tonne range. A "hotspot" is the Algeciras/Gibraltar area where there were four spills in period reviewed. Historically, major oil spills have mainly been from tankers.

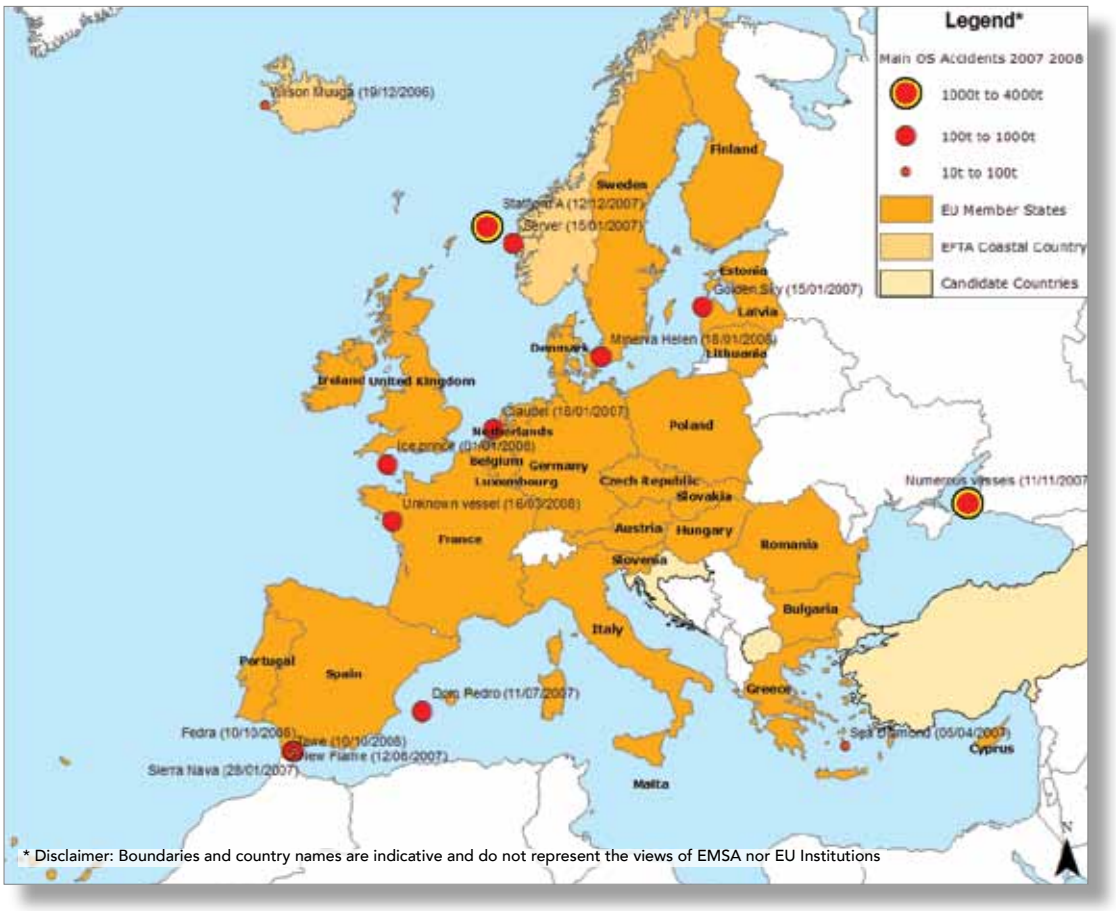


Figure 6.5 - Main Ship Sourced Oil Spills: 2007-2008 (Source: EMSA Maritime Accident Review)*

** As of 17 June 2010, Iceland is an EU Candidate Country in addition to being an EFTA Contracting Party.*

The map on the next page illustrates the distribution of accidental oil spills over the longer term and illustrates the distribution of major oil spills over the last 25 years around European and adjacent waters.

Those incidents involving more than 10,000 tonnes are highlighted and listed in more detail in the subsequent table (Figure 6.7). It is striking that a significant proportion of these spills are in Western Europe.

Those incidents involving more than 10,000 tonnes are highlighted and listed in more detail in the subsequent table. It is striking that a significant proportion of these spills are in Western Europe.

As can be appreciated most incidents occur due a combination factors. The information below has classified "cause" in terms of the primary event or operation in progress at the time of the spill. Spills for which the relevant information is not available or where the cause was not one of those given are listed under "Other/unknown".

For incidents involving spills in excess of 700 tonnes it is apparent from the table that approximately:

- 29 % of these are related to collisions;
- 36 % of these are related to groundings;
- 65 % of these are related to collisions and groundings;
- 77 % of these are related to collisions, groundings and hull failures.

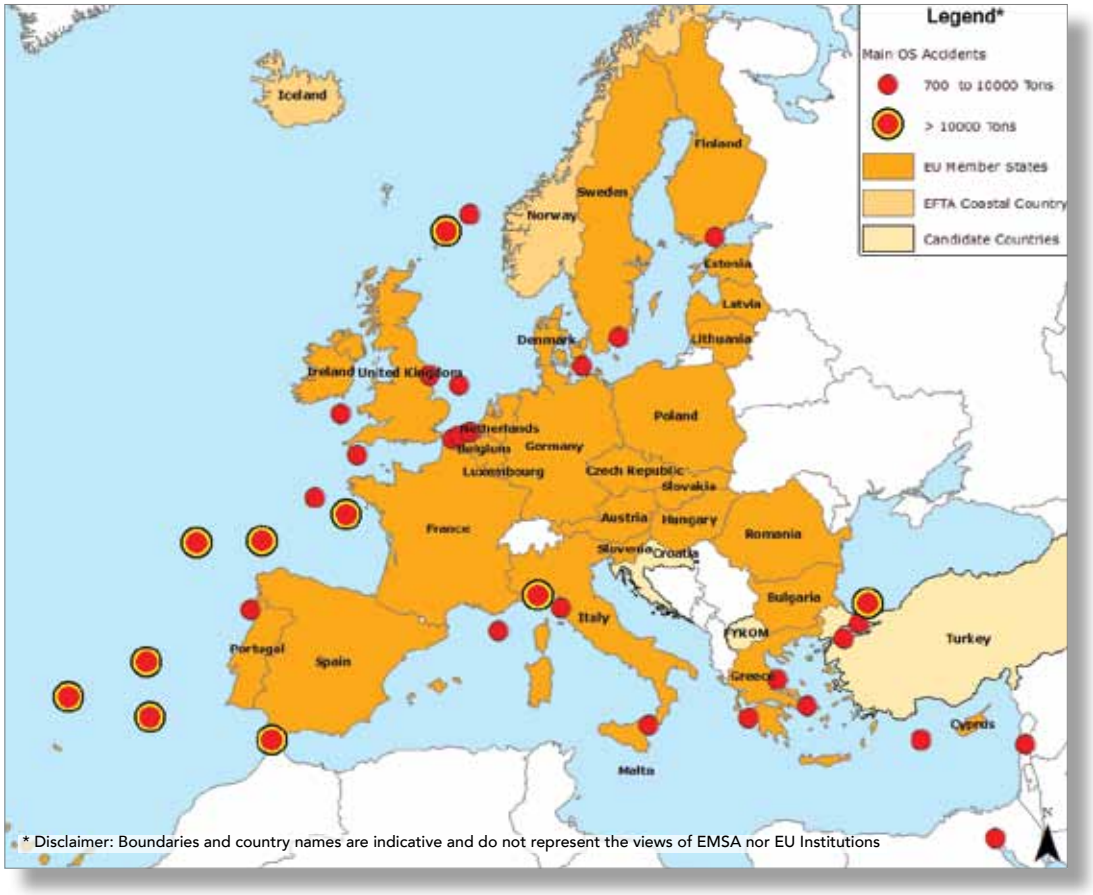


Figure 6.6 - Large Oil Tanker Spills since 1984 (Source: ITOPF)*

** As of 17 June 2010, Iceland is an EU Candidate Country in addition to being an EFTA Contracting Party.*

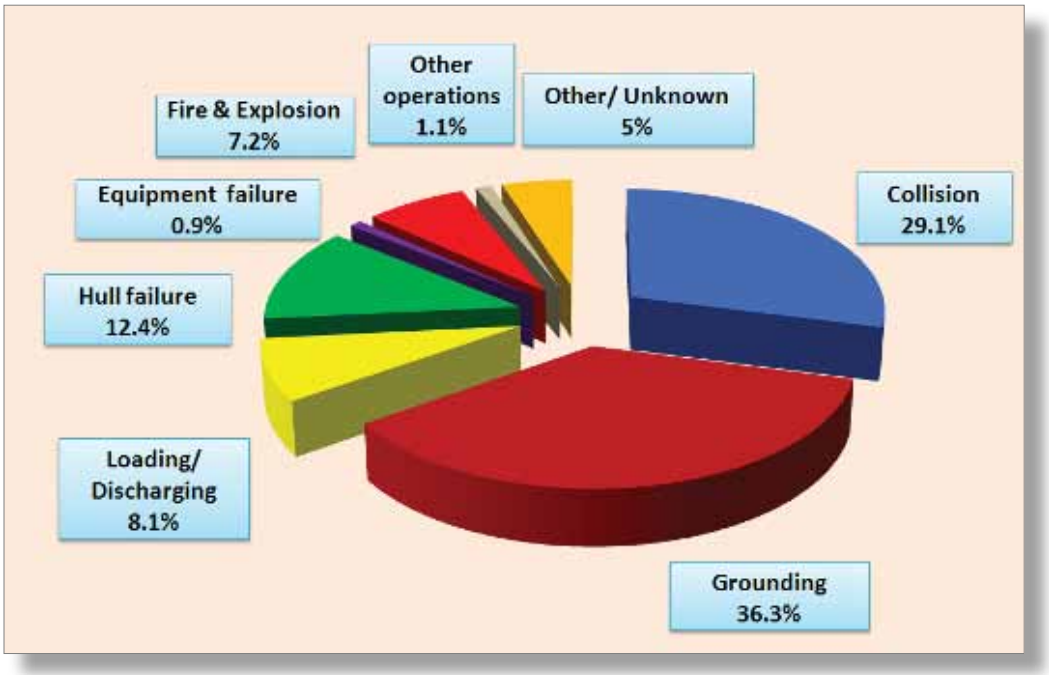


Figure 6.7 - Incidence of Oil Tanker Spills >700 tonnes by Cause: 1970-2009 (Source: ITOPF)

6.5. MERCHANT SHIPPING: TRAFFIC PATTERNS

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.

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. In addition, in many EU sea areas, weather conditions, geographical restrictions, tidal conditions and other factors may mean that the danger of accidents will increase unless improved safety and environmental risk reduction procedures are set in place. 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.

Based on (limited) data extracted from SafeSeaNet, the vessel traffic monitoring system hosted by the Agency, the map below shows the relative density of shipping traffic around Europe. It should be noted that some relevant AIS stations (e.g. along the Atlantic coast in France and Portugal as well as along North Africa) are not presently part of the SafeSeaNet system. In parallel the data sample is of a relatively short time period which could be subject to seasonal variations. Accordingly the map provides an indicative overview of shipping density around Europe.

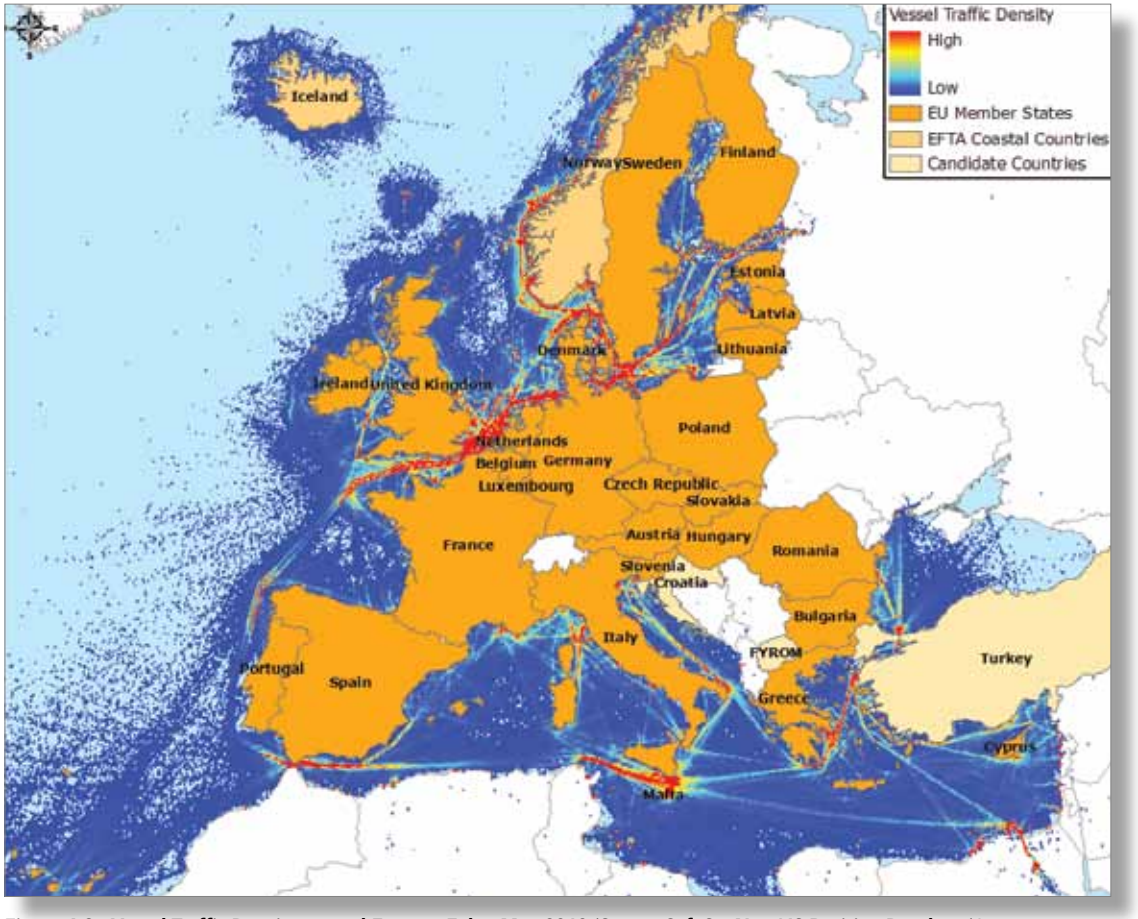


Figure 6.8 - Vessel Traffic Density around Europe: Feb – May 2010 (Source:SafeSeaNet AIS Position Database)*

** As of 17 June 2010, Iceland is an EU Candidate Country in addition to being an EFTA Contracting Party.*

Vessel traffic separation schemes and other measures to ensure safe passage notwithstanding, there is clearly a correlation between shipping traffic density and the risk of a collision with another vessel or offshore structure and even that of a grounding ashore. Whilst it is natural to focus on oil spills from tankers, it is worth noting that the current merchant shipping trend is one of increasing vessel size for most types of ships. These non-tankers can carry significant amounts of fuel, often heavy fuel oil/bunkers. For larger vessels the quantity can be in thousands of tonnes of oil that could potentially be spilt. Consequently the risk of a collision or grounding should also be considered as potential source of a significant oil spill.

With respect to the Baltic shipping traffic situation, much of this is located in the southern and central parts of the Baltic Sea, and economic downturns aside, ship voyages and cargo volumes are generally increasing, not least due to the transport of crude oil from Russia. The south-western approaches between Denmark and Sweden and the Gulf of Finland are the two areas with the greatest concentrations of shipping traffic.

Regarding the North Sea, the Channel and the Atlantic Coast there is a huge amount of ship traffic operating between the Atlantic Ocean and northern EU ports as well traffic with Northern Russian ports.

The Mediterranean and Black Seas, taken together, are very heavily trafficked in a number of areas, with much of the through traffic going in two main directions. The largest volume of through traffic uses the main east-west lanes between the Indian and Atlantic Oceans, and passes between the Suez Canal and the Straits of Gibraltar. There is also a huge volume of through traffic using the main north-south lanes, which pass through the Aegean Sea between Greece and Turkey. The requirement to move oil westwards from both the Black Sea and Gulf regions means that a significant number of tankers are also passing through. Finally, the amount of internal traffic in the region is also huge. Although the Mediterranean and Black Seas are both enclosed bodies of water, and although the sea conditions are frequently calmer than in more northerly waters, major storms and heavy seas can occur in both from time to time.

6.6. MERCHANT SHIPPING: TANKER TRAFFIC PATTERNS

As is self-evident, oil tankers are a source of oil spills. Keeping in mind the earlier statistics on the causes of major spills, it is important to have an overview of tanker trading patterns around Europe. It is also important to see if any identifiable changes in these patterns have occurred since the 2004 Oil Action Plan.

With this in mind, the Agency contracted two companies for the provision of oil cargo data (Lloyds List Intelligence) and the subsequent cartographic representation of this data using shipping routes (COWI A/S). The oil cargo trading data provided by Lloyds List Intelligence is based on their APEX database, which gathers global seaborne oil trade and tanker movement information based on ports calls. The information refers to the transportation of crude oil in vessels above 10,000 deadweight (DWT). Consequently ships smaller than this threshold are not included nor represented in the maps.

The oil cargo data has been sourced for 2004, the year EMSA's Oil Action Plan was approved by the Administrative Board, and 2009, the most recent complete year for which data is available. It should be highlighted that the economic crisis had a significant effect on merchant shipping in 2009.

COWI A/S analysed and aggregated the data. They also established, based on the data available (port to port) and their experience, the tanker trading routes and created the associated maps. Regarding the routes taken by the ships, these have been consolidated into a format that is both presentable as well as being as representative as possible. Accordingly, the routes displayed should be taken as indicative within the framework of the need to have an overview of tanker trading patterns around Europe.

6.6.1. Tanker Traffic Patterns by Number of Voyages

The map (Figure 6.9) on the next page shows the number of voyages by tankers around Europe. As expected the traditional main tanker routes are clearly shown.

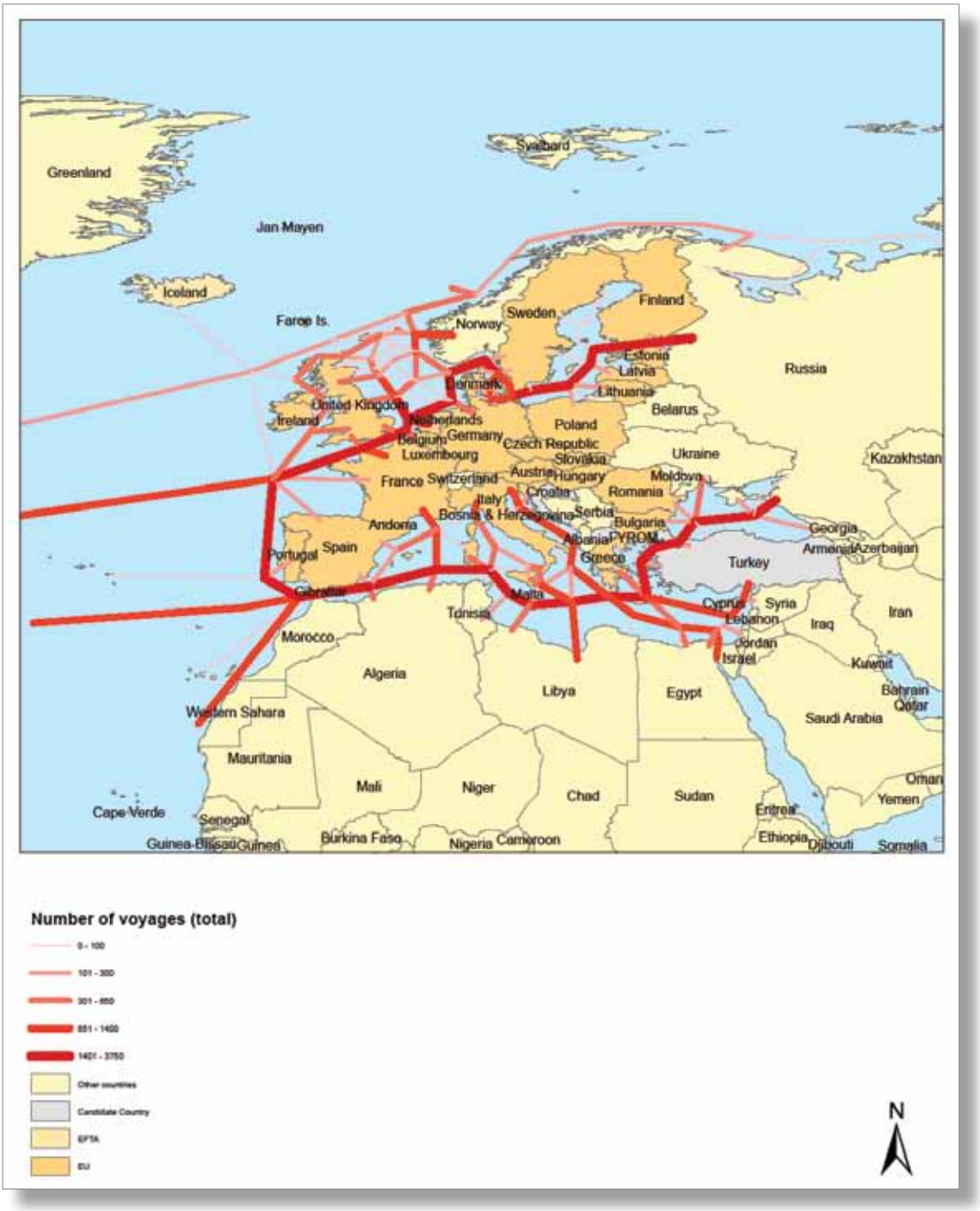


Figure 6.9 - Number of Tanker Voyages: 2009 (Source LLI/COWI)

With regard to evolving tanker trading patterns, analysis has been undertaken comparing data from 2004 with that of 2009. The next map (Figure 6.10) shows relative (%) changes in number of tanker voyages along the trading routes.

With reference to changes in number of tanker voyages between 2004 and 2009 the following can be noted:

- The predicted increase in exports of oil from Russia and the Former Soviet Union (FSU) countries has occurred. The areas most affected are along the Norwegian coast as well as the Baltic and the Black Seas;
- For the Baltic Sea Route from the Gulf of Finland the number of voyages increased from 501 to 910. Voyages from Kaliningrad decreased from 58 to 2;

- For the northern route through the Barents Sea the number of voyages increased from 94 to 122;
- For the Black Sea Route the number of voyages increased from 861 to 910;
- Trade from the Arabian Gulf across the Mediterranean to Northern European ports has also shown a significant increase;
- There has been a significant increase in exports from the eastern Mediterranean most probably due to the new pipeline network that has become operational in this area;
- The number of tanker voyages in the North Sea would appear to have partly decreased and partly increased depending on individual routes. This could be due to an increase ship-to-ship transfers e.g. from a small tanker sailing from a Russian port to a larger vessel for onward transportation. The changes shown could also be due to the data set itself as tankers of a size below 10,000 DWT are not represented. It is also possible that the combination of both factors has led to the complex pattern shown.

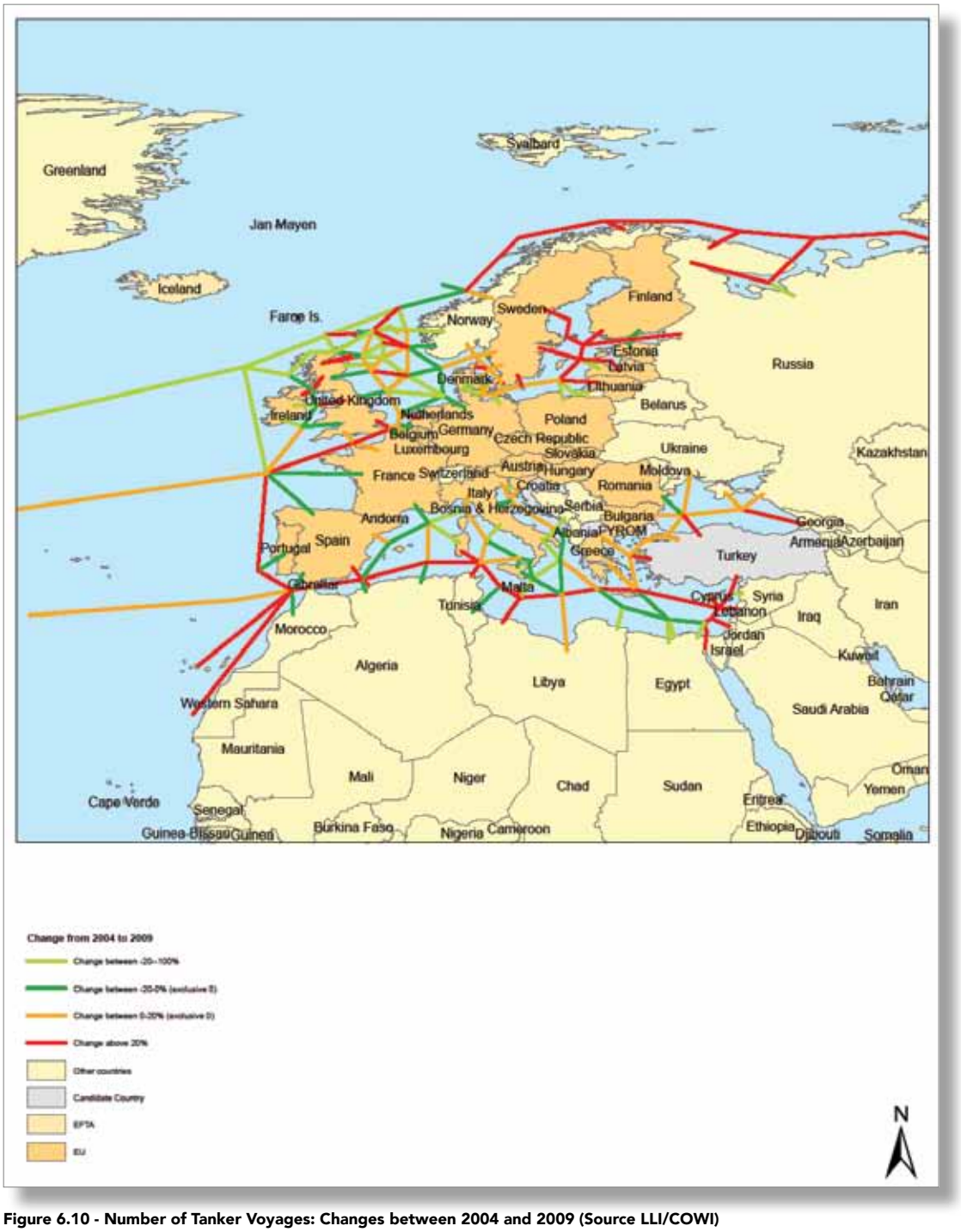


Figure 6.10 - Number of Tanker Voyages: Changes between 2004 and 2009 (Source LLI/COWI)

6.6.2. Tanker Traffic Patterns by Quantity of Oil Transported

With regarding to understanding oil cargo trading patterns, another perspective is that of the quantity of oil being transported. The maps below illustrate the situation in 2009 as well as a comparison with 2004.

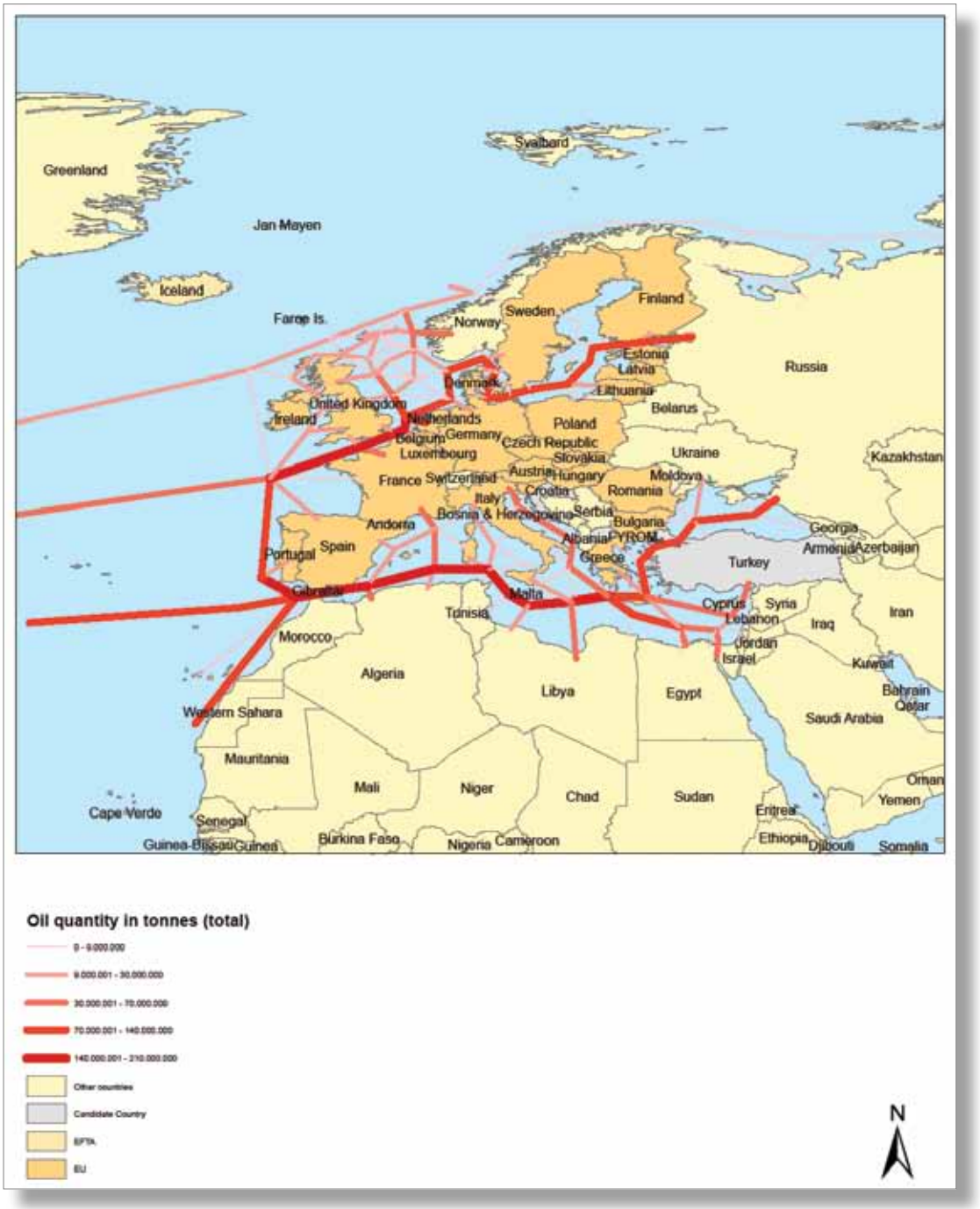


Figure 6.11 - Quantity of Oil Transported: 2009 (Source LLI/COWI)

As expected there is a strong correlation between the voyage patterns and the amount of oil cargo transported. With regard to total seaborne crude tonnes there was little change (-0.57 %) between 2004 and 2009. Given the traditional trend of year on year increase in oil consumption the nominal change between 2004 and 2009 could be due to the general economic downturn that occurred in 2009. The following map shows the changes between 2004 and 2009 at the route specific level.

With reference to changes in the quantity of oil transported between 2004 and 2009 the following can be noted:

- The expected increase in exports of oil from Russia and the Former Soviet Union (FSU) countries has occurred. The areas most affected are along the Norwegian coast as well as the Baltic and the Black Seas;
- For the Baltic Sea Route from the Gulf of Finland the largest increase of transported crude oil was observed, from 40.5 to 79.8 million tonnes. The volume of other oil products increased from 0.1 to 2.2 million tonnes;
- For the Black Sea Route the transported crude oil increased from 71,4 to 81.2 million tonnes. The volume of other oil products decreased from 4.1 to 0.9 million tonnes;
- For the northern route through the Barents Sea only a minor increase from 7.1 to 7.2 million tonnes crude oil was observed.

Figure 6.12 - Quantity of Oil Transported: Changes between 2004 and 2009 (Source LLI/COWI)

6.7. OTHER INDICATORS

Additional factors can also be considered with the framework of accidents and spills. Some of these are included below based on the availability of data.

Age of Tankers

The age of a tanker is linked to the level of maintenance required to keep the vessel fit for purpose. The charts below show, based on the data available, the age profile of tankers trading crude oil in the various regions of Europe in 2009 as well changes between 2004 and 2009 those age profiles. It should be noted that there is insufficient data for tankers aged 30 years or more to make robust comparisons.

From the chart below, in 2009 and for tankers greater than 10,000 DWT, the vast majority of crude was transported by ships aged 14 years or less. Older tankers are a feature of trade in the Mediterranean and the North East Atlantic.

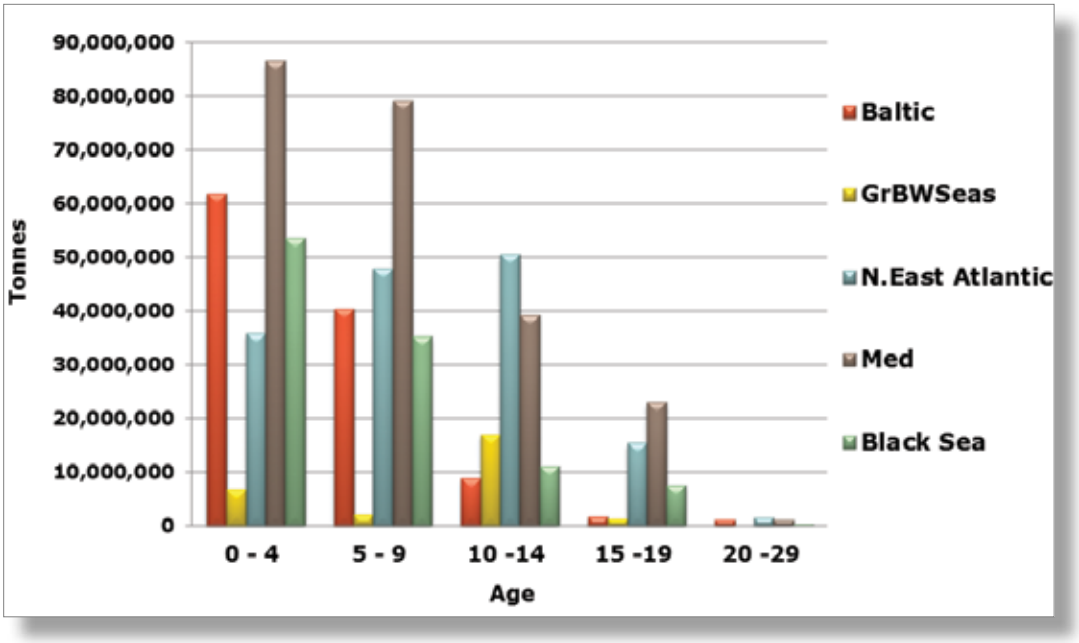


Figure 6.13 - Tanker Age Profile per Region* for Quantity of Crude Oil Transported: 2009 (Source LLI)

**** GrBWSeas refers to the Greenland Sea, the Norwegian Sea, the Barents Sea and the White Sea.***
N. East Atlantic Ocean includes the Bay of Biscay, Celtic Sea and the North Sea.

From the next chart (Figure 6.14), it would appear, for tankers greater than 10,000 DWT, that the Baltic is experiencing a significant increase in trade in older tankers i.e. more than 20 years of age. Cross-checking with the earlier chart indicates that this increase in based on a relatively small amount of oil transported. The areas of the Greenland Sea, Norwegian Sea, the Barents Sea and the White Sea are showing trend of increasing age but with more emphasis in the 10-20 age brackets.

Tanker Hull Type

Following previous major incidents there have been a number of initiatives enhance the basic design of tanker with respect to safety. One of the steps taken has been to phase out single hull tankers.

The following map (Figure 6.15) shows single hull tanker trade patterns in 2009.

From the map there were still a significant number of single hull tankers trading in 2009. 2010 is a key year with respect to the phase out of such tankers and so the trend of reduced trade can be expected. Analysis of 2004/2009 changes (not shown) confirms the expected decrease in the use of single hull tankers. This no doubt reflects the changes in maritime legislation aiming at such an effect. What is not clear at this stage, due to the various exemptions allowed under MARPOL, is the effect in the medium term. In particular, the Black Sea and the East Mediterranean Sea may be confronted with negative consequences of the continued use of single hull tankers in these sea areas.

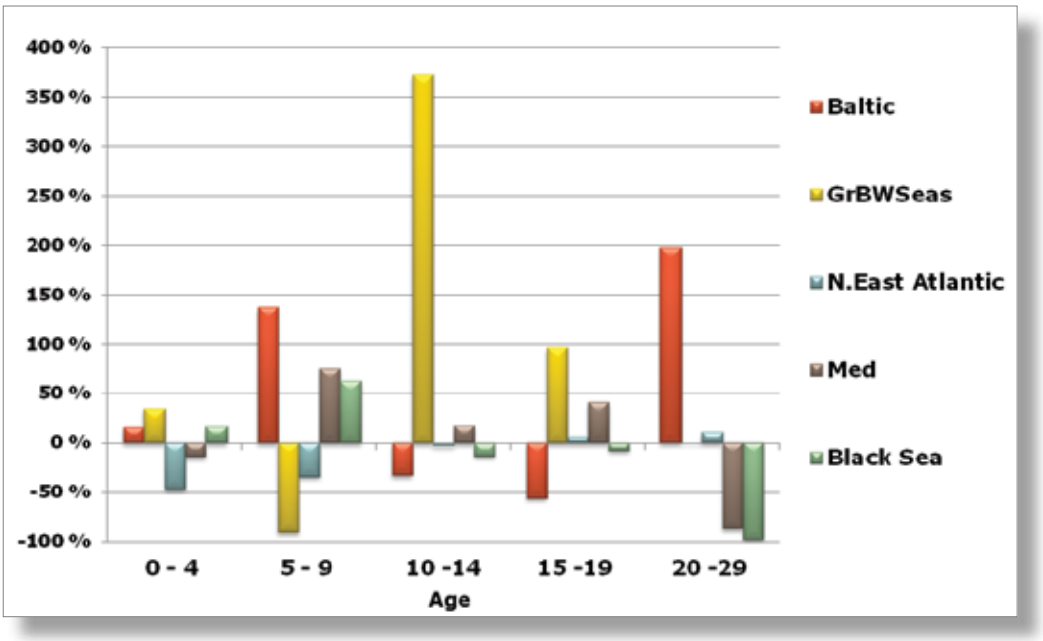


Figure 6.14 - Tanker Age Profile per Region* for Quantity of Crude Oil Transported: Changes 2004 -2009 (Source LLI)

**** GrBWSeas refers to the Greenland Sea, the Norwegian Sea, the Barents Sea and the White Sea. N. East Atlantic Ocean includes the Bay of Biscay, Celtic Sea and the North Sea.***

Figure 6.15 - Single Hull Tankers: Number of Voyages: 2009 (Source LLI/COWI)

6.8. TRENDS IN SPILL FACTORS

Ship to Ship Transfers: Lightering

Lightering involves the process of transferring cargo from a larger vessel (typically a Very Large Crude Carrier or Suezmax) to a smaller vessel, or service ship (typically an Aframax). By way of an example, a Very Large Crude Carrier could offload to as many as four or five smaller vessels which in themselves can still be of a significant size e.g. 50-80,000 DWT. The reverse operation is also undertaken. In general, lightering is undertaken when restrictions such as depth of water, narrow entrances or small berths impede a large vessel from entering a port. This type of activity can also be done in reverse, loading from a terminal and carrying cargo out to a bigger vessel offshore. The extent of such activities is largely driven by long-haul crude oil import volumes, which fluctuate depending on demand for petroleum products and refinery utilisation.

Such ship to ship transfers (STS) do occur around Europe. Unfortunately, there does not appear to any collated and/or consolidated data regarding the actual areas and the amounts of oil being transferred. Accordingly, it is difficult to build a picture of such operations at the European level. One of the most well-known recent trends is an increase in STS operations of relatively small tankers due to the shallow waters of the Baltic Sea and some of the approaches to the Northern Maritime Corridor ports. However, once this stage of the journey has been negotiated it is then more economically viable to transfer the oil into larger tankers for the onward journey to its eventual destination in either the Americas or the Far East. Data from the UK's Maritime and Coastguard Agency (MCA) indicates that such operations tend to involve transfer of oil from a number of smaller vessels (around 2-6) into one larger vessel.

Arctic Issues

Another evolving issue is the expected increase in activities in and around the Arctic related to shipping and oil/gas production. According to information available through the Arctic Council, the environmental, economic and socio-cultural changes occurring in the Arctic today are primarily driven by two key factors: climate change and increasing economic activity. Regarding climate change, it is estimated that warming of the Arctic could be more than (potentially twice) the global average. It was also concluded that the reduction in sea ice will continue to lengthen the navigation season and very likely increase access to Arctic resources.

On the economic front, most large-scale activity has focused on offshore fisheries and hydrocarbon development. Important fisheries and rich mineral and hydrocarbon reserves are becoming increasingly accessible due to technological advances and the observed trend toward longer periods of open sea. This trend also has significant implications for the use of the Arctic as an efficient shipping route.

It should also be noted that, following the 2985th Foreign Affairs Council meeting in December 2009, the Council of the European Union adopted a set of conclusions in relation to Arctic issues. Inter alia, the Council considered that there was a need for responsible, sustainable and cautious action in view of new possibilities for transport, natural resource extraction and other entrepreneurial activities linked to melting sea ice and other climate change effects. It agreed with the Commission that one of the main policy objectives should be promoting sustainable use of natural resources. Those conclusions of particular relevance can be summarised as follows:

- Research regarding environmental protection in light of long range transport of hazardous chemicals;
- Reinforced co-operation for emergencies;
- Monitoring of the evolving situation with regard to transoceanic Arctic routes for shipping and navigation.

As shown in the map on the next page, the EMSA Network of Stand-by Oil Spill Response Vessels does not provide any reasonable coverage of the Artic area.

Oil and Gas Industry Facilities

The recent Deepwater Horizon incident in the Gulf of Mexico, and the huge amount of oil released into the marine environment, is a harsh reminder of the potential for major spills from petroleum industry facilities. Within the European context there are two notable incidents that involved EMSA.

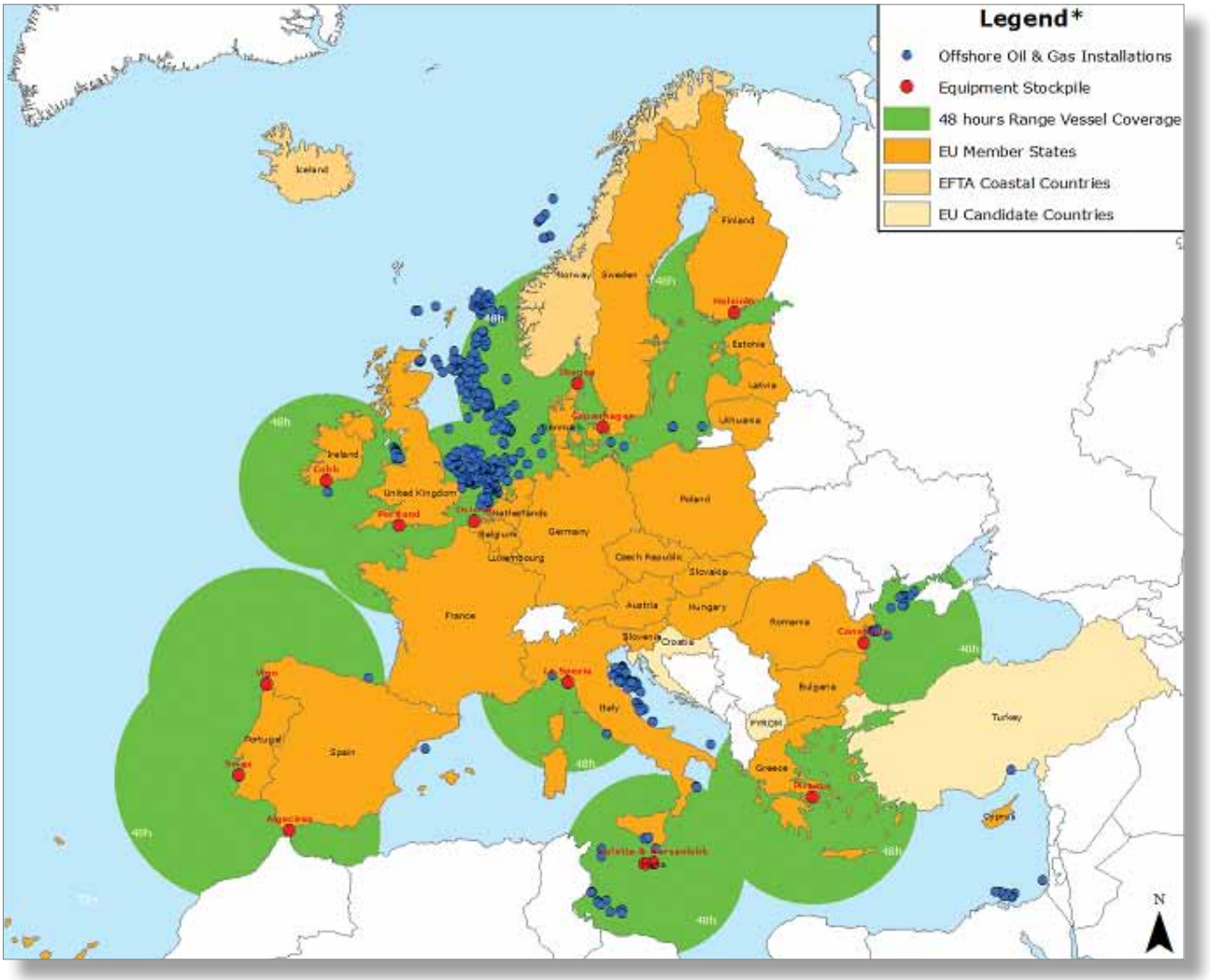
The first occurred at the Statfjord A oil platform in Norway in 2007. Approximately 3,850 tonnes of Brent crude oil leaked during loading from the Statfjord Alpha platform to a tank ship. The leak occurred in a pipe between the platform and a nearby loading buoy where tankers dock to load up. The second was the Jieh Spill in Lebanon in 2006. As a result of conflict in the Lebanon region, a substantial amount, initially estimated at 10,000 tonnes, of medium/

heavy fuel split when a number of oil storage tanks were damaged and caught fire in Jieh on the Lebanese coast.

Regarding exploration and production across Europe, there is expected to be a general increase in activities as new fields are developed. The map below, based on the collation of data from a number of sources including the Oil and Gas Producers (OGP) industry association, shows the distribution of offshore facilities around Europe. This data has been combined with the 48h (after mobilisation) coverage of the EMSA Network of Stand-by Oil Spill Response Vessels.

The on-going concern over this issue will require reflection at the European level regarding the most appropriate way forward. The Agency will separately reflect on the oil platform safety situation in the European Union and will analyse its own capacities in this respect and, if required, its suitability to respond to spills caused by offshore installations.

From the map, it can be concluded that the Network covers many of the main oil fields in Europe. Areas that that are poorly supported include the northern North Sea and the Adriatic Sea (as well as the Arctic).



** Disclaimer: Boundaries and country names are indicative and do not represent the views of EMSA nor EU institutions. The range is shown as the area which a vessel can reach at an estimated speed of 10 knots within the time given counting the mobilisation time and delaying factors. Source: International Association of Oil and Gas Producers OGP + EEA Environment Report Assessment Report n°10 (2003) + CMap Electronic Nautical Charts + Petroleum Economist Ltd Oil and Gas Map.*

Figure 6.16 - Offshore Facilities around Europe & the EMSA Network of Stand-by Spill Response Vessels (Source: Multiple inputs including OGP)**

*** As of 17 June 2010, Iceland is an EU Candidate Country in addition to being an EFTA Contracting Party.*

6.9. SYNOPSIS OF OIL SPILL PREPAREDNESS AND RESPONSE FACTORS

The various factors described above can be summarised on a regional basis as shown in the table below.

From the table it is clear that there are a range of oil spill factors which are more or less important depending on the different regions in Europe. The complexity and range of issues reflects the broad nature of the European Union as a whole. Each sea region has its own individual risk profile.

TABLE 6.1 - SYNOPSIS OF OIL SPILL PREPAREDNESS AND RESPONSE FACTORS

	Region				
Factor	Baltic Sea	North Sea	Atlantic	Mediterranean	Black Sea
MS Response Vessels	Significant number of smaller vessels and some medium sized vessels	High density of large and medium sized vessels in southern North Sea		Significant number of smaller vessels and some medium sized vessels	
Environmental Aspects	PSSA (whole area) High Natura 2000 density	PSSA (small zone) High Natura 2000 density in southern area	PSSA (whole area) High Natura 2000 density in northern area	Enclosed body of water	Enclosed body of water
Merchant Shipping: Accident Density	High density found in Finland, Sweden, Germany and Denmark	High density found in Norway, UK, the Netherlands, Belgium and the Channel	High density found in UK and Ireland	High density found in Greece	
Accidental Oil Spills			High density of large tanker spills		
Merchant Shipping: Traffic Patterns	High density found in the southern and central areas; The south-western approaches between Denmark and Sweden and the Gulf of Finland are the two areas with the greatest concentrations	High density found in the southern North Sea & the Channel	High density found along southern the Atlantic Coast	High density found along: - The main east-west routes between the Suez Canal and the Straits of Gibraltar - The north-south route passing through the Aegean Sea	High density found at Bosporus Straits
Tanker Traffic Patterns: Voyages/Quantity	Significant increase due to Russian exports	Possible decrease in traffic	Significant increase in traffic	Significant increase in east-west traffic	Increase in traffic levels
Tanker Age Profile	Most crude is transported in tankers of 14 years or less; Greenland/Norwegian/Barents/White Seas are showing trend of increasing age but within the 10-20 year range			Significant trade using older tankers	Significant trade using older tankers
Single Hull Profile				Significant number of voyages	Significant number of voyages
Offshore Facilities	Some in southern area	Very high density	Very low density	High density in Adriatic Sea and off parts of North Africa	High density of Russia and Romania

6.10. SUMMARY

Reflecting the complex nature of merchant shipping around Europe, the risk factors identified above and their importance per region varies widely. Some areas are of particularly high ecological/environmental value whilst others have a high density of merchant shipping traffic. The overview is further complicated when one considers the trends in tanker trading patterns with respect to number of voyages, quantity transported and age profile and even the effect of regulations to phase-out single hull tankers.

Such considerations would imply that the Agency's initial assumptions, as identified in the 2004 Oil Action Plan, are still broadly valid. The main theme of providing a broadly similar level of support across Europe with an emphasis on tanker trading routes would appear to be appropriate, except for the Black Sea. The main issues that were not fully considered at the time related to the oil and gas industry offshore facilities and European policies regarding the Arctic.

7. CONCLUSIONS

7.1. FINDINGS AND RECOMMENDATIONS

As described earlier the Agency has undertaken a wide range of activities in the field of marine pollution preparedness and response during the period 2007-2009. The activities have been presented in detail under the three main themes of operational assistance, co-operation & co-ordination, and information. It should be noted that published previously individual annual Reports are also available for the years 2007, 2008 and 2009 through the Agency website.

As can be expected, the main expenditures relate to the operational services, in particular the Network of Stand-by Oil Spill Response Vessels and CleanSeaNet, the oil spill satellite detection and monitoring service.

Analysis has been undertaken on the cost-efficiency of the approaches implemented to provide these two main operational services at the European level. The conclusion of the analysis is that the Agency has set-up and maintained these services in a cost efficient manner at the European level. This conclusion is supported by the various evaluations of EMSA activities in this field as well as by stakeholder feedback. The added (operational) value of such a framework has been confirmed. The technical specifications of the at-sea oil recovery service provided through the Network of Standby Oil Spill Response Vessels have been recognised as being fit for purpose

It must be highlighted that the purpose of the Network is to "top-up" Member States' response capacity when affected by a spill. The primary responsibility to respond to an incident is, and remains, with national authorities. Accordingly, the Agency provides a "European tier" of response capacity that is aimed at assisting coastal States. Clearly, such a "reserve for disasters" should have limits in terms of how much response capacity is made available.

As shown in the map on the next page, the Network currently provides a level of operational coverage that is broadly similar across Europe. The main areas of weak/no coverage in terms of time needed for an EMSA vessel to arrive onsite include the Arctic, the northern North Sea, the Bay of Biscay, the Canary Islands, parts of the central Mediterranean area, the Adriatic and the eastern Mediterranean.

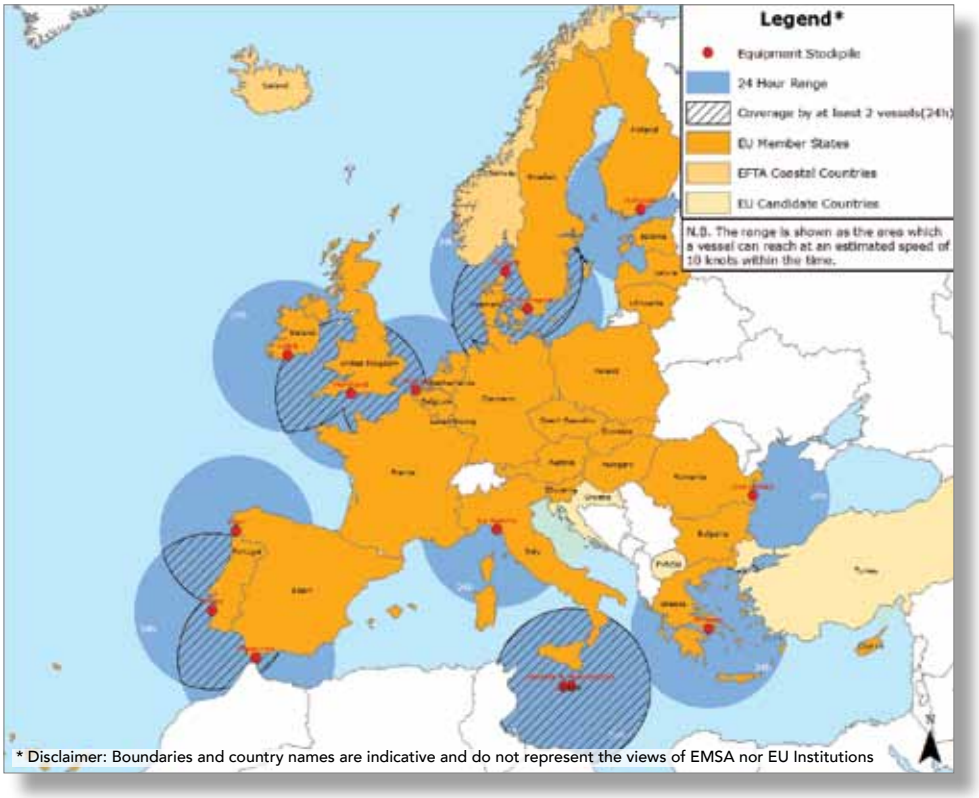


Figure 7.1 - Network of Standby Oil Spill Response Vessels: Coverage from "Ready to Sail*
** As of 17 June 2010, Iceland is an EU Candidate Country in addition to being an EFTA Contracting Party.*

The time needed for the vessels to be "ready to sail" varies between contracts. Accordingly, a mobilisation time of up to 24 hours, for discharging any cargo and for loading specialised response equipment, should be kept in mind before the vessel is "ready to sail".

With regard to more general feedback from stakeholders, primarily Member States and their marine pollution experts, the conclusion is that there has been a positive evolution of their perception with respect to the scope of activities undertaken by the Agency. EMSA has implemented complex and challenging projects in an effective manner. Whilst there is always room for improvement, the overall sense is that the Agency provides added value to the pollution preparedness and response mechanisms of Member States.

The 2004 Oil Action Plan identified a number of assumptions regarding oil spill risk factors around European waters. This analysis remains valid with certain exceptions. The main conclusion is that the risk factor overview across Europe is complex. Each area has its own profile wherein different specific elements are more or less significant. Additional issues that need to be considered include the following:

- The potential threat posed by the relatively high concentration of single hull tankers trading in the East Mediterranean and Black Sea areas;
- The increase in ship to ship transfers of oil and the associated general lack of detailed information on the scale of these activities;
- The development of the Arctic in general and the increase in shipping and oil/gas exploration activities in particular;
- Particularly in the wake of the Deepwater Horizon incident, the potential threat posed by offshore oil facilities;
- The increasing importance to make available EMSA pollution preparedness and response resources and activities to neighbouring countries in adjacent seas.

With the abovementioned issues in mind, the Agency intends to continue the broad line of activities that it has undertaken to date and as described in earlier chapters. CleanSeaNet is, as of 2011, already in phase of service upgrading whilst Co-operation & Co-ordination and Information activities will continue in the same vein.

Such actions will have to be carried out within the existing financial envelope, as provided by the Budget Authorities.

It is worth noting that given the utilisation of budget appropriations to date, there is very limited scope for any major new activities to be implemented within the remainder of the financial envelope available through the existing Multi-annual Funding Regulation.

The Multi-annual Funding (MAF) Regulation itself has proven to date to be a very useful tool for enabling the Agency to implement its activities in the field of pollution preparedness and response. The complex nature of some of these activities, combined with the need to have multi-annual contracts with industry allowing, for example, the Agency to benefit from one-off investments in pre-fitting vessels for oil recovery services and to create economies of scale for satellite based services, has been greatly facilitated by the MAF Regulation.

The (cost-efficient) sustainability of the operational services, which is a key factor in their added value, is only possible through the budgetary framework provided by the MAF Regulation. **Accordingly, it is strongly recommended that the financial envelope be renewed beyond its expiry date in 2013.**

7.2. BUDGET APPROPRIATIONS: SUMMARY

Based on the continuation of the services described at the level indicated it is possible to estimate the overall utilisation of the Multi-annual Funding financial envelope of EUR 154 million over the period 2007-2013. The table below shows the results of the projected utilisation.

Whilst the utilisation rate for Commitment Appropriations is very good, the projected utilisation of Payments Appropriations is lower. A number of factors influence the rate of payments. For example, with respect to the Network of Standby Oil Pollution Response Vessels, if there is a delay regarding a new contract in entering the operational phase of the service, there is a reduction in payments for that year. Similarly, if a satellite image provider does not deliver the product in a timely manner then there is a reduction in payment. In addition, 4 year contracts signed (committed) before 2014 will trigger payments up to 2017 which will fall outside the current Financial Perspectives. The "rolling" effect of renewed or replacement contracts evens out such effects. The balance can only be achieved if the aggregated value of contracts running into 2007 were the same as at the end of 2013. Clearly this is not possible as the Agency was in the "building up" phase in 2007 compared to a significantly more mature structure expected by the end of 2013. It is worth noting that in 2005 the Agency started making commitments and initial payments in relation to the first set of 3-year Standby Oil Spill Response Vessel contracts. 2006 saw similar actions with respect to setting up the CleanSeaNet service, also based on 3-year contracts. Accordingly, payments for these two main activities are spread over a number of years, some of which fall into the period covered by the Multi-annual Funding Regulation.

TABLE 7.1 - EXPECTED UTILISATION OF MAF REGULATION FINANCIAL ENVELOPE

	EXPECTED UTILISATION OF MAF FINANCIAL ENVELOPE	
	Utilisation compared to: - Actual amounts for 2007-9, - Amount projected for 2010 - Amount requested for 2011 and - Amount estimated for 2012-13	
	Commitments	Payments
2007	23,979,706	15,314,262
2008	17,094,428	15,452,978
2009	18,766,800	17,302,982
2010	20,241,742	13,332,883
2011: Requested	23,000,000	20,000,000
2012: Est.	21,000,000	21,000,000
2013: Est.	25,600,000	20,000,000
TOTAL	149,682,676	122,403,105
MAF Envelope	154,000,000	154,000,000
Difference	4,317,324	31,596,896
Utilisation (%)	97.20	79.48

About EMSA

The European Maritime Safety Agency is one of the European Union's decentralised agencies. Based in Lisbon, the Agency provides technical assistance and support to the European Commission and Member States in the development and implementation of EU legislation on maritime safety, pollution by ships and maritime security. It has also been given operational tasks in the field of oil pollution response, vessel monitoring and in long-range identification and tracking of vessels.

http://www.emsa.europa.eu

EUROPEAN MARITIME SAFETY AGENCY