

The Challenge of the Shipping Industry to Minimise Oil Pollution

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Abstract

Oil pollution of the sea from shipping is of great concern, not only to the public and governments, but also to the shipping industry itself and its customers. This paper addresses both illegal as well as accidental discharges and the causes to such spills.

On this basis, necessary measures to discourage illegal discharges as well as to reduce the risk for accidental spills are discussed as seen from the perspective of the shipping industry.

These measures comprise both those to be taken by the industry itself as well as those to be taken by flag states, port states and coastal states.

It is noted that both the number and the quantities of oil spills have shown a downward trend and it is believed that recent measures taken, as well as the continued focus on such spills will contribute to further significant reductions.

Introduction

International shipping is subject to a very comprehensive set of rules and regulations covering most types of discharges and emissions. Regulations related to oil spills were the first to be developed and have over the years been improved and tightened several times, latest in December 2003.

Today these regulations ensure low operational discharges as well as minimal risk for accidental oil spills when complied with.

The individual shipping company's responsibility is to adhere to these regulations, first of all:

- by maintaining the ship and its equipment in a satisfactory condition,
- by implementing and adhering to a proper safety management system, and
- by providing a crew that is fully capable and fit to operate the ship safely

However, small and large accidents do occur from time to time, and most of these are due to non-compliance with the requirements, not only by the shipping company, but also from other actors such as the flag state and/or the ships classification society, terminal operators and others.

Furthermore, also intentional discharges of oily water from ships in violation of MARPOL, are regrettably carried out. Although the quantities of oil in such spills are generally small,

many of them do considerable harm to birdlife and cause pollution of beaches and coastal areas.

Norwegian Shipowners' Association (NSA), as an association of international shipping companies striving for high quality operations, takes active part in promoting the environmental standard of the industry in general and of Norwegian shipping in particular. I will here address how we see the challenges and what we are doing to meet these.

Environmental policy and activities of NSA

Norwegian shipping

The number and tonnage of ships controlled by Norwegian shipping companies as of 31 March 2004 is shown in Fig. 1.

Register	No of ships	Gross tonnage (GT)	Deadweight (dwt)
NOR	230	2.213.436	3.126.184
NIS	711	17.073.097	24.270.445
Foreign	676	10.451.196	15.085.558
Total	1.617	29.737.729	42.482.187

Fig. 1 Distribution of Norwegian controlled fleet on various registers (Source NSA)

These figures imply that Norway has the second largest merchant fleet under a national flag (after Greece) and Norwegian shipping companies control the third largest fleet (after Greece and Japan) when we exclude open registers

Thus Norway and Norwegian shipping are able to play an important role in promoting the environmental standard of international shipping, both because of our size and our proactive efforts for improving the industry's environmental performance.

Environmental policy of NSA

NSA activities within this area are governed by the following objective:

“To promote a competitive Norwegian shipping and offshore contracting industry with a high environmental standard”

I have underlined competitive because without this precondition, a company with a high environmental standard that cannot compete in the market will not be able to survive and this does nothing good for the environment.

This objective is not primarily based on idealism, but on the following two considerations:

- firstly, for commercial reasons since the markets mainly served by Norwegian shipping require a high safety and environmental standard, and this must be ensured by any company with a long term perspective on its business, and

- secondly, for political reasons since we can only hope to achieve the necessary competitive framework in Norway if we can demonstrate and be perceived as having a high safety and environmental standard.

Environmental activities of NSA

To achieve this goal, NSA activities in this area are primarily concentrating on the following three areas:

1. To establish an international regulatory framework with an environmental standard acceptable to the leading shipping nations and users of sea transport services such as US and EU, as well as to support the effective implementation and enforcement of these regulations. This we do in close co-operation with Norwegian authorities and international shipping organisations.
2. To support research and development related to our regulatory contributions and for the development of procedures and equipment to effectively comply with current and future regulations.
3. To inform our member companies about the regulatory developments as early as possible and to provide guidance and recommendations with respect to early implementation

The more detailed policy and action plans for the various environmental issues are presented in our Environmental Programme which is regularly updated, the last one from June last year.

Most of the focus is directed to the establishment and implementation of currently unregulated environmental impacts from shipping such as the reduction of air emissions including greenhouse gas emissions, use of less harmful anti fouling, prevent the spreading of unwanted aquatic organisms through the ships ballast water and the safe and environmental friendly recycling of obsolete ships.

We do also, however, acknowledge that still more need to be done to reduce illegal and accidental oil spill to sea, and my task here is to address our position in this regard.

Categories of oil spills

In order to structure the discussion, I will start by defining the three different categories of oil spills as follows:

- ***Operational discharges***
These are legal discharges of oil or oily water in accordance with The International Convention for the Prevention of Pollution from Ships (MARPOL).
- ***Illegal discharges***
These are conscious discharges in violation of MARPOL.
- ***Accidental oil spills***
These are unintentional oil spills due to accidents such as collisions, groundings and structural failure causing spills of oil cargo or bunker oil, or it can be operational accidents related to loading or unloading of oil cargo, operation of the oily water treatment plant, etc.

In this context it should also be mentioned that in addition to oil spills from shipping, oil is also coming from other sources. A study by UNEP from 1990, gave the following distribution between the various sources:

Industrial discharges	60,8 %
From non-tanker shipping	14,4 %
Natural seepage from the ground	10,3 %
Tanker accidents	6,6 %
Operational discharges from tankers	4,7 %
Offshore production	2,1 %
Refineries and terminals	1,2 %

According to this study, the shipping industry is accountable for about ¼ of the total oil input to the sea.

Operational discharges according to MARPOL

MARPOL Annex I, Reg. 9 defines the limits for how much oil a ship can legally discharge. It differentiates between oil residues from the cargo tanks and other oily waste, generally from machinery spaces in the engine room, which are mixed with the bilge water.

In general a tanker proceeding en route outside 50 nautical miles from the nearest land and not within a special area, can discharge not more than 30 litres per nautical mile. The total quantity must be below 1/30.000 of the total quantity of the particular cargo of which the residue formed a part. The tanker must have a slop tank arrangement and have in operation an oil discharge monitoring and control system.

With regard to oily water from machinery spaces, ships of 400 tons gross and above proceeding en route and not within a special area can discharge cleaned bilge water provided the oil content of the effluent without dilution does not exceed 15 ppm. The ship must have in operation a proper oil filtering equipment, and if it is 10.000 tons gross and above, it shall furthermore has in operation an oil discharge monitoring and control system. Water with this small amount of oil does not produce any sheen on the water and is totally harmless.

Within a special area, no discharge of cargo residues from tankers is permitted. With respect to oily waste from machinery spaces, also ships below 400 GT have to comply with the cleaning standard of 15 ppm as applicable for the larger ships.

Therefore, ships complying with the MARPOL-requirements do not cause any unacceptable pollution since the standard is considered to be well within what the nature is able to deal with.

However, it is not necessarily an easy task to comply with MARPOL. Use of detergents to clean the engine room spaces can make it difficult to separate out the oil in the oily water separator. Therefore this has to be taken into account when selecting detergents and in the operation of the plant. Furthermore, many Oil Discharge Monitoring and Control Systems require frequent and relatively complicated maintenance to operate properly, and it may not be immediately discovered when it fails.

Illegal discharges

Illegal discharges get much less publicity than the really large accidental oil spills, but as they significantly outnumber the latter, the total quantities are not insignificant and they may do substantial harm to birdlife and may also cause highly unwanted pollution of sensitive beaches.

Therefore, over the last years, many countries have intensified the control of ships and significantly increased the sanctions for violations of the MARPOL-convention with respect to discharges of oil and oily water.

There may be several reasons for these conscious and thus illegal discharges, the two most typical being:

- Lack of reception facilities in ports are forcing ships to discharge the oil at sea when storage capacity onboard is exceeded
- Non-delivery in ports in order to save time and money

Remedial measures

For these reasons, the measures to be taken to improve the situation are the following:

1. To put pressure on ports to establish reception facilities according to the requirements of MARPOL which should be easily accessible and cost-effective.
2. To encourage ports to implement a pricing system incorporating elements of the “no-special fee” principle in order to stimulate delivery since in such a framework, there is little to save from non-delivery.

Despite of such measures, there may still be ships that will not comply with the requirements and discharge oil or oily water in conflict with MARPOL. To further fight such actions, two additional measures should be implemented:

3. To introduce improved control and surveillance to discover and prove illegal discharges, both in regard to ships coming to port by inspecting the oil record book and in regard to ships transiting the coastal waters of a state by air surveillance.
4. To apply stricter sanctions, including higher criminal and civil penalties to deter ships from illegal discharges

Adequacy of reception facilities

With regard to the first point, the shipping industry has for decades complained about the lack of reception facilities with limited success. There are still many ports where such facilities are non-existing or highly inadequate and IMO has repeatedly urged industry to report such deficiencies through their flag states, but in general, the effect on ports have so far been limited.

We therefore welcome the adoption by EU of directive 2000/59/EC in November 2000 on port reception facilities for ship generated waste and cargo residues. This directive is forcing ports to provide adequate reception facilities adapted to the normal ship traffic to the port. While this is also a requirement of MARPOL, the Commission will closely supervise compliance with this directive with the support from the newly established European Maritime Safety Agency (EMSA).

As far as the rest of the world is concerned, we have to continue to urge shipping companies to report deficiencies and have this followed up in IMO. We believe the new Audit Scheme under development in IMO will provide a better tool for IMO to put pressure on member states that are not fulfilling their obligations in relation to IMO instruments.

Pricing principles – no-special-fee principle

In the early 90'ties, NSA funded a project carried out by the Norwegian Society for the Conservation of Nature (Norges Naturvernforbund - NNV) to investigate the causes for illegal discharges of oil in Norwegian Coastal waters and to propose remedial actions. One of the findings was that the high cost for receiving oily waste in ports caused many ships to rather discharge the oil at sea.

NSA and NNV therefore advocated a no-special fee system, similar to that used by some other countries to stimulate delivery of oily waste. The cost system should be designed in such a way that all ships pay a certain fee regardless whether they delivered oily waste or not, and the fee should be dimensioned in such a way that over a longer period of time, each ship would approximately pay an accumulated price corresponding to what such a ship would generate of operational waste. This principle is also incorporated into the abovementioned EU directive.

Surveillance and sanctions

Several coastal states, and in particular the US, have intensified their surveillance and significantly increased the criminal fines for such violations over the last years to deter ships from illegal discharging of oil. In the US, a large number of companies and persons onshore and onboard have been heavily fined, with the record so far being 27 mill USD for a company with 30 different incidents over a period of years. This has of course a dramatic deterring effect and I am quite confident that ships crew must be very desperate (or ignorant) if they consciously discharge oil illegally in US waters or in the waters of other coastal states that strengthens their enforcement.

Our challenges in relation to illegal discharges are partly to influence the proper responsible authorities through IMO and other channels, as well as to have the industry itself to ensure full compliance with MARPOL at all times.

As an example of the latter, we arranged a seminar on June 2 where also a representative from US Department of Justice was invited to give an update on the recent developments in vessel pollution enforcement in the US.

Accidental discharges of oil

Accidental discharges covers all unintentional discharges, from small spills due to operational or equipment failure in connection with pumping of oil, to major spills due to collisions, groundings or major hull failures.

Quite understandable, it is the major oil spills that attract most publicity, in particular when a major oil spill occurs near the coast of industrialised countries causing huge economic damage as a result. The two largest oil spill over the last 5 years, namely the Erika spill of about 20.000 tonnes in December 1999 outside France and the Prestige spill of some 77.000 tons outside Spain in November 2002 created a strong political pressure for actions.

Prevention is the best cure

As it is generally difficult to avoid serious pollution damage when oil has escaped from a ship, the primary strategy to avoid such serious pollution is to introduce adequate preventive measures in order to reduce the likelihood for such spills. However, since we cannot totally eliminate the risk, we must also have proper contingency plans, firstly to reduce the oil outflow from damaged ships and secondly to confine and remove the oil escaped from ships.

The proper type of preventive measures depends on the type of accident. To reduce the risk of having a major structural failure of a tanker requires a different approach and solutions than in the case of a collision.

Causes of oil spills

The International Tanker Owners Pollution Federation Limited (ITOPF) register most cargo related oil spills and have accumulated a comprehensive database containing information of more than 10.000 oil spills from tankers, combined carriers and barges, some 85% of which were less than seven tonnes. Comprehensive statistical information is available from their web page at www.itopf.com.

A summary of the causes for the various size categories of oil spill is shown in Table 2.

Cause	Distribution of number of oil spills (%)					
	< 7 tonnes		7 – 700 tonnes		> 700 tonnes	
Groundings	228	3	212	19	114	34
Collisions	167	2	274	24	95	28
Hull failures	572	7	88	8	43	13
Loading/discharging	2.812	37	326	28	30	9
Fire & explosion	85	1	11	1	29	9
Bunkering	548	7	26	2	0	0
Other operations	1.177	15	5	5	0	0
Other/unknown	2.175	28	143	13	24	7
	7.764	100	1.135	100	335	100

Table 2 Causes of oil spill for the various size groups (Source ITOPF)

Precautionary measures

The risk of any accidental discharge would be generally very low if all shipping companies focused on their primary responsibilities mentioned in the introduction, namely:

- to maintain the ship and its equipment in a satisfactory condition, and
- to provide a crew that is fully capable and fit to operate the ship safely

To ensure these responsibilities, it is a must for any shipping company to have implemented a proper safety and environmental management plan.

In order to assist our member companies in implementing an effective management system, we have recently published an updated Guideline for Environmental Management in Shipping Companies to this effect.

More specific preventive measures can be identified for each group of causes, of which some examples of important measures related to the most common causes to the largest spills are as follows:

Groundings

- Improved navigational aids (such as ECDIS)
- Vessel traffic management systems
- Better marking of fairways

Collisions

- Improved navigational aids (such as AIS)
- Vessel traffic management systems
- Introduction of traffic separation schemes

Hull failures

- Improved coating system to reduce corrosion in ballast water tanks
- Improved inspection of critical hull elements by shipping company/crew, by flag state and/or, by classification society and partly also by port state

In all these areas, a wide range of improvements has been introduced on a national, regional and international level. Of particular importance to international shipping is that the regulatory framework must be based on international regulations. The industry has therefore strongly advocated and supported strengthening of the regulatory regime of IMO, first of all through the MARPOL-convention, but also through other instruments such as the SOLAS-convention related to ship safety and the STCW-convention related to competency requirements.

The significance of vetting by the major oil companies

In order to avoid chartering tankers not in full compliance with all relevant rules and regulations, particularly in relation to the risk of causing oil spills, the major oil companies have introduced vetting of tankers and the operating company. This is both welcomed and acknowledged by the shipping industry as a very important measure to identify deficiencies and have them rectified, as a supplement to the survey and inspections made by the flag state and/or the ships classification society. The results of the inspections are made available to other oil companies and authorities when requested.

The main concern of the shipping industry in this regard is that most of the oil majors do not accept the vetting made by other oil companies and therefor carry out their own. This often creates an unreasonable burden on the crew when in port where multiple vettings shall be carried out.

The wish of the shipping industry is therefore, by standardising the vettings as well as to train the vetting inspectors to the same high standard, that the majors will take the benefit of a recent vetting from another oil company rather than repeating the same a short time afterwards, thus saving resources both for the shipping company as well as for themselves.

The issue of double hull versus single hull tankers

One of the most difficult and controversial issues with respect to the environmental safety of tankers has been the phasing out of single hull tankers.

Following the Exxon Valdez accident in 1989 and the adoption of the Oil Pollution Act of 1990 (OPA90) in the US, requiring new ships to enter US ports to be of double hull design and gradually phasing out single hull tankers, also IMO adopted similar international regulations in 1992. Thus all new tankers above 5.000 dwt contracted after 6 July 1993 had to be of double hull design or of a design with equivalent safety against oil outflow in case of a collision or grounding. In addition, single hull tankers had to be phased out when they reached an age of 30 years. The rationale for double hull tankers is that the risk for oil outflow in case of a low energy collision or grounding is less than for a single hull tanker. Because of this new design requirement, it was necessary to phase out single hull vessels, otherwise many of them would continue to be operated beyond normal replacement age and thus delay the introduction of the more costly double hull tanker.

After the Erika-accident in December 1999 outside France spilling some 20.000 tons of heavy fuel oil, EU put forward several proposals to tighten up the regulatory framework, both within EU but also on the international level through IMO. The most relevant proposal, strongly supported and improved by the industry was improved inspection of older ships, the so called Condition Assessment Scheme (CAS), as the cause of the Erika-accident was hull failure due to structural deterioration that was not detected during the periodic inspections of the ship.

However, a proposal was also put forward to accelerate the phasing out of single hull oil tankers, and a new schedule was agreed and adopted by IMO in April 2001, implying inter alia that single hull tankers should be phased out within 2007 or 2015, depending on its design. This was of course extremely dramatic for owners of relatively new single hull tankers delivered as late as 1996, but this was after all a better compromise than phasing them out 5 years earlier as proposed by some EU member states.

Only about 1 1/2 years later, we got the Prestige-accident in November 2002 outside Spain. The ship was damaged in heavy weather and asked permission to seek a place of refuge to safeguard the ship and transfer the cargo of heavy fuel oil. However, the Spanish authorities denied this request and forced the ship to get to sea and after battling heavy sea for 6 days, it eventually broke in two and foundered, spilling a substantial portion of its cargo of 77.000 tonnes with the rest going down with the ship.

Despite the fact that this accident had nothing to do with the design of the ship, but its structural condition, a fierce political pressure led to a further accelerated phasing out of single hull tankers within EU, moving the end date from 2015 to 2010, creating further havoc for owners of such ships. Also this proposal was submitted to IMO, and in an effort to bring the regulations for tankers within an international framework, similar amendments to MARPOL, with some provisions for regional exemptions, were adopted in December 2003.

Most of us in the industry as well as many of the professionals in the maritime administrations of European and other countries, have not been able to justify this

accelerated phasing out, neither as a measure to prevent accidents such as Erika and Prestige, nor on a cost/benefit basis.

This is now decided and the industry will of course have to adhere to these revised schedules. However, one must not live in the belief that a double tanker is without risk. Subject to a high energy grounding penetrating both skins, the oil outflow from a double hull tanker could in fact be larger than for a single hull tanker as the filling of the empty double bottom in loaded condition would make it more difficult to refloat the ship.

Furthermore, if a double hull tanker is not properly maintained and followed up by detailed inspection, also such a ship may be weakened over time and represent the same risk as for instance Prestige. therefore steps have now been initiated to develop adequate inspection schemes for these ships, equivalent to those specified for single hull tankers.

Contingency plans and places of refuge

I will not discuss contingency plans in a wider context here, as I will limit myself to preventive measures. However, one very important contingency measure, which is also an effective preventive measure in many cases, is the provision of a place of refuge in a situation where a ship is damaged and need to get into sheltered water to reduce the stresses on the ship and to offload cargo or carry out temporary repairs.

We know for sure that if Spanish authorities had allowed Prestige into a place of refuge, the oil spill would have been minimal. The industry has therefore strongly advocated that states must provide such places, and are therefore pleased to see that both the EU Commission and IMO has taken steps to force coastal states to establish such areas as well as efficient decision making to consider and decide on such a request.

Conclusions

Reverting once more to the statistics of ITOPF, I have in Fig. 1 and Fig. 2 presented graphs showing a clear downward trend with respect to both numbers of (large) spills as well as with respect to quantities of oil spilled since 1970 and up to and including 2003.

These figures do not properly reflect the new measures introduced in the wake of the Erika and the Prestige accidents. When these and other measures under consideration come fully into play, they will no doubt contribute to a further significant reduction in oil spills at sea.

In addition, the increase attention and more severe sanctions relative to illegal discharges, will also contribute to a significant reduction of such spills.

While I don't believe we can totally eliminate illegal and accidental oil spill, we should nevertheless have a vision of zero oil spills from shipping.

Figures

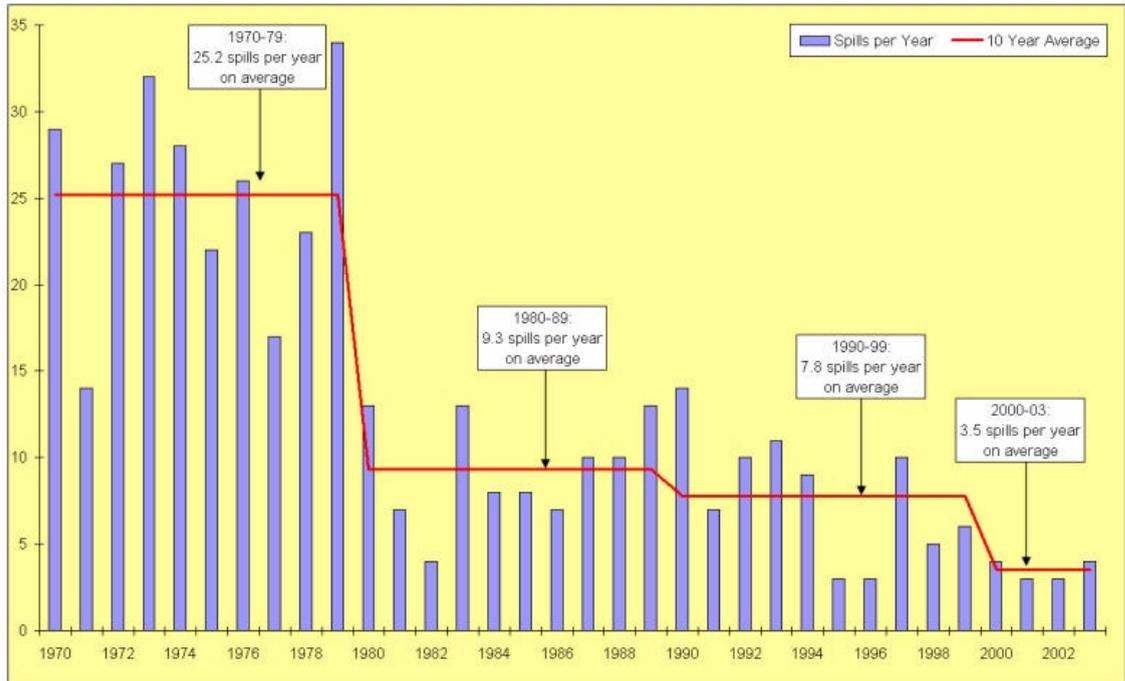


Fig. 1 Numbers of large oil spills (over 700 tonnes) 1970– 2003 (Source ITOPF)

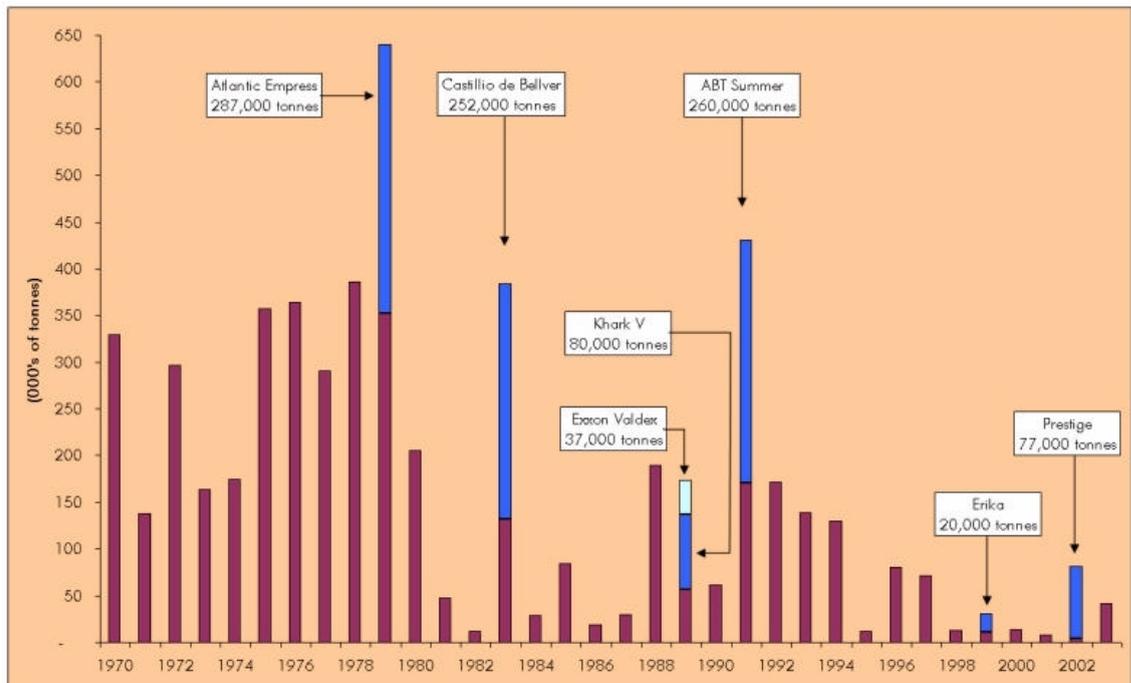


Fig. 2 Quantities of oil spilled (all size groups) 1970 – 2003 (Source ITOPF)