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REPORT FROM THE COMMISSION TO THE EUROPEAN PARLIAMENT AND THE COUNCIL

Mid-term evaluation of Regulation (EU) No 911/2014 on multiannual funding for the action of the European Maritime Safety Agency in the field of response to marine pollution caused by ships and oil and gas installations

{COM(2018) 564 final}

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Glossary

Term or acronym	*Meaning or definition*
AIS	Automatic Identification System
EMSA	European Maritime Safety Agency
CSN	CleanSeaNet
EODC	Earth Observation Data Centre
MAF	Multi Annual Framework
SSN	SafeSeaNet
EAS	Equipment Assistance service
VOO	Vessel of Opportunity
NRT	Near real Time
SAR	Synthetic Aperture Radar
HELCOM	Helsinki Commission
REMPEC	Regional Marine Pollution Emergency Response Center for the Mediterranean Sea
MPV	Multi-purpose Vessel
OSRV	Oil Spill Response Vessel
VAC	Vessel Availability Contract
POLREP	Pollution Report
POLWARN	Pollution Warning
POLINF	Pollution Information
CECIS MP	Common Emergency Communication and Information System for Marnie Pollution
APM	Anti-pollution Measures
CAAR	Consolidated Annual Activity Report
Cefic	European Chemical Industry Federation
MAR ICE	Maritime Incident Chemical Emergency
HNS	Hazardous and Noxious Substances
MAR CIS	Maritime Chemicals Information Sheets

DUET	Dispersant Usage Evaluation Tool
SPD	Single Programming Document

1. INTRODUCTION

Purpose and scope

The purpose of the evaluation is to assess the European Maritime Safety Agency's (EMSA) measures to respond to marine pollution caused by ships and oil and gas installations as covered by Regulation (EU) No 911/2014[1]. The Commission has the legal obligation to carry out a mid-term evaluation and to submit to the European Parliament and to the Council a report no later than 31 December 2017[2].

The report covers the period between 1 January 2014 and 31 December 2016 and it presents an evaluation of the Agency's ability to fulfil its responsibilities in an effective and cost-efficient manner in EU waters and beyond in relation to third countries sharing a seabasin with the Union.

The evaluation assesses:

- the relevance of EMSA's measures to respond to pollution and whether these measures address current pollution risks and pollution response needs. In this regard the utility of the action is being looked at (to what extent different stakeholders' groups are being satisfied).
- the effectiveness of EMSA's measures to detect and respond to pollution and how effective was the use by EMSA of the Union contribution
- the efficiency of EMSA's measures to respond to pollution and of the use by EMSA of the Union contribution and whether the costs were proportionate to the benefits, notably through a quantitative assessment of actual costs and benefits of the Network of Stand-by Oil Spill Response Vessels
- the coherence of EMSA's measures to respond to pollution with other EU intervention means such as the Union Civil Protection Mechanism
- the EU added value of EMSA's measures to respond to pollution compared to interventions at regional (in particular those of regional agreements and organisation) or national levels by public authorities or the private sector. In this regard the complementarity of the intervention is being looked at.

The results of this report will be used by the Commission and the Administrative Board of EMSA to discuss any relevant reorientation regarding the allocation of resources and the activities within the annual and multiannual programming exercise of the Agency. In the medium term, this report will also feed in the discussions regarding the future EU multiannual Financial Framework post 2020 and the related Commission proposal.

[1] Regulation (EU) No 911/2014 of the European Parliament and of the Council of 23 July 2014 on multiannual funding for the action of the European Maritime Safety Agency in the field of response to marine pollution caused by ships and oil and gas installations (OJ L 257, 28.8.2014)
[2] Article 7, Regulation (EU) No 911/2014

2. BACKGROUND TO THE INTERVENTION

Description of the intervention and its objectives

The marine environment, European coasts and European citizens have been affected by major oil spills on a regular basis. Tankers such as the *Torrey Canyon* (1967), *Amoco Cadiz* (1978), *Erika* (1999) and *Prestige* (2002), to name just a few, are in everybody's memories. Deepwater Horizon came as a sharp reminder of the major risks associated with oil and gas installations and exploratory oil drilling. The raised awareness of the socio-economic and environmental impacts of oil spills[3] has been one of the driving forces in the evolution of preparedness and response structures in Member States and industry. As a result, contingencies for ship/installation-sourced pollution should be ready and able to mitigate the potential damage.

In the aftermath of the Prestige disaster which highlighted the existing shortage of at sea oil recovery capacity in Europe at the time, the EU decided to set up a top-up capacity at EU level to help coastal States around Europe to respond quickly, effectively and efficiently to a major oil spill. EMSA was mandated in 2004 to provide this top-up capacity to Member States. It should not substitute national capacities (either at national level or at regional level) but provide the necessary additional capacities in case of a major incident. The initial framework for the creation of additional response capacity to assist Member States upon request in case of large oil spills was described in EMSA's Action Plan for Oil Pollution Preparedness and Response[4].

Consequently, the Network of Stand-by Oil Spill Response Vessels has been built up and maintained through annual procurement procedures starting in 2005. This service is based on the long term chartering of commercial vessels, which are adapted to become occasional oil spill response vessels. When they are not required to respond to a spill, they undertake their normal commercial activities provided that they remain within a 24 hours radius allowing them to intervene quickly in case of an emergency. EMSA supports the costs of adapting the vessel (up to a certain cap laid down in the tender specifications), pays a quarterly availability fee for providing the standby service. The pollution response equipment is also the property of EMSA. If called to action, the requesting State will pay a daily operational fee which is fixed in the contract. A summary table of the network building activities is attached as Annex 3. The service supplements the resources and arrangements that have already been set up at national and regional levels.

Illegal, either incidental or deliberate, discharges of oil (and other substances) in the marine environment is a major source of marine pollution which is less visible than major oil spills but not less damageable and has therefore been subject to international regulation (IMO MARPOL Convention) and EU law. With the adoption of Directive 2005/35/EC as amended on ship-sourced pollution[5], the task of detecting spills including illegal discharges at sea was elaborated and incorporated into EMSA's activities to

[3] As an example, the study published by Fundación Barrie de la Maza on the impact of the Prestige spill in 2003 estimated the coastal clean-up operation as costing around €2.5 billion, with around €2.2 billion spent during the first two years. The total economic damage over ten years was estimated by various authors (Professional Economist Associations of Galicia) at around €5 billion.

[4] As adopted by the Agency's Administrative Board in October 2004. It can be downloaded from the EMSA website: www.emsa.europa.eu

[5] Directive 2009/123/EC of 21 October 2009 amending Directive 2005/35/EC on ship-source pollution and on the introduction of penalties for infringements (OJ L280, 27/10/09)

respond to marine pollution from ships. As a result, the satellite based oil spill detection and monitoring service CleanSeaNet was established in 2007.

When a possible oil spill is detected in national waters, an alert message is delivered to the relevant country. In cases of high alert level spills, EMSA Maritime Support Service may call the coastal State to ensure that the alert has been received and to offer additional support. Analysed images are available to national contact points in near real time, in less than 30 minutes after the satellite acquires the image. The service includes the identification of potential polluters by combining the image taken by the satellite with vessel traffic information. After receiving the enriched information the national authority then decides on the appropriate operational response, for example, sending an asset such as an aircraft to check the area and verify the spill, or requesting an inspection of the vessel in the next port of call.

Since the very beginning, the CleanSeaNet service has also had the explicit purpose of providing support during accidental large-scale pollution events.

Regarding chemical pollution from ships, the need to address the risks associated with this type of pollution led to consultations with the Member States and the Commission and the resulting drafting of a specific Action Plan for Hazardous & Noxious Substances (HNS) Pollution Preparedness and Response[6], which was adopted by EMSA's Administrative Board in June 2007. The added value for EMSA intervention was identified as being the rapid provision of expert information and advice on chemical substances during an emergency to support any requesting party's decision making process.

Following the *Deepwater Horizon* disaster involving an offshore oil drilling rig, the same logic was applied that EMSA could intervene in case of major incident not replacing the prime responsibility of the oil and gas industry to have its own response means. A review [7] of the European preparedness to respond to oil spills from offshore installations indicated the need to further enhance the European marine pollution response capacity. Subsequently EMSA's mandate for operational assistance was enlarged to also include response to marine pollution caused by oil and gas installations. The framework for this new task was described in the 2013 Action Plan for Response to Marine Pollution from Oil and Gas Installations.

According to its founding regulation[8], EMSA is tasked to:

- Support on request with additional means in a cost efficient way the pollution response mechanisms of Member States;
- Provide Member States and the Commission with technical and scientific assistance in the field of marine pollution from ships and oil and gas installations.

These tasks are implemented by providing antipollution means (specialised ships and equipment), satellite images to detect pollution (CleanSeaNet), expert advice and information in case of chemical spills and through regular meetings to exchange

[6] http://www.emsa.europa.eu/opr-documents/action-plans/item/260-action-plan-for-hns-pollution-preparedness-and-response.html
[7] http://emsa.europa.eu/opr-documents/item/1961-action-plan-for-response-to-marine-pollution-from-oil-and-gas-installations.html
[8] Regulation (EU) No 100/2013, amending the Agency's Founding Regulation (EC) No 1406/2002 establishing a European Maritime Safety Agency (OJ L 39, 9.2.2013)

information on best practices among the EU/EFTA Member States and Regional Agreements.

Already in the early days of implementing the Agency's legal task in the field of ship-sourced pollution and the execution of its 2004 Oil Pollution Action Plan for setting-up its operational assistance, EMSA was confronted with difficulties to reconcile the need to conclude multi-annual contracts with industry with the "annuality" of the EU /EMSA budget. Such contracts are needed in particular for stand-by oil spill response vessel arrangements, where substantial investments are required, as well as for organising the CleanSeaNet service.

The 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[9] 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".

The first financial envelope for the period 2007-2013 was €154 million. The envelope for the current period 2014-2020 is €160.5 million.

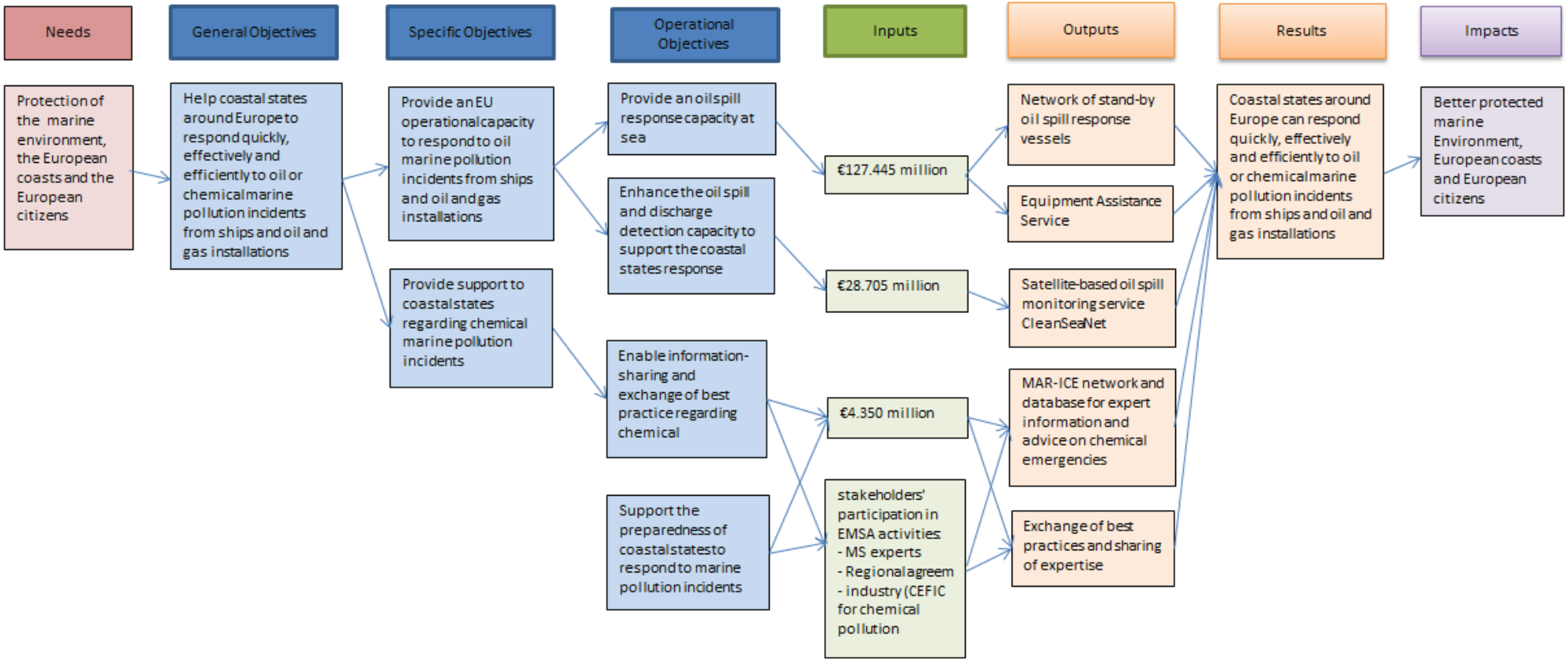
In a complementary way to the mandate of EMSA, the objective of Regulation (EU) No 911/2014 is to facilitate the provision of an EU operational capacity supporting Member States' capacities to respond to oil or chemical marine pollution incidents from ships and oil and gas installations. It does so by laying down indicatively the financing amount and the scope of the Agency financed actions over 7 years (2014-2020).

The multiannual perspective set out in Regulation (EU) No 911/2014 provides legal certainty and a stable framework to allow the Agency to conclude multiannual contracts with the industry both in relation to stand-by oil-spill response vessels and for organising CleanSeaNet.

The above elements are encapsulated in the following intervention logic matrix.

[9] 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.*

Figure 1: Intervention logic



To achieve the objectives of providing Europe with an effective and efficient anti-pollution top-up capacity, the Agency offers a range of services to help coastal States around Europe respond adequately to oil or chemical marine pollution incidents from ships and oil and gas installations.

The services offered by the Agency can be described as a "toolbox" to provide any requesting State with the most suitable response means. Through these services, EMSA aims to complement and top-up existing response resources at national and regional level.

The Agency sustains the operational readiness of these services, through dedicated drills and exercises, and organises their quick mobilisation when requested. Once activated, the relevant services are operated under the control and responsibility of the requesting party. The services are available at the request of EU Member States, EFTA/EEA countries and neighbouring countries sharing a regional sea basin with the EU.

EMSA provides at EU level the following operational services:

- A Network of Stand-by Oil Spill Response Vessels distributed along the European coastline with different types of oil combatting equipment arrangements, complemented by strategically positioned oil dispersant stockpiles;
- An Equipment Assistance Service, offering dedicated stockpiles of oil pollution response equipment;
- A satellite-based oil spill monitoring service known as CleanSeaNet;
- The MAR-ICE Network (Marine-Intervention in Chemical Emergencies), a service for chemical emergencies providing expert information and advice;
- The MAR-CIS database of substance-specific marine chemical information sheets.

Through its Maritime Support Services centre, open 24/7, the Agency also supports decision-making at EU level providing alerts and rapid assessment in case of major accidents and risk of pollution.

In addition, EMSA facilitates the exchange of best practices and the sharing of expertise through:

- The Consultative Technical Group for Marine Pollution Preparedness and Response (CTG MPPR);
- The Pollution Response Services User Group;
- The Inter-Secretariat meeting of the Regional Agreement Secretariats and DG ECHO;
- Subject-specific trainings and workshops.

Last, EMSA disseminates information through the publication of inventories of Member States policies and operational response capacities, specialised information sheets and brochures.

Regarding financing, Regulation (EU) No 911/2014 provides for €160.5 million over a period of seven years (2014-2020) with the following indicative spread:

- €127.445 million for the network of response vessels and anti-pollution equipment (including 6 million to combat marine pollution by oil and gas installations)
- €28.705 million for the satellite-based oil spill monitoring service known as CleanSeaNet
- €4.350 million for cooperation and coordination activities with Member States including training and studies

Baseline and points of comparison

The present report covers the first part of the second Multi Annual Funding Regulation concerning EMSA's anti-pollution measures. By January 2014 and after ten years of development, EMSA had already established a comprehensive set of activities in the field of marine pollution detection, preparedness and response. This included the CleanSeaNet service and a network of contracted oil spill response vessels, which consisted of 18 vessels. This network was set-up to top-up national response capacities as third tier[10].

The baseline scenario is the situation in which the financing regulation and the associated funding were not in place for this period (2014-2016). The Agency's capability listed in table 1 end of 2013 including the vessel network and the CleanSeaNet routine monitoring would have had to stop. As most of EMSA activities are implemented through multi annual contracts which overlaps the previous and current Multi Annual Funding Regulations, such a scenario would have entailed identifying proper external funding in order to terminate these contracts and/or being faced with several litigations. Member States would have been left without any service, thus being forced to find alternative solutions for some of them (CleanSeaNet for instance) at increased costs. Moreover, EMSA would not have been in a position to deliver on its mandate in the field of assistance to Member States for pollution response as this task is entirely funded through the Multi Annual Funding Regulation.

The beginning of the implementation of the Action Plan for Response to Marine Pollution from Offshore Installations coincides with the period under review for this evaluation (2014-2016).

Hence, the evaluation assesses the effectiveness, efficiency, relevance, coherence and added value of the EMSA capability against a baseline where EMSA is not in a position to deliver assistance in accordance with its mandate.

[10] The concept of Tiered Preparedness and Response is a long-standing, internationally recognized system, developed originally by the oil industry and endorsed by the IMO Convention on Oil Pollution Preparedness, Response and Co-operation. The concept has been considered as a function of size and location of a potential oil spill, with three tiers typically defined. Tier 1 spills are operational in nature occurring at or near an operator's own facilities, as a consequence of its own activities. The individual operators are expected to respond with their own resources. Tier 2 spills are most likely to extend outside the remit of the Tier 1 response area and possibly be larger in size, where additional resources are needed from a variety of potential sources and a broader range of stakeholders may be involved in the response. Tier 3 spills are those that, due to their scale and likelihood to cause major impacts, call for substantial further resources from a range of national and international sources.

3. IMPLEMENTATION / STATE OF PLAY

Description of the current situation

In the aftermath of the *Deepwater Horizon* oil spill, EMSA's tasks were enlarged to also provide pollution response assistance to Member States in case of large-scale oil spills originating from oil and gas installations. These spills, especially well blowouts, can differ substantially from ship-sourced oil pollution. One of the reasons is the potentially larger quantity and prolonged release of spilled oil[11], if the leakage proves difficult to stop. Environmental impacts as well as safety hazards associated with oil spills originating from oil and gas installations could be more severe than with ship-sourced oil spills due to the potential continuous release of fresh oil. Responding to such spills requires, besides the already available recovery capacities, to develop new capacities in terms of magnitude and techniques (use of dispersants, in situ burning).

The main activities to prepare for EMSA's potential intervention in the field of response to pollution as identified in the Action Plan for Response to Marine Pollution from Oil and Gas Installations and implemented are:

- Adaptation of the network of stand-by oil spill response vessels;
- Provision of specialised equipment;
- Provision of oil spill dispersants; and
- Monitoring and evaluation tools, including the CleanSeaNet service.

With regard to response, EMSA's capacity also covers the response to oil pollution caused by oil/mixed oil and gas installations. The response to pollution caused by gas installations is not addressed by the Agency due to the particularities of such incidents. EMSA's expertise and response capabilities are primarily focused on oil pollution in the marine environment. Gas emissions may include liquid condensates, which evaporate into the atmosphere, with limited residues persisting on the water surface, meaning that on-site recovery is limited.

Notwithstanding the extension of the mandate of EMSA to cover potential spills from oil and gas installations, the current multi-annual financial framework for 2014-2020 has been slightly increased compared to the previous period (€160.5 million compared to €154 million for 2007-2014). Within this envelope, the Agency had to adapt its strategy by exploiting synergies and prioritising activities.

It should be noted here though that the industry has an important role to play in the prevention of, and preparedness for and response to, oil spills caused by oil and gas installations. This is usually as part of the license conditions of the shelf State[12], by undertaking initiatives to improve the safety and environmental standards of oil activities and to limit the extent of incidents that can affect human life and the environment. Existing public and private pollution response capabilities and contingency plans at

[11] As a comparison, *Deepwater Horizon* generated a spill of 800,000 tons of oil compared to 20,000 tons for the *Erika* and 64,000 tons for the *Prestige* accidents.

[12] Under the United Nations Convention on the Law of the Sea, the name continental shelf was given a legal definition as the stretch of the seabed adjacent to the shores of a particular country to which it belongs.

regional and national level are regularly updated and reviewed to be ready to respond to the challenges posed by the nature of spills from offshore operations[13].

In line with its mandate to top-up Member States' capacities, and also taking into account the industry resources, EMSA has therefore focussed on activities that were complementing the existing resources whilst being cost-efficient.

A comparison of the situations at the beginning and end of the reporting period (2014-2016) is presented below in table 1.

Table 1: Summary of the evolution of Pollution Response Services (PRS) between 2013 and 2016

N°	Activity		End of 2013	2014 - 2016
1	Vessel Network	Number of contracted vessels and overall storage capacity for recovered oil.	18 fully equipped vessels available for pollution response, around 63,000 m^3 storage capacity.	17 fully equipped vessels available for pollution response, around 62,000 m^3 storage capacity.
		Geographical adaptation to cover areas with offshore installations	Mediterranean Sea and Black Sea coverage.	Relocation of vessel arrangements to cover northern North Sea, Adriatic Sea and Canary Islands and Madeira areas.
		Technical adaptation vessels/equipment based in areas with the presence of oil and gas installations for recovery of oil with Flashpoint (FP) < 60°C	(Only) vessels based in the Mediterranean certified for recovery of oil with FP < 60°C. Seven of the 18 vessels certified for recovery of oil with FP < 60°C.	All the contracted vessels based in areas with the presence of oil and gas installations certified for recovery of oil with FP < 60°C. Ten of these 17 vessels certified for recovery of oil with FP < 60°C.
		Contractual adaptation for extended response operations	Incident Response Contract for a duration of 21 days, renewable	Incident Response Contract for a duration of 30 days, renewable.
3	Dispersant Application	Vessel dispersant application	-	Four vessel arrangements equipped with seaborne dispersant application systems. Four dispersant stockpiles, 200 tonnes each, established in Cyprus, Malta, Sines (Portugal) and Las Palmas (Spain).
		Airborne dispersant application	-	Although contracts were awarded to two companies that had submitted tenders, both eventually declined and withdrew their offers resulting in unsuccessful procurement of an aerial dispersant application service.

[13] These obligations results in particular of Directive 2013/30/EU of the European Parliament and of the Council on safety of offshore oil and gas operations

4	Provision of specialised equipment	Setting-up a new Equipment Assistance Service (EAS)	-	Two Equipment Assistance Service (EAS) stockpiles established in the Northern North Sea (Aberdeen, UK) and in the Baltic Sea (Gdansk, Poland). This new service provides specialised stand-alone equipment (i.e. fire booms, trawl nets and integrated oil containment and recovery systems), which can be used by Vessels of Opportunity (VOO), ready for mobilisation and transport at short notice, around the clock.
5	CleanSeaNet	Routine monitoring (average area monitored per year)	387 million km^2	623 million km^2

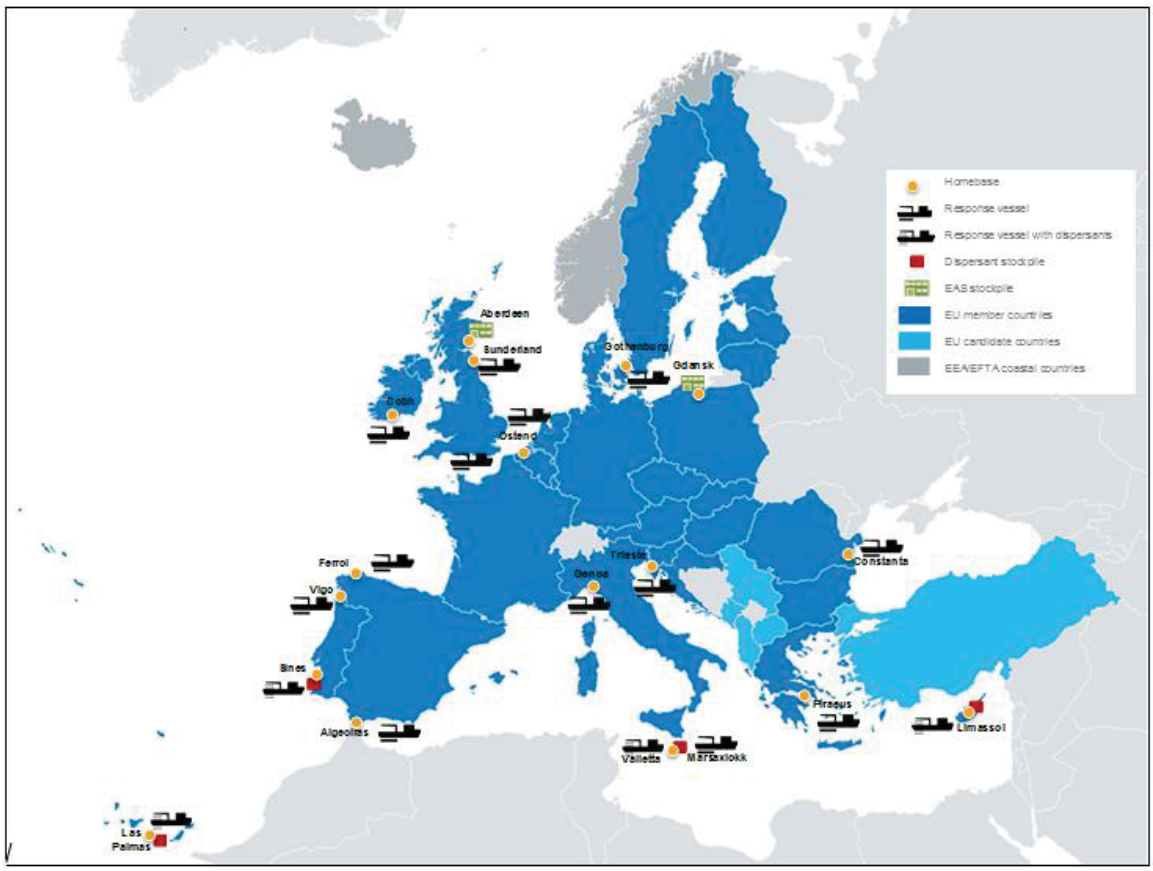
Oil Pollution Response Services

Regarding operational oil pollution response services, at the end of 2016 EMSA's oil pollution response resources comprised the following arrangements:

- 17 fully equipped stand-by oil spill response vessels for mechanical recovery of oil, 4 of which equipped in addition with dispersant spraying capability;
- 4 dispersant stockpiles;
- 2 Equipment Assistance Service (EAS) stockpiles.

The distribution of EMSA's pollution response arrangements at the end of 2016 is shown in Figure 2.

Figure 2: Distribution of EMSA's pollution response arrangements in European waters at the end of 2016



Source: EMSA

Oil Spill Response Vessel Network

During the reporting period, the Agency completed several "improvement projects" to upgrade the response capacity of its fleet of vessels and to adapt them in line with the actions identified in the Action Plan for Response to Marine Pollution from Oil and Gas Installations, mainly by adding some dispersant spraying capacities on some arrangements in areas where this response technique is accepted by the coastal States or by improving the capacity of the vessels to deal with oil with a flashpoint below 60°[14].

Although the oil spill response vessels were not called into real action during the period under review they participated in regular exercises with the Member States (see annex 4).

Equipment Assistance Service

As part of the 'Action Plan for Response to Marine Pollution from Oil and Gas Installations', a key task for the Agency during the reporting period has been the implementation of the Equipment Assistance Service programme. This programme aims to make EMSA's pollution response toolbox more diverse through the provision of specialised stand-alone equipment for use on board Vessels Of Opportunity and to

[14] Fresh and continued releases of oil from offshore installations create vaporous and explosive atmospheres. In order to be able to intervene near the source of the spill, ships and equipment need to be adapted to avoid creating a hazard.

enhance the response capabilities of the Agency with new equipment systems not available in EMSA or Member States inventories. As of 2016, two EAS stockpiles have been established in the North Sea and Baltic Sea. The service is a new one and has only been operational for the last six month period under the reporting period. During this short period there was no request for the service by the Member States

Dispersant Service

In order to effectively carry out the new task of responding to marine pollution caused by oil and gas installations, EMSA developed a new service through the establishment of:

- Limited dispersant[15] stocks associated to the home bases' of selected EMSA contracted vessels; and
- Seaborne dispersant application systems on selected EMSA contracted vessels.

Through the provision of dispersant and seaborne dispersant application systems, EMSA has made available additional oil spill response services at European level. The dispersant application service is intended primarily for use in the event of major pollution events originating from oil and gas installations, but it may also be deployed in the case of ship-sourced pollution, depending on the decision of the affected Member States.

Drills and Exercises

EMSA's vessel contractors are obliged to train their crews and to maintain the oil pollution response equipment in order to be ready to carry out oil pollution response services efficiently. To demonstrate the fulfilment of these obligations, the contractors are bound to carry out drills, with each contracted vessel, on a quarterly basis. These drills are assessed by EMSA observers. The satisfactory performance of the drill is a condition for the payment of the quarterly availability fee by the Agency. Furthermore, contractors are also contractually bound to participate in exercises with member States up to ten days a year. Details including the number of drills during the reporting period can be found in the annual Drills and Exercises Annual Reports 2014, 2015, and 2016, which are available on EMSA's website. A summary table of exercises is attached as Annex 4.

CleanSeaNet

The Agency has continued to provide its satellite based oil spill and vessel detection and monitoring service CleanSeaNet. CleanSeaNet provides support to European coastal States in the identification of illegal discharges and potential polluters, as well as response operations linked with accidental spills. The service provides regular monitoring of coastal waters through the near real time analysis of Earth Observation Synthetic Aperture Radar images to support enforcement against illegal discharges of polluting substances, and pollution resulting from accidents and emergencies.

In 2014, EMSA issued new framework contracts with CleanSeaNet service providers. In parallel, during 2015 and 2016, the EMSA Earth Observation portfolio was expanded to include optical satellites that could be used to support the CleanSeaNet service during large accidental spills.

[15] An **oil dispersant** is a mixture of emulsifiers and solvents that helps break oil into small droplets following an oil spill. Small droplets are easier to disperse throughout a water volume, and small droplets may be more readily biodegraded by microbes.

Key figures for the CleanSeaNet routine monitoring service to 28 coastal States are presented below:

Approximately 1,870 million km^2 were monitored in the period 2014-2016:

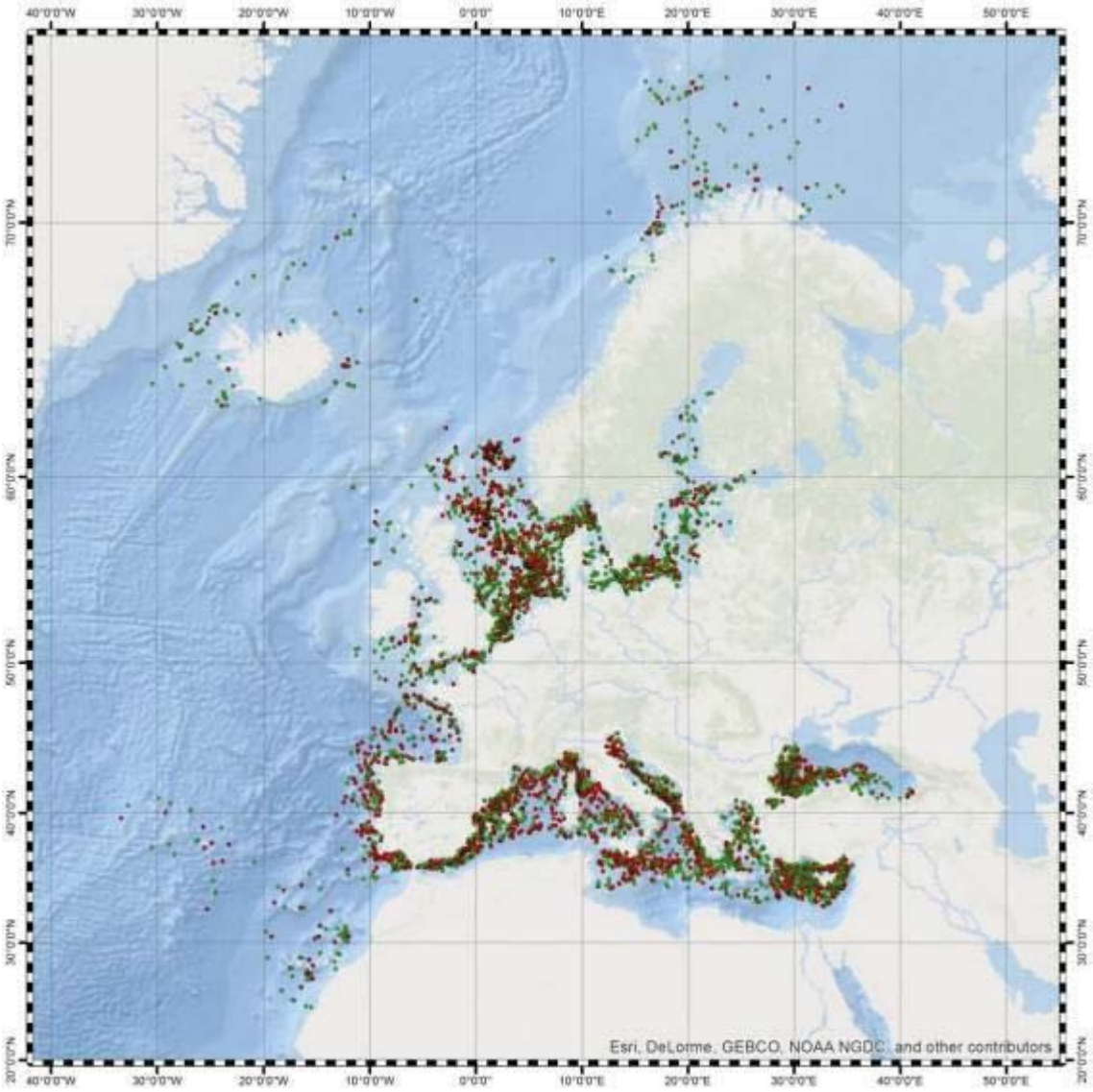
- On average 623 million km^2 per year were monitored,
- This compares with an average of 387 million km^2 per year over the 6 previous years (2008-2013).

In the event of accidental pollution, emergency satellite support can be provided to national response operations. During the reporting period 2014-2016, CleanSeaNet provided support to 10 accidental spills and emergencies, with the specific delivery of 38 satellite images in support to response operations.

The Agency supports dedicated surveillance operations organized by Member States and Regional Agreements in European Waters. Examples include the regular Coordinated Extended Pollution Control Operations and Tour d'Horizon operations, as well as other occasional national or regional operations. These consist of intensive campaigns of aerial surveillance flights over a given maritime area. From 2014 to 2016, the Agency supported 26 surveillance operations, with 100 additional satellite images ordered specifically to monitor them.

The Agency also established new framework contracts for the provision of Earth Observation optical products. These, although less used in the context of oil spill monitoring, expand the possibilities available to coastal States, who can request optical products if needed (e.g. for closer monitoring in case of incidents or emergencies, in particular near the coastline where synthetic aperture radar images are more difficult to interpret).

Figure 3: CleanSeaNet 2014–2016: Class A (red): "most probably oil" and Class B (green): "possibly oil or chemical product" detections in EU coastal State waters (except French Outermost Regions), Iceland, Norway, Turkey and Montenegro



Cooperation and Information activities relating to Pollution Preparedness and Response to promote best practices and enhance information sharing

The work of the Consultative Technical Group for Marine Pollution Preparedness and Response (CTG MPPR), a group of Member States technical experts, continued during the period of 2014-2016. EMSA also sustained its cooperation with the pollution response experts of EU Member States, EFTA/EEA coastal Countries, EU Candidate Countries, the Regional Agreements Secretariats (Bonn Agreement, HELCOM, Barcelona Convention (REMPEC), Black Sea Commission, Copenhagen Agreement and Lisbon Agreement), the Commission (DG ECHO) and, on behalf of the Commission, with the International Maritime Organization (IMO).

EMSA furthermore continued to coordinate the Inter-Secretariat meetings. These meetings provide the only forum which brings together all the Regional Agreements in Europe along with DG ECHO and EMSA, and as such are much appreciated by the Regional Agreements. The meetings focus on exchanging information on marine

pollution preparedness and response activities and projects undertaken within the various Regional Agreements, while promoting the dissemination of best practices in this field and identifying issues of common interest across the European regions, which could potentially lead to common actions that could benefit all or several of the regions.

Cooperation with the Commission / DG ECHO

The Agency continued to provide assistance for the Commission's activities on the Union Civil Protection Mechanism regarding maritime incidents. More specifically, EMSA worked closely with DG ECHO since late 2015 on the improvement of the Common Emergency Communication and Information System for Marine Pollution (CECIS MP). This included a complete revision of the resource tree for pollution response equipment and the entering of all EMSA and EU/EFTA Member States resources in the CECIS MP database.

In 2016, EMSA also supported DG ECHO in the development of the course content and training curricula for the Technical Expert Course for Maritime Incidents. The prime objective of this course is to prepare maritime experts for interventions and deployments in an affected country as part of a Union Civil Protection Team.

Activities with regard to Hazardous and Noxious Substances

EMSA pursued its activities with respect to marine incidents involving chemicals, which are different in content from the activities related to oil spills and involve technical and scientific expertise and information activities that can be mobilised during an emergency rather than dedicated response assets[16].

Notably the MAR-ICE Network (Marine-Intervention in Chemical Emergencies) which had become operational in January 2009 following the signing of a Memorandum of Understanding by Cefic[17], Cedre[18] and EMSA, continued providing a 24/7 service free of charge to the EU Member States and coastal EFTA States. The MAR-ICE 24/7 service can advise and support Member States upon request with timely information on scientific, technical, and operational aspects of a spill involving hazardous and noxious substances.

Furthermore, EMSA continued developing the so-called MAR-CIS datasheets on chemical substances frequently transported by sea, which provide information for the initial stage of incidents involving chemical substances to all EU and EFTA/EEA coastal countries as well as the coastal EU Candidate Countries. A follow-up MAR-CIS 2 project[19] started in 2015 helps to broaden the dissemination and improve the MAR-CIS information. Since December 2016, the MAR-CIS information is available through a web portal. The information is also linked to the SafeSeaNet Central Hazmat database enlarging its distribution. The MAR-CIS datasheets are also provided to Member States through the MAR-ICE network.

[16] As outlined in the 2007 Action Plan for Hazardous and Noxious Substances Pollution Preparedness and Response, adopted by the Agency's Administrative Board in June 2007 – http://www.emsa.europa.eu
[17] The European Chemical Industry Council - http://www.cefic.org/
[18] French association providing expertise regarding accidental water pollution for response support, contingency planning, training, analysis and testing and research - https://wwz.cedre.fr/en
[19] The MAR-CIS 1 project was completed in 2015 and brought the total number of available datasheets to 213.

In addition, EMSA has developed in-house modelling capacity to predict the trajectory and fate of oil and chemical spills at sea. The information is currently provided to EMSA's management and the Commission. It is also available to Member States upon request as they usually have access to local and higher resolution modelling tools.

The Agency also continued its information and support activities in the field of oil spill dispersants. More specifically, the Dispersant Usage Evaluation Tool (DUET)[20] was improved and training on its use provided to Member States.

Inventories of Member States Policies and operational response capacities

One of the Agency's tasks is to "maintain a list of the public and, where available, private pollution response mechanisms and associated response capabilities in the various regions of the Union", as defined by Regulation (EU) No 911/2014. Following up on it, EMSA published the updated information for the "*Inventory of national policies regarding the use of oil spill dispersants in the EU*" and the "*Inventory of EU Member States Oil Pollution Response Vessels"* on its website in 2014 and 2016 respectively. The data of EMSA's inventories on EU/EFTA Member States pollution response resources was used by the Agency to populate the CECIS[21] Marine Pollution database[22], managed by DG ECHO.

Financial Summary of Activities implemented during 2014 – 2016

Table 2: EMSA Pollution Preparedness and Response Activities: Financial summary (€)

2014 - 2016	Commitments	Payments
Network of Stand-by Oil Spill recovery vessels	33,921,449	39,043,483
Oil and Gas Installations (Platform)	2,697,471	2,606,866
Exercises	758,725	747,130
Equipment Assistance Service	8,950,479	5,919,380
Earth Observation Services and Licenses	10,364,585	10,024,900
CSN Service Developments	1,582,001	1,175,703
Support to CSN Users	112,966	104,935
Remotely Piloted Aircraft Systems	179,246	0
Cooperation and Coordination Meetings	389,430	197,592
HNS Information and activities	558,643	384,556
Related missions of EMSA staff	332,500	250,311
Total:	59,847,495	60,456,232

Budget execution for anti-pollution measures was challenging in all three years under review due to unforeseen events. Examples of such challenges were the withdrawal of

[20] DUET is a three-dimensional numeric model to simulate oil spills with dispersant applications that allows a quantitative comparison of these response options with different levels of effectiveness of the dispersant and timing of its application.

[21] Common Emergency Communication and Information System

[22] CECIS Marine Pollution is a web-based alert and notification application to facilitate emergency communication between EU Member States, other participating states, EMSA and the Emergency Response Coordination Centre (ERCC) of the European Commission

one ship owner following the contract award for an oil spill response vessel, the bankruptcy of another company that had been awarded a vessel contract, the last minute withdrawals of the awarded offers for aerial dispersant spraying services, and the non-renewal of a contract for an oil spill response vessel.

To understand the discrepancies between the commitments appropriations and the payments appropriations during the period under review, it has to be reminded that most of the activities are taken place under multiannual contracts which trigger a 4 year commitment in year A whereas payments will be scheduled along the years A, B, C and D. This also means that, for commitments undertaken under the previous multiannual financial period, payments appropriations had to be allocated in the first years of implementation of the current multi-annual financial period.

EMSA has managed to overcome these challenges by modifying major projects and tenders, which resulted in adaptation of the payment appropriations over the years in order to maintain the level of service and implement the new strategic projects as approved by the Administrative Board of the Agency. It should be noted that most of the contracts used for services are multiannual: 4 years renewable once for Vessel Availability Contracts and two years renewable for 2 additional years for Equipment Assistance Services. The balance between the amount of commitments and payments for these contracts is to be seen therefore on a 2-, 4- or even 8-year time basis. The deviation from the initial schedule of commitments has resulted also in changes in the payment appropriations throughout the years.

The use of the Union contribution by EMSA is monitored through the Agency's annual reports concerning the financial execution for this particular activity and through the general monitoring of the Agency's accounts by the budgetary authority and the European Court of Auditors.

4. METHOD

Short description of methodology

The analysis is based on the evidence gathered by the Agency which has some extensive and strict obligations regarding planning and reporting on the implementation of its activities. The Agency's planned activities are outlined in the annually updated Single Programming Document for the next three-year period and the detailed work programme is thoroughly discussed and approved at the Administrative Board each November. The annual reporting obligations of the Agency's activities are also addressed in detail in an Annex to EMSA's Consolidated Annual Activity Report as required under Regulation (EU) No 911/2014. Furthermore, the present evaluation is supported by an external independent study on the cost efficiency and cost effectiveness of EMSA's operational pollution response services consisting of the network of contracted standby oil spill response vessels, the stockpiles of specialised oil pollution response equipment, and the stockpiles of oil spill dispersants. The study was contracted by EMSA and conducted by the consulting firm Ramboll[23].

[23] STUDY ON THE COST EFFECTIVENESS AND EFFICIENCY OF EMSA'S OIL POLLUTION RESPONSE SERVICES, Final report intended for the European Maritime Safety Agency, Contract EMSA/NEG/08/2016, April 2017.

The study has examined and evaluated whether the oil pollution response services established by the Agency are effective when compared against the objectives outlined in the Regulation, and whether they are cost efficient in comparison with existing or potentially equivalent services performed by other governmental agencies and private organisations. Based on an input-output model, the cost-efficiency analysis is based on the allocation of real costs of EMSA's oil spill response service (adjusted to inflation) per unit of output i.e. per cubic metre (m^3) of oil storage capacity, per contract arrangement (per region and type of vessel), per type of equipment in Equipment Assistance Service stockpiles, per tonne of dispersant, per exercise and per vessel. Furthermore, the study distinguishes the different parts of the service: Oil Spill Response Vessels, dispersant application capability, and the Equipment Assistance Service. Further, the cost of recovering one tonne of oil at sea is compared with the cost of shoreline-clean-up.

Ramboll also conducted a multi-criteria analysis to compare the EMSA model (of chartered oil spill response vessels) to alternate options such as building dedicated response vessels or multi-purpose vessels[9].

The findings of the study rely on the assessment of evidence based on triangulated data collected from a range of different sources, including internal and external documentation, a targeted stakeholder consultation conducted by EMSA consisting of a survey administered to Member States, plus interviews with key stakeholders conducted by Ramboll. In addition, industry and cost data provided by shipyards and shipbrokers were collected and expert assessments were provided by oil pollution response experts subcontracted by Ramboll.

In telephone interviews with relevant stakeholders of EMSA's services, questions were asked to assess EMSA's oil pollution response services and to compare EMSA's capabilities with that of Member States. Countries that had not responded to EMSA's online survey were asked additional questions in line with the EMSA consultation. Additionally, third countries that may also utilise EMSA's services were interviewed as well. Further information regarding these interviews could be found in Annex 5 to this report.

Regarding consultation processes, EMSA conducted directly an online targeted survey with the EU/EFTA coastal Member States as the main stakeholders of the Agency. In 33 questions, the Member States were given the opportunity to provide feedback on the Agency activities by subject. Scores between 1 (very poor) and 5 (very good) allowed an assessment of the level of satisfaction. In addition to the numeric scores, each question invited written comments. A total of 23 individual sets of answers were received from 19 out of 23 EU Member States and the EFTA countries Iceland and Norway. More details on the outcome of this survey can be found in Annex 5 of this report.

In order to also consider the opinion of the public at large, the Commission conducted a public online consultation[24] between August and October 2017. In overall 48 questions covering all of EMSA's activities but focussing on pollution detection preparedness and response, survey participants were asked for their opinion with five options between "strongly agree" to "strongly disagree". Overall, 23 replies from 13 EU countries were received. Of these, 3 were from private citizens, 2 from NGOs, 1 from the unions, 5 from

[24] https://ec.europa.eu/info/consultations/public-consultation-evaluation-european-maritime-safety-agency-including-its-pollution-response-services_en

industry associations, 2 from companies (of which one is an oil spill response organisation) and 10 from governmental organisations (this included 4 from different ministries of 1 country). Further information regarding these interviews can be found in Annex 6 to this report.

Limitations and robustness of findings

One of the key limitations of this evaluation is linked to the difficulty to assess the effectiveness, efficiency, relevance and added-value of a capacity which is essentially a cover in case of major oil spill and for that reason is not activated as long as there is no such major incident. It has to be recalled that the mandate of the Agency is to provide Member States with additional means, i.e. the Agency's resources are not (should not be) deemed to constitute the first line of response. In order to overcome the lack of real data, the support study opted for assessing the compared costs of shore-side clean-up for the cost-benefit analysis of the vessels which appeared as a useful assessment to help substantiating the added-value of the EMSA cover economically.

With regard to evaluating the ecological impact of EMSA's action at European level, the assessment of the amount of economic and ecological damage that can be avoided thanks to EMSA's response services should be considered with utmost caution as past cases show that there is a considerable discrepancy between estimated damages and damages actually assessed and compensated.

The data available from the International Oil Pollution Compensation Funds (the Funds) only reflect the claims addressed to and settled by the Funds, leaving aside what has been paid in compliance with Courts decisions or out of Court settlements where the Funds were not a Party. On top of this consideration, the cost of environmental damage as such is not eligible to the Funds except for reasonable reinstatement costs or ecological impact and remediation studies.

In the *Erika* incident for instance, figures vary greatly from one source to another: according to an audit performed by Mazars et Guérard at the request of the affected local authorities[25], the total prejudice (without environmental damage) caused by the incident was estimated to € 1 billion. According to the IOPC Fund records, compensation was paid for approximately € 130 million to claimants. In the civil court procedure against the ship owner (the limitation fund proceedings), the total amount of claims against the ship owner was approximately € 500 million. This amount included the claim by the French State for € 154.5 million, the claim by the French oil company Total for € 143 million (corresponding to the costs of clean-up, the treatment and disposal of waste directly undertaken) and the subrogated claims by the ship owner's insurer for € 13 million (corresponding to the individual claimants the insurer had directly compensated under the Civil Liability Convention). None of these claims was related to environmental damage. Another study[26], requested by the same local authorities and used before the Criminal Court proposed to value the environmental damage to an amount of € 370 million. However, the Criminal Court awarded € 192.5 million to the claimants (including € 154.5 million to the French State), this amount included for some claimants compensation for environmental damage.

[25] Mazars et Guérard 2001 Audit sur le coût de la marée noire de l'ERIKA.(not publicly available)
[26] Bonnieux, F. (2006). Evaluation économique du préjudice écologique causé par le naufrage de l'Erika (INRA publication).

To sum up, based on the studies mentioned above, the overall damage resulting from the incident was estimated in various studies to € 1.370 million whereas, on the basis of the compensation paid, the overall recognised damages are in the range of € 322,5 million.

Therefore, in view of such considerable discrepancies, the report did not focus on trying to value the socioeconomic and ecological implication of the Agency's response preparedness relating to marine pollution caused by ships and oil and gas installations, as requested by the co-legislator.

One of the recommendations of Ramboll based on its consultations and analysis is that EMSA should work with all the regional agreements and coastal Member States to determine the environmental risk of oil spills and their potential impacts, in order to provide input for the decisions that must be made regarding response options. There is a similar recommendation that has been formulated by the Administrative Board of EMSA on the basis of the overall external evaluation of the Agency's mandate and activities[27]. To follow-up on the Board recommendation, EMSA has proposed to undertake a kind of "stress test" of the regional capacities and mechanisms to assess the situation. This can be based on the analysis of maritime traffic and the kind of response actions triggered (with or without EMSA response capacities). Extensive risk assessment exercises have recently taken place for the North Sea and Baltic Sea (the BRISK and Be Aware projects) whose results will be used. EMSA will work with Member States and Regional Agreements and the intention is to have this exercise finalised by the end of 2019.

Despite these acknowledged weaknesses, an attempt was made in the external study conducted by Ramboll by using hypothetical scenarios and the available data of costs as described above.

Regarding CleanSeaNet, the analysis can rely on usage and measurable outputs and the findings are therefore considered as sufficiently robust.

Another limitation of this evaluation relates to the low response rate of the open public consultation and consequent lack of input from stakeholders beyond national administrations. The latter are however the main stakeholders as beneficiary of the Agency's assistance and they were consulted extensively both by Ramboll and EMSA. Some still responded to the open public consultation.

5. ANALYSIS AND ANSWERS TO THE EVALUATION QUESTIONS

Effectiveness

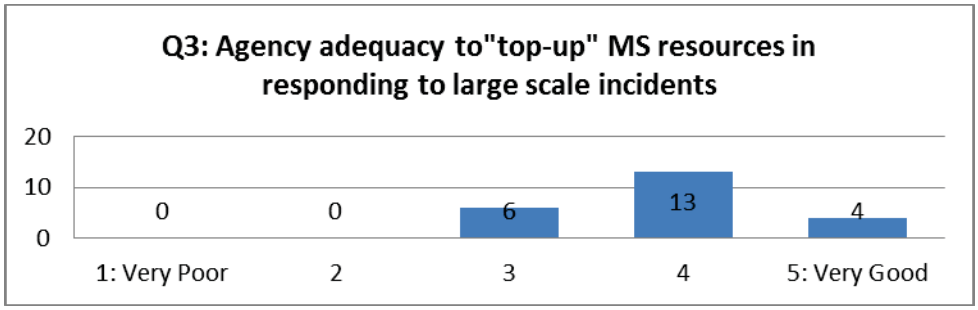
How effective was the use by EMSA of the Union contribution and to what extent were EMSA's measures effective to respond to marine pollution?

In the absence of actual spills the assessment has been carried out with a view to estimate to what extent EMSA has developed an appropriate toolbox to achieve the objective of an adequate pollution response capacity at EU level.

[27] Evaluation on the implementation of the Regulation (EC) No 1406/2002 establishing EMSA - Final Report, May 2017, Ramboll - http://www.emsa.europa.eu/news-a-press-centre/external-news

Consultations have illustrated that a majority of respondents amongst national administrations were satisfied with the way the Agency addressed its task of topping-up Member States resources in responding to large-scale incidents (Figure 4).

Figure 4



Source: EMSA survey to Member States

Worth noting that the reasons for a lower degree of satisfaction were:

- The country has never requested assistance from a stand-by oil response vessel;
- The available response capacity should be better taken into account;
- Capacity gaps should be better identified regionally through a new standard method.

The replies to the open public consultation confirmed this overall positive perception of EMSA's capacity at EU level to respond to marine pollution, in particular from ships. The rate of satisfaction appears as more mixed in relation to oil and gas installations and this can be explained by the relatively recent extension of EMSA's mandate and the lack of awareness and ability by stakeholders to assess EMSA's capacity.

The reporting from EMSA regarding the use of the Union contribution shows that, in terms of geographical coverage, there is a balance. On one side, it is based on risk analyses made and location of vessels where the ratio risks/existing capacities is the less favorable (solidarity of the EU funds) and, on the other side, it is based on an even distribution of vessels to cover all sea areas and benefit to all Member States. The success of a response operation being dependent on the fast availability of response means, the regional approach to cover risk is paramount. The storage capacity of oil recovery vessels and the type of equipment has been fixed based on an analysis of available capacities and needs[28] and in consultation with experts from Member States and regional organizations leading to the drafting of Action Plans[29] subsequently adopted by the Administrative Board of the Agency.

As shown by the interviews carried out (please see Annex 5), Member States appear as rather satisfied with the geographical coverage of European waters by EMSA's stand-by oil recovery vessel network. Among the national administrations consulted that poorly rated that geographical coverage, some of them pointed out that the location of the vessels is inadequate, since their location is too far from their area of interest. On the other hand, some Member States found the location of the vessels extremely convenient. Moreover, some questioned whether the coverage of all EU waters was necessary.

[28] These capacities have been identified through the inventories of Member States response means that EMSA is tasked with maintaining (http://emsa.europa.eu/opr-documents/opr-inventories.html)
[29] http://emsa.europa.eu/opr-documents/action-plans.html

The assessment of the newly established Equipment Assistance Service by stakeholders appear as less positive and this could be related to the relative novelty of this service and the lack of awareness and understanding of its features. Generally speaking the Equipment Assistance Service is considered useful, but some Member States have commented on the fact that equipment is already shared at regional level. National administrations were widely satisfied with the type of equipment that has been or will be purchased in the context of the Equipment Assistance Service – however this is especially if it complements the types already available in Member States' stockpiles. There is a more diverse appreciation regarding the location (currently North Sea and Baltic Sea) and also the number and the comments go towards a better coverage with more depots where there is a need.

Like for the stand-by oil recovery vessel network, the key factors to assess the effectiveness of the equipment assistance service appears to be the complementarity in relation to the available response capacity at national and regional level in terms of geographical location and level of capacity.

In adapting to the needs of spills originating from oil and gas installations, vessels based in areas with offshore activities have been equipped to respond to spills with oil of flashpoints below 60°C. Capabilities were further enhanced by establishing strategically located stockpiles of oil spill dispersants[30] and dispersant application capabilities on EMSA's vessels in selected areas. Furthermore the procurement of specialised oil spill response equipment (rarely available in Member States) to be used from Vessels of Opportunity further enhanced EMSA's capacity to assist Member States.

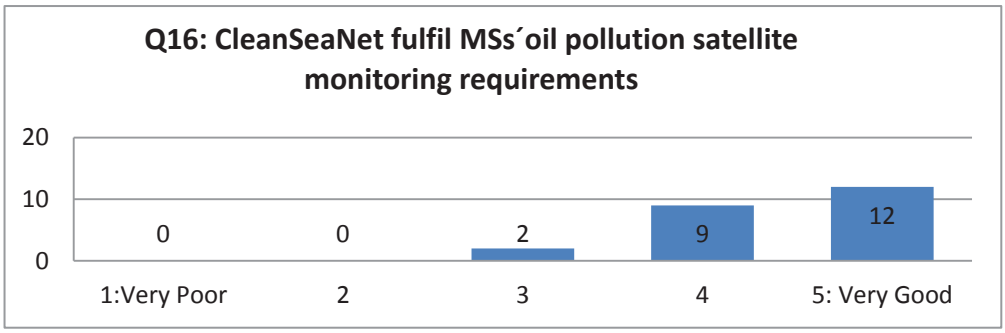
Regarding CleanSeaNet, evidence shows that the service has been very effective in providing near real time detections of potential oil spills due to illegal discharges as well as supporting response operation to accidental spills. According to reports by national authorities, the scheduling of satellite images improves their ability to plan aerial surveillance operations. The CleanSeaNet images can indeed be integrated with data from other EU information sources available at EMSA (e.g. traffic monitoring information from SafeSeaNet, satellite Automatic Identification System data, weather information, etc.). Combining data makes the overall information provided to Member States more valuable operationally and can assist in the identification of polluters.

The awareness in the maritime community that there is a high quality / high volume operational activity with respect to the detection of marine oil spills across European waters provides a strong deterrence to potential polluters; the "deterrent" effect. The deterrence is most effective when supported by consistent follow-up throughout the response chain e.g. from detection to enforcement of the relevant legal framework.

Member States have all a positive experience with CleanSeaNet as illustrated in Figure 5, since it is considered a useful, unique and valuable service by many of them. The performance of the service in terms of timeliness of product delivery, quality of delivered products and daily support and training provided by EMSA for the use of the service were all rated very positively by the national administrations. This good rating was confirmed by the results of the open public consultation.

[30] Given the variety of approaches regarding the use of dispersants, EMSA has obviously only positioned dispersant stockpiles and application systems in areas with favourable policies.

Figure 5



Source: EMSA survey to Member States

Targeted consultations indicate that the activities related to hazardous and noxious substances are considered valuable on average by the Member States. The results of the public consultation indicate that although less known to the public, these activities, mostly focused on the providing of expert information to deal with a chemical emergency, are welcome. On average the MAR-ICE service is activated by the Member States five times a year. It is worth noting that this activity is very different as a service compared to the operational capacity for oil pollution response and is representing a very minor part of the use of the Union contribution (see Table 3). The analysis in this report is therefore not developed extensively.

Finally through the work of the Consultative Technical Group for Marine Pollution Preparedness and Response and the meetings of the InterSecretariat, the Agency is providing effective platforms for EU/EFTA coastal Member States, coastal EU Candidate Countries and the Regional Agreements including the Commission (DG ECHO) to promote best practices and share relevant information. Regular feedback by participants and the results of the consultations have shown that there is general appreciation of these meetings which are considered as useful. Again though important in itself this activity is a minor part of the use of the Union contribution and has not been analysed extensively.

Efficiency

How efficient was the use by EMSA of the Union contribution and to what extent were the costs of EMSA's measures proportionate to the benefits?

The costs of EMSA's measures over the period are listed in table 2 under chapter 3. The analysis to what extent these costs have been proportionate to the benefits is hampered by the methodological limitations mentioned before (such as the difficulty to assess cost savings related to minimising environmental damage). The benefits of EMSA's measures can be described in qualitative terms: availability on request of a top-up capacity with the network of vessels and the equipment assistance service, detections alerts provided by the CleanSeaNet service, knowledge building and access to information about hazardous and noxious substances, etc. This does not allow undertaking a cost-benefit analysis of the EMSA anti-pollution capacity.

However, an attempt was made to assess the efficiency of the use by EMSA of the Union contribution and the efficiency of the measures consuming the bigger part of the budget (the network of vessels and the CleanSeaNet service) as presented below.

Network of oil pollution response vessels and Equipment Assistance Service

The inherent limitations of the existing model of chartering oil spill response vessels have been highlighted in the support study: there are not many existing suitable vessels that can be contracted for an effective third tier capacity and this has been typically a created market. It should be stated again here that EMSA's "top-up" capacity is a cover the EU has decided to take, difficult to justify economically as long as there is no major spill. In case of an incident and activation however, the charter rates are pre-established and fixed, thus protecting the requesting party from opportunistic increases in hire rates and guaranteeing that costs are proportionate to the benefits and primarily that the service exists.

Regarding the inherent efficiency of the chartering by EMSA, the external study has concluded and recommended exploring potential improvements to the current service model and the procurement procedures that are being applied.

Beyond the inherent efficiency of the current model of chartering oil spill response vessels that conduct their normal commercial activities unless activated for pollution response, one main question raised in the external study was whether EMSA could have achieved its set objectives and be as cost-efficient as this model, considering alternative models.

First, a comparative analysis of the costs of an at-sea clean-up of 1 tonne of oil with the costs of a shore-line clean-up of 1 tonne of oil was performed. This analysis allowed concluding on whether EMSA's oil spill response services provide value for money by improving the effectiveness of interventions in cases of large spills, preventing drifting oil from reaching the shore.

In the absence of major spills in European waters in the past decade EMSA's capacities have not been mobilised in an oil pollution response operation. Therefore, in order to estimate the costs of recovery of one tonne of oil at sea for the network of EMSA vessels, theoretical scenarios of intervention have been constructed to simulate the intervention of a typical EMSA vessel to an oil pollution incident.

In comparison to the average cost per tonne of oil recovered on-shore of € 5,744 (based on the data available on historical costs), the total costs per tonne when using of EMSA at-sea-recovery vessels is € 287- 681 / tonne, so between 20 to 8 times lower.

The above findings indicate that EMSA's oil pollution response activities would be cost-effective when compared to the fall-out resulting from an absence of capacity to adequately recover oil before reaching the shoreline.

The external study also conducted a comparative analysis of EMSA's current service arrangements versus other potential service models. The main question raised and answered by this section is whether EMSA could have achieved its set objectives and be as cost-efficient as the current service model, considering alternatives. In this sense, the models are tested as if they had been implemented during the same financial period (i.e. from January 1, 2014 to December 31, 2020).

This comparative assessment of the current model and potential alternative service models for EMSA was based on a multi-criteria analysis. The baseline was considered to be the average level of service and average costs related to it over the period (2014 - 2020). All alternative options are assessed against it. In Table 3, indicators of costs and level of service for the alternative models are compared with those in the baseline

scenario. The line "Short description" explains what is the envisaged model, the lines below are the difference for each criterion in the figures for the alternative models (in plus or minus) compared to the baseline.

Table 3: Multi criteria analysis scorecard[31]

Criteria	Model 1.2	Model 2.1	Model 2.2	Model 2.3.1	Model 2.3.3	Model 3.1	Model 3.3.3	Model 5.1	Model 5.2
Short description:	2 possible contract renewals	EMSA builds OSRVs & hires a ship anagement firm	EMSA builds OSRVs, chartered to MS (bareboat)	EMSA charters OSRVs (bareboat)	EMSA time charters OSRVs (long term)	EMSA co-financing the building of MPVs with MS	EMSA charters MPVs, shared with MS or EU agencies	EMSA replaces some VACs with built OSRVs	EMSA replaces some VACs with built MPVs
Suitability for Tier III at sea pollution response	0	0	0	0	0	-	-	0	+
Top-up of Member States capabilities/added value at EU level	0	0	-	0	0	-	-	0	+
Cost-efficiency (overall)	0	--	--	--	--	--	--	--	--
Cost-efficiency (EMSA)	0	--	--	--	--	--	--	--	-
Budgetary Impact (overall)	0	--	--	--	--	--	--	--	--
Budgetary Impact (EMSA)	0	--	--	--	--	--	--	--	-
Overall technical, financial, organisational feasibility	+	-	-	--	0	-	0	0	0
Compatibility with EU Financial Regulation and EMSA's Legal mandate	0	0	0	0	0	0	0	0	0

Table 3 shows that, overall, Model 1.2 is the least costly to implement with some positive budgetary effect from the baseline (current model) and minor difference in the level of service, however these differences are likely to be within the margin of error of the model used.

Model 5.2 appears to be an advantageous model: although it is more expensive to implement for EMSA than the baseline, the potential gains in the services associated with the use of Multi-purpose Vessels are particularly interesting as these assets could be shared with other EU agencies and the Member States in the context of multi mission operations under the scope of the Coast Guard Functions..

CleanSeaNet service

The use of European Space Agency managed satellites has brought considerable cost reductions to the service as licenses are available free of charge. EMSA only pays service providers for the near real time generation of the CleanSeaNet Earth Observation products (acquisition, processing and analysis of the satellite imagery). Over the period 2014-2016, the costs of the service per 1,000 km ^{2} monitored decreased approximately by 22%. It should be noted that following the loss of contact with the ENVISAT satellite in 2012 and until the entry into operations of the Sentinel-1A satellite in 2015, EMSA had to rely solely on commercial satellites, which implied a significant increase in the overall costs of the service. Following the entry into operations and initial ramp-up phase, from

[31] OSRV for oil spill response vessel; VAC for vessel availability contract; MPV for multi-purpose vessel

the second half of 2016, EMSA has been ordering proportionally more Sentinel-1 Earth Observation products, and this is due to increase further in the coming years. The figures are already beginning to reflect the decreasing costs per 1,000 km^2 monitored, and this should be even more apparent from 2017 onwards. By using Sentinel 1-A and 1-B, the CleanSeaNet service can provide improved satellite coverage, while simultaneously reducing the costs of the service.

Relevance

Are EMSA's measures relevant and to what extent do these measures address current pollution risks and pollution response needs?

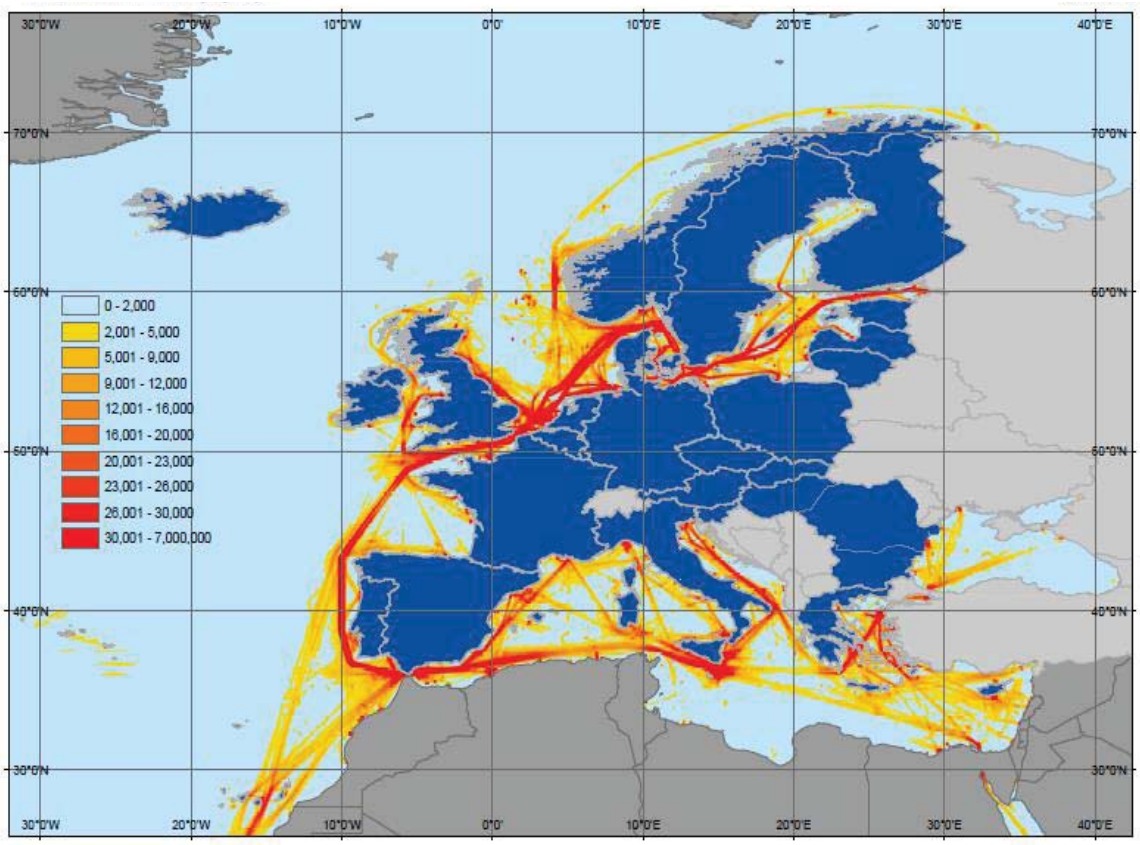
It should be noted first that EMSA's additional oil spill response capacity to assist EU/EFTA coastal Member States in case of large scale spill from vessels and oil and gas installations has been developed because it became apparent in the context of major disasters that there were not enough resources available in the coastal EU Member States.

The results of the targeted consultation carried out by EMSA show that all but two Member States support continuing the current activities for pollution response and consider them of continued relevance. From the open public consultation (with the limitations related to representativeness), it appears that other stakeholders such as NGOs and companies concur as well that EMSA's capacity is relevant and should be maintained.

In relation to risks, the establishment and maintenance of the network of contracted oil spill response vessels was initially based on a number of factors including the trading routes of oil tankers and historic tanker incident (spills). Regular reviews have illustrated that the pattern of oil transport routes has not significantly changed over the past decade. Figure 6 shows the oil tanker routes based on Automatic Identification System[32] positions (from EMSA's SafeSeaNet, the vessel traffic monitoring and information system) for the month of September 2016 (as an example).

[32] Automatic tracking system used on ships and by competent authorities for ship identification and avoidance of collision

Figure 6: Tanker traffic density based on SafeSeaNet data: September 2016.



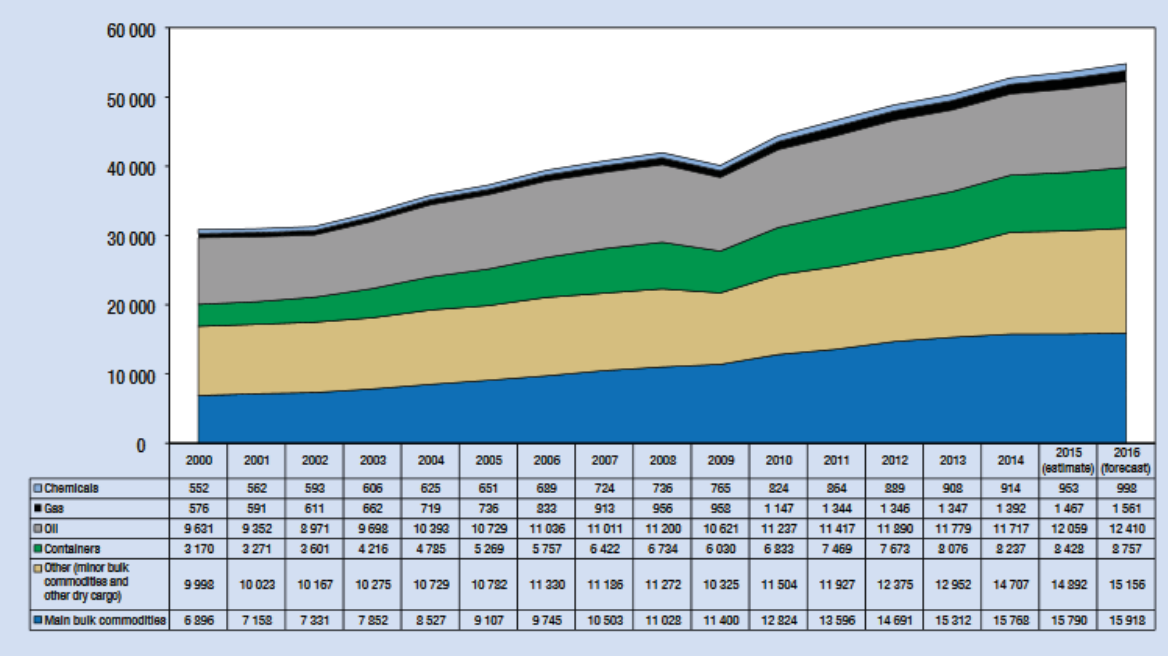
Source: EMSA

There is also evidence of the increase in traffic and the shift towards bigger units (Figure 7). According to UNCTAD review of maritime transport 2016[33], continued increase in the volume of seaborne transport is taking place, the threshold of 10 billion tonnes of seaborne cargo having been passed in 2015. In a highly competitive market, a shift towards newly built larger vessels can be observed. Furthermore due to a significant overcapacity of the world fleet, freight rates are affected negatively and operators are not able to cover their fixed costs in certain segments, which may have an implication on maintenance policy.

The sinking of the *Sanchi* tanker in Chinese waters mid-January demonstrated that the risks of a major accident with a significant spillage and potential marine pollution remain high. In recent years, there has not been any such major disaster in EU waters but several incidents illustrated the relevance of maintaining a diverse and effective oil spill response capacity, such as the sinking of the *Agia Zoni II* tanker in Greek waters in September 2017.

[33] UNCTAD/RMT/2016)

Figure 7: World seaborne trade by cargo type, 2000–2016 (Estimated billions of ton–miles)



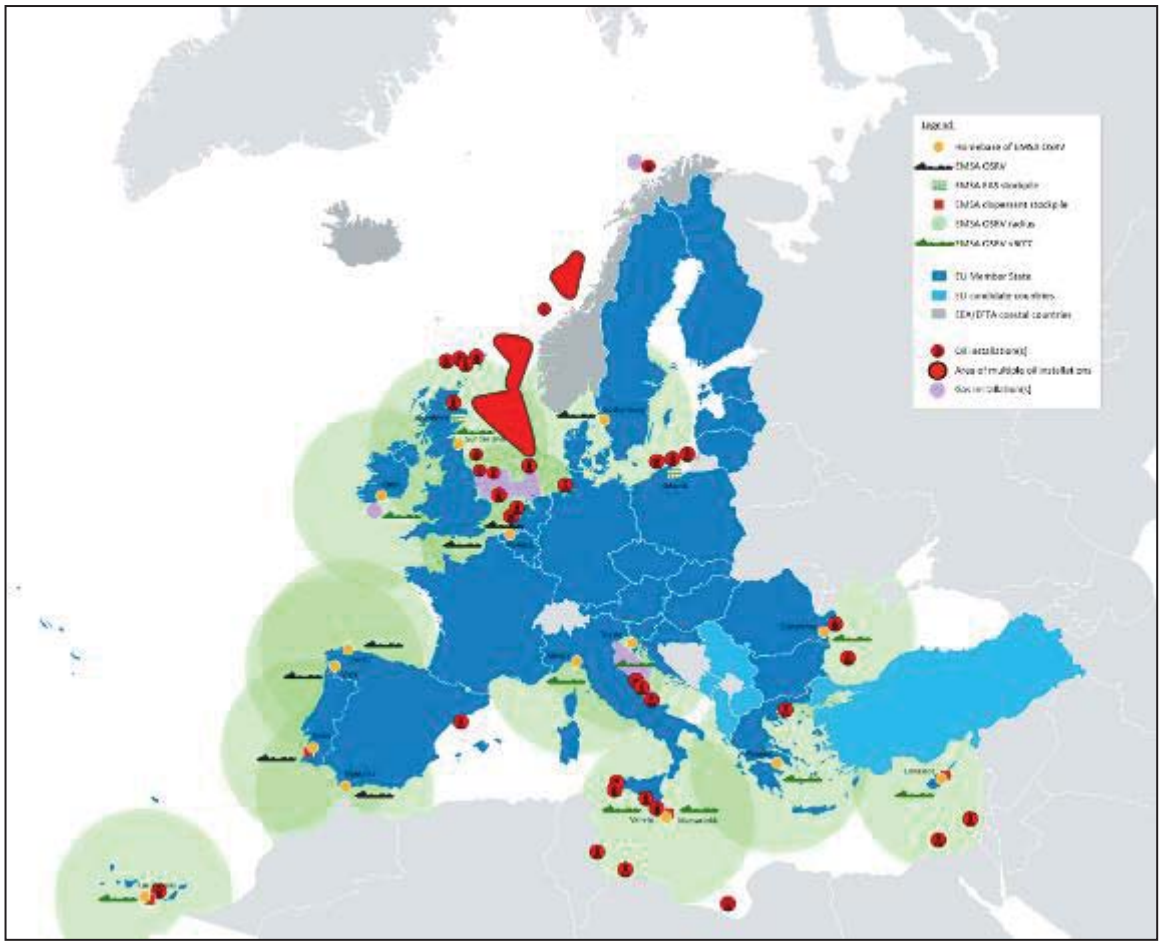
	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015 (estimate)	2016 (forecast)
Chemicals	552	562	593	606	625	651	689	724	736	765	824	864	889	908	914	953	998
Gas	576	591	611	662	719	736	833	913	956	958	1 147	1 344	1 346	1 347	1 392	1 467	1 561
Oil	9 631	9 352	8 971	9 698	10 393	10 729	11 036	11 011	11 200	10 621	11 237	11 417	11 890	11 779	11 717	12 059	12 410
Containers	3 170	3 271	3 601	4 216	4 785	5 269	5 757	6 422	6 734	6 030	6 833	7 469	7 673	8 076	8 237	8 428	8 757
Other (minor bulk commodities and other dry cargo)	9 998	10 023	10 167	10 275	10 729	10 782	11 330	11 186	11 272	10 325	11 504	11 927	12 375	12 952	14 707	14 892	15 156
Main bulk commodities	6 896	7 158	7 331	7 852	8 527	9 107	9 745	10 503	11 028	11 400	12 824	13 596	14 691	15 312	15 768	15 790	15 918

Source: UNCTAD/RMT/2016 page 7

Regarding oil and gas installations, in addition to the over 1000 offshore oil rigs and platforms present in European waters, hydrocarbon exploration is expanding to new areas. Figure 8 shows the areas of oil and gas installations as well as EMSA's pollution response resources (2016).

Since offshore oil and gas activities in European waters began, a number of oil spills originating from oil and gas installations have been recorded. With the increase and expansion of offshore oil and gas activities, as more regions are considered for exploratory drilling and extraction, the map of the European oil and gas industry is changing and the number of oil and gas installations is increasing, which may increase the probability of incidents that could lead to oil spills.

Figure 8: EMSA's services (and 24 h vessels' radius) and oil and gas installations, 2016.



Source: EMSA

CleanSeaNet

Figure 8 indicates the total number of possible spills detected in the years 2008 through 2016, while the line graph indicates the average number of detections per million km^2 monitored. The overall trend over most of the past decade has been a year-on-year reduction in the number of possible spills detected per million km^2 monitored, with a marked decrease per year in the period 2008-2010 (which coincided with the economic downturn in Europe, as well as an increase in awareness of maritime pollution related issues and an improvement in the provision of port reception facilities across the continent), and a more gradual decrease in the period 2010-2015.

While illustrating the impact of the CleanSeaNet service in terms of deterrent effect, this figure also shows that spills and discharges have continued leading to possible pollution detection and hence sustain the continued relevance of the service.

In 2016, the trend reversed, with an increase in the number of possible spills detected.

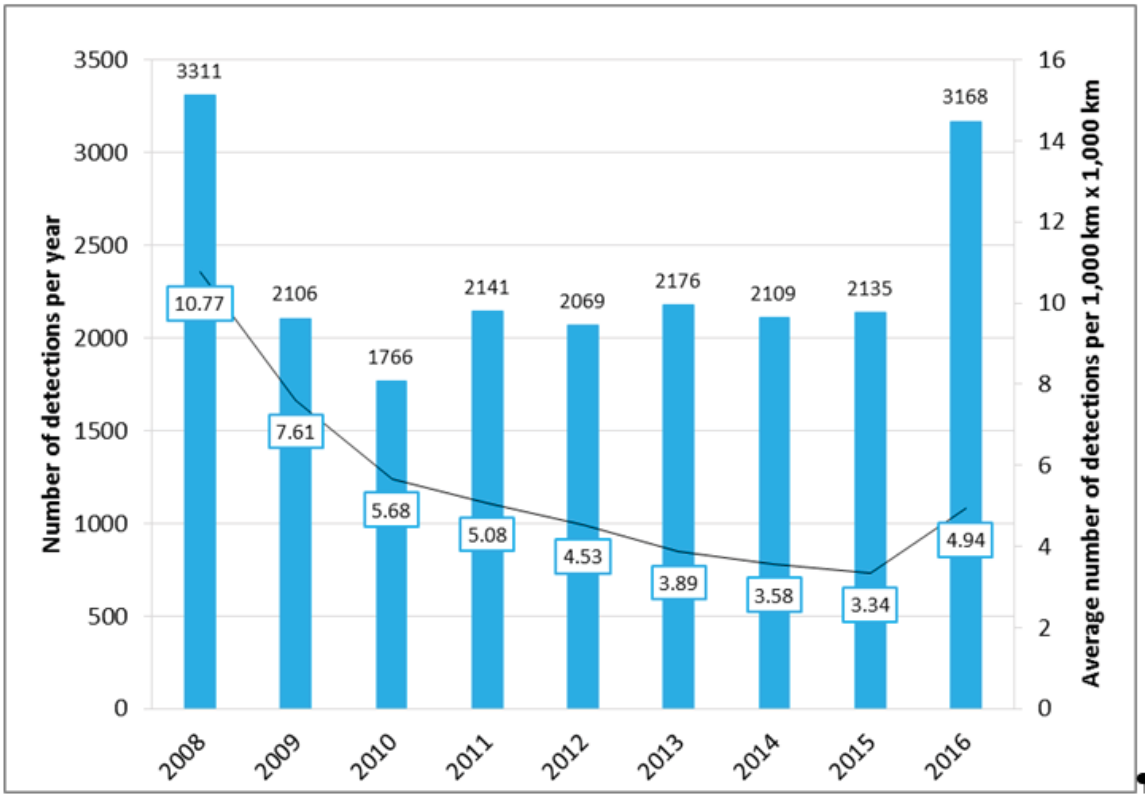
There are a number of possible reasons why the trend may have reversed in 2016.

- The introduction of the Sentinel-1 satellites has resulted in improved detection capabilities. With the improved spatial resolution of Sentinel-1 it is now possible to detect much smaller spills than before; these smaller spills are more numerous and would not have been detected previously. The average size of spills detected

in 2016 was 25% smaller than in 2015. In 2015, no spills below 0.1 km^2 were detected whereas this threshold decreased to 0.04 km^2 in 2016.

- Optimisation of CleanSeaNet planning, due to use of new tools, increased the ratio of sea surface to land surface captured on the images in 2016.
- To a lesser extent, an increase in shipping volume could have caused the increase in detections; SafeSeaNet registered a 5% increase in the number of ship calls from 2015 to 2016, while Eurostat also records an increase in seaborne goods handled in European ports over recent years[34].

Figure 9: CleanSeaNet 2008 – 2016: trends in possible pollution detected



Source: EMSA

Activities with regard to hazardous and noxious substances

The main challenge faced by responders when facing a chemical incident is access to cargo data and emergency response specialized advice, including short risk assessment as chemicals beside being transported in bulk are transported in parcels and substances may interact when in contact. By developing the MAR-ICE service and being available to assist Member States 24/7 in case of a chemical incident, EMSA has demonstrated the relevance of its action in the field of HNS response.

[34] From the Eurostat website: http://ec.europa.eu/eurostat/statistics-explained/index.php/File:Gross_weight_of_seaborne_goods_handled_in_all_ports_(in_million_tonne)_1997-2015.png

Coherence

Are EMSA's measures coherent with other EU intervention means?

Although the focus of EU maritime transport and maritime safety policy and legislation is on prevention including with the assistance of EMSA, incidents resulting in huge spillage causing high economic and environmental damages could still happen as illustrated above hence the complementarity of an effective preparedness and disaster response capacity at EU level.

EMSA's response capacity is also coherent with EU civil protection policy. In case of a major incident and subsequent request by a State, EMSA's capacities will be mobilised through the European Union Civil Protection Mechanism, the overarching framework for civil protection from manmade and natural disasters. This will ensure coherence of the EU response on the maritime side with the potential response made on the shore / coastal side. On a more technical level, EMSA's work to link its SafeSeaNet system to CECIS MP (the Common Emergency Communication and Information System for Marine Pollution) in relation to relevant pollution notification by competent national authorities increased the coherence between the various systems.

However, the synergy between the two components (EU Civil Protection Mechanism and EMSA anti-pollution measures) could be further improved with a view to offer enhanced support to Member States in case of emergency. Some Member States indicated that the pollution response equipment transportation cost may set back or delay their decision for mobilization of EMSA assets. Transport co-financing provision through the Union Civil Protection Mechanism currently cannot be applied in this case due to the limitations in the current legal base of the Mechanism (Decision No 1313/2013/EU).

There is furthermore coherence with the EU environmental policy as the intervention aims at preventing the deliberate release of pollutant from ships as well as minimizing as much as possible the effect of an accidental release in marine waters.

Another area which benefits from EMSA's pollution preparedness and response activities is the EU Neighbourhood partnerships policy. EMSA's capacity may be mobilised upon request of a third country sharing a regional sea basin with the EU in case of a major disaster. EMSA is integrating preparedness activities in its technical assistance provided to neighbouring partner countries through the SafeMed (for Mediterranean countries) and the Black and Caspian Sea projects. European Neighbourhood partner countries are also benefitting from the CleanSeaNet shared European capacity and the investments made in Earth Observation services.

In the latter area of earth observation for maritime purposes, based on the experience and competences developed over the years, EMSA is also now able to deliver Earth Observation products to users of EMSA's Integrated Maritime Services. Such Integrated Maritime Services are provided for purposes beyond marine pollution monitoring and detection, such as maritime safety and security, fisheries control, border control, law enforcement, customs, and other Coast Guard functions. More recently, the Agency became the Entrusted Entity for implementing the Copernicus Maritime Surveillance service[35].

[35] On 3 December 2015, EMSA signed a Delegation Agreement with the European Commission (DG-GROW) which identifies EMSA as the Entrusted Entity to implement the Copernicus Maritime

EU added value

To what extent do EMSA's measures provide added-value compared to interventions at regional (in particular those of regional agreements and organisations) or national levels by public authorities or the private sector?

Network of oil pollution response vessels and Equipment Assistance Service

The network of oil pollution response vessels is based on a regional approach which complements the national approaches. The additional Equipment Assistance Service providing specialised oil spill response equipment that is not typically (or not at all) available in Member States further improves the preparedness level that can be best achieved at a European scale.

The following tables show the EU added value to the national capacities. According to its mandate, EMSA has focused on assets designed for spills of a significant amount, an investment that Member States could not have achieved at national level.

Table 4 Member States' and EMSA's oil pollution response vessels

	Number of vessels		Storage capacity (m^3)	
Storage Capacity	**Member States and EFTA (MS)**	**EMSA**	**MS**	**EMSA**
< 200 m^3	172	0	8,861	0
200 m^3 - 700 m^3	56	0	17,311	0
700 m^3 - 1500 m^3	23	1	24,935	997
> 1500 m^3	19	17	70,553	62,475

In accordance with its mandate, EMSA has contracted oil recovery vessels with large storage capacity thus ensuring less frequent need for port calls to offload recovered oil thereby optimising the at-sea recovery periods. In other words, the Agency's 17 vessels nearly equal the storage capacity of all Member States vessels of comparable capacity.

Table 5 Member States' and EMSA's oil pollution response equipment

	Quantity	
	Member States	**EMSA**
Containment and Recovery Systems	16	12
Weir Booms	2	2
Fire Booms	1	8
Sweeping arms	12	19
Dispersant (tonnes)	~ 3,500	800

Table 6 Numbers of Member States' and EMSA's oil skimmers by recovery capacity

	Number of skimmers	
Capacity	**Member States**	**EMSA**
Less than 100 m^3/h	196	0
100 - 250 m^3/h	20	19
> 250 m^3/h	16	10

Surveillance Services during the period 2016-2020. See http://www.emsa.europa.eu/copernicus.html for more information

In terms of oil recovery capacity, the figures clearly show that EMSA has selected powerful equipment for major crises according to its mandate. The Agency's capacity quasi tallies the overall capacity of Member States, a trend that will be even strengthened by the upcoming replacement of first generation skimmers by high capacity ones.

Regarding complementarity of EMSA means with capacity under regional agreements and/or the private sector, the tiered approach has been applied to ensure such complementarity. EMSA's response means have been established as tier 3, topping up existing capacity by other actors.

Furthermore, the external study by Ramboll has concluded that the existence of EMSA's oil pollution response services topping up national and private resources does not seem to be having an adverse impact on the level of preparedness of the EU Member States and EFTA countries. This has remained stable over the period analysed, and appears set to follow the same trend looking ahead towards 2020.

In an attempt to try to simulate the added value of the recovery capacity of the vessel network, EMSA has developed four different scenarios during two hypothetical and two past oil spills in different areas in Europe. The results are summarised in the following table. More details regarding each scenarios and the methodology used for the calculation can be found in Annex 7.

However, although several conservative assumptions have been taken for building the scenarios, it has to be emphasized that the figures resulting from these simulations should not be taken for granted.

As a matter of fact, except in close areas, the probability to recover most of the oil at sea in any incident in the open sea is low. In the Prestige incident for instance, out of an amount of 63.000 tonnes released, the amount of oil and water mixture (i.e. considerably less pure oil) recovered is estimated to 18.000 tonnes. The figure needs to be considered in the context in which the removal of 1tonne of oil from the sea could avoid up to 10 tons of oil and debris ashore.

Table 7: simulation of EMSA added value in several oil spill scenarios

Area	Incident	Incident area	Pure oil Spilled (tons)	Type of oil	Storage capacity mobilised by MS (m^3)	Storage capacity mobilised by EMSA (tonnes)	Quantity of pure oil recovered by EMSA (tonnes)
Black Sea	Hypothetical	Off Bourgas, Bulgaria	50,000	Bunker C HFO	2,392	23,802	11,270
Med Sea	Hypothetical	Off Genoa, Italy	50,000	Bunker C HFO	4,830	14,140	12,141
Atlantic	Prestige	Cape Finisterre, Galicia, Spain	63,000	IFO 650	18,895	33,801	21,657
Baltic Sea	Baltic Carrier	Kadet fairway, Jutlans islands, Denmark	2,700	HFO	3,125	2,880	609

Source: EMSA

If the results related to the two past real incidents are considered, the figures of recovered oily- water mixture compare as follows.

Incident	Real amount of oil water mixture recovered at sea (according to official sources)	Result from simulation (oil-water mixture)
Prestige	18,000 m^3	67,723 m^3
Baltic Carrier	940 m^3	913 m^3

It has to be stressed again that the figures resulting from the simulation are subject to limitations, in particular in the case of the Baltic Carrier, the incident occurred in shallow water making response operations by ships with a great draught impossible.

Clean Sea Net service

The added value of running the CleanSeaNet service at a European level goes beyond solely economic advantages. By having a centralised approach, CleanSeaNet provides several advantages when compared to the hypothetical alternative of implementing multiple services at a national level.

Firstly there is enhanced quality and harmonisation of delivered services. By centralising service delivery of CleanSeaNet Earth Observation products, EMSA gathers significant knowledge on the quality of the deliverables from the different service providers and can quickly identify issues and gaps in the service delivery. Improvements that are identified can then be deployed to the benefit of the entire CleanSeaNet user community.

Secondly, increased cooperation is facilitated between coastal States: as many Earth Observation products cover the waters of more than one Member State, the use of CleanSeaNet leads to increased cooperation between neighbouring countries, which can even expand to activities outside of pollution monitoring. The CleanSeaNet User Group also provides a forum to share experiences and build relations between operational users with the objective of increasing service efficiency.

Coordination activities

Along the same line, the setting up of the CTG-MPPR and the InterSecretariats Meetings provide Member States and Regional Agreements with a forum where they can share best practices and identified common needs. These meetings and ad hoc working group have resulted in the production of European guidelines and dedicated trainings such as maritime aerial surveillance which allows for the strengthening of national and regional capacities.

6. CONCLUSIONS

The mid-term evaluation concludes that EMSA has established and maintains a comprehensive pollution detection, preparedness and response program in line with its mandate to top-up EU/EFTA coastal Member States capacities to respond to large scale incidents.

The analysis has been limited by the difficulty to assess the effectiveness, efficiency, relevance and added-value of a capacity which is essentially a cover in case of major oil spill and for that reason is not activated as long as there is no such major incident. With regard to evaluating the socio-economic and ecological impact of EMSA's action at European level, there are also methodological limitations related to the very few case studies and the absence of relevant data and studies.

Notwithstanding these limitations, the analysis shows that the existing network of chartered oil spill response vessels, which conduct normal commercial activities and only assume spill response activities upon request, allowed the establishment of large response capacities complementing Member States' resources. EMSA services represent an effective, state-of-the-art oil spill response capability which is able to provide urgent support to one or more Member States or third countries that share a regional basin with the EU and are severely threatened by the consequences of a major marine oil spill. With regard to the Member States' current capabilities, EMSA services cover the perceived existing gaps in 'tier 3' response capacity by topping up the capacities of Member States for all the waters of the EU.

The deployment of new vessels, their technical specifications, and the stockpiles of dispersant established since 2013, all demonstrate that the Agency has also taken steps to adapt its capabilities to meet its new mandate of addressing the risks connected with oil and gas installations.

The analysis has confirmed that EMSA has established a comprehensive system with additional storage capacity to support Member States in the event of an incident. The EMSA services have added-value, and are still relevant today and coherent with preventive approaches at EU level and other EU policies. The support study as well as the Administrative Board of EMSA nevertheless pointed to a need for further knowledge gathering on this subject. As such, EMSA will launch a further risk assessment exercise in 2018-2019, as recommended by its Administrative Board. The agency will work with regional and national authorities to carry out a sort of stress test of existing capacities, in order to provide input for the decisions that must be made regarding response options.

Regarding efficiency, the attempts made to assess notably the cost-effectiveness of the existing model of chartered vessels suggest that EMSA's oil pollution response activities would be cost effective when compared to the economic consequences that would result from the absence of capacity on its part to adequately deal with an oil spill and prevent it from reaching the shoreline. Furthermore EMSA fulfils the requirements of its mandate within (and up to) the budget allocated to it for this purpose in a cost-efficient manner. This conclusion is based on the fact that the level of service currently provided by EMSA could not be replicated at lower cost using any feasible alternative model as described in the external study.

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.

The evaluation also concludes that the satellite based oil spill detection service CleanSeaNet, providing rapid alerts to the affected Member States on potential pollution from illegal discharges, identifying potential polluters and providing support to response operations of large accidental spills is relevant and provides an effective and efficient tool for Member States. It is best situated at EU level, covering all European marine waters and beyond, and providing much added-value. It ensures a uniform assessment and overview of discharge trends and the deterrent effect of the spill monitoring programme. It is relevant towards the needs and current trends given the continued level of deliberate discharge or incidental spill in EU waters. Furthermore, coupled with the implementation of the earth observation Copernicus programme, it is in coherence with a broad portfolio of other EU policies in relation to maritime surveillance.

Overall the evaluation therefore concludes that EMSA's activities certainly contribute to a better protection of the marine environment, European coasts and European citizens than before these measures were established.

EUROPEAN
COMMISSION

Brussels, 31.7.2018
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PART 2/2

COMMISSION STAFF WORKING DOCUMENT
Accompanying the document

REPORT FROM THE COMMISSION TO THE EUROPEAN PARLIAMENT AND THE COUNCIL

Mid-term evaluation of Regulation (EU) No 911/2014 on multiannual funding for the action of the European Maritime Safety Agency in the field of response to marine pollution caused by ships and oil and gas installations

{COM(2018) 564 final}

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APPENDIX 1: PROCEDURAL INFORMATION

1. Lead DG, D*e*CIDE PLANNING/CWP REFERENCES

DG MOVE is the lead DG. The Decide Planning entry is: 2017/MOVE/029.

2. Organisation and timing

The evaluation was launched in December 2016.

The ISG met 3 times in December 2016, in March 2017 and in February 2018 to discuss the roadmap, the consultation strategy, the work and the results of the external study contracted by EMSA in relation to the network of stand-by vessels, and the draft evaluation report.

3. The ISG is composed of DG MOVE (units D2 and A3), SG, BUDG, ECHO, ENER and ENV.Exceptions to the better regulation guidelines

The Better Regulation Guidelines were followed.

4. Consultation of the RSB (if applicable)

5. N/AEvidence, sources and quality

The evidence supporting the evaluation includes:

- Evidence gathered by the Agency which has some extensive and strict obligations regarding planning and reporting on the implementation of its activities. The Agency's planned activities are outlined in the annually updated Single Programming Document for the next three-year period and the detailed work programme for the following year. The annual reporting obligations of the Agency's activities are also addressed in detail in an Annex to EMSA's Consolidated Annual Activity Report as required under Regulation (EU) No 911/2014.
- Evidence from the Action Plans drafted by the Agency in consultation with national authorities, regional agreements and industry: Action Plan for HNS Pollution Preparedness and Response (June 2007); Action Plan for Oil Pollution Preparedness and Response (February 2010); Action Plan for Response to Marine Pollution from Oil and Gas Installations (January 2014).
- Evidence gathered by the Agency in-house and through several events like workshops with stakeholders such as EMSA's Consultative Technical Group on Marine Pollution Preparedness
- Results of the various consultation processes: open public consultation, targeted consultations, etc. (see below)

Furthermore, the present evaluation is supported by an external independent study on the cost efficiency and cost effectiveness of EMSA's operational pollution response services consisting of the network of contracted standby oil spill response vessels, the stockpiles of specialised oil pollution response equipment, and the stockpiles of oil spill dispersants. The study was contracted by EMSA and conducted by the consulting firm Ramboll.

The findings of the study rely on the assessment of evidence based on triangulated data collected from a range of different sources, including internal and external documentation, a targeted stakeholder consultation conducted by EMSA consisting of a survey administered to Member States, plus interviews with key stakeholders conducted by Ramboll. In addition, industry and cost data provided by shipyards and shipbrokers were collected and expert assessments were provided by oil pollution response experts subcontracted by Ramboll.

In telephone interviews with relevant stakeholders of EMSA's services, questions were asked to assess EMSA's oil pollution response services and to compare EMSA's capabilities with that of Member States. Countries that had not responded to EMSA's online survey were asked additional questions in line with the EMSA consultation. Additionally, third countries that may also utilise EMSA's services were interviewed as well. Further information regarding these interviews could be found in Annex 6 to this report.

Regarding consultation processes, EMSA conducted directly an online targeted survey with the EU/EFTA coastal Member States as the main stakeholders of the Agency. A total of 23 individual sets of answers were received from 19 out of 23 EU Member States and the EFTA countries Iceland and Norway. More details on the outcome of this survey can be found in Annex 5 of this report.

In order to also consider the opinion of the public at large, the Commission conducted a public online consultation[1] between August and October 2017. Overall, 23 replies from 13 EU countries were received. Of these, 3 were from private citizens, 2 from NGOs, 1 from the unions, 5 from industry associations, 2 from companies (of which one is an oil spill response organisation) and 10 from governmental organisations (this included 4 from different ministries of 1 country). More details on the outcome of this survey can be found in Annex 6 of this report.

One limitation has been the lack of data and evidence regarding the socioeconomic, ecological and financial implications of the Agency's response preparedness relating to marine pollution caused by ships and oil and gas installations, an analysis that was requested by the co-legislator.

Another limitation of this evaluation relates to the low response rate of the open public consultation and consequent lack of input from stakeholders beyond national administrations. The latter are however the main stakeholders as beneficiary of the Agency's assistance and they were consulted extensively both by Ramboll and EMSA. Some still responded to the open public consultation.

[1] https://ec.europa.eu/info/consultations/public-consultation-evaluation-european-maritime-safety-agency-including-its-pollution-response-services_en

APPENDIX 2: STAKEHOLDERS CONSULTATION

1. Methodology

The goal of the consultation was to collect views and opinions on the scope of Regulation (EU) No 911/2014, including the tasks assigned to EMSA and the financial envelope associated to these tasks.

The initial roadmap was published from 3 to 31 of March 2017 and no feedback was received.

In order to prepare this report, a consultation strategy was drafted. The consultation activities included an online survey of EMSA stakeholders in the maritime administrations of coastal EU/EFTA Member States and an open public consultation that was held between August and October 2017 covering the five evaluation criteria and addressing non-technical issues to ensure that non-organised interests (like any interested citizen) were consulted.

In addition, further evidence was gathered through the external study contracted by EMSA on the Cost effectiveness and cost-efficiency of EMSA's network of oil pollution response vessels and Equipment Assistance Service. This external study also included telephone interviews with EMSA stakeholders.

2. Results of the consultations

a) EMSA online targeted consultation

EMSA consulted the EU/EFTA coastal Member States as the main stakeholders of the Agency. In thirty-three questions, the Member States were given the opportunity to provide feedback on the Agency activities by subject. Scores between 1 (very poor) and 5 (very good) allowed an assessment of the level of satisfaction. In addition to the numeric scores, each question invited written comments. A total of 23 individual sets of answers were received from 19 out of 23 EU coastal Member States and EFTA countries Iceland and Norway.

The targeted consultation attested the Agency positive marks on its pollution response services. The overall average score was 3.7. The best scores were given to the CleanSeaNet service. High marks were also awarded to the Agency's activities with regard to information materials including the EU Claims Management Guidelines. Lower scores (although still above the medium value) were given to the oil spill dispersant related activities. Here one must remember that not all EU countries consider dispersants an important response option. In fact, the riparian countries of the Baltic Sea for instance have decided to only consider dispersants as a last response option.

Numeric results of EMSA's online targeted consultation:

- Best score (4.3) for CleanSeaNet
- Vessel Network: 3.6
- EAS: 3.5
- MAR-ICE: 3.8
- Cooperation and Information: 3.7
- Information material such as Inventories, 4.0
- Claims Management: 4.0
- Dispersants (stockpiles and seaborne systems) 3.2

More details of the outcome of the targeted consultation are presented in Annex 5 and in the Ramboll study (Annex 7).

b) Open public online consultation

The Commission conducted an online consultation on all EMSA activities between August and October 2017. In addition to general questions about the responders and their affiliation, 48 questions related to anti-pollution measures on seven subjects (such as the vessel network, EAS, CSN, HNS, etc.) were asked. All subject categories allowed for free text comments in addition to a selection of pre-defined answers.

The scope of the open public consultation covered the public perception on:

(1) the relevance of EMSA's measures to respond to pollution and whether these measures address current pollution risks and pollution response needs.

(2) the effectiveness of EMSA's measures to respond to pollution and how effective was the use by EMSA of the Union contribution.

(3) the efficiency of EMSA's measures to respond to pollution and of the use by EMSA of the Union contribution and whether the costs were proportionate to the benefits.

(4) the coherence of EMSA's measures to respond to pollution with other EU interventions means such as ECHO's civil protection mechanism.

(5) the EU added value of EMSA's measures to respond to pollution compared to interventions at regional (in particular those of regional agreements and organisation) or national levels by public authorities or the private sector.

Overall, 23 replies from 13 EU countries were received. Of these, 3 were from private citizens, 2 from NGOs, 1 from the Unions, 5 from industry associations, 2 from companies (of which one is an oil spill response organisation) and 10 from governmental organisations (this included 4 from different ministries of 1 country).

This rather small sample (of only 23 replies) cannot be seen as representative of the public opinion regarding EMSA and its anti-pollution measures. The 3 responses from citizens do not provide much information as the responders introduced themselves as “not familiar with the work of the agency” and their comments are not on the subject matter (i.e.: complaints that EMSA does not address marine noise pollution).

However the public consultation allowed reaching out to other interested stakeholders than the Member States and even for the latter other national departments replied which gives a complementary viewpoint to the views expressed through the EMSA online targeted consultation.

Even if the sample is very small and therefore cannot provide strong evidence of a general satisfaction or dissatisfaction regarding EMSA services, the replies are quite informative.

Overall respondents are generally positive about EMSA contribution to adequate preparedness and response to marine pollution from ships. The positive contribution regarding an adequate preparedness and response to marine pollution from oil and gas installations gets lower scores which could be explained by lack of awareness and the relatively recent nature of this activity. The same can be said for the Equipment Assistance Service relatively recent as well. On the other hand the network of vessels is viewed as adequate and well equipped by a majority of respondents.

CleanSeaNet is generally perceived as very useful for marine pollution detection and the deterrent effect with regard to illegal discharges is confirmed by a majority of respondents. Finally regarding EMSA activities for chemical spill response, respondents consider that EMSA could do more by helping Member States to develop their capacity.

A full analysis of the results is presented in annex 6.

c) External Study on the Cost Effectiveness and Cost Efficiency of EMSA's Oil Pollution Response Services – targeted consultations

The study conducted by EMSA's contractor Ramboll has a more limited scope than the present evaluation. It contains an assessment of the cost effectiveness and cost efficiency of the EMSA's Oil Pollution Response Services, comprising the network of contracted standby oil spill response vessels, the stockpiles of specialised oil pollution response equipment, and the stockpiles of oil spill dispersants.

The findings of the study rely on the assessment of evidence based on triangulated data collected from a range of different sources, including internal and external documentation, a targeted stakeholder consultation conducted by EMSA consisting of a survey administered to Member States (referred under (a)), plus interviews with key stakeholders conducted by Ramboll. In addition, industry and cost data provided by shipyards and shipbrokers were collected and expert assessments were provided by oil pollution response experts subcontracted by Ramboll.

In telephone interviews with relevant stakeholders of EMSA's services, questions were asked to assess EMSA's oil pollution response services and to compare EMSA's capabilities with that of Member States. Countries that had not responded to EMSA's online survey were asked additional questions in line with the EMSA consultation. Additionally, third countries that may also utilise EMSA's services, but were neither consulted in EMSA's survey nor by DG ECHO, were interviewed as well. Further information regarding these interviews could be found in Annex 7 to this report.

APPENDIX 3: OVERVIEW OF THE VESSEL NETWORK BUILDING ACTIVITIES IN YEARS 2014, 2015, AND 2016

AREA COVERED	CONTRACTOR/ CONTRACT	VESSEL/S	VESSEL TYPE / STORAGE CAPACITY (m^3)	SERVICE		
				2014	2015	2016
Northern Baltic	Arctia Icebreaking Ltd VAC 09/NEG/01/2009 Lot 1	*Kontio*	Icebreaker / 2033	✓	✓	Expired on 13/04/2016 Tender launched
Southern Baltic	OW Tankers A/S VAC NEG/01/2011 Lot 1	*OW Copenhagen*	Chemical Tanker / 4450	✓	Terminated [2] 16/04/2015 Tender launched	-
	Stena Oil EMSA/NEG/1/2015 Lot 2	*Norden*	Oil Tanker / 2880	-	-	Replace-ment started on 03/06/2016
Northern North Sea	James Fisher Everard Ltd EMSA/NEG/1/2013 Lot 1	*Mersey Fisher, Thames Fisher*	Product Tankers / 5028 / 5028	New Service started on 14/08/2014	✓	✓
North Sea	DC Industrial S.A. VAC 08/NEG/03/2008 Lot 2	*DC Vlaanderen 3000, Interballast 3*	Hopper Dredgers / 2744 / 1886	✓	Expired on 20/06/2015 Tender launched	-
Channel and Southern North Sea	DC Industrial S.A. 2014/EMSA/NEG/1/2014 Lot 3.1	*Interballast 3*	Hopper Dredger / 1886	-	Replace-ment started on 24/09/2015	✓
	DC Industrial S.A. 2014/EMSA/NEG/1/2014 Lot 3.2	*DC Vlaanderen 3000*	Hopper Dredger / 2744	-	Replace-ment started on 01/10/2015	✓

[2] EMSA terminated the contract due to bankruptcy of the contractor.

Atlantic North	James Fisher Everard Ltd EMSA/NEG /1/2013 Lot 2	*Galway Fisher,* *Forth Fisher*	Product Tankers / 4754 / 4754	Replace-ment started on 13/06/2014	✓	✓
Atlantic Coast	James Fisher Everard Ltd VAC 07-NEG/01/2007 Lot 1	*Forth Fisher,* *Mersey Fisher, Galway Fisher*	Product Tankers / 4754 / 5028 / 4754	Contract expired on 20/04/2014 Tender launched	-	-
	Remolcadores Nossa Terra S.A. EMSA/NEG/1/2014 Lot 1	*Ria de Vigo*	Offshore Supply / 1522	-	Replace-ment started on 12/06/2015	✓
Bay of Biscay	Ibaizabal VAC NEG/01/2012 Lot 3	*Monte Arucas*	Oil tanker / 2952	✓	✓	✓
	Remolcadores Nossa Terra S.A. VAC 08-NEG/07/2008	*Ria de Vigo*	Offshore Supply / 1522	Expired on 31/12/2014 Tender launched	-	-
Southern Atlantic Coast	Mureloil VAC NEG/1/2012 Lot 1	*Bahia Tres*	Oil Tanker / 7413	✓	✓	✓
Canary Islands and Madeira	Petrogas EMSA/NEG/1/2015 Lot 1	*Mencey*	Oil Tanker / 3500	-	-	New Service started on 15/07/2016
Western Mediterranean	Naviera Altube EMSA NEG/1/2011 Lot 4	*Monte Anaga*	Oil Tanker / 4096	✓	✓	Renewed on 20/03/2016
	Ciane EMSA/NEG/34/2012	*Brezzamare*	Oil Tanker / 3288	✓	✓	✓
Central Mediterranean	Tankship EMSA NEG/1/2011 Lot 2	*Balluta Bay*	Oil Tanker /2800	✓	✓	Renewed on 15/05/2016
	SL Ship Management Ltd EMSA NEG/1/2012 Lot	*Santa Maria*	Oil Tanker / 2421	✓	✓	✓

	2					
Adriatic Sea	Castalia EMSA/NEG/1/2013 Lot 4	*Marisa N*	Oil Tanker / 1562	-	New Service started on 16/01/2015	✓
Aegean Sea	Environmental Protection Engineering S.A. VAC 07-NEG/01/2007 Lot 3	*Aktea OSRV* *(Aegis I as a back-up vessel)*	Oil Tanker/ 3000 (Offshore Supply / 950)	Expired on 22/02/2014 Tender launched	-	-
	Environmental Protection Engineering S.A. EMSA/NEG/1/2013 Lot 3	*Aktea OSRV* *(Aegis I as a back-up vessel)*	Oil Tanker / 3000 Offshore Supply / 950	Replace-ment started on 13/03/2014 Aegis I - 22/05/2014	✓	✓
Eastern Mediterranean	Petronav EMSA NEG/1/2010 Lot 1	*Alexandria*	Oil Tanker / 7458	✓	Renewed on 05/05/2015	✓
Black Sea	Bon Marine Ltd EMSA NEG/1/2011 Lot 5	*Enterprise*	Oil Tanker / 1374	✓	✓	Expired on 20/09/2016 Tender launched
	Grup Servicii Petroliere VAC 08-NEG/03/2008 Lot 1	*GSP Orion*	Offshore Supply / 1334	Expired on 31/12/2014 Tender launched	-	-
Northern Black Sea	Petronav EMSA/NEG/1/2014 Lot 2	*Amalthia*	Oil Tanker / 5154	-	Replace-ment started on 21/08/2015	✓

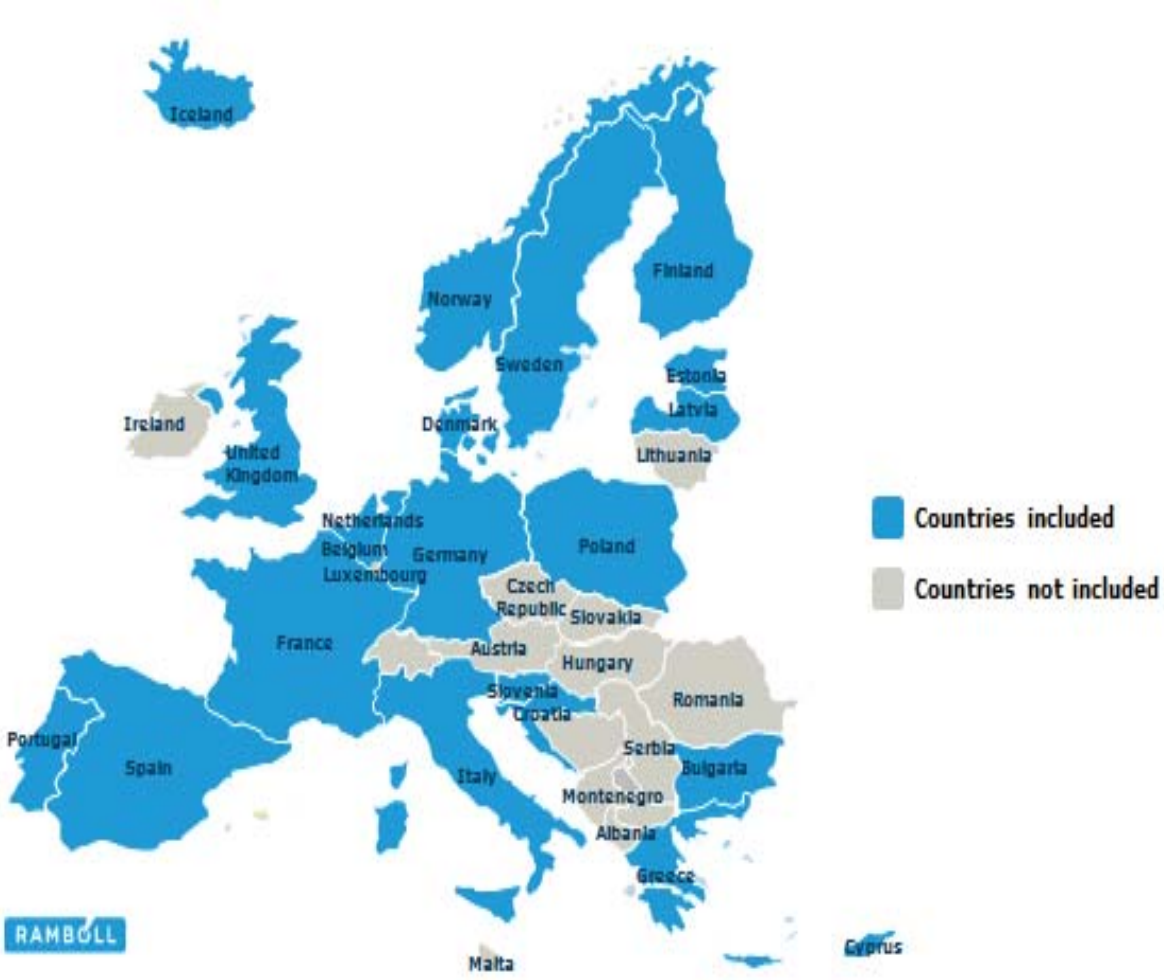
APPENDIX 4: INTERNATIONAL EXERCISES WITH EMSA VESSELS PARTICIPATION IN YEARS 2014 – 2016

N°	Name	Date	Location	Participating Parties	EMSA vessel/s
2014					
1	**OIL IN ICE**	27/03/2014	Kotka, Finland	Finland, EMSA	*Kontio (arctic skimmer)*
2	**NEMESIS, CYPRUS**	10/04/2014	Cyprus	Cyprus, Israel, Greece, USA, EMSA	*Alexandria*
3	**BALEX DELTA 2014**	11/06/2014	Ventspils, Latvia	Denmark, Estonia, Finland, Latvia, Lithuania, Poland, Sweden and EMSA	*OW Copenhagen*
4	**GALICIA 2014**	18/06/2014	Ria de Arousa, Spain	Spain, EMSA	*Ria de Vigo*
5	**ORSEC BISCAYE 33**	19/06/2014	Arcachon, France	France, EMSA	*Monte Arucas*
6	**MALTEX 2014**	03/09/2014	Valetta, Malta	Malta, EMSA	*Santa Maria, Balluta Bay*
7	**RAMOGEPOL**	17/09/2014	Elba Island, Italy	Italy, France, Spain, Monaco, EMSA	*Brezzamare*
8	**MASTIA 2014**	25/09/2014	Cartagena Roads, Spain	Spain, EMSA	*Monte Anaga*
9	**MANCHEX 2014**	30/09/2014	Calais, France	France, EMSA	*Thames Fisher*
10	**POLLEX 2014**	02/10/2014	Vlakte van de Raan, The Netherlands	The Netherlands, Belgium, EMSA	*DC Vlaanderen 3000, Interballast 3*
2015					
1	**SAFEMED III**	21-23 April 2015	Bilbao, Spain	EMSA, Observers from SAFEMED III beneficiary countries	*Monte Arucas*
2	**POLMAR MER 2015**	12-13 May 2015	Port of Sete, France	France, EMSA	*Brezzamare*
3	**ANEMONA 2015**	13-14 May 2015	Leixoes, Portugal	Portugal, Spain, EMSA	*Monte Arucas*
4	**ROCHES DOUVRES**	27-28 May 2015	Port Saint Malo, France	France, EMSA	*Forth Fisher*
5	**TRITON 2015**	03 June 2015	Gulf of Elefsis, Greece	Greece, EMSA	*Aktea OSRV, Aegis I*
6	**NEMESIS 2015**	01 July 2015	Limassol, Cyprus	Cyprus, Greece, Israel, USA, EMSA.	*Alexandria*
7	**MALTEX 2015**	2 September 2015	Valetta, Malta	Malta, EMSA	*Balluta Bay, Santa Maria*
8	**POLEX 2015**	2 September	Ostend, Belgium	Belgium, The Netherlands, EMSA	*Mersey Fisher*

		2015			
9	**OPEN SHIP**	23 September 2015	Helsinki, Finland	Finland, EMSA	*Kontio*
2016					
1	**RAMOGEPOL**	27 April 2016	Monaco	Monaco, France, Italy, Spain, EMSA	*Brezzamare*
2	**SIMULEX**	25-27 April 2016	Nador, Morocco	Safemed III participants, Morocco, EMSA	*Monte Anaga*
3	**POLMAR**	11 May 2016	Le Havre,France	France, EMSA	*Interballast III*
4	**GASCOGNE**	25 May 2016	Golfe of Gascogne, France	France, EMSA	*Monte Arucas*
5	**TRACECA II**	15-16 June 2016	Constanta, Romania	TRACECA II beneficiary Countries, Romania, EMSA	*Amalthia*
6	**BREEZE**	15 July 2016	Burgas Bay,Bulgaria	Bulgaria, Romania Turkey, US, EMSA	*Enterprise*
7	**COPENHAGEN AGREEMENT**	20-22 September 2016	Lysekil, Sweden	Parties to the Copenhagen Agreement, Sweden, EMSA	*Norden*
8	**MALTA OPEN SHIP**	4 October 2016	Valetta, Malta	Malta, EMSA	*Balluta Bay*
9	**NEMESIS 2016**	12 October 2016	Limassol, Cyprus	Cyprus, Greece, France, UK, Egypt, US, EMSA	*Alexandria*
10	**ATLANTIC POLEX.PT**	20 October 2016	Portimao, Portugal	Portugal, Spain, EMSA	*Bahia Tres* *Monte Anaga*

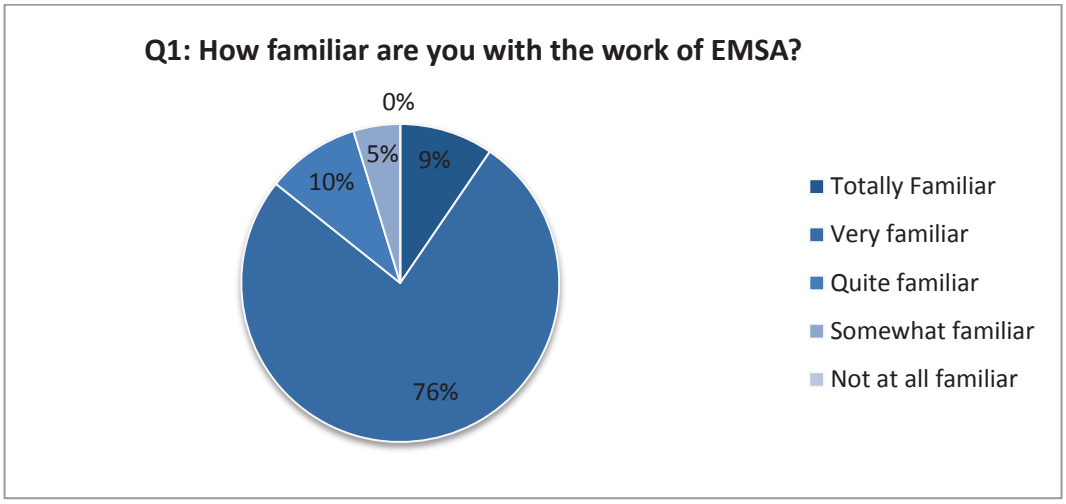
APPENDIX 5: ANALYSIS OF EMSA SURVEY TO MEMBER STATES

The following is an analysis of data from 19 out of 28 MSs, as well as from Iceland and Norway. However, the total of the answers given amounts at 23, since HR and IT gave two answers for each question of the questionnaire.



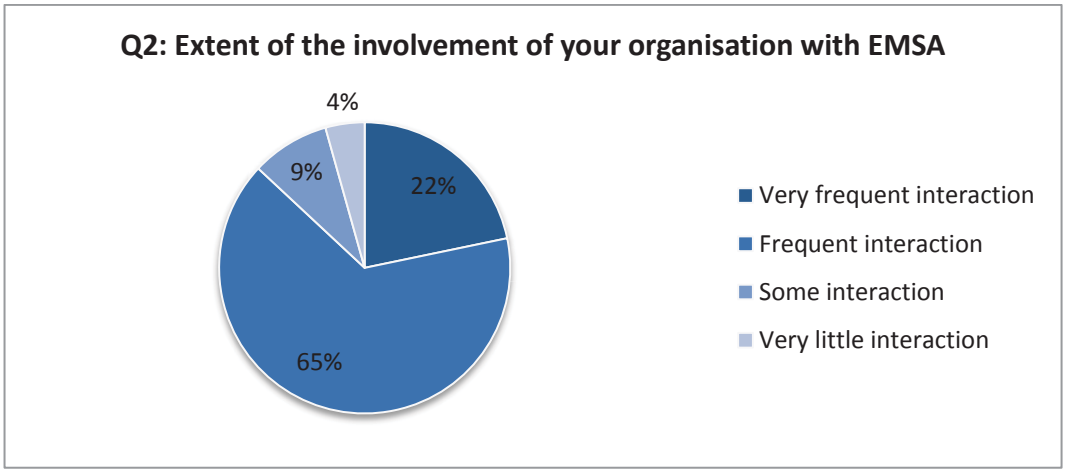
How familiar are you with the work of EMSA?

The majority of the MS (15/21) were very familiar with the work done by EMSA, only one Member State did not have any knowledge of EMSA.



1. **To what extent does the work of your organisation involve interaction with EMSA?**

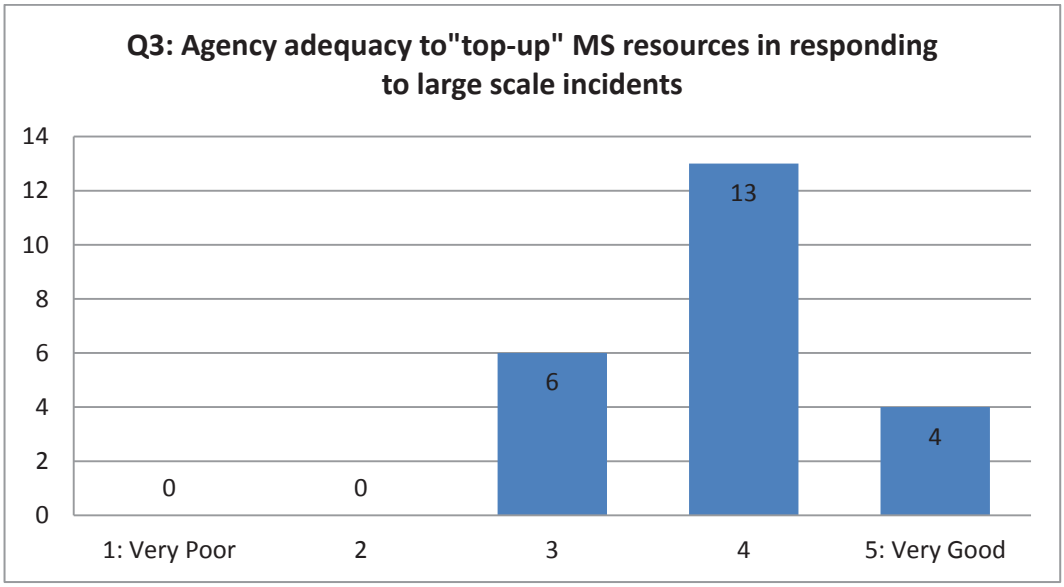
15/21 MS´s respondents had very frequent interaction with EMSA. 5/21 had frequent interaction with EMSA. 2/21had some interaction with the work of EMSA, while one had very little interaction with the Agency.



Given the absence of a European Standard for national response mechanisms and capacities, has the Agency adequately addressed its operational task of "topping-up" Member States resources in responding to large scale incidents?

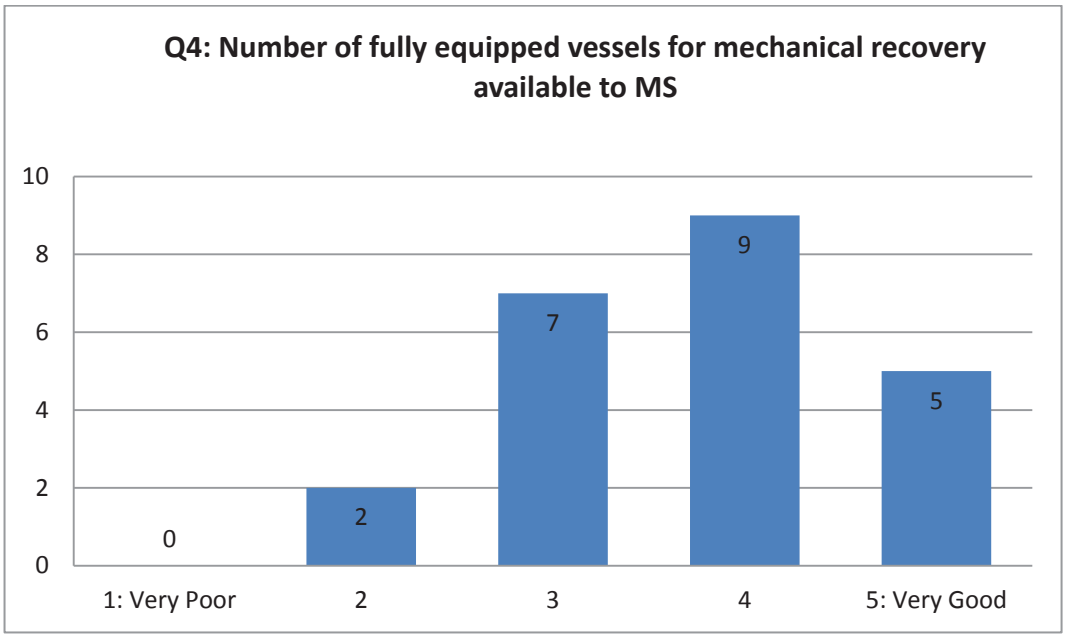
The majority of respondents (11/21) were satisfied with the way the Agency addressed its task of "topping-up" MS resources in responding to large scale incidents (4/5). The reasons for lower degree of satisfaction were:

- The country has never requested assistance from a standby Oil response Vessel;
- The available response capacity should be better taken into account;
- Capacity gaps should be better identified regionally through a new standard method.



2. How do you rate the number of fully equipped vessels for mechanical recovery that are available to the EU Member States?

Generally speaking, MSs consider the number of fully equipped vessels for mechanical recovery between satisfying and very good.

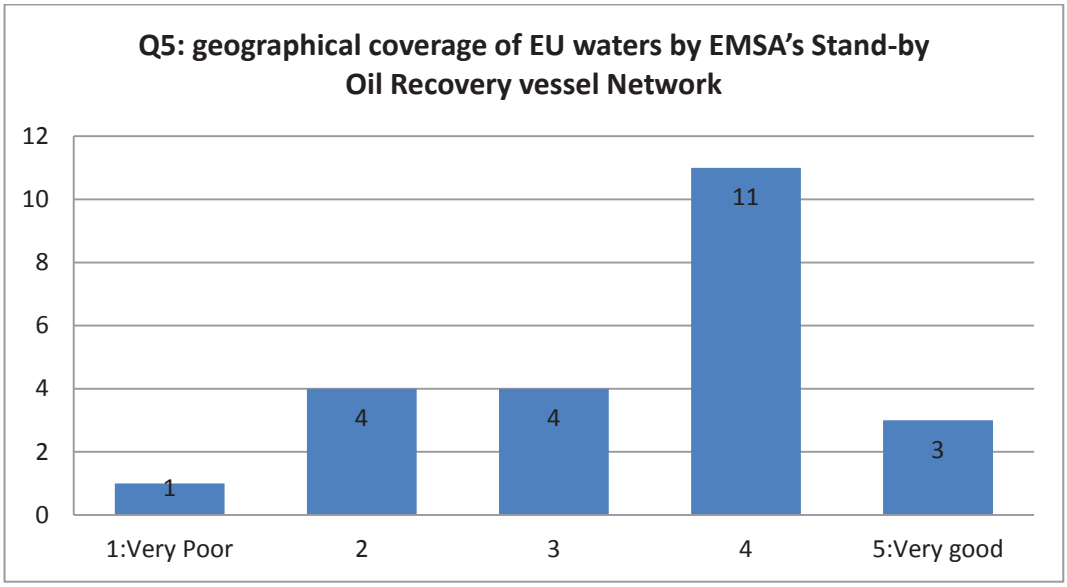


How do you rate the geographical coverage of European waters by EMSA's Stand-by Oil Recovery vessel Network?

Among the Countries that poorly rated this question, some of them pointed out that the location of the EMSA vessels is inadequate, since it is too far to reach the available ships.

On the other hand, some MS find the location of the vessels extremely convenient. Moreover, some question whether the coverage of all EU waters is necessary.

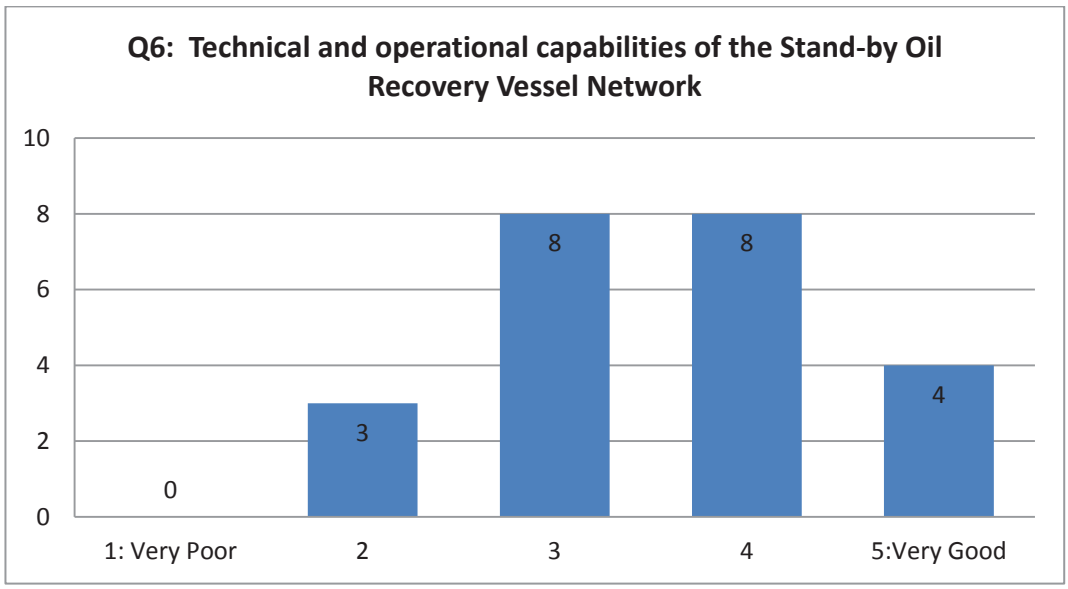
Generally speaking, MS are rather satisfied with the geographical coverage of EU waters.



3. How do you rate the technical and operational capabilities of the EMSA contracted Stand-by Oil Recovery Vessel Network?

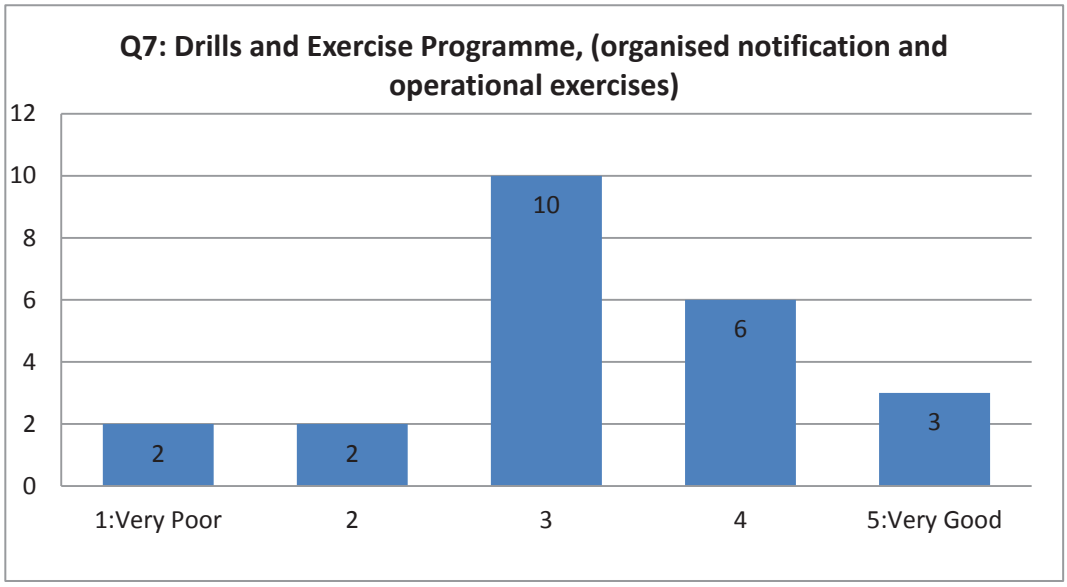
Among the countries which gave the lowest quotations (mark 2 or 3) the given reasons for that were:

- the ships are not fit to operate with flash point below 60° (10/17 vessels are certified for operations with flashpoint below 60°);
- doubts about the capability of the crew (the concerned MSs did not attend any drill or exercise);
- no information on the type of equipment on board was available (all information is available on the website);
- the carrying capacity is quite small (with a minimum storage capacity of 1500M3, EMSA vessels are above the capacity available in the MS inventories).



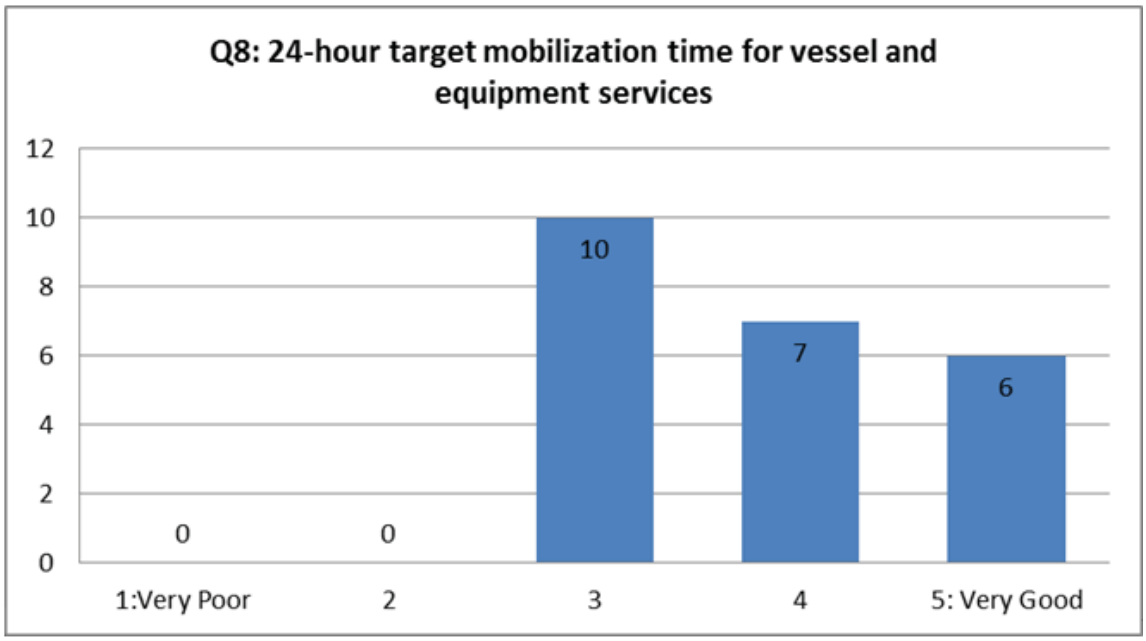
4. How do you rate the EMSA Drills and Exercise Program, and more specifically the notification and operational exercises that EMSA has organized in the given period?

Most of the comments are related to the absence of knowledge about these drills. Several MS rated highly the participation in operational exercises and requested them to be even more frequent.



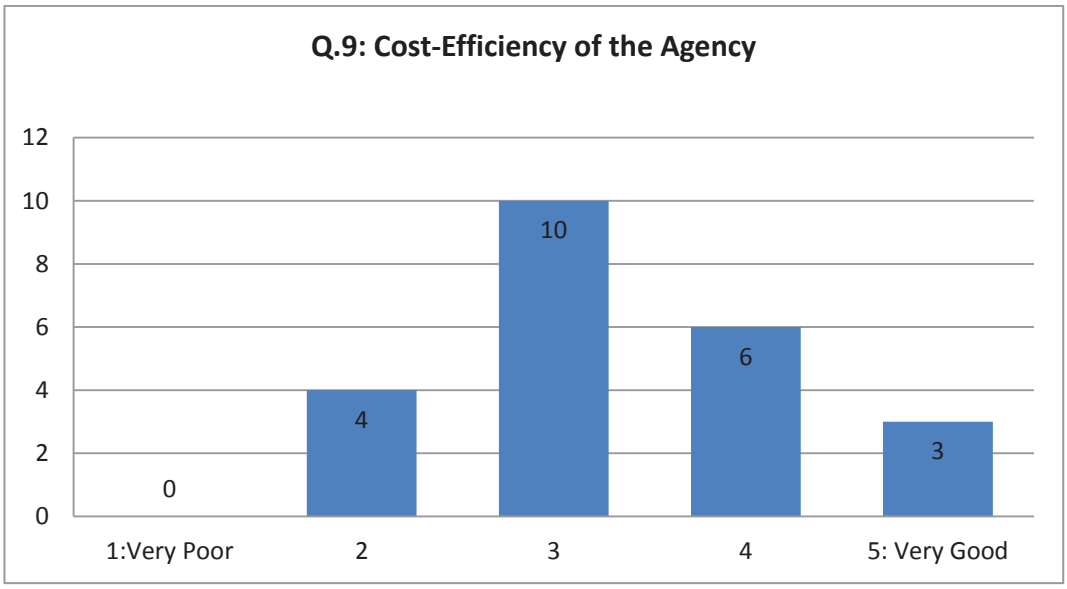
5. **How do you rate the 24-hour target mobilization time for vessel and equipment services as of 2016?**

Overall the comments were positive, taking into account in particular that EMSA assets are top-up means and are not supposed to be the first response means on site.



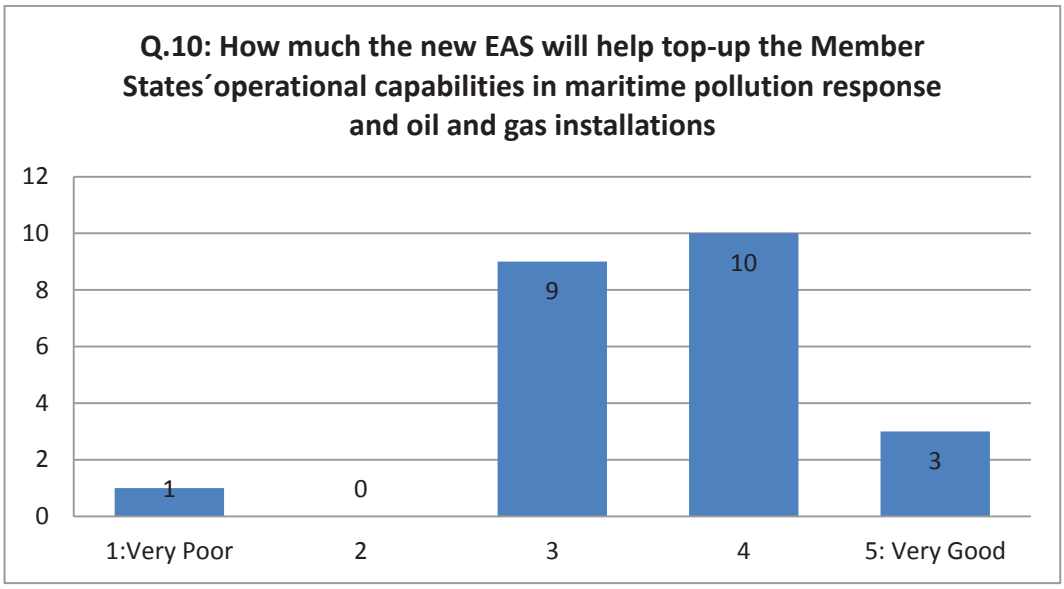
6. **How cost-efficient do you consider that the Agency been in implementing its operational tasks in the field of response to ship-sourced pollution and pollution from oil and gas installations?**

The replies are divided mainly for the reason that it is difficult to appreciate.



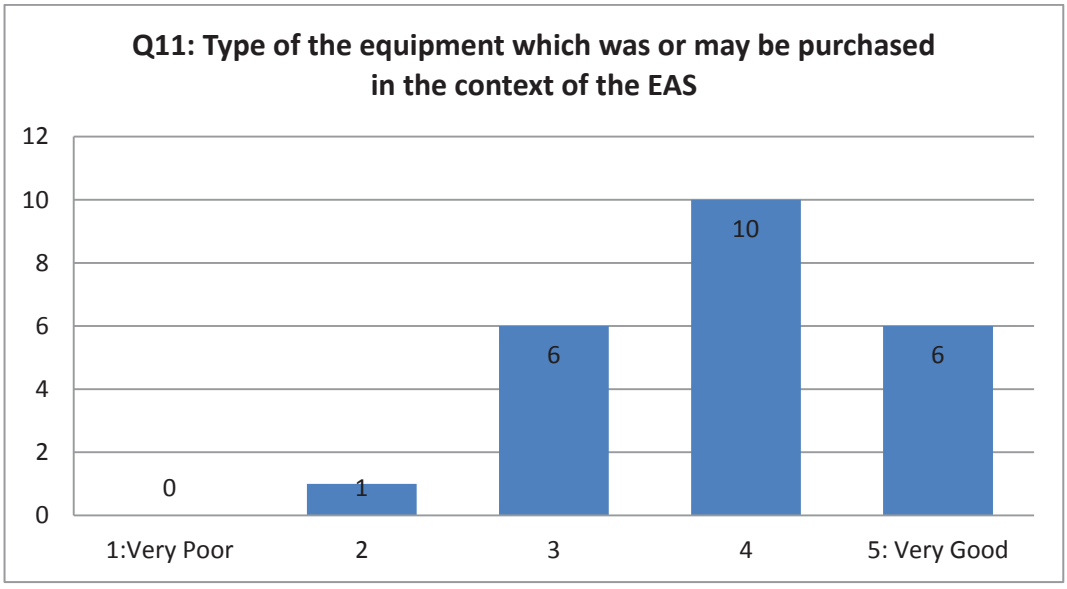
7. **To what extent do you consider that the newly established Equipment Assistance Service (EAS) will help top-up the Member States' operational capabilities in the field of response to marine pollution from ships and also oil and gas installations?**

Generally speaking EAS is considered useful, but some comments on the fact that equipment is already shared at regional level.



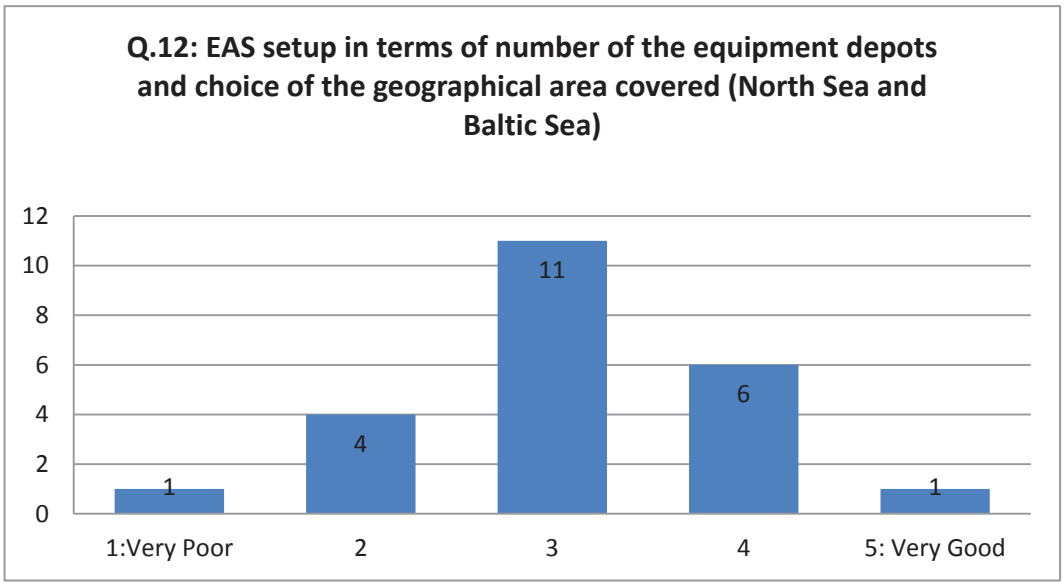
8. **How do you rate the type of the equipment, as well as its technical characteristics, which was or may in the future be purchased in the context of the EAS? (e.g. fire booms, high speed containment, decanting and recovery systems, integrated containment and recovery system, oil trawl nets).**

MSs were widely satisfied with the type of equipment that has been or will be purchased in the context of EAS, especially if it complements the types already available in MS stockpiles.



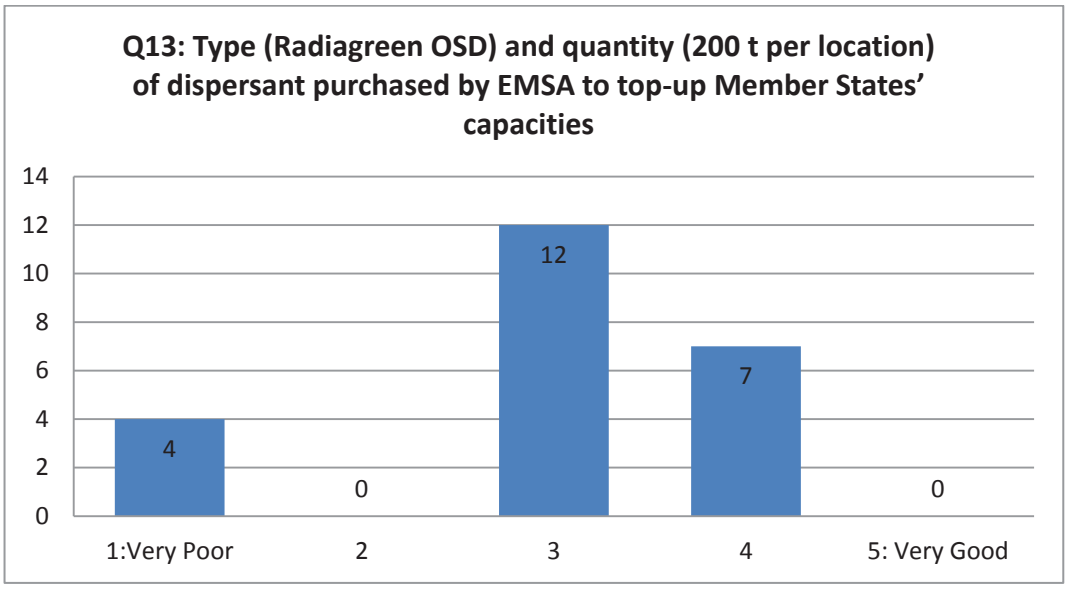
9. How do you evaluate the EAS setup in terms of the number of the equipment depots, as well as the choice of the geographical area that they currently cover (North Sea and Baltic Sea)?

There is a more diverse appreciation regarding the location and also the number, the comments go towards a better coverage with more depots where there is a need.



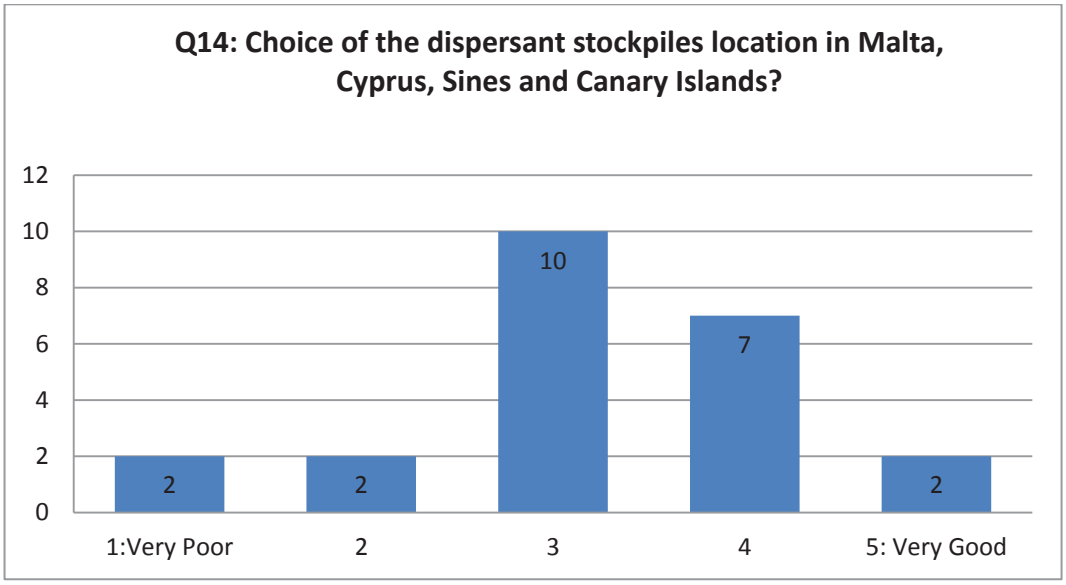
10. How do you rate the type (Radiagreen OSD) and quantity (200 t per location) of dispersant that EMSA has purchased to top-up Member States' capacities?

The lowest quotations are given by countries which do not use dispersant, other MS not also using dispersant gave the mid mark as a neutral position. Several comments were made regarding the fact that this particular product is not in the list of approved products from several MS.



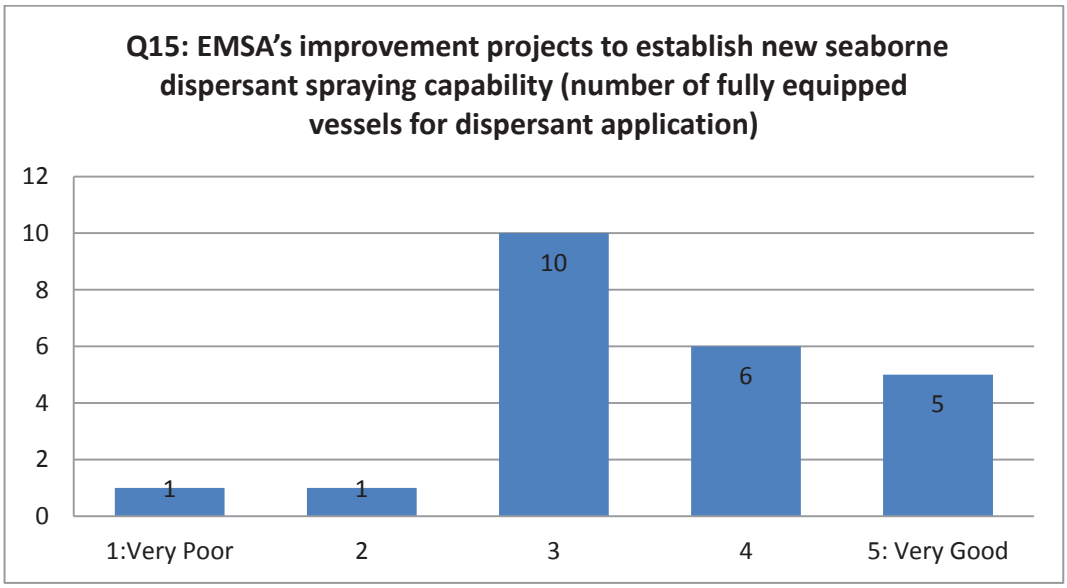
11. How do you rate the choice of the dispersant stockpiles location in Malta, Cyprus, Sines (Portugal) and Canary Islands (Spain)?

The comments reflect the national policies on the use of dispersant as well as the appreciation of the respondent regarding the accessibility to the stockpile for his country.



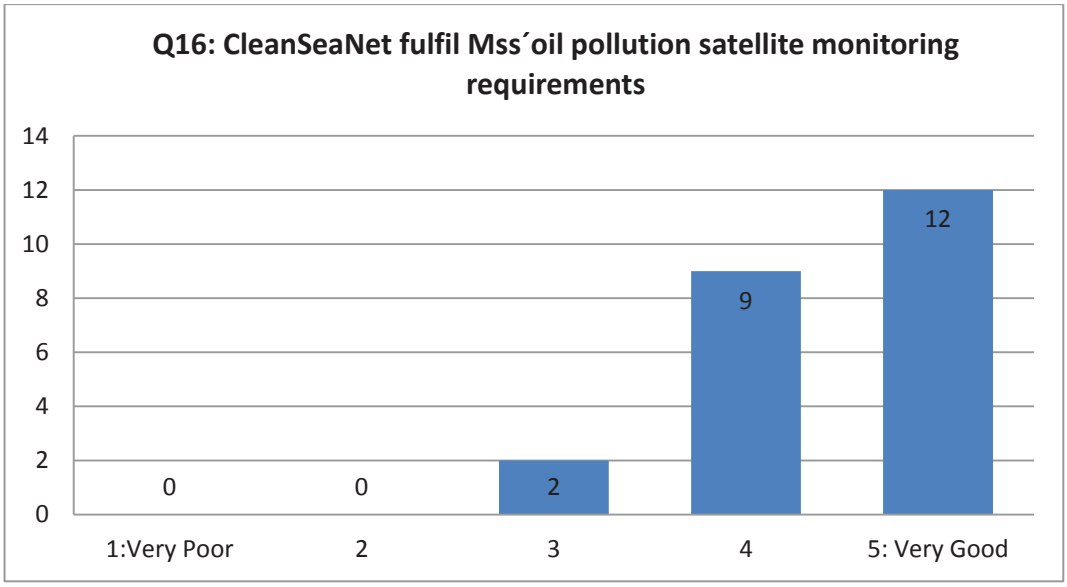
12. How do you rate EMSA's improvement projects to establish new seaborne dispersant spraying capability, and in particular the number of fully equipped vessels for dispersant application?

These improvements projects are rather well received but several comments were made on the need to try and secure an airborne capacity.

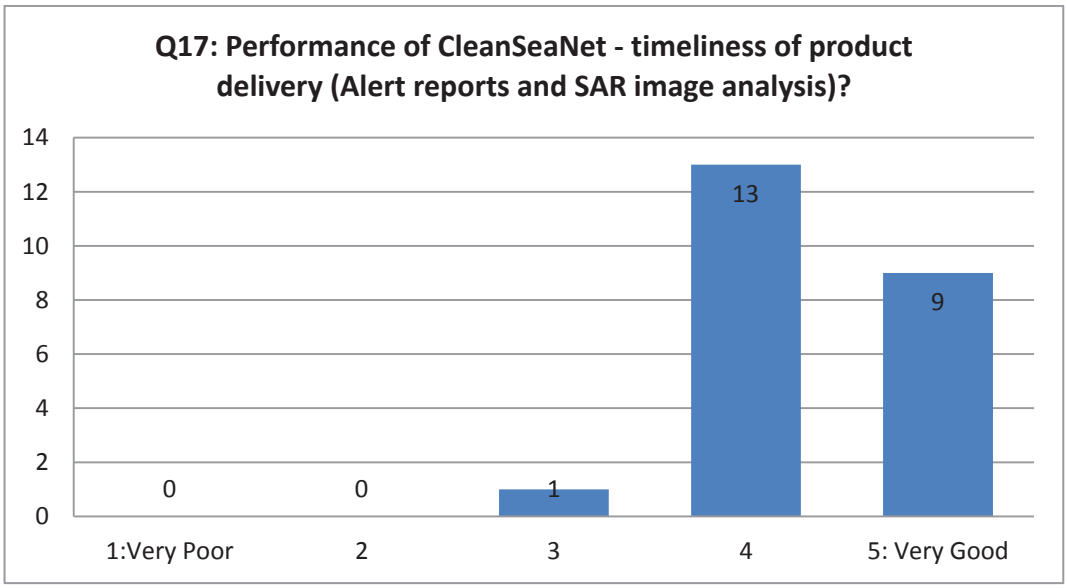


13. To what extent does the CleanSeaNet service fulfil your oil pollution satellite monitoring requirements?

MSs have all a positive experience with CleanSeaNet, since it is considered a useful, unique and valuable service by many of them.

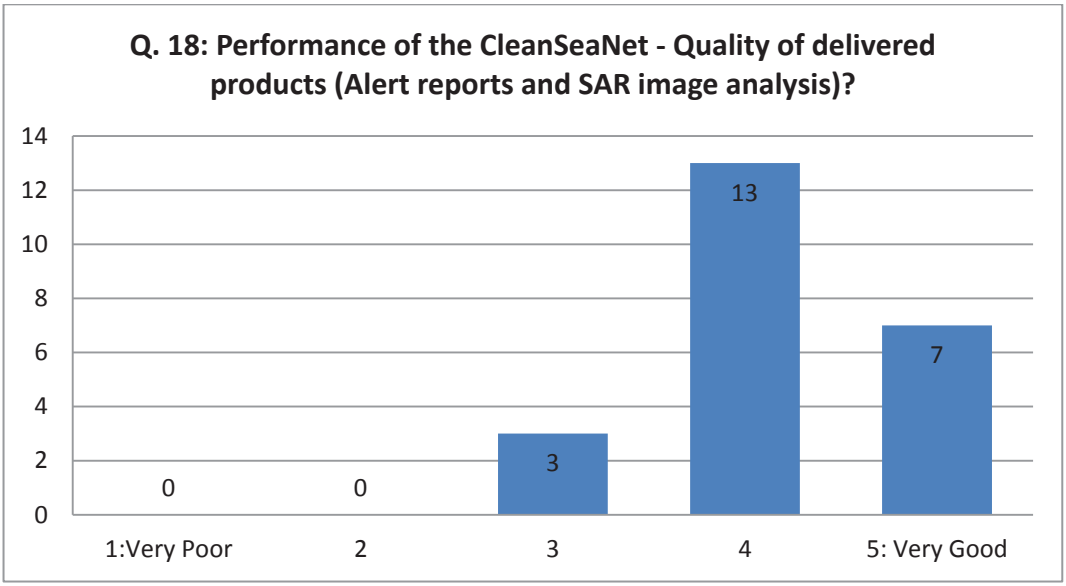


14. How would you assess the performance of the CleanSeaNet service, in terms of timeliness of product delivery (Alert reports and SAR image analysis)?



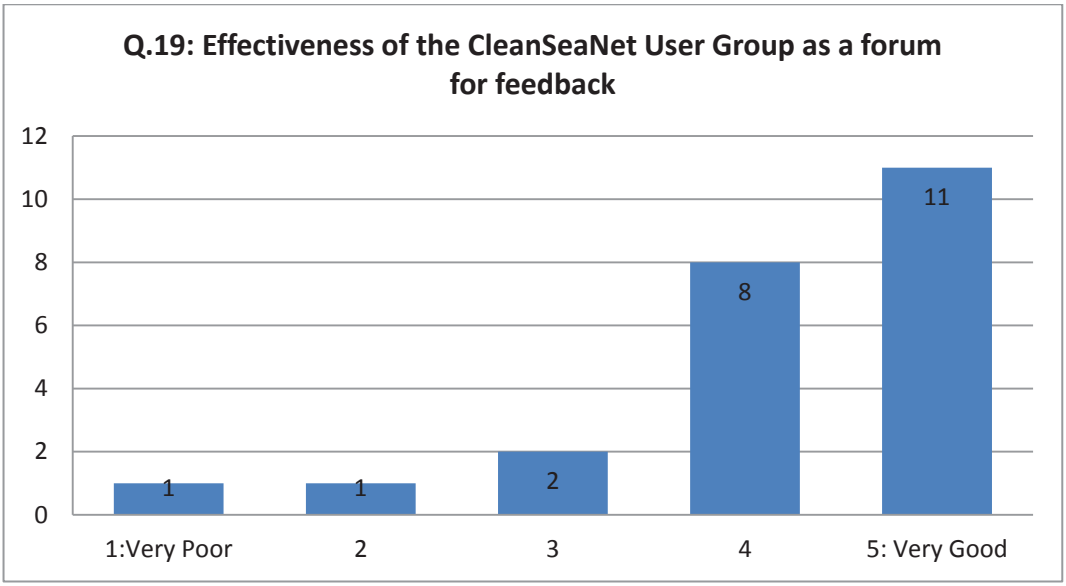
15. How would you assess the performance of the CleanSeaNet service, in terms of quality of delivered products (Alert reports and SAR image analysis)?

The quality is overall positively assessed, the limitation being the difficulty to discriminate between oil spills and natural phenomena.



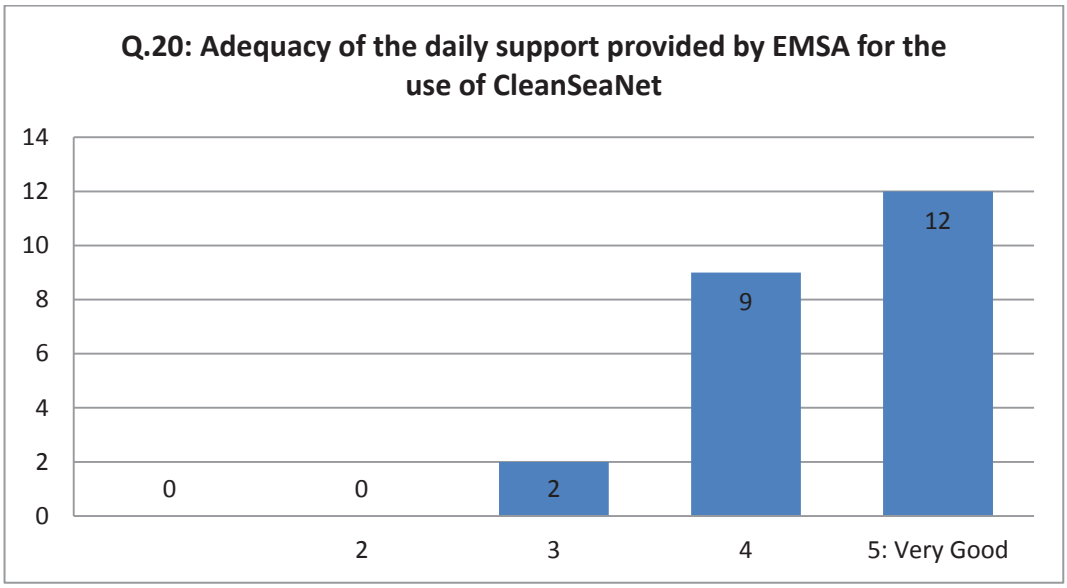
16. How would you assess the effectiveness of the CleanSeaNet User Group as a forum for feedback (e.g. did you have the opportunity to present your views, to benefit from other Member States experience and to contribute to the improvement of the service)?

On the overall, the User Group is considered very effective, since it provides for an opportunity to share experience, meet CSN system developers and discuss with MS representatives the efficiency of this service, as well as present real case studies.



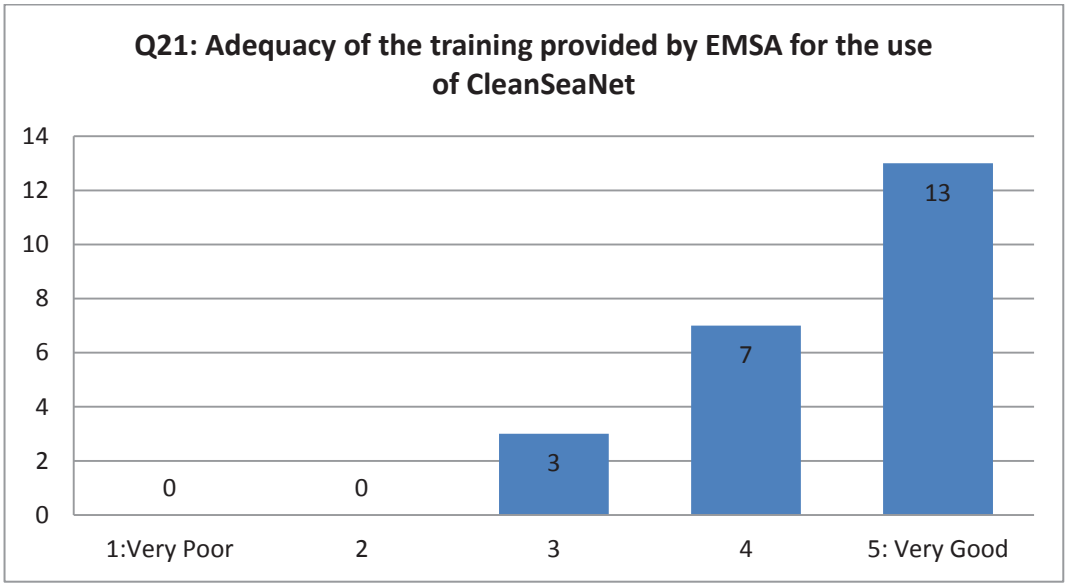
17. How adequate was daily support provided by EMSA for the use of CleanSeaNet in your operational activities?

Generally well rated.



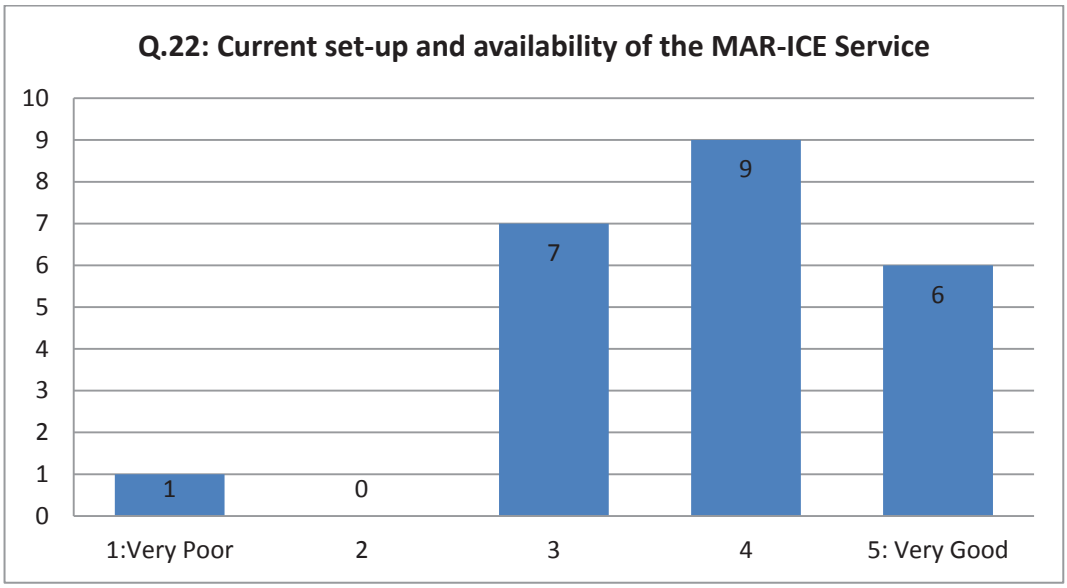
18. How adequate was the training provided by EMSA for the use of CleanSeaNet in your operational activities?

The Trainings have been positively evaluated by all MS. The only remarks were about duration – since they should be done more frequently and last at least 2 days (– and contents – which should be more practical and based on real case scenarios.



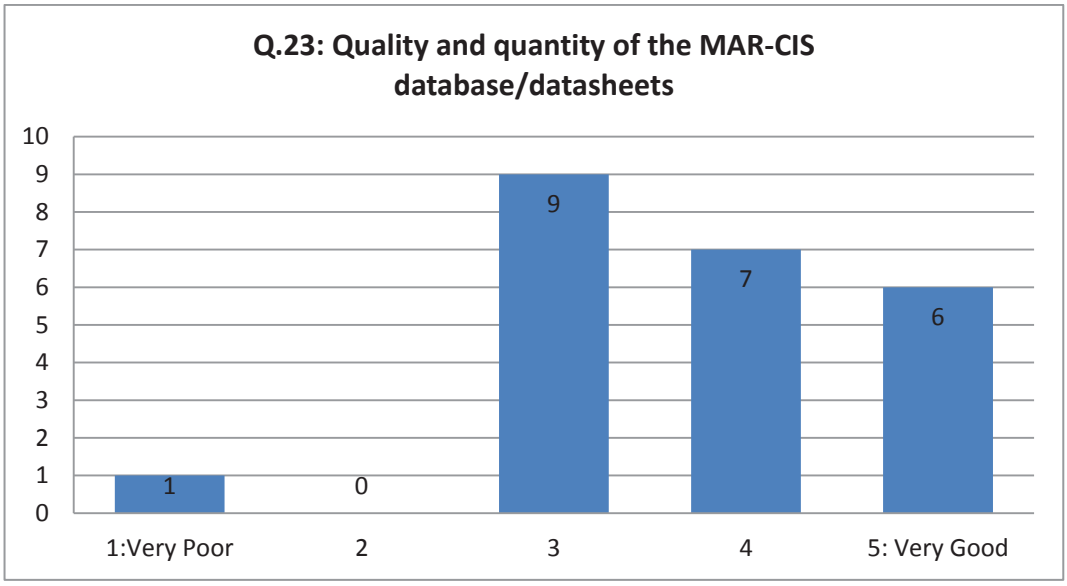
19. How do you rate the current set-up and availability of the MAR-ICE Service?

Generally speaking, although this service has not been largely used, MSs consider it to be valuable.



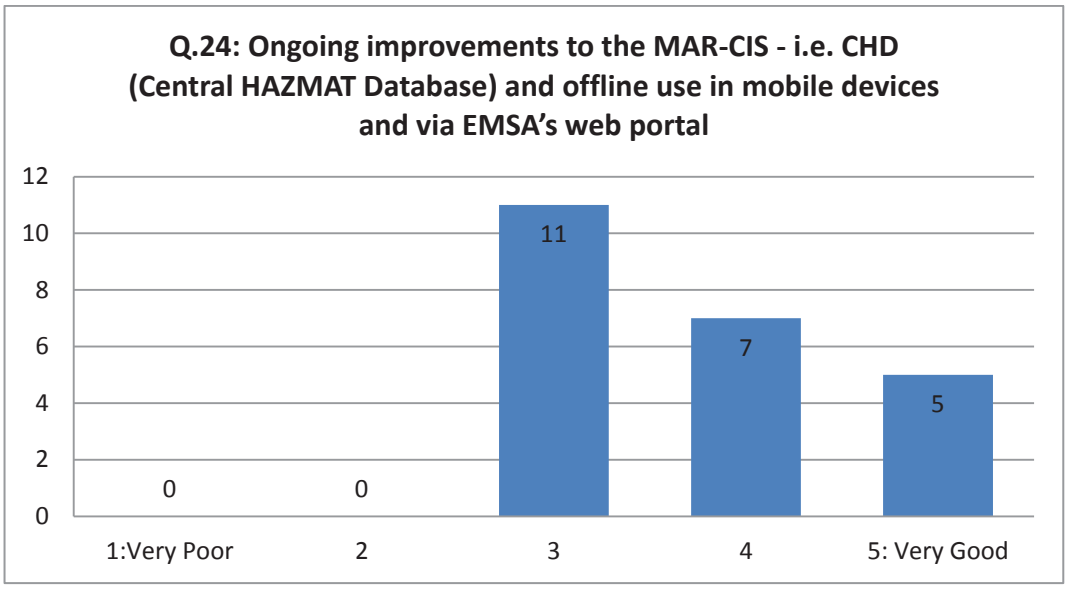
20. How do you assess the quality and quantity of the MAR-CIS database/datasheets?

Most of the "3" marks were given by MS which didn't use the system. Those who actually used it gave higher marks.



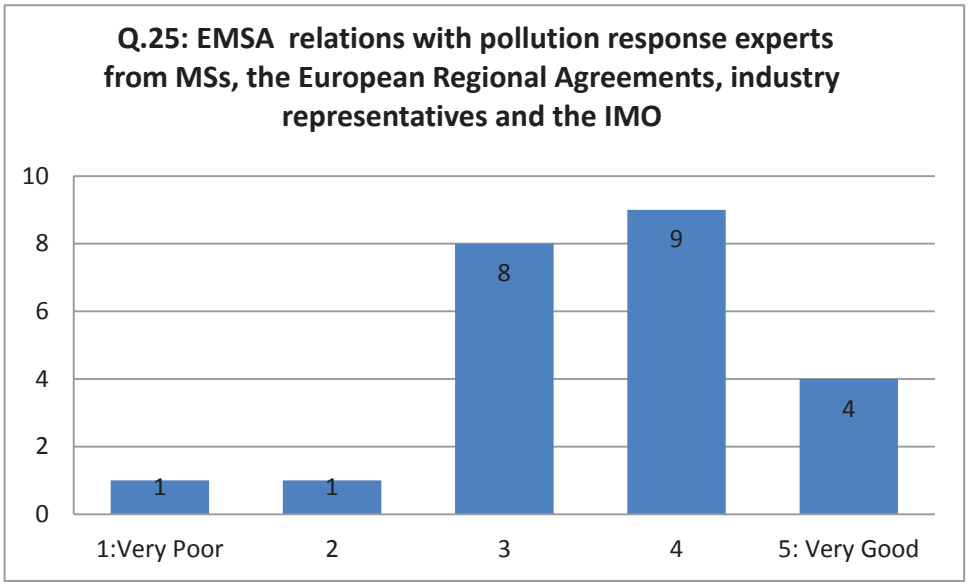
21. How do you assess the ongoing improvements to the MAR-CIS, such as the creation of links to the new CHD (Central HAZMAT Database) application in SafeSeaNet and the possibility of offline use in mobile devices and via EMSA's web portal?

Half of the respondents were not aware of these developments, the other welcome them as particularly relevant for assistance in an emergency.



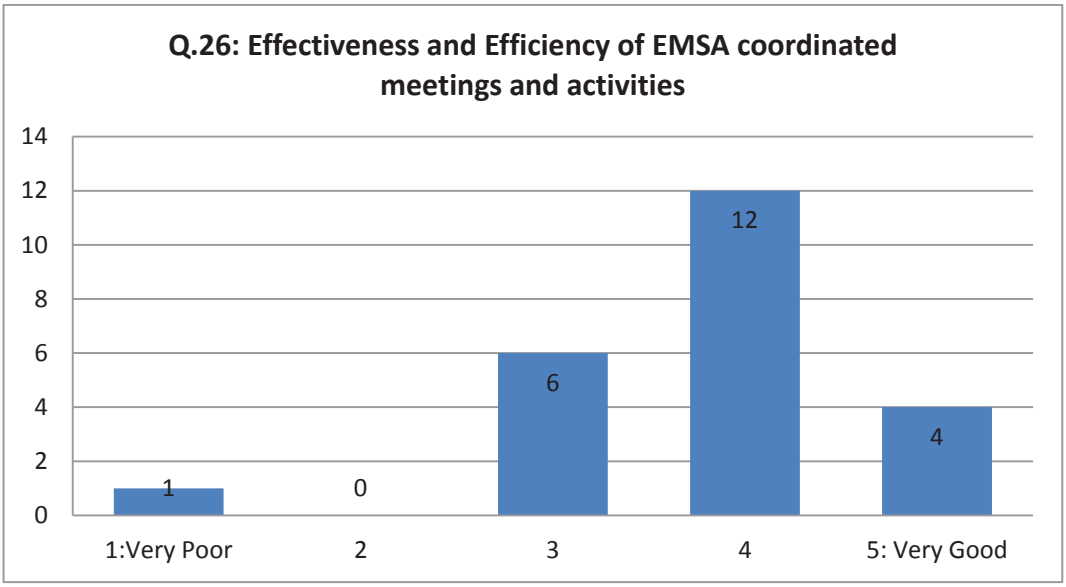
22. To which extent has EMSA (within the framework of its three Action Plans) developed relations with pollution response experts from Member States, the European Regional Agreements, industry representatives (e.g. oil spill associations and chemical industry) and the International Maritime Organisation? Please provide examples of successful cooperation.

Generally speaking, MS are satisfied with the extent to which EMSA has developed relations with pollution response experts from MS and other stakeholders. Some MS noticed that there have been large improvements in this sector over the last few years and consider these relations largely successful. However some MS noted that there should be stronger interaction with the industry.



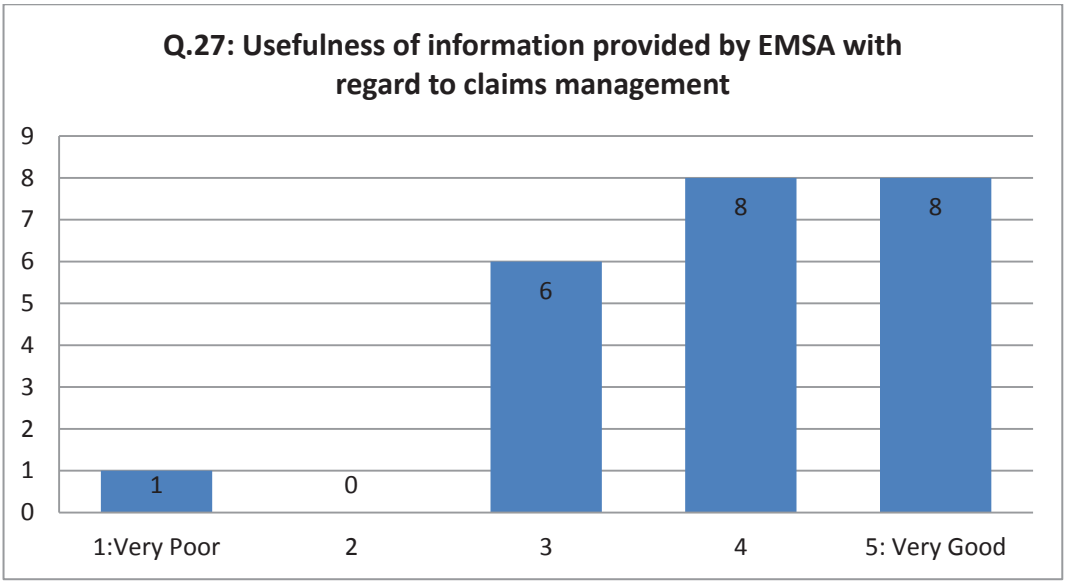
23. How effective and efficient do you consider the EMSA coordinated meetings and activities, such as the CTG MPPR, the Vessel User Group, Empollex, TCG Dispersants, other workshops?

There is generally appreciation of these meetings and activities although some mentioned that the meetings are too numerous and too short in duration to really maximize the benefit of meeting with the experts from the other MS**.**



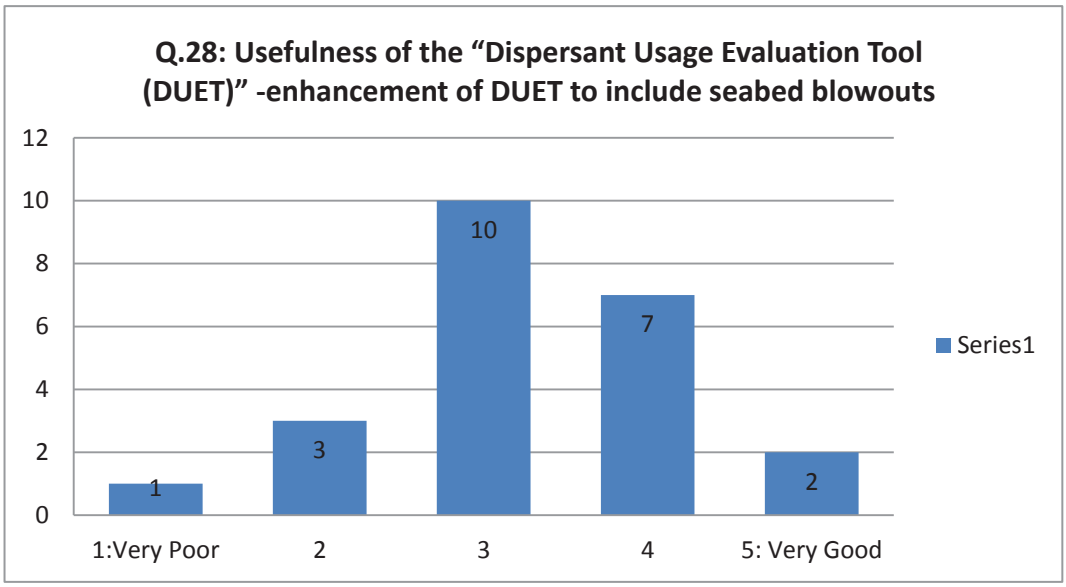
24. How useful do you consider the provision of information provided by EMSA with regard to claims management, including the "EU States Claims Management Guidelines"?

Generally the information provided by EMSA with regard to claims management is considered to be useful.



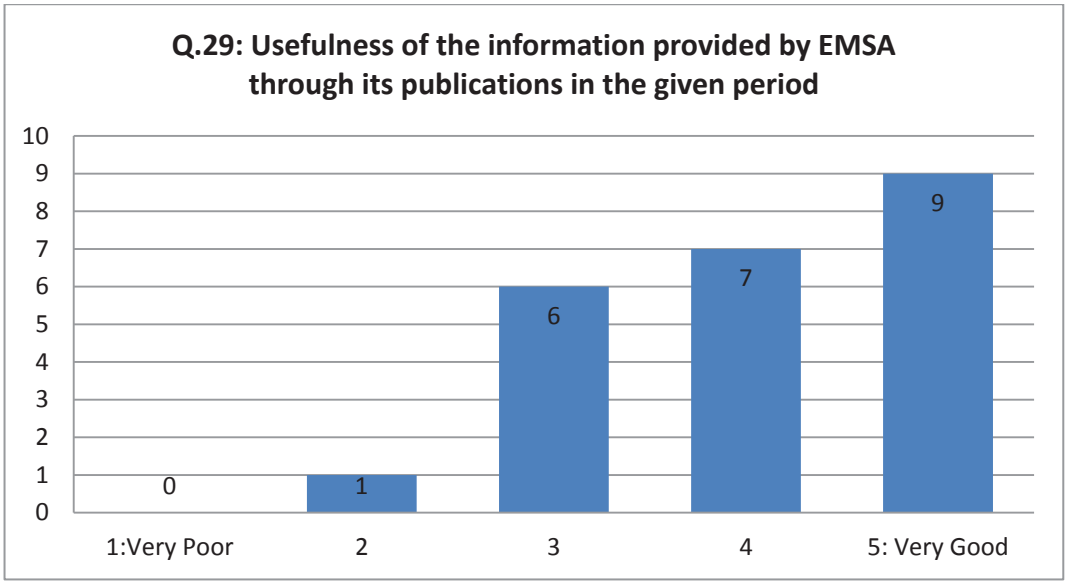
25. How useful do you consider the "Dispersant Usage Evaluation Tool (DUET)", and in particular the enhancement of DUET in order for it to include seabed blowouts?

The answer reflects the fact that many countries do not consider the use of dispersant, some considered the toll as being too theoretical, others welcome it.



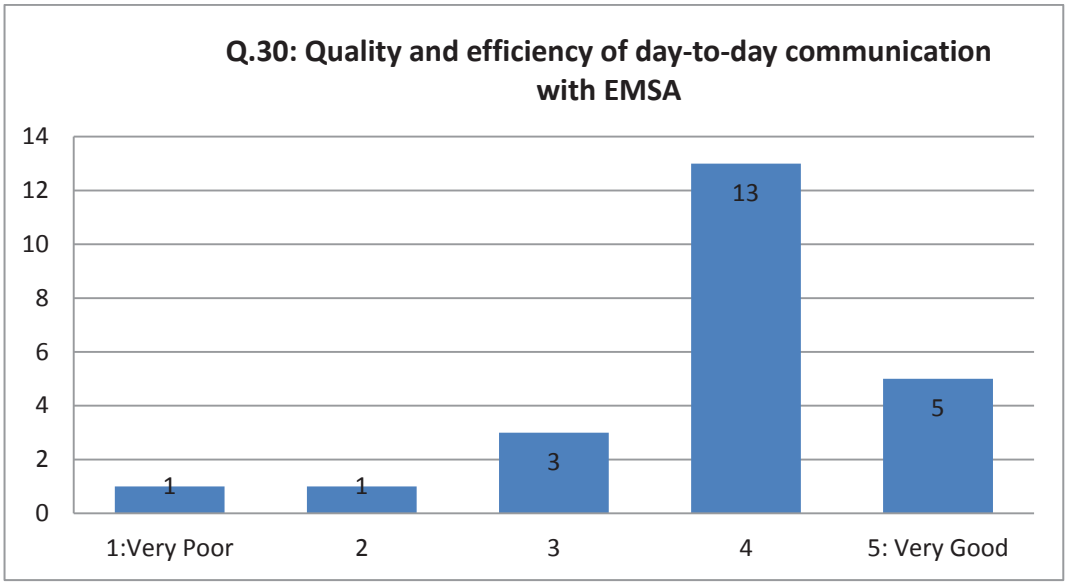
26. How useful do you consider the provision of information provided by EMSA though its publications in the given period? (e.g. the Inventory of national policies regarding the use of oil spill dispersants in the EU, and the Handbook for the Network of Stand-by Oil Spill Response Vessels and Equipment)

Generally the provision of information provided by EMSA through its publications is considered useful.



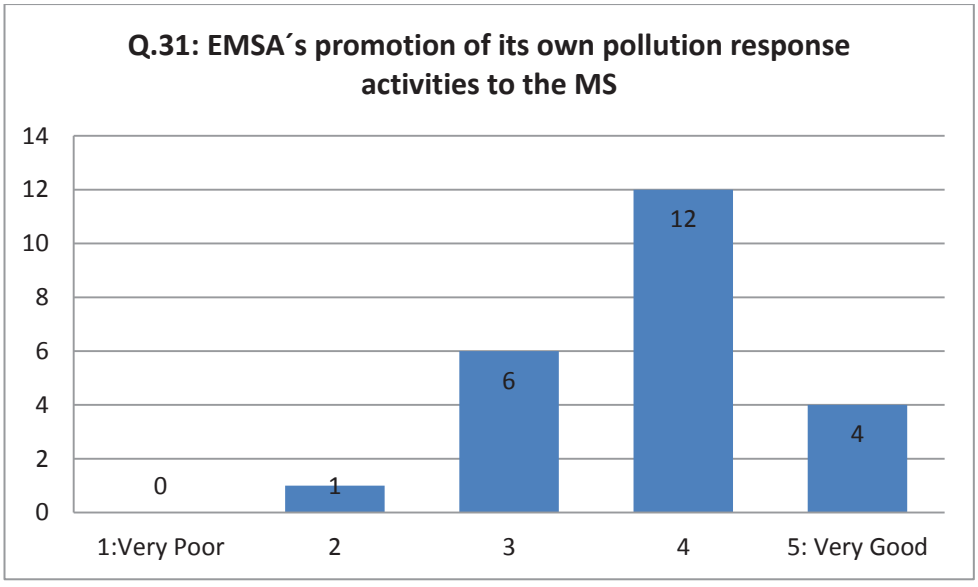
27. How do you rate the quality and efficiency of day-to-day communication with EMSA in the given period?

Communication with EMSA is considered to be prompt, of high quality, constructive and direct. Nevertheless, it has been noted that EMSA should be a bit more active in informing MSs on new products or procedures.



28. How do you evaluate EMSA in promoting its own pollution response activities to the MS, and in proactively informing them about new developments through brochures, meetings, workshops etc.?

Meetings and workshops are considered to give good information and it is acknowledged that generally EMSA introduces its activities very well and in a professional way. However EMSA should deliver more proactive information to MS on new developments.



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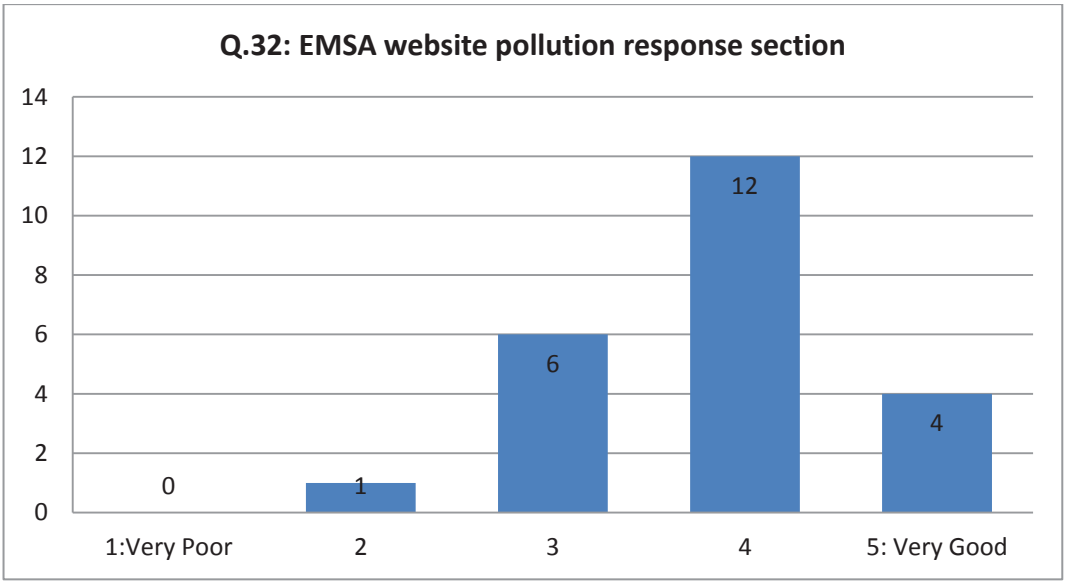
29. How do you rate the EMSA website pollution response section (e.g. is it user friendly, updated, easy to find relevant information)?

It is generally well perceived by MS, even though it could be improved by:

- Including IRC form, equipment prices
- Publishing all presentations and meeting documents from every EMSA meeting
- Adding personal contact details (email, office telephone number) of EMSA's personnel

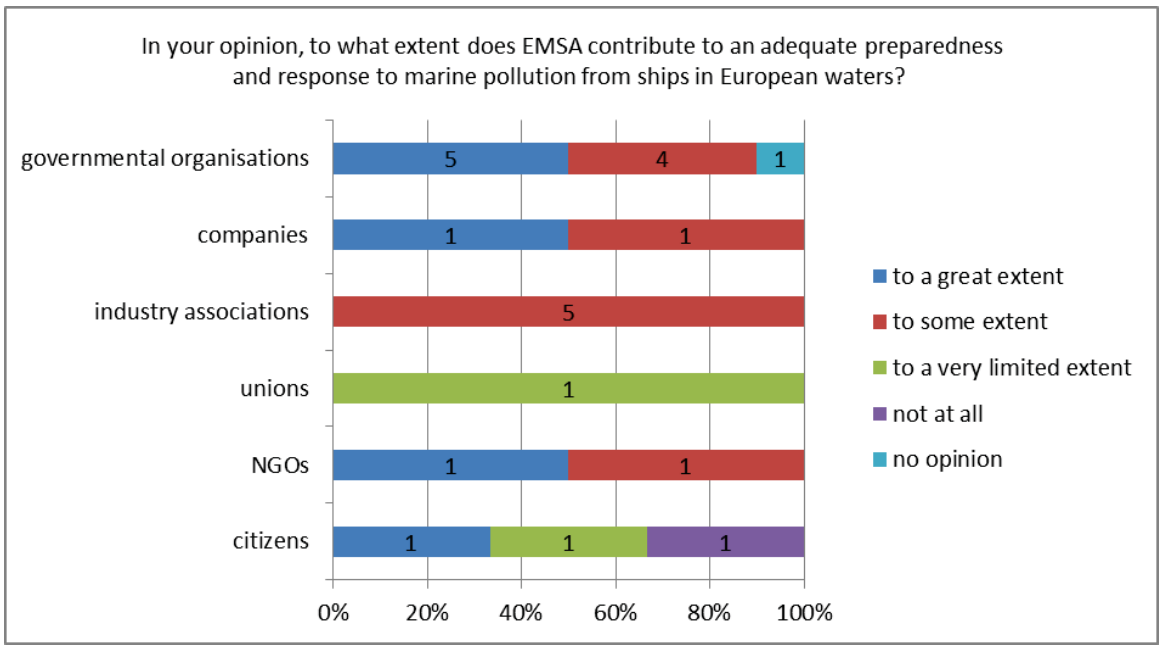


30. What are your general thoughts on EMSA's ongoing and planned activities in relation to pollution response?

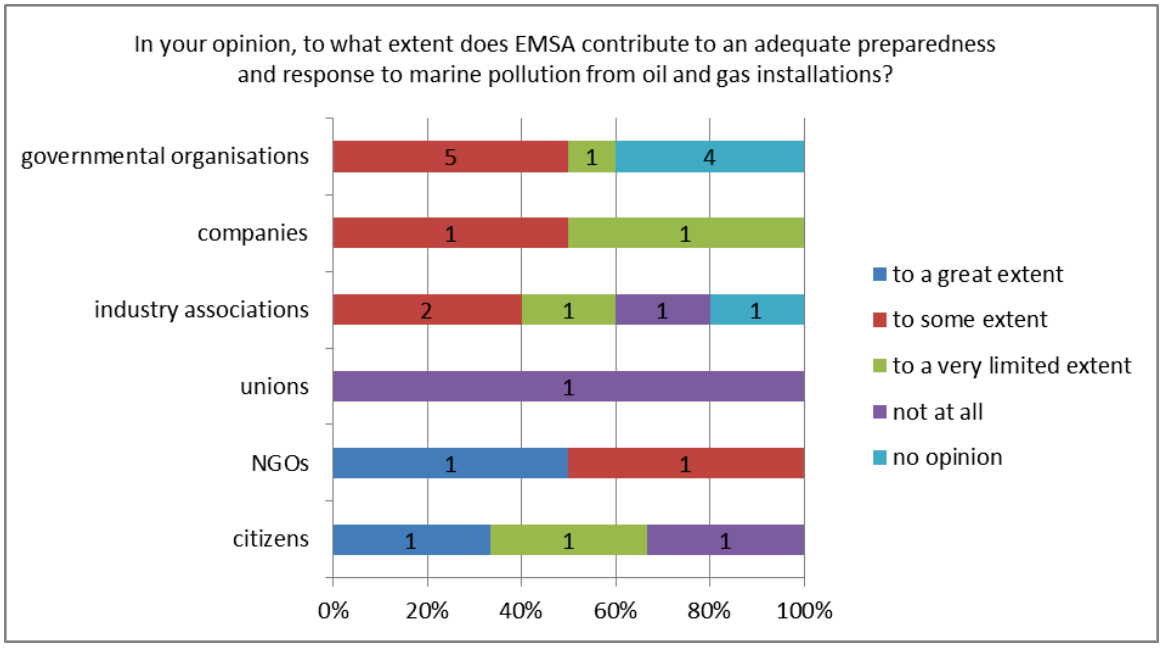
All but 2 MS support continuing the current activities, several MS raise their expectations for EMSA to be more involved in research and new tehcnologies. Some also expressed their opinion that EMSA should work more closely with the Regional Agreements. The 2 who disagree with this general support expressed, in one case, doubts about the relevance of EMSA and, in the second case, considered it has no sufficient information about what EMSA does.

APPENDIX 6: RESULTS OF THE PUBLIC ONLINE CONSULTATION

In your opinion, to what extent does EMSA contribute to an adequate preparedness and response to marine pollution from ships in European waters?



In your opinion, to what extent does EMSA contribute to an adequate preparedness and response to marine pollution from oil and gas installations?

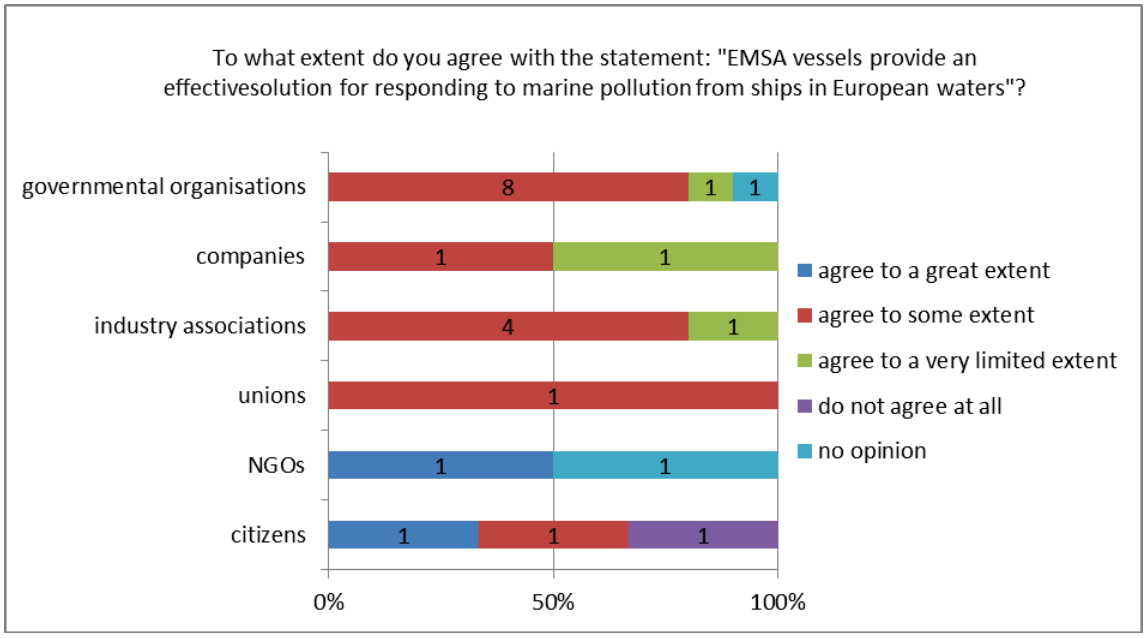


The majority of respondents gave a positive answer when asked about the EMSA Pollution Response Services. Nevertheless, there are some differences among the opinions regarding the response to ship pollution and pollution coming from oil and gas installations. Most of the respondents (9 governmental organisations, 2 companies, 5 industry associations, 2 NGOs and 1 citizen) believe that EMSA contribute to an

adequate preparedness and response to marine pollution from ships to a great or to some extent, but when asked about pollution from oil and gas installations, less governmental organisations, companies and industry associations (5 governmental organisations, 1 company and 2 industry associations) gave a positive answer (to a great or to some extent). 4 of the governmental organisations preferred to not give an opinion in the second answer. The union also gave a more negative answer in the second questions. The opinions from NGOs and citizens remained the same for both questions.

Negative opinions are due to the lack of approach of EMSA to noise pollution and the lack of an evaluation to the EMSA contribution to an adequate response to oil and gas installations, as these responsibilities have been added to EMSA recently.

Network of Stand-by Oil Spill Response Vessels



The majority of respondents answered that EMSA vessels provide 'to some extent' an effective solution for responding to marine pollution from ships in European waters (8 governmental organisations, 1 company, 4 industry associations, 1 union and 1 citizen). In addition, 1 NGO and 1 citizen answered 'to a great extent'.

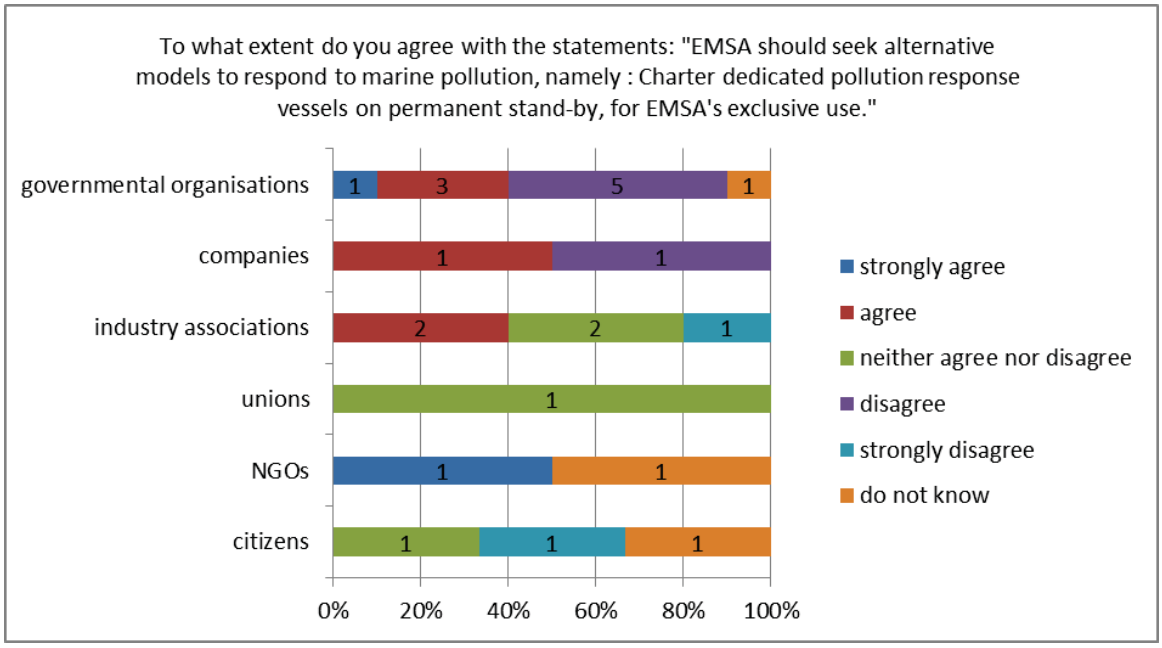
The reasons for this positive perception relate to the answers given in the questions 13, 14 and 15. The majority of respondents (15 of 23) consider that the network of EMSA vessels is adequate to complement existing resources at national level and 10 of 23 of the respondents also consider that the network of EMSA vessels is adequate at regional level. In addition, the majority of the respondents think that EMSA vessels are equipped enough: 'very well equipped' (1 of 23), 'well equipped' (6 of 23), or 'adequately equipped' (8 of 23).

Some of the negative comments point out the need for a more balanced geographical coverage ("only 5 vessels are located in the sea areas north from Bay of Bisca"). In addition to this, 8 of 23 of the respondents consider that the coverage at regional level is insufficient, mainly because of the lack of national resources. Last, 2 of the industry associations consider EMSA vessels poorly equipped. They mention that some vessels

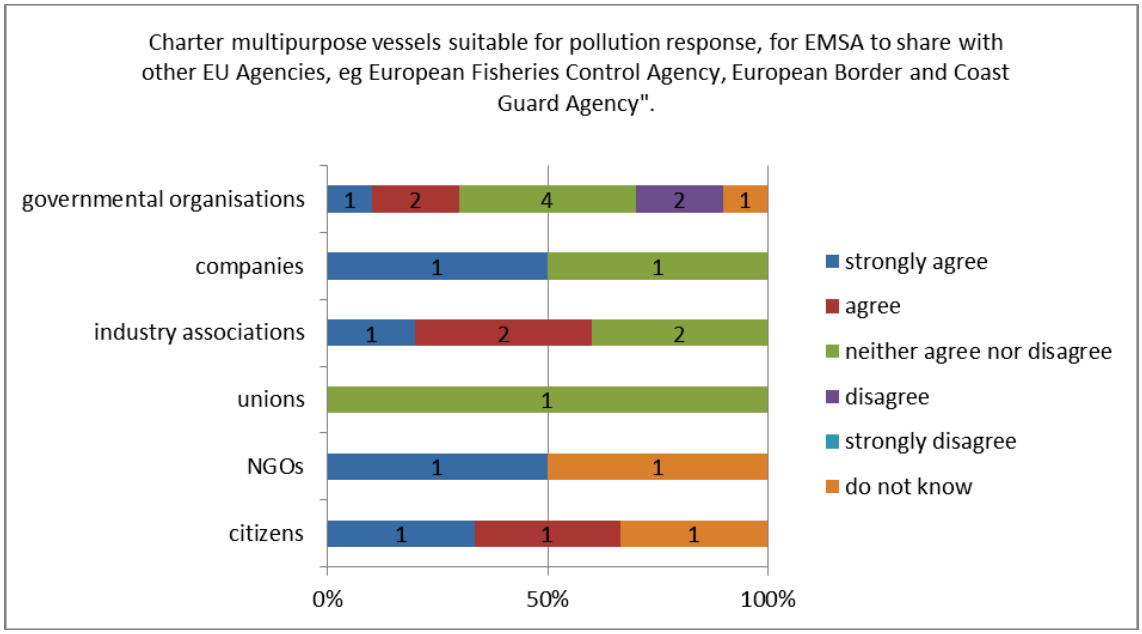
are not ideal for the multi operational task assigned (e.g. Storage, Dispersant spraying, mechanical Oil recovery and booming).

To what extent do you agree with the statements "EMSA should seek alternative models to respond to marine pollution, namely:

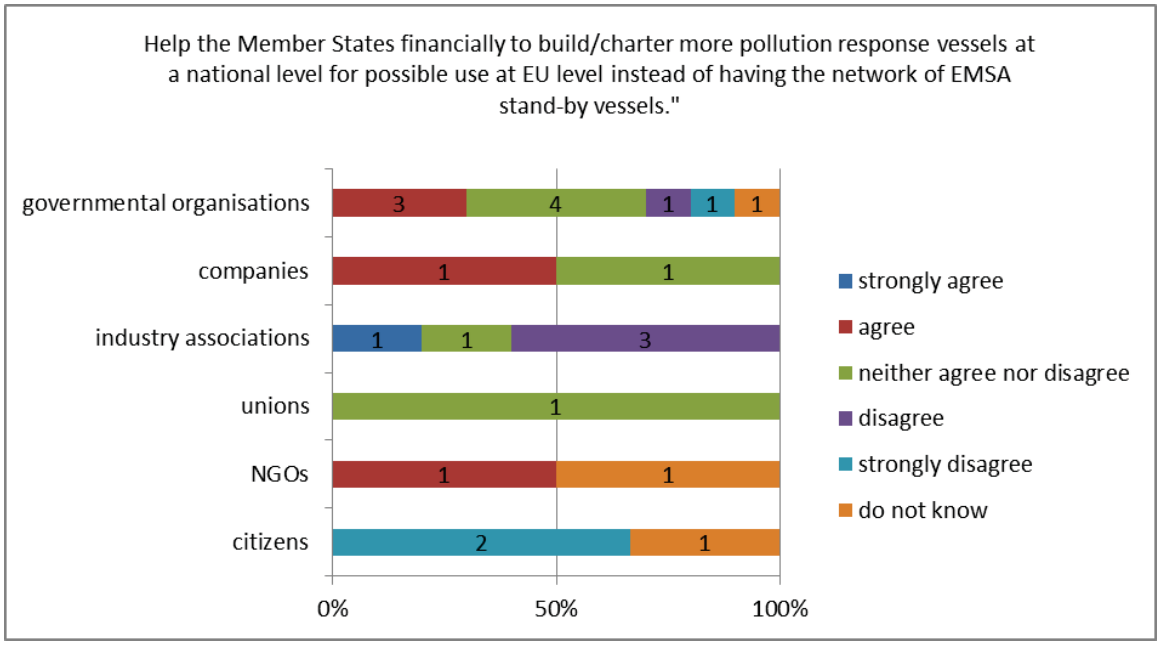
a) Charter dedicated pollution response vessels on permanent stand-by, for EMSA's exclusive use."



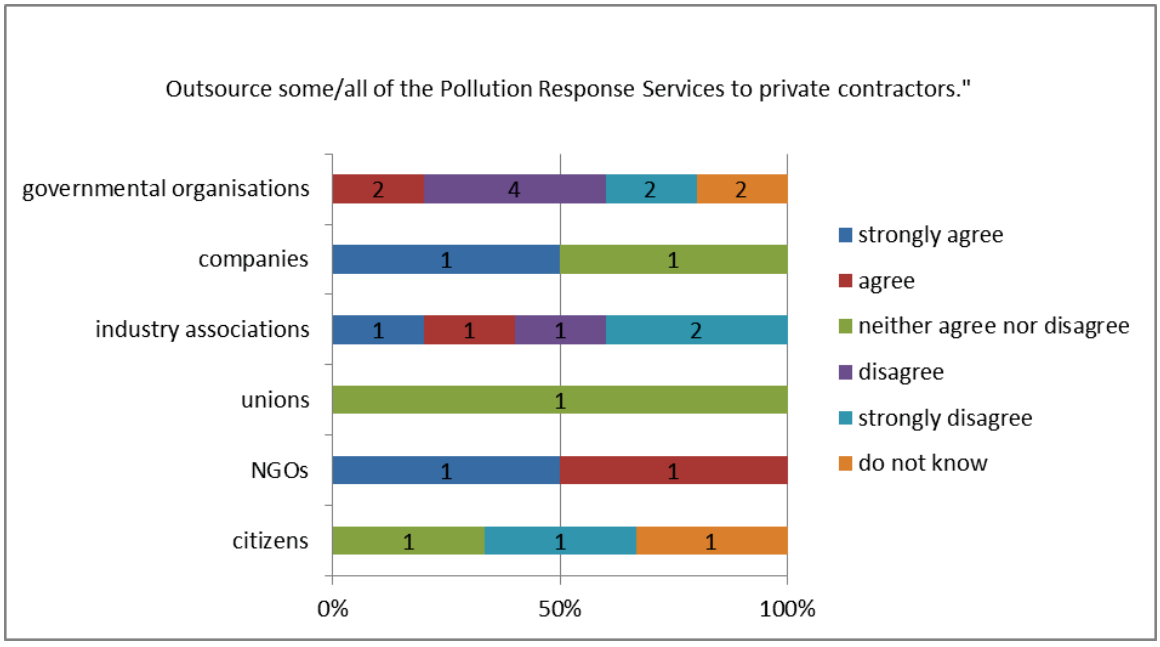
b) Charter multipurpose vessels suitable for pollution response, for EMSA to share with other EU Agencies, eg European Fisheries Control Agency, European Border and Coast Guard Agency."



c) Help the Member States financially to build/charter more pollution response vessels at a national level for possible use at EU level instead of having the network of EMSA stand-by vessels."



d) Outsource some/all of the Pollution Response Services to private contractors."



There is no clear majority to consider whether EMSA should seek alternative models to respond to marine pollution in general.

To the question related to charter dedicated pollution response vessels on permanent stand-by, for EMSA's exclusive use, 8 of 23 respondents agree. Most of the respondents that did not agree were governments (5), in addition to 1 company. The other half of governments agree or strongly agree, in addition to 1 company, 2 industry associations and 1 NGO.

Only when considering if EMSA should seek charter multipurpose vessels suitable for pollution response, for EMSA to share with other EU Agencies, there is a general

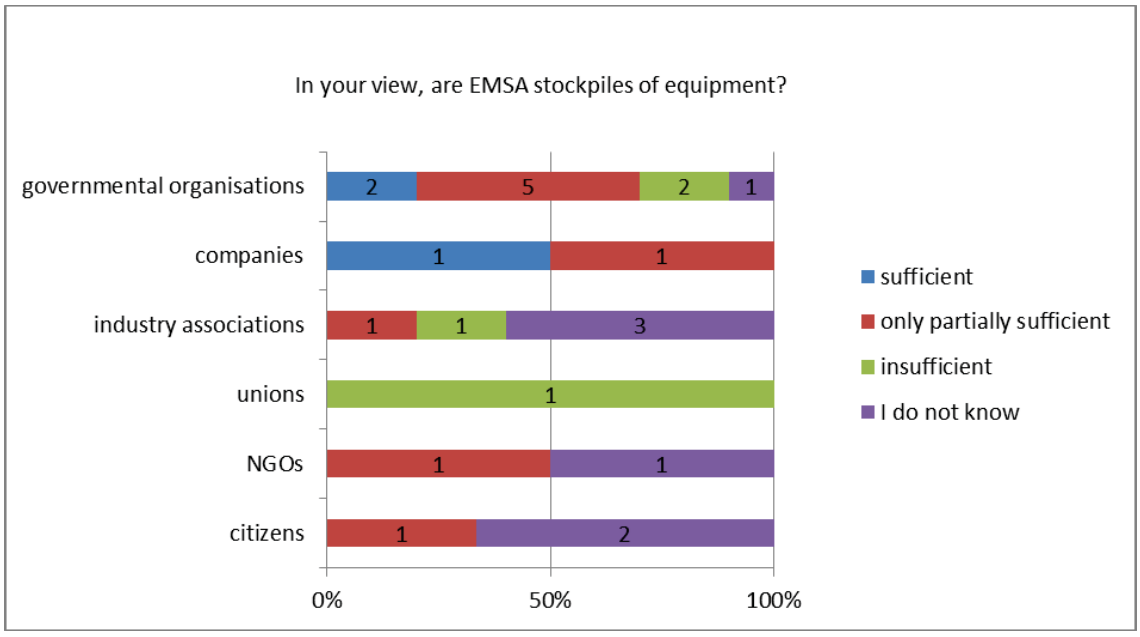
agreement among the respondents (10 out 23 agree or strongly agree). A significant number (8 out of 23) neither agree nor disagree. Only two disagree (2 governments) and no respondent strongly disagrees.

To the question if EMSA should 'help the Member States financially to build/charter more pollution response vessels at a national level for possible use at EU level instead of having the network of EMSA stand-by vessels', most of the citizens and industry associations that answered disagree; while most of governmental organisations; in addition to 1 company and 1 NGO, agree. 7 out of 23 respondents neither agree nor disagree.

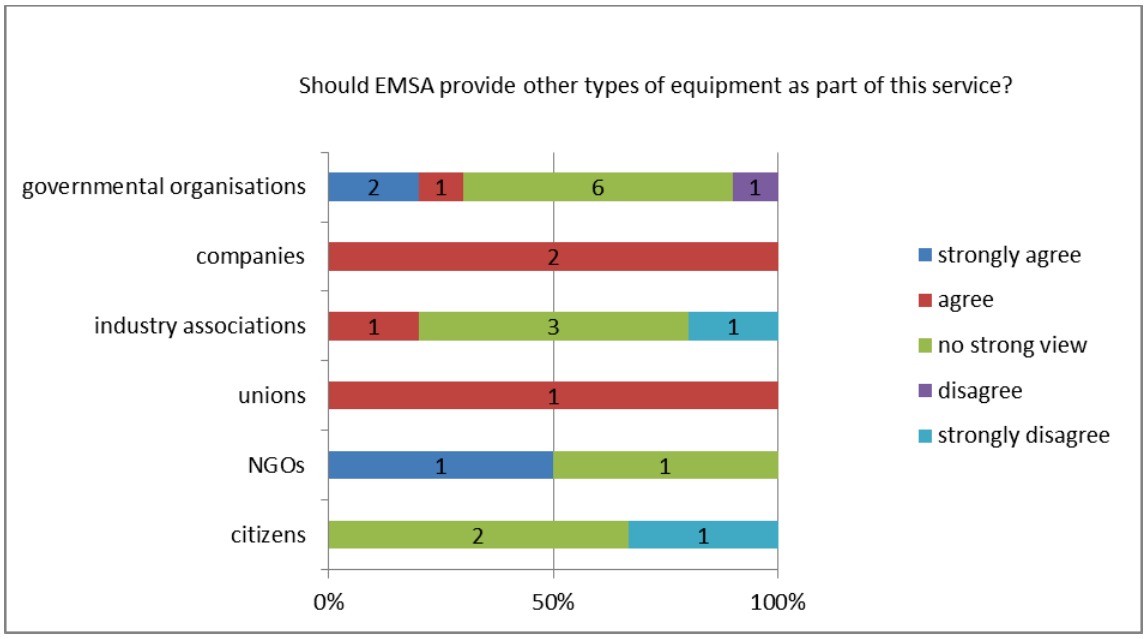
To the contrary, most governmental organisations disagree with outsourcing the Pollution Response Services to private contractors (10 out of 23 respondents in total), while 7 out of 23 respondents (including the 2 companies, 1 NGO and 2 of the industry associations) agree with this alternative model.

Equipment Assistance Service

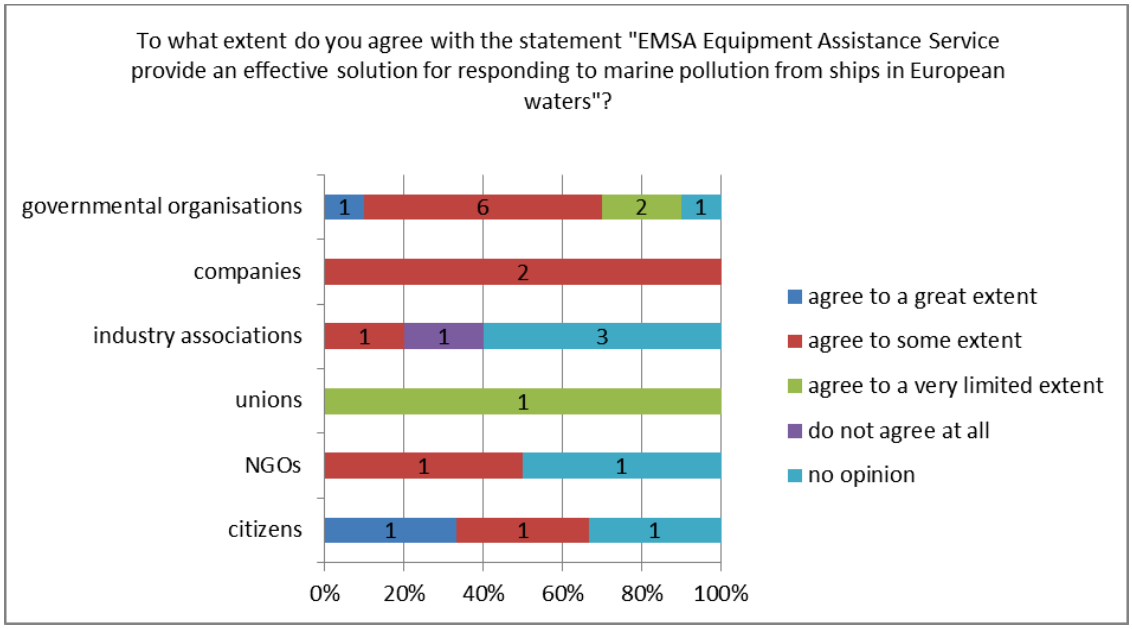
In your view, are EMSA stockpiles of equipment?



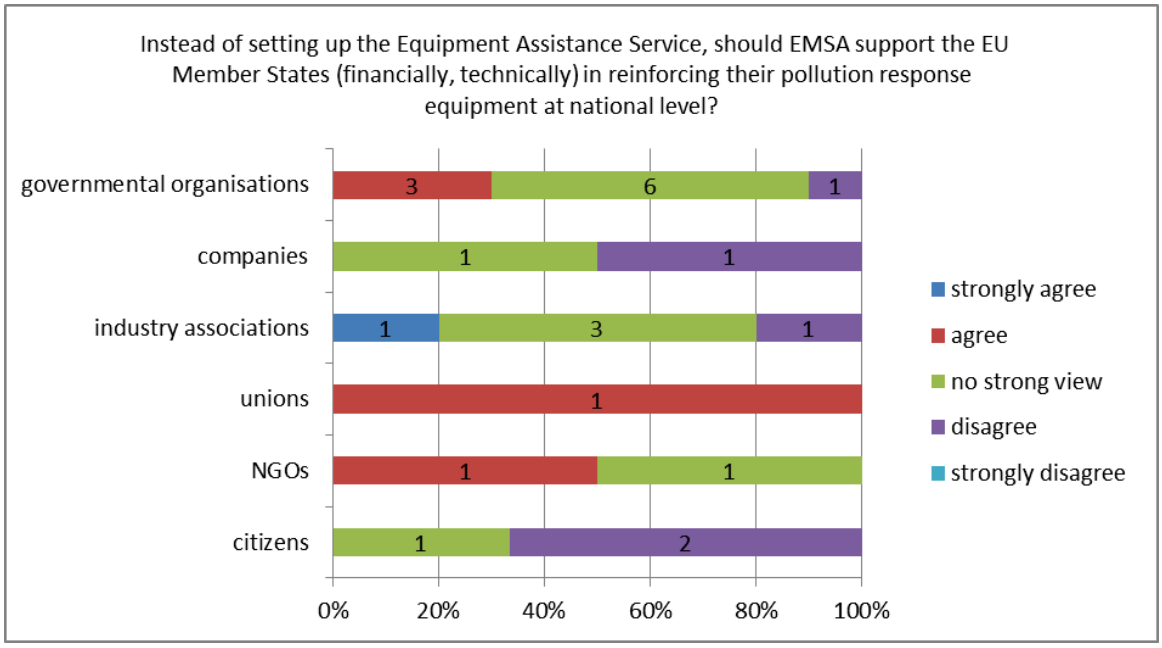
Should EMSA provide other types of equipment as part of this service?



To what extent do you agree with the statement "EMSA Equipment Assistance Service provide an effective solution for responding to marine pollution from ships in European waters"?



Instead of setting up the Equipment Assistance Service, should EMSA support the EU Member States (financially, technically) in reinforcing their pollution response equipment at national level?



The majority of respondents (6 governments, 2 companies, 1 industry association, 1 NGO and 1 citizen) agree to some extent with the statement "EMSA Equipment Assistance Service provide an effective solution for responding to marine pollution from ships in European waters". 2 respondents (1 governmental organisation and 1 citizen) agree to a great extent. Only 1 respondent (1 industry) does not consider that the Equipment Assistance Service provides an effective solution to marine pollution from ships in European waters.

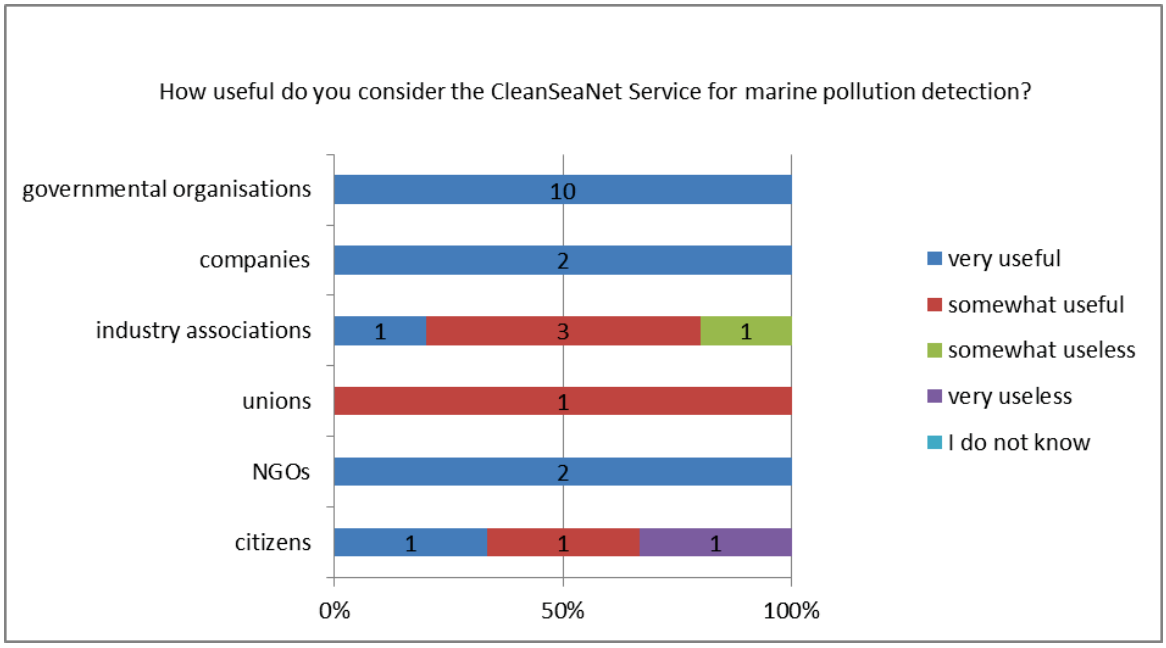
Overall, the most selected answer is positive. This answer is consistent with the answers to the previous questions (18 and 19). Most of the respondents think that EMSA stockpiles of equipment are partially sufficient. Some propose to consult the Member States before deciding on which equipment should the EMSA depots have as the regional needs vary. 4 of the respondents consider the stockpiles of equipment insufficient.

The majority of respondents (12 of 23) do not have a strong view regarding the question if EMSA should provide other types of equipment. The number of respondents that consider that EMSA should provide other types of equipment is consistent with the number that believes that the Equipment Assistance Service does not provide an effective solution. These respondents propose: aerial surveillance, coastal waters response equipment and protocols, emergency lightering equipment, tank capacity and wildlife response equipment stockpile.

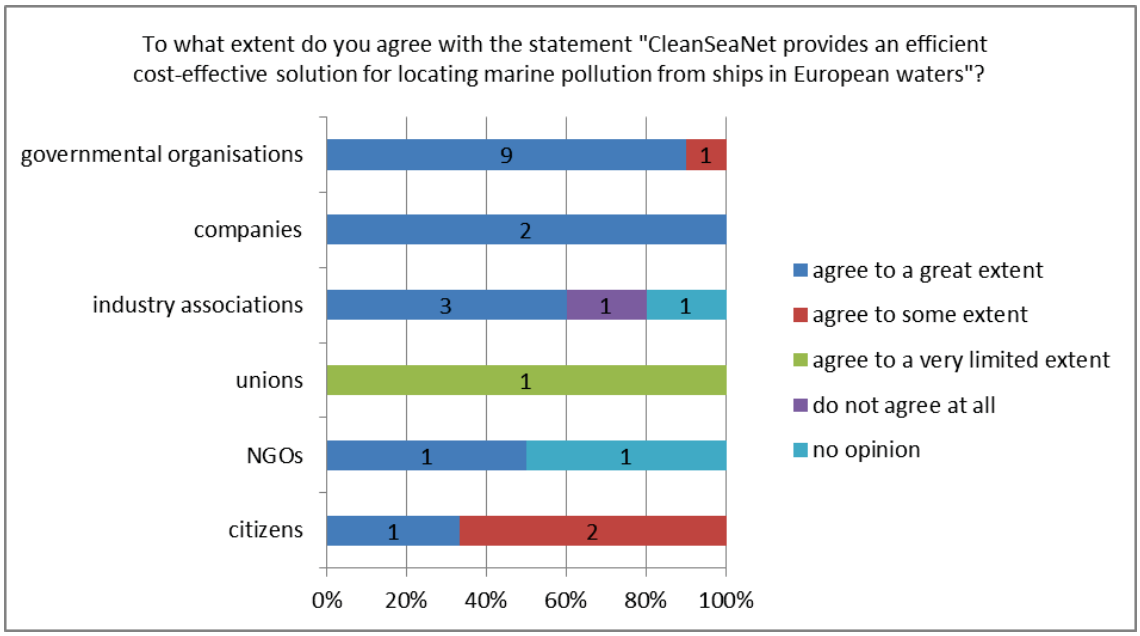
A similar answer was given by the respondents to the question whether EMSA should support the EU Member States in reinforcing their pollution response equipment at national level. The majority of respondents do not have a strong view, mostly governments and industry associations. 1 respondent strongly agrees, 5 respondents agree; and other 5 respondents disagree.

Earth Observation Services – CleanSeaNet

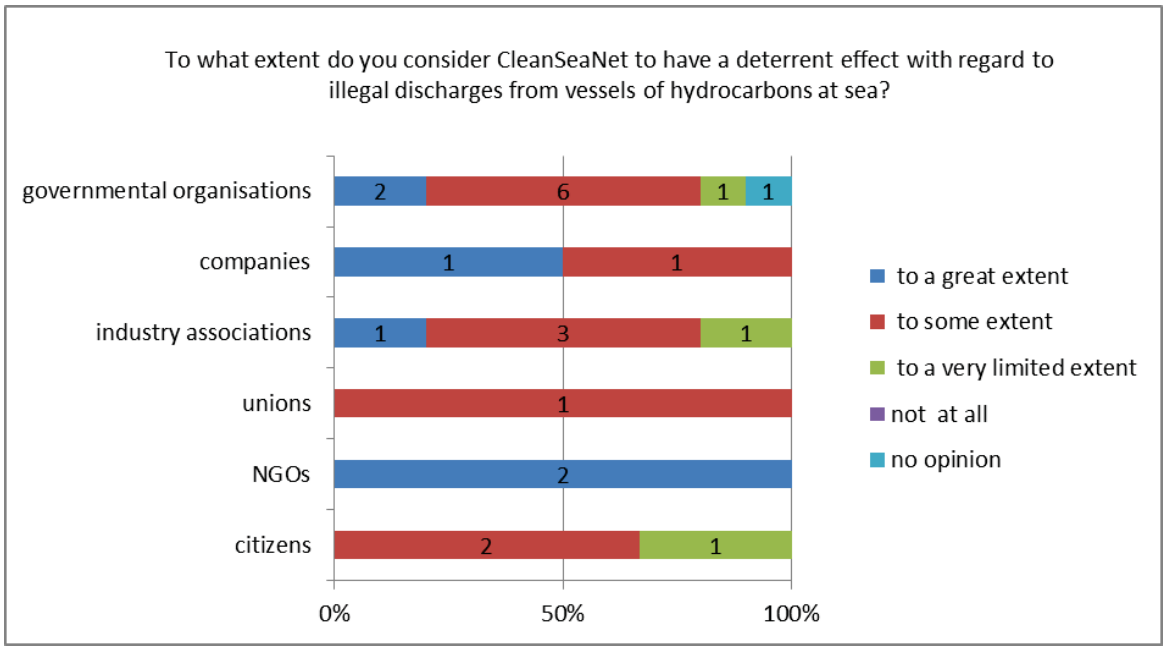
How useful do you consider the CleanSeaNet Service for marine pollution detection?



To what extent do you agree with the statement "CleanSeaNet provide an efficient solution for locating marine pollution from ships in European waters"?

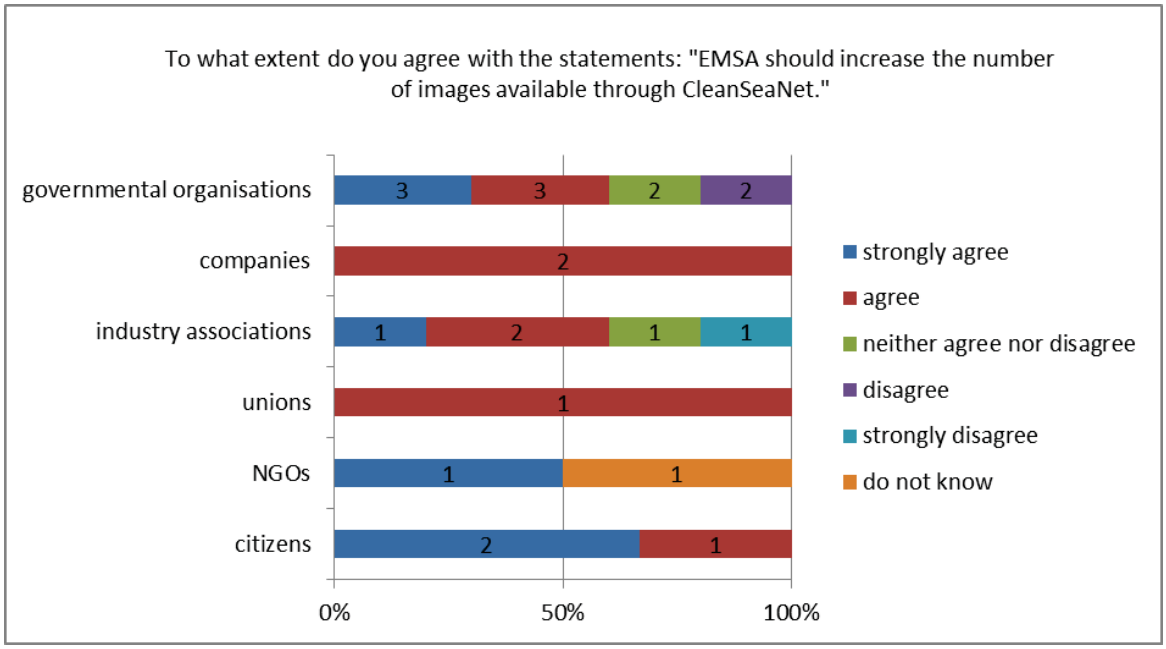


To what extent do you consider CleanSeaNet to have a deterrent effect with regard to illegal discharges from vessels of hydrocarbons at sea?

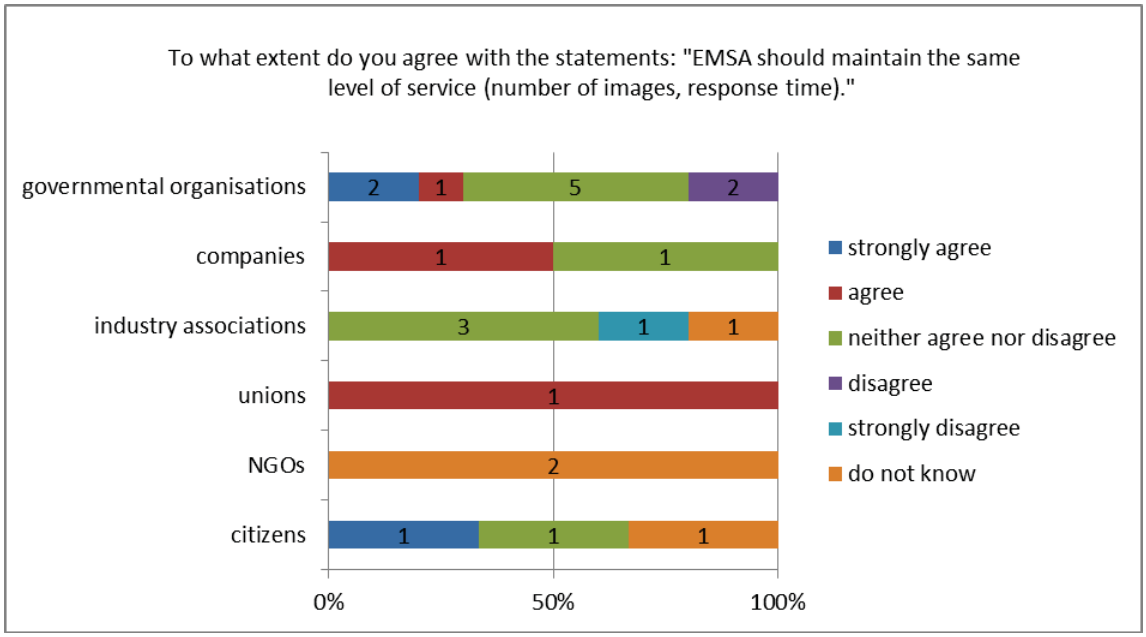


To what extent do you agree with the statements: "EMSA should:

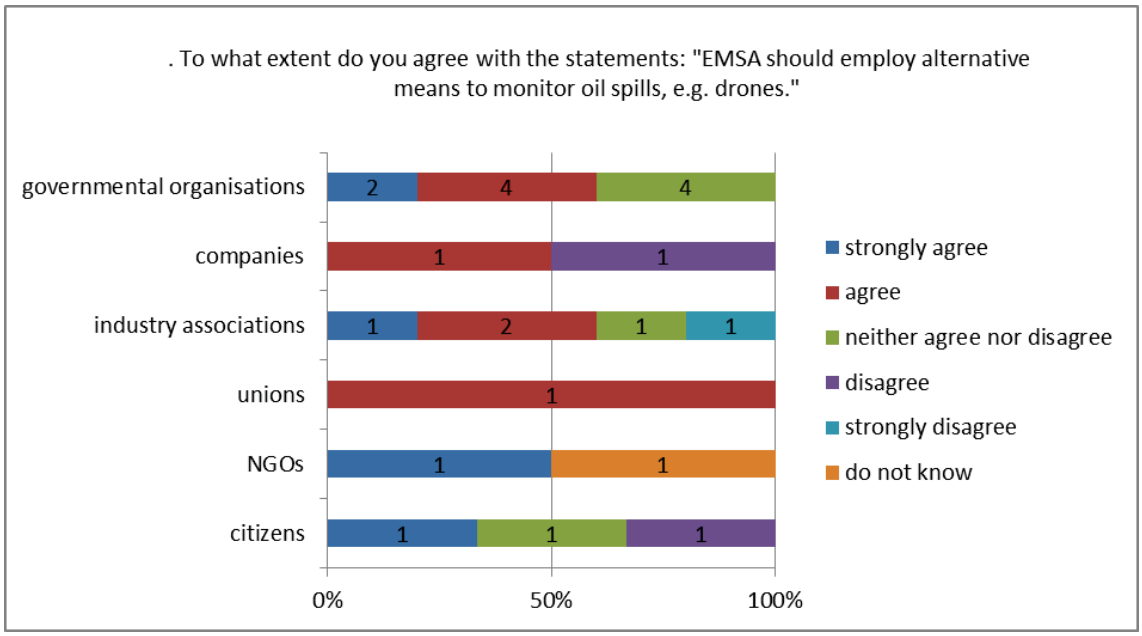
a) Increase the number of images available through CleanSeaNet."



b) Maintain the same level of service (number of images, response time)."



c) Employ alternative means to monitor oil spills, e.g. drones."



The great majority of respondents consider the CleanSeaNet Service very useful or useful for marine pollution detection. Only two respondents consider this Service somewhat useless or very useless.

The majority of respondents (9 governments, 2 companies, 3 industry associations, 1 NGO and 1 citizen) consider the CleanSeaNet Service very useful for marine pollution detection. In this regard, the majority of respondents agree to a great extent with that CleanSeaNet provides an effective solution for locating marine pollution from ships in European waters. In addition, other 3 respondents agree to some extent. One respondent (1 union) agree to a very limited extent and another respondent (1 industry association) do not agree at all.

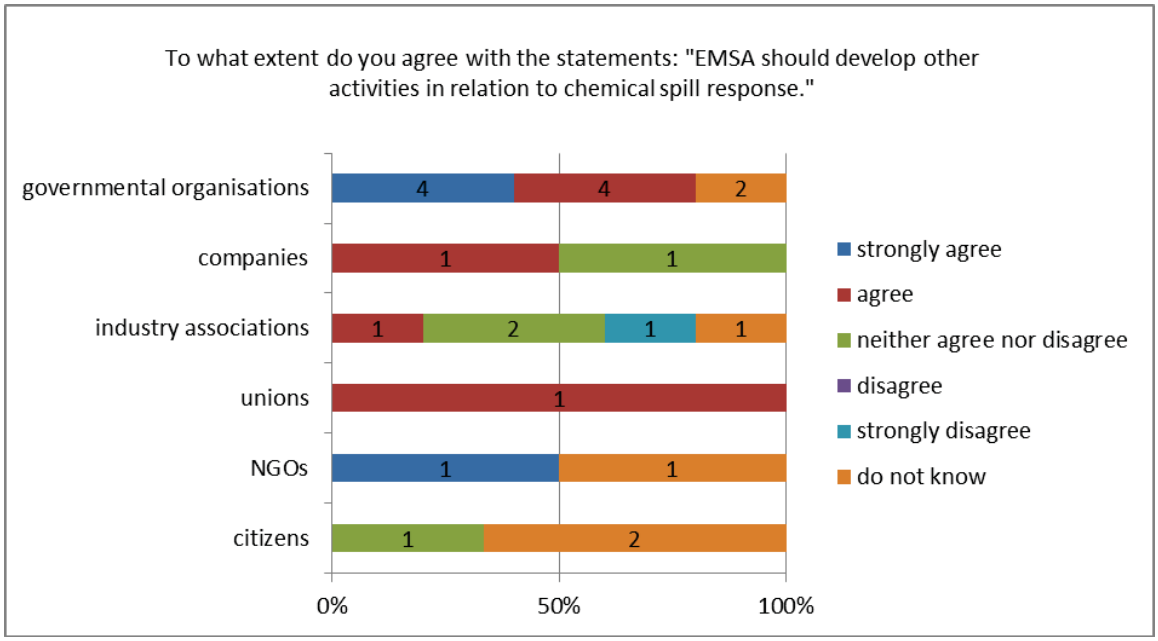
The answers to the question if CleanSeaNet has a deterrent effect with regard to illegal discharges from vessels of hydrocarbons at sea are also mostly positive. 6 of the respondents (2 governmental organisations, 1 company, 1 industry association and 1 NGO) answered 'to a great extent' and 13 (6 governmental organisations, 1 company, 3 industry associations, 1 union and 2 citizens) 'to some extent'. Only 3 respondents (1 government, 1 industry, 1 citizen) consider that CleanSeaNet has a very limited deterrent effect.

In addition, the majority of respondents consider that EMSA should increase the number of images available through CleanSeaNet (7 strongly agree and 9 agree). It is also worth mentioning that the majority agrees with EMSA employing alternative means to monitor oil spills (5 strongly agree and 8 agree). The industry association that strongly disagrees with those statements underlines that this type of service often benefits from outsourcing to expert industry bodies e.g. ITOPF, OSRL etc. One government considers that drone surveillance seems to be problematic at the moment due to varying national regulations, and drone use in monitoring and identifying spills of other hazardous and noxious substances would be highly interesting. One of the companies considers that drones are a more tactical tool for local level response and that EMSA should maintain focus on providing the broad-scale CleanSeasNet satellite coverage with the minimal-possible image processing time.

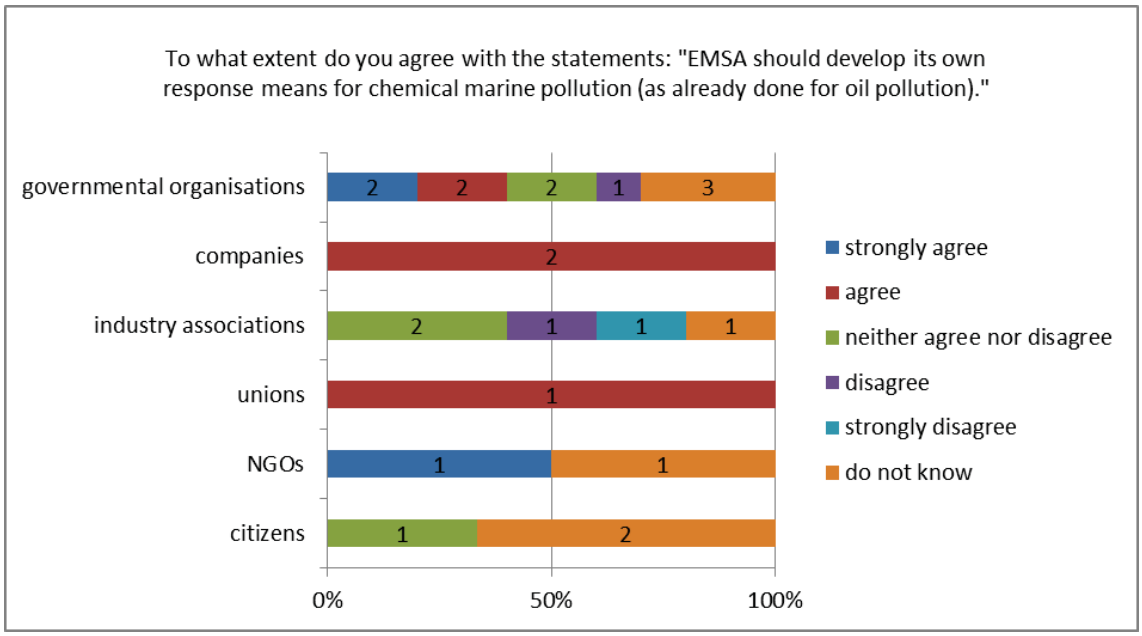
Chemical Spill Response

To what extent do you agree with the statements: "EMSA should:

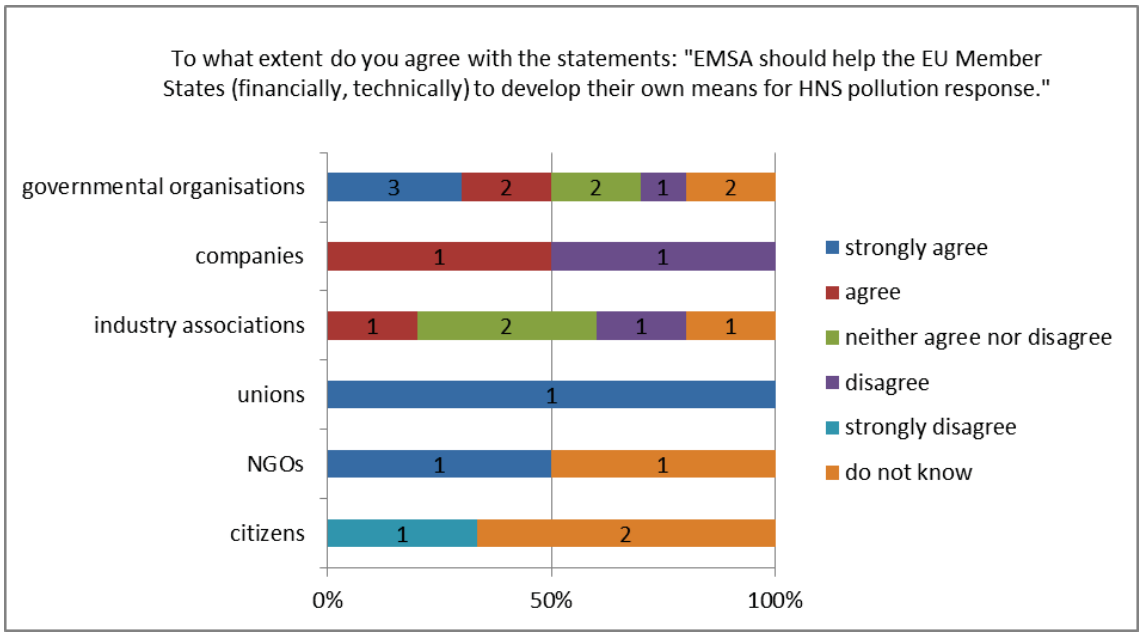
a) Develop other activities in relation to chemical spill response."



b) Develop its own response means for chemical marine pollution (as already done for oil pollution)."



c) To what extent do you agree with the statements: "EMSA should help the EU Member States (financially, technically) to develop their own means for HNS pollution response."



The majority of respondents agree or strongly agree with that EMSA should develop other activities in relation to chemical spill response (5 strongly agree - 4 governmental organisations and 1 NGO, and 7 agree - 4 governmental organisations, 1 company, 1 industry association, 1 union). Only 1 respondent (1 industry association) strongly disagrees.

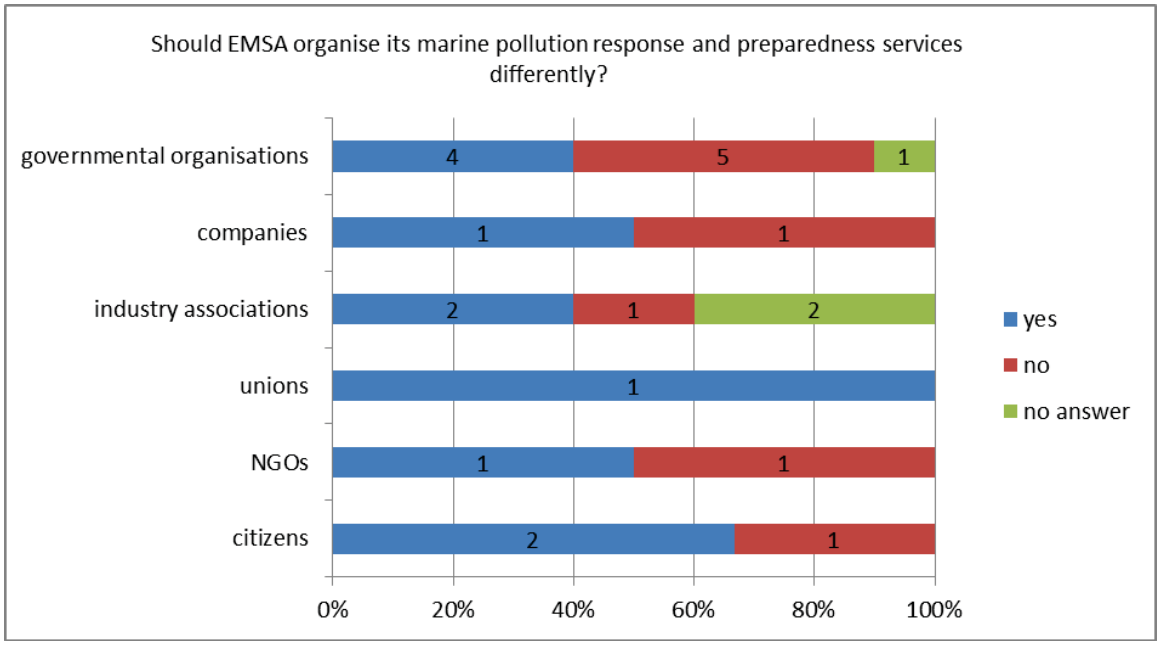
There is no general strong opinion whether EMSA should develop its own response means for chemical marine pollution. 7 respondents (3 governmental organisations, 1 industry association and 2 citizens) no not know. In addition, 5 of the respondents (2

governmental organisations, 2 industries, 1 citizen) neither agree nor disagree. On the other hand, 3 strongly agree (2 governmental organisations and 1 NGO) and 5 agree (2 governmental organisations, 2 companies and 1 union). Also 2 disagree (1governmental organisation and 1 industry association) and 1 (industry association) strongly disagrees.

Lastly, 9 of the respondents agree or strongly agree with that EMSA should help the EU Member States to develop their own means for HNS pollution response. Among the ones that strongly agree, there are 3 governmental organisations, 1 union and 1 NGO. Among the ones that agree, there are 2 governmental organisations, 1 company and 1 industry association. The rest of the respondents mostly do not know (6 of 23) or neither agree nor disagree (4 of 23). There are 3 respondents (1 government, 1 company and 1 industry association) that disagree and 1 citizen that strongly disagrees. One of the respondents mentions in this regard that most Member States have very little experience with chemical spill response so the centralising of information resources and service make sense.

Conclusions regarding the pollution response services of EMSA

Should EMSA organise its marine pollution response and preparedness services differently?



The stakeholders groups are divided whether EMSA should organise its marine pollution response and preparedness services differently, with exception of the union, which has answered affirmatively. 11 of the respondents answer 'yes', while 9 answer 'no'. 3 did no answer.

Some of the proposals mentioned are:

"EMSA's role should be setting national and industry requirements to meet global regulation needs and assisting national bodies to develop appropriate responses".

"EMSA needs to address noise pollution".

"There needs to be a clearer demonstration as to how the EMSA capability provision meets the assessed risk and dovetails efficiently with resources and capability provided by Member States and also by industry".

"EMSA should take into account all the EU coastguards services and brings the services not only at national level but also at regional level".

"The competence extension to offshore oil and gas pollution would benefit from a larger cooperation with industry representatives".

"More proactive role in monitoring oil spill and HNS contingency planning".

"EMSA should play a more pro-active role in helping to bridge the link between offshore and shoreline preparedness and encourage national authorities to develop more cohesive and effective approaches that integrate all aspects of a response EMSA is well positioned to support national authorities in this role and to aid in the dissemination of good practice in preparedness and response".

"EMSA should cooperate more with other stakeholders".

APPENDIX 7: SIMULATIONS ON THE POTENTIAL AMOUNT OF POLLUTANT RECOVERED AT-SEA BY EMSA CONTRACTED VESSELS

Important note:

The following simulations of oil spill responses operations have to be considered as a theoretical attempt to estimate the added value of EMSA's oil recovery vessels. In no way the figures resulting from this exercise should be construed as representing the capacity of EMSA recovery vessels in a real incident as many different parameters may interact during an oil spill response operation making the overall modelling difficult. To identify a few:

- There are a considerable number of variables related to the operating environment (daylight, wind, waves, sea temperature, air temperature) as well as changes to the chemical and physical properties of the oil (surface concentration, viscosity, VOCs) that effect the fate of the oil after its release. This has an effect on the recovery capabilities.
- The recovered product will, in almost all cases, be some oil mixed with water to a certain content. This water content will depend either of the stage of weathering of the oil and of the type of equipment used or a combination of these two factors.
- Decision by the authorities in charge of leading the response may also greatly influence the success of the recovery: once the oily mixture is on board, a decantation process is used to separate the oil from the water. Consequently, decanted clean water in accordance with MARPOL threshold could be discharged at sea, allowing for the recovery vessel to operate longer on scene. However, quite often, authorities do not allow this discharge; this decision resulting in the need for the ships to go back more frequently to a discharging facility, thus reducing their operational time and increasing the volume of waste.
- The location of the incident also greatly influence the result of the scenario: Near the shoreline, the window of opportunity for efficient at sea operations may be limited as oil is expected to strand onshore faster, while on the high seas it will influence directly the operational time for the response vessels as they will have to go back, discharge and return on scene. When oil has spread, the encounter rate of slick will also decrease.

Integrating all these parameters in a model requires making assumptions for each element which may affect the confidence in the final results. In any case, for the purpose of this report, it was not possible to create such a model. Therefore the calculations are based on conservative rates of effectiveness and operational time. The results represent a fair estimate of what could be the added value of EMSA recovery vessels in several scenarios. But is has to stressed again that this is a theoretical exercise and should not be taken as guaranteed.

Background

One of the ways in which EMSA is implementing its task in the pollution response field is by providing a stand-by service to Member States based on at-sea mechanical recovery by specialised ships with large storage capacity for recovered oil. For this purpose, a network of oil spill response vessels stationed along the EU coastline has been built up in the last 12 years. The objective of these simulations is to estimate the potential amount of pollutant recovered at-sea by EMSA contracted vessels and analyse the benefits and limitations of this network using a few spill scenarios. It needs to be taken into account that neither the Equipment Assistance Service (EAS) for vessels of opportunity nor the dispersant spraying capabilities of EMSA vessels are taken into account for these simulations. In the case of dispersant the choice is guided by the fact that the oil concerned by the scenarios is heavy fuel oil which has a low dispersibility, therefore this response strategy has been disregarded. For the Equipment Assistance Service, the efficiency of its use will depend on the capacity of the concerned Member States to mobilise vessels of opportunity and to arrange for storage capacities.

Along the same line, the scenarios have not used the resources of the Member States as they generally do not offer large storage capacity and consequently their efficiency will be heavily affected by the time spent in transfer operations to the discharging facility. However the available resources identified by the Member States in the vicinity of the incident have been summed up in a table.

The circumstances under which the large spills occurred in Europe differed significantly. Weather conditions, type of coastline, distance from coast, type of oil, etc., made each incident a unique case. Any future incident will probably be different from any other in the past but will have common elements.

Selected scenarios

These scenarios were geographically spread to cover different four European sea areas. In this way, it was possible to analyse the distribution of the network and potential regional imbalances. The scenarios include past incidents, like *Prestige* or *Baltic Carrier*, and hypothetical scenarios based on potential new risks expected in near future, as follows:

- Black Sea: Hypothetical scenario – Bourgas, Bulgaria;
- Mediterranean Sea: Hypothetical scenario – Genoa, Italy;
- Atlantic Coast: Actual past scenario – Prestige;
- Baltic Sea: Actual past scenario – Baltic Carrier.

Performance indicators

The amount of oil recovered by each EMSA contracted vessel is estimated by analysing the oil recovery cycle divided into the steps identified in the figure below. Depending on the ‘window of opportunity’, each vessel may be able to carry out more than one cycle.

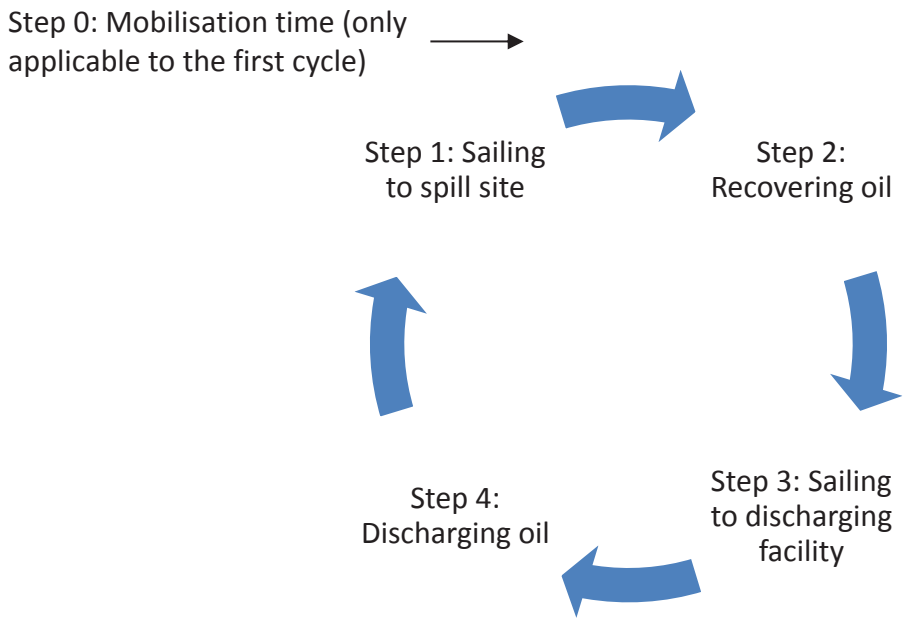


Figure 1 - Oil recovery cycle

Step 0: Mobilisation time. The time elapsed since the incident occurred until the moment in which the vessel would be ready to sail from its home port with the equipment on board. In past incidents (prior to EMSA), the mobilisation of vessels was delayed due to the negotiations of the contractual terms. To minimise the delays, EMSA has introduced a system by which no time is spent negotiating the contract. Tariffs and conditions are pre-agreed. The mobilisation time varies between contracts, but is usually 24h. It has been assumed that all EMSA vessels in the vicinity of the incident would be mobilised immediately by the Requesting State.

Step 1: Sailing to the spill site. During the first cycle, the time taken to sail to the spill site depends on the distance from the vessel's home port to the spill site and on the speed of the vessel. The speed considered for all the vessels was 10 knots (12 knots being the maximum speed for most of the EMSA vessels). For the remaining oil recovery cycles, where applicable, this time has been estimated considering the distance from the discharging port to the spill site. Such a distance varies from case to case.

Step 2: Recovering oil. The following factors affect the efficiency of this phase:

2.1. Spill area: The distance between the incident and the coast is a crucial factor during an oil spill. In general, the closer to the coast, the sooner the oil will wash ashore. Another key element related to the at-sea recovery operation is the depth of the waters in which the spill occurs. In general, the EMSA vessels will operate more efficiently in open waters than in a coastal area where the sea depth may limit the operation.

2.2. Oil recovery device: All EMSA vessels have two independent oil recovery systems on-board: sweeping arms and boom and skimmer. For these simulations, it has been assumed that vessels would use the rigid sweeping arms as these devices, in addition to

being more efficient in adverse weather conditions, allow the vessel to work independently[3].

2.3. Pump type and capacity: All EMSA vessels are equipped with two types of pumps for the oil recovery devices. Depending on the type of oil, a different pump will be used. The Positive Displacement Archimedes Screw (PDAS) pump has a lower capacity ($150m^3/h$) but higher discharge pressure (max. 10 bar) than centrifugal pumps ($360m^3/h$ and max. 7 bar). Accordingly, the use of the PDAS pump was considered for heavy oils and the centrifugal pump for crude oils. The capacity of the pumps for the purpose of this report was set to 33% of their nominal values to include the effect of the high viscosity of the oil recovered[4] and the percentage of water, which is recovered together with the oil.

2.4. Daily hours recovering oil: The percentage of time in which the pumps are running and the vessel is actually recovering oil. All EMSA vessels have a radar-based system to remotely detect the position of oil slicks. These slicks are, in general, compact during the first hours/days following the spill. However, as time elapses, the oil spreads, and therefore the vessel must chase the oil longer so decreasing the actual oil recovery time (the encounter rate). For this calculation, it has been assumed, unless otherwise indicated, that the percentage of time recovering oil was 50% for the first cycle (12 hours per day), 25% for the second cycle (6 hours per day) and 12.5% for the third cycle and onwards (3 hours per day).

2.5. Time to fill the tanks: The larger the capacity of the vessel, the more time it can be recovering oil at-sea (the time for sailing back to port and discharge is minimised). It has been assumed that the vessel would sail to port for discharging when the vessel is 80% full of pollutant (oil-water mixture). The remaining 20% capacity is filled with water, which is needed to facilitate discharging. Therefore, the time to fill the tanks has been estimated as follows:

$$\text{Time to fill the tanks (days)} = \frac{80\% \text{ Storage Capacity } (m^3)}{33\% \text{ Pump Capacity } \left(m^3/h\right) * \text{Daily Hours Recovering Oil (12 h/day or 6 h/day or 3 h/day)}}$$

Sometimes, the vessels are unable to complete a full cycle. When the limit of the 'window of opportunity' has passed, the operation would finish regardless of the amount of pollutant in the storage tanks.

2.6. Pollutant recovered: This is calculated by summing up the amounts of pollutant recovered at each cycle. It has also been considered that the water content in the emulsion was 60% during the first cycle, 70% during the second cycle and 80% during the third and following cycles. It was also considered that $1m^3$=1 tonne of pollutant.

Step 3: Sailing to the discharging port. The sailing time to the discharging port is equivalent to the sailing time to the spill site (see Step 1), and accordingly has been estimated on a case-by-case basis.

[3] In order to deploy the booms, at least one additional vessel is needed.

[4] Usually the capacity of the pumps is expressed in cubic metres per hour (m^3/hr) of water that it would be able to deliver. Therefore, with high viscous oil, the capacity is reduced accordingly.

Step 4: Discharging. It has been assumed that the discharging process would take one day. The EMSA vessels, equipped with heating and specialised pumps, are able to discharge the full cargo in less than one day. However, factors like manoeuvring in port, availability of discharging facilities and potential replenishment have also been taken into account. Therefore, the discharging time has increased accordingly.

For the simulations, the weather parameters have been considered unchanged during the spill operations. The spill forecast has been done using the OIL/MAP software.

Scenario 1: Bourgas, Bulgaria (hypothetical scenario using OILMAP)

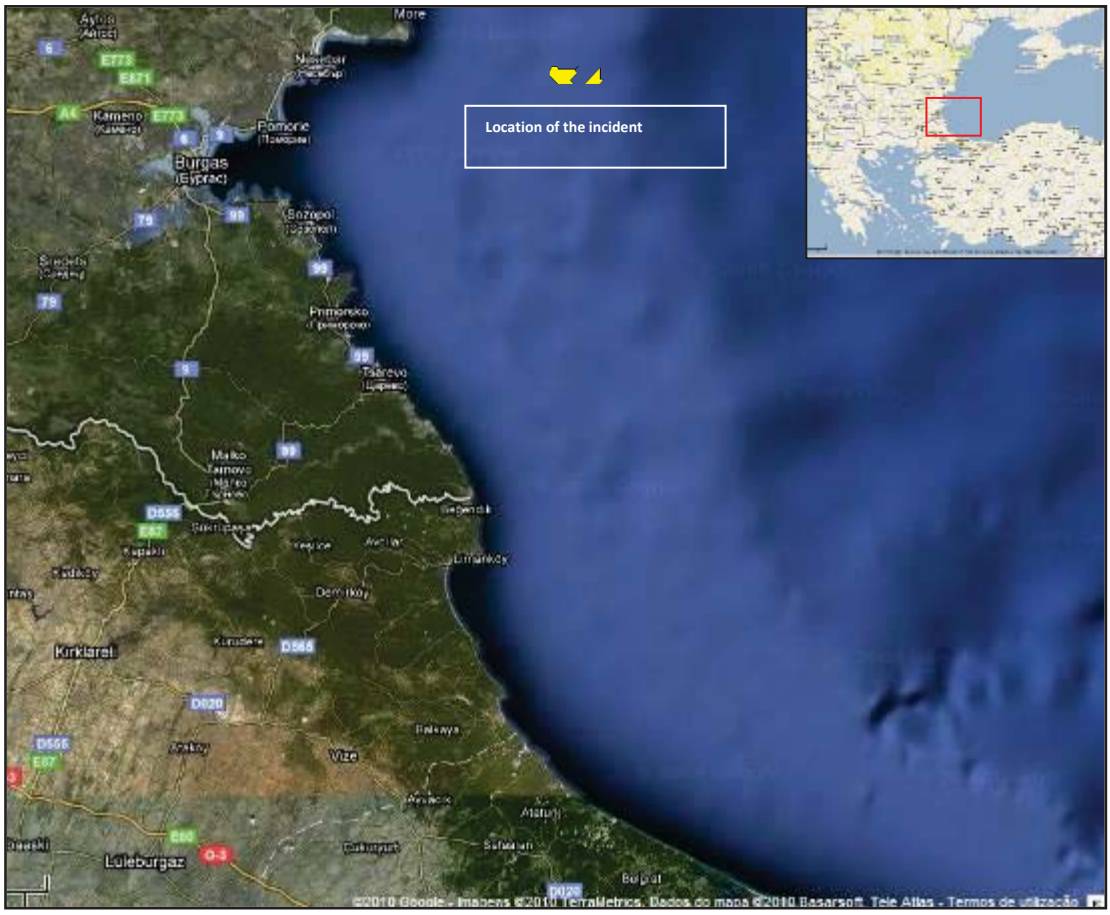


Figure 1 – Location of the Bourgas incident

- Incident area: Off Bourgas, Bulgaria
- Location: 42°39'N; 28°19'E
- Type of oil: Bunker C heavy fuel oil
- Quantity spilled: 50,000m^3
- Type of release: Continuous 24 hours
- Distance from shore: 38 nm
- Wind: Variable, NNE

Window of opportunity for mechanical recovery

There were moderate to strong northeast winds at the time of the spill. The 'window of opportunity' considered for the calculation was **12 days**.

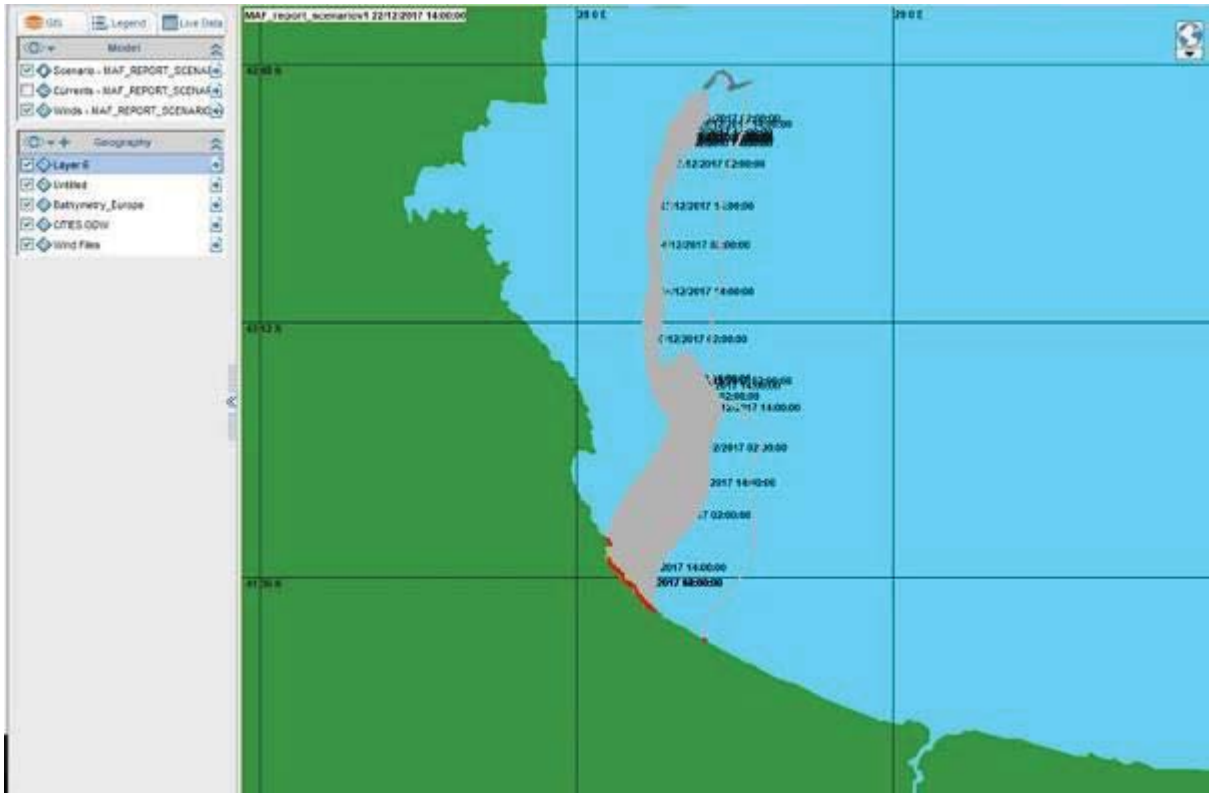


Fig.3 - The trajectory model shows that after 12 days all the oil would reach the shoreline of Turkey

EMSA total storage capacity mobilised

The resources available in the Black Sea (*Enterprise* and *Amalthia*), the East Mediterranean Sea (*Alexandria*), the Aegean Sea (*Aktea OSRV*), and Central Mediterranean (*Balluta Bay, Santa Maria*) would be mobilised due to the length of the 'window of opportunity'. The total storage capacity of these EMSA vessels is **22,207** m^3.

Oil recovery cycle analysis

Step 0: Mobilisation time: 24 hours.

Step 1: Sailing time to spill site: ranging from approx. 4 hours (*Enterprise*) to 4 days (*Balluta Bay* and *Santa Maria*)

Step 2: Recovering oil:

2.1. Spill area: Open sea.

2.2. Oil recovery device: Rigid sweeping arms.

2.3. Pump type and capacity: 2 x PDAS pumps (150m^3/h max. capacity per pump at 33%)

2.4. Daily hours recovering oil: 12 hours (1 cycle); 6 hours (second cycle); 3 hours (third cycle and onwards)

2.5. Time necessary to fill the tanks: Varies from 2 days (*Santa Maria*) to 4.5 days (*Amalthia*). On the other hand, Alexandria was not able to fill in tanks as the limit of the 'window of opportunity' has already passed before that.

2.6. Pollutant recovered: The total quantity of oil-water emulsion for the whole period (12 days) recovered by the 6 mobilised vessels equals to **31,644 m^3**. The quantity of recovered pure oil would be **11,270 tonnes** (23% of the total quantity of 50,000 m^3 spilled oil).

Step 4: Discharging: 24 hours per vessel

Summary of EMSA potential contribution to the Bourgas incident

Vessel Name	Distance from home port to spill Site (Nm)	Time to reach spill site (days)	Storage Capacity (m^3)	Recovered oil water emulsion (tonnes)	Recovered pure oil (tonnes)
Enterprise	35	1.15	1,374	3,838	1,261
Amalthia	95	1.40	5,154	7,629	2,701
Santa Maria	960	5.00	2,421	3,874	1,356
Balluta Bay	965	5.02	2,800	4,480	1,568
Alexandria	807	4.36	7,458	6,772	2,628
Aktea OSRV	470	2.96	3,000	5,052	1,756
	Total:		**23,802**	**31,644**	**11,270**

MS resources in the area

Country	Vessel Name	Vessel Type	Storage Capacity (m^3)	Heating system	Specialised Oil spill recovery equipment
BULGARIA	RUSALKA	Oil recovery vessel	128	No	Booms and skimmer
ROMANIA	GROZAVUL	Multipurpose	No	No	No
ROMANIA	MSV TIRRENO	Offshore supply	190	No	Booms and skimmer
ROMANIA	HERCULES	Multipurpose vessel	No	No	Booms and skimmer
ROMANIA	MAI0201	Offshore Patrol Vessel	No	No	No
ROMANIA	NICOLAE ZEICU	Multipurpose vessel	100	Yes	No
ROMANIA	BUCURESTI	Offshore supply	No	No	Booms and skimmer
ROMANIA	ASTANA	Offshore supply	No	No	No
ROMANIA	GSP QUEEN	Tug	No	No	No
ROMANIA	GSP KING	Tug	No	No	No
ROMANIA	GSP ALCOR	Tug	No	No	No
ROMANIA	GSP ANTARES	Tug	974	Yes	No
ROMANIA	GSP Orion	Tug	1,000	No	No
	Total:		**2,392**		

Scenario 2: Genoa, Italy (hypothetical scenario using OILMAP)

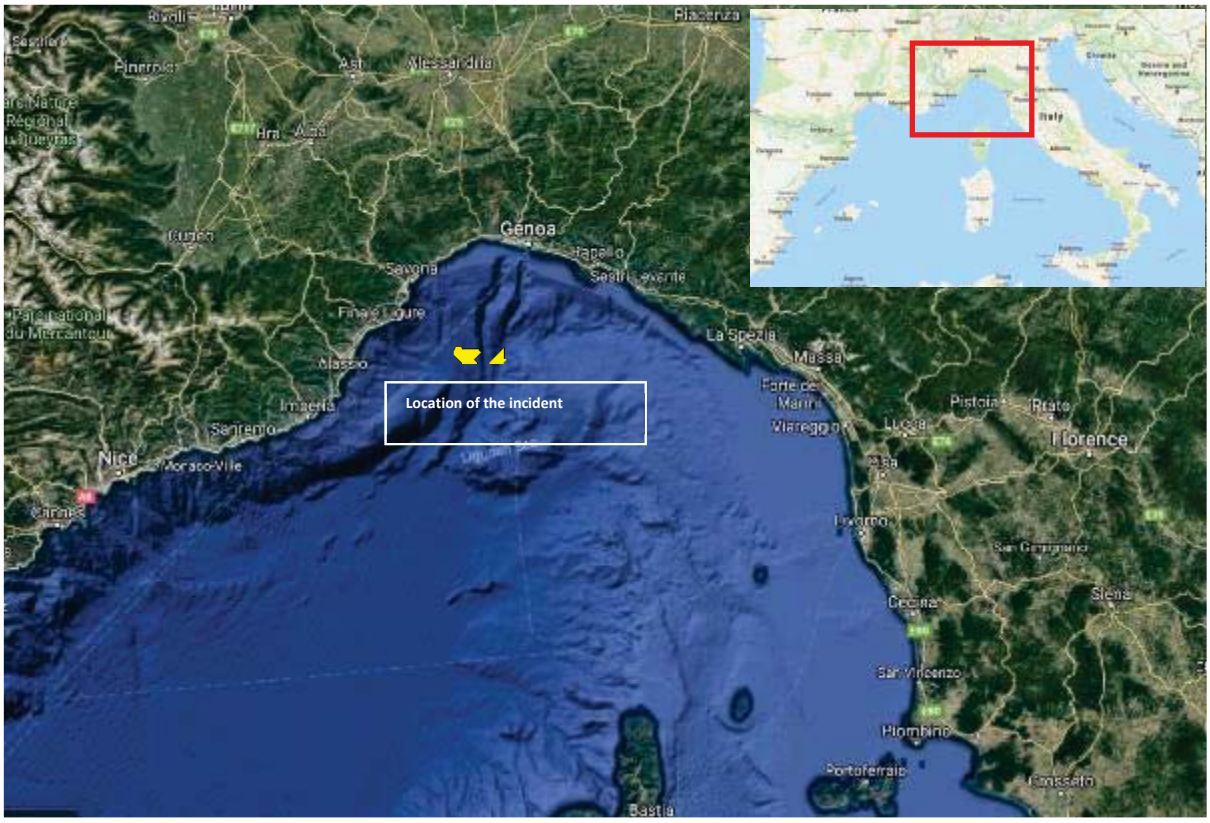


Figure 4 – Location of the Genoa incident

-
- Genoa, Italy
- Location: 42°57'N; 8°42'E
- Type of oil: Bunker C heavy fuel oil
- Quantity spilled: 50,000m^3
- Type of release: Continuous 24 hours
- Distance from shore: 30 nm
- Wind: Variable

Window of opportunity for mechanical recovery

There were moderate winds at the time of the spill. For the duration of the model (14 days) the spill was floating in open sea without reaching the shore. In any case, for the purpose of the calculation the 'window of opportunity' considered was **20 days**.

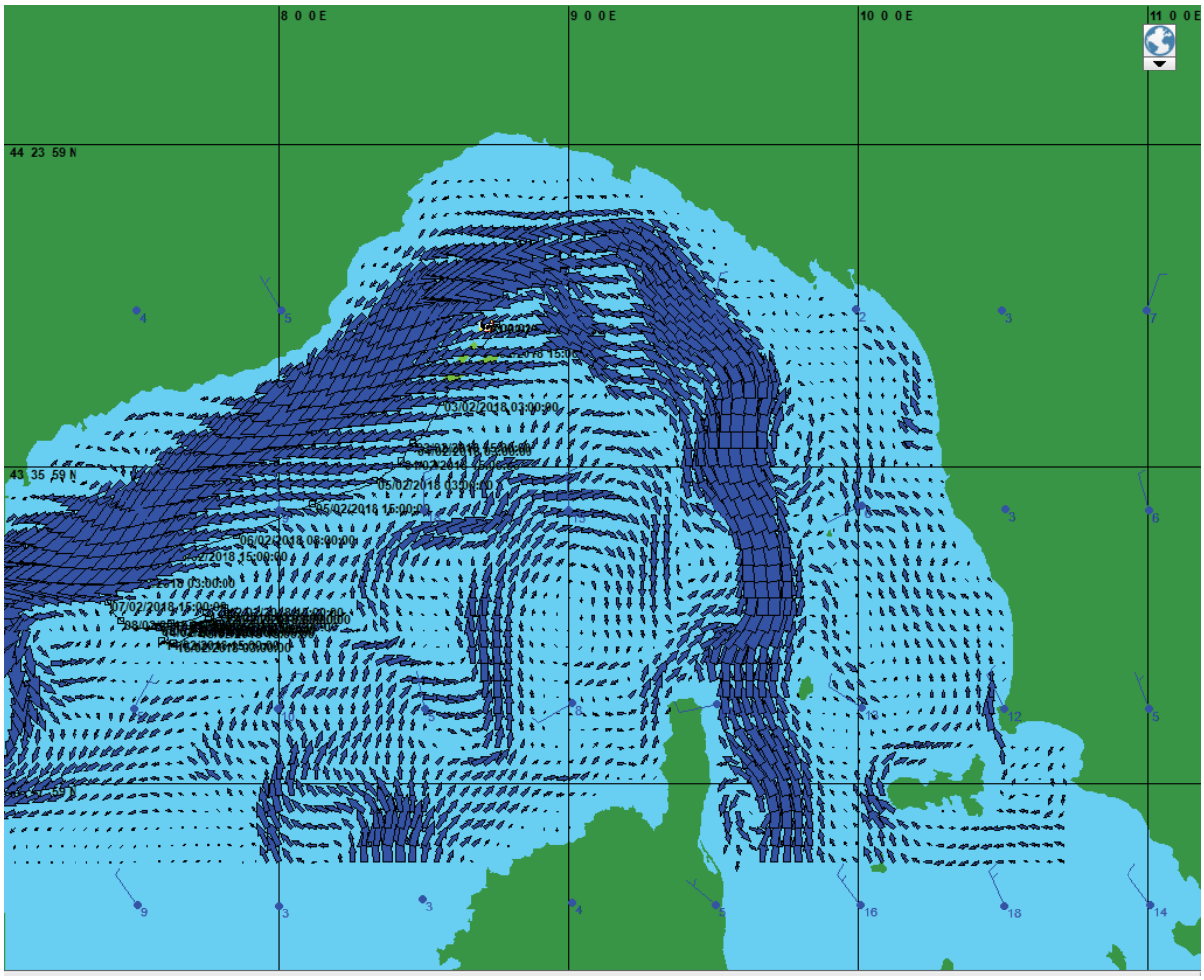


Fig.5 - The trajectory model shows that after 14 days the oil slick is still not reaching shore

EMSA total storage capacity mobilised

The resources available in the West Mediterranean Sea (*Monte Anaga* and *Brezzamare*), Central Mediterranean (*Balluta Bay, Santa Maria*) and Adriatic Sea (*Marisa N*) and would be mobilised due to the length of the 'window of opportunity'. The total capacity of these EMSA vessels is **14,140 m^3**.

Oil recovery cycle analysis

Step 0: Mobilisation time: 24 hours.

xxxxxxxxxxxxxxxxxxxxxxxxxxxxx. Step 1: Time to spill site: ranging from less than 3 hours (Brezzamare) to almost 5 days (Marisa N)

Step 2: Recovering oil:

2.7. Spill area: Open sea.

2.8. Oil recovery device: Rigid sweeping arms.

2.9. Pump type and capacity: 2 x PDAS pumps (150m^3/h max. capacity per pump at 33%)

2.10. Daily hours recovering oil: 12 hours (1 cycle); 6 hours (second cycle); 3 hours (third cycle and onwards)

2.11. Time necessary to fill the tanks: Varies from 1 day (*Marisa N*) to almost 3 days (*Monte Anaga*).

2.12. Pollutant recovered: The total quantity of oil-water emulsion for the whole period (12 days 0 recovered by the 5 mobilised vessels equals to **43,739 m^3**. The quantity of recovered pure oil would be **12,141 tonnes** (24% of the total quantity of 50,000 m^3 spilled oil).

Step 4: Discharging: 24 hours per vessel

Summary of EMSA potential contribution to the Genoa incident

Vessel Name	Distance from home port to spill site (Nm)	Time to reach spill site (days)	Storage Capacity (m^3)	Recovered oil water emulsion (tonnes)	Recovered pure oil (tonnes)
Brezzamare	29	1.12	3,288	10,518	2,893
Monte Anaga	850	4.54	4,069	9,766	2,930
Santa Maria	560	3.33	2,421	8,432	2,267
Balluta Bay	560	3.33	2,800	8,912	2,454
Marisa N	1,140	5.75	1,562	6,111	1,597
	Total:		**14,140**	**43,739**	**12,141**

MS resources in the area

Country	Vessel Name	Vessel Type	Storage Capacity (m^3)	Heating system	Specialised Oil spill recovery equipment
FRANCE	ABEILLE FLANDRE	Emergency Towing Vessel	No	No	No
FRANCE	JASON	Oil recovery vessel	1,000	Yes	Sweeping arm, booms and skimmer
FRANCE	AILETTE	Oil recovery vessel	480	Yes	Sweeping arm, booms and skimmer
ITALY	LUIGI DATTILO	Offshore patrol vessel	495	Not specified	Booms and skimmer
ITALY	UBALDO DICIOTTI	Offshore patrol vessel	495	Not specified	Booms and skimmer
ITALY	SPICA	Oil recovery vessel	267	Not specified	Booms and skimmer
ITALY	TITO	Oil recovery vessel	218	Not specified	Booms and skimmer
ITALY	KORAL	Oil recovery vessel	205	Not specified	Booms and skimmer
ITALY	SECOMAR QUATTRO	Oil recovery vessel	308	Not specified	Booms and skimmer

ITALY	ESINO	Oil recovery vessel	238	Not specified	Booms and skimmer
ITALY	IEVOLI RED	Oil recovery vessel	218	Not specified	Booms and skimmer
ITALY	IEVOLI WHITE	Oil recovery vessel	218	Not specified	Booms and skimmer
ITALY	SANTANGELO	Oil recovery vessel	203	Not specified	Booms and skimmer
SPAIN	PUNTA MAYOR	Multi-purpose vessel	198	No	Sweeping arms, booms and skimmer
SPAIN	SAR MASTELERO	Salvage tug	No	No	No
SPAIN	LUZ DE MAR	Multi-purpose vessel	287	Yes	Sweeping arms and skimmer
SPAIN	MARTA MATA	Salvage tug	No	No	No
SPAIN	MARIA ZAMBRANO	Salvage tug	No	No	No
	Total:		**4,830**		

Scenario 3: Prestige (based on the actual past incident)

Figure 6 – Location of the Prestige incident

- Date: 13 November 2002
- Incident area: Off Cape Finisterre, Galicia, Spain
- Vessel type: Single-hulled oil tanker
- Built date: 1976
- Length: 243.50 m
- Draught: 14.00 m
- Flag: Bahamas
- Cause of spill: Hull damage and sinking
- Type of cargo: IFO 650 (heavy fuel oil)
- Quantity transported: 77,000 tonnes (63,000 spilled and 14,000 recovered from wreck)
- First oil reached shore: 3 days after spill
- Length of coast affected: 1,900 km
- Distance to shore: 140 nm
- Prevailing winds: South West

The incident

On 13 November 2002, while some 30 nautical miles off Cape Finisterre (Galicia, Spain), the Bahamas registered oil tanker *Prestige* (81,564 DWT) began listing in adverse weather conditions and leaking oil. The vessel was carrying 76,972 tonnes of IFO 650 heavy fuel oil.

The *Prestige* incident led to four main oil releases:

First Release – Vessel Drifting Powerless, 13 – 15 November 2002

It is estimated that up to 1,000 tonnes of oil were lost initially, while drifting powerless (although on 14 November the engine ran for some hours) towards the Spanish coast from 13 to 15 November 2002. No oil recovery vessel was deployed at this time. Several tugs were deployed and one of them started to tow the vessel. The slick had a length of 37km.

Figure 7 – Tanker Prestige - the latest large spill in Europe

Second Release – Loss of Shell Plating of No.3 Starboard Ballast Tank, 15 – 19 November 2002

In the early hours of 15 November, while the *Prestige* was being towed away from the Spanish coast, a section of shell plating in the vicinity of No. 3 starboard ballast tank was lost and the rate of oil spillage increased. It is difficult to estimate the amount spilled during this period, but considering that the tank capacity, it can be estimated between 7,000 and 10,000 tonnes.

Third Release – The Vessel Sinks, 19 November 2002

On 19 November, the vessel finally broke in two and sank some 140 nautical miles west off Vigo (Spain). The bow section stayed at a depth of 3,500 metres and the stern section at a depth of 3,830 metres. The break-up and sinking released an estimated 25,000 tonnes of oil.

Fourth Release – Continuous Leaking from the Wreck

After sinking, oil continued leaking from the wreck at a slowly declining rate over several weeks. On 1 December, the French mini-submarine *Nautilus* was deployed. After the inspection of the wreck, it was estimated that the vessel was leaking oil at a rate of 125 tonnes/day.

The final amount of oil that leaked from the vessel is estimated at 63,000 tonnes. The 14,000 tonnes that remained in the wreck were recovered during an operation led by the oil company Repsol using shuttle tanks.

Window of opportunity

The oil was continuously leaking from the wreck for some weeks. One of the most efficient vessels in this incident, the *Arca*, arrived at the spill site ten days following the spill. The vessel was recovering oil for 31 continuous days, i.e. until day 41 after the incident. Other vessels, like the Danish *Gunnar Seidenfaden*, which arrived 22 days after the incident, was also able to recover oil, although with a significant lower efficiency. Two to three weeks after the spill, the efficiency of the at-sea oil recovery operation drops significantly, as the oil tends to spread over a large area and/or to break into small patches. In this situation, the vessels must spend a long time chasing the oil before recovering it. In addition, the oil will become more and more viscous when floating on the sea. Accordingly, the efficient 'window of opportunity' to recover oil at-sea has been estimated in **21 days**.

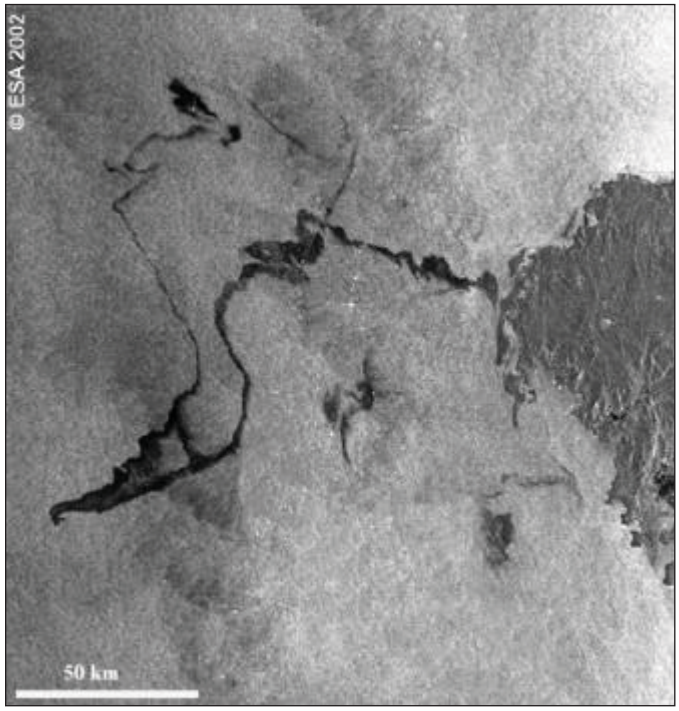


Figure 8 – Satellite image showing the main slick trajectories following the Prestige incident

Pollutant at-sea

The *Prestige* had 77,000 tonnes of fuel oil on board and 14,000 tonnes remained in the wreck. Therefore, 63,000 tonnes of pure oil spilled into the sea. Considering the percentage of water content in the emulsion approximately 120,000 tonnes of pollutant were at-sea.

EMSA total storage capacity mobilised

The resources available in the North Sea (*DC Vlaanderen, Interballast 3, Forth Fisher*), the Atlantic (*Ria de Vigo, Monte Arucas, Bahia Tres, Thames Fisher*), the Canary Islands (*Mencey*) *and Monte Anaga* (*Algeciras)* would be mobilised due to the length of the 'window of opportunity'. The total capacity of these EMSA vessels is **33,801 m^3**.

Oil recovery cycle analysis

Step 0: Mobilisation time: 24 hours.

Step 1: Sailing time to spill site: ranging from 12 hours (*Ria de Vigo*) to 7 days (*Thames Fisher*)

Step 2: Recovering oil:

2.13. Spill area: Open sea.

2.14. Oil recovery device: Rigid sweeping arms.

2.15. Pump type and capacity: 2 x PDAS pumps (150m^3/h max. capacity per pump at 33%)

2.16. Daily hours recovering oil: 12 hours (1 cycle); 6 hours (second cycle); 3 hours (third cycle and onwards)

2.17. Time to fill the tanks: Varies from 1 day (Ria de Vigo) to 5 days (*Bahia Tres*).

2.18. Pollutant recovered: The total quantity of oil-water emulsion for the whole period (21 days) recovered by the 8 mobilised vessels equals to **67,723 m^3**. The quantity of recovered pure oil would be **21,657 tonnes** (34% of the total quantity of 63,000 m^3 spilled oil).

Step 4: Discharging: 24 hours per vessel

Summary of EMSA potential contribution to the Prestige incident

Vessel Name	Distance from home port to spill Site (Nm)	Time to reach spill site (days)	Storage Capacity (m^3)	Recovered oil water emulsion (tonnes)	Recovered pure oil (tonnes)
Ria de Vigo	103	1.43	1,522	5,051	1,375
Monte Arucas	165	1.69	2,952	7,085	2,125
Monta Anaga	570	3.38	4,069	8,152	2,607
Bahia Tres	350	2.46	7,400	11,840	4,144
Forth Fisher	514	3.14	4,700	8,853	2,899
Thames Fisher	1,725	8.19	5,028	8,045	2,816
Mencey	950	4.96	3,500	7,109	2,262
Interballast III	682	3.84	1,886	5,137	1,480
DC Vlaanderen	682	2.84	2,744	6,189	1,896
	Total:		**33,801**	**67,723**	**21,657**

MS resources in the area

Country	Vessel Name	Vessel Type	Storage Capacity (m^3)	Heating system	Specialised Oil spill recovery equipment
FRANCE	ABEILLE LIBERTE	Emergency towing vessel	No	No	No
FRANCE	ABEILLE BOURBON	Emergency towing vessel	No	No	No
FRANCE	ARGONAUTE	Oil recovery vessel	1,500	Yes	Sweeping arm, booms and skimmer
SPAIN	SAPEUR	Oil recovery vessel	1,000	Yes	Sweeping arm, booms and skimmer
SPAIN	ALONSO DE CHAVES	Multipurpose vessel	25	No	Skimmer
SPAIN	PUNTA MAYOR	Multi-purpose vessel	198	No	Sweeping arms, booms and skimmer
SPAIN	SAR MASTELERO	Salvage tug	No	No	No
SPAIN	LUZ DE MAR	Multi-purpose vessel	287	Yes	Sweeping arms and skimmer
SPAIN	MARTA MATA	Salvage tug	No	No	No
SPAIN	MARIA ZAMBRANO	Salvage tug	No	No	No
SPAIN	PUNTA SALINAS	Multi-purpose vessel	145		Booms and skimmer
SPAIN	MIGUEL DE CERVANTES	Multi-purpose vessel	247	Yes	Sweeping arms and skimmer
SPAIN	DON INDA	Multi-purpose vessel	1,750	Yes	Sweeping arms and skimmer
SPAIN	CLARA CAMPOAMOR	Multi-purpose vessel	1,750	Yes	Sweeping arms and skimmer
SPAIN	SAR MESANA	Salvage tug	No	No	No
SPAIN	MARÍA DE MAEZTU	Salvage tug	No	No	No
SPAIN	MARÍA PITA	Salvage tug	No	No	No
NETHER-LANDS	ARCA	Oil recovery vessel	1,018	No	Booms and skimmer
GERMANY	BOTTSAND	Twin hull oil recovery Vessel	790	Yes	Skimmers
GERMANY	VILM	Oil recovery vessel	500	Yes	Sweeping arms
GERMANY	KIEL	Oil recovery vessel	325	No	Booms and skimmer
GERMANY	EVERSAND	Twin hull oil recovery Vessel	790	Yes	Skimmers
GERMANY	KNECHTSAND	Oil recovery vessel	400	No	Skimmer
GERMANY	NORDSEE	Oil recovery vessel	5,400	No	Sweeping arms
GERMANY	NEUWERK	Emergency towing vessel	1,000	Yes	Sweeping arms and booms
GERMANY	SCHARHÖRN	Emergency towing vessel	430	Yes	Sweeping arms
GERMANY	MELLUM	Emergency towing vessel	910	No	Sweeping arms
GERMANY	ARKONA	Emergency towing vessel	430	Yes	Booms
	Total:		**18,895**		

In the real incident, bad weather prohibited recovery operations during several days. Beside international response means, fishermen also participated efficiently in the response operations. From the 13 November 2002 until the end of December 2002, it is estimated that 18,000 m^3 of emulsion were collected.

Scenario 4: Baltic Carrier (based on the actual past incident)

Figure 9 – Location of the Baltic Carrier incident

Date: 29 March 2001
Incident area: Kadet fairway, Jutland islands (Denmark)
Vessel type: Oil and chemical tanker
Built date: 2000
Length: 175 m
Draught: 11.2 m
Flag: Marshall Islands
Cause of spill: Collision
Type of cargo: Heavy fuel oil
Quantity transported: 30,000 tonnes (2,700 tonnes spilled)
Oily waste collected onshore: 11,000 tonnes
First oil reached shore: 17 hours after the spill
Length of coast affected: 50 km
Distance to shore: 16 miles

The incident

Figure 10 – Picture of the Baltic Carrier following the collision

On the night of 28 March 2001 during a storm in the Baltic Sea (Beaufort 9 - very rough sea), the cargo vessel *Tern* collided with the oil tanker *Baltic Carrier* approximately 16 nautical miles southeast of the Danish islands Falster and Møn. The tanker was carrying 30,000 tonnes of HFO. The quantity of HFO released was estimated at 2,700 tonnes (capacity of tank number 6).

Fifteen Danish, Swedish and German vessels were mobilised to spot slicks or recover the oil. After the initial phase on Friday 30 March, it was established that vessels with shallow draught and capable of operating in shallow waters were required. Subsequently four vessels were chartered.

Window of opportunity

Excluding the first day due to adverse weather conditions, the 'window of opportunity' to recover oil at-sea was very limited due to the short distance to shore. Accordingly, it can be established at 3 days.

Estimated pollutant at-sea

According to the Danish official report, about 2,700 tonnes (by considering $1m^3 \approx 1$ tonne) of heavy fuel oil were spilled at-sea. However, due to the distance to the coast, only a part of the oil was recoverable at-sea. The National oil recovery vessels were mobilised very quickly and recovered practically all the pollutant which could be taken at open sea.

EMSA total storage capacity mobilised

Only one vessel available in the Southern Baltic Sea (*Norden*) would be mobilised due to the short duration of the 'window of opportunity' and small quantity of spilled oil. The total capacity of the vessel is **2,880 m^3**.

Oil recovery cycle analysis

Step 0: Mobilisation time: 24 hours.

Step 1: Sailing time to spill site:

Step 2: Recovering oil:

2.19. Spill area: Open sea.

2.20. Oil recovery device: Rigid sweeping arms.

2.21. Pump type and capacity: 2 x PDAS pumps (150m^3/h max. capacity per pump at 33%)

2.22. Daily hours recovering oil: 12 hours (1 cycle);

2.23. Time to fill the tanks: *Norden* was not able to fill in tanks as the limit of the 'window of opportunity' has already passed before that.

2.24. Pollutant recovered: The total quantity of oil-water emulsion for the whole period (3 days) recovered by the vessel equals to **609 m^3**. The quantity of recovered pure oil would be **913 tonnes** (22% of the total quantity of 2,700 m^3 spilled oil).

Step 4: Discharging: 24 hours per vessel

Summary of EMSA potential contribution to the Baltic Carrier incident

Vessel Name	Distance from home port to spill Site (Nm)	Time to reach spill site (days)	Storage Capacity (m^3)	Recovered oil water emulsion (tonnes)	Recovered pure oil (tonnes)
Norden	175	1.73	2,880	1,522	913
	Total:		**2,880**	**1,522**	**609**

MS resources in the area

Country	Vessel Name	Vessel Type	Storage Capacity (m^3)	Heating system	Specialised Oil spill recovery equipment
DENMARK	A561 GUNNAR SEIDENFADEN	Offshore supply	310	Partially	Booms and skimmer
DENMARK	A560 GUNNAR THORSEN	Offshore supply	310	Partially	Booms and skimmer
SWEDEN	KBV 034	Anti-pollution vessel	355	Partially	Sweeping arms, booms and skimmer
SWEDEN	KBV 001	Multi-purpose vessel	1,050	Yes	Sweeping arms and skimmer
SWEDEN	KBV 003	Multi-purpose vessel	1,100	Yes	Sweeping arms and skimmer
	Total:		**3,125**		

CONCLUSIONS

Added value

- 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 from past spills have been considered when designing the EMSA network. The estimated performance in the new scenarios confirms the suitability of the concept design.

- The pollution response equipment chosen by EMSA has been designed to cope with high viscosity oil and adverse weather conditions (up to Beaufort 5 approximately), taking into account the main lessons learnt from past spills.

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

- In the cases analysed, it has been estimated that the EMSA network would potentially recover between 22% and 34% of the pollutant at-sea. This wide range reflects the different circumstances that affect the efficiency of the at-sea oil recovery operation, especially the 'window of opportunity' available to recover oil at-sea. It must be remembered that each tonne of pollutant recovered at-sea, avoids several tonnes of solid waste onshore (up to 11 tonnes in some cases), thus dramatically reducing the environmental and socio-economic impact of any spill.

Overall Conclusion

For most of the scenarios considered, the EMSA network has proven to have a capacity to considerably reduce the amount of pollutant reaching the shore therefore reducing the environmental, social and economic impacts. For these reasons, it can be concluded that the network of stand-by oil spill recovery vessels is a powerful resource in the hands of the Member States to combat large oil spills. In all the areas analysed, EMSA would be able to mobilise, at request, a higher storage capacity than that available from National resources. Accordingly, with the current distribution and capacity, EMSA fulfils its mandate to "top-up" Member State oil pollution response capacity, as well as being a valuable reserve for disasters both from an environmental and economic perspective.