



Protection of the Wadden Sea from ship accidents through the establishment of a „PSSA Wadden Sea“



A realization plan for the Trilateral Cooperation of Denmark, Germany and The Netherlands



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Author: WWF Project Team Pallas

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Editor and contact: Dr. Hans-Ulrich Rösner, WWF-Projektbüro Wattenmeer, Ph. (+49)4841/62073, Fax: (+49)4841/4736, Email: roesner@wwf.de

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Orders: To the editor please. This study is also available as a pdf-file.

Cover picture: Burning cargo vessel "Pallas" (C. Kaiser).

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Summary

We propose that the Wadden Sea countries, working together in the "Trilateral Cooperation for the protection of the Wadden Sea", decide to establish a "Particularly Sensitive Sea Area" (PSSA) called "PSSA Wadden Sea". In order to do this, we put forward a proposal going beyond the current regulations. The proposal consists of nine concrete measures suitable for reducing the danger resulting from ship traffic for the Wadden Sea and its coast:

- 1 As the most important measure, we propose the establishment of several safety areas, named according to their function: surveillance area, intervention area and protection area, which together form the "PSSA Wadden Sea" (Fig. 1, 2).
- 2 The effective protection of the PSSA Wadden Sea is only feasible by creating a PSSA Control Centre with a Marine Operation Coordination Group (MOCG) where all information regarding ship traffic is gathered. The MOCG will decide whether ships may enter or leave the Wadden Sea harbours and if necessary on appropriate safety measures. These decisions depend upon the traffic situation and will follow a set of defined and published decision making criteria. These measures will be taken under close consultation with the local Traffic Control Centres.
- 3 Data regarding all ships sailing in the surveillance area will be collected in a continuously updated information file, that has yet to be developed. It will be located in the PSSA Control Centre.
- 4 The geographical location of Wadden Sea harbours shows how important pilotage is to safety. Pilotage should be made compulsory beyond the existing guidelines according to a risk study that has yet to be realised. The obligation to accept pilotage will affect both the ships entering and leaving PSSA-harbours and ships just passing the PSSA-area. Pilotage by highly qualified and motivated staff is essential for effective security. All measures which have been thought out, initiated or already taken to reduce pilotage costs must now be checked to see if they reduce or jeopardise the efforts for security and cancelled if necessary.
- 5 As a PSSA Wadden Sea protection measure, all ships with a high potential of danger must be either actively or passively accompanied. The MOCG decides upon the type and extent of piloting from case to case along the lines of published decision making criteria.
- 6 All ships in the Wadden Sea must be suitably equipped so that in the case of an emergency, they can be towed away quickly. As long as ships are not already subject to SOLAS equipment regulations (emergency towing gear), at least an emergency towing penant ("insurance wire") must be ready at the bow and stern. However, the ultimate goal should be that all ships sailing in the PSSA are equipped with SOLAS emergency towing gear.
- 7 The establishment of several Safe Havens in the PSSA Wadden Sea is essential. A thorough study must be undertaken to decide which harbours and roadsteads should be named Safe Havens for different ship sizes and cargo types. This study should be carried out by ex-

perts from the Wadden Sea states taking into account risks, danger potentials and protection requirements. Furthermore, at least one port neighbouring the Wadden Sea, e.g. Rotterdam, must be set up as a Safe Haven for damaged vessels of every size and cargo type.

- 8 For the protection of the PSSA Wadden Sea, several "emergency response vessels" (ERV) are necessary, which are spaced at regular intervals in the intervention zone and are on permanent stand-by. These ERVs, regardless of their shipyard country, should be constructed in the same way to allow an exchange of entire ship crews and individual crew members between the countries. Moreover, the provision of a further ERV is recommendable to be used for replacement in case of repairs or maintenance work, for training purposes and as a supplement if one of the other ERVs is involved in an emergency operation. The locations of these ERVs would be identical to the positions of the tugs currently stationed in northern Europe (at the Wadden Sea "Waker" and "Oceanic"), with an additional vessel in Esbjerg (Denmark). Locations for further ERVs would be Humber estuary (Great Britain) and Stavanger (Norway).
- 9 At the moment the agreement on defined ship routes outside the Wadden Sea is the result of nautical considerations regarding the safety of the ships. Ship routes that also take into consideration the protection of the Wadden Sea and the coast, must be located further seaward and have to consider also the current and wind directions / strengths, the sailing and drift speed and other factors.

At both trilateral ministerial conferences during 1994 and 1997, it was decided to consider the establishment of a PSSA. The WWF therefore now sees it as the logical progression for the protection of nature and the people living at the coast to decide on the proposed measures during the next ministerial conference in 2001 and to apply for them at the IMO to come into force together with the designation of a PSSA Wadden Sea.

Introduction

The Wadden Sea, Europe's largest coastal wetland and one of its last natural areas, is a shallow sea extending from Den Helder in the Netherlands, along the entire northwest coast of Germany to Esbjerg in Denmark. In 1982, a Joint Declaration on the Protection of the Wadden Sea was agreed between the three countries, in which they declared their intention to coordinate future activities for the protection of the Wadden Sea. Several governmental conferences have been held since this date and most parts of the Wadden Sea are now protected by means of conservation law implemented in all countries and are being designated also as protected areas according to European conservation directives. WWF has promoted and stimulated this development and clearly acknowledges the progress made.

However, not only the recent "Pallas" accident shows that the protection against risks from shipping disasters has not kept up with other progress. Such disasters have the potential to put a serious setback on much of the achieved conservation success in the Wadden Sea. They also severely threaten the tourism industry, which is the economic backbone of the area.

Beside the necessary national regulations – many of them presently under discussion in Germany as result of the "Pallas" accident – and international regulations such as those by the EU and the IMO, there are also options for serious improvements by the trilateral cooperation of the Wadden Sea countries.

Therefore there is no doubt that the trilateral Wadden Sea is a sea area that because of its uniqueness and sensibility could be declared by the International Marine Organisation as a "Particularly Sensitive Sea Area" (PSSA). This step could lead to the introduction of further Vessel Traffic measures and equipment regulations to increase the safety for the Wadden Sea and its people. Regarding the excessive ship traffic, the navigationally hazardous areas in the vicinity of the shallow Wadden Sea, the closeness of the countries Germany, the Netherlands and Denmark in the common natural landscape Wadden Sea, the already ongoing co-operation in nature conservation as well as the fact that accidents in most cases also affect the neighboring countries, a further binding co-operation in protecting the Wadden Sea against dangers from seaborne traffic should prove to be immensely useful.

The urgency of such measures is not only highlighted in numerous accidents and near accidents but also in the fact that the efforts to reduce the costs for international shipping and port business do not take into account the environment. Therefore decisions are made at the expense of safety. Examples for this development in Germany are the efforts to weaken the piloting regulations as well as the rationalisation of pilotage.

We propose that the Wadden Sea countries, working together in the "Trilateral Cooperation for the protection of the Wadden Sea" should decide to establish a "Particular Sensitive Sea Area" (PSSA) called "PSSA Wadden Sea". In order to do this, we put forward a draft proposal going beyond the current regulations which consists of nine concrete measures suitable for reducing the potential danger resulting from ship traffic for the Wadden Sea and its coast.

At both trilateral conferences in 1994 and 1997 it was decided to consider the establishment of a PSSA (see Appendix 1). WWF therefore now considers the next logical step for protecting the nature and the people living at the coast to decide on the suggested measures during the next ministerial conference in 2001 and to apply for them

to come into force at the IMO together with the acknowledgement of a "PSSA Wadden Sea" (see Appendix 2).

All of these proposed measures refer to the traffic of sea ships i.e. of ships to which the "International Convention for the Safety Of Life At Sea" (SOLAS) applies. Ships which only navigate in one country, cargo vessels of less than 500 tons gross tonnage, pleasure yachts not engaged in trade, fishing vessels, military vessels and others are therefore excluded from the proposals in this concept.

The measures proposed in our concept cannot be realised without any further costs or even cost-saving. **If you think that safety is expensive, try an accident!**

At the same time, we do not want to drive sea traffic out of the Wadden Sea and respectively out of river mouths and their ports to other less safe areas through the implementation of these measures. One example for this could be the shuttle tankers from the oil fields in the North Sea which would no longer go to Wilhelmshaven but e.g. to Dunkirk instead, to reduce their transport costs. Public pressure will be necessary here as well to make the use of safe and environmentally beneficial ships, routes, areas and ports normal for the trade in the Wadden Sea countries. A certification of such a safe (sea) transport chain – according to ISO 14000ff for example – could help the consumer decide when buying products and therefore further encourage the industry.

This concept does not stand in competition to the current discussion about economically encouraging systems (e.g. "green ports"). Such measures certainly make sense, but can by no means replace the effect of these proposed measures for protecting the coast, which lie more in the area of order regulations. Such measures certainly have the advantage of being compulsory. This is not in contradiction to the "green port" initiative, since such a port must not limit efforts like this only to an environmentally beneficial disposal of ships' waste or reduced port dues for ships which clean their emissions. A so-called "green" port also has to provide safety measures if a ship – in spite of all efforts for safety – has an accident and puts the environment at risk.

Because of the ongoing intensive discussion regarding offshore wind parks in the North Sea off the Wadden Sea and the resulting risk potential for ship traffic, we address this question regarding the safety of navigation (see Appendix 3).

What is a PSSA?

Definition and Description

By resolution A.720 (17) the IMO assembly has adopted the "Guidelines for the Designation of Special Areas and the Identification of Particularly Sensitive Sea Areas" (IMO 1991). The mechanism to identify a PSSA has been further elaborated through a recent IMO resolution (IMO 2000, see Appendix 2).

Particularly Sensitive Sea Areas (PSSAs) are areas of the seas and oceans that need special protection through action by the International Maritime Organisation (IMO) because of their ecological, economic, cultural or scientific significance, and their vulnerability to harmful impacts from shipping activities. PSSAs can benefit valuable ecosystems such as coral reefs, coastal wetlands and important habitats. They are also important for migrating birds, sea turtles, whales or other marine species, as well as feeding grounds for valuable fish stocks. In addition, they can benefit marine areas of particular importance for tourism, recreation, traditional subsistence, science or education. And if any of the above areas are close to shipping lanes, suffer from bad weather, have narrow passages, shallow depths or submerged reefs, or are otherwise sensitive to shipping impacts, then they may need PSSA assistance to protect them (Gjerde 1999).

International law limits the ability of coastal nations to impose and enforce their own environmental and navigation regulations on foreign ships passing through their waters. Within their 12-mile territorial waters, coastal nations may not "impair" a foreign ship's right of innocent passage. Beyond the territorial seas, in the Exclusive Economic Zone or equivalent extending out to 200 miles from the shore, coastal states can only adopt regulations that have been previously approved by the IMO. As such, international regulations are generally meant to apply to all ships everywhere they go. Thus it can be difficult to protect discrete areas of the marine environment that are particularly sensitive. However, through PSSAs, area-specific rules can be matched to local needs and conditions.

PSSAs can help coastal nations prevent accidents, avoid habitat damage and stop intentional pollution by regulating the passage of ships through or away from sensitive areas. The marking of PSSAs on nautical charts also serves to inform mariners of the need to take special care when approaching a sensitive area. Some of the measures available through the IMO to protect PSSAs include:

- **Areas to be avoided** to prohibit entry of tankers or other ships carrying hazardous cargoes,
- **Traffic separation schemes** to require ships to stay within designated lanes,
- **Inshore traffic zones and deep water routes** to separate local traffic from transiting traffic,
- **Special discharge restrictions** under MARPOL 73/78 to ban the discharge of oily wastes, garbage and other harmful substances from ships,
- **Pilotage requirements** to ensure ships use local pilots who are expert local navigators,
- **Mandatory reporting requirements** to ensure two-way communication between ship and shore,
- **Vessel traffic management** service systems to help manage and control ships' passage.
- **Special innovative measures** may also be introduced to address specific local problems.

A PSSA can be a useful management tool to protect nationally designated marine protected areas that are vulnerable to shipping impacts. However, PSSAs do not have to be restricted to national marine protected areas: they can also protect other ecologically, economically, or socially significant marine areas that are exposed to threats from shipping. The global publicity generated through PSSA identification can sometimes benefit the area further by stimulating efforts to protect it from other potentially harmful maritime activities such as drilling, dredging and fishing, or land-based operations that cause pollution or wetlands destruction.

Two countries have already benefited from having PSSAs identified. In 1991 the IMO approved its first PSSA; Australia's Great Barrier Reef. Australia was thus able to require all ships transiting through treacherous reef passages to use local pilots, and accidents in the Great Barrier Reef Marine Park have been drastically reduced as a result. And Cuba's Cabana-Samaguey Archipelago was identified as a PSSA in 1998 to complement the country's national strategy to manage all threats to this ecologically unique and economically valuable area. Other coastal nations with important marine areas that are vulnerable to shipping impacts can petition the IMO to have them recognised as PSSAs.

IMO guidelines provide the criteria and procedure for identification of a PSSA. A petition will need to show that the area is significant in at least one of the criteria:

- **Ecological:** uniqueness, dependency, representativeness, diversity, productivity, naturalness, integrity, vulnerability;
- **Social, Cultural and Economic:** economic benefit, recreation, human dependency;
- **Scientific and Educational:** research, baselines and monitoring studies, education, historical value).

If it is to be successful, a petition should include an assessment of the area's vulnerability to damage by shipping activities, identify proposed measures to protect the area, and explain how those measures will work. It should further describe the oceanographic and ecological conditions that make the area sensitive to shipping impacts and indicate any other sources of environmental pressure that increase that sensitivity. Some countries such as Australia and New Zealand have used coastal managers and communities to assist in identifying areas that deserve greater protection and are at risk from shipping activity. They know that all those with a stake in protecting the coastal and marine environment should be involved in decisions regarding ways to minimise the environmental impact of shipping. The sources concerned can also provide much of the information needed to develop an effective IMO petition.

Marine Environmental High Risk Area

Extensive protection of sensitive sea areas against the dangers of shipping impacts is not only demanded in Europe for the trilateral Wadden Sea. In their report "Safer ships, cleaner seas", which was published in 1994, the British "Lord Donaldson's Inquiry" established and defined the term "Marine Environmental High Risk Areas" (MEHRAs) as follows (Donaldson 1994):

"The choice of areas will inevitably be controversial, and we believe that it is important to establish criteria, based on both shipping patterns and environmental importance, to use as guidelines. IMO has already established guidelines for the designation of Special Areas (under MARPOL: ... the North Sea and English Channel are already Special Areas for garbage disposal purposes) and the identification of particularly sensitive sea areas. These should obviously be taken into account. We need to identify areas of special environmental, ecological or economic

value which are subject to a high risk of damage from pollution from shipping. In determining whether such an area exists, regard should be given to the following **maritime** considerations:

- (a) the number, type and size of vessels passing and the nature of their cargoes;
- (b) the distance of the usual shipping lanes from the shore;
- (c) any circumstances giving rise to an increased risk of collision such as a significant amount of traffic going across the normal flow;
- (d) hydrographical conditions relevant to safe navigation, such as a lack of safe anchorages; and
- (e) prevailing meteorological and tidal characteristics.

Regard should also be given to the following **environmental** considerations:

- (a) existence of wildlife feeding or breeding sites of international significance or the presence of biological communities of either flora or fauna or both of particular interest or rarity: designation as a Special Protection Area under the EC Birds Directives or an Area of Special Conservation under the Habitats Directive normally be regarded as evidence of this.
- (b) the existence of commercially exploitable biological resources and mariculture sites; and
- (c) the extent to which the area provides a public recreational amenity.

*These outline considerations will no doubt need more refinement. A particular area would obviously need to qualify on **both** sets of consideration to be a candidate for special treatment. It is unlikely to be enough for an area simply to meet one of each set of criteria: it should score highly on both sets."*

The Donaldson' Inquiry concretely proposed the sea areas off Skomer and the Isles of Scilly as MEHRAs: "We obviously cannot identify all sites which deserve MEHRA status, but we can suggest some examples. We have already suggested Skomer and the Isles of Scilly" (Donaldson 1994). The accuracy of this suggestion was proved two years later by the accident of the tanker "Sea Empress", which according to experts could have very likely been avoided if the demands of Donaldson in 1994 had been met. MEHRAs can be viewed as a "preparation" for the IMO instrument PSSA on a national level. This shows that also other countries bordering on the North Sea carry out area-related initiatives for a better protection against ship hazards. Together with the "Pallas" accident, the story of the "Sea Empress" warns us that the protection of sensitive sea areas must be carried out before serious ecological damage or even a disaster occurs.

Why a "PSSA Wadden Sea"?

The Wadden Sea meets without doubt both the maritime and the environmental requirements for a PSSA designation. Therefore this fact will not be further addressed. To illustrate this, we would like to point out the number of shipping movements (260,000 a year) which make the Wadden Sea and its surroundings one of the most frequented sea areas worldwide. In 1999, in the German North Sea ports alone, 171.5 million tons of cargo were transferred (see Table 1). Basically, every single ship entering the southern part of the North Sea can be a threat to the Wadden Sea.

Port	Total traffic			Bulk cargo			General cargo		
	1999	1998	1992	1999	1998	1992	1999	1998	1992
Brake	5.0	4.7	4.6	3.1	3.1	3.2	1.9	1.7	1.4
Bremen	11.5	13.7	13.6	8.5	10.0	8.1	3.0	3.8	5.5
Bremerhaven	20.1	17.1	13.6	0.4	0.5	3.6	19.7	16.7	10.0
Brunsbüttel	7.3	7.8	7.8	7.3	7.7	7.8	0.0	0.1	0.0
Bützfleth	4.3	3.9	3.1	4.3	3.9	3.1	0.0	0.0	0.0
Cuxhaven	1.1	1.4	1.2	0.4	0.5	0.4	0.8	0.9	0.8
Emden	3.3	2.9	1.7	0.7	0.6	1.1	2.6	2.3	0.5
Hamburg	73.4	68.9	59.9	36.8	35.8	38.3	36.2	33.1	21.6
Nordenham	2.6	2.0	3.3	2.4	1.8	3.0	0.2	0.2	0.4
Wilhelmshaven	39.7	44.0	31.6	39.4	43.7	31.5	0.3	0.3	0.1
Total	168.3	166.4	140.4	103.3	107.6	100.1	64.7	59.1	40.3

Table 1: Transfer of sea cargo in German North Sea ports (million tons; Stat. Bundesamt Wiesbaden, 2000)

Structure of a "PSSA Wadden Sea"

1. Delimitation and Areas of the PSSA

As the most important measure, we propose the establishment of different safety areas, named according to their function; surveillance area, intervention area and protection area (see the following sub-sections). Together, these areas form the PSSA Wadden Sea (see figure 1 and figure 2).

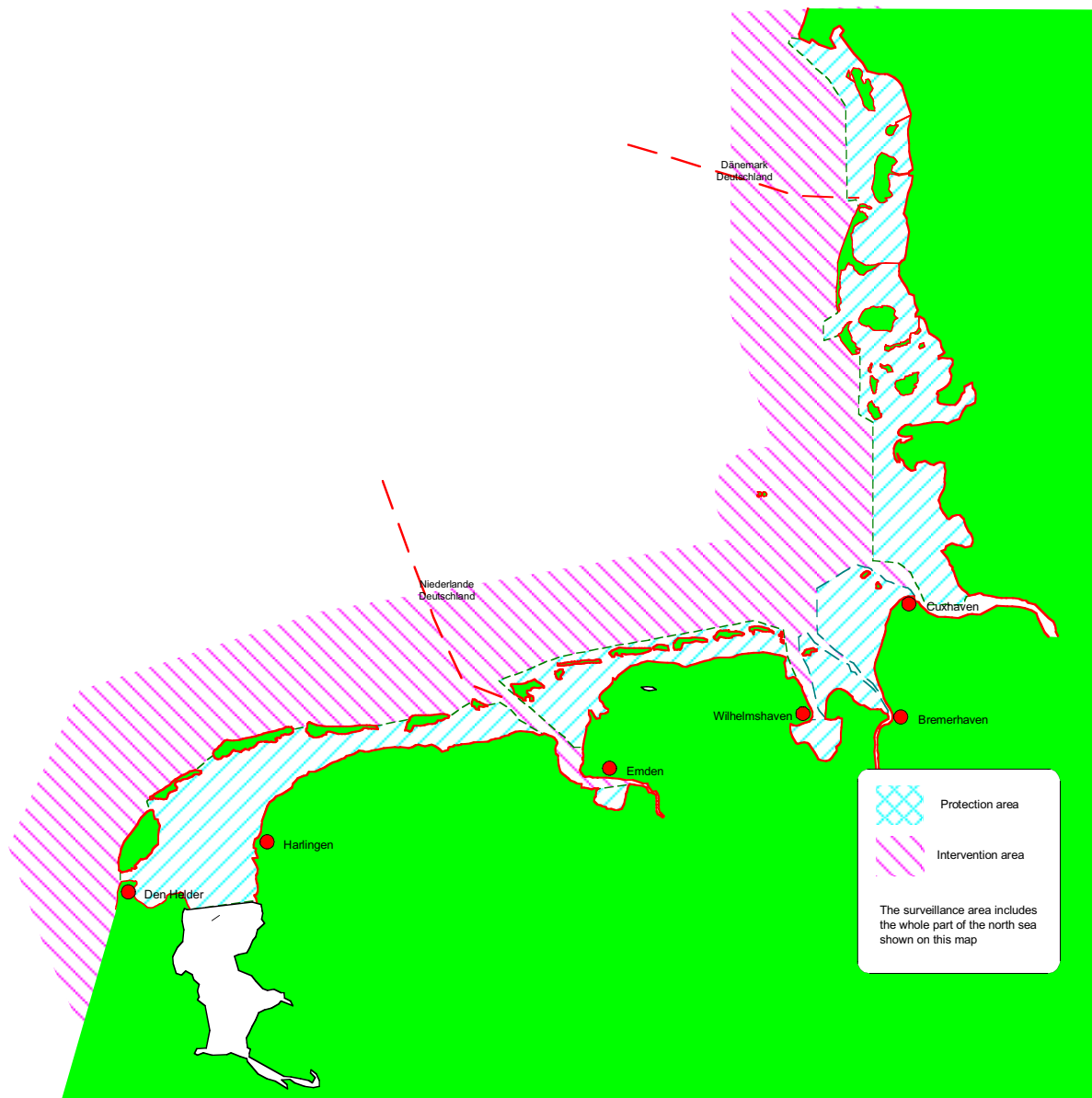


Figure 1: Overview of the protection and intervention areas in a PSSA Wadden Sea

1.1 Surveillance Area

The surveillance area extends as far beyond the protection and intervention areas of the PSSA as possible. The aim would be an extension from the western entrance of the English Channel up to Skagen for the sea traffic running parallel to the PSSA and at least 250 sea miles into the North Sea. Into the estuaries and rivers the surveillance area should extend to the respective port entrances.

In this area ship traffic is monitored. Monitoring takes place both from land and sea and is used to control the ship traffic in the vicinity of the intervention area in order to detect and identify potentially dangerous ships in time.

Monitoring from land is carried out via radar surveillance chains where information is collected and evaluated by the local Vessel Traffic Centres. This monitoring system has already proved to be worth while in the traffic separation areas of the northern European coast. The required technical infrastructure already exists. Some of the existing radar surveillance chains, however, require updating to a modern, high-resolution system.

In the local Vessel Traffic Centre, expert navigators evaluate the information provided by the radar surveillance chains. The main goal of this evaluation is the detection of ships with abnormal behaviour e.g.

- unfounded changes of course (failure of the rudder unit, "blackout", inexperienced staff),
- unfounded change of speed (failure of engines, "blackout"),
- disregard of traffic regulations (inexperienced staff).

Such incidents are recorded in the information log file of the ship (see section 3) and will be used to evaluate the potential danger it poses and to start eventual protective measures like escorting (see section 5). Monitoring from sea is carried out by means of aircrafts and vessels.

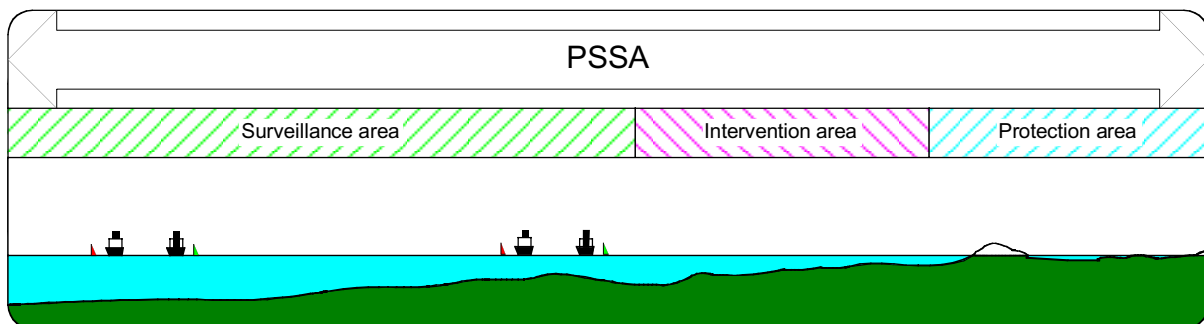


Figure 2: Schematic overview of the different areas in a PSSA Wadden Sea

The surveillance area is very large because it is also necessary to monitor the ship traffic running parallel to the PSSA. This ensures that the PSSA Control Centre (see section 2) is informed about these ships so that when a ship approaches the intervention area, there is enough information available to take suitable action. In principle, the PSSA Wadden Sea surveillance area can overlap with and also complement other related areas e.g. the area off the British coast.

1.2 Intervention Area

If a ship leaves the surveillance area and heads towards the PSSA without prior agreement with the local Vessel Traffic Centre, it will enter the intervention area. At this point, the authorities, organisations and companies instructed to protect the PSSA intervene in accordance with orders given by the local Vessel Traffic Centres or the PSSA Control Centre on the basis of a fixed graduated plan published in the sea manuals. Their task is to intervene and prevent the ship from entering the protection area of the PSSA. The graduated plan takes into consideration the directions and strengths of wind and current, draught and speed of the ship as well as the reasons for entering the protective area. The intervention possibilities can be the instruction to immediately leave the area, drop anchor, or even the obligation (and enforcement) to accept a tugboat. Furthermore, it is possible to bring a "boarding team" on board, to determine the objective reasons for the intrusion into the Intervention Area and to check or even enforce that the given instructions are carried out.

The width of the intervention area must be defined in accordance with the nautical and meteorological conditions. The main fact here is the operating radius of the intervening teams provided for the prevention of an accident. These teams must arrive at least 1.5 hours before the damaged vessel will run aground, so as to have enough time to establish a towing connection and to turn the damaged vessel against wind and current. It is regarded today, that the intervention area should be at least 9 sea miles wide.

All the information and data e.g. about sea traffic, weather and current conditions and above all about the available equipment and teams must be collected in an operation centre which is responsible for the entire PSSA (see section 2). Here, the status is continuously updated to enable the head of operations to intervene on the spot at any time. Additionally, the head of operations decides, depending on the traffic situation, which ship may use which shipping route through the PSSA at what speed. The operation centre should be situated as close to the PSSA as possible, to facilitate the personal contact between operation centre, local Vessel Traffic Centres and the intervening team.

1.3 Protection Area

The protection area of the PSSA would have to be defined analogue to the trilateral conservation area. The intrusion of ships (for a definition see Introduction) into the protection area should be prevented by the actions of the PSSA.

Both the intervention area and the protection area combined are to be considered the care zone of the PSSA.

2. PSSA Control Centre and MOCG

The effective protection of the PSSA Wadden Sea is only feasible by creating a PSSA Control Centre with a Marine Operation Coordination Group (MOCG) where all the information regarding ship traffic is gathered. The MOCG will decide whether ships may enter or leave the Wadden Sea harbours and if necessary on appropriate safety measures. These decisions depend upon the traffic situation and will follow a set of defined, public decision-making criteria. These measures will be taken under close consultation with the local Vessel Traffic Centres (see figure 3).

The Marine Operation Coordination Group (MOCG) could consist of a trilateral team. It is absolutely necessary that one single member of the trilateral team has the overall control to clarify the responsibilities both internally and externally. In the scope of this trilateral co-operation it would make sense for the members of the MOCG to take turns in regular intervals in holding the overall control. A change of the overall control in the middle of a rescue operation respective to the location of the accident did not prove to be useful during the "Pallas" disaster in Germany and should be avoided. It is of the highest significance for the operations management, that the protection of the Wadden Sea is not treated as a national task of the relevant country but instead as a common task of all three countries. A change of the overall control respective to the site of the accident does not only contradict this basic concept, but also the conditions in the trilateral Wadden Sea. A ship accident and in particular the resulting consequences will in many cases not be limited to one area or country.

To ensure continuous monitoring, recording and evaluation etc. of the incoming information, the control centre must be manned at all times. Additionally, it is absolutely necessary that the management of the control centre consists of highly qualified staff with knowledge and experience in the fields of seamanship and accident management as well as teamwork and leadership. The MOCG must have the required decision-making powers to carry through their decisions according to the necessity of the taken measures, regardless of the costs. The experience of the investigation of the "Sea Empress" accident, lead by Lord Donaldson, has also highlighted this and shows especially that political decision-makers should not interfere in the management of an intervention (Donaldson 1999). This was made clear with the short expression "*Back him or sack him!*".

It would be absolutely necessary to keep the existing local Vessel Traffic Centres in the PSSA e.g. for the rivers Ems, Jade, Weser and Elbe, and also in the ports of the entire southern part of the North Sea, since they inform the ships about the current traffic situation, the conditions of the shipping routes as well as about disturbances, water levels, accidents, the weather and the tides. A regional limitation of the local Vessel Traffic Centre facilitates the assignment and maintenance of the area-specific information. It cannot be expected that a transfer of the tasks from the currently decentralised local Vessel Traffic Centre to the PSSA Control Centre will lead to rationalising effects or cost savings. The local Vessel Traffic Centres supervise the keeping of licences and orders as well as determining and recording offenses or infringements. The task of the PSSA Control Centre is, however, the general illustration and coordination of the entire ship traffic in the surveillance area, together with the coordination of ship traffic through the intervention area which also includes the organisation of interventions.

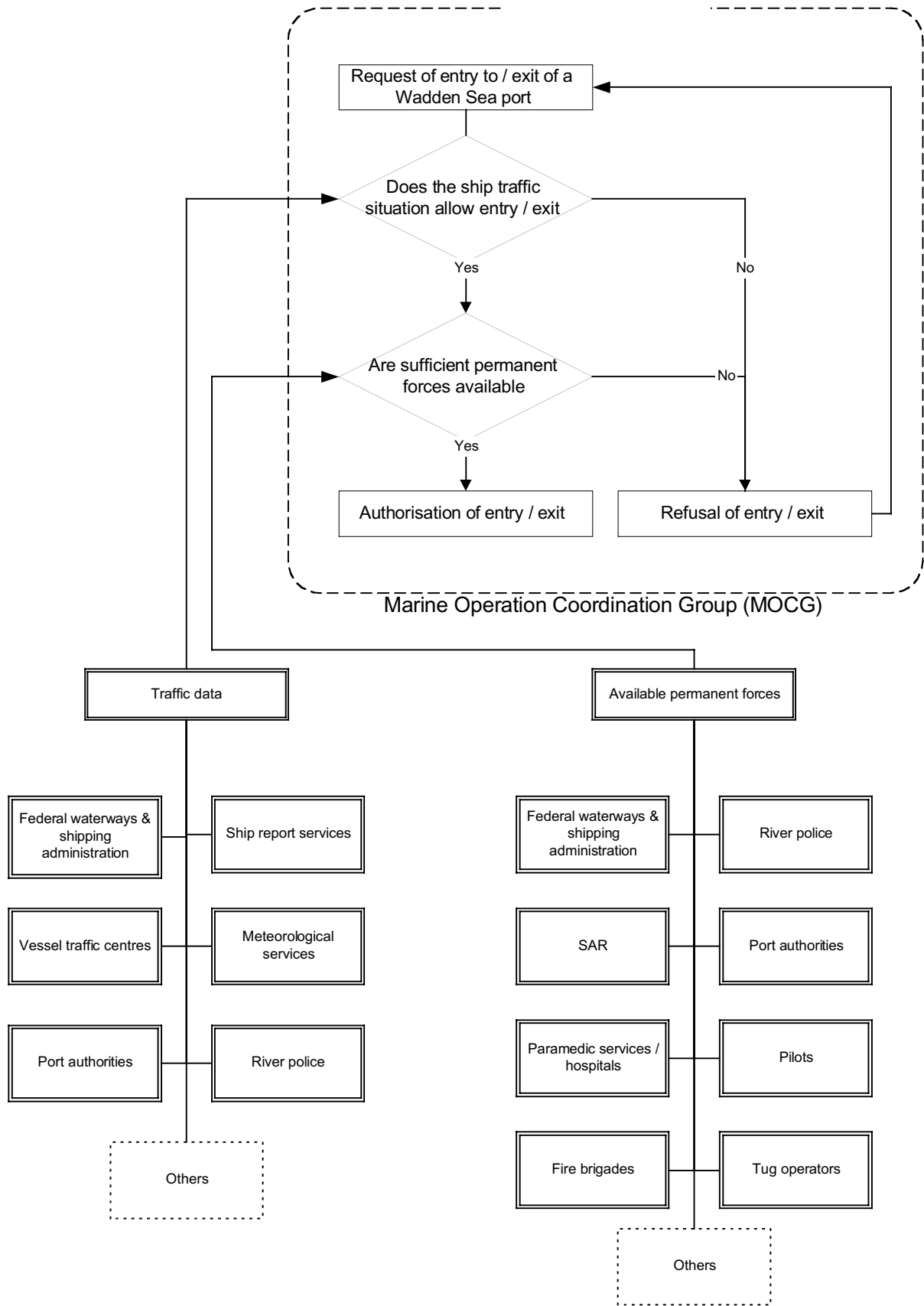


Figure 3: Organisation scheme for the operations management in the PSSA Control Centre

3. Information Log File

Data regarding all ships sailing in the surveillance area will be collected in a continuously updated information log file, that has yet to be developed. It will be located in the PSSA Control Centre.

The information in this file includes among other things the data described in table 2. The information log file is maintained continuously and can be accessed via a password at any time by all authorities, organisations and companies responsible for the protection of the PSSA. One important basis for this information data would be the database EQUASIS that can be found in the Internet since May 2000 under the address www.equasis.org. The information log file of the PSSA, however, includes additional data (see table 2).

PSSA information log file	Found in EQUASIS
IMO number, call sign and name of ship	Yes
Main dimensions, type	Yes
Cargo	No
Special features e.g. Single/Double-Hull, "Lightweight construction"	No
Additional sources of information e.g. constructing shipyard/construction plans/ emergency plans/fire prevention plans	No
Results/Claims of port State controls	Yes
Particular events (see section "Surveillance Area")	No
Contact e.g. Owner*, operator* (=ship owner), insurance*, owner of cargo, Charterer, (if applicable), agent, classification society*	Partly (only those marked with *)

Table 2: Comparison of the suggested PSSA information log file with the EQUASIS database

It could be possible, after the question of data protection is settled, to publish a "cleaned" version of the information log file – like a certificate for the ship owner – via EQUASIS for example. Thus, the ship owner can prove the reliability of his ship to potential customers. The positive effect of such an action would be that the efforts by the shipping business for safe ship traffic near the PSSA would be effectively supported. For the shipping business, however, a certificate could facilitate quality management.

4. Acceptance of Pilotage

Pilots assist the captain with their knowledge of the area when navigating through difficult i.e. narrow, highly frequented, shallow or continuously changing waters. The task of the pilot, however, is solely to advise the captain. The responsibility for the ship still lies with the captain. Pilots can be divided by their area of operation into; deep sea or North Sea, sea, river, channel or harbour pilots. The deep sea or North Sea pilot comes on board either in a European port or via a pilot boat in the English Channel and pilots the ship until the seapilot takes over (see table 3). The harbour pilot takes over the ship from the seapilot (on the rivers Elbe and Weser from the riverpilot) and assists the captain until the ship is moored safely at its berth. On ships which enter a harbour without seapilot or riverpilot e.g. Esbjerg or Den Helder, the North Sea pilot is of assistance until the respective pilot takes over.

Area	Ems	Jade	Weser	Elbe
Seapilot	Light-buoy "GW/TG" up to Papenburg	Light-vessel "German Bight" up to harbour entrance Wilhelmshaven	Light-vessel "German Bight" up to Bremerhaven (mouth of the river Geeste)	Light-vessel "German Bight" up to Brunsbüttel
Riverpilot	-	-	Bremerhaven (mouth of the river Geeste) up to harbour entrance Bremen or Elsflëth	Brunsbüttel up to harbour entrance Hamburg

Table 3: Division of pilots when heading for the German North Sea ports (Pilotage Act 1987)

The presence of a pilot on board is an important safety component in the protection of a PSSA. The pilot does not only assist the captain with his navigational knowledge of the area during the passage through the PSSA, but can also facilitate the communication between the captain and the local Vessel Traffic Centre.

The geographical position of the Wadden Sea harbours shows how important pilotage is to safety. Pilotage should be made compulsory beyond the existing guidelines according to a risk study that has yet to be realised. The obligation to accept pilotage will affect both the ships entering and leaving PSSA harbours and ships just passing the PSSA area.

The advantage of such a measure is, that the pilot on board a ship can support the accident management of the captain and operations management in case of an accident with his knowledge and can therefore ensure that suitable actions are started and carried out in time. The costs arising from such measures of approx. 2,- Euro/sea mile are relatively low in relation to their benefit (table 4) and are almost independent from the size of the ship.

	Cherbourg	Le Havre	Antwerp	Rotterdam	Emden	Elbe/Weser	Skaw
Cherbourg		374 Euro	563 Euro	683 Euro	908 Euro	982 Euro	1,314 Euro
Le Havre	825 HFI		538 Euro	626 Euro	860 Euro	939 Euro	1,221 Euro
Antwerp	1240 HFI	1185 HFI		374 Euro	520 Euro	642 Euro	982 Euro
Rotterdam	1505 HFI	1380 HFI	825 HFI		497 Euro	613 Euro	948 Euro
Emden	2000 HFI	1895 HFI	1145 HFI	1095 HFI		374 Euro	735 Euro
Elbe/Weser	2165 HFI	2070 HFI	1415 HFI	1350 HFI	825 HFI		735 Euro
Skaw	2895 HFI	2690 HFI	2465 HFI	2090 HFI	1620 HFI	1620 HFI	

Table 4: Costs for North Sea pilots until the relevant area is entered (in Dutch Gulder (HFI) and Euro; Dirkzwager 1999)

This coordination function for the accident management is a task which was not part of the piloting work before, even if it was done more than once by the pilots working on board at the time an emergency occurred. A successful coordination requires the pilots to have some experience about accident management. Today, such experience does not yet exist. This experience has to be given to the pilots and founded during practices together with the operations management and the intervention team.

The captains of ships with peccs would have to acquire and prove this additional knowledge before the Pilot Exception Certificate (PEC) is granted. Here a good point would be an obligation to participate regularly in practices would be useful which could take place e.g. in ship handling simulators.

Detailed information about the organisation of piloting in the vicinity of ports is only available for Germany at the moment, which will be discussed in the following section. For the German North Sea ports, however, the pilots are of significant importance for the safety of ship traffic considering their size, their location directly next to the PSSA Wadden Sea and the very difficult conditions at the mouths of the rivers Ems, Jade, Weser and Elbe.

The outlines of the law concerning pilotage are stated down in the German Pilotage Act (1997; SeeLG). According to this law, a pilot apprentice must now spend at least two years at sea with the certificate as "master mariner" before he receives an appointment as pilot after a 6-months-period of further education in the relevant area. After that, his work is a "*non-commercial occupation on a freelance basis*" (§ 3 SeeLG). „*Setup and maintenance of pilotage as well as the supervision of pilotage are subject to the authority of the Federation*" (§ 1 SeeLG).

The ships passing through the area have to pay pilotage fees for the provision of piloting facilities. If a ship accepts a pilot, it has to pay a pilotage fee for this service: „*The amount of the pilotage fees has to be calculated in a way, that they cover at the public expenses for pilotage purposes; the public interest in supporting the traffic has to be considered. The amount of the pilotage dues has to be calculated in such a way that pilots with normal duties receive a salary and a provision in accordance with their education and responsibility*" (§ 45 SeeLG).

The amount of these pilotage dues and fees is determined by the federal minister of transport ("Bundesverkehrsministerium" BMVBW). Figure 4 illustrates the piloting dues for certain ports (Hamburg/Bremerhaven) or port areas (Rotterdam) by means of two ship examples.

Under the pressure of the harbour business and some ship owners, the German government tried during the last few years to de-regulate pilotage to "improve the competitiveness of the German sea ports" (BMVBW 1999). The aim of these efforts was, and still is, to reduce the costs for piloting which according to the shipping and harbour business "is charging the shipping industry with overall costs of approx. DM 220 million a year" (ZVDS 2000). The pilots themselves do not see the competitiveness of the ports endangered by the pilotage dues since they are in some cases significantly lower than in other North Sea ports (see figure 4).

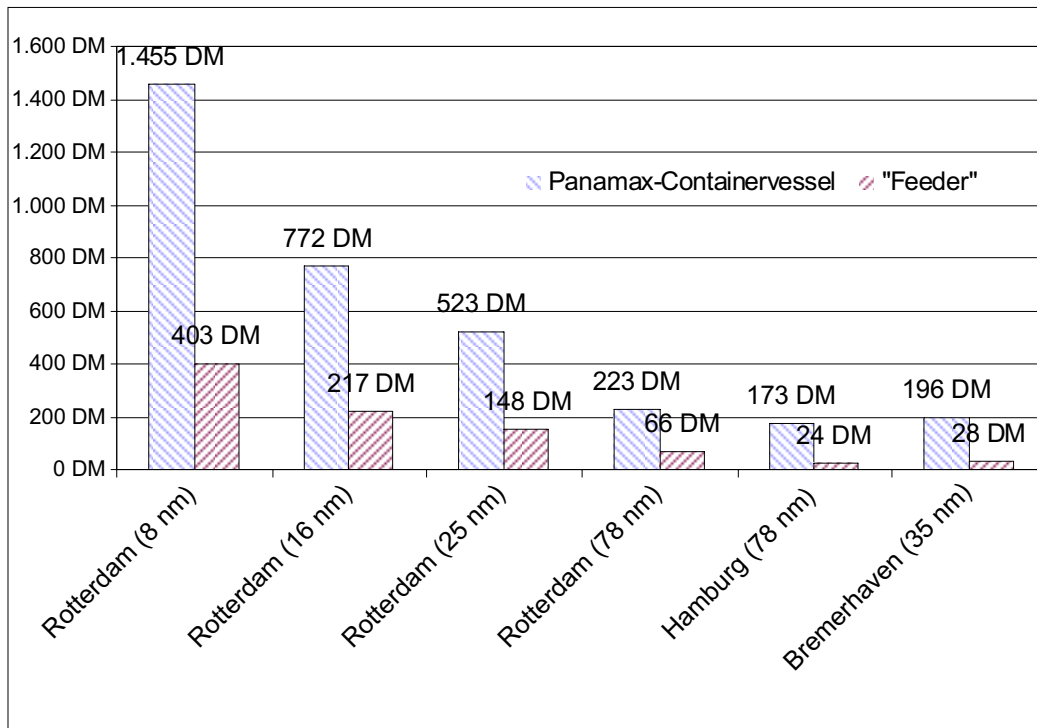


Figure 4: Comparison of the piloting dues per sea mile in relation to the area length (BSHL 2000)

The consequences of the de-regulating measures which are currently developed by the federal minister of transport for the safety of the Wadden Sea, today, cannot be entirely foreseen. The fact that the obligation to accept pilotage will be weakened even further, can be deduced from an answer of the German government to a request in the German "Bundestag". An extract from the response: „The obligation to accept a pilot and the requirements necessary to be excused from this obligation depend on a system which is graded by the size of the ship and the danger potential. Following this system, all ships of a particular minimum size according to each area are obligated to accept a pilot. With increasing ship sizes, the possibility of exemption from this obligation is coupled with growing demands on the captain concerning the knowledge of the area and the number of passages, which have to be undertaken up front with pilot assistance. Ships with a particularly dangerous cargo e.g. tankers can only be exempted from piloting

obligation under strict conditions and when their length is less than 90m. This ensures that these ships are lead through German pilotage areas navigationally safely and by qualified staff and experienced pilots only.

Along with the gradual reform of pilotage, it is currently checked if the criteria for the piloting obligation can be properly amended or modified. One point of this could be e.g. to take into consideration the relationship of ship's length and width, meaning the operating area of the ship, instead of only the ships length, as before. Furthermore, it is considered to add also the draught as a criteria for piloting obligation." (Bundestag 2000)

The current version of this system which is graded by "ship size and danger potential" does not take into consideration the danger for the environment coming from every single ship from their transported working materials alone. In particular, ships which are not tankers but have a dangerous cargo, can pose a significantly greater danger when the mixing of different cargos, even in small amounts, takes place.

Pilotage by qualified and motivated staff is essential for the effective protection of the PSSA Wadden Sea. All measures which have been thought out, initiated or already taken to reduce pilotage cost must now be checked to see if they reduce or jeopardise these efforts and cancelled, if necessary.

5. Escorting

One measure to increase the safety of ship traffic is to escort the ships. Depending on the width of the shipping channel or the sea area and the danger potential of a ship, passive or active escorting will be carried out. The basis of judgement for the danger potential, apart from to the type and amount of cargo and other factors, is the suggested information log file (see section 3).

On the basis of the "Oil Pollution Act" of 1990 (= OPA 90) active escorting of tankers is already compulsory in some US areas like the Prince William Sound (Alaska). In the UK, the emergency towing vessel chartered by the British Marine and Coastguard Agency (MCA) on demand, passively escorts ships drifting with an engine or rudder failure that have to pass the Street of Dover.

As a PSSA Wadden Sea protection measure, all ships with a high potential of danger must be escorted either actively or passively. The MOCG decide upon the type and extent of this escorting from case to case according to public decision-making criteria.

Criteria are the size of the ship, cargo, technical equipment (redundant drive and rudder unit, take-home drive, emergency towing arrangement), speed, unusual features, and also strength and direction of the wind.

5.1 Passive Escorting

During passive escorting a tug accompanies a ship without, unlike active escorting, a towing connection between the two ships. The towing connection is established only when necessary i.e. if the tug is called for help. The mooring between the two ships can take up to half an hour, in some cases even longer, depending on the weather, the knowledge and experience of the crews and the conditions in the area. Therefore, passive escorting only makes sense as a safety concept in sea areas where there is enough time left in an emergency to establish the towing connection. For passive escorting, the tug does not have to be in close vicinity of the ship. It only has to be on site in time if an accident occurs. That is why, passive escorting can also be done by an "on call" tug if the risks have been considered properly.

One advantage of passive escorting is that the emergency towing vessel can provide its service at high speeds and in all weather conditions. The accompanied ship does not have to reduce its speed. However, passive escorting can only be carried out by those tugs that have both the required towing capacity and speed. The sea assistance tugs available in the North Sea today have a towing capacity of max. 70t Bollard pull and a relatively low speed of about 14 knots. Therefore, their use is limited and only possible in good weather.

A much better choice for passive escorting are powerful salvage tugs like the emergency towing vessels "Waker" (120t, 15 knots), chartered by the Dutch Government, and the "Oceanic" (180t, 19 knots), chartered by the German government. One additional advantage of these tugs is that they have sufficient quarters to accommodate a rescue team of experienced seamen. Such a team can be brought on board a damaged vessel to support the crew in establishing the towing connection.

The number of ships suitable for passive escorting is limited. Worldwide, not a single salvage tug was built between 1980 and 1998 for civil use: in Europe, the last salvage tug was put into service in 1979. In 1998, the "Koyo Maru" was built in Japan. It was the first salvage tug to be built after almost 20 years (Belton 1999). Towing actions today are carried out by "anchor

handling tug supply vessels" (AHTSVs), which in fact have a high towing capacity compared with salvage tugs, especially in bad weather, but at a significantly lower speed.

For passive escorting in every weather, such emergency towing vessels would be suitable as they are designed particularly for these tasks and are very different from the usual salvage tug. Previous salvage tugs were and are designed in a way that they can work independently at sea for as long as possible. They need both provisions for a big action radius and extensive equipment (i.e. material and tools) for reparation work on the damaged vessel at sea. This would not be necessary for a new type of emergency towing vessel, since they operate near the coast. A high operation speed in bad weather, redundancies for drive and towing winches as well as quickly available equipment on hand with tools and material is essential for a emergency towing vessel (Wibel 2000). The first result of considerations for the development of a special ship (see figure 5) was presented to the public in September 2000 on the SMM exhibition in Hamburg by two German towing and salvage companies. This "safety ship" is supposed to be equipped with a Bollard pull of more than 180t and a speed of 18 to 19 knots; it is extremely maneuverable and due to its changeable draught it can be used for towing actions in bad weather as operations in shallow waters as well (Mordhorst 2000).

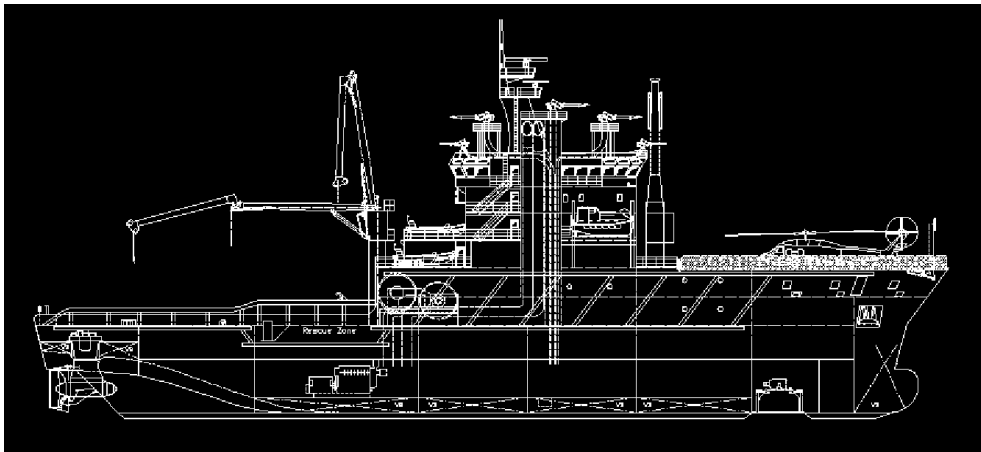


Figure 5: Draft plan of an ERV (T&S 2000)

5.2 Active Escorting

During active escorting, unlike during passive escorting, a tug accompanies a ship after a towing connection has been established between both ships. In the case of an accident, the accompanying tug can intervene on the spot, assist or prevent changes to the ship's course and reduce the ship's speed or even tow it backwards.

The usual propeller tugs can only go up to 4 knots for active escorting, as it is dangerous for the tugs to go faster. Modern tugs with "Schottel" or "Voith-Schneider" drives are also suitable for speeds of more than 4 knots. The actual maximum speed, however, depends on the hull velocity and the freeboard of the respective tugboat. *"But ASDs and Voith Schneider and twin azimuthing tractors (VSTs and TATs) make excellent active escorts. As a rule of thumb, ASDs are better at taking the way off ships and VS tractors are better at turning them. This does not*

mean that ASDs can not turn ships and VS can not stop them; but each has characteristics which, at speeds above about eight knots, makes the ASD more effective at stopping and the VS tractor at turning the escorted ship" (Belton 1999).

The obligation of escorting tankers has resulted in the development of a special type of tug for this task. The main differences between this type of the harbour and sea tugs, are a high hull and pec speed, high freeboard and a high towing capacity in relation to its size (table 5). In 1992, the first active escort tug, namely the "Loop Responder", was put into service. Today many of these special ships are in operation.

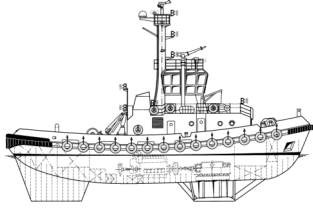
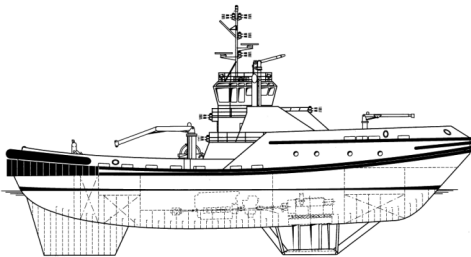
		
Task	Harbour and sea assistance	Active escorting
Area of operation	European ports	Prince William Sound (Alaska)
Dimensions [length overall x W x D]	28 x 9 x 4.6m	46.6 x 14.6 x 7.3m
Speed	12.6kn	15.7kn
Bollard pull	35t	95.5t
Power	2 x 1,270 kW	2 x 3,460 kW

Table 5: Comparison of existing sample assistance and escort tugs

There are no tugs in the North Sea ports yet, which can be used for active escorting, like the special ships that operate in Alaska and other oil ports, found mainly in the US. The costs for an active escort would depend mainly on the duration of the action which again depends on the escorting distance and the possible pec speed. As there is no data available about chartering fees for escort tugboats, the cost estimates in table 6 are based on the chartering fees for sea assistance tugs in the German North Sea ports of DM 880,-/hour. The distances refer to the "Lotsenversetzposition" in the respective area.

From	To	Distance	Fee for 10 kn	Fee for 15 kn
German Bight	Wilhelmshaven	42 sm	DM 3.690,-	DM 2.470,-
Elbe	Cuxhaven	24 sm	DM 2.110,-	DM 1.410,-
Elbe	Hamburg	78 sm	DM 6.860,-	DM 4.580,-
Weser	Bremerhaven	35 sm	DM 3.080,-	DM 2.050,-

Table 6: Cost estimates for active escorting

6. Emergency towing arrangement

All ships in the PSSA Wadden Sea must be suitably equipped so that they can be towed away quickly in the case of an emergency. As long as ships are not already subject to SOLAS equipment regulations, at least an emergency towing penant (insurance wire) must be ready at the bow and stern. However, the ultimate goal should be that all ships sailing in the PSSA are equipped with a SOLAS emergency towing arrangement.

Since 1 January 1999, tankers with a minimum of 20,000tdw at bow and stern must be equipped with an emergency towing arrangement according to the international SOLAS regulations 3-4. Non-tankers, however, are excluded from this regulation. In the case of an accident, the emergency towing arrangement significantly facilitates the establishing of a towing connection. The tug can also take the eye of the emergency towing wire in bad weather by means of the attached chaser on board and shackle its towing wire to it.

By means of an emergency towing arrangement, even inexperienced seamen can establish a towing connection. Practices in the German Bight have shown, that even in a storm this procedure can be carried out in no more than 15 minutes and a tanker can be towed away. Therefore, an emergency towing arrangement is a big safety advantage.

The fact that the IMO is currently discussing a general obligation for all ships to have one and not only tankers over 20,000tdw shows the significance of an emergency towing arrangement as a safety measure on board. According to the presented proposal, such an emergency towing arrangement could be compulsory for the PSSA Wadden Sea even before the IMO introduce it at a worldwide level.

One of the original forms of an emergency towing arrangement which does not include the more strict SOLAS regulations for tankers is the towing penant (insurance wire) which many ships have installed (see figure 6). In the case of an emergency, this towing wire (according to the size of the ship) is moored to the ship by the crew of the damaged vessel and passed to the tug. The advantage of this wire is that the tug does not have to give its own towing gear to the damaged vessel. A subsequent disadvantage to the cost of this tug is that the use of such a wire requires a sufficient number of experienced seamen. In October 1998 it took five seamen dropped by helicopter onto the damaged "Pallas", which was burning and drifting without fuel supply or crew during a storm of 9 - 10 Bft, two hours to moor the towing penant (GAUSS 1999).

The anchoring gear of a ship also provides a means of establishing a towing connection. The checking of the anchor requires a very high level of experience and takes so much time that this procedure is no alternative to the emergency towing arrangement (Hashagen 2000).

During the so-called "chasing", a special ring is fastened around the anchor chain and pulled up to the anchor. This procedure is also carried out during the moving of anchors of offshore platforms in bad weather or rough seas. The establishment of a towing connection is possible in principle but the application of this procedure as an alternative to an emergency towing arrangement will fail without the development of the so-far not existing "chasers" needed for such operations (Hashagen 2000). The emergency wire, mentioned in recommendation no. 16 of the Grobecker Commission (Grobecker 2000), is no alternative to the emergency towing arrangement. This emergency wire is compulsory on tankers in port and consists of one wire both at bow and stern on the water side that almost reaches the waterline. In an emergency, the assistance tugs can tow the tanker away from the pier without any help from the crew. It is not a prudent idea to keep this wire at sea permanently, as it could accidentally hook onto the anchor. Furthermore, the wire is permanently immersed in water and is therefore subject to heavy wear

and experience shows that it would then break if used as emergency towing wire. It is possible that the commission accidentally used the term "emergency wire" instead of "insurance wire" in its recommendation.

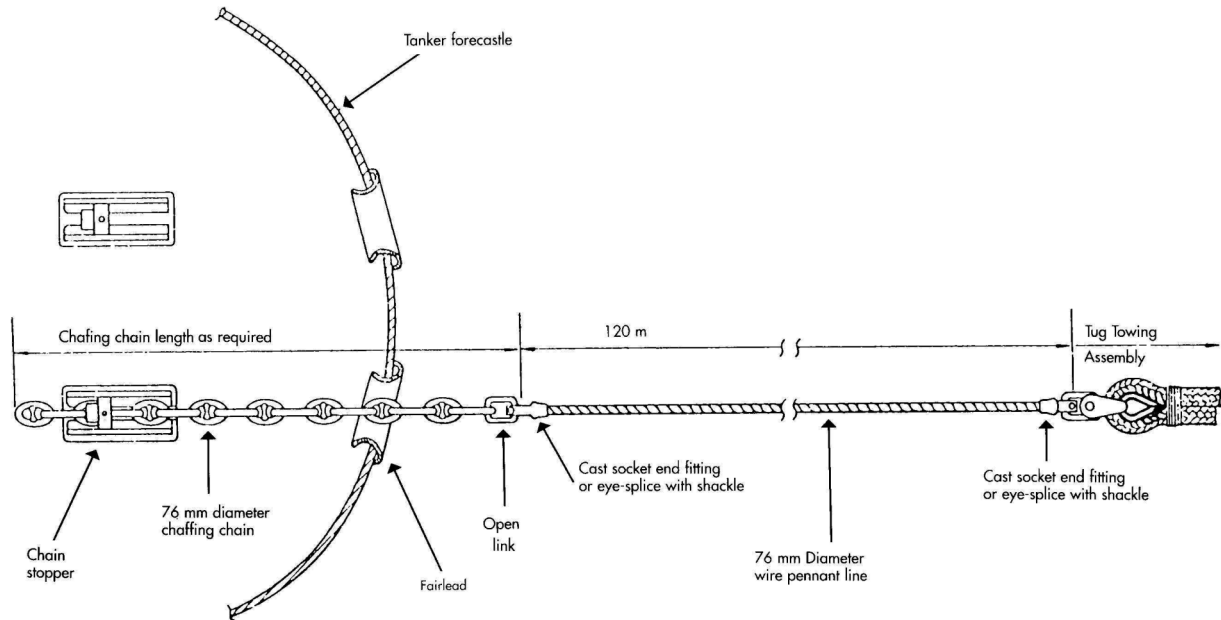


Figure 6: Example of the positioning of a towing pennant or insurance wire

For tankers of more than 20,000 tdw the emergency towing arrangements recommended by SOLAS are the best means of establishing in a secure connection to the damaged vessel. To provide a ship with such equipment is not always easy due to the already existing equipment on board. Various work is necessary such as the welding of foundations to the ship's deck or the reinforcement of the deck. The crew is often not equipped to carry out this work or does not have enough experience. A towing pennant should be stored on every ship. Until the compulsory fitting of all ships passing through the PSSA Wadden Sea with an emergency towing arrangement according to SOLAS is put into action. Towing pennants can be produced with little effort on land, then checked and delivered to the ship before it enters the PSSA Wadden Sea.

7. Safe Haven

The establishment of various Safe Haven in the PSSA Wadden Sea is essential.

A "Safe Haven" is a harbour or berth where a damaged vessel carrying dangerous cargo can be moored to existing equipment and subsequently decontaminated and disposed of. The following operational, constructional and technical requirements have to be considered when choosing a "Safe Haven":

- Access with enough draught for seagoing vessels,
- Existing fire fighting appliances with the necessary supply and means of disposal. The water and foam, used in extinguishing the fire,
- Existing equipment for protection and disposal as well as according logistics,
- Greatest possible distance from residential and industrial areas,
- Convenient traffic network (e.g. roads, railway nearby),
- Not situated in ecologically sensitive areas,
- Possibly situated directly on the coast.

Already in 1994, the German expert group "Schadstoffunfallbekämpfung" arrived in its final report at the following conclusion: "Today the expert group does not know about any harbour in Germany with the described operational, constructional and technical features". This statement can be transferred to all Wadden Sea nations.

Safe Havens can be established in the following ways:

1. Stationary. All required equipment and tools – e.g. pier, protective and disposal equipment – are permanently available and exist in sufficient number. The advantage of these ports is that they are ready for use at any time and provide maximum safety. Continuous safety checks and measures of environmental conditions give a picture of the equipment under normal operation which allows for conclusions according to emergency concepts.

2. Partly equipped. All required equipment and tools are only partially available and have to be supplied on demand. These ports require prepared pier and suitable mobile appliances but have to be fully equipped in an emergency by the supply of tools. This alternative is more economical than a stationary Safe Haven but needs some time for preparation in an emergency.

3. On demand. The pier (or mooring or roadstead) is equipped as a Safe Haven by supplying the according equipment and tools when needed. This type of Safe Haven requires little constructional preparation but demands a highly detailed as well as tried and tested plane. Such a Safe Haven could for example consist of a double row of dolphins that are positioned on a sheltered roadstead where the damaged vessel and the barges (pontoons) are moored. The barges will be located in a nearby harbour and then transported to the dolphin row when needed.

At the North Sea coast and the river mouths of Ems, Jade, Weser and Elbe, there are a lot of ports where dangerous cargo is moved. Transportation ranges from the ferry piers which supply the islands of West, East and North Frisia, to the terminals for the chemical industry or the loading pier for weapons and ammunition.

Not a single Safe Haven exists today throughout the area of the trilateral Wadden Sea that meets the experts' requirements although the need of Safe Havens has been recognized over 15 years ago. In 1994 the German expert group "Schadstoffunfallbekämpfung" (SUBS 1994) found that *„in Germany (...) until today no legal decisions were made according to the designation or summary of the rights of the Federation and the States“* has not changed much since. In Germany, the entering or towing away of a damaged vessel in a Federal State harbour or a Safe Haven of the Federation can only be ordered by the responsible operating staff, if an emergency by higher law occurs or on the basis of the emergency laws. This order, however, can only be given during actual and acute dangers or considerable damage to people, animals, important common goods or the environment. Therefore it is not possible to enter a Safe Haven as a precaution to avoid potential danger. The damage caused by the tanker "Erika" and the bulk carrier "Treasure" could very likely have been avoided by entering a "Safe Haven".

M/T "Erika": On 11 December 1999, the captain of the tanker "Erika" made an urgent request to port authorities of Nantes-St.-Nazaire to enter the port because of a crack in the hull with resulting in loss of cargo and listing. This request was denied on the grounds of the potential danger of oil pollution in the river Loire. The captain was instead advised to enter another port for an investigation (THB 1999). By the next day, the tanker travelling under The Maltese flag broke into two parts in the Biskaya and a significant part of the 30,000t cargo of heavy oil poured out and polluted more than 400km of the coast.

M/S "Treasure": On 23 June 2000, the bulk carrier "Treasure" sank about 10 sea miles off Cape Town, after the sea tore a hole of approx. 17 x 10m in the hull. The South African authorities at first allowed the carrier to anchor on coast for checks and repairs, but then ordered the tanker to be towed away to open sea. The captain of the tanker was denied entrance to the port of Saldanha Bay as a Safe Haven. According to the classification society, the sinking of the "Treasure" could have been avoided by a repairs in Saldanha Bay (Associated Press 2000).

The decision about which havens or roadsteads in the Wadden Sea area could be prepared for which ship sizes and cargo types must be made the subject of a detailed study carried out by experts from the Wadden Sea states taking into account risks, danger potentials and protection requirements. Furthermore, at least one port in the close vicinity of the Wadden Sea, for example Rotterdam, must be set up as a Safe Haven for damaged vessels of any size and cargo type.

8. Emergency Response Vessels

All European governments provide emergency towing capacities to protect their coasts. In 1994, a working group called *Working Group for Emergency towing (ETOW)* of the contracting parties of the Bonn Agreement defined the tasks of "Emergency Towing Vessels" (ETVs) as follows:

Role of Emergency Towing Vessels (ETVs)

The primary role of any ETV is prevention of pollution or environmental damage occurring as a result of vessel breakdown or mechanical failure. The prime example may be quoted as a disabled laden tanker driving ashore in bad weather and subsequently losing part or all its cargo.

Secondary Roles may be defined and delegated by individual Contracting Parties, and may include all or some of the following responsibilities.

Suggested Secondary Roles

- a) *Counter Pollution Duties*
- b) *Search and Rescue Duties*
- c) *Guardship Duties*
- d) *Surveillance and TSS Identification Duties*
- e) *Customs/Police/Fishing/Law Enforcement/Military*
- f) *Assistance to other Governmental maritime authorities*

Availability

Individual needs and policies will define ETV availability. Consideration should be given to the possibility of ETVs being employed in other duties, perhaps to off-set costs, but equally ETV managers should consider whether such deployment would compromise the prime requirement.

Moreover in the case chartered ETVs, it may be advisable to ensure the availability of a replacement vessel at the shortest possible notice should the ETV become unserviceable for any reason.

The Bonn Parties use either salvage tugs or anchor handling tugs as ETVs which have been modified accordingly. In the Netherlands, the salvage tug "Waker" which is run by a private community of shipowners, was set up in 1995 as an ETV. The German government uses a salvage tug all the year round for emergency towing operations which is chartered since 1996 from a shipowner for this purpose. They also have two multi-purpose vessels developed for accidents with harmful substances and other tasks. The Danish government did not think it necessary to provide ETVs, since according to them, private tugs, offshore supply vessels and anchor handling tugs exist in almost all Danish North Sea ports.

With the exception of the two sister ships "Abeille Flandre" and "Abeille Languedoc", chartered by the French government as salvage tugs, all ETVs are entirely different. The reason for this diversity is, that none of the existing ETVs were designed, developed or built for this type of operation but instead existing ships were modified for this task. The multi-purpose vessel "Neuwerk", developed and put into service in 1998 by the German Water and Shipping Authority is currently newest and modern ETV. It is specialised in responding to accidents involving harmful substances. The advantage, but also the disadvantage, of such diversity is, that every ship has different strengths and weaknesses.

The principal and secondary tasks of an ETV were proposed by the ETOW working group. According to rescue experts the development of a new type of ship, called "emergency response vessel", is necessary (see section 5.1: "Passive Escorting" for a description).

For the protection of PSSA Wadden Sea, several "Emergency Response Vessels (ERV)" are necessary, which are spaced at regular intervals in the intervention zone and are on permanent stand-by. These ERVs, regardless of their shipyard country, should be constructed in the same way so as to allow an exchange of entire ship crews and individual crew members between the countries. Moreover, the provision of a further ERV is recommendable to be used for replacement in case of repairs or maintenance work, for training purposes and as a supplement if one of the other ERVs is involved in an emergency operation.

The locations of these ERVs would be identical to the positions of the tugs currently stationed in northern Europe (at the Wadden Sea "Waker" and "Oceanic"), with an additional vessel in Esbjerg (Denmark, see figure 7). Locations for further ERVs would be the Humber estuary (Great Britain) and Stavanger (Norway).

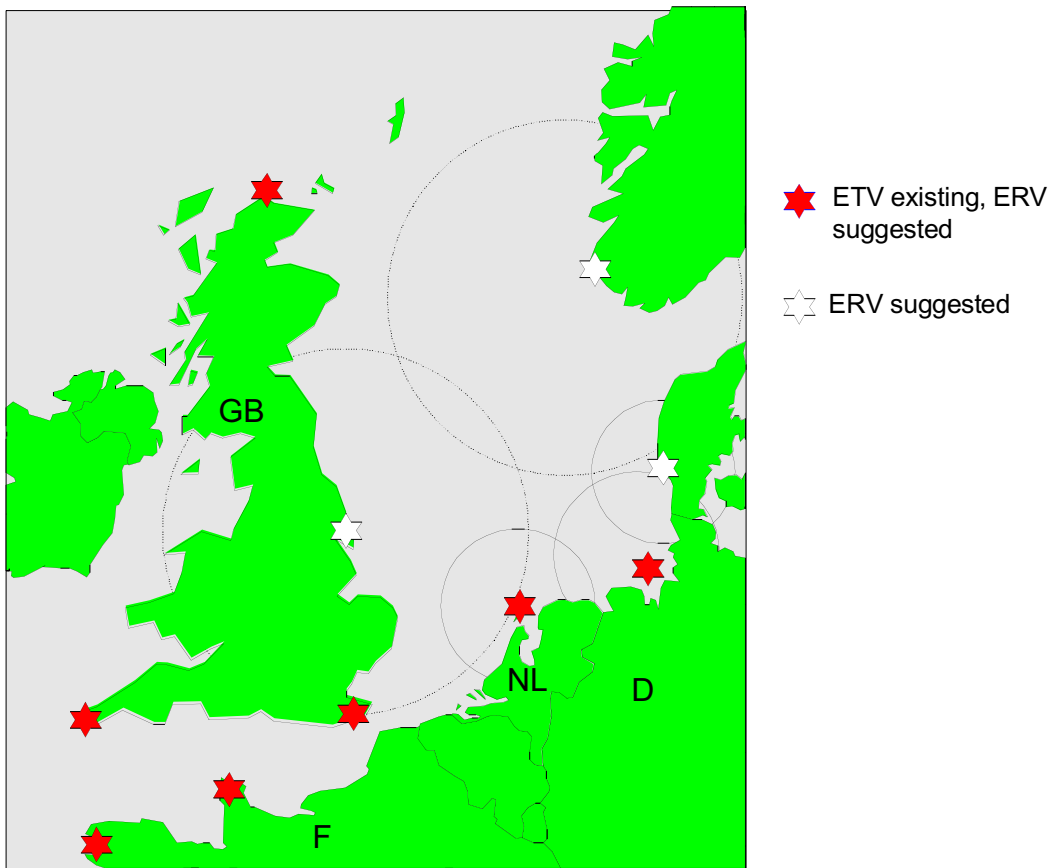


Figure 7: Proposed locations for ERVs (see also figure 5)

9. Transfer of Shipping Routes

The current agreement on defined shipping routes outside the trilateral Wadden Sea (off the Netherlands and Lower Saxony/Hamburg) is the result of nautical considerations regarding the safety of the ship traffic (see figure 8). Shipping routes that also take into consideration the protection of the Wadden Sea and the coast must be located further seawards than today and have to, among other factors, also consider the directions/strengths of wind and current, the sailing and drift speed (see figure 9).

A final transfer of the shipping routes can only be taken by experts after a thorough consideration of the various risk factors. The risk potential of the transported cargo, the availability of tugs and emergency towing arrangement and other technical factors have to be taken into special consideration. One result of these considerations can also be that other shipping routes are established beyond the current number of fixed shipping routes. The introduction of the dynamic routing concept could also be possible, whereby ships would have their routes dictated according to the ships` risk potential.

Until the final discussion and the agreement by the Trilateral Wadden Sea Conference, the currently existing shipping routes off the Dutch and Lower Saxonian coast must be located at least five sea miles further seaward.

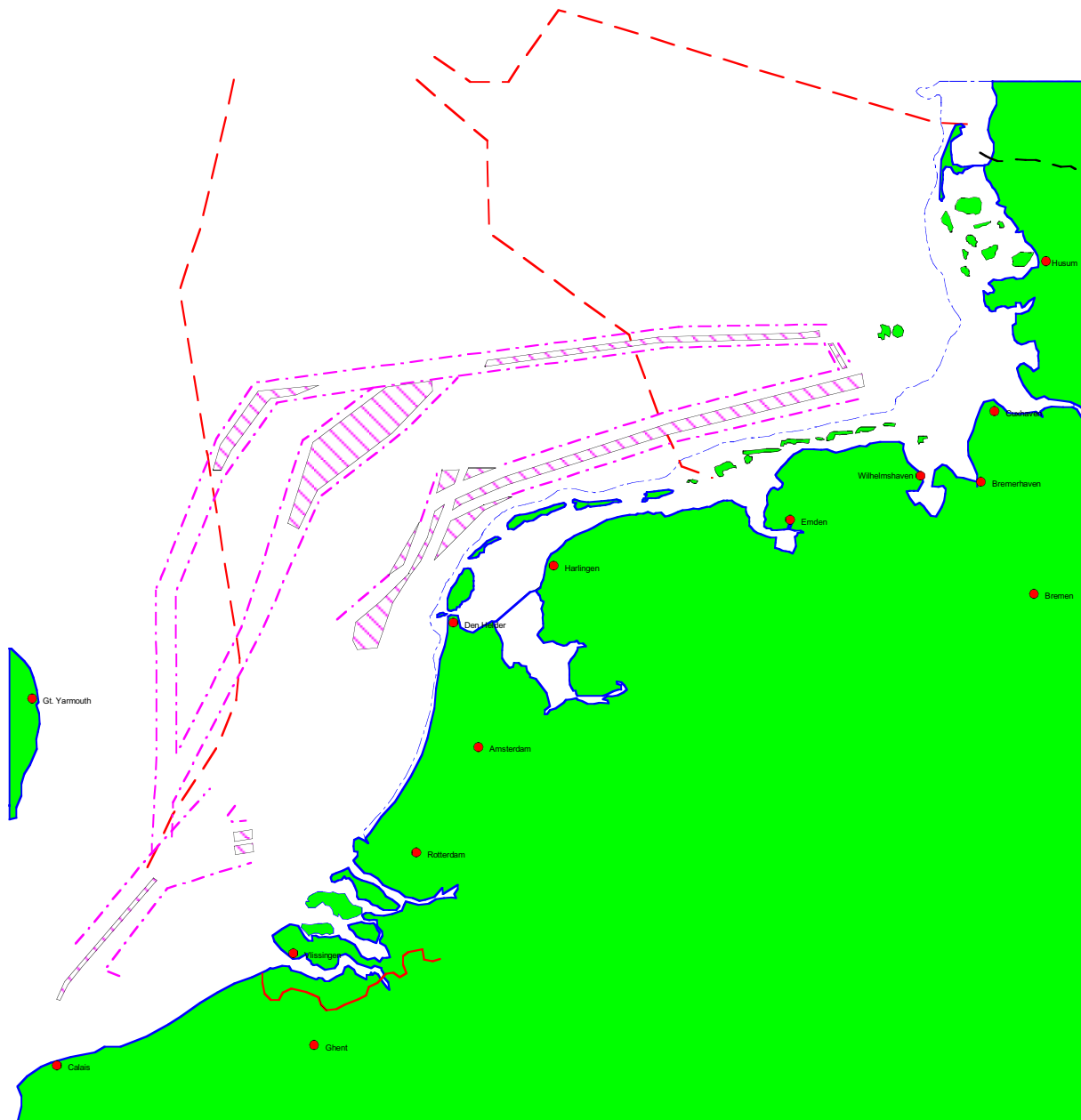


Figure 8: Current layout of the shipping routes in the southern part of the North Sea

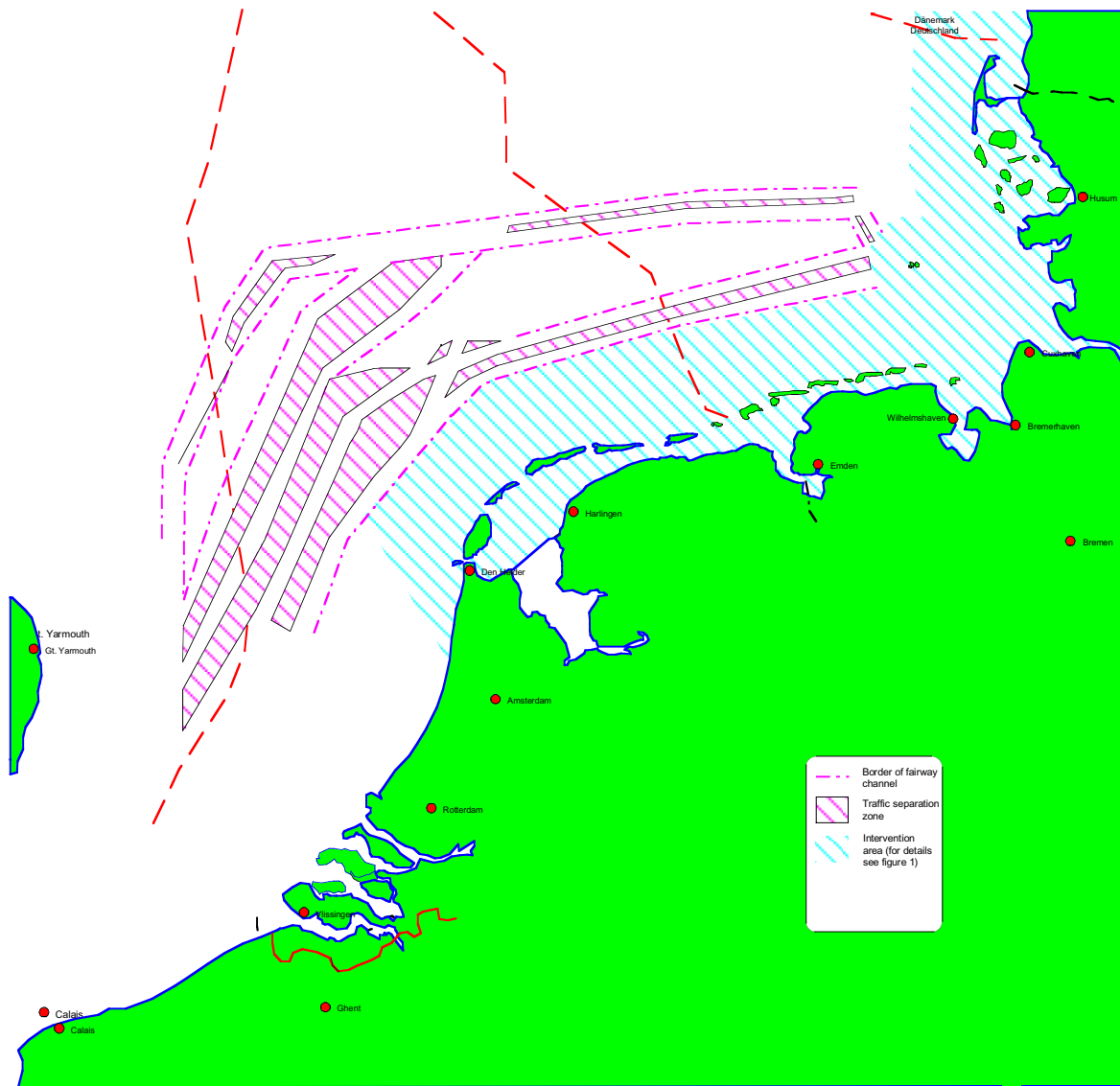


Figure 9: Proposal for a transfer of the shipping routes

Appendix 1: Previous Trilateral Agreements concerning PSSA

In 1994 and 1997 the Ministers responsible for the protection of the Wadden Sea Area of Denmark, the Federal Republic of Germany and the Netherlands met at the 7th and the 8th Trilateral Governmental Conferences on the Protection of the Wadden Sea. At these Conferences the following decisions concerning a possible PSSA were taken:

in the Leeuwarden Declaration (1994):

64. Being aware of the current discussion within the IMO about environmental problems caused by shipping, in order to improve the protection of the marine environment through various measures, including the establishment of Particularly Sensitive Areas (PSAs), to take the following steps:

64.1. to study and consider a proposal to the IMO to designate the Wadden Sea and an adjacent zone as Particularly Sensitive Area;

64.2. to support the initiatives in the IMO to make routing measures and reporting systems mandatory for all ships or for certain categories of ships carrying dangerous or harmful cargoes; [...]

in the Stade Declaration (1997):

§ 23 The Ministers NOTE the progress being made within the International Maritime Organisation (IMO) to reduce the environmental impact of shipping on sensitive sea areas like the Wadden Sea, especially with the mandatory routing measures for oil- and chemical tankers off the Dutch and German Wadden Sea coast.

§ 24 The Ministers NOTE that all relevant measures have been taken inside the Wadden Sea Area or in the adjacent area according to the conditions for Particularly Sensitive Sea Areas (PSSAs) as required by the IMO.

§ 25 The Ministers ENDORSE a study on the possibilities for a proposal to the IMO to designate the Wadden Sea and an adjacent zone as Particularly Sensitive Sea Area (PSSA).

in the „Wadden Sea Plan“ (1997):

§ 2.1.3 With the aim of eliminating operational pollution and minimising accidental pollution, an information and guiding system for ships carrying hazardous substances will be established.

§ 2.1.4 Harbours bordering the Wadden Sea will have adequate facilities to handle all types of residues and wastes generated by ships to meet the requirements of the MARPOL Convention.

§ 2.1.5 To prevent spills of oil and hazardous substances to the aquatic environment and wildlife, activities aiming at improving enforcement (surveillance and prosecution) of agreed regulations and policies to combat illegal discharges will be continued.



IMO

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ASSEMBLY
21st session
Agenda item 11

A 21/Res.885
4 February 2000
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RESOLUTION A.885(21)
adopted on 25 November 1999

**PROCEDURES FOR THE IDENTIFICATION OF PARTICULARLY SENSITIVE SEA
AREAS AND THE ADOPTION OF ASSOCIATED PROTECTIVE MEASURES AND
AMENDMENTS TO THE GUIDELINES CONTAINED IN RESOLUTION A.720(17)**

THE ASSEMBLY,

RECALLING Article 15(j) of the Convention on the International Maritime Organization concerning the functions of the Assembly in relation to regulations and guidelines concerning maritime safety, the prevention and control of marine pollution from ships and other matters concerning the effect of shipping on the marine environment,

RECALLING ALSO resolution A.720(17) by which the Assembly adopted the Guidelines for the Designation of Special Areas and the Identification of Particularly Sensitive Sea Areas,

RECALLING FURTHER that the Assembly, at its seventeenth session, when adopting resolution A.720(17), requested the Marine Environment Protection Committee and the Maritime Safety Committee to keep the Guidelines under review,

RECOGNIZING the need to supplement the Guidelines in order to clarify the procedures for the identification of Particularly Sensitive Sea Areas and the adoption of associated protective measures, and to add the description of the new Particularly Sensitive Sea Area (Sabana-Camagüey Archipelago, Cuba),

HAVING CONSIDERED the recommendations made by the Marine Environment Protection Committee at its forty-third session and the Sub-Committee on Safety of Navigation at its forty-fifth session,

1. ADOPTS:

- (a) new procedures for the identification of Particularly Sensitive Sea Areas and the adoption of associated protective measures, which supersede the procedures contained in paragraphs 3.2 and 3.5 of the Annex to resolution A.720(17) as set out in Annex 1 to the present resolution; and

- (b) amendments to the Guidelines contained in resolution A.720(17) as set out in Annex 2 to the present resolution for the purpose of adding the description of the new Particularly Sensitive Sea Area (Sabana-Camagüey Archipelago, Cuba);
2. INVITES Governments to apply the new procedures when proposing a Particularly Sensitive Sea Area;
3. REQUESTS the Marine Environment Protection Committee and the Maritime Safety Committee to keep the Guidelines and the annexed procedures under review.

ANNEX 1

PROCEDURES FOR THE IDENTIFICATION OF PARTICULARLY SENSITIVE SEA AREAS AND THE ADOPTION OF ASSOCIATED PROTECTIVE MEASURES

1 OBJECTIVES

1.1 The purposes of these procedures for the identification of particularly sensitive sea areas (PSSAs) and the adoption of Associated Protective Measures are to:

- .1 set forth the practical steps necessary to implement chapter 3 of the Guidelines;
- .2 provide guidance to Member Governments in the formulation and submission of applications for identification of PSSAs and adoption of their necessary Associated Protective Measures;
- .3 ensure that in that process all interests - those of the coastal State, flag State, and the environmental and shipping communities - are thoroughly considered on the basis of relevant scientific, technical, economic, and environmental information regarding the area at risk of damage from international maritime activities and the protective measures to minimize that risk; and
- .4 provide for the assessment of such applications by IMO.

1.2 Identification of any PSSA and the adoption of Associated Protective Measures require consideration of three integral components: the particular environmental conditions of the area to be identified, the vulnerability of such area to damage by identified international maritime activities, and the competence of IMO to provide Associated Protective Measures for the area to address those risks from these maritime activities.

2 DEFINITIONS

2.1 *Associated Protective Measure* - an international rule or standard that falls within the purview of IMO and regulates international maritime activities for the protection of the area at risk.

2.2 *Guidelines for the Designation of Special Areas and the Identification of Particularly Sensitive Sea Areas (Guidelines)* - the Guidelines adopted by Assembly resolution A.720(17) in 1991, as amended, which are primarily intended to assist IMO and Member Governments in identifying, managing, and protecting sensitive sea areas.

2.3 *Identification of a particularly sensitive sea area* - a determination by IMO that a proposing Member Government, in accordance with the Guidelines, has established a need for Associated Protective Measures for a particular sea area because of the area's recognized ecological, socio-economic, or scientific characteristics and its vulnerability to damage (that is, injury or environmental harm) by identified international maritime activities.

2.4 *International maritime activities* - vessel traffic and other vessel-based operations that are subject to regulation by international rules and standards within the purview of IMO.

2.5 *Member Governments* - those governments which are Contracting Parties to the Convention on the International Maritime Organization.

2.6 *IMO* - the International Maritime Organization (IMO), which is the international body responsible for identifying areas as Particularly Sensitive Sea Areas and adopting the Associated Protective Measures.

2.7 *Particularly Sensitive Sea Area* - an area that needs special protection through action by IMO because of its significance for recognized ecological or socio-economic or scientific reasons and which may be vulnerable to damage by international maritime activities.

2.8 *Proposing Member Government* - a Member Government (or Governments) submitting an application for PSSA identification with its Associated Protective Measures to IMO.

3 APPLICATION BY A PROPOSING MEMBER GOVERNMENT FOR IDENTIFICATION OF A PSSA AND THE ADOPTION OF ASSOCIATED PROTECTIVE MEASURES

3.1 An application to IMO for identification of a PSSA and the adoption of Associated Protective Measures, or an amendment thereto, may be submitted only by a Proposing Member Government. Where two or more Governments have a common interest in a particular area, they should formulate a co-ordinated proposal. The proposal should contain integrated measures and procedures for co-operation between the jurisdictions of the Proposing Member Governments.

3.2 The application should first clearly set forth a summary of the objectives of the proposed PSSA identification, the location of the area, the need for protection and the preliminary proposal for Associated Protective Measures. The summary should include the reasons why the proposed Associated Protective Measures are the preferred method for providing protection for the area to be identified as a PSSA.

3.2.1 Each application should then consist of two parts. In the first part, the application should contain a description of the area, the significance of the environmental characteristics of the area at risk of damage from particular international maritime activities, and an assessment of its vulnerability to damage by these activities. In the second part, the application should show how the proposed Associated Protective Measures will protect the area from the identified risks and show that the measures are within the competence of IMO.

3.2.2 Part I - *Description, Significance of the area and Vulnerability*

- .1 *Description* - a detailed description of the location of the proposed area, along with a chart on which the location of area is clearly marked, should be submitted with the application.
- .2 *Significance of the area* - the application should state the significance of the area on the basis of recognized ecological, socio-economic, or scientific reasons, and should explicitly refer to the criteria listed in paragraph 3.3.5 of the Guidelines.

- .3 *Vulnerability of the Area to Damage by International Maritime Activities* - the application should provide an explanation of the nature and extent of risk that international maritime activities pose to the environment of the proposed area. The application should describe: the particular ongoing or future international maritime activities that are causing or may cause damage to the marine environment of the proposed area and the damage and degree of harm that may result from such activities, either from such activity alone or in combination with other potential threats.
- (a) Maritime activities: the application should set forth such information as:
- types of maritime activities in the proposed area;
 - the nature and volume of international vessel traffic;
 - types of cargo carried by such traffic;
 - the prevailing oceanographic and meteorological conditions;
 - any evidence that these activities are causing damage and whether damage is of a recurring or cumulative nature;
 - any history of groundings, collisions, or spills in the area and any consequences of such incidents; and
 - any foreseeable circumstances or scenarios under which significant damage could occur.
- (b) Potential harm: After identification of the activities and the risk of damage, the application should state the harm that may be expected to result from such activities. The application should explain the effects of the damage on the environmental characteristics of the proposed area and indicate any potential economic harm that may result from such damage.

3.2.3 Part II - *Appropriate Associated Protective Measures and IMO's competence to adopt such measures*

- .1 The application should propose the Associated Protective Measures which are available through IMO and show how they provide the needed protection from the threats of damage posed by international maritime activities occurring in and around the area.
- (a) The application should identify the proposed measures which may include (i) any measure that is already available in an existing instrument; or (ii) any measure that does not yet exist but that should be available as a generally applicable measure and that falls within the competence of IMO; or (iii) any measure proposed for adoption in the territorial sea or pursuant to Article 211(6) of the United Nations Convention on the Law of the Sea that is specifically tailored to particular, localized circumstances of the area proposed to be identified as a PSSA, where existing measures or a

generally applicable measure (as described in subparagraph (ii) above) would not adequately address the particularised need of the area at risk. For non-parties to the United Nations Convention on the Law of the Sea, such measures may still be adopted pursuant to customary international law.

- (b) These measures may include ships' routing measures; discharge restrictions; operational criteria; and prohibited activities, and should be specifically tailored to meet the need of the area at risk.
- .2 The application should clearly specify the category or categories of ships to which the proposed Associated Protective Measures would apply, consistent with the provisions of the United Nations Convention on the Law of the Sea (including those related to vessels entitled to sovereign immunity) and other pertinent instruments.
- .3 The application should include the steps that the proposing Member Government has taken or will take to pursue the adoption of a generally applicable measure or the recognition of the proposed measure by IMO.
- .4 The application should indicate the possible impact of any proposed measures on the safety and efficiency of navigation, taking into account the area of the ocean in which the proposed measures are to be implemented. The application should set forth such information as:
- consistency with the General Provisions on Ships' Routing;
 - implications for vessel safety;
 - impact on vessel operations; and
 - financial implications for shipowners.

3.3 An application for PSSA identification should address all relevant considerations and criteria in the Guidelines and in these procedures, and should include relevant supporting information for each such item.

3.4 The application should contain a summary of steps taken, if any, by the Proposing Member Government to date to protect the proposed area.

3.5 The proposing Member Government should also include in the application the details of action to be taken pursuant to domestic law for the failure of a ship to comply with the requirements of the Associated Protective Measures. Any action taken should be consistent with international law as reflected in the United Nations Convention on the Law of the Sea.

4 CRITERIA FOR ASSESSMENT OF APPLICATIONS FOR IDENTIFICATION OF PSSAs AND THE ADOPTION OF ASSOCIATED PROTECTIVE MEASURES BY IMO

4.1 IMO should consider each application, or amendment thereto, submitted to it by a proposing Member Government on a case by case basis, to determine whether identification of the area as a PSSA and the adoption of Associated Protective Measures are warranted.

4.2 In assessing each proposal, IMO should take into account the criteria which are to be included in each application as set forth above in section 3.3 of the Guidelines. In particular, IMO should consider:

- .1 the full range of protective measures available, and determine whether the Associated Protective Measures identified by the proposing Member Government are appropriate to address effectively the assessed risk of damage to the proposed area by identified international maritime activities and to provide the needed protection;
- .2 whether such measures might result in potential significant adverse effects by international maritime activities on the environment outside the proposed PSSA area; and
- .3 whether the size of the area is limited to that necessary to address the identified need.

4.3 The procedure for considering a PSSA application by IMO is as follows:

- .1 the Marine Environment Protection Committee (MEPC) should bear primary responsibility within IMO for considering PSSA applications, and all applications should first be submitted to the MEPC;
- .2 the MEPC should initially review the application to determine whether it addresses the provisions of the Guidelines. If it does, the MEPC may approve in principle the identification of the area as a PSSA, and should refer the application, with its Associated Protective Measures, to the appropriate Sub-Committee or Committee (which could be the MEPC itself) that is responsible for addressing the particular Associated Protective Measures proposed for the area. The Sub-Committee may seek the advice of the MEPC on issues pertinent to the application. The MEPC should make no final determination to approve identification until after the Associated Special Protective Measures have been considered and approved by the pertinent Sub-Committee or Committee;
- .3 for measures that require approval by the Maritime Safety Committee (MSC), the Sub-Committee should forward its recommendation for approval of the Associated Protective Measures to the MSC or, if the Sub-Committee rejects the measures, it should inform the MEPC and provide the proposing Member Governments with a statement of reasons for its decision. The MSC should consider any such recommendations and, if the measures are to be adopted, it should notify the MEPC of its decision;
- .4 if an application is submitted without fully identifying Associated Protective Measures, the MEPC may approve in principle the identification of the area as a PSSA, pending submission of at least one proposed Associated Protective Measure within 2 years of such approval and subsequent adoption of at least one Associated Protective Measure; and

- .5 after the approval by the appropriate Sub-Committee or Committee of the Associated Protective Measures, the MEPC may provide final approval of the application for PSSA identification. If the application is rejected, the MEPC should notify the proposing Member Government and provide a statement of reasons for its decision.

4.4 IMO should provide a forum for the review and re-evaluation of any Associated Protective Measure adopted, as necessary, taking into account pertinent comments, reports, and observations on the measures. Member Governments which have ships operating in the area of the identified PSSA are encouraged to bring any concerns over the Associated Protective Measures to IMO so that any necessary adjustments may be made. The Member Governments which originally submitted the application for identification with the Associated Protective Measures should also bring any concerns, or proposals for additional measures or modifications to any Associated Protective Measure, to IMO.

4.5 After adoption of the application for identification of a PSSA and its Associated Protective Measures, IMO should ensure that the effective date of implementation is as soon as possible based on IMO rules and consistent with international law.

4.6 IMO should, in assessing applications for identification of PSSAs and their Associated Protective Measures, take into account the technical and financial resources available to developing Member Governments and those with economies in transition.

5 IMPLEMENTATION OF IDENTIFIED PSSAs AND THEIR ASSOCIATED PROTECTIVE MEASURES

5.1 When a PSSA is finally approved, all Associated Protective Measures should be identified on charts in accordance with the symbols and methods of the International Hydrographic Organization (IHO). Proposing Member Governments may also chart identified PSSAs in accordance with appropriate national symbols; however, if an international symbol is adopted by the IHO the proposing Member Governments should mark PSSAs in accordance with such symbol and other IHO recommended methods.

5.2 Proposing Member Governments should ensure that any Associated Protective Measure is implemented in accordance with international law as reflected in the United Nations Convention on the Law of the Sea and any other applicable instruments.

5.3 Member Governments should take all appropriate steps to ensure that ships flying their flag comply with the Associated Protective Measures adopted to protect the area identified as a PSSA. Those Member Governments which have received information of an alleged violation of an Associated Protective Measure by a ship flying their flag should provide the Government which has reported the offence with the details of any appropriate action taken.

Appendix 3: Comments regarding Offshore Installations

The current discussion about the positioning of offshore wind parks dangers does not take into consideration the fact that such wind parks can pose further risks for the Wadden Sea. According to the currently available information, the location of such parks could be permitted up to one seamile from the buoyage shipping routes. The authorities take for granted that the ship traffic always follows the marked routes. In reality, however, this is not the case.

Even ships that follow the marked routes may leave them. If for example it can be foreseen that a ship may be disabled, due to an urgently required repair to the drive or rudder unit, the ship will leave the fairway, if possible, in order to avoid obstructing ship traffic. The captain will either anchor or let the ship drift depending on the weather, duration of the disturbance or impaired maneuverability, water depth and ship size.

It is not always possible to anchor a ship for safe anchorage in the North Sea, the ship has to be first stopped or be moving slowly (< 1 knot) to make the anchor hold. The ship will drift in spite of the anchor if the speed cannot be reduced enough because of a strong current and failure of the drive unit as following:

Lucky Fortune: On 4 December 1999, the unloaded bulk carrier "Lucky Fortune" was drifting during storm towards Sylt at up to 5 knots, although an anchor with a 150m chain had been dropped. The cargo vessel could only be stopped by the professional management of the responsible authorities and the performance of the "Oceanic" crew.

Pallas: On 28 October 1998 in a storm of 9 - 10 Bft, the cargo vessel "Pallas" which was loaded with wood was drifting towards the island Amrum. This was in spite of a dropped anchor with a 150m chain which could operate optionally at a water depth of approx. 20 m. A second anchor could not be dropped because it had already burnt down and has ceased to function during an earlier rescue attempt. The "Pallas" ran aground and caused a considerable oil pollution.

Hudson Bay 1: On 26 January 1993, the loaded cargo vessel "Hudson Bay 1" which as a "OBO carrier" could transport Oil, Bulk and Ore was leaving the mouth of the river Elbe and was drifting after a failure of the motor during a storm towards Helgoland (see Appendix 3, figure 1). The chain of the first anchor dropped starboard broke and thus the second anchor was dropped. In spite of this, the ship drifted further towards Helgoland at a speed of up to 2.5 knots and it was stopped only a few hundred meters before it ran aground because two tugs relieved the strain of the anchor and the wind dropped to 7 - 8 Bft.

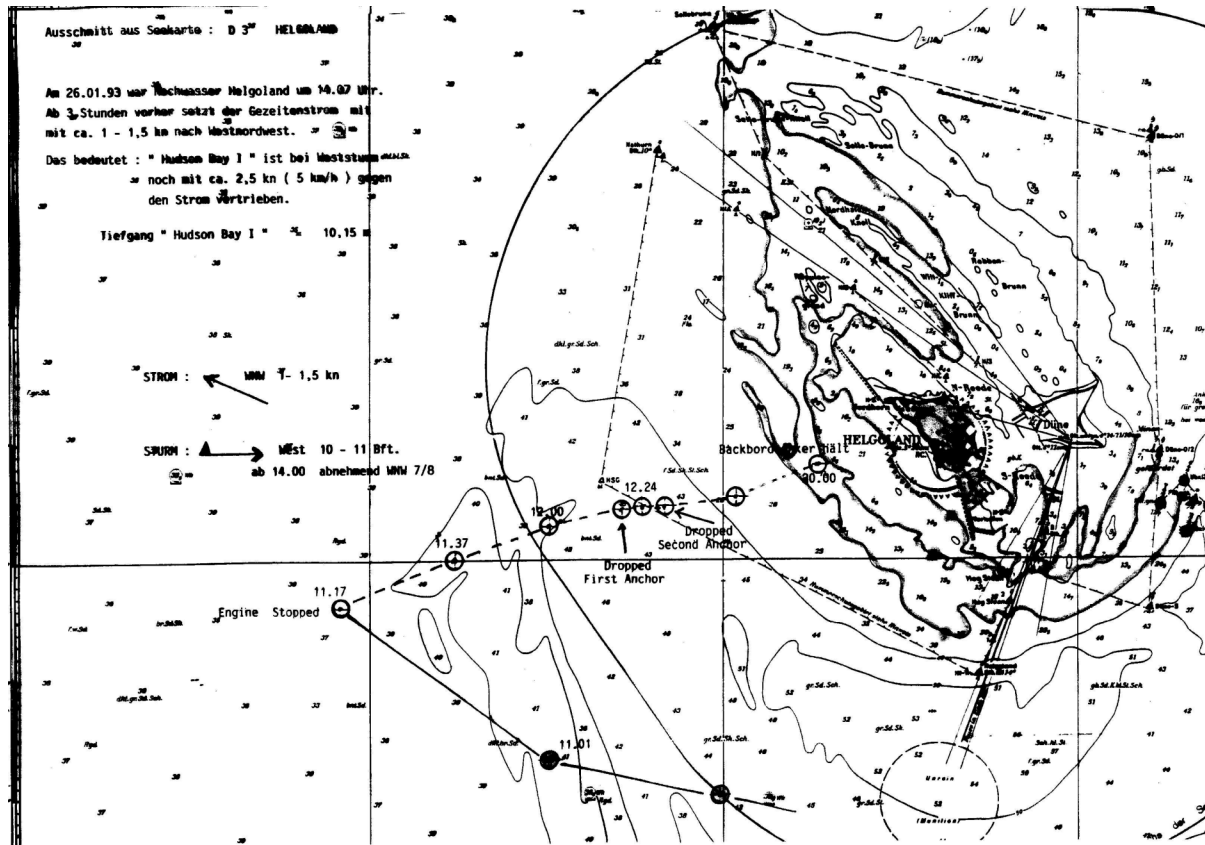


Figure 1: Drifting route of the "Hudson Bay 1" according to the ship's register from 26.01.1993

From simulations on the ship handling simulator SUSAN in Hamburg, it can be seen that a Jumbo cargo vessel with a capacity of up to 6,600 TEU can develop very high drifting speeds of up to 4.4 knots during a storm of about 10 Bft. (Hashagen 2000).

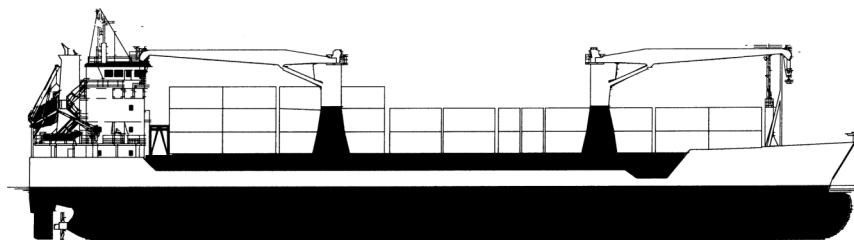


Figure 2: Example of a cargo vessel (500 TEU)

Even the stopping of a ship from full speed by means of the engine takes some time, in which the ship covers a distance of 5 to 10 ship lengths. These values are gathered by means of a test during the trial trip of the ship. According to the ship owner, the time of a small container vessel (500 TEU, approx. 100m long, 15 knots, see Appendix 3, figure 2) was 115 seconds, in which

the ship with its engines "full speed backwards" covers a distance of 665m. This can be significantly higher for a loaded ship depending on the mass, size, loading condition, drive unit, depth of the ship to be stopped. The stopping distance of a ship whose engine power suddenly fails during the trip cannot easily be estimated. During the SUSAN simulation of a Jumbo cargo vessel accident, it was found that after an engine failure at a simulated speed of 18 knots the ship still needed more than one hour until the ship loses all ground speed and the drift is stopped. The speed of the ship is reduced asymptotically. The speed is still 10 knots 5 minutes after the engine failure (Hashagen 2000). During this time, the damaged vessel would have covered a distance of 1.5 sea miles.

It can be assumed that a ship colliding with a wind park will be seriously damaged. This damage can lead to the loss of both ship and cargo with subsequent environmental consequences. This is because the foundation of the wind park is considerably stronger than the hull of a ship.

A wind park at sea is a danger for shipping and ships must therefore be protected. A wind park can be compared to an artificial rock coast. The costs for such protection measures have to be paid for by the operator of the wind park. If not, the state will pay the cost for the protection measure as it has a big interest in promoting renewable energy sources as part of a policy of sustainability.

The following protection measures are possible:

- the transfer of the shipping routes
- the extension of the intervention area or
- the permanent stationing of safety tugs in wind parks or in their vicinity.

If a wind park is planned within the intervention zone as originally proposed in the catalogue of PSSA measures, the zone must be extended for enough seawards to so as to allow the rescue team has enough time to stop the ship before it can collide with the wind park.

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Abbreviations

IMO	International Maritime Organisation
PSSA	Particularly Sensitive Sea Area
SOLAS	International Convention for the Safety Of Life At Sea



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WWF Deutschland
Rebstöcker Straße 55
60326 Frankfurt
Tel.: (+49)69/79144-0
Fax: (+49)69/617221
info@wwf.de
www.wwf.de
www.global200.de

**WWF-Projektbüro
Wattenmeer**
Norderstr. 3
25813 Husum
Tel.: (+49)4841/62073
Fax: (+49)4841/4736
husum@wwf.de