

## **Oil Spills in Ports**

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### Introduction

Whilst large oil spills arising from shipping accidents often make dramatic news, most oil spills are small and originate in or near ports. ITOPF oil spill statistics for tankers, for instance, reveal that 80% of all tanker spills are less than 7 tonnes and that 80% of these arise from operational accidents such as those that might occur during loading, discharging, and bunkering.

There are international compensation regimes such as the Civil Liability Convention (“CLC”) and the International Oil Pollution Compensation Fund (“IOPCF”) which are available in many countries to compensate for oil pollution damage caused by tanker spills and these include reasonable response costs. The incident and response are, nonetheless, often disruptive, especially to commercial port activity<sup>2</sup>. Response operations in most places have become much more efficient in recent decades as contingency plans, specialised response equipment and trained response teams have been put in place. One additional area where lessons could be learned is the way in which the design of port structures themselves affect the efficiency of clean-up work. Given ITOPF’s role on site in assisting port authorities to implement technically reasonable response operations during a spill incident, the aim of this article is to share some of ITOPF’s international experiences, and thus to assist others, before an incident, in preparing efficient plans and setting realistic expectations of the standard of cleaning likely to be achieved.

### Clean-up techniques in ports

The primary reasons for oil spill clean-up in industrial ports are to return the port as quickly as possible to normal operations and to minimise the risk of remobilisation of

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<sup>1</sup> International Tankers Oil Pollution Federation Ltd (ITOPF), London. The views expressed are those of the author.

<sup>2</sup> The CLC and IOPCF conventions relate to damage caused by spills of persistent oils from tankers. Bunker spills from other vessels are currently covered by the LLMC convention which will be enhanced by the Bunkers Convention once it is ratified by enough countries and comes into force. For more details see the ITOPF website: [www.itopf.com](http://www.itopf.com)

oil into environmentally or aesthetically sensitive areas. The techniques are often similar to those used outside the port. The main differences are the need to work around normal port operations, the physical nature of port structures, and the shift of emphasis towards industrial, rather than aesthetic or environmental criteria when determining the appropriate clean-up endpoints.

The first response in a port is the same as at any other location, namely to try secure the spillage and to deploy booms and skimmers to contain its spread. The sheltered conditions offered in many ports, which are protected from wind and heavy wave action, can provide an ideal opportunity for effective recovery which is not available in the rough seas off many coasts (Photo 1). It is also usually the case that response equipment is close at hand, which allows rapid deployment and a real chance of getting a spill under control.

More specific to industrial ports is the problem of oil becoming trapped under long wharves (Photo 2). Unless addressed, this can prove to be a continual source of oil contamination, especially when the prop wash and water movement from berthing operations moves the oil out into the open. Containing and recovering oil under wharves using the traditional booming techniques are difficult given the countless obstructions often present. Depending on the oil type and the wharf structure, it is sometimes feasible to force the oil out using ships propellers or fire hoses, and sometimes access can be gained for vacuum units to deploy hoses and recover the oil. Photos 3 to 5 illustrate some options.

Ventilation, headroom and accessibility are key health and safety issues for clean-up personnel in the semi-enclosed spaces under wharfs and other port structures. In some cases, the wharfs are built with such short piles that it is difficult and dangerous for clean-up crews to get underneath the structures at all states of the tide. In other cases, the long access routes for working deep under some wharfs make work impractical because of the danger of being trapped under the wharf by a rising tide (Photo 6). This is especially true for commercially-active wharfs where the quickest escape routes may be blocked by vessels hundreds of metres long.

Once floating oil has been addressed, response operations can then shift towards removing oil stranded on shorelines and facilities. Sometimes it may be possible to remove the bulk layer of oil by manually scraping or wiping with rags. This is often

very easy where contaminated surfaces like concrete, steel and wood are smooth and easily accessible and it is sometimes possible to return these areas to their original condition pretty quickly. The presence of marine growths such as algal films can make the oil removal process easier. Sometimes stains are left, but aesthetic concerns are often minimal in industrial areas. With the ever-increasing availability of small, efficient hot and cold water pressure cleaners a good standard of cleaning can often be achieved relatively easy (Photo 6).

Porous surfaces such as crumbling or rough cement (Photo 7), rusty steel or hard natural surfaces can be more time consuming to clean, even with hot water high pressure units and there is the added complication that aggressive cleaning techniques may cause structural damage. Common sense needs to be applied, perhaps using less aggressive cleaning (e.g. lower pressure “flushing”) and accepting lower standards of cleanliness.

The shapes of port structures can also affect the strategy and operational level of effort. By far the easiest shapes to deal with are long, flat walls which make it easy to fix hard and sorbent booms in the water to collect the oil freed by cleaning (Photo 8). Pilings are much more troublesome to clean because the operator must continually change his angle of attack and because movement is often hampered by the presence of other pilings or obstructions. Especially time consuming are round pilings that are surrounded by water (Photo 9). In this case the workers must continually manoeuvre a small boat around so as to be able to access all sides of the structure. If there are tidal currents or swell in the area, safety concerns arise and oily spray is less controlled, risking re-contamination of cleaned areas. Booming around the immediate work area is also more difficult than with flat walls. Multi-faceted shapes, such as small tetrapods, boulders, rubble, or other various objects can be very time-consuming to clean for the same reasons. Another problem posed by these objects is that they may be oiled underneath making clean-up more difficult and dangerous.

The “floor” or substrate under a wharf can have a major influence on the efficiency of work carried out below. Commonly observed under wharves are flat cement stone or gravel floors, mud banks, sloped boulder shorelines, wooden walkways over water, or just water. In most cases there is a combination of different floor types along the length of the wharf. All else being equal, solid floors (Photo 10) or ones with a hard, compact base (Photo 11) are safer and easier to work on than sloped ones and those

made up of boulders (Photo 12). Further, the difference between any fixed floor and water can be significant in determining the required level of effort because boat-based operations are much more time-consuming, risky and labour intensive.

#### Termination of clean-up in ports

The standard of cleaning required should be discussed and agreed early on in the response. If a contingency plan is in place, this should provide the guiding principles and priorities. When defining the termination standards, consideration should be given to minimising the impact on the environment and matching the final level of cleanliness with the use and priority of the location.<sup>3</sup> However, the health and safety of responders as well as the efficiency of the available clean-up techniques dictate what might be achievable in practice. The usual result is that higher, more stringent, clean-up end-points are assigned for amenity areas (e.g. bathing beaches, marinas, fishing harbours) than for industrial areas, except for example, where water intakes or cruise ship terminals are located. Environmentally sensitive areas may also warrant careful or reduced effort so as to minimise damage caused by the clean-up techniques themselves.

#### Conclusion

While industrial port areas are among the locations most at risk from oil spills, they are also among the least environmentally sensitive and are often well prepared for clean up. Response equipment and clean-up personnel can be on site within hours of the incident and operations guided by practical principles are usually laid down in long-term contingency plans. The technology used is generally similar to that used outside ports, but the priorities, constraints and risks are somewhat different. This is mainly because clean up has to be scheduled around normal port activities, and the work carried out to a standard that does not compromise worker safety or sensitive areas outside the industrial port areas.

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<sup>3</sup> There are a number of interesting papers on the subject. See, for instance, “When should clean-up operations be brought to a close – HOW CLEAN IS CLEAN?” by Loïc Kerambrun (Cedre) and Hugh Parker (ITOPF), paper presented at the ‘20 Years after the AMOCO CADIZ’ Symposium, 15-17 October 1998; or “Termination of Shoreline Clean-up – A Technical Perspective” by Brian Dicks, et al. (ITOPF), available at [www.ITOPF.com](http://www.ITOPF.com).