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Port safety

The new harbour development is essential so that the port can continue to provide the energy needs of the growing city and port of Galway and a safe and efficient interface and with the maritime environment. The building of the Topaz Galway Terminal on the Enterprise Park was the first step in moving the risk, imposed by the oil terminals, away from the centre of the town. This improvement will not be complete until the oil tanker berths are moved from the enclosed dock; as a safety concern this move is highly desirable. It is also hoped that the Leeside operation will move to the new terminal.

Tanker safety

Safety in tanker operations is a simple question of making sure that vapour and a source of ignition never come together in the same place. Both are rigidly controlled and areas where there may be vapour at some stage are zoned and only equipment rated as safe to use in a particular zone is allowed to be used. Precautions are taken to prevent static electricity generation or discharge.

Tankers using the port of Galway are only there to discharge their cargo, which means that vapours are not released from the ship as they would be if a cargo tank is being filled. The harbour master does not allow ballasting or repair work in the harbour.

Explosions on small tankers are extremely rare and if they do happen it is usually during repair work or tank cleaning, neither of which is allowed in the port of Galway. The problem of what to do if a damaged vessel had to be made seaworthy before it can leave will be more easily dealt with in the new port.

Ship's officers are subject to international requirements for certification and training and tanker crews have to undergo additional training in tanker practice and firefighting. Tankers themselves have to have certificates of compliance with international conventions on different aspects of marine safety and marine pollution prevention and are subject to many inspections and audits.

Terminal safety

Oil terminals are also subject to internal and external safety audits and staff are on a continual round of training. The safety standards are extremely rigorous and the time and cost is accepted by the industry because of potential hazards involved. Topaz Galway Terminal's design was subject to a hazard and operability study and risk assessment. The emergency fire protection is in excess of standards.

Explosions in tanks ashore are extremely rare events, there is a weak weld around the roof edge of the tank which will allow the roof to lift and relieve the explosion rather than the whole tank exploding, leaving a fire in the tank for which there are fixed firefighting installations and backup response capability.

Ship/shore interface

Between the ship and the shore is a ship/shore safety checklist which is completed by ship and terminal staff before each transfer. The flexible hoses are subject to regular pressure tests and visual inspections.

Navigational hazards

Because of the nature of the work it is impossible to say that ship movements are without hazard, however the port of Galway has some 50 years experience in accepting tankers and other vessels into its dock safely, though the size of these vessels has always been limited.

An incident which is followed by fire or pollution usually involves vessels on passage at sea or in a river or channel rather than damage caused during manoeuvring into or from a berth alongside.

The new tanker berth at Dun Aengus Quay North instead of Folan Quay presents a slight increase in risk as any vessel entering the dock has to go past the tanker berth.

Entering the docks is made difficult by the current from the Corib River which flows eastwards across the dock entrance. Pilot skill and the professional relationship between him and the ship's master allow ships to navigate this safely. This hazard will not exist if the berth is built outside the docks.

The greatest risk reduction measure in tanker operations is in the introduction of double bottomed or double hulled vessels. This greatly reduces the likelihood of a spill following hull damage though it means that the vessel is larger to carry the same amount of cargo.

Elimination of risk

If a risk has been identified, the first question to ask is:-
- Can that risk be eliminated?

The second question if it cannot be eliminated is:-
- With all the risk controls in place, is the residual risk tolerable?

Under these conditions all measures must be taken to reduce the risk as low as reasonably practical (ALARP). This means paying out for safety measures until the cost or effort of the safety measure, in money or effort, brings no meaningful return in increased safety.

The risk may be tolerable but it is not zero. Moving the tanker berths from the enclosed dock eliminates the risk from the dock area.

Although it might be a disproportionate cost to build the new dock to replace a tolerable risk, it would be an added bonus if in doing so Galway was left with a more commercially viable port because it is lifted from the restriction of tidal access, and the bonus of being able to develop the tourism activities in line with the regional development, as outlined in the business case. That it might make possible, measures to exploit alternative and renewable sources of energy, make it an imperative.

Non oil-related hazards

There are hazards in the port area which are not oil related. Open quays which are accessible to the public without safety railings. Overhead loads, cargo handling machinery, vehicles and other hazards of stevedoring activities with just temporary barriers and notices to separate the general public. Heaps of cargo or items of equipment waiting to be loaded or carried away may have intrinsic hazards.

These hazards will also be eliminated from the dock area and better regulated when the new port is built. The public will be allowed in the new amenity areas but there will be restricted access to the cargo handling areas.

Buncefield

In the six years since the large fire and explosion which occurred in Buncefield in 2005, the incident has been thoroughly investigated.

The Investigating Committee formed an Explosives Group who published two reports on the actual explosion. They also formed and an industry based task group who produced recommendations on procedures and equipment designed prevent a repeat of the incident. The investigating committee then published its final report and recommendations.

The UK Health and Safety Executive (HSE) commissioned several independent research projects, looked at its own advice on land use planning around large scale petroleum storage sites and after public consultation produced a revised set of procedures. The research and enquiry process found that the basic approach of the HSE was substantially correct but that the procedures should be more restrictive and account should be taken of societal risks. The Irish HSA published its own policy and approach document based on this research. The quantified risk assessment of the New Port of Galway by Entec is based on this document.

The conclusion was that a vapour cloud explosion did happen. Four companies were fined a total of 9.5 million GBP for the management failings that led to the incident. With all the recommendations implemented the residual risk is taken care of by land use planning.

The New Port of Galway

The new port has a direct entrance with no cross currents. There is a large turning circle which allows for ease of manoeuvring. The tanker berth will be fitted with cargo handling equipment and fire fighting equipment appropriate to the size of the vessels using it, and will be operated according to the International Safety Guide for Oil Tankers and Terminals.

Marine pollution

The International Maritime Organisation took responsibility for safety of life at sea shortly after the sinking of the Titanic with the Safety of Life at Sea (SOLAS) Convention and later took responsibility for marine pollution with the MARPOL Convention, both of which have been updated and amended with various protocols and circulars.

Any ship of more than 400 tons and tankers of more than 150 tons must have a ship's marine pollution plan (SOPEP), as well as equipment for dealing with oil spills. When bunkering there has to be a designated officer in charge and they must follow safe bunkering procedures. Samples are left ashore as a fingerprint so that polluters can be identified. The human element is addressed in that a ship has to carry a copy of the International Safety Management (ISM) Code and guidelines on implementation. Having it on board is not enough, it has to be used to draw up ship operation plans and emergency procedures. Records have to be kept of hours of work and hours of rest because fatigue has been shown to be a factor in some incidents.

IMO continues its work to improve safety at sea and protection of the marine environment. Everything is addressed from ship construction and equipment to safety of navigation and training and certification of the seafarer. On cargo ships, packages containing marine pollutants have to be declared and a plan of where they are stowed on board left ashore so that polluting substances can

be removed from a sunken vessel. Funds are available for to pay for such work. Annex VI to MARPOL, on clean air, limits sulphur oxide and nitrogen oxide as well as particulate emissions and a new amendment in July 2011 limits greenhouse gas emissions.

Port state control

90% of world trade goes by sea so the work of IMO is important. Marine safety conventions, of which only a few have been mentioned here, require certification of ships. These certificates require ships to be subject to periodic survey and inspection. The marine administrations of port states can, and do, detain substandard ships. All this has led to a substantial decline in pollution incidents in spite of an increase in world trade.

Protection of the environment

I know that Galway Harbour staff are protective of the environment, many of them have been on anti pollution training courses and a good supply of spill response equipment is kept at the port. I remember when GHC staff were in involved in cleaning up oil that had come down the Corib river and was affecting the Claddagh swans. The port spill response plans are include in the EIS.

Ships that will be invited into the new port are also protective of the environment. An IMO document that describes MARPOL and its annexes follows.

International Convention for the Prevention of Pollution from Ships (MARPOL)

Adoption: 1973 (Convention), 1978 (1978 Protocol), 1997 (Protocol - Annex VI); Entry into force: 2 October 1983 (Annexes I and II).

The MARPOL Convention is the main international convention covering prevention of pollution of the marine environment by ships from operational or accidental causes. It is a combination of two treaties adopted in 1973 and 1978 respectively and also includes the Protocol of 1997 (Annex VI). It has been updated by amendments through the years.

The International Convention for the Prevention of Pollution from Ships (MARPOL) was adopted on 2 November 1973 at IMO and covered pollution by oil, chemicals, harmful substances in packaged form, sewage and garbage. The Protocol of 1978 relating to the 1973 International Convention for the Prevention of Pollution from Ships (1978 MARPOL Protocol) was adopted at a Conference on Tanker Safety and Pollution Prevention in February 1978 held in response to a spate of tanker accidents in 1976-1977. As the 1973 MARPOL Convention had not yet entered into force, the 1978 MARPOL Protocol absorbed the parent Convention. The combined instrument is referred to as the International Convention for the Prevention of Marine Pollution from Ships, 1973, as modified by the Protocol of 1978 relating thereto (MARPOL 73/78), and it entered into force on 2 October 1983 (Annexes I and II). In 1997 a Protocol was adopted to add a new Annex VI.

The Convention includes regulations aimed at preventing and minimizing pollution from ships - both accidental pollution and that from routine operations - and currently includes six technical Annexes. special Areas with strict controls on operational discharges are included in most Annexes:

Annex I Regulations for the Prevention of Pollution by Oil (entered into force 2 October 1983)
Covers prevention of pollution by oil from operational measures as well as from accidental discharges. The 1992 amendments to Annex I made it mandatory for new oil tankers to have double hulls and brought in a phase-in schedule for existing tankers to fit double hulls, which was subsequently revised in 2001 and 2003.

Annex II Regulations for the Control of Pollution by Noxious Liquid Substances in Bulk (entered into force 2 October 1983)
Annex II details the discharge criteria and measures for the control of pollution by noxious liquid substances carried in bulk.
Some 250 substances were evaluated and included in the list appended to the Convention. The discharge of their residues is allowed only to reception facilities until certain concentrations and conditions (which vary with the category of substances) are complied with.
In any case, no discharge of residues containing noxious substances is permitted within 12 miles of the nearest land. More stringent restrictions applied to the Baltic and Black Sea areas.

Annex III Prevention of Pollution by Harmful Substances Carried by Sea in Packaged Form (entered into force 1 July 1992)
Annex III contains general requirements for the issuing of detailed standards on packing, marking, labelling, documentation, stowage, quantity limitations, exceptions and notifications for preventing pollution by harmful substances. The International Maritime Dangerous Goods (IMDG) Code has, since 1991, included marine pollutants.

Annex IV Prevention of Pollution by Sewage from Ships (entered into force 27 September 2003)
Annex IV contains requirements to control pollution of the sea by sewage.

Annex V Prevention of Pollution by Garbage from Ships (entered into force 31 December 1988)
This deals with different types of garbage and specifies the distances from land and the manner in which they may be disposed of. The requirements are much stricter in a number of "special areas" but perhaps the most important feature of the Annex is the complete ban imposed on the dumping into the sea of all forms of plastic.

Annex VI Prevention of Air Pollution from Ships (entered into force 19 May 2005)
The regulations in this annex set limits on sulphur oxide and nitrogen oxide emissions from ship exhausts as well as particulate matter and prohibit deliberate emissions of ozone depleting substances. Emission control areas set more stringent standards.

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