

Transportation of oil, protection of the environment

As an Island nation without indigenous oil reserves, Ireland imports all of its oil requirements, whether as crude oil or refined products (petrol, diesel, home heat oil, aviation fuel, etc.). After importation, the oil is transported in bulk, usually by road tanker to the petrol station or industrial user either directly or via local distribution facilities.

Transportation of oil, whether by sea tanker or road tanker, involves risk. The oil industry is committed to observing the highest appropriate standards for oil transportation. In the unfortunate event of an accident, the oil industry has measures in place to respond to and deal with any consequent spillage and mitigate the damage to people and the environment.

1. Avoiding and managing marine spills

1.1 Quantity of oil being transported

The quantities of oil being transported can vary greatly and this will depend on the size of vessel involved and whether the oil is cargo or bunkers. Tankers are usually described as being "large" (up to about 120,000 tonnes), "very large" or VLCC (up to about 300,000 tonnes) and "ultra large" or ULCC (over about 300,000 tonnes).

A 250,000 tonne bulk-carrier, although not designed to carry oil as cargo, could have 12,000 tonnes of heavy fuel oil on board as bunkers.

Coastal tankers, used to transport parcels of refined products from refineries to distribution outlets, can vary from 500 tonnes to about 20,000 tonnes. However, coastal tankers, used to carry crude oil from a storage terminal to a refinery or to lighten a large tanker, can vary in size from 8,000 to 100,000 tonnes, dead-weight.

Fuel oils are supplied to power stations and large industries by ship. Fuel oil, petrol, diesels, lubricating and hydraulic oils are also transported to storage or distribution facilities by sea. Ships being supplied with bunker fuel in port are supplied by pipeline, barges or by road tankers on the quay.

1.2 Risks of oil pollution around the Irish coast

Many of the above types of vessel may be passing the Irish coast at any time. Some of the vessels will be bound to or coming from Irish ports but many will be passing along our coast en route to other destinations. The Irish Sea is the only route for traffic using ports on the western side of the UK and vessels must pass this area when bound to or from these ports from almost any other part of the world.

A number of refineries are located along the west coast of the UK adding further to the quantities of crude and refined products in the area. Similarly, traffic will pass the south coast en route to the UK and Canada. Many large vessels pass up the west coast, bound for northern European ports, rather than use the busy English Channel. Ireland's geographical location and proximity to busy shipping lanes means that we are exposed to a volume and variety of traffic passing our coast. Furthermore, we are vulnerable as a refuge for shelter from bad weather for vessels experiencing or developing difficulties in the Atlantic or Western approaches to the English Channel.

Large quantities of heavy fuel oils are imported to ESB power stations and large industrial plants such as Aughinish Alumina. The refinery in Whitegate imports crude oil in parcels as big as 83,000 tonnes and exports a residual product in lots as big as 50,000 tonnes. In addition, tankers calling to load such cargoes may already have a part load from another port. Therefore, it is possible to have 70,000/80,000 tonne cargoes of residual fuel/oil in the Cork Harbour area.

1.3 Tiered response

Oil Spill incidents are classified into the following response tiers:

Tier I - Small Local Spills

This covers operations at oil company owned, operated (or shared) facilities where events are largely controlled by the oil company's operating procedures and personnel and equipment can be made available to respond immediately to an "on site" incident. Such an incident would generally be associated with ship transfer or bunkering operations at a jetty, pier or mooring and around water-side storage tanks. The facility contingency plan should recognize the need for a rapid response capability aimed at quickly containing and, if possible, recovering the spill.

Tier II - Medium sized spills in the vicinity of an oil company's facilities

This covers spills beyond local response team capability where resources from other oil companies, industry and possibly government response agencies in the area can be called in on a mutual aid basis. The oil company may participate in a local co-operative where each member pools its *Tier I* resources and has access to any equipment which may have been jointly purchased by a co-operative. *Tier II* risks would typically be associated with shipping accidents in ports or harbours, in estuaries and coastal waters, but could also be from pipelines, tank failures or nearshore exploration and be used to recover oil.

Tier III - Large Spills

This covers major incidents, typically from spillages at sea such as those from tankers and offshore platforms, the scale and scope of which is beyond the capabilities of the *Tier II*. Substantial further resources will be required and support from a national or international cooperative stockpile may be necessary. Because such incidents often become high profile and politically sensitive, the *Tier III* plan will most probably form part of a National Emergency Plan headed by an appropriate national agency or government department.

1.4 Initial response

Reports of a marine oil spillage are usually first received by harbour authorities, by a ship's owner or agent. Harbour masters, agents or owners review the report quickly and alert the Irish Marine Emergency Services (IMES) of the Department of the Marine.

In a major pollution incident involving oil, chemical or dangerous substance at sea which threatens pollution of the Irish coastline or related interests, the Director, IMES, will deploy the Marine Pollution Response Team (MPRT) to some convenient location to set up a Joint Response Centre with the Local Authorities and the company to direct and co-ordinate the on-shore response.

The team may also be used to provide advice and assistance to the local authorities with regard to on-shore clean-up of oil, chemical or dangerous substance pollution. During the period the oil company involved will have initiated its own contingency plan, taking immediate action to minimize the loss of oil and to contain any which has been spilled. The tanker owner will be involved in assessment and response planning through the Independent Tanker Owners' Pollution Federation (ITOPF). The oil company and ITOPF will also have been in close touch with IMES.

1.5 Tackling the spill at sea

If it is possible to do so, the spill is most effectively dealt with by tackling it speedily whilst it is still at sea. Aircraft spraying can be used to break up the oil, and wave action will complete the dispersion. Where wave heights are not excessive, it may also be possible to use mechanical means to contain and collect the oil with booms. In general, oil booms may be used to deflect oil away from a sensitive area, to guide oil towards a location in which it might be recovered, to encircle or entrap oil on the water. Different forms of skimmers, vacuum units and recovery devices may be used to remove the oil from the water surface. Dispersant chemicals may be used to disperse the oil on the surface of the water.

Several types of absorbent material and products to enhance biological degradation are available.

1.6 Shoreline protection

If it becomes apparent that the spillage is likely to reach the shore, the local authorities concerned (who have already alerted their emergency services) will action their contingency plans. Working with IMES, ITOPF and the oil company, they will set up a Joint Response Centre (JRC) to determine the resources necessary to handle the emergency at stretches of shoreline likely to be affected. Containment booms may be deployed to protect specific areas but these are less than perfect in unfavourable weather and tidal conditions when the oil can be driven under and over floating booms. Particular care is directed to protecting sensitive parts of the shore, such as those with nature reserves, salt marshes and river estuaries. The JRC has to assess how changes of wind and tide, possible as well as probable, are likely to affect the situation, and to work with environmental, tourist, leisure and fishing bodies in an effort to minimize damage to the environment and wildlife-

1.7. Shoreline clean-up

If the oil does reach the beaches, the clean-up task could be a long drawn-out exercise over many weeks, and labour and equipment will have to be drawn from many sources including oil company personnel, local authority staff and, in the extreme, military personnel. The local authority in charge of the shoreline clean-up, can call upon government support to supplement its own resources as needed.

Mechanical cleaning and physical removal of as much of the oil "mousse" as possible is the only way of cleaning-up. Specially-prepared approved dispersants may be available to help with final cleaning after the "mousse" has been removed, but they must be carefully selected to ensure no lasting damage is caused to the underlying ground ecology.

Natural weathering by wind, sun and water will eventually degrade any remaining oil, and the shorelines will revert to their original condition.

1.8 Additional equipment stockpiles

Many of the oil and chemical companies have been involved in co-operation with harbour authorities in establishing stocks of materials and equipment for use in the event of a spill or incident in harbours. The harbour authority acts as contractor to the consortium and the oil companies provide the equipment. To date such provisions have been put in place at Dublin, Cork, Limerick, Foynes and Drogheda.

In addition, back-up resources may also be available from the worldwide stockpiles owned by the oil companies such as the Oil Spill Response Ltd. at Southampton which has a multi-million pound oil spill response stockpile financed purely by the oil industry. These resources would be called out to provide a *Tier III* level of response.

2. Preventing Inland Oil Spills

2.1 Immediate action

The action to be taken to deal with a spillage of any oil products depends on what the product is and on where the incident occurs. In each case the basic objectives are to minimise the spill and contain and recover what has spilt. If the product involved is highly volatile, like petrol, there is less likelihood of lasting environmental damage but a higher safety risk. With a heavier, viscous product, like lubricating or fuel oil, ground and water contamination will be more serious but the immediate safety risk will be comparatively low. The Water Pollution Act requires that where a spill occurs where product is likely to enter drains or water it must be reported to the local authority.

2.2 Inland Oil Spill Consortium

An Inland Oil Spill Consortium has been formed by a number of oil companies. The oil companies own stocks of material and equipment suitable for responding to a spillage of oil such as might be required following a road tanker accident or in the case of a tank leak or overfill.

2.3 Response

Within terminals, trained personnel and contingency plans are available to take immediate action to minimise, contain and stop any spilled oil spreading. Dependent on the size of the spill, the fire service and the port authority may be involved. If the incident occurs whilst the product is on its way to customers, then the immediate response will be carried out by either one of, or a combination of, the oil companies involved, the Fire Service, the Police and the Local

Authority. The oil company whose product is involved will be quickly notified.

Where an oil company has been made aware that an incident has occurred involving spillage of product they must ensure that the relevant authorities are notified. Usually the pollution officer of the local authority concerned will also be informed. For a significant incident a Response Control Group will be immediately set up on the site to co-ordinate the response and to deal with the problems occurring. Where a volatile product is involved, the fire service and Garda Siochana will promptly impose strict safety measures including, if necessary, the evacuation of members of the public from the area until the situation is rendered safe. The contractor for the Inland Oil Spill Consortium will be immediately mobilised to site by the oil company involved. They will carry out whatever cleanup is possible and necessary, usually in co-operation with the local authority. They will remain at the spill site until requested to leave by the oil company. The oil company will at all stages be responsible for clean-up activities unless instructed otherwise by the authorities.

2.4 Longer term action

Longer-term measures to monitor ground water and water aquifers may be set up by the local authority until it is satisfied that all traces of the product are at acceptable levels. The condition of contaminated soil will need to be assessed and remedial action taken. This may require treatment and, in extreme cases, this soil may have to be excavated and removed. Approval of the disposal must be obtained under licence before any oil contaminated soil is disposed of in a local authority disposal site.

3. Avoiding of leakage from underground storage tanks

There are an estimated 8,000 underground storage tanks in use in Ireland. A large proportion is used for petrol storage.

The oil industry has set the highest priority on safety and environmental protection and over the past decade actual standards have been progressively raised. The industry requires its suppliers and contractors to maintain similar standards and also encourages its customers to do so.

3.1 Background

The legal requirements for service stations are contained in SI No.311 of 1979 The Dangerous Substances (Retail and Private Petroleum Stores) Regulations. These regulations control the licensing of petrol filling stations and private stores and lay down requirements for the design, construction, installation, maintenance and testing of equipment. This Statutory Instrument also contains regulations for the proper drainage of the site and the provision of oil interceptors to prevent the escape of petroleum to the environment.

The Dangerous Substances (Retail and Private Petroleum Stores) Regulations, 1979 & 1988 requires the periodic recording of the tank contents and dispenser pump meter readings for all underground storage tanks, for the purpose of precautions against the risk of leakage of petrol, where

- the soundness or integrity of a tank is suspect, or
- the tank has been installed for over 20 years, or
- it is specified as a license condition, or
- it is required by a Licensing Authority Notice.

3.2 Current Status

The renovations of the service station networks of member oil companies over the past five to ten years means that standards are now higher than ever and the risks of leaks are lower. These standards are continually reviewed and updated to keep up with technological developments.

The risk of leakages at forecourts has been greatly reduced by a whole range of features such as double skinned tanks and pipework, sensitive leak detection including interstitial monitoring on double-wall tanks, concrete encasing of tanks or the installation of tanks in concrete vaults and greatly improved anti-corrosion treatments for buried tanks and pipe work. Spillages during delivery are prevented by developments such as level alarms, overspill prevention devices and full containment construction of tank manholes.

The oil companies are estimated to own some 40% of the underground storage tanks in Ireland, the other 60% being owned by commercial operators or independent retailers.

Proper stock control using the 2001 Wetstock Inventory Control for Petrol Stations, published by the Health and Safety Authority will detect any leaks that may occur and allow prompt action to minimize environmental impact. All leaks are regarded extremely seriously and immediate steps are taken to prevent further leakage together with appropriate measures for any containment and clean-up that may be required.