**OIL AND CHEMICAL SPILLS AND THEIR PREVENTION[[1]](#footnote-1)\***

Oil and chemical spills have increased in size generally since the 1960’s, resulting in greater public awareness and public and diplomatic regulations simultaneous with the increase in size of number and size of tank ships.

Beginning with the TORREY CANYON grounding and oil spill in 1967 off the United Kingdom, spills from vessels, whether large or small, have become not only a public concern for environmental, clean-up, restoration, and compensation reasons, but also for the shipping industry and their Protection and Indemnity Clubs, who typically cover liability for them.

**REGULATORY REGIME**

Internationally, the prevention of such spills is governed by the International Convention for the Prevention of Pollution from Ships (MARPOL), and the compensation scheme for those affected by such spills is the International Convention on Civil Liability for Oil Pollution Damage (CLC). In the United States, the primary legislation is the Federal Water Pollution Control Act (FWPCA), enacted in 1948, and amended in 1972 to become the Clean Water Act (CWA). The CWA imposed “strict liability” on vessels for spills, with few exceptions. It has been supplemented by the Oil Pollution Act of 1990 (OPA ‘90). For chemical discharges, the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) enacted in 1980, deals with the chemical discharge, both on water and ashore.

These international and U.S.-based regulatory schemes aim to prevent the spills in the first place, and in the United States they set forth a very thorough (and expensive) system of required containment and clean-up, and liability not only for clean-up and compensation to businesses, but also to individuals, states, and Indian tribes. Since OPA ‘90, claimants in the U.S. are no longer limited to those who were actually “oiled”, but now include businesses and individuals whose livelihoods (whether maritime, resort-based, fishing-based, or otherwise) were adversely affected by the oil spills.

**LIMITATION OF LIABILITY UNDER OPA ’90 AND THE NPFC’S ROLE**

Currently under OPA ’90, the liability limit for a typical sea going tanker is $2,000 per gross ton for double hull ships and $3,200 for single-hull ships, so a 40,000 DWT tanker would have a liability limit of $80,000,000. Such limitation is difficult to attain, however, since it requires the ship interests to not have violated any safety regulation, which is difficult in most cases since this is such a heavily regulated industry.

In the Philadelphia anchor strike incident described below, however, the Coast Guard acting through its National Pollution Fund Center (NPFC) allowed the ship to limit its liability to its tonnage limit of $47,000,000, with the remaining majority of the cleanup expenses being paid by a trust fund (the Oil Spill Liability Trust Fund) which was established by OPA ’90 by way of a per barrel tax on domestic and imported oil.

There are defenses under OPA ’90 which will absolve vessel owners and operators of any liability, but only if they are the “sole cause” of the discharge, namely: a) Act of God, b) act of war, or c) act or omission of an unrelated third party. So, while limitation of liability is difficult to assert, a complete defense to liability is even more difficult.

**RISK**

Needless to say, cleanup (and assessment/monitoring costs and civil penalties) can be extremely expensive. Vessel interests must have a pollution response program, a relationship with a recognized pollution response contractor and QI (“Qualified Individual”) to assist owners in dealing with the spill.

Also, it is not unknown in some nations for a vessel crew to be arrested and detained for an indeterminate period. In the United States, criminal prosecution for accidental oil or chemical spills is quite rare, even though the FWPCA allows criminal prosecution of “negligent discharge” of oil. In large spills (or intentional spills of any size), criminal prosecution is not unusual.

**THE NATURE OF THE PROBLEM**

Small spills are typically those which occur as the result of human error in handling the product during transfer. Typical are overflows or spills during bunkering, cargo loading, transfer, or lightering, or leaks from transfer hoses or flanges, occasionally caused or aggravated by wave wash from passing ships. Minor structural failures may cause other local spills, such as cracks or corrosion in ballast piping which passes through fuel tanks. Occasionally, it results from an intentional discharge of oily waste or bilge water.

But the large spills usually result from a marine casualty. Offshore, it is typically either collision or structural failure of a tank ship; while along shore or in port, it is typically collision or grounding. The advent of the MARPOL and OPA ‘90 requirements phasing in double-hulled tank ships has resulted in fewer spills when the accompanying marine casualty is a minor shell fracture, or mild ranging damage. Therefore, an allision or grounding has to be fairly serious to trigger a large spill. The result is that most of the very large spills are from tank ships rather than from dry cargo vessels that have spilled bunker oil, and most of the tanker casualties involve the older single-skin ships, which are by now almost phased out.

**SAMPLE INCIDENTS – “LESSONS LEARNED”**

**Groundings**

Aside from the older cases such as the TORREY CANYON and the AMOCO CADIZ in Europe, the best-known case in the United States, and the incident which essentially brought about OPA ‘90, was the single-hull EXXON VALDEZ which stranded on Bligh reef while departing Valdez, Alaska with a full cargo in 1989. The reaction from the resulting spill was the Oil Pollution Act of 1990, which mandated double hulls, increased liability limits, and required more operational precaution to prevent future groundings. The “lesson learned” was navigational; a junior mate, left alone on the bridge by the master and made a planned course change too late.

**Anchor Strikes**

Several other incidents have been the result of ships’ hulls being pierced by their own anchors. One of these involved a U.S. tank ship and navigational misjudgment regarding the depth of water as she attempted to anchor off Los Angeles in 1990, resulting in a 1300-ton spill near some California beaches, causing environmental damage and much adverse media coverage. The “lesson learned”? Do not anchor without sufficient depth.

Another single-hull incident in the Mississippi River below New Orleans, in 2000, happened after a crankcase explosion and power loss, when her pilot dropped anchor to arrest the vessel’s sheer towards shore, and it pierced one of the cargo tank bottoms resulting in a 1900-ton spill, a large cleanup bill, and claims from nearby fishermen and others.

The “lesson learned” here was about engine maintenance, which can prevent crankcase explosions. A sudden loss of propulsion in pilot waters will inevitably cause a ship to go off course, and in such an emergency, crews have to make the difficult decision as to whether striking shore, or risking a possible anchor strike.

In the Delaware River in 2004, a single-hull Panamax tanker struck an abandoned anchor while navigating inbound to an oil terminal south of Philadelphia. This anchor for many years had apparently existed in the federal anchorage she was navigating, but had not previously been struck; no one (except perhaps whoever dropped it) knew of its existence. The resulting 900-ton spill and cleanup in adverse winter weather cost over $100 million.

The “lesson” here is twofold. Lost anchors should always be reported to the authorities, especially in pilot waters where they might damage a ship; and, under-keel clearance requirements, set forth in the OPA regulations specifically for single-hull tankers, should be strictly observed and written into the vessel’s passage plan.

**Collision Cases**

A downbound chemical tanker in the Mississippi River at night in 2008 cut a loaded river fuel barge in half when the barge’s towboat unexpectedly turned to port in front of the ship. The towboat’s captain had gone ashore and left her in the charge of an under-licensed apprentice mate, who apparently did not see the downbound chemical tanker. A large (1,000 ton) oil spill affected shipping and shoreline interests in the New Orleans and Mississippi River area for several months.

The “lesson learned”? Licensed captains should not leave the vessel to an unqualified officer. The secondary lesson is that in a narrow channel, even under-licensed mates must keep a sharp lookout and be aware of ship traffic on a clear night. Both the captain and the mate were prosecuted criminally.

**Allision-Pilotage**

A container ship got underway in November 2007, outbound from Oakland in fog in San Francisco Bay under pilotage, and heavily grazed a “tower” piling of the Bay Bridge with her port side, spilling approximately 180 tons of bunker fuel into San Francisco Bay. This caused a large reaction in an environmentally-sensitive area, and prompted the Coast Guard to upgrade its medical examination standards for pilots and mariners. The local pilot was disoriented in the fog, and apparently affected by prescription medication he had been taking and had not disclosed to the Coast Guard. He pled guilty to violating the Clean Water Act and served several months in prison.

Again, a navigation lesson (be cautious in fog; consider staying at berth until the fog burns off), and also one of pilot competence, a matter for pilot regulation authorities.

**Natural Disasters**

Events such as recent tsunamis and hurricanes could have a catastrophic impact on tank vessels or conventional cargo vessels, and cause release of oil or chemicals. Once a storm track has been identified that might adversely impact a vessel’s track while on her way to her next port of call, every effort should be made through weather routing and “master’s informed discretion” to avoid the storm and minimize the risk of hull damage.

**CONCLUSION**

As one can see, oil and chemical spills vary in size and cause, but the large spills, or potentially large spills, typically have **a distinct marine casualty** as their triggering cause. MARPOL, OPA ‘90, and other ship construction and operating regulations have indeed improved vessel safety and lessened the likelihood of a spill from a grounding or collision; and sound ship construction, ship design, maintenance, and loading practices reduce the risk of structural failures offshore. Still, the predominant marine casualties causing the large spills are collisions, groundings, or anchor strikes. These should be dealt with through crew training, attention to ISM procedures afloat and ashore, and sound navigational practices. Improving ships themselves will reduce spills only to a certain extent – it is still mostly the “human factors” of lack of situational awareness or lack of maintenance, which damages ships in the first place, and causes the spill.

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