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"The Prestige Incident, an Update."

Presented by

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Abstract.

The Prestige oil spill incident off the northern Spanish coast in November 2002 was not exceptionally large but it has had a significant impact. The 70,000 ton vessel carrying very heavy fuel oil was refused entry to a Spanish port became disabled and in towing her offshore she sank spilling some 40,000 tons of oil. This oil did not disperse and in the severe weather very little was recovered at sea, the majority impacting the coastlines of north Spain and France in the Bay of Biscay.

This paper addresses the issues that arise from this spill, specifically the technical difficulties faced in;

- The handling and pumping of the heavy oil,
- Significant waste generation,
- The programme of oil recovery from the wreck.

And also the more political issues of;

- Changes in European legislation
- Compensation
- Legal action against the classification society, ABS.

This paper is a collection of information from different sources that have addressed these issues in various depths. The author has used this information and provides references for the reader for further research but takes no credit for the work himself.

History

The Prestige was a single hulled tanker built in Japan in the mid 1970's and was owned at the time of the incident by Athens based Universal Maritime. She set sail from Latvia in the Baltic Sea bound for Singapore with a stop scheduled in Gibraltar for bunkering.

On 13th November 2002 when she was about 45km off Finisterre NW Spain the vessel was disabled and sent out distress signals. She then drifted to within a few miles of the Gallician coast. On 14th November a tug was sent out by the Spanish authorities to tow vessel out to sea and the Spanish coast guard and the salver attached lines. The next day however the vessel was abandoned and salvers were instructed to take the ship further offshore where she was caught in severe gales and suffered structural failure in way of her port midships cargo tanks resulting in the loss of some 25,000 tone from these tanks.

Over the next three days the Salvage Company tried to prevent the tanker from splitting by turning it so that its ruptured hull no longer faced the waves all the while towing her further south and keeping her offshore until she was roughly on the borderline of areas for which Spain and Portugal have responsibility for maritime rescue operations.

The Prestige finally broke up and sank in approx. 3600m of water 250km off the coast of Northwest Spain, taking an undetermined amount of fuel into the Atlantic with it. Estimates of between 25 and 40,000 tons of the original 70,000 tonnes remained in the vessel on sinking. This oil was soon observed to be leaking and to reduce the flow of escaping oil; a submarine was used to patch holes in sunken vessel.

The oil spill subsequently spread over 660 miles of coastline crossing 3 international boundaries and 7 regional boundaries.

Clean Up Operations

The overall responsibility for the management of the oil spill was the Spanish authorities and they were quick to activate their cooperation plans with neighbouring countries, particularly France whose coastline was also impacted. A large number of vessels were mobilised from European countries to assist in the offshore clean up and Sasemar, the Spanish Marine Safety Agency mobilsed their staff and OSRL from Southampton with whom they had a standing agreement. Response to the spill started on 14th November.

A crisis centre was established in La Coruna and included the Spanish Gevernment, the Spansih, Navy, Airforce and Coastguard and the local Government of Galicia and neighbouring Juntas

Response Issues that arose

a) Response options
Heavy oil precluded the use of dispersants
Heavy weather made recovery at sea dangerous and of limited effectiveness
Shoreline response rapidly became the only option.
b) Offshore response
Large tidal changes meant oil impacted over a wide area and mobilised with each tide.
The density of the oil made manual recovery possible but it soon became an overwhelming task.
c) Fate of oil
The oil that impacted the coast was stranded in the rocky shoreline or buried in the sandy areas.
The oil was also buried by wind blown sand
Oil was sunken in the intertidal zone through sedimentation
d) Shoreline response
There are a wide range of shoreline types in the area and the oil spill impacted:
Rocky Shoreline, Sandy Beaches, Estuaries, Salt Marshes, Fisheries inc Shellfish, Tourism, Birdlife
Due to the size of the impacted area and the location there was a lack of qualified, experienced personnel for the clean up. This, and the subsequent publicity resulted in a very large numbers of volunteers
In many areas there was difficult access to reach coastline.
e) Waste management (see later section for details)
There was an inevitable log jam in the recovery process due to the large volumes of material being collected
Local refinery was unable or unwilling to take waste material

f) Pumping the oil (see later section for details)
Pumping of the oil was challenging due to viscosity
Shoreline debris created further difficulties for handling recovered oil

The Handling and Pumping of Heavy Oils

Overview of Viscous Oil.

Viscous Oil presents a lot of problems to the oil spill industry including pumping, storage, transporting, heating and cleaning/rehabilitation of response equipment.
The primary problem is pumping the oil, getting the oil into and running the pump without stalling the motor and then discharging along the hose. Temperature is a deciding factor in this as the higher the temperature the easier it is to pump. Clearly viscous oils unheated in storage tanks or washed up on a beach will have cooled and be difficult to pump. Challenges arise then in both the recovery and the storage. Once the oil is recovered and in temporary storage it will need to be kept "warm" to be able to move it for disposal. This is an ongoing problem and one that is being tackled, it was a major issue in the Prestige and has prompted further development work.

Industry Progression.

The Oil Spill Industry is aware of the need for improved equipment, systems and techniques of dealing with Viscous Oil after such Spills as the New Clarissa, Erika and the Prestige. One group of agencies dealing with the progression is J.V.O.P.S. Joint Viscous Oil Pumping Systems. Bringing together the United States Coast Guard and the Canadian Coast Guard (National Strike Force), implementing a pump system capable of pumping oil from between 200,000 and 500,000 centistokes and 1'500 feet of discharge hose using positive displacement Archimedes screw pumps. The project is experimenting with the use of water injection flanges on the inlet and discharge of the pumps (DOP250 and GT185) to form a water annulus ring around the inside of the discharge hose to lubricate the oil. The difference in pumping rate from between water injection and no injection is approximately 10 fold. The trials are testing the difference in water injection temperature from cold through to steam.

Further Information.

The J.V.O.P.S workshops is an ongoing project with the involvement of Oil Spill Response Ltd (UK), Flemming Co (Norway), Hyde Marine Inc (USA), Ro-Clean Desmi (USA & Norway) to name a few. Further information can be found at NOSCA Interspill 2004 (Norway), International Oil Spill Conference 2005 (Miami) and a website www.uscg.mil/systems/gse/gse2

Significant Waste Generation and the Management of the Issue

This section was prepared by Cassie Richardson of OSRL Southampton who has written various papers on Waste management and was part of the team involved in the preparation of the latest IPIECA report series on the subject.

Prestige, Spain Nov 2002 – Feb 2003. The handling and disposal of oily waste have major implications for oil clean up operations. It can hinder the entire operation by causing bottlenecks and delays in further recovery of oil, unless suitable arrangements can be made. The Author during the Prestige spill has observed an example of this.

On the November 19, 2002 the oil tanker Prestige sank in the Atlantic Ocean off the coast of Spain, taking down with it at least 18 million gallons of fuel. The tanker had been damaged in a storm near the coast. Almost two million gallons of oil leaked from the vessel before it sank. A Dutch salvage ship towed the ship 130 miles offshore to prevent more oil from reaching the coastal areas. This is evidence of the current ill feeling towards "ports of refuge" and as a result approximately 150 miles of Spain's beaches was affected by the spill. The ship was carrying fuel oil, which is heavier than unrefined crude oil and more difficult to clean up. (*The Environmental Literacy Council, 2003).*

Fate of the oil. There are two basic types of fuel oil: Distillate fuel oil (lighter, thinner, better for cold-start) and Residual fuel oil (heavier, thicker, more powerful, better lubrication) as was spilt from the Prestige. They are only used for industrial and marine applications because, although fuel oil is cheaper than diesel oil, it is more difficult to handle (must be settled, pre-heated and filtered, and leave a sludge at the bottom of the tanks).

The main physical properties that effect the behaviour of oil spilled at sea are:

Specific Gravity: This compares the density of a mineral to the density of water, in the case of the oil spilled from the Prestige, its SP was around 0.9962 time heavier than water, this is the main measurement used when identifying the best response options.

Viscosity: Refers to the oil's resistance to flow, measured in centistokes. Viscosity of HFO is maintained at 13 CST for its efficient burning. High viscosity oils such as HFO flow with difficulty, low viscosity oils are more mobile, this measurement can be effected by sea temperature and heat absorption.

Pour point: The temperature below which the oil does not flow. Typically heavy-fuel-oil, graded IF-300 (Intermediate Fuel) has 300×10^{-6} m^2/s at 50 ºC (300 cSt), 25×10^{-6} m^2/s at 100 ºC, and the flash-point at 60..80 ºC.

Asphaltene: With reference to *Polor Compounds,* these compounds tend to encourage the formation of stable water-in-oil emulsions. HFO normally contains between 4% and 12% of asphaltenes, which is high enough to cause sludging problems.

The way in which an oil slick breaks up and dissipates depends largely on how persistent the oil is.
Persistent oils, such as that spilt from the Prestige, break up and dissipate more slowly. Emulsion was the fundamental factor behind the extent of environmental impact. Due to the oils asphaltene content being so high the absorption of water was that much greater, increasing its viscosity that much more. So by the time it reached the shore line one was looking at what closely resembled a chocolate moose effect!

Operational outcome. With 150 Spanish service men working on one site, the control of the waste was one of the foremost but toughest focuses.

Segregation was achieved as soon the oil was recovered. Temporary storage facilities were identified (skips) and each was designated a specific waste types. The skips where

lined with a plastic membrane and when this wasn't available, a quick hardening foam (Expandi Foam) was used to block up any possible holes and gaps in the sides. In the event of a spill and the subsequent clean-up operation, all oil and oiled debris collected becomes a waste that must be segregated, stored, treated, disposed of or recycled. The key to successful waste management is to classify and segregate these wastes at source before it passes into further stages of the waste stream. The waste generated from the prestige spill consisted of:

- Oil and water
- Oil and debris
- Oil and organic material
- Oil, pebbles and other sediment particles
- Oiled Personal Protective Equipment

Each waste type was channelled into individual storage containers, dependent upon their type.

Location of the storage was given careful consideration. It must be above high-water spring tide and storm wave limits otherwise it risks being washed away. In regions subjected to extreme heat, certain storage containers, especially plastic bags, should be protected from prolonged exposure to direct sunlight as this can cause breakdown of the bag material, oil then can leak from the bags. Storage containers should be labelled with the contents, quantities and relevant hazard markings before transportation, and relevant documentation passed to the driver or storage manager. In many countries this is enforced by legislation.

Secondary contamination was then a major issue and had to be carefully planned out to minimise further contamination. The principal methods adopted were; firstly to introduce a 'zoning' system in which the site of the oil collection was known as the hot zone (dirty area), then the volunteers would walk through the decontamination section (warm zone) where they would be stripped of oiled outer clothing. Moving into the cold zone, which was free of oiled material, it is mainly used as a lay down area for equipment, muster points, first aid and refreshments. This method reduced the amount of oil being removed off the site unintentionally by people and equipment.

During recovery in the 'hot zone', a strategy of a chain was introduced so that only a few of the volunteers were collecting oil at one time, while the others were passing buckets up the chain to the skips, the back down. A number of these chains were installed over the whole site. The amount of oiled Personal Protective Equipment (thus more waste) was reduced dramatically using this method.

Problems encountered. The removal of oil off site is a fundamental link in the waste stream; if this is not carried out sufficiently then the initial collection of oil will be hindered. In the case of the prestige site, this fundamental link was being effected greatly by the scarcity of intermediate storage support, resulting in a bottleneck of skips wanting to leave site thus delaying the recovery operation. All oil recovery operations were stopped until the skips could freely move and unload their cargo.

An intermediate storage site serves two main purposes. Firstly, efficient oil recovery i.e. if oil is not removed from site then no more can be collected. It also gives responders time to organise final disposal whilst continuing to recover oil. Secondly, on large spills, when final storage sites may be a long distance from the collection sites, it allows efficient

transfer of waste. This is achieved by combining small loads so that fewer journeys are made to the final destination thus reducing fuel consumption, economic and temporal costs and the number of contaminated vehicles. There are a number of geographical and legal criteria that these sites should meet, all of which should be researched into during the contingency planning stage.

The storage facilities used in this spill had careful consideration made with regard to their location and size, most of them were even lined to stop liquid oil leaching out. Segregation has been mentioned as being the most fundamental tool to aid waste disposal options having positive impacts on both environmental and economical issues. Due to this there must be continuity with regard to keeping it segregated at all times through out the waste life cycle. Unfortunately this was not achieved; all the waste was emptied together into the intermediate storage sites. The next stage of waste management, final storage, was also not actioned, so there was no transportation in place to take it away to final storage facilities where it would wait until finally being disposed of, thus the pits filled up quickly. This was the reason why the bottleneck occurred on the spill sites.

Other waste streams. Off shore recovery did commence as soon as the weather calmed, but by this time the oil consistency was very viscous and could only be recovered using mechanical grab-like skimmers or by hand – which was the method adopted by fishermen. The total quantity of waste collected offshore was in the region of 35,000 tonnes. As there was nothing set in motion to receive the oil the boats sat in dock for more than three days – wasting valuable oil recovery time. This is an example of another waste stream that needed management.

Other waste issues. As soon as stages one and two of the initial oil recovery was complete (the removal of bulk oil then residual oil) the volunteers entered into the third of clean up. This is where the site is cleaned to an aesthetic merit e.g. rock polishing. This was done without the supervision of trained responders so the management of the waste generated was not considered. This was also evident at sites still undergoing stage one and two of oil recovery, without an approved beach master. Bags of mixed waste were left on the side of the road with no apparent transportation in place for their removal. The sparing of PPE was also not considered when with care, most issued PPE could be reused.

Recovery of oil from the Wreck

The Spanish government has decided that the Prestige wreck must be cleared of oil and has tasked RepsolYPF the Spanish major oil company (previously state owned) to recover the oil.

This is ground breaking action as oil has never before been recovered from such depths (4000m) and the engineering required to complete the task is completely innovative. It is also important to note that the cost of doing this is far outside that amount available from either the compensation funds or the insurers and the decision as to who will eventually pay for this has yet to be made.

Various options are currently being developed and more information is being sought from RepsolYPF by the author.

Some ideas that have been explored and are being developed are:

1. A pilot project was run that included a “hot tap” of the tanks and a decanting of recovered fuel into bags that were floated to the surface for recovery. These large bags became difficult to handle as they neared the surface and the idea of lifting this onto a vessel, or moving onto a barge proved too dangerous.
2. A second project is being developed which includes the sinking of a concrete tube down to the wreck site. Using a similar hot tapping process the tube is filled and then this is brought close to the surface where it will be pumped out into a waiting vessel.

Trails by RepsolYPF have taken place and are ongoing. Some results are available and have been published through their web site and through Cedre 6/10/03. A paper was presented to a conference in 2003 by Ramon Hernan (E & P Repsol YPF).

Changes in Legislation

After the Erika incident a change in legislation was proposed by the European Union that would have banned single hulled tankers in 2005. Post the Prestige incident this was speeded up and legislation has been enacted primarily involves the accelerated phasing-in of double hulled tankers. The legislation also banned from immediate effect the transport of heavy fuel oil in single hulled ships
The main changes made to achieve this are stated below:
Full documentation of the legislation can be found on the European Maritime Safety Agency website. http://www.emsa.eu.int/end183d004.html

The following information is a useful summary and was taken from the summary provided for the Intertanko Council meeting, London,17-18 September 2003.

> The Regulation applies to oil tankers of 5,000 tons deadweight and above entering or leaving a port or offshore terminal or anchoring in an area under the jurisdiction of an EU/EEA Member State, irrespective of their flag. It also applies to tankers of 5,000 tons deadweight and above flying the flag of an EU/EEA Member State.
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> Category (1) oil tankers are defined as oil tankers of 20,000 tons deadweight and above carrying crude oil, fuel oil, heavy diesel oil or lubricating oil as cargo, and oil tankers of 30,000 tons deadweight and above carrying other types of oil, which do not comply with the requirements for new oil tankers as defined in Regulation 1(26) of Annex I of MARPOL 73/78.
> The new phase-out deadlines of Category (1) vessels are the following:
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> – 2003 for ships delivered in 1980 or earlier.
> – 2004 for ships delivered in 1981.
> – 2005 for ships delivered in 1982 or later.
>
> Category (2) oil tankers are defined as oil tankers of 20,000 tons deadweight and above which carry crude oil, fuel oil, heavy diesel oil or lubricating oil as cargo, and tankers of 30,000 tons deadweight and above carrying other types of oil which comply with the requirements for new oil tankers as defined in Regulation 1(26) of Annex I of MARPOL 73/78.

Category (3) tankers are smaller oil tankers of between 5000 and 20,000 tons deadweight.
The phase-out deadlines for Category (2) and (3) tankers are:
– 2003 for ships delivered in 1975 or earlier.
– 2004 for ships delivered in 1976.
– 2005 for ships delivered in 1977.
– 2006 for ships delivered in 1978 and 1979.
– 2007 for ships delivered in 1980 and 1981.
– 2008 for ships delivered in 1982.
– 2009 for ships delivered in 1983.
– 2010 for ships delivered in 1984 or later.

Category (2) and (3) tankers meeting the requirements of the existing Regulation 13G will be allowed to continue to operate up until 2015 or 25 years of age, whichever is the earlier.

A BAN ON TRANSPORT OF HEAVY FUEL OIL IN SINGLE HULL TANKERS

The ban applies to oil tankers of 600 tonnes deadweight and above. No oil tanker carrying heavy grades of oil, irrespective of its flag, shall be allowed to enter or leave ports or offshore terminals or to anchor in areas under the jurisdiction of an EU Member State unless such a tanker is a double hull tanker.

The new EU Regulation makes it obligatory after 2005 for all single hull oil tankers older than 15 years and irrespective of flag, to comply with CAS before they enter or leave ports or offshore installations or anchor in areas under the jurisdiction of an EU Member State.

Compensation

Compensation, payable under the 1992 Civil Liability and Fund Conventions, is available to any individual, business, private organisation or public body who has suffered pollution damage as a result of the *Prestige* incident.
It is estimated that the total losses caused by the incident in Spain, France and Portugal could be as high as €1 000 - 1 100 million (£705 - 776 million) which is well in excess of the amount available under the 1992 Conventions.
Approximately €22 million (£16 million) compensation is available from the shipowner's liability insurer (the London P & I Club). Additional compensation of up to approximately €150 million (£105 million) is available from the 1992 Fund. In total, a total of €172 million (£121 million) is available.

With respect to Spain, some 410 claims totalling €538 million (£379 million) have been presented to the Spanish Claims Office. The biggest claim is that by the Spanish Government for €384 million (£271 million), which relates to clean-up operations and to payments made by the Spanish Government to individuals and businesses affected by the oil spill. A claim for €131 million (£92 million) has been submitted by various groups of fishermen, representing some 13 600 fishermen and shellfish harvesters.

The French Claims Office have received 160 compensation claims totalling €7.2 million (£5.1 million). These claims relate to clean-up and to losses in the fishing, mariculture and tourism industries. Further claims are expected in Spain and France.

Further information is available from the IOPC website. http://www.iopcfund.org/intro.htm of which the following is an extract.

"In May 2003, the Executive Committee took note of the estimates of the economic consequences of the incident made by the Spanish, French and Portuguese Governments and the uncertainties in respect of these estimates, in particular as regards the potential losses in the tourism sector. The Committee decided to fix, for the time being, the level of payment at 15% of the actual loss or damage suffered by the respective claimants. This decision enabled the 1992 Fund to start payments to claimants. The Committee decided in October 2003 to maintain the level of payments at 15%.
At the October 2003 session the Spanish Government requested that the 1992 Fund should make advance payments on account, subject to certain conditions.
The Assembly decided that the Fund should, in accordance with normal procedures, make a preliminary assessment of the claim submitted in October 2003 by the Spanish Government for €383.7 million (£271 million) and pay 15% of the preliminarily assessed amount. In view of the exceptional circumstances of the Prestige incident, the Committee further decided to authorise the Director, subject to a general assessment of the total admissible damage in Spain arising from the incident, to make a further payment of the balance between 15% of the assessed amount of that claim and 15% of that claim as submitted (15% of €383.7 million = €57 555 000). The Assembly further decided that before such a further payment is made, the Spanish Government should provide a guarantee from a financial institution with the financial standing laid down in the 1992 Fund's Internal Investment Guidelines, so as to protect the 1992 Fund if an overpayment situation were to arise"

Legal Action Against the Classification Society.

The Spanish and the Galician Governments have both launched legal proceedings against the Classification Society with which the ship was entered, American Bureau of Shipping. The claim is lodged in New York and ABS have counter claimed against them both in Spain.
The actions are still at the discovery stage and will take some time to come to trial.
To date there has not been an occasion where the limits of liability of the classification societies has been broken although there is an ongoing action against RINA in the French courts over the Erika incident.
More information on these actions is being sought.

Conclusion

The Prestige incident has had a wide reaching impact on the marine and oil spill industries and while it was not the largest amount of oil spilled it will be remembered primarily for the effect on legislation that came about as a direct consequence.

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