

# The Consequences of Providing and Refusing Refuge

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## Abstract

*This paper examines all the coastal state refusals and provisions of refuge of stricken vessels in the Center for Tankship Excellence Tanker and Bulk Carrier Casualty database. According to this set of data, there is only one case where provision of refuge resulted in a sizable (2000 ton) spill to the refuge provider. On the other hand, we have two cases where failure to provide refuge turned smallish to moderate spills into two gargantuan spills totalling 160,000 tons. In both cases, almost all the oil came ashore on the refusing country's coast. We have identified at least 10 casualties in which provision of refuge very likely prevented a 200,000 ton plus spill. Most of the spillage would have come ashore on the refuge provider. It appears that enlightened self-interest can be a strong reason for providing refuge.*

## Keywords

Tanker; Coastal State; Port State; Refuge;

## 1 Background

The purpose of this note is not to discuss the legality or morality of providing or refusing refuge to distressed vessels, but rather to examine the actual consequences. The Center for Tankship Excellence (CTX) maintains a tanker and bulk carrier casualty data base (CDB). This is a public, freely available, event centric data base. It can be accessed on the CTX web site. Each casualty is described as a sequence of events, and each event can be described in considerable detail. See The CTX Casualty Database, Version 4.0. for a full description.

Among the possible events are Coastal State Refuses Refuge and Coastal State Provides Refuge. In this paper, we pick out the casualties in which

these events occurred, and then examine the following events to see how these decisions worked out.

## 2 Refusals of Refuge

Table 1 lists the coastal state refusals currently in the CDB. We cannot of course claim that this list is complete.<sup>1</sup> It is simply the ones the CTX's knows about. The spill volumes shown are Known Volume. In the case of the Castor, we know there was some spillage, but we don't know how much. Let's see how these refusals worked out.

### 2.1 Urquiola

The URQUIOLA was an unmitigated disaster.<sup>2</sup> This fully loaded 110,000 dwt tanker touched bottom on an uncharted ledge entering La Coruña. The extent of the damage is unclear, but at least the FP tank, one center tank, and the starboard bunker tank was breached. It is probable all the center cargo tanks were holed on the flat bottom. But the crew transferred fuel from holed bunker tank, and hydrostatic balance was quickly achieved in the cargo tanks. The engine room and pump room were operational. Weather was calm and clear. At that point, no further significant spillage was possible without another screw up. The ship could easily have been brought into sheltered waters, ballasted down, and then lightered using salvage pumps for the breached tanks.

However, the Port Captain immediately ordered Urquiola 200 miles offshore without even the most cursory survey.[6]. He explicitly required the ship to go out the same channel she had come in, despite the fact that a deeper channel was available. At this point, the ship's draft forward was 1.5 meter more than it was on its way in due to the flooding forward, and the tide was lower. The ship stranded in almost the same place she touched earlier. This time

<sup>1</sup> Conspicuously missing from this list is the ERIKA. While it is true the Donges harbor master told the ship she could not enter the Loire if she was leaking, the ship continued on a basically eastward course, until she broke up. The French may have been about to refuse refuge; but, if so, they never got the chance.

<sup>2</sup> If you are viewing this paper on line, the ship names in SMALL CAPS are links to the casualty's *precis* file in the CTX database. There you will find descriptions of the casualty drawn from various sources and/or links to such descriptions.

she hit hard with massive venting forward. She was abandoned by all but the pilot and the master. Two hours later the non-inerted tanker exploded, killing the captain, and creating one of the largest spills in history. In all some 110,000 m<sup>3</sup> of oil was spilled into the ocean or burned into the atmosphere. Almost all the oil came ashore in the La Coruña region.

## 2.2 Argo Merchant

In the case of the Argo Merchant, The ARGO MERCHANT a very poorly operated and maintained 30,000 ton tanker went aground at low speed on Georges Bank about 29 miles from Nantucket. She was 24 miles off course. The ship was not badly damaged at the time. The US Coast Guard refused the master's request to jettison 6,000 tons of fuel oil to refloat the ship. Instead the USCG invoked the Intervention Convention — the first time this had been done — and took charge of the salvage operations. These operations failed. A week later the ship broke up spilling 29,000 m<sup>3</sup> of heavy fuel oil. The winds and current kept the oil offshore.

In this case, no shoreline was impacted by the spill, but it is quite possible that the coastal state's actions injected an additional 23,000 tons of oil into a prolific fishing grounds.

## 2.3 Andros Patria

The ANDROS PATRIA was a loaded VLCC which suffered a massive structural failure just off the north-west corner of Spain. She quickly lost 50,000 tons of her 208,000 ton cargo; but then the situation stabilized, and salvors were able to take her under tow. Spain, Portugal, France and the U.K are known to have refused refuge. The Andros Patria was towed to an area 200 mile south of the Azores, and eventually completed lightering north of the Canaries, as the salvors moved ever southward in an attempt to find better weather.

In this case, the ship's survival indicates she could have been brought into sheltered waters where the probability of a successful lightering would have been a lot higher. But fortunately little if any additional pollution resulted from the four refusals,

## 2.4 Assimi

The ASSIMI, loaded with 52,500 tons of Iranian crude from Iran to Aden suffered an engine room fire off the coast of Oman, cause unknown. The crew abandoned, the fire spread to the cargo, but salvors were able to take the ship under tow. Oman refused permission to enter the Straits of Hormuz and the ship was towed to deep water with the intention of sinking her. However, before that happened the ship suffered more explosions, and sank herself.

In this case, the inability to get the fires under control indicates the coastal state's decision almost

certainly did not cause any additional pollution, and moved the pollution away from shore.

## 2.5 Starfish

The STARFISH was a bulk carrier in very poor condition. Crossing the Indian Ocean she suffered flooding in two of her seven holds and diverted to Mauritius. She was refused refuge, escorted offshore, the crew taken off, and allowed to sink.

Given the poor condition of the ship and the limited salvage resources available, it is not clear that the ship could have been saved, in which case the coastal state's action moved the bunker spill offshore and prevented a possible blockage of the harbor.

## 2.6 Sea Empress

On the evening of 15th of February, 1996, the Suezmax tanker SEA EMPRESS was entering Milford Haven with 130,000 tons of light crude on board. The pilot misjudged the tidal set and the ship grounded on her starboard side, and then floated free, drifting into deeper water. 7 of her 14 cargo tank were damaged, but all the damage was very low. After losing about 5000 tons, hydrostatic balance was quickly established, and spillage stopped. The flooding of three ballast tanks further improved the hydrostatic balance. At that point she could have been brought into sheltered waters, with little or no additional spillage.[9]

However, the Harbor Master effectively refused entry, the weather worsened (as had been predicted), the tugs lost control of the ship, and over the next six days the ship re-grounded and re-floated at least four more times. The final grounding was in very shallow water at the peak of the tide. Most of the total of the 72,000 tons spilled was lost on the subsequent ebb tide. Almost all this oil came ashore on the Welsh coast. The Harbor Master's policy turned a 5,000 ton spill into a 72,000 ton spill.

## 2.7 Treasure

The TREASURE is an example of a rare, and rather puzzling refusal of refuge by South Africa. The Treasure was a Capesize bulk carrier in lousy condition which experienced flooding in her Number 4 hold. She sought refuge in Cape Town, but was denied and ordered 50 miles off shore. However, less than 10 miles offshore she sunk near Robbins Island, a penguin rookery. The crew was rescued but the resulting 1300 ton bunker spill oiled thousands of penguins.

The key issue here is could the ship have been saved. Cape Town is well equipped with salvage resources. However, the fact that the ship sank so quickly after being denied suggests that she might not have been. In any event, the coastal state gained little from the refusal.

## 2.8 Bear G

The BEAR G was an OBO loaded with 75,000 tons of gasoline. When she attempted to enter New York in October, 2000, the USCG found gasoline leaking into at least two double bottom tanks and turned her away. The ship diverted to Point Tupper for repairs. Not clear what would have happened if the Canadians — perhaps unwittingly — had not taken her in.

## 2.9 Eastern Power

The fully loaded VLCC EASTERN POWER, bound for Come-by-Chance in Newfoundland developed hull cracks low in 1S. The ship transferred enough oil out of the tank to establish hydrostatic balance and requested refuge. The Canadians initially refused and then several days later said the ship could come in if 1S were completely emptied of cargo, which was both unnecessary and probably impossible without illegally putting cargo into ballast tanks.[4, pages 507-508] The damaged ship diverted 3000 miles to the Caymans where she was lightered.

The Canadians took a big, unnecessary risk of a 250,000 ton spill, but got away with it.<sup>3</sup>

## 2.10 Castor

The CASTOR, a 31,000 ton product tanker loaded with gasoline suffered a massive main deck crack in the western Med on New Year's Eve 2001. She was refused refuge by just about every country in the western half of the Mediterranean in part because of the volatile nature of the cargo. She was towed around the Med for 40 days before finally being lightered in open waters well off Malta.<sup>4</sup> Subsequent inspection of the ship revealed the steel in the area of the deck failure was in horrible condition despite the fact that she had successfully passed all her Class surveys.[1]

In this case, none of the coastal states suffered as a result of the refusal. But the safety argument is bogus. It is true that there was an obvious argument for not bringing the ship into a port, but refuge in semi-protected waters several miles offshore, preferably downwind, could have been provided without any risk to people ashore. In any event, the successful lightering of the ship in totally unprotected water pretty much proves it could have been done in semi-protected waters.

## 2.11 Front Tobago

The single screw VLCC FRONT TOBAGO, was loaded with 249,000 tons of crude when it suffered a massive crankshaft failure off Japan her destination on 2nd May 2002. The ship was taken under

tow by the twin screw, 13,500 hp tug Smitwijs Singapore. The Japanese refused refuge. The ship was towed to Taiwan which also refused refuge. Eventually, the ship was lightered in open waters and towed to Singapore.

Coastal state authorities appear to be unaware of the fact that once a single screw ship is under the control of a well-found multi-screw tug, she is less likely to have a problem entering port than when under her own power.[7]

## 2.12 Prestige

The PRESTIGE was carrying 72,000 tons of fuel oil in the Bay of Biscay suffered a side shell failure in ballast tank, 3S, in heavy weather. 3S, originally a cargo tank, was converted to a segregated ballast tank without coating it. CTX would be surprised if it were not badly wasted. The flooding also extended into 2AS, an original ballast tank. The ship took on a 24 degree list, taking the main engine off-line. The list was so high that cargo was leaking from the tank lids and butterworth openings. The list was corrected by counter-flooding 2AP and 3P, but this put the sagging moment 50% over the legal limit. However, the ship still had sufficient strength to withstand the stresses if there were no substantial wastage. The ship asked for refuge, but this was not only denied by Spain and Portugal, but the ship was forced further offshore.

It is not clear exactly when the ship started leaking again. Some Spanish sources claim that the cargo tanks were holed early in the process. This appears to be based on the areal extent of the original slick combined with an unrealistically high estimate of the spill thickness. Other sources claim she did not start leaking again until well into the tow off-shore.

In any event six days into the tow, the ship failed in sag and sank creating a 72,000 ton spill. Oil seeping from his wreck will probably contaminate European shores for a decade or more.

Unlike most of the casualties in this paper, this is not an easy call, even in hindsight. Given that the ship survived six days, she almost certainly would have survived the short tow to sheltered waters. On the other hand, few would predict that a ship, whose steel was probably in bad condition and had already started to fail, could handled stresses 50% over legal limits for any length of time. Forcing such a ship offshore, practically guaranteed a 72,000 ton spill; but one whose impact would be spread over a wide area. The courageous decision would have been to bring the ship in, but it would have been risky for the immediate area.

<sup>3</sup> Transport Canada spins this incident slightly differently, claiming the owner diverted to the Caribbean “due to inclement weather concerns”. This is highly implausible.

<sup>4</sup> She was offer refuge by Cyprus, but did not take advantage of this, presumably because of the distance.[5]

### 3 Provisions of Refuge

To balance the books a little, Table 2 lists the casualties in which a coastal state's provision of refuge was important in mitigating the casualty.<sup>5</sup>

We know this list is woefully incomplete. In the case of South Africa alone, there are something like 100 tanker casualties, Table 3, between 1966 and 1984 which can be construed to be provision of refuge.<sup>6</sup>

The problem is that in almost all these cases the coastal state response was so successful in preventing a spill, that the casualty received so little attention that we have insufficient data to enter it in the CDB.

Nonetheless the CDB does contain some instructive examples of a coast state providing refuge.

#### 3.1 Esso Essen

The ESSO ESSEN, was a loaded 48,000 ton tanker which grounded rounding Cape Point in April, 1968. Clearly, she was not 12 miles offshore as required by the legislation of the time. We don't know why. Six of her 12 cargo tanks were breached. Thousands of seabirds were oiled. She did not strand and was allowed into False Bay. Sources vary, but the most likely spillage was 4000 tons, which would have occurred very quickly after the grounding.

The ship was pretty obviously in no condition to proceed. We know very little about the damage; but there is a good chance that, if she had not found immediate refuge, the ship would have sunk somewhere near the South African coast a la Treasure, releasing another 40,000 tons.

#### 3.2 Oswego Guardian

After ramming and sinking the Texanita in August, 1972 with a loss of 44 lives and 8,000 to 10,000 tons of oil, the loaded 100,000 ton tanker OSWEGO GUARDIAN, was allowed into Cape Town, lightered, and dry docked. She suffered massive damage to her bow, but apparently the damage did not extend into the cargo area. There is no record of any further spillage.

#### 3.3 OBO Queen

Repeat of Oswego Guardian two years later. Loaded 103,000 dwt OBO QUEEN, cut into the centerline of Tekton which eventually sank. Ship with massive

<sup>5</sup> The KIRKI is not on this list. This is a judgement call. After the Kirki lost her forepeak tank 23 miles off the southwest coast of Australia, the Australian required the ship to be towed 700 miles north to an area north of the Dampier Archipelago that could hardly be called a place of refuge. During the tow, the ship lost another 10,000 tons of cargo. On the other hand, the ship was in horrible condition, 64,500 tons was successfully lightered, and the Australians could have towed the Kirki straight offshore and sunk her.

Nor have we included the TANIO. After the Tanio broke in two off the north coast of Brittany, the stern section was towed around the English Channel for several days before being allowed into Le Havre.

If your definition of provision of refuge is broad enough to include these two casualties, the basic conclusions of this paper would not be changed.

<sup>6</sup> Table 3 was extracted from Brookes [2]. The full list is at the NCS web site.

bow damage was allowed into Port Elizabeth, apparently without further spillage.

#### 3.4 Princess Ann Marine

Loaded 70,000 ton tanker PRINCESS ANN MARIE had a major side shell failure in eastern Indian Ocean in May, 1975. and lost 15,000 tons of crude from at least two cargo tanks. CTX suspects ballast tank wastage. She was allowed into the Dampier Archipelago and the cargo lightered with nil further spillage.

#### 3.5 Pacific Colocotronis

Perhaps the most dramatic provision of refuge in the CDB involved the PACIFIC COLOCOTRONIS. The Pacific Colocotronis, loaded with 72,000 tons of volatile Algerian crude for Wilhemshaven, was off the Dutch coast on the 28th of September, 1975 when she started leaking cargo in way of 3P. The weather was good, but inspection by the Dutch Coast Guard revealed the damage was much worse than the ship had reported with at least two very large side shell cracks. Colocotronis ships had a habit of getting into trouble. The CTX is confident that the root problem was a badly wasted port segregated ballast tank. We can also be confident that the starboard ballast tank was in no better condition. The weather was forecast to worsen. The ship was in no condition to proceed. On 1st of October, Ijmuiden allowed the still leaking ship into its harbor. In all the Pacific Colocotronis spilled about 1,800 m3. But Ijmuiden's courageous action almost certainly prevented a further 85,000 m3 of toxic light crude spilling into the North Sea. Much of that oil would have ended up on Dutch shores.

#### 3.6 Norse Queen

Fully loaded VLCC adrift off South Africa after major machinery failure. She was towed to Algoa Bay and lightered. 225,000 ton spill averted.

#### 3.7 Venoil/Venpet

On 16 December 1977, two 325,000 ton tankers the VENOIL. and VENPET collided 40 miles off South Africa. The Venoil was loaded with 312,000 tons of crude. Both ships were holed, spilled oil, caught fire and were abandoned. Both ships were taken under tow, allowed to drift in the Agulhas Current until the

fires were out and they had stopped leaking, and then towed into Algoa Bay, where the remaining 289,000 tons of oil on the Venoil was lightered.

### 3.8 World Horizon

The WORLD HORIZON was another fully loaded VLCC off South Africa. In this case, the badly wasted forepeak tank simply fell off in bad weather. Ship was only six years old. There was some cargo leakage. She apparently proceeded to St Helena Bay (some say False Bay) under her own power and was lightered. Another 220,000 ton spill averted.

### 3.9 Christos Bitas

The CHRISTOS BITAS is a combination of staggeringly bad ship performance and remarkably professional coastal state response. The Christos Bitas, loaded with 35,000 tons of crude, was proceeding north in the Irish Sea, bound for Belfast. One radar had not been working for two years, the RDF had not been calibrated for four years.[3] On entering the Irish Sea, she lost her other radar. Dense fog, but she proceeded blind, not even slowing down. She grounded on rocks off Milford Haven holing at least half of her 12 cargo tanks. Three hours later the Christos Bitas refloated herself, and the Master blithely proceeded toward Belfast with the ship leaking and sinking.

She was intercepted by the Royal Navy. With the weather deteriorating, the Christos Bitas was towed toward the Irish coast where lightering could proceed in the lee of the land. In an difficult, complex ten day operation, the salvors managed to off-load almost all the cargo, before towing the ship out to deep water, and sinking her 300 miles off Ireland.

This should have been a 35,000 ton spill in the Irish Sea. Thanks to the intelligent, courageous response the actually spillage was about 4,000 tons.

### 3.10 Turgut Reis

The TURGUT REIS is an interesting casualty if only because of the contrast in coast state performance with the Prestige 22 years later. Here's Hooke's description:

The Turkish motor tanker Turgut Reis was on a voyage from Le Havre to the Mediterranean, carrying 18,000 tons of diesel oil, when she sustained a major hull fracture in very heavy seas about 105 miles north of Corunna in lat 45.05N, long 07.50W on December 15, 1979. With oil seeping out and water entering in, the 37 crew requested immediate assistance but, due to the atrocious weather, none of the vessels that proceeded to the area could get close enough to transfer them until eight hours later

when the weather abated slightly. The Turgut Reis was then towed to position off Algeciras, where she was anchored until being towed to Gibraltar on January 28, 1980. After being declared a constructive total loss, she was towed to Aliaga, near Izmir, in May 1980, to be scrapped.[8, page 488]

The similarities to the Erika and Prestige are obvious. But the coastal state reaction was entirely different and the resulting spill, according to Etkin, was only 300 m3. It may have been a bit more, but the fact remains courageous coastal state reaction turned an Erika into an event no one remembers.

### 3.11 Energy Endurance

The ENERGY ENDURANCE is yet another case of a loaded VLCC suffering serious damage to a badly corroded forepeak tank off South Africa. In this case, the damaged involved the forward bunker tank. Despite the fact that the ship was leaking, the South Africans allowed the ship to be towed into Algoa Bay and lightered. The ship was in such bad condition, she was scrapped. It is quite possible a 250,000 ton spill was averted.

### 3.12 Almizar

The ALMIZAR a 110,000 ton tanker was fully loaded, Venezuela to Rotterdam, when the side shell failed in way of the midship ballast tanks in heavy weather off Portugal, resulting in an 8 m by 4 m hole. There was no spill, but the tank flooded, and the ship was adrift for reasons unknown. She was towed to Sines, discharged, then towed to Setubal. The ship was in such bad condition she was scrapped. This is almost certainly another case of segregated ballast tank corrosion.

It would not have taken much for the damage to spread to the neighboring cargo tanks. The Portuguese response may have averted as much as a 100,000 ton spill.

### 3.13 Charalambos

The CHARALAMBROS is another case of midship ballast tank wastage. This loaded 57,000 ton tanker suffered severe side shell damage off the Yucatan in heavy weather; but the damage apparently did not extend into the cargo tanks. She diverted to Freeport, Bahamas discharged her cargo and was towed to the scrap yard.

### 3.14 Enrico Dandolo

The ENRICO DANDOLO a 28,000 ton product carrier, was loaded with gas-oil Amsterdam to the US Gulf, when she encountered heavy weather in the Bay of Biscay. She made it into La Coruña on 2nd

of February, 1984 where she was found to have a warped deck and a badly damaged hull. The damage was so bad that she was declared a CTL on the spot and scrapped.

Another precursor of the Erika and Prestige, but thanks to the provision of refuge the lucky crew survived and apparently there was no spill.

### 3.15 Kowloon Bridge

The KOWLOON BRIDGE was a sister ship to the Derbyshire and a deeply flawed vessel. On 18 November 1986, this 169,000 ton OBO was loaded with iron ore when she experienced a major deck failure in the North Atlantic off Ireland. She was allowed into Bantry Bay and received some repairs. But three days later she managed to lose her anchor, and decided to head for open water. But then she lost her steering, stranded near the entrance to the bay, and split in two forward of the bridge. The ship had 2000 tons of bunkers on board. There is no mention of any recovery. Several local sources claim the wreck leaked oil over a multi-year period. CTX is assuming a 2000 ton BFO spill. This is a rare case in which the coastal state suffered a sizable spill as a result of providing refuge. Of course, there's a decent chance the ship would have fetched up on the Irish coast if she had not been provided refuge.

In 2005, there was an attempt to salvage the wreck and the iron ore. Dive groups bemoaned the loss of a spectacular dive site and the damage to the marine life that flourished around the wreck.

### 3.16 Dodsland

The nearly new, OBO DODSLAND was in bound to Quebec loaded when the master reported flooding into double hull ballast tanks. The ship was diverted to Halifax where divers found large cracks in the bilge area. The 75,000 ton cargo of crude was lightered and the vessel dry-docked. There was an attempt to blame ice for the damage but the bilge on a loaded 75,000 ton tanker is 10 m below the waterline.

### 3.17 Kition

The KITION was a loaded 169,000 ton tanker whose engine room flooded in heavy weather off Cape Town in October 1988, cause unknown. She was towed into Table Bay, and then to Saldanha Bay and lightered. She was in such bad condition, she was scrapped in a rising market.

### 3.18 Tribulus

The TRIBULUS was a 127,000 ton bulk carrier loaded with iron ore, when she had a massive side shell failure in way of Hold 8 southwest of Ireland in heavy weather. The ship was allowed into Bantry Bay where she stayed for three months repairing. There

was some spillage. Hold 8 was the aftmost hold. Apparently the damage, a 21 m by 10 m hole, involved the starboard fuel oil tank. The ship had 550 tons of bunkers on board, probably half of which was in this tank. The spill appears to have taken the form of a slow leak which was largely contained by booms. CTX has assigned a nominal spill volume of 50 m<sup>3</sup> to this casualty.

The Tribulus was alternate hold loaded with No. 8 empty. This means she was in serious danger of sinking as many bulk carriers have done in this situation. In fact, most of the crew was helicoptered off the ship well offshore. The Irish decision to allow the Tribulus in probably saved the ship and most of the bunkers at the cost of some inshore spillage.

### 3.19 Mimosa

The MIMOSA was a 357,000 ton ULCC which had a long history of problems. Here's a first hand account of what happened to her in August, 1991.

I was on the Mimosa in the summer of 1991, when we ran into heavy seas at south tip of Africa. We were fully loaded on the way to Rotterdam when this happened.

First we had a steering gear break down. A non-return valve in the valve block between the two cylinders cracked, the pipe connected could not take the pressure, and, all the oil in the system went on the flooring. The rudder slammed from side to side as the outside sea would drive it. The noise and the speed with which the rudder went from side to side was tremendous. We managed to somehow secure the cylinder in a fixed position with everything we could find of chain blocks. Then we sealed off the steering gear room. The bridge was then able to go dead slow astern for some 12 hours, and we went in a circle in the hurricane. This probably saved us from ending up on the South African rocks. After 12 hours, there was a loud bang from the steering gear room, and the rudder was "free" again. By then the seas had subsided and we got tug boat assistance.

When it was safe to go out on deck, we saw a 340 m<sup>2</sup> hole in ballast tank 5S. The shell plate was nowhere to be found. And yes, corrosion did play a major role in this

Fortunately, the ballast tank damage did not extend into the neighboring cargo tanks. The South Africans towed the Mimosa into Algoa Bay where she was lightered averting a 350,000 ton spill.

### 3.20 Atlas Pride

The ATLAS PRIDE was a 249,000 ton ore-oiler fully loaded with crude when she lost her badly corroded Forepeak tank off South Africa in heavy weather. The tank simply fell off. The ship was towed to Algoa Bay and lightered. A 250,000 ton spill was averted.

### 3.21 Trave Ore

The TRAVE ORE was a 108,000 ton bulk carrier alternate hold loaded with iron ore when the bulkhead between Hold 8 and Hold 9 collapsed off Norway. Earlier the crew had gone to ITF complaining about the condition of the structure, something crews only do in the most extreme situations. The ship was able to make it into Kristiansund.

### 3.22 Kamari

The KAMARI was a Capesize bulk carrier loaded with iron ore when she suffered extensive structural failures off southern Brazil. She put into the Rio Plata. On inspection, her steel was in such bad shape they could not even safely discharge the cargo. She was towed out to sea and sunk with the cargo still on board.

### 3.23 Arima

The ARIMA, another Capesize bulker, got a bit further. She also was loaded with iron ore, Brazil to the Far East when she suffered a 47 meter long crack in her side shell off Cape Town. She was allowed into False Bay and repaired.

### 3.24 Tochal

The TOCHAL was a 300,068 ton Iranian ULCC which had suffered both war damage and bad maintenance during the Iran-Iraq War. In June, 1996 her badly corroded Forepeak tank fell off 90 miles northwest of Cape Town. She was fully loaded. The forward fuel oil tank was involved and there was some BFO spillage. The condition of the forepeak tank was so bad, the decision was made to tow her stern first to False Bay, where she was lightered. A 300,000 ton spill narrowly averted.

### 3.25 Mimosa

In January, 1995, we renew acquaintances with our old friend the MIMOSA. This time the fully loaded 357,000 ton ULCC suffers massive forepeak tank damage off Scotland. She was allowed into Lyme Bay, not the safest of places, and lightered. This was a very risky decision on the part of the UK, but, given the alternatives, probably the right one.

### 3.26 Kraka

The KRAKA was a sister ship to the Mimosa. She had a major machinery failure fully loaded off South Africa. She was towed to False Bay, lightered, and then towed to Dubai. Another 350,000 ton spill averted, not that they had much choice.

### 3.27 OBO Venture

The 70,000 ton OBO VENTURE was loaded with 59,000 tons of gasoline when she suffered a major machinery failure off South Africa. She was towed into Cape Town.

### 3.28 Eurydice

The fully loaded 95,000 ton tanker EURYDICE was about to enter Sydney when she started leaking cargo. Divers discovered a 15 cm flat bottom crack in 3C. They applied a magnetic patch, and she was escorted into port.

### 3.29 Genmar Kestrel

Two 150,000 dwt tankers, the GENMAR KESTREL and the TRIJATA both loaded, and on nearly parallel courses somehow managed to get into a collision north of Port Said after leaving the Suez. The double sided Kestrel was holed in three starboard tanks, spilled about 1000 m3 of cargo, took on a big list, which shut down her main engine. She was towed to Cyprus and lightered in the lee of the island.

### 3.30 Front Vanguard

The part-loaded 300,000 ton tanker FRONT VANGUARD had a blackout in the Suez Canal, grounded, holing at least one ballast tank, but there was no spill. She was towed to Cyprus and lightered in the lee of the island.

## 4 Summary

It will come as no surprise that in an issue like this there are no hard and fast rules. But it is also surprisingly clear that on the whole the countries that provided refuge have fared better, from a purely selfish point of view, than the countries that refused refuge. There is no case in our admittedly small sample where a country suffered grievous harm from allowing refuge. The worst that we can find is the 2000 ton bunker spill from the Kowloon Bridge that might have happened anyway if refuge had been refused. There are at least two cases, the Urquiola and the Sea Empress, where the country that refused refuge did suffer massive damage from unnecessary 70,000 ton plus spills. And there are many cases where it is quite likely that the country that provide refuge would have suffered grievous harm if she had done

the opposite. As Table 3 indicates, if South Africa had not followed a policy of providing refuge, there is good chance that she would have suffered a score of 200,000 ton plus spills. Conversely, the only major casualty in which you can plausibly argue that the refusing country came out ahead is the Prestige, and even then the case is a weak one, and a 72,000 ton spill that turned out to be preventable was not prevented.

So why have refusals become the norm? The major reason of course is the dichotomy between the risk/reward for the refusing authority and the risk/reward for society as whole. In the past this was balanced by the professionalism of the maritime authorities and their concern for crew safety. The authorities have become increasingly politicized and the crews can always be taken off by helicopter.

But there is one technical thread in our refusals, that perhaps we can do something about and that is a lack of understanding of the efficacy of hydrostatic balance on the part of coastal state authorities. Once a tank reaches hydrostatic balance and stops leaking, which normally is very quickly, especially in groundings, that tank is not going to leak any more unless the ship is stranded and the tide goes out or someone starts discharging the intact tanks first. And if the ship can be ballasted down, so much the better.<sup>7</sup> If the refusing authorities understood hydrostatic balance, then there is a chance that some of the more egregious mistakes, such as the the Canadians handling of the Eastern Power could be avoided.

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<sup>7</sup> Often the ship will ballast herself down by flooding ballast tanks. This happened in the case of both the Urquiola and the Sea Empress.



Table 1: Coastal State Refused Refuge

Based on CTX Casualty Data Base as of 20090216

DATE	Country	Ship	DEAD	Volume(m3)
19760512	Spain	urquiola	1	111700
19761215	United states	argo merchant	0	29000
19781231	Spain	andros patria	30	58800
19781231	Portugal	andros patria	30	58800
19781231	United kingdom	andros patria	30	58800
19781231	France	andros patria	30	58800
19830107	Oman	assimi	0	60200
19891219	Spain	khark 5	0	82300
19891219	Portugal	khark 5	0	82300
19910408	Mauritius	starfish	0	0
19960215	United kingdom	sea empress	0	84400
20000614	South africa	treasure	0	1400
20001031	United states	bear g	0	0
20001206	Canada	eastern power	0	0
20001231	Morocco	castor	0	0
20001231	Algeria	castor	0	0
20001231	France	castor	0	0
20001231	Gibraltar	castor	0	0
20001231	Greece	castor	0	0
20001231	Italy	castor	0	0
20001231	Malta	castor	0	0
20001231	Spain	castor	0	0
20001231	Tunisia	castor	0	0
20020502	Japan	front tobago	0	0
20020502	Taiwan, province of	front tobago	0	0
20021113	Spain	prestige	0	82000
20021113	Portugal	prestige	0	82000

Table 2: Coastal State Allowed Refuge

Based on CTX Casualty Data Base as of 20090216				
DATE	Country	Ship	DEAD	Volume(m3)
19680429	South africa	esso essen	0	4400
19720821	South africa	oswego guardian	44	11700
19741010	South africa	obo queen	0	600
19750513	Australia	princess ann marie	0	16000
19750928	Netherlands	pacific colocotronis	0	1760
19770600	South africa	norse queen	0	0
19771216	South africa	venpet	2	4000
19771216	South africa	venoil	2	31000
19780526	South africa	world horizon	0	830
19781012	Ireland	christos bitas	0	4290
19791215	Spain	turgut reis	0	300
19810409	South africa	energy endurance	0	2100
19811214	Portugal	almizar	0	0
19821226	Bahamas	charalambos	0	1160
19840202	Spain	enrico dandolo	0	0
19861118	Ireland	kowloon bridge	0	2000
19870217	Canada	dodsland	0	0
19881019	South africa	kition	0	0
19900205	Ireland	tribulus	0	50
19910803	South africa	mimosa	0	0
19910829	South africa	atlas pride	0	0
19920815	Norway	trave ore	0	0
19940225	Uruguay	kamari	0	0
19940418	South africa	arima	0	0
19940602	South africa	tochal	0	223
19950111	United kingdom	mimosa	0	0
19960300	South africa	kraka	0	0
20020629	South africa	obo venture	0	0
20040214	Australia	eurydice	0	0
20050204	Cyprus	genmar kestrel	0	1557
20061020	Cyprus	front vanguard	0	6000

Table 3: South Africa Provisions of Tanker Refuge

DATE	Ship Name	Deadwt	Location	Description
Jun 1966	A P Moller	93,850	South African South Coast	Power failuer, repaired in False Bay
May 1981	Agip Sardegna	253,358	55 mi South East of Cape Point	Rudder damaged, repaired
Mar 1979	Al Rafidain	317,500	12 miles South of Cape Agulhas	Power failure, towed to North of Robben Island
Aug 1979	Alcazar	150,769	14 miles South of Cape Point	Lost rudder, towed to Cape Town
May 1970	Alkor	23,820	South African South coast	Accomodation fire, repaired in Durban
Jun 1982	Alsama Alarabia	315,695	1300 mi W of Orange Rivers	Power failure, repaired, proceeded
Apr 1974	Amaco Singapore	232,162	South African West coast	Hull damage, repaired in Cape Town
Jul 1977	Amoco Milford Haven	232,162	10 miles East of Danger Point	Power failure, repaired
May 1974	Andros Aries	223,808	Off Maputo	Explosion, fire, proceeded to Durban
Oct 1968	Angelos Lysis	17,670	Off Durban	Hull damage, repaired in Durban
Oct 1971	Anita Monti	229,000	700 miles North East of Durban	Engine room fire, towed to Cape Town
Jul 1982	Antonios G	290,588	Mocambique Channel	Hull damaged, cgo transhipped to Torill Knudsen in
Sep 1973	Astraea	20,938	40 miles off Cape Point	Power failure, towed to Cape Town
Jul 1968	Atlantic Faith	23,004	Cape Town	Power failure, towed to Europe
Sep 1971	Atlantic Lady	19,980	South African South coast	Hell damage, repaired in Durban
Feb 1968	Azadeh	3,662	70 miles SW of Port Elizabeth	Rudder damage, towed to Durban
Aug 1976	Bergehus	205,807	South Africa west coast	Boiler fire, repaired in Cape Town
May 1980	Brissac	240,000	45 miles West of Durban	Steering gear damaged, repaired
Dec 1968	Cardo	75,000	180 miles South East of Durban	Collision, proceeded to Durban
Jan 1978	Castillo de Lorca	173,064	Off Mombasa	Power failure, escorted to Mombasa
Jun 1978	Cherry Bay	21,600	Mocambique Channel	Power failure, towed to Durban
Dec 1976	Cis Brovig	107,802	East of East London	Rudder damage, towed to Port Elizabeth
Nov 1980	Coalinga	270,702	130 miles NW of Cape Town	Power failure, towed to Cape Town
Dec 1976	D'Artagan	276,234	Mocambique Channel	Power failure, towed to Durban
Mar 1969	Daghild	43,650	Off Beira	Accomodation fire, repaired in Durban

DATE	Ship Name	Deadweight	Location	Description
Mar 1980	Dalma	265,040	1500 miles North of Cape Town	Engine room fire, repaired in Cape Town
Jun 1972	Dewdale	63,588	40 miles South of Durban	Power failure, towed to Durban
Nov 1971	Dirch Maersk	205,600	Off Mossel Bay	Power failure, towed to Cape Town
Jul 1966	Eleni	18,435	550 miles NW of Cape Town	Lost a rudder, towed to Cape Town
Mar 1971	Energy Endurance	213,373	4 mis South of Umhlanga Rocks	Power failure, repaired
Apr 1981	Energy Endurance	205,807	Off East London	Hull damage, transhipped cargo to vessel Regina in
Apr 1972	Esso Antwerp	76,209	Off Durban	Propeller damaged, new blade cut in Cape Town
Apr 1968	Esso Essen	48,535	Olifants Point	Hull damage, proceeded to False Bay
Jan 1971	Esso Europort	256,000	East Coast	Hull damage, repaired in Durban
Jun 1981	Esso Nederland	253,000	Off Beira	Engine room fire, towed to Cape Town
Aug 1976	Esso Northumbria	250,000	Table Bay	Rudder damage, repaired in Cape Town
Oct 1973	Esso Scotia	249,952	South West African coast	Power failure, repaired in Walvis Bay
Nov 1970	Esso Ulidia	250,000	South West African coast	Explosion, proceeded to Walvis Bay
Nov 1975	Esso Venture	254,361	West Coast	Power failure, repaired in Cape Town
Aug 1970	Fernstar	98,543	Off East London	Power failure, towed to Durban
Nov 1972	Fina Britannia	226,579	2,000 miles NE of Durban	Power failure, towed to False Bay
Jun 1976	Gazana	23,492	450 miles NE of Durban	Power failure, towed to Durban
Aug 1970	Georgios V	20,267	80 miles West of Walvis Bay	Caught fire, explosion. towed to Walvis Bay
Mar 1968	Gervase Sleigh	16,220	Arabian Gulf	Hull damage, repaired in Durban
Aug 1971	Globtik Mercury	55,800	Mocambique Channel	Hull damage, repaired in Durban
Jul 1980	Gogo Ranger	21,000	600 miles NE of Mauritius	Lost rudder, towed to Durban
Dec 1981	Gogo Ranger	21,000	250 miles west of the Benguela	Caught fire, explosion in the engine room,
Sep 1971	Golar Liz	107,000	South West African coast	Power failure, repaired in Walvis Bay
Oct 1968	Gwenola	101,130	Cape Agulhas	Grounded, reflaoted, towed to Cape Town
Jan 1971	Hemisphere	26,075	Durban	Power failure, repaired in Durban
Jul 1972	Jacaranda	98,333	230 miles NW of Cape Town	Explosion in engine roome, towed to Cape Town
Jan 1977	Jacques Cartier	90,397	60 miles East of Cape Recife	Power failure, towed to Cape Town
Oct 1967	Kent	48,800	African West coast	Power failure, repaired in Cape Town
Dec 1970	Kismet	41,850	Antonio Aries	Power failure, towed to Durban
Feb 1970	Kollbryn	91,800	1,000 North East of Durban	Power failure, repaired in Durban
Aug 1974	Kristine Maersk	330,000	South Africa west coast	Power failure, repaired in Durban
Mar 1978	La Nina	96,716	African east coast	Rudder damaged, proceeded to Durban
Oct 1967	Lake Luzerne	16,672	Cape Town harbour	Oil leak, put to sea and repaired in Walvis Bay
Aug 1975	Lucid	6,722	South Africa west coast	Power failure, towed to Cape Town
Feb 1973	Mabruk	33,154	Riet Point	Hull damage, repaired in Durban
Dec 1969	Mactra	205,000	Mocambique Channel	Explosion, repaired in Durban
Oct 1966	Malmohus	93,250	300 miles NE of Durban	Hull damage, proceeded to Durban
Feb 1970	Mammohus	93,250	South African East coast	Power failure, repaired in Durban
Jan 1973	Marcus Lolli Getti	149,000	350 miles off Mombassa	Power failure, towed to Cape Town
Jun 1978	Maria Alexandra	239,000	Mocambique Channel	Power failure, towed to Durban
Apr 1978	Massachusetts Getty	69,042	Off Cape Agulhas	Power failure, repaired
Jul 1967	Mercury	33,600	South West African coast	Power failure, towed to Walvis Bay, then to Cape
Oct 1973	Mesix	35,246	300 miles NW of Walvis Bay	Power failure, towed to Walvis Bay
Feb 1974	Mexico Wellington	65,000	300 miles off SWA coast	Explosion in engine room, proceeded to Walvis Bay
May 1973	Mina	32,728	Off Mossel Bay	Collision, caught fire. Proceeded to Cape Town
Sep 1974	Mobil Durban	23,422	Off Durban	Power failure, repaired in Durban
Jun 1970	Mobil Explorer	43,610	Off West Africa	Caught fire, towed to Cape Town
Oct 1977	Mobil Falcon	277,000	80 miles NW of Cape Town	Power failure, repaired
Oct 1976	N'tchengue	140,000	East coast	Engine room fire, proceeded to Cape Town
Jun 1977	Norse Queen	232,369	30 miles SE of Cape Recife	Power failure, towed to Algoa Bay, cgo transhipped
Apr 1979	Ogden Sungari	275,932	Mocambique Channel	Power failure, proceeded to Saldanha Bay, cargo
Aug 1972	Oswego Guardian	96,608	Cape Agulhas	Collision, proceeded to Cape Town
Apr 1972	Permina Samudra VI	24,900	Arabian Gulf	Power failure, towed to Durban
Jun 1973	Philippine Leader	96,191	35 miles SE of East London	Explosion, towed to Port Elizabeth
Jun 1981	Point Margo	34,303	40 miles East of East London	Power failure, towed to Durban
Dec 1975	Port Hawkesbury	252,970	Mocamboque Channel	Power failure, repaired in Cape Town
Oct 1967	Poukou	16,500	Africa East coast	Power failure, repaired in Durban
Oct 1968	Presidente Oribe	18,584	East African coast	Rudder damage, repaired in Durban
Apr 1968	R G Follis	63,090	Mocambique Channel	Caught fire, flooding, towed to Durban
Oct 1968	S G Embiricos	29,732	Socotra Island	Powewr failure, towed to Durban
Jan 1975	Scapbay	20,239	Off Natal south coast	Explosion, caught fire, towed to Durban
Jun 1966	Sea Spirit	114,000	South African South Coast	Power failuer, repaired in False Bay
Apr 1972	Silver Castle	20,053	Bushmans River	Collision, towed to Mossel Bay, transhipped cgo to
Jan 1975	Texas Trader	27,500	Off Zululand	Lost propeller, towed to Cape Town
May 1974	Theodegmon	33,119	Off Durban	Fire in engine room, towed to Durban
Jul 1975	Tiiskeri	112,628	Off East London	Rudder damage, towed to False Bay
Sep 1982	Torvanger	28,026	Off Richards Bay	Steering gear damaged, towed to Richards Bay
Jan 1976	Vassiliki Colocotron	386,000	South Africa south coast	Hull damage, repaired in Table Bay
Dec 1977	Venoil	330,954	39 miles SW of Cape St Francis	Collision, fire. Towed to Algoa Bay. Cargo
Dec 1977	Venpet	330,959	39 miles SW of Cape St Francis	Collision, towed to Algoa Bay then to Cape Town
Jul 1982	Victoria	240,597	South Africa south coast	Steering gear damaged, repaired in False Bay
Feb 1972	Vivipara	32,265	Quoin Point	Power failure, towed to Cape Town
Jun 1979	Wahran	392,372	South Africa east coast	Steering gear damaged, repaired in Port Elizabeth
May 1974	Wilstar	132,700	Off Natal	Hull damage, proceeded to Algoa Bay. Cargo

DATE	Ship Name	Deadweight	Location	Description
Aug 1976	World Cavalier	268,337	South Africa south coast	Power failure, repaired in False Bay
Jun 1978	World Horizon	227,839	60 miles South of Cape Recife	Hull damaged, proceeded to St Helena Bay. Cargo
Jun 1977	World Mandate	173,715	400 miles West of Cape Town	Power failure, proceeded to False Bay
Apr 1980	World Mandate	173,715	20 miles West of Cape Agulhas	Power failure, towed to False Bay
Aug 1974	World Princess	226,000	Off Green Point	Fire in engine room, towed to Cape Town
Mar 1974	World Unicorn	252,850	25 miles South of Quoin Point	Power failure, towed to Cape Town
Jul 1974	World Unicorn	252,000	Indian Ocean	Hull damage, repaired in False Bay

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