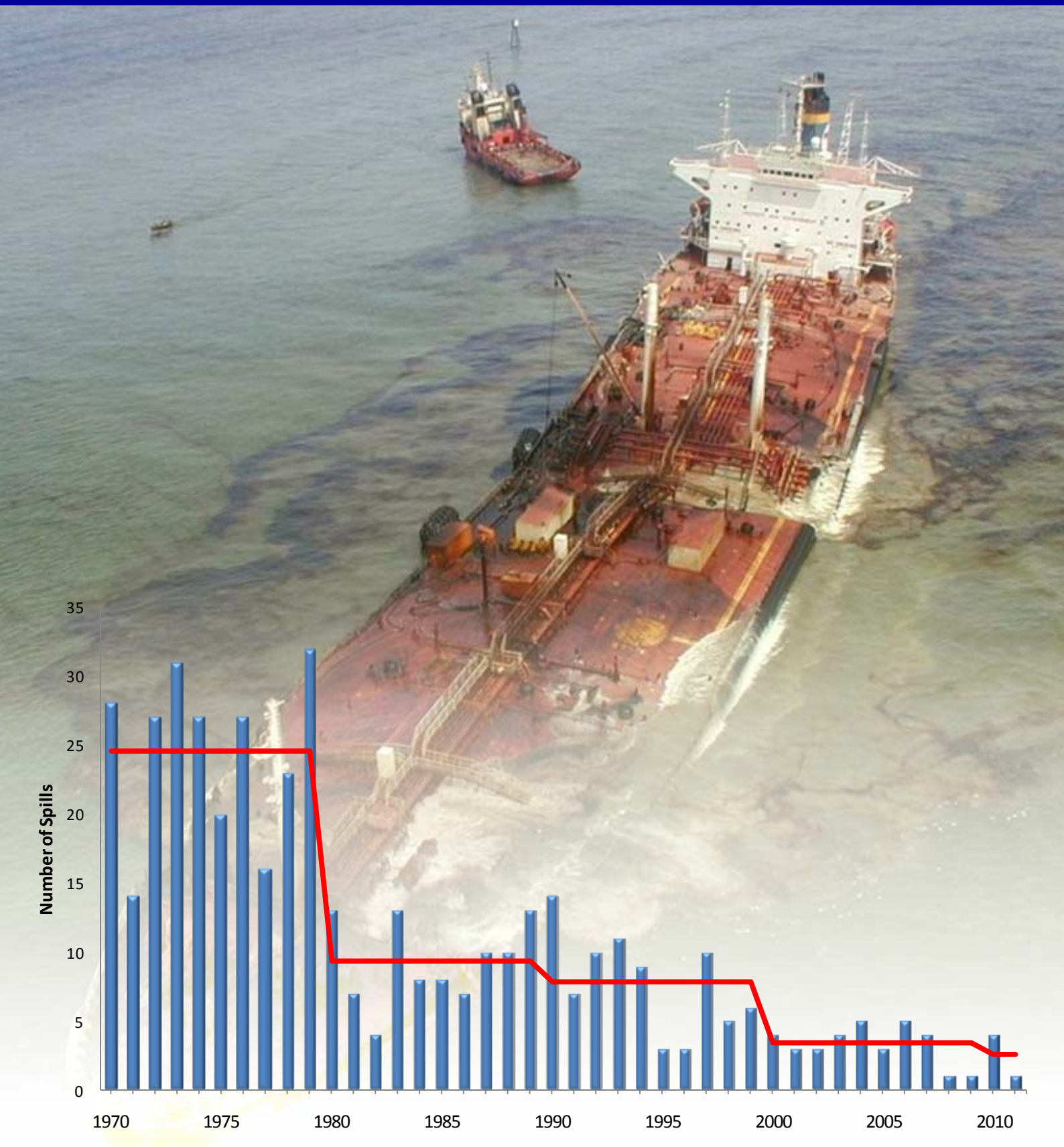
OIL TANKER SPILL STATISTICS 2011



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BACKGROUND

ITOPF maintains a database of oil spills from tankers, combined carriers and barges. This contains information on ACCIDENTAL spillages since 1970, except those resulting from acts of war.

The data held includes the type of oil spilt, the spill amount, the cause and location of the incident and the vessel involved. For historical reasons, spills are generally categorised by size,<7 tonnes, 7-700 tonnes and >700 tonnes (<50 bbls, 50-5,000 bbls, >5,000 bbls), although the actual amount spilt is also recorded. Information is now held on nearly 10,000 incidents, the vast majority of which (81%) fall into the smallest category i.e. <7 tonnes.

Information is gathered from both published sources, such as the shipping press and other specialist publications, and also from vessel owners and their insurers. Unsurprisingly, information from published sources generally relates to large spills, often resulting from collisions, groundings, structural damage, fires and explosions, whereas the majority of individual reports relate to small operational spillages. Complete reporting of this latter type of spill is clearly difficult to achieve.

It should be noted that the figures for the amount of oil spilt in an incident include all oil lost to the environment, including that which burnt or remained in a sunken vessel. There is considerable annual variation in both the incidence of oil spills and the amounts of oil lost. Whilst we strive to maintain precise records for all spill information, we cannot guarantee that the information taken from the shipping press and other sources is complete or accurate. Consequently, the figures in the following tables, and any averages derived from them should be viewed with an element of caution.

NUMBERS AND AMOUNTS SPILT

NUMBER OF OIL SPILLS

The incidence of large spills is relatively low and detailed statistical analysis is rarely possible, consequently emphasis is placed on identifying trends. Thus, it is apparent from Table1 that the number of large spills (>700 tonnes) has decreased significantly during the last 42 years during which records have been kept. The average number of major spills for the previous decade (2000-2009) is just over three, approximately eight times less than for the 1970s. Looking at this downward trend from another perspective, 55% of the large spills recorded occurred in the 1970s, and this percentage has decreased each decade to 7% in the 2000s (Figure 1).

A decline can also be observed with medium sized spills (7-700 tonnes) in Table 1. Here, the average number of spills in the 2000s was close to 15, whereas in the 1990s the average number of spills was almost double this number.

For 2011, one large spill was recorded (Figure 2 and Table 1). Four medium spills were also recorded in 2011, representing the lowest annual figure recorded for the second year in a row for this category. The total of all spills over 7 tonnes for 2011 is the lowest so far and is a significant reduction compared to the average for the previous decade.

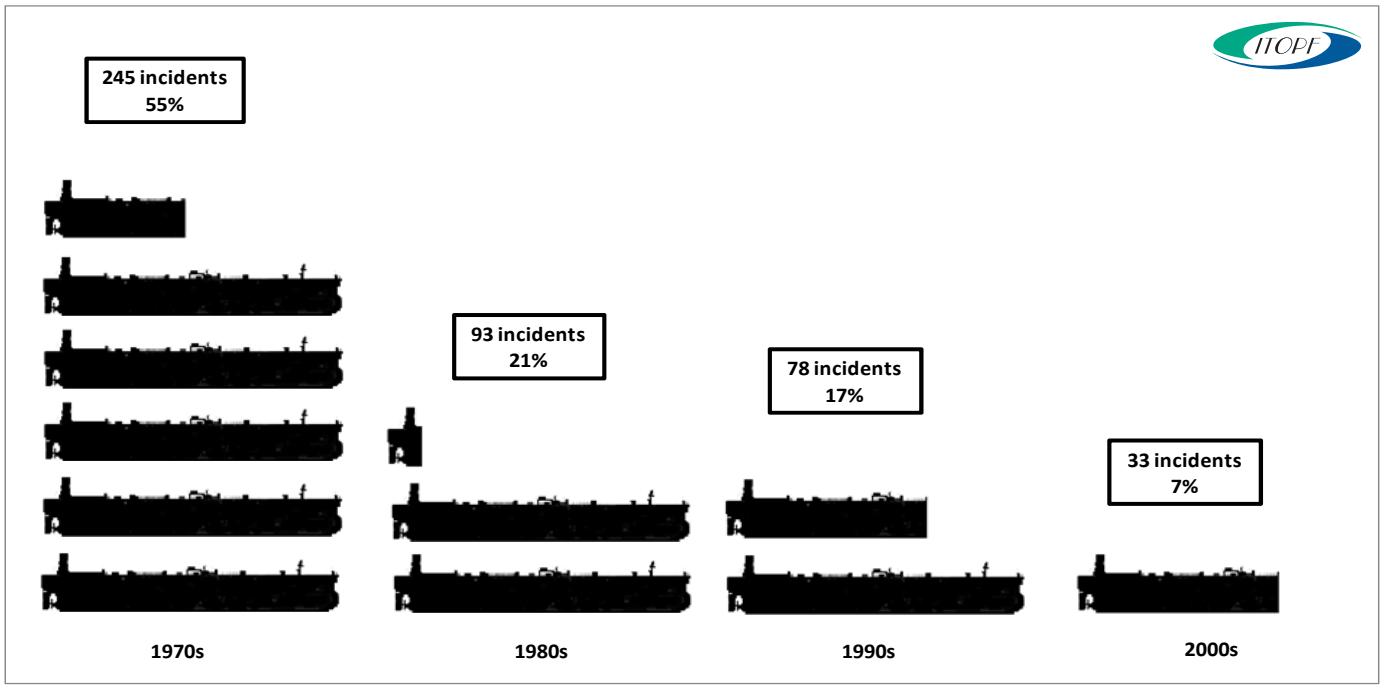

Figure 1: Major spills as a percentage of those recorded from 1970 to 2009 per decade

Year	7-700 Tonnes	>700 Tonnes
1970	7	28
1971	18	14
1972	48	27
1973	28	31
1974	90	27
1975	96	20
1976	67	27
1977	69	16
1978	59	23
1979	60	32
1970s Total	**542**	**245**
Average for decade	**54.2**	**24.5**

Year	7-700 Tonnes	>700 Tonnes
1980	52	13
1981	54	7
1982	46	4
1983	52	13
1984	26	8
1985	33	8
1986	27	7
1987	27	10
1988	11	10
1989	33	13
1980s Total	**361**	**93**
Average for decade	**36.1**	**9.3**

Year	7-700 Tonnes	>700 Tonnes
1990	51	14
1991	30	7
1992	31	10
1993	31	11
1994	26	9
1995	20	3
1996	20	3
1997	28	10
1998	26	5
1999	20	6
1990s Total	**283**	**78**
Average for decade	**28.3**	**7.8**

Year	7-700 Tonnes	>700 Tonnes
2000	21	4
2001	17	3
2002	13	3
2003	17	4
2004	17	5
2005	22	3
2006	13	5
2007	13	4
2008	8	1
2009	7	1
2000s Total	**149**	**33**
Average for decade	**14.9**	**3.3**

Year	7-700 Tonnes	>700 Tonnes
2010	4	4
2011	4	1
2010s Total	**8**	**5**
Average	**4**	**2.5**

Table 1: Annual number of oil spills (>7 tonnes)

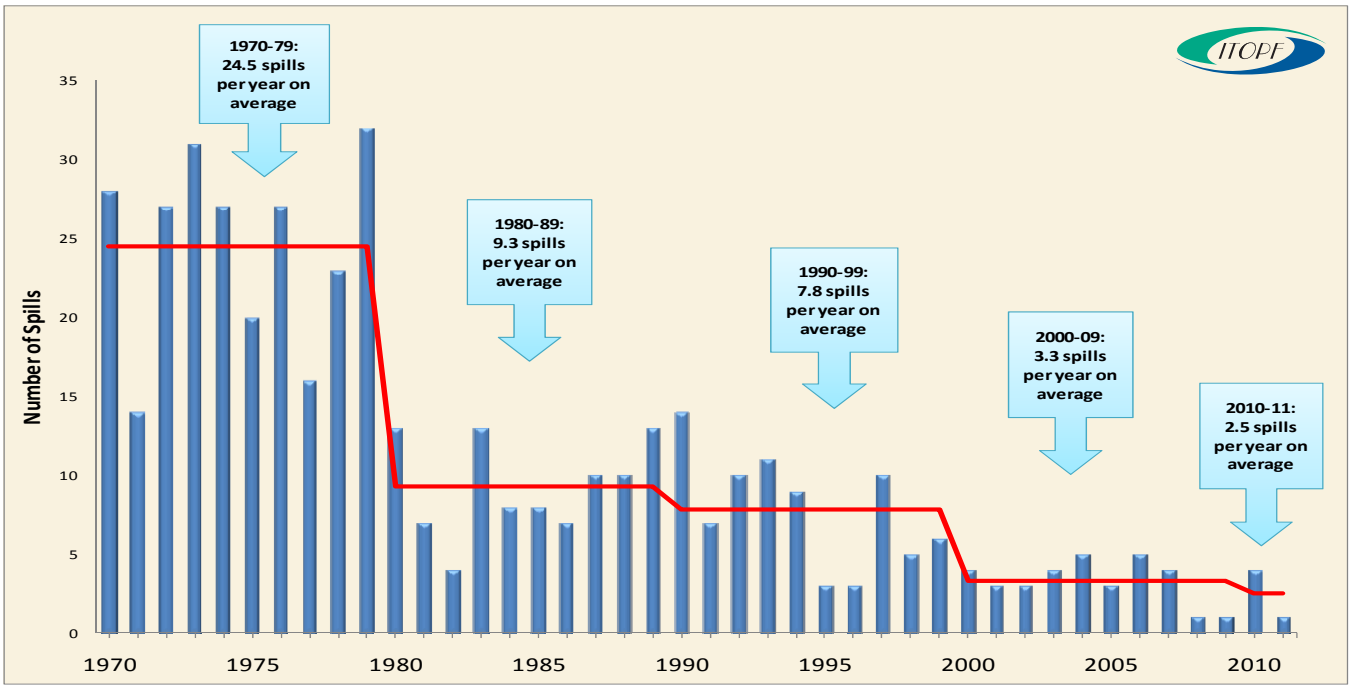

Figure 2: Number of large spills (over 700 tonnes) from 1970 to 2011

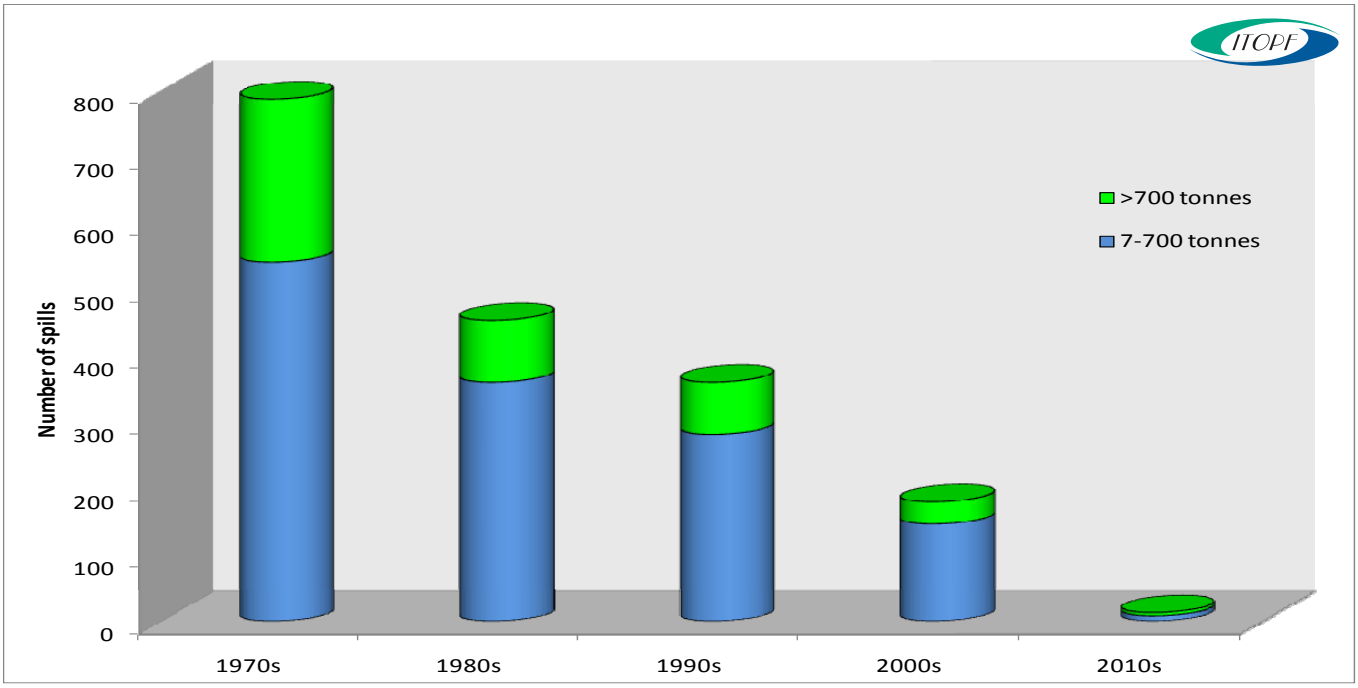

Figure 3: Number of medium (7-700 tonnes) and large (> 700 tonnes) spills per decade from 1970 to 2011

QUANTITIES OF OIL SPILT

The vast majority of spills are small (i.e. less than 7 tonnes) and data on numbers and amounts is incomplete due to the inconsistent reporting of smaller incidents worldwide.

Reports on spills of 7 tonnes and above tend to be more reliable and information from these is included in the database to give a series of annual estimates of the total quantity spilt for the years 1970-2011. These amounts are rounded to the nearest thousand where practical.

Approximately 5.7 million tonnes of oil were lost as a result of tanker incidents from 1970 to 2011. However, as Figure 4 and 6 indicate, the volume of oil spilt from tankers demonstrates a significant improvement through the decades. Consistent with the reduction in the number of oil spills from tankers, the volume of oil spilt also shows a marked reduction. For instance, from Table 2 it is interesting to observe that an amount greater than the total quantity of oil spilt in the decade 2000 to 2009 (211,000 tonnes) was spilt in several single years in earlier decades.

The total amount of oil lost to the environment in 2011 is the lowest on record so far (Table 2 and Figure 4).

Year	Quantity (tonnes)
1970	324,000
1971	143,000
1972	313,000
1973	159,000
1974	173,000
1975	351,000
1976	398,000
1977	276,000
1978	393,000
1979	636,000
1970s Total	**3,166,000**

Year	Quantity (tonnes)
1980	206,000
1981	48,000
1982	12,000
1983	384,000
1984	29,000
1985	85,000
1986	19,000
1987	30,000
1988	190,000
1989	174,000
1980s Total	**1,177,000**

Year	Quantity (tonnes)
1990	61,000
1991	431,000
1992	167,000
1993	140,000
1994	130,000
1995	12,000
1996	80,000
1997	72,000
1998	15,000
1999	29,000
1990s Total	**1,137,000**

Year	Quantity (tonnes)
2000	14,000
2001	8,000
2002	67,000
2003	42,000
2004	16,000
2005	18,000
2006	23,000
2007	18,000
2008	3,000
2009	2,000
2000s Total	**211,000**

Year	Quantity (tonnes)
2010	12,000
2011	1,000
2010s Total	**13,000**

Table 2: Annual quantity of oil spilt

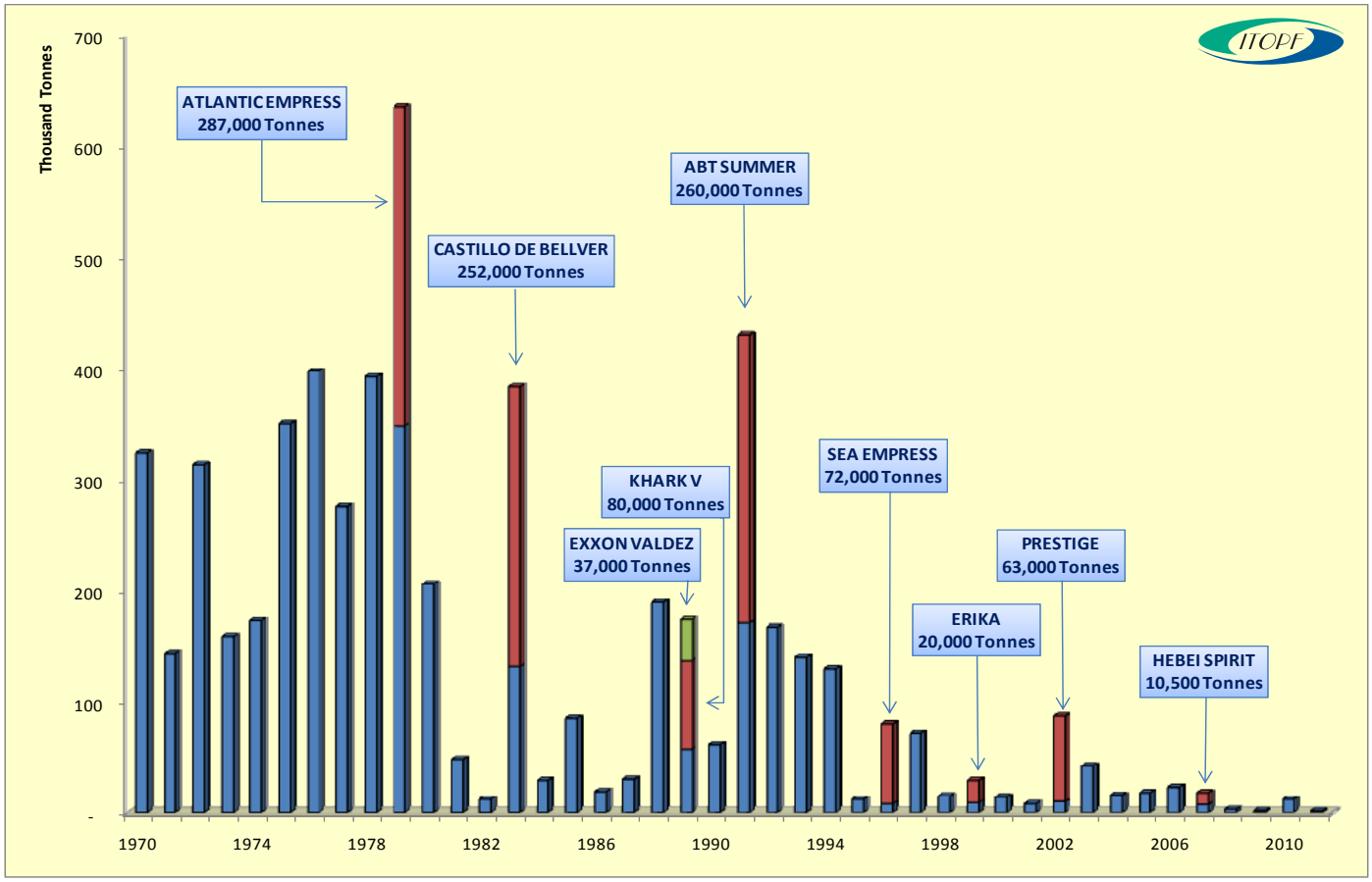

Figure 4: Quantities of oil spilt over 7 tonnes, 1970 to 2011

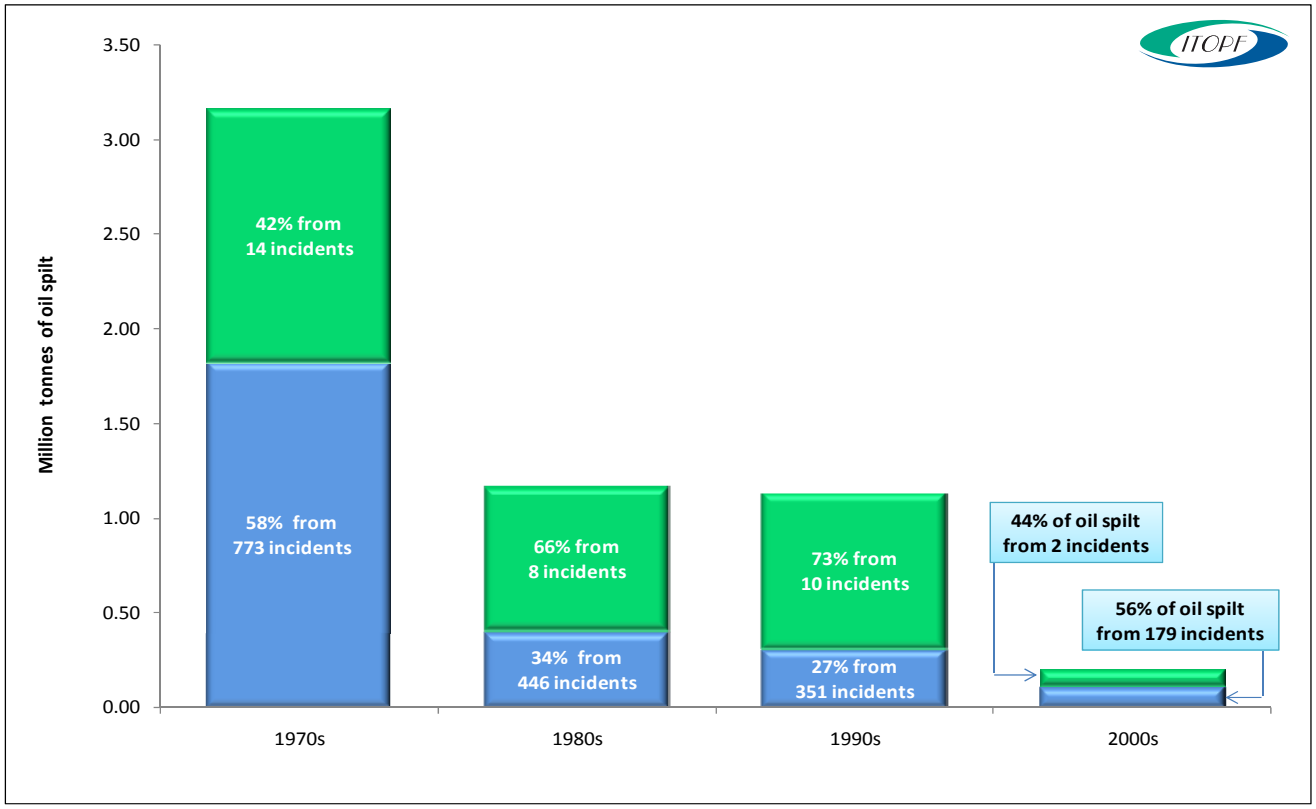

Figure 5: Spills over 7 tonnes per decade showing the influence of a relatively small number of comparatively large spills on the overall figure

As demonstrated in Figure 5, when looking at the frequency and quantities of oil spilt, it should be noted that a few very large spills are responsible for a high percentage of oil spilt. For example, in more recent decades the following can be seen:

- In the 1990s there were 361 spills over 7 tonnes, resulting in 1,137,000 tonnes of oil lost; 73% of this amount was spilt in just 10 incidents.
- In the 2000s there were 181 spills over 7 tonnes, resulting in 210,000 tonnes of oil lost; 44% of this amount was spilt in just 2 incidents.

The figures for a particular year may therefore be severely distorted by a single large incident. This is clearly illustrated by incidents such as ATLANTIC EMPRESS (1979), 287,000 tonnes spilt; CASTILLO DE BELLVER (1983), 252,000 tonnes spilt and ABT SUMMER (1991), 260,000 tonnes spilt.

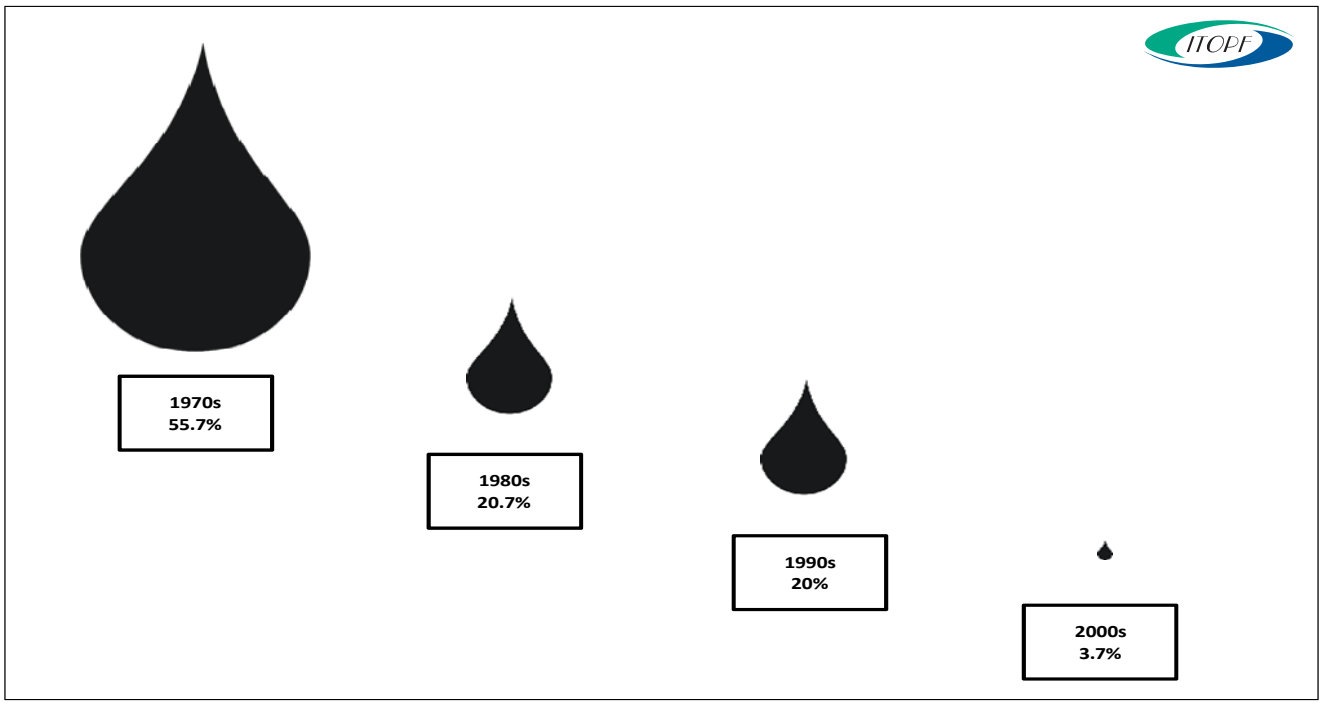

Figure 6: Oil spilt per decade from 1970 to 2009 (excluding 2010–2011) as a percentage of the total spilt

MAJOR OIL SPILLS

Table 3 below gives a brief summary of 20 major oil spills since 1967. The map in Figure 7 shows where they occurred. A number of these incidents, despite their large size, caused little or no environmental damage as the oil was spilt some distance offshore and did not impact coastlines. It is for this reason that some of the names listed may be unfamiliar. EXXON VALDEZ is included for comparison although this incident falls someway outside the group.

Position	Shipname	Year	Location	Spill Size (tonnes)
1	ATLANTIC EMPRESS	1979	Off Tobago, West Indies	287,000
2	ABT SUMMER	1991	700 nautical miles off Angola	260,000
3	CASTILLO DE BELLVER	1983	Off Saldanha Bay, South Africa	252,000
4	AMOCO CADIZ	1978	Off Brittany, France	223,000
5	HAVEN	1991	Genoa, Italy	144,000
6	ODYSSEY	1988	700 nautical miles off Nova Scotia, Canada	132,000
7	TORREY CANYON	1967	Scilly Isles, UK	119,000
8	SEA STAR	1972	Gulf of Oman	115,000
9	IRENES SERENADE	1980	Navarino Bay, Greece	100,000
10	URQUIOLA	1976	La Coruna, Spain	100,000
11	HAWAIIAN PATRIOT	1977	300 nautical miles off Honolulu	95,000
12	INDEPENDENTA	1979	Bosphorus, Turkey	95,000
13	JAKOB MAERSK	1975	Oporto, Portugal	88,000
14	BRAER	1993	Shetland Islands, UK	85,000
15	KHARK 5	1989	120 nautical miles off Atlantic coast of Morocco	80,000
16	AEGEAN SEA	1992	La Coruna, Spain	74,000
17	SEA EMPRESS	1996	Milford Haven, UK	72,000
18	NOVA	1985	Off Kharg Island, Gulf of Iran	70,000
19	KATINA P.	1992	Off Maputo, Mozambique	66,700
20	PRESTIGE	2002	Off Spanish coast	63,000
35	EXXON VALDEZ	1989	Prince William Sound, Alaska, USA	37,000

Table 3: Major oil spills since 1967

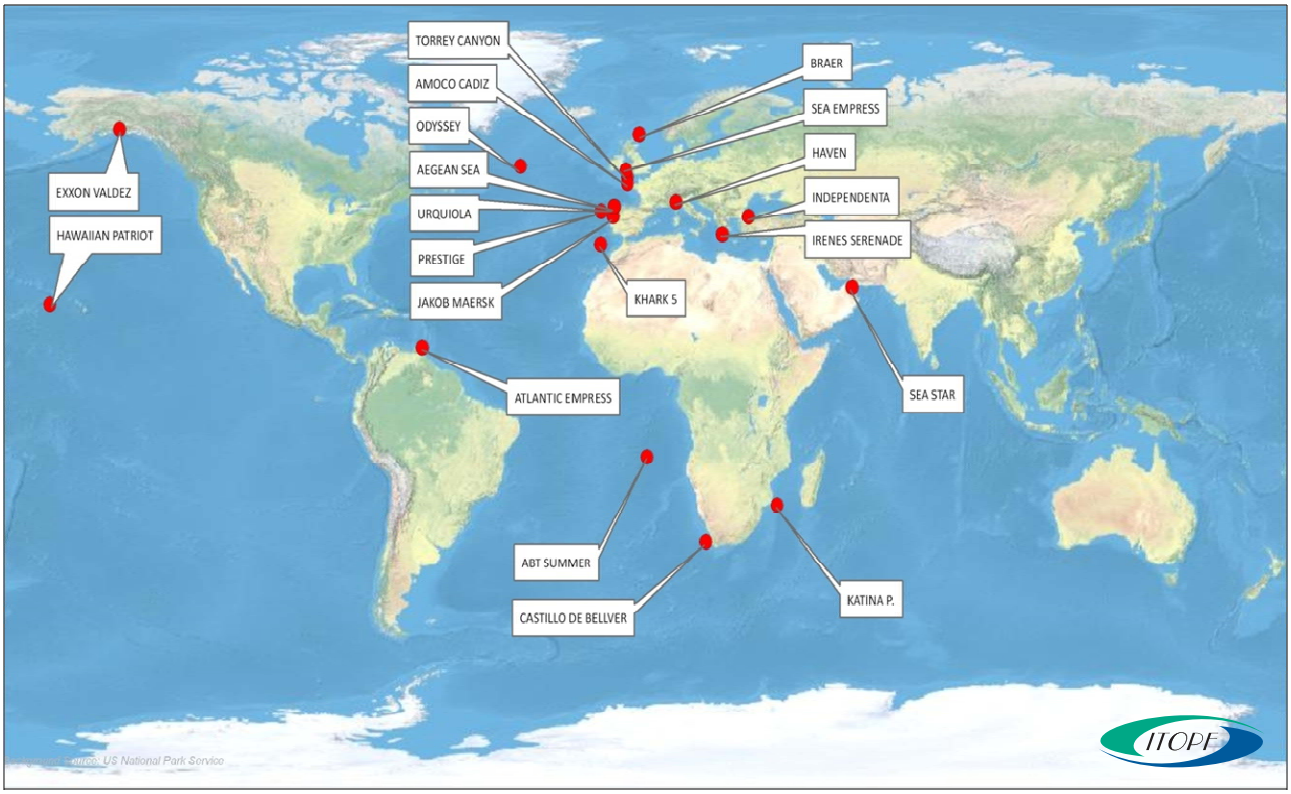

Figure 7: Location of major spills

SEABORNE OIL TRADE

Apart from a fall in the early 1980s during the worldwide economic recession, seaborne oil trade has grown steadily from 1970 (Figure 8). While increased movements might imply increased risk, it is encouraging to observe however that downward trends in oil spills continue despite an overall increase in oil trading over the period.

*Figure 8: Seaborne oil trade and number of tanker spills over 7 tonnes, 1970 to 2011 (Crude and Oil Product *)*

* *Product vessels of 60,000 DWT and above*

CAUSES OF SPILLS

The causes and circumstances of oil spills are varied, but can have a significant effect on the final quantity spilt. The following analysis explores the incidence of spills of different sizes in terms of the operation that the vessel was undertaking at the time of the incident and the primary cause of the spill. For small and medium sized spills operations have been grouped into Loading/Discharging, Bunkering, Other Operations and Unknown Operations. Other Operations includes activities such as ballasting, de-ballasting, tank cleaning and when the vessel is *en route*.

Reporting of larger spills tends to provide much more information and accuracy, which has allowed further breakdown of vessel operations. Therefore, operations for larger spills have been grouped into Loading/ Discharging, Bunkering, At Anchor (Inland/Restricted waters), At Anchor (Open water), Underway (Open water), Underway (Inland/Restricted waters), Other Operations and Unknown Operations. The primary causes have been designated to Allisions/Collisions, Groundings, Hull Failures, Equipment Failures, Fire and Explosion, and Other/Unknown. Other causes include events such as heavy weather damage and human error. Spills where the relevant information is not available have been designated as Unknown.

Small and medium sized spills account for 95% of all the incidents recorded; a large percentage of these spills, 40% and 29% respectively, occurred during loading and discharging operations which normally take place in ports and oil terminals (Figures 9 and 12). While the cause of these spills is largely unknown it can be seen that equipment and hull failures account for approximately 46% of these incidents for both size categories (Figures 11 and 14) . Nevertheless, there is a significant difference in the percentage of allisions, collisions and groundings between these two size groups where we see the percentage increasing from 2% for smaller spills to 35% for medium spills (Figure 14).

Large spills account for the remaining 5% of all the incidents recorded and the occurrence of these incidents has significantly decreased over the past 42 years. From Figure 15, it can be seen that 50% of large spills occurred while the vessels were underway in open water; allisions, collisions and groundings accounted for 58% of the causes for these spills (Figure 17). These same causes account for an even higher percentage of incidents when the vessel was underway in inland or restricted waters, being linked to some 95% of spills.

Perhaps unsurprisingly activities during loading or discharging result in significantly more small or medium sized spills than large spills. However, large spills do still occur during loading and discharging, and from Figure 17 and Table 6, it can be seen that 61% of these incidents are caused by fires, explosions and equipment failures.

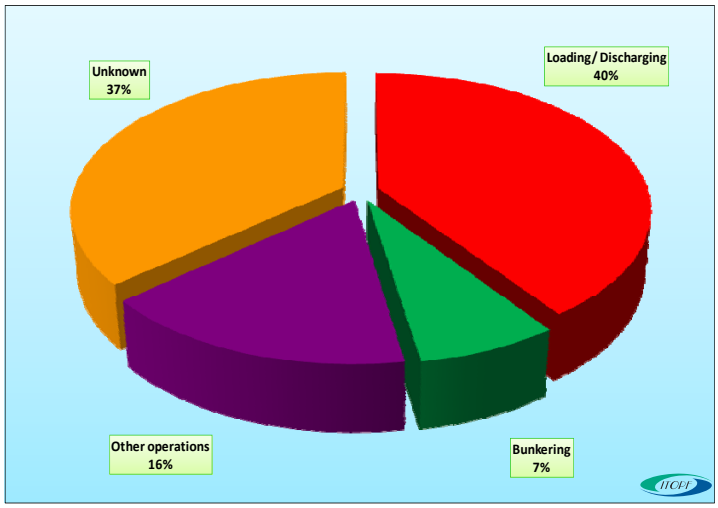

Figure 9: Incidence of spills <7 tonnes by operation at time of incident, 1974-2011

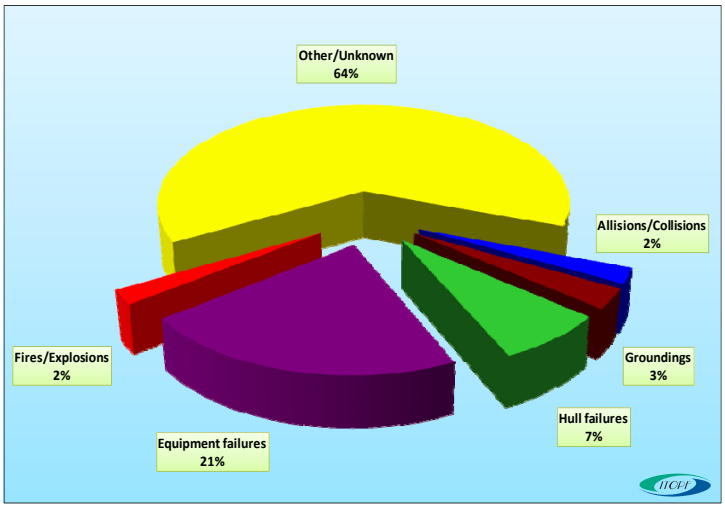

Figure 10: Incidence of spills <7 tonnes by cause, 1974-2011

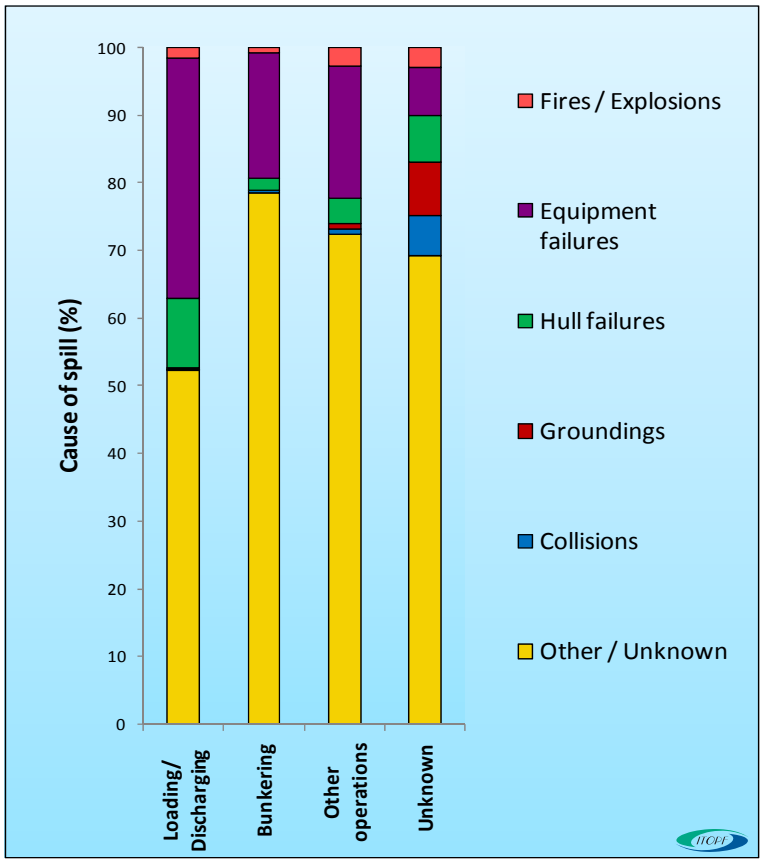

Figure 11: Incidence of spills <7 tonnes by operation at time of incident and primary cause of spill, 1974-2011

	Operations			
	Loading/ Discharging	Bunkering	Other operations	Unknown
	3156	563	1270	2852
Causes				
Collisions	1	2	11	168
Groundings	2	0	9	228
Hull failures	324	10	47	196
Equipment failures	1123	104	250	202
Fires/Explosions	50	5	34	84
Other/Unknown	1656	442	919	1974
Total	**3156**	**563**	**1270**	**2852**

Table 4: Incidence of spills <7 tonnes by operation at time of incident and primary cause of spill, 1974-2011

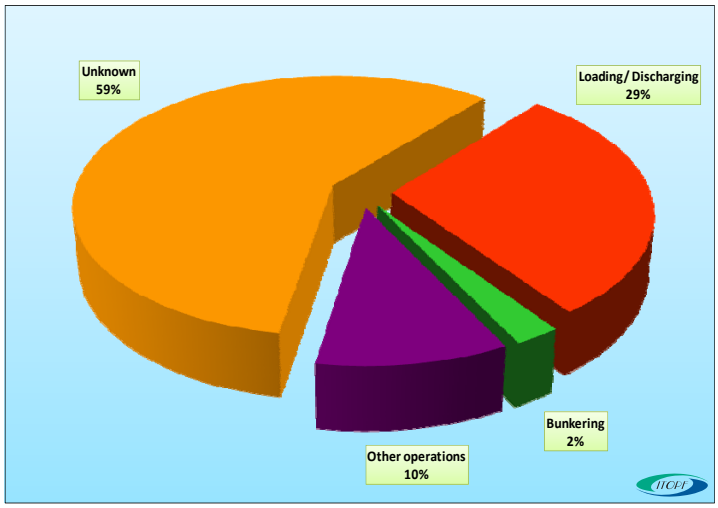

Figure 12: Incidence of spills 7-700 tonnes by operation at time of incident, 1970-2011

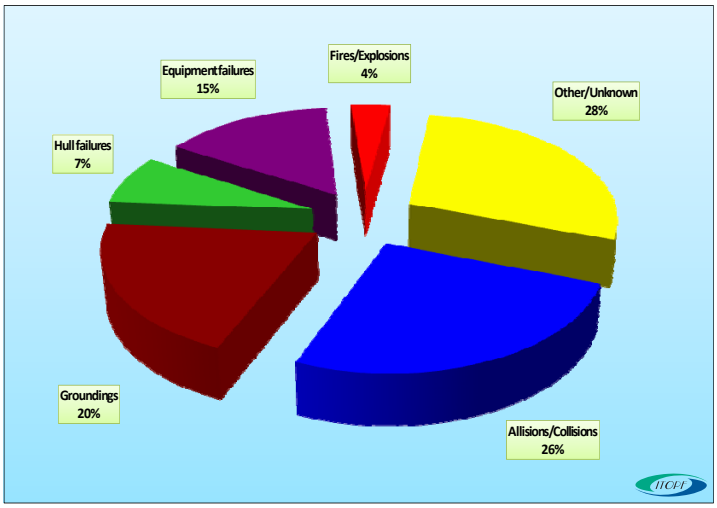

Figure 13: Incidence of spills 7-700 tonnes by cause, 1970-2011

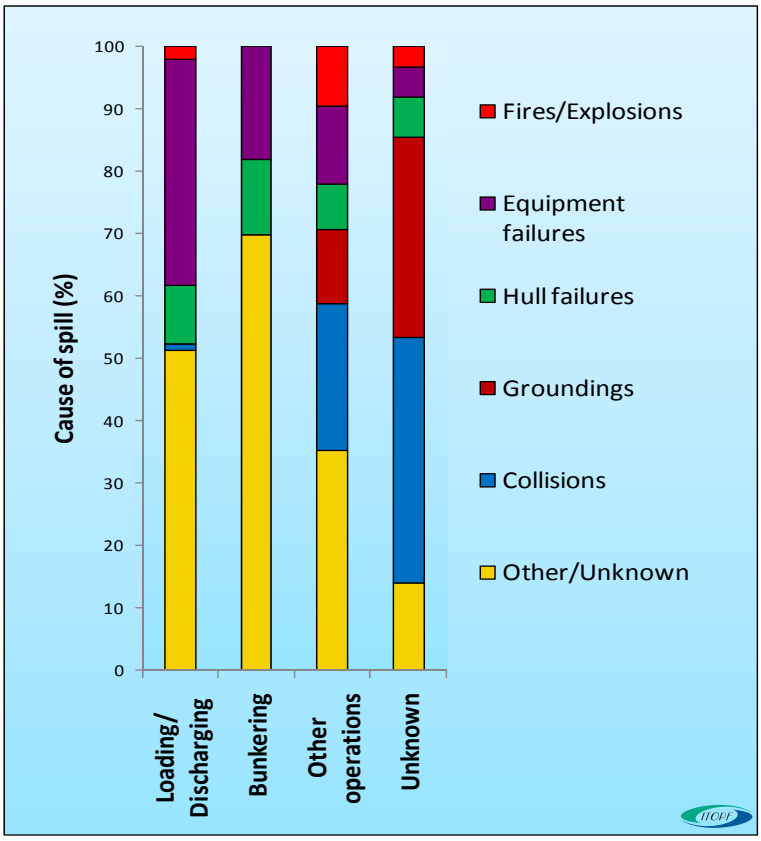

Figure 14: Incidence of spills 7-700 tonnes by operation at time of incident and primary cause of spill, 1970-2011

	Operations			
	Loading/ Discharging	Bunkering	Other operations	Unknown
	388	33	136	785
Causes				
Collisions	4	0	32	308
Groundings	0	0	16	253
Hull failures	36	4	10	50
Equipment failures	141	6	17	38
Fires/Explosions	8	0	13	26
Other/Unknown	199	23	48	110
Total	**388**	**33**	**136**	**785**

Table 5: Incidence of spills 7-700 tonnes by operation at time of incident and primary cause of spill, 1970-2011

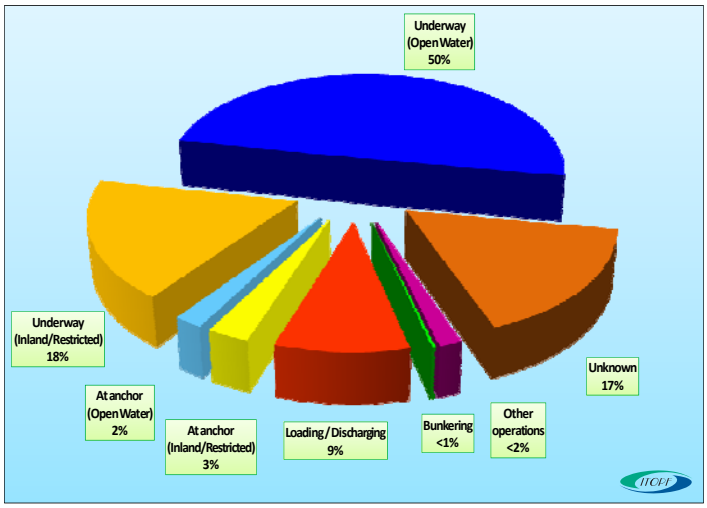

Figure 15: Incidence of spills >700 tonnes by operation at time of incident, 1970-2011

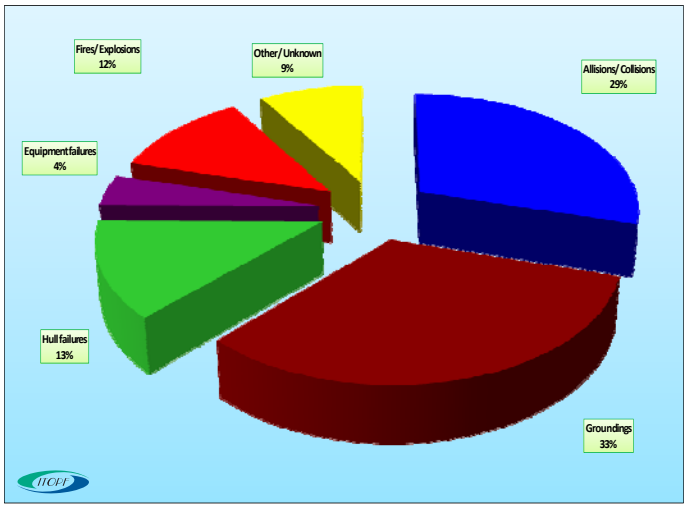

Figure 16: Incidence of spills >700 tonnes by cause, 1970-2011

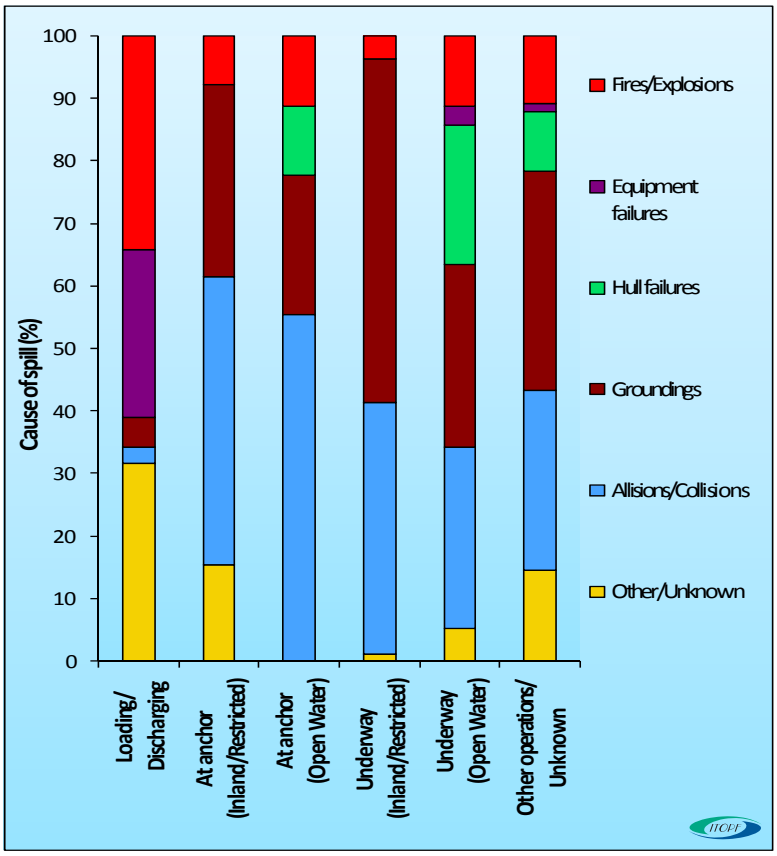

Figure 17: Incidence of spills >700 tonnes by operation at time of incident and primary cause of spill, 1970-2011. (One bunkering incident occurred in this size category but has not been included in the adjacent figure)

	Operations						
	At anchor (Inland/Restricted)	At anchor (Open Water)	Underway (Inland/ Restricted)	Underway (Open Water)	Loading/ Discharging	Bunkering	Other operations/ Unknown
	13	9	82	225	41	1	83
Causes							
Allisions/Collisions	6	5	33	65	1	0	24
Groundings	4	2	45	66	2	0	29
Hull failures	0	1	0	50	0	0	8
Equipment failures	0	0	0	7	11	0	1
Fires/Explosions	1	1	3	25	14	1	9
Other/Unknown	2	0	1	12	13	0	12
Total	**13**	**9**	**82**	**225**	**41**	**1**	**83**

Table 6: Incidence of spills >700 tonnes by operation at time of incident and primary cause of spill, 1970-2011

ITOPF is a not-for-profit organisation established on behalf of the world's shipowners and their insurers to promote effective response to marine spills of oil, chemicals and other hazardous substances. Technical services include emergency response, advice on clean-up techniques, pollution damage assessment, assistance with spill response planning and the provision of training. ITOPF is a source of comprehensive information on marine oil pollution and this statistics leaflet is one of a number of publications available. Information in this leaflet may be reproduced with the prior express permission of ITOPF. For further information please contact:

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