

# Oil combating

along the Swedish coastline  
and in the major lakes up to 2010



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Emergency Response Support Department

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# Contents

<b>Introduction</b> .....	5
<b>Summary</b> .....	7
<b>1 Environmental quality objectives for sea, coastline and lakes</b> .....	10
<b>2 Oil combating</b> .....	12
2.1 Players .....	12
2.2 Preventive work.....	13
2.3 Operational oil combating at sea and on land.....	14
<b>3 Practical experience</b> .....	16
3.1 Legislation and strategies.....	16
3.2 Collaboration .....	17
3.3 Operational work .....	18
3.4 Training .....	18
3.5 Oil pollution.....	19
3.6 Finance.....	21
3.7 Other experience .....	23
<b>4 Risk analysis</b> .....	24
4.1 Risks associated with maritime vessel traffic and transport patterns .....	25
<b>5 Objectives for future Swedish oil combating</b> .....	27
5.1 Overall objectives .....	27
5.2 Objectives .....	27
<b>6 Measures</b> .....	29
6.1 Preventive measures.....	29
6.2 Measures for maritime oil combating .....	30
6.3 Measures for coastline oil combating.....	31
6.4 Measures for monitoring activities .....	33



# Introduction

Serious damage is caused by oil spills along the Swedish coastline and in the inland waterways. Damage is caused to the natural environment with its flora and fauna, coastal areas are soiled and sea/lake beds are destroyed. Oil spills also have social and financial consequences for the people affected.

For this reason, it is important primarily to undertake measures to limit emissions of oil from vessels. If this type of emission nevertheless does occur, facilities must be available to permit the oil quickly to be dealt with in order to minimise damage. Many authorities, organisations and companies have been working together since the 1970s on this type of emergency preparedness and pollution control in Sweden.

In 1971, the Swedish Government gave the Coast Guard responsibility for maritime oil combating in Swedish waters. This laid the foundations for the modern Swedish marine oil combating system, but it was 1984 before there was a joint formulation of the aims of this oil combating. This was outlined in the document entitled *Aims of Swedish marine oil pollution protection for the 1990s*, which was drawn up by the Swedish Coast Guard, the former Swedish National Fire Services Board, the Swedish Maritime Administration, the Swedish Environmental Protection Agency and the Association of Local Authorities. The document was revised in 1996, largely by the same parties. However, by this time the Swedish Rescue Services Agency had replaced the Swedish National Fire Services Board and the Swedish Environmental Research Institute was also involved in the work.

*Swedish marine oil pollution protection facing the 21st century* was published in 1996 by the Swedish Rescue Services Agency (ISBN 91-88890-23-6). Since then, however, various things have happened that make it necessary to draw up a new description of how oil combating should operate in Swedish seas and inland waterways (the large lakes) up to the year 2010:

- The amount of maritime oil transportation close to our shores has increased considerably and is estimated to increase further in future. There also continues to be a large number of illegal emissions of oil.
- There have been technological developments within the field of oil combating; for example, there are now new methods for identifying oil and new navigation and identification systems for shipping.
- New legislation has been introduced for shipping and for the authorities, municipalities, and organisations that work with oil combating. The authorities and municipalities concerned have also been given new instructions for their work.
- All Swedish environmental legislation has now been brought together in Miljöbalken [the Environmental Code], with the objective of promoting sustainable development. According to the guiding principle of sector responsibility, each societal sector in Sweden is to take responsibility for ensuring that environmental aspects are integrated into all activities within that sector.

- Environmental work in Sweden is now aimed at achieving 15 national environmental quality objectives. In particular, the environmental objectives of “Seas in balance plus a living coastline and archipelago” and “Living lakes and watercourses” are relevant in oil combating work. Swedish environmental work is also guided by the Strategy for Sustainable Production and Consumption - Integrated Product Policy (IPP) - with the aim of reducing the environmental impact of goods and services.

Against this background, therefore, the Swedish Rescue Services Agency, the Swedish Coast Guard, the Swedish Maritime Administration, the Swedish Environmental Protection Agency, the Association of Local Authorities and the Swedish Environmental Research Institute, acting together as the national coordination group, drew up this new document about the future direction of Swedish maritime oil combating system: *Oil combating along the Swedish coastline and in the large lakes up to 2010 (ISBN 91-7253-237-8)*.

Within its area of responsibility and in collaboration with other relevant authorities, the Swedish Rescue Services Agency has to develop emergency preparedness for an environmental emergency service and decontamination activities in the event of accidental oil spills and to report to the government about the measures that have been taken. One element of this is the work on formulating the aims of contingency plans for combating oil pollution and decontaminating oil spills at sea and in the large lakes, as well as proposals for the future aims of contingency plans.

Since the 1980s, the foundation of long-term planning for a Swedish environmental rescue service has been the collective view of the parties collaborating in Sweden’s maritime oil combating system, together with Sweden’s various commitments in international agreements. Practical experience of combating pollution and of decontamination operations forms an important foundation for this work.

The collaboration group reports on a collective view of damage caused by oil pollution and how Sweden’s oil combating system should function and be structured. This basic view is founded on practical experience and conclusions from previous work and contains revisions of those areas in which an amended risk scenario and access to new technology is considered to lead to an amendment or development of aims. The group is establishing the threat scenario that is considered to be a dimensioning scenario for the Swedish oil combating system and is reporting collective overall objectives, prioritised strategies and remedial measures.

In the new Swedish Civil Protection Act, and associated regulations, responsibilities and mandates are laid down in an unambiguous manner. In addition, the legislation creates a good foundation for the parties involved constantly to work together at central, regional and local levels as regards operational planning, technical collaboration etc. Internationally, also, there is now a greater degree of collaboration than was previously the case.

It might also be mentioned that the Swedish contingency plan for combating oil pollution also covers the sort of chemicals that can be combated and taken care of in principle using the same technology as for oil spills. In this document, however, the terms “combating oil pollution” or “oil combating” are used as all-encompassing terms.



# Summary

The document *Oil combating along the Swedish coastline and in the major lakes up to 2010* is intended to act as a strategy and policy document. Work on the document has been in the form of a national collaboration group with representatives from the Swedish Rescue Services Agency, the Swedish Coast Guard, the Swedish Maritime Administration, the Swedish Environmental Protection Agency, the Swedish Association of Local Authorities and the Swedish Environmental Research Institute.

## Facts are needed for decision-making and operations

The aim is to provide the Swedish Government, Parliament and the authorities with a compilation of facts, for their overall position on which objectives and means should apply for Swedish oil combating. This is required:

- in order to facilitate long-term planning,
- so that the authorities concerned have a common basis for work with oil combating,
- to provide a basis for decisions on research and development work,
- to provide opportunities for collaboration in the context of relevant Swedish national environmental objectives, primarily, “Seas in balance and a living coastline and archipelago” and “Living lakes and waterways”,
- to provide the authorities concerned with increased opportunities for collaboration at operations and within the feeding back of lessons learned from such operations, which in turn provides basic data for continued monitoring of how Swedish oil combating is functioning, so that a foundation can be created for potential decisions on changes to the aims and directions of the oil combating service,
- to provide opportunities for feeding back lessons learned from international oil combating systems.

A compilation of facts about Swedish oil combating is also needed to provide the general public with a good representation of how oil combating in Swedish waters is planned and operates.

## Objectives for Swedish oil combating work up to the year 2010

The overall objective of Sweden’s oil combating prevention system is to protect the Swedish economic zone, Swedish territorial waters, the Lakes Vänern, Vättern and Mälaren as well as the Swedish coastline against the damage that oil pollution can cause to the environment and to socio-economic value.

The overall objective for the Swedish oil combating system up to the year 2010 can be subdivided into the following sub-objectives:

- objective for preventive measures,
- objective for maritime oil combating,

- objective for coastline oil combating,
- objective for follow-up activities after the execution of oil combating operations.

The objective for *preventive measures* is to minimise the risks of oil spills at sea and in inland waterways.

The objective for maritime oil combating *is to have the capacity to combat spills at an early stage and by taking effective combating measures to tangibly contribute to reducing the negative effects of serious spills on the aquatic environment and along the coastline.*

*The objective for coastline oil combating is that there should be emergency preparedness to permit combating operations for oil that comes ashore from oil spills and to be able to decontaminate the coastline. The objective should be to minimise the economic and social consequences and environmental impact of the pollution.*

*The objective for follow-up activities and evaluation is to gather and process details of practical experience from previous incidents and operations performed. This will then be of assistance when the aims of the work are to be further developed.*

*One common objective is that*

- it should be possible to commence operational collaboration between the authorities concerned at national, regional and local levels immediately when an oil spill has occurred.

## Programme of measures

The following measures are proposed to achieve these objectives.

### Preventive measures

- The process that has started to classify the Baltic Sea as a particularly sensitive sea area (PSSA) should be concluded by the year 2007
- Illegal emissions of oil in Swedish waters should be negligible by the year 2010
- Prohibitions ought to be introduced for traffic in Swedish waters involving single-hulled vessels used for carrying all types of oil cargo
- A more efficient partnership ought to be built up between the authorities that are responsible for port inspection in the Baltic Sea area
- Observance of the Baltic Strategy on Port Reception Facilities for Ship-generated Wastes ought to be monitored
- The Swedish oil combating authorities and organisations concerned ought to carry out joint exercises
- International collaboration is being further developed

## Measures for maritime oil combating

- There is to be an increase in emergency preparedness and the capacity for combating oil spills
- International collaboration is to be further developed
- Development of the oil drift model, Seatrack Web, is to continue

## Measures for coastline oil combating

- A national, Internet-based environmental atlas of the Swedish coastline and the large lakes needs to be drawn up and brought into practical use.
- The work on municipal contingency plans needs to be speeded up.
- There is a need for the development of more environmentally-adapted methods for oil decontamination along the coastline.
- Legislation on hazardous waste needs to be evaluated and, if possible, amended to make it easier to deal with oil-contaminated material.
- Emergency preparedness for coastline oil combating needs to be further revised further in detail.

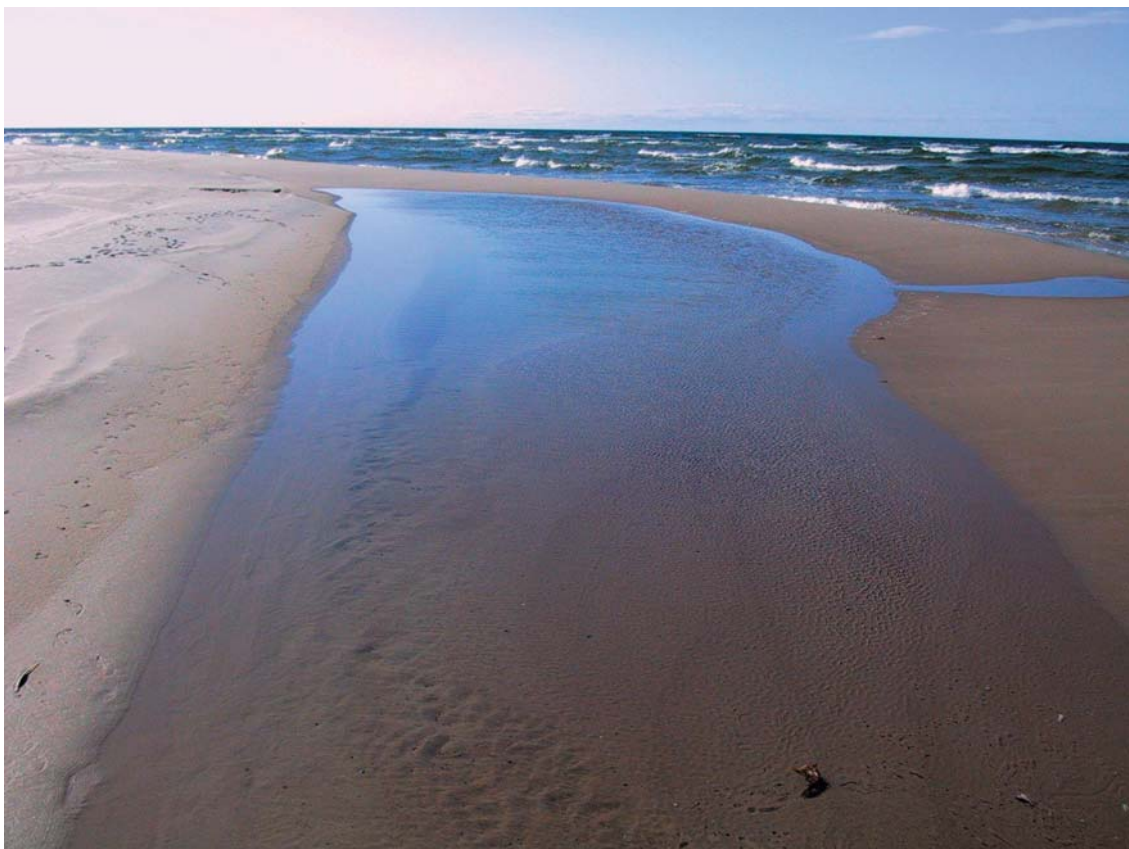
## Measures for monitoring activities

- There needs to be further development of methods for monitoring and assessing the consequences of oil that comes ashore and its decontamination.
- Joint monitoring is to be carried out after major coastal oil pollution and its decontamination.

# 1 Environmental quality objectives for the sea, coastline and lakes

The overall objective of Swedish public sector environmental work is to hand over, to the next generation, a society in which the major environmental problems have been solved. This means that the environmental impact should have reduced to levels that are sustainable in the long term. In 1999, with this as its objective, the Swedish Parliament adopted fifteen national environmental quality objectives. Tangible, measurable and dated sub-objectives have been adopted for each environmental quality objective, with an overall total of around 60 such sub-objectives.

The environmental quality objectives and sub-objectives are not regulated by statute and are therefore not legally binding. However, they should act as a guide for the environmental measures that government authorities and other public bodies undertake. Some of the previous environmental objectives have been incorporated into the new structure, while others have disappeared. The environmental objective policy does not apply to what are called sector objectives decided upon within particular policy areas, such as agriculture, culture, forestry and transport.



*Photo: Per Bjurholm, Swedish Environmental Protection Agency*

To obtain a clear distribution of responsibility in environmental objective work, responsible authorities have been appointed for each of the environmental quality objectives. Among the items that the Swedish Environmental Protection Agency are responsible for are the, “Seas in balance plus a living coastline and archipelago” and “Living lakes and watercourses”.

One of the sub-objectives for the objective: “Seas in balance plus a living coastline and archipelago” is that “by stricter legislation and increased surveillance, emissions of oil and chemicals from vessels should be minimised and should be negligible by the year 2010”. The principle responsibility that has been assigned to certain authorities does not remove the responsibility for the environmental objective work from other authorities however, for example, within the framework of their particular sector responsibility. Examples of national authorities that have important tasks as regards the sub-objective on emissions of oil and chemicals from vessels are the Swedish Rescue Services Agency, the Swedish Coast Guard and the Swedish Maritime Administration.

One of the sub-objectives of “Living lakes and watercourses” is that “by the year 2009, water supply plans with water protection areas and protection regulations will have been set up for all public and larger private surface sources of water supply”. Since the large lakes of Vänern, Mälaren and Vättern are important sources of drinking water, which could be damaged by oil spills, this sub-objective is of importance to them.

The Swedish Rescue Services Agency has the sector responsibility for the environmental quality objectives within the area civil protection, (which entails emergency preparedness, emergency prevention and emergency response) and as such has drawn up five overall environmental objectives. The objective that concerns oil combating preparedness is “Reducing the number of maritime oil and chemical spills and reducing the consequences of those spills”.

The Swedish Maritime Administration and the Swedish Coast Guard have joint responsibility for fulfilling certain parts of the national environmental quality objectives. Their environmental objective work is primarily aimed at minimising illegal operational emissions from vessels, in other words emissions of contaminated oily waste (ballast water, rinse water, bilge water and oil residues) that originate from the normal operation of a vessel.



## 2 Oil combating

### 2.1 Players

The responsibility for the Swedish environmental rescue service in the event of oil spills is currently shared between several national, regional and local authorities.

*The Swedish Rescue Services Agency* coordinates public sector activities within the rescue services and supervises the municipal fire brigades. Where necessary, the Swedish Rescue Services Agency supports municipal authorities with personnel and materials from the five regional oil combating depots. According to the Civil Protection Act the municipal authorities have the right to claim a certain amount of compensation from the government for costs that the municipal authorities have to pay in conjunction with emissions of oil or other hazardous substances and the subsequent decontamination work. The Swedish Rescue Services Agency is testing such compensation issues. At its four colleges the Agency is running a new two-year training course on civil protection. This training course contains a joint syllabus that contains sections on oil combating. The training course is primarily aimed at providing skills that can be applied during the acute phase of an emergency operation. The Swedish Rescue Services Agency participates on the working party of the Helsinki Commission (HELCOM) on issues concerning oil combating and the EU Management Committee on Marine Pollution, as well as in the Copenhagen Agreement and in the Arctic Council.

Within Swedish territorial waters – with the exception of waterways, canals, ports and lakes other than Vänern, Vättern and Mälaren – and within the Swedish economic zone, *the Swedish Coast Guard* is responsible for emergency services when oil or other hazardous substances have leaked into the water. This obligation is controlled in the Swedish Civil Protection Act. The Coast Guard's tasks also include monitoring the adherence to national and international regulations on protection of the marine environment. The Coast Guard is Sweden's representative in the working party of the Helsinki Commission (HELCOM) on issues concerning combating pollution and the EU Management Committee on Marine Pollution, as well as in the Bonn Agreement, the Copenhagen Agreement and the Arctic Council.

*The Swedish Maritime Administration* holds principal responsibility for measures aimed at preventing oil emissions from vessels and emergencies at sea. When emergencies occur, according to the law on measures to combat pollution from shipping, the Swedish Maritime Administration is to ensure that measures are taken onboard as far as possible to prevent or limit oil spills. The Swedish Maritime Administration is Sweden's representative in the HELCOM working party on maritime issues, as well as in the UN's International Maritime Organisation (IMO) (the IMO's environmental committee and maritime safety committee) and in the EU's maritime safety partnership

*The Swedish Environmental Protection Agency* is the national environmental authority and its tasks include monitoring the environmental effects of oil spills. The Environmental Protection Agency is the responsible Swedish authority for the ECE Convention on Environmental Impact Assessments in a Trans-boundary Context (the Esbo Convention). The Environmental Protection Agency is also the Swedish supervision body for the Nordic Environmental Protection Conven-

tion and is responsible for the Swedish work within the OSPAR Commission for the Northeast Atlantic (including the Skagerrak). Similarly, the Environmental Protection Agency is Sweden's representative on many of the HELCOM working parties.

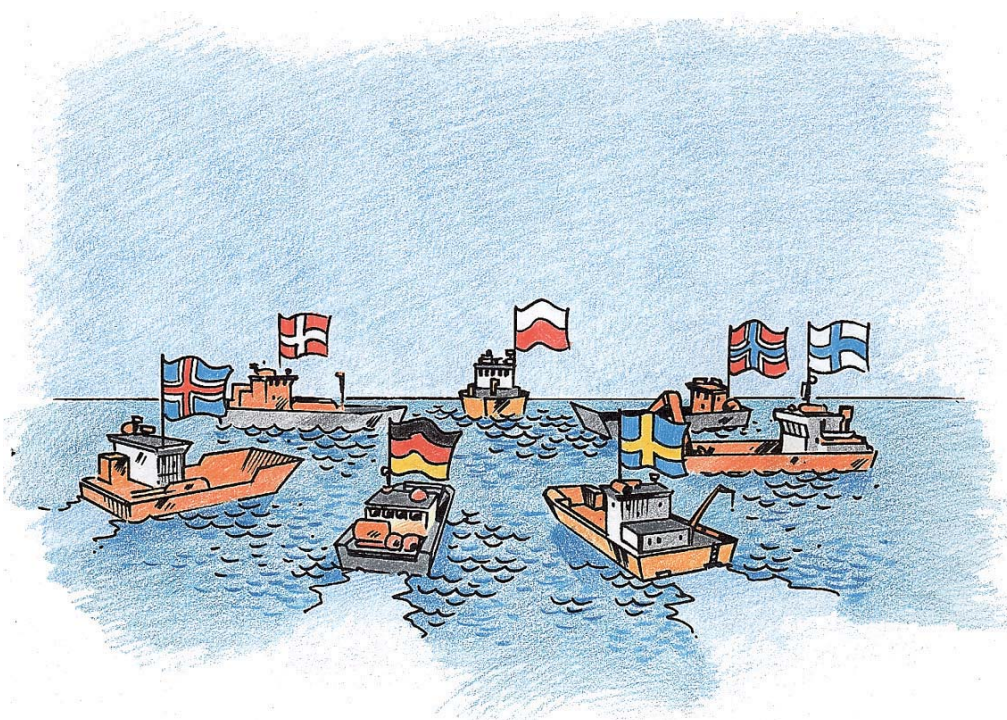
*The Environmental Protection Agency* has agreements with *IVL Swedish Environmental Research Institute* which involve the Institute maintaining an "emergency oil service", from which the municipal authorities can obtain advice about oil decontamination. The emergency oil service assists by providing expert support to the Environmental Protection Agency and other authorities in the event of oil spills at sea and in inland waterways

In addition to the Civil Protection Act, *the municipal authorities* are responsible for the fire & rescue services within their own areas. Among the factors required for an actual service provided to be regarded as a rescue service, there must be a need for rapid intervention. Oil that threatens to come ashore will normally be regarded as grounds for calling in the fire & rescue service. If the oil has already come ashore and the damage cannot be made worse, the intervention required is decontamination. The oil decontamination of coastal areas is governed by a specific statute, but in practice the municipal authority is responsible for its own geographical area.

According to the Civil Protection Act the Swedish Government may order, or in particular cases decide that *the county administrative boards* should take over responsibility from the municipal fire & rescue services within one or more municipal areas. This can, for example, be the case with major oil incidents. If the emergency response also includes a national rescue service, the county administrative board is responsible for coordinating the work.

## 2.2 Preventive work

Shipping is an international matter and therefore various international conventions and agreements largely form the basis of the Swedish legislation for Swedish environmental work within shipping and oil combating at sea.



## 2.3 Operational oil combating at sea and on land

### 2.3.1 Prioritised strategies for combating and decontaminating oil pollution

In general, the earlier and more forcefully that operations can be applied to combat an oil spill, the greater the chance of the oil combating being successful.

- *Firstly*, measures are taken onboard the vessel involved in the incident (the disabled vessel) in order to prevent or, as far as possible, to limit the pollution. Such measures include the lighterage of oil onboard to undamaged tanks, trimming (pumping water between tanks), transferring oil from the damaged vessel to another vessel plus sealing up damaged tanks.
- *Secondly*, measures are taken to limit the spread of oil that has been released into the water. This is achieved by surrounding the oil with booms and starting to remove the oil from the water.
- *Thirdly*, the aim is to remove the greatest possible volume of oil from the water. At the same time, measures are taken to prevent oil from being channelled into and spreading throughout the archipelago, from reaching particularly sensitive areas (nature reserves, breeding areas or valuable areas for recreation, outdoor sports or other leisure activities), and from spreading along the coast and affecting more areas.

Oil that has come ashore will be retrieved using mechanical methods. If it is assessed as being necessary, fine decontamination of the area will be carried out afterwards. In choosing methods for coastline oil decontamination, a number of different conditions and factors have to be observed:

- What type of coastline is affected?
- Of how much importance and interest is the coastal area from an ecological or socio-economic perspective?
- What is the volume of the oil that has come ashore?
- How deeply has the oil penetrated into the ground material?
- What type of oil is it and what form and state is it in (tarry clumps, oil in liquid form etc.)?
- What possibility is there of transporting equipment to the area to be decontaminated?
- What are the external conditions – waves, currents, weather – in the area?
- How major is the damage from oil pollution in coastal areas?

### 2.3.2 Methods for maritime oil combating

The options for successfully combating a maritime oil spill depend largely on the physical and chemical properties of the oil, how quickly oil combating operations can commence and the resources avail-



Photo: Swedish Coast Guard



able, plus what access there is to suitable equipment and methods, personnel training, and the weather conditions on site.

### 2.3.3 Methods for decontaminating oil pollution in coastal areas

Oil combating measures are taken in coastal areas before, during and after the oil has come ashore. There are four kinds of methods for decontaminating oil within coastal areas.

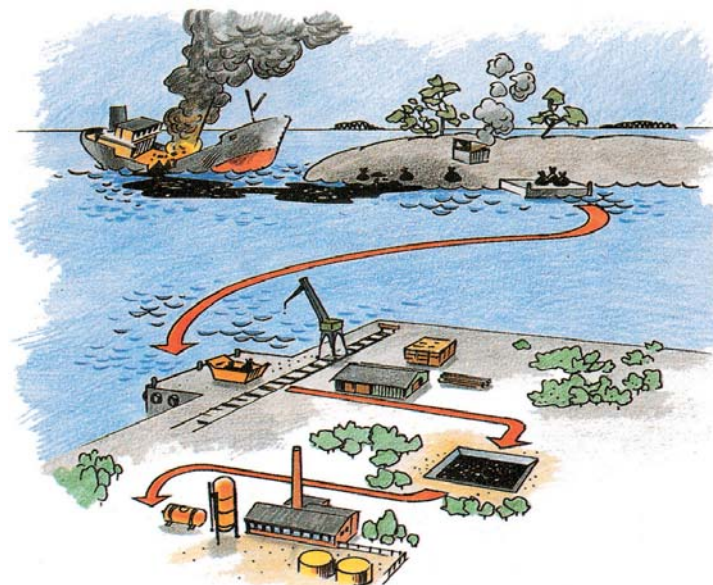
- *Coastline washing:* Here, water at different temperatures is used for flooding or high/low pressure washing. Sand-blasting can also be used.
- *Mechanical retrieval:* The oil can be removed in the polluted area using manual or mechanical methods. Manual removal is carried out using hand tools, while mechanical removal is performed using vacuum suction, shore cleaners, front loaders and similar equipment
- *Accelerated biological decomposition:* This involves adding nutrients to stimulate the growth of the micro-organisms that break down oil naturally.
- *Natural recovery:* If the area is difficult to access or if normal decontamination methods are disruptive or directly harmful, the best solution may be to leave the oil alone, to be dispersed and broken down naturally.



Photo: Swedish Rescue Services Agency

### 2.3.4 Dealing with retrieved oil and oil-contaminated waste

Transferring oil, heating up collected oil, taking away oil and storing oil-contaminated waste are important stages in oil combating and decontamination operations. The entire chain of events, however, from discharging, via transport and intermediate storage until finally taking care of the oil that has been recovered from the water or from coastal areas, has to function in an efficient, smooth manner. It is important therefore that the contingency plans are able to handle the large volumes of oil residues of variable purity and with different properties, which is often the situation.



## 3 Practical experience

The proposed programme of measures (section 6) is based on the positive and negative experience gained during the last ten years of oil combating in Swedish waters and along the Swedish coastline:

- During the period 1990-2003, the Swedish Coast Guard recorded a total of 4,321 oil spills in Swedish waters (Swedish territorial waters and economic zone). Of these, 343 of the spills were so large that the Coast Guard needed to carry out oil combating operations. During the same period the Swedish Rescue Services Agency, the municipal authorities concerned etc, carried out a total of 118 oil decontamination operations in different coastal areas. The compensation costs for these operations totalled just over SEK 63 million
- Practical experience shows that rapid criminal investigations and the ability rapidly to bring the perpetrators to court in conjunction with illegal oil spills can give good results. In turn this is assessed as having a deterrent effect on potential perpetrators.
- Cooperation with our neighbouring countries has proven crucial to allow efficient oil combating operations for oil spills in coastal waters. International collaboration is now also developing, e.g. within the Helsinki Commission, as regards measures for coastline decontamination.
- There are still deficiencies in municipal contingency planning and the municipal authorities actively need support in this work.
- It is frequently the actual decontamination operations in coastal areas that lead to the most serious environmental damage from oil pollution. Methodology and routines need to be developed for the systematic follow-up of and feedback from the practical experience that the various bodies involved gain during actual oil combating operations for oil that comes ashore. It is also important to draw up manuals containing recommendations about the decontamination methods that are appropriate for use on different types of coastline, with the aim of reducing the environmental damage of the decontamination itself.
- There is often a requirement for coordination when decontamination covers several municipal areas. In some cases, the county administrative board has coordinated measures and resources, and this has been shown to work well.
- In ports, the responsibility for combating oil pollution usually lies with the municipal authority. In certain municipal areas, there are deficiencies in the coordination between the port and the municipal authority. The municipal authorities have to coordinate the planning and resources for combating oil pollution in port areas.

### 3.1 Legislation and strategies

As regards the *application of the regulations*, to summarise, the responsible municipal authorities and the organisations consider that this has worked well and has made good collaboration possible.

The Civil Protection Act, like the former Swedish Rescue Services Act, indicates limitations between state and municipal fire & rescue services. This means that the responsibility held by the Coast Guard for an oil combating operation that has begun onboard a distressed vessel at sea



will transfer to the municipal fire & rescue service if this vessel has to be brought into port. On the other hand, the responsibility transfers from the municipal fire & rescue service to the Coast Guard if the vessel has to be taken out of a port. The coordination group believes that the responsibility should always be with the authority that decided on oil combating measures and that commenced the operation.

Through the work currently taking place within the EU, requirements are being specified to ensure that all EU states should make arrangements so that a distressed vessel can be brought into an appropriately sheltered location if required (Place of Refuge). The Swedish regulations ought therefore to be formulated to ensure that a responsible authority (the Swedish Maritime Administration, the Swedish Coast Guard or the municipal fire & rescue services authority) can take decisions that will guarantee access to such a place of refuge.

According to the experience gained by the Swedish Maritime Administration from maritime emergencies in Swedish waters and the subsequent work with the distressed vessels, collaboration between all of the parties involved at the incident site has been good over the years. On some occasions there has been confusion about the responsibilities onboard a distressed vessel, but that did not disrupt the practical maritime safety and rescue work.

## 3.2 Collaboration

The Coast Guard has extensive *international working relationships*. This collaboration has proven to be of crucial importance to the options to successfully be able to combat maritime oil pollution together with one or more other countries. There are several examples of the way that collaboration has given particularly good results, both in economic terms and from an environmental perspective.



Photo: Swedish Rescue Services Agency

Sweden has also set up agreements on coastal decontamination – that is, for mutual support in the event of oil coming ashore. Agreements of this type exist with Estonia, Latvia and Lithuania. It is not as common to have trans-national collaboration in the case of coastline decontamination operations as it is with maritime oil combating operations, but within HELCOM work is in progress on developing collaboration also within the areas of coastline protection and coastline decontamination.

There is comprehensive *Nordic collaboration* on maritime safety regulations as well as practical oil combating. This applies both to direct collaboration between the countries and collaboration before dealing with various issues in different international contexts. The everyday collaboration and the contacts between the maritime inspection agencies of the countries are highly significant, as are the annual meetings between the Nordic directors of maritime safety.

### 3.3 Operational work

Experience gained, mainly from the three major maritime emergencies involving oil spills that have affected the Swedish area of responsibility - the *Volgoneft* in 1989, the *Baltic Carrier* in 2001 and the *Fu Shan Hai* in 2003, have shown that command and collaboration have worked well.

As regards emergency *preparedness*, experience shows that early interventions with environmental protection vessels, which are constantly operational, are one condition for successfully being able to combat maritime oil pollution.



Photo: Swedish Coast Guard

However, experience of oil spills shows that *municipal contingency* plans ought to be and can be improved primarily as regards risk assessment, collaboration and how environmental information is used operationally.

A lack of planned and/or prepared intermediate storage and final storage locations for the oil collected is often a crucial bottleneck in oil combating and decontamination operations in the event of major oil spills. The municipal authorities should deal with oil picked up at sea by the environmental emergency service vessels as well as the oil collected in coastal areas. There is currently still a lack of places that have been chartered in advance as regards their suitability from the environmental and transportation perspective to act as intermediate and final storage locations for oil.

Experience shows that it often involves very large volumes of oil waste, which are difficult to deal with. At the same time, it is doubtful whether it should be regarded as feasible for each municipal authority to plan for large-scale intermediate storage. Rather, each county should plan and prepare for one or two appropriate intermediate storage locations for large volumes, while the municipal authorities ought to concentrate on planning collection locations and locations for temporary storage of the oil waste while waiting for further transportation to the county intermediate storage location(s).

Many municipal authorities have no contingency plans covering fire & rescue services and decontamination work, and good opportunities for handling (receiving and then getting rid of) the oil. Each municipal authority concerned ought therefore to be involved actively in the risk planning work.

### 3.4 Training

The relatively comprehensive *training* courses that are held and supplemented with repeat *exercises* are preconditions for having good emergency preparedness and the ability to implement successful oil combating and decontamination operations. To date, it is unusual to have joint exercises with the various rescue services, personnel at the Swedish Rescue Services Agency's oil combating depot and the Coast Guard, but the demand for such exercises is constantly increasing.

Through its four colleges, the Swedish Rescue Services Agency fulfils its task of providing training courses to increase the competence of students, local authorities, companies etc. within oil combating. A decontamination training course was held in two stages during 2002.

The Swedish Rescue Services Agency also trains the personnel who run the mobile oil combating depots. These personnel are placed at the disposal of the municipal authorities in the event of an oil spill. They also provide shorter training courses for the people involved in decontamination, primarily as regards the handling of decontamination equipment.

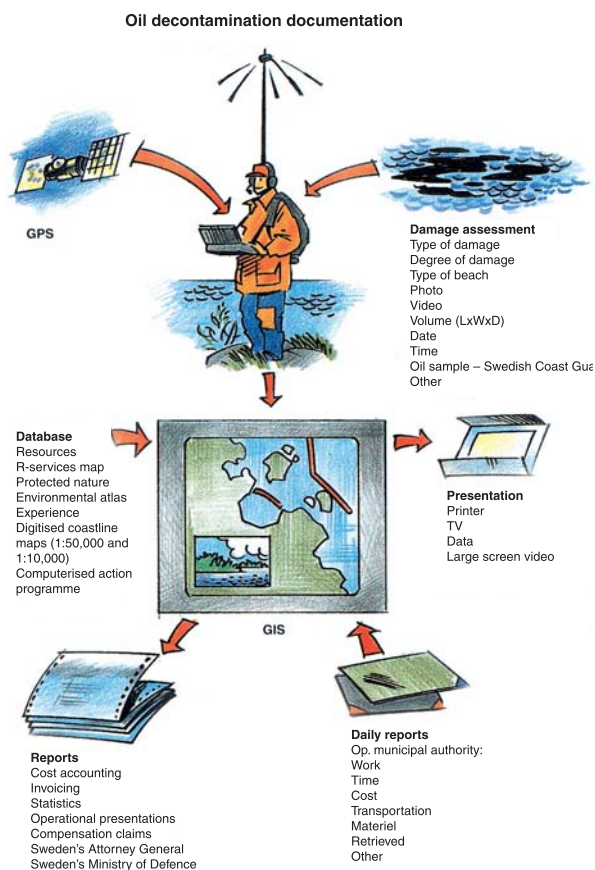
### 3.5 Oil pollution

Usually, when oil comes ashore, the municipal authorities are faced with the fact that the oil is already there and that damage assessment and decontamination are necessary. It is most frequently a case of minor volumes of oil from operational emissions.

It is difficult to detect oil under ice and snow, which can be worrying when carrying out assessments and decontamination in winter, and to detect oil under substances such as seaweed and sand. In both cases, better skills and methods are required.



Photo: Swedish Coast Guard



It is difficult to carry out decontamination operations where *consideration for the environment* is just as important as consideration for economic interests. The reporting system used today only provides information in financial terms and there is no good system for documenting and reporting damage to the natural world. There are also no methods and procedures for monitoring this type of damage and changes in the environment that could arise further into the future. Such measures should be dealt with in their context and together with the decontamination itself. Neither is it always the oil that causes the most serious damage. On the contrary, it is not all that unusual for it to be the actual decontamination operation that leads to the greatest environmental damage.

Aircraft monitoring with remote analysis equipment is an important precondition for the Coast Guard being able to *detect and document* the dispersion of an oil spill and by means of repeated surveillance flights to be able to follow how the spill spreads.



The reports from the aircraft provide the incident commander with a good basis on which to make decisions about the work required in the medium term (the most immediate six hours after detection). Because the aircraft has a marker/oil buoy that can be dropped into an oil slick to take samples of the oil, the possibilities of determining what type of oil it is and to make comparative analyses are increased.

The aircraft are equipped with FLIRs (Forward-Looking InfraRed Cameras). This has increased the chances, in darkness, of classifying and to a certain extent identifying vessel that are suspected of causing illegal oil emissions.

When combating oil pollution in darkness, much positive experience has been gained from using floodlights with UV lights, IR cameras or special radar. It has proven possible to detect and follow an oil slick by means of satellite monitoring.

The Swedish Meteorological and Hydrological Institute (SMHI) developed the oil drift model, Seatrack Web (STW). STW is based on current and wind models and can be used to simulate how an oil spill spreads in an area of water. Figure SMHI

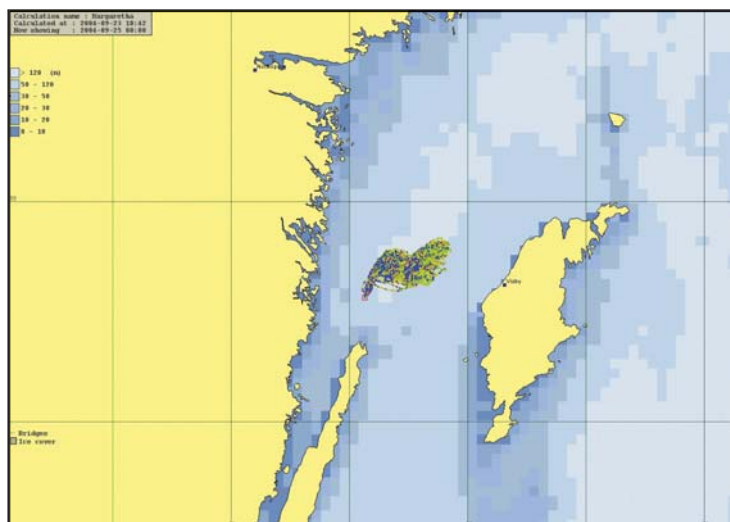


Illustration: SMHI

Mechanical methods are used when *combating oil pollution in Swedish waters*.

Advancing systems – vessels which, while underway, pick up oil from the water's surface using scanning arms that stretch out from the vessel's sides via brushes or pumping systems

– have made oil combating more efficient. As regards dealing with heavy oils and oil in water mixed with ice, materials and methods can be stated still to be insufficient, on a global basis.

#### *Decontaminating coastal areas:*

The costs of work to limit the effects of an oil spill are high. Retrieving oil at sea is materially-intensive work, while coastline decontamination is an operation that is manpower-intensive. The cost of decontamination per metre of coastline and per kg of oil varies a lot depending on the damage scenario and the environmental conditions. The Swedish Rescue Services Agency has developed a system for guiding and trapping oil



Photo: Swedish Rescue Services Agency

and to mechanically protect coastal areas. The system was used for the first time and with great success in the summer of 2003 along the Skåne coastline, which was hit by the oil spill from the foundered Chinese bulk-loader, the *Fu Shan Hai*, off Bornholm.

*Municipal oil combating and decontamination:* The work of the fire & rescue services is introduced immediately when details of an oil spill become known. With the support of the regulations on disposition in the Civil Protection Act, the municipal authorities can requisition personnel and materiel for this purpose. The choice of decontamination methods ought to be made through consultation between the Swedish Rescue Services Agency and the municipality.

After the acute oil combating phase (mechanical control of the oil and the laying out of coastline protection covers, etc.) the work on decontaminating coastal areas begins. When the incident involves major oil spills of such a scale that the situation, in accordance with the new law on extraordinary incidents in peace-time, is assessed as leading to a serious emergency, a risk assessment needs to be carried out and certain contingency plans made.

A great deal of manpower is required to carry out coastline decontamination and those who participate are usually quite unfamiliar with this type of work. They therefore need to have some introductory training before the work starts. It is also important to be able to maintain safety for the personnel involved. Apart from having been given training, the personnel must be commanded by a responsible command team (who have employer responsibilities). This also applies to the volunteers who participate in the work.

For oil combating and oil decontamination work in coastal areas, different types of *technology and materiel* are required, for example, depending on the type of area that is affected, the weather conditions in which people will have to work, and the type of oil is involved. Light-weight booms and protective covers ought to be used widely, since the environment can then be protected and the costs of decontamination kept down.

The municipal authorities with storage facilities make available the oil combating materiel, which the Swedish Rescue Services Agency can use. There are 10-15 trained people in each of the municipal authorities with storage facilities. An expert workforce ought to be established to retain the level of skill and experience from the work carried out. This expert workforce ought to be able to report for duty at short notice, both in Sweden and overseas, to be able to participate in all operations, to act as a support for municipalities and under the municipally appointed incident commander to take responsibility for whole operations. The expert workforce should above all be an important resource and a valuable support if major coastal oil pollution occurs.

## 3.6 Finance

The collaboration with the International Oil Pollution Fund and with the insurance companies (the P&I clubs) has worked in a satisfactory manner. Often, negotiations go on for several years, sometimes ending in some lesser compromise. The work is very time consuming. The key to a successful result is therefore perseverance in negotiations, based on the documentation of how the operation was performed and the expected decisions and expenses from this.

Experience shows that major demands are being made of the state, to be able in detail to verify the costs that have been accrued for oil combating and decontamination in conjunction with oil spills. Such reporting should be left to the body that caused the spill/pollution (which means



that both the vessel that has released the oil and the vessel's owner should have the reporting responsibility), to the insurance companies and to the International Oil Pollution Fund. It is particularly important to document all decisions, as well as the situation pertaining at the time the relevant decision was made.

The regulations for the municipality's right to compensation for decontamination costs, as well as the regulations for compensation for rescue service costs, have now been written into the Civil Protection Act. It covers such things as the conditions for intervention in other people's rights, obligations for state or municipal participation in emergency operations at the request of the incident commander and the municipality's right to compensation from the state for costs incurred during the provision of municipal rescue services due to an emission into the water of oil or other hazardous substances.

In certain cases, the Swedish Rescue Services Agency only becomes aware that oil decontamination has taken place when the municipal authority in question requests compensation from the agency. On such occasions, it can be difficult to assess whether the decontamination has taken place to the extent that was necessary.



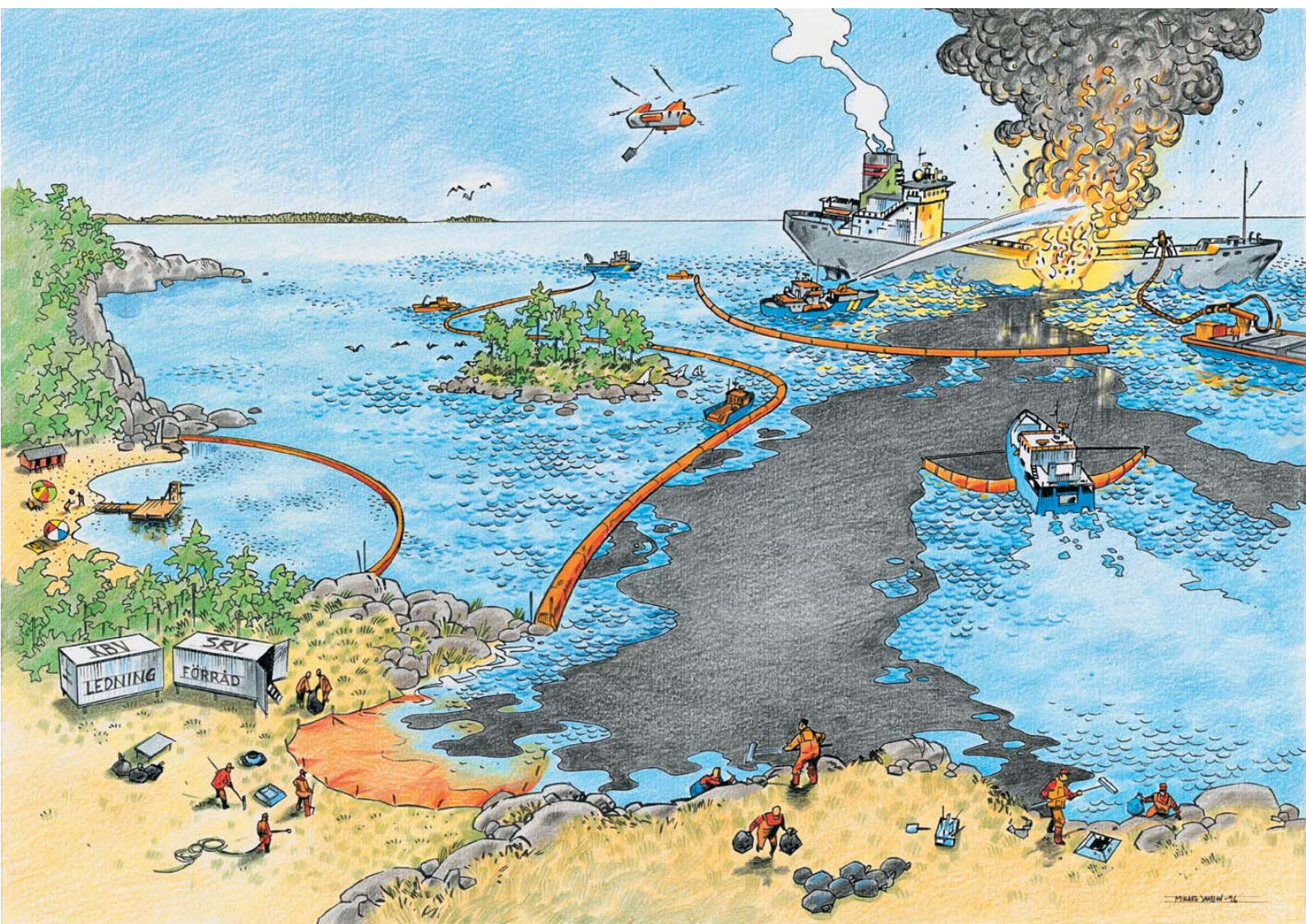
*Photo: Swedish Rescue Services Agency*



### 3.7 Other experience

Having oil samples from a spill is highly important to the continued investigation into the issue of guilt and for assessing the risks to the environment. Special equipment and training for taking oil samples are now available.

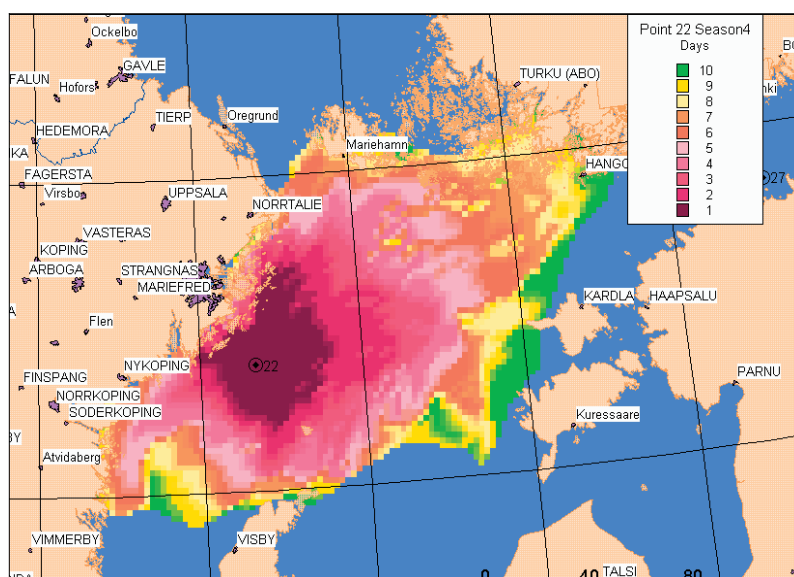
In Denmark, the Navy (the responsible authority for environmental protection at sea) has introduced a method of contacting vessels by radio when they have been observed within the Danish area of responsibility and to inform them of the current regulations about emissions of environmentally hazardous substances. In this way, captains are given important information while also being made aware that they are being observed. This method is said to have functioned in a preventive manner and has led to a reduction in the number of emissions in Danish waters. Within HELCOM consideration is being given to the current possibility of introducing the same method in other suitable areas within the Baltic area.





## 4 Risk analysis

It is not possible to make any quantitative risk assessments on the basis of the material emerging from the structure of the work on this document. On the other hand, it is possible to highlight some anticipated and important changes to the risk scenario that applies today. These risk assessments are made on the basis of trends that are shown in available statistics, as well as those from known expansion plans and from forecasts that are made for future maritime traffic and for increased port activity in several of the countries around the Baltic. As previously mentioned, however, a number of international regulations have already had an impact on the risk scenario and will also affect it in future and partly be able to compensate for the increases in risk that are mentioned here.



The illustration is an example of a dispersion calculation that shows the “risk zones” within which an oil spill from a maritime emergency can drift and spread within the course of 1, 3, 5, 7 and 10 days. Source Dr. S. Ovsienko. From HELCOM SEA:5/2002

There are numerous factors that have already contributed to or are expected to be going to contribute to the risks of oil spills reducing in future:

- In the long term, the international fleets will become younger, the proportion of tankers with single hulls will reduce and the number of vessels with double hulls will increase. This is going to mean that the consequences of running aground and of collisions will be less serious as regards oil spills.
- New regulations, such as the ISM code and the STCW Convention, have been introduced to be able to specify stricter safety requirements for handling and transporting oil. This contributes to a generally raised level of awareness concerning environmental issues and this type of safety.
- The expansion of information systems (VTS) for maritime traffic is expected to produce results in the form of reduced emergency risks. Similarly, the expansion of automatic identification systems (AIS) facilitates safe navigation, which reduces emergency risks and makes it easier to identify and trace vessels that may be linked to illegal emissions of oil.

However, there are also numerous factors and circumstances that contribute to increasing the risks of accidental oil spills:

- Maritime traffic, including oil transportation, is increasing in the Baltic. An increase is expected in the number of vessel movements as well as the volumes of oil that are being transported.
- In the short term, it is not possible to rule out the fact that a considerable proportion of this increased maritime oil transportation in the Baltic will take place using older vessels that are in poor condition.
- The procedures for port inspections in the Baltic area have not been harmonised, which means that inferior vessels can traffic the area without being subject to a port inspection.
- Terrorist acts have been identified and observed as fully conceivable threats against maritime vessels and installations for extracting oil and gas.

## 4.1 Risks with maritime traffic and transport patterns

The IMO and the EU have agreed a timetable for phasing out oil tankers with single hulls, which is based on single-hulled vessels being phased out by 2010. In addition, since September 2003, there are EU requirements that oil tankers of more than 5000 DW transporting heavy oil should be equipped with double hulls. Oil tankers of less than 5000 DW but more than 600 DW should fulfil the requirements by 2008.

*A comparative assessment* of different types of change makes it reasonable to assume that the risks will move in the direction of an increased probability of accidents involving tankers, and then particularly in the Baltic. This assessment is based mainly on the fact that tanker traffic is going to increase. Until now, the Baltic and other Swedish waters have been spared from any major tanker accidents and numerous measures have been taken or are being taken further to reduce the risks of such accidents occurring. The assessment is still that it is not quite possible to compensate for the increased risk implied by an increase in traffic through the Baltic and further on through the Kattegatt and Skagerrak. In addition, there is nothing to indicate that the expected increase in traffic will involve vessels that fulfil the requirements of the best safety standards, at least not in the short term.



Photo: Swedish Environmental Research Institute

Instead, from experience to date, the conclusion could be reached that the vessels responsible for the increase in traffic in the Baltic will be older and will meet lower safety standards than, for example, those vessels that regularly come into Swedish ports.

Assessments of the measures taken to reduce the number of operational emissions in the Baltic area, as well as available statistics over the number of actual emissions, show that the measures have been effective. It is therefore reasonable to assume that the risks that the many, frequent small operational emissions have implied will reduce in significance in the considered risk scenario for Swedish waters over the period up to 2010. As emerged previously, one of the sub-objectives of the national environmental objective for coastlines and seas is that illegal emissions of oil should have ceased by the year 2010.

**PROBABILITY**

Very probable	↓ 1 4		HIGH RISK
Probable	5	↑ 2 3	
Unlikely	LOW RISK	7	↑ 2 3 6
	Small emission	Large emission	Disaster

The risks can be summarised schematically in the following way:

- 1 = Operational emissions
- 2 = Groundings
- 3 = Collisions
- 4 = Loading/unloading
- 5 = Fire/explosion
- 6 = Terrorist acts
- 7 = Incidents at offshore installations

**CONSEQUENCES**

As the figure above indicates, the very probable risks of a minor operational emission are estimated to reduce (the number one framed by a down arrow). The risks are assessed as unchanged as regards emissions from vessel loading/unloading (the number four with no frame). Changes in the risks linked to the other incidents in the figure can be assessed and interpreted in a similar manner.



# 5 Objectives for future Swedish oil combating

The proposals for the objectives and measures for future Swedish oil combating that are given here have been drawn up on the basis of the current risk scenario and assessments of the future risk scenario as regards emissions of oil and chemicals in Swedish waters or in sea areas that border these. The proposals are also based on the basic experience gained to date within Swedish oil combating work. Two of the national environmental objectives form the basis for the following objectives for oil combating at sea and in the large lakes.

## 5.1 Overall objectives

The overall objective of the Swedish oil combating system is to protect the Swedish economic zone, Swedish territorial waters, the Lakes Vänern, Vättern and Mälaren as well as the Swedish coastline against the damage that oil pollution can cause to the environment and to socio-economic value.

The overall objective for the Swedish oil combating system until the year 2010 can be subdivided into the following sub-objectives:

- objective for preventive measures,
- objective for oil combating at sea and in the large lakes,
- objective for coastline oil combating,
- objective for follow-up activities after the execution of oil combating measures.

## 5.2 Objectives

### Objective for preventive measures

The overall objective for the preventive measures is to minimise the risks of emissions of oil at sea. The objective consists of the following sub-objectives:

- The process that has commenced to classify the Baltic Sea as a particularly sensitive sea area (PSSA) should be concluded by the year 2007
- Illegal emissions of oil in Swedish waters should, in principle, be negligible by the year 2010.
- A prohibition ought to be introduced for traffic in Swedish waters involving single-hulled vessels used for carrying all types of oil cargo
- A more efficient partnership ought to be built up between the authorities that are responsible for port inspection in the Baltic Sea area
- Observance of the Baltic Strategy on Port Reception Facilities for Ship-generated Wastes ought to be monitored
- The Swedish oil combating authorities and organisations concerned ought to carry out joint exercises.
- The international partnership is being further developed

## Objective for maritime oil combating

The overall objective *for maritime oil combating* is to have the ability to combat spills at an early stage and by taking effective oil combating measures to tangibly contribute to reducing the negative effects of serious spills on the aquatic environment and on coastal areas. The objective can be broken down into the following sub-objectives:

- There should be a constant state of emergency preparedness to command and commence maritime oil combating operations.
- Up to the year 2010, the capacity to combat maritime oil pollution should be increased from currently being able to deal with 5,000 tons of oil on one and the same occasion, to being able to combat 10,000 tons on one and the same occasion.
- Rather, capacity should be created to prevent oil getting into the body of water, by means of emergency towing, emergency booms, or firefighting, when there is an acute risk of oil emissions following an accident. In connection with this, the capacity should also be developed to deal with oil from a vessel that is brought into a place of refuge.
- By the year 2007, there should be capacity to implement oil combating operations regardless of the visibility conditions en route to and at the emergency site, such as in waters containing ice.
- International operational partnership should be able to commence immediately in the case of major emissions of oil.
- Development of the oil drift model, Seatrack Web, is to continue.

## Objective for coastline oil combating

*The objective for coastline oil combating is that there should be emergency preparedness to permit the combating of oil pollution that comes ashore from oil spills and to be able to decontaminate coastal areas to minimise the economic and social consequences and the environmental impact of the emissions. The objective can be broken down into the following sub-objectives:*

- In 2010, there should be a capacity to deal with 10,000 tons of oil on shore from one oil spill in a manner that does not entail any long-term environmental or economic effects.
- By the year 2007, environmentally-adapted decontamination methods should have been developed.
- By the year 2007, a national, Internet-based environmental atlas should have been drawn up for the Swedish coastline and for the large lakes.
- In 2007, there should be contingency plans in place for oil combating in all of the Swedish municipal authority areas along the coasts and around the large lakes.
- By the year 2010, it should be possible to further limit the extent of coastal oil pollution and it should be possible to protect particularly sensitive areas.

## Objective for monitoring and evaluation

*The objective for monitoring and evaluation activities should by 2006 have developed methods for the long-term monitoring of the environmental impact of oil coming ashore. Similarly, there will be an intensification of the work on the feeding back of lessons learned and experience from practical operations in order to develop skills and competence.*

# 6 Measures

## 6.1 Preventive measures

**The process to classify the Baltic Sea as a particularly sensitive sea area (PSSA) has begun and should be completed by 2007.**

In order to be classified as a particularly sensitive sea area (PSSA) according to the IMO's regulations, an area must fulfil three conditions: The area must be of ecological, social, cultural, economic and scientific significance. International shipping may damage the area. Suitable protective measures can be taken as part of the IMO's work. In 2003, Sweden and other Baltic states, excluding Russia, applied to the IMO to have the Baltic Sea classified as a PSSA area. In April 2004 the IMO made a decision in principle to classify the Baltic Sea, excluding Russian waters, as a PSSA. The applicant countries, within two years of the decision, may return to the IMO with proposals for new protective measures which will apply to the classified area. Final approval for the application is dealt with when the countries have returned with these proposals. After that, any measures are taken by the party carrying them out. These should be completed by 2007.

- *Responsibility for measures:* Swedish Maritime Administration, Swedish Environmental Protection Agency and the Swedish Coast Guard

**Illegal discharges of oil in Swedish waters will have ceased by 2010 in principle.**

In order for it to be possible to achieve the proposed part target of stopping illegal discharge of oil in Swedish waters in principle by 2010, the chances of detecting those causing the discharge must be improved. Flying times for the Swedish Coast Guard aircraft should be gradually doubled over a five year period. In practice this means an increase of 3,000 flying hours. Furthermore, the sensor system should be optimised to gain the best possible likelihood of detecting perpetrators, achieve the best chance of identifying vessels and to obtain the best possible quality of documentation. So that satellite reconnaissance can be exploited in an optimal way, flight monitoring should be co-ordinated with satellite paths to provide immediate monitoring of the results of reconnaissance. Increased flight monitoring also means that oil discharging can be detected at an earlier stage. This in turn means that the combat time at sea is increased and that the risks of the oil being driven ashore are simultaneously reduced.

- *Responsibility for measures:* Swedish Coast Guard

**Sweden will work towards a ban on operating single-hull vessels transporting oil in the Baltic Sea area.**

IMO requirements on phasing out single-hull vessels apply internationally since September 2002. According to the current schedule for the phasing out, all single-hull tankers will have been taken out of service by 2010. The EU has therefore decided to bring forward the phasing out of single-hull oil tankers which call in at EU ports. This decision means that vessels which do not meet demands for double hulls will have been taken out of service by 2010 at the latest.

- *Responsibility for measures:* Swedish Maritime Administration

**More effective cooperation should be developed between the authorities responsible for monitoring sea areas in the Baltic.**

In order to avoid or reduce the risks associated with sub-standard vessels using the waters, there is an international agreement on monitoring sea areas. In Sweden, the Swedish Maritime Administration has undertaken to monitor a certain proportion of incoming vessels registered under some other foreign flag. Sweden is working to get all countries around the Baltic Sea to sign up to the Paris MoU on monitoring sea areas.

- *Responsibility for measures:* Swedish Maritime Administration, Marine Surveying Department

**Adherence to the Baltic Sea strategy if reception plants for waste from maritime vessels are to be followed up.**

Through international collaboration with the Baltic States, Sweden will encourage investors who aim to guarantee that there are reception plants for all types of waste generated by shipping in ports in the Baltic area.

- *Responsibility for measures:* Swedish Maritime Administration

**Affected Swedish oil combating authorities and municipalities will carry out regular joint training exercises.**

The Swedish Rescue Services Agency, the Swedish Coast Guard, the Swedish Maritime Administration, the municipalities, the county administrative boards and the Swedish Environmental Protection Agency need to have ongoing close, integrated collaboration in order to ensure a smoothly functioning national oil combating programme. Both theoretical (table-top exercises) and practical exercises should be held regularly.

- *Responsibility for measures:* Authorities and municipalities affected.

**International collaboration will be expanded.**

Shipping is an international activity of the highest degree. Swedish authorities should work energetically in international matters relating to shipping and transport safety to prevent the discharge of oil. The work of the EU in developing procedures and ways of working within the area of shipping is of top priority, as is the work carried out within HELCOM.

- *Responsibility for measures:* Swedish Coast Guard and Swedish Maritime Administration

## 6.2 Maritime oil combating measures

**The willingness and capacity to combat discharges of oil will be increased.**

According to the current arrangements for Swedish oil combating in ports and in the major lakes, there is to be joint readiness to be able to combat oil spills of up to 5 000 tons by mechanical means at one and the same time. Bearing in mind that the size of oil transport vessels is increasing – a tank on a large oil tanker contains between 10,000 and 20,000 tons of oil – this target should be amended. Moreover, in order to optimise the operating time and capacity to combat a certain volume of oil spill in the water, it is also important that in pumping oil from one vessel to another, assistance with maritime firefighting and emergency tugs etc. can prevent the oil spilling into the water. This can be achieved through a high degree of readiness at sea, particularly in high-risk areas and through increased presence and links with particularly

susceptible areas. The capacity to carry out emergency towing, emergency lightering and fire-fighting, as well as to carry out combat operations irrespective of the visual conditions and in ice, should be ensured by concluding an ongoing development project within the Swedish Coast Guard. The capacity to handle oil from a vessel at a protected site will be developed.

- *Responsibility for measures:* Swedish Coast Guard

#### **International collaboration will be expanded.**

Besides having access at national level to suitable equipment and being able to maintain a high state of readiness, the capacity to combat large oil spills should be ensured by effective international cooperation in the Baltic Sea and in Kattegat and Skagerack. The cooperation which occurs as part of, among other things, the Bonn Agreement, Copenhagen Agreement and Helsinki Convention, provides a sound basis for this collaboration. Within the EU, measures are being taken to strengthen cooperation and expand the capacity to take charge of large-scale incidents. Sweden should further promote cooperation by taking a very active part in the work within these organisations.

- *Responsibility for measures:* Swedish Coast Guard and Swedish Rescue Services Agency

#### **The Seatrack Web oil drift model will be developed.**

The Seatrack Web oil drift model should have a higher breakdown of tidal data than is currently the case. The system should also be developed so that it is possible to make calculations which take into account the specific properties of different oils. Icy conditions should also be input into the model and the descriptions of turbulence further developed.

- *Responsibility for measures:* Swedish Coast Guard and Swedish Rescue Services Agency

## **6.3 Measures for oil combating in coastal areas**

### **A national, web-based environmental atlas of the Swedish coast and the larger sea areas will be developed and put into service.**

The environmental atlas will be used as a tool in country administrative boards and municipal long term planning of preventive work and to plan the size of oil combating resources which are required in different areas and where they are needed. The atlas will also be used as an operational tool for incident commanders with serious emergencies. The Swedish Environmental Research Institute was commissioned by the Swedish Environmental Protection Agency to conduct a pilot study which was recorded in 2003. The work on developing an environmental atlas is now being continued by a working group led by the Swedish Environmental Research Institute and commissioned by the Swedish Environmental Protection Agency. Among other things the project makes use of experience from developing the environmental atlas which the Swedish Environmental Research Institute and the county administrative boards for Västra Götaland drew up. An atlas is expected to be ready for practical use by 2007.

- *Responsibility for measures:* Swedish Environmental Protection Agency, Swedish Environmental Research Institute and affected county administrative boards.



**Current preparation plans will be found in all affected municipalities and counties.**

By 2007 at the latest there should be regional preparation plans for all counties. The regional plans are being drawn up jointly by municipalities and county administrative boards and will build on the existing municipal plans. Together with the new environmental atlas the plans will provide the basis for deciding on suitable measures for combating and cleaning up where there is a risk of oil spills in coastal areas. The municipalities will also draw up plans for taking charge of the oil and oil-polluted waste which is collected. These plans will be regularly updated. Exercises in collaboration between the Swedish Coast Guard, the Swedish Rescue Services Agency, municipalities and county administrative boards should be held regularly to ensure readiness to deal with spillages of petrochemicals and to facilitate a speedy implementation of necessary measures.

- *Responsibility for measures:* All affected authorities and municipalities.

**Environmentally friendly methods for cleaning up oil in coastal areas will be developed.**

Environmentally friendly cleaning methods need to be developed by 2006 at the latest. All municipalities should have access to and knowledge of the clean-up manual.

- *Responsibility for measures:* Swedish Rescue Services Agency, Association of Local Authorities, and Swedish Environmental Protection Agency.

**In legislation on dangerous waste an exception should be made in order to make it easier to take charge of oil-contaminated material.**

The legislation on dangerous waste should be reviewed by 2006 at the latest to make it easier at a local level to handle material from the coastal areas that have lower levels of oil contamination.

- *Responsibility for measures:* Swedish Rescue Services Agency and Swedish Environmental Protection Agency.

**National oil combating in coastal areas will be reviewed.**

The focus of the Swedish Rescue Services Agency's emergency preparedness and its capacity should be reviewed in more detail. This should be done by 2006 in conjunction with changing the depot structure by creating two base depots with responsibility for providing cleaning and an emergency service and three depots with responsibility for providing an emergency service and cleaning for smaller operations.

- *Responsibility for measures:* Swedish Rescue Services Agency.

## 6.4 Measures for follow-up activities

Methods need to be developed for following up and determining the consequences of oil spills and clean-ups

The system for following up oil pollution prevention work needs to be developed by 2006 at the latest. By consequences is meant, for example, environmental and socio-economic impact. Experiences from operations carried out will be guarded against and form the basis for developing techniques and methods, collaboration, accounting costs and other documentation.

- *Responsibility for measures:* Swedish Rescue Services Agency and Swedish Environmental Protection Agency.

**There will be a joint follow-up after major oil spills and clean-ups.**

Each authority will evaluate its own as well as the joint contribution with a view to developing skills and collaboration.

- *Responsibility for measures:* All affected authorities





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