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| journal or publication title | "Heavy oil spilled from Russian tanker "Nakhodoka" in 2006 : Towards eco-responsibility, earth sense" |
| page range | 404-413 |
| year | 2003-10-01 |
| URL | http://hdl.handle.net/2297/5550 |

AN OIL SLICK ON THE GALICIAN COAST: THE SHIPWRECK OF THE *PRESTIGE*

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ABSTRACT

In November 2002 the oil tanker *Prestige* sunk on the Galician coast (Spain). The oil spill meant a serious ecological disaster for all of Europe. Great effort has been put to remedy its effects. This tragedy has shown that thorough measures that guarantee the safe sea trade of dangerous substances are needed.

INTRODUCTION

The Galician coast, in the North West of Spain, is vital for international trading. More than 1,400 oil tankers sail through this area, lashed by frequent storms, towards Fisterra every year. Most of these tankers are mono hull vessels, which dramatically increases the risk of disaster. Over the last 30 years, there have been seven serious accidents in Galician waters: *Polycommander* (1970), *Erkowitz* (1970), *Urquiola* (1976), *Andros Patria* (1978), *Cason* (1987), *Aegean Sea* (1992), and *Prestige* (2002). This latest shipwreck was the worst ecological disaster in Galician history and triggered the most serious oil slick ever in Europe.

THE FACTS

The *Prestige* was an old mono hull vessel, made in Japan in 1976. It weighted 81,574 tonnes, was 18.7 metres tall, 243.49 metres long and had a beam of 35.5 metres. Despite having passed all the relevant safety controls required by standard international regulations, it was still found that the tanker was unsuitable to sail and transport oil. This highlights the lack of thoroughness on the inspection of cargo ships carrying highly contaminant substances. The *Prestige* was registered with a Liberian company and travelled under a Bahaman flag with a Philippine captain, Apostolos Mangouras. The crew, all from the Philippines and Rumania, had not received enough

training to enable them to carry out their duties. The tanker had departed from Riga (Leetonia) and was heading to Singapore to deliver an approximate 77,000 tonnes of fuel oil M-100. This is an extremely toxic oil-derivate substance, difficult to treat, with a high density and viscosity, and very rich in heavy metals and sulphur. It presents a low degree of solubility in water and sticks to rocks and earth, making it a highly hazardous product for the environment. This substance is currently out of use.

On 13th November 02, 28 miles from Fisterra (A Coruña), in an area known as Costa da Morte (The Death Coast), the *Prestige* leaked water and the crew was evacuated. The heavy storm, the captain's lack of co-operation and the powerlessness of the tugs, woefully ill-equipped for this kind of emergency, left the tanker drifting towards Muxía (A Coruña) where it run aground 4 miles from the coast. Two options were considered: either tug the tanker to a bay or transfer the oil to other ships in the open sea. Both options were ruled out by the Spanish authorities, who ordered to move the *Prestige* away from the Galician coast instead. This controversial decision led to the trial of several members of the Spanish Government and has even been questioned in the European Parliament.

Due to the bad weather and to certain decisions made by the company in charge of the rescue operation, the tanker drifted first North-NorthWest and then South. On 19th November, the vessel split into two at approximately 130 miles from Fisterra, having moved 243 miles adrift. The bow sank 3,800 metres and the stern 3,500 deep. The water temperature was 2.3 degrees. At the time of sinking, the ship was still carrying around 56,000 tonnes of oil.

THE OIL SPILL AND THE CLEANING WORKS

Over the next few days, the oil spilled (45,000 tonnes in total according to the latest estimates) affected all the Galician coast. It started in Costa da Morte and progressively extended from North to South reaching all the Galician coast down to the Rías Baixas (Pontevedra). Both the coastline and the National Park of the Atlantic Isles were devastated. The oil slick, aided by ocean currents and the strong winds blowing towards the East, spread 2,100 kilometres along the Spanish North coast and

500 kilometres into the French coastline, reaching Penmark Cape (Britannia). This has been the worst oil spillage ever in the history of the maritime disasters regarding the vast extension of affected land, exceeding the *Exxon Valdez* in Canada.

Disorganization and lack of means were severe drawbacks in the fight against the tragedy. France, Italy, Belgium, Holland and Germany sent "anti-pollution" ships equipped to suck oil in the open sea. Unfortunately, these strategies proved to be ineffective due to the high density of the oil and the bad weather. However, Galician sailors and shellfish gatherers played a crucial role by using their own vessels. They used all types of tools (hand-made nets, plastic containers, washbowls and skimmers) and even invented new ones such as the giant skimmer. It was thanks to their action that the oil slick was stopped from spreading towards Ría de Arousa (an important shellfish producer) and the rest of the Rías Baixas.

The catastrophe resulted in 504 Galician beaches (out of a total of 702) being severely affected by the oil slick, covering 12.6 square kilometres of coast. Also, 1,450,000 square metres of rock have been stained. French (Cedre), English (OSRL) and American (ITOPF, NOAA and EPA) technicians fought hand in hand with their Spanish colleagues to clean the coastline, and the Spanish Administration hired the services of the cleaning company Tragsa.

The most striking event in the protection of the environment has been the unprecedented cooperation of thousands of volunteers who astonished the world with their uninterested commitment. According to the report "Coordination of volunteers in the Galician coast" compiled by the Xunta de Galicia, a total of 326,914 volunteers took part in the cleaning works until the 30th June 03. Almost half of them were Galicians, and most of the remaining ones were Spanish, though it is also worth mentioning the arrival of foreign nationals from countries such as Italy, Belgium, France, Portugal, Japan and Lithuania. This shows the extent of the global concern for this environmental disaster.

The Spanish Army actively helped by both monitoring the disaster at sea and cleaning the beaches and rocks alongside the other volunteers. An amazing number of 25,000 soldiers, 14 vessels, 11 aircrafts, 5 helicopters and more than 100 vehicles were

deployed in the area. The Armed Forces were dismissed at the end of June 03, and by mid July the Ministry of the Environment decided to entrust the cleaning project only to professionals.

Despite initial fears that the carcinogenic nature of some toxic substances in the oil could affect those involved in the cleaning process, a report published by the Xunta in November 02 confirmed that samples of oil had been analysed and no carcinogenic substances had been found. Generally speaking, it can be said that the people who worked in direct contact with the oil have not suffered from any severe side effect and are not likely to in the long-term. The most common complaints have been skin, eye and pharynx inflammation, breathing difficulties, nausea and headaches, all of them caused by the exposure to these substances, either by breathing or by direct contact with the skin.

The removal of oil from sandy areas was carried out mainly by hand, using sieves, shovels and buckets, though some heavy machinery has been sporadically used in some areas (e.g. tractors, power shovels and lorries). The workers were faced with the remarkably difficult task of removing the oil buried in sediments, previously located and analysed by the Environmental teams. Approximately 68,000 tonnes of waste had been removed by 27th June 03, and by mid July there were only 9 Galician beaches left to clean. However, by the end of July fresh oil slicks had arrived in the North coast of Spain, mainly in Lugo. This resulted in the withdrawal of the blue flag in some of the sandy areas.

Regarding the cleaning of rocky areas, this has been the first time ever that so many hydro cleaning machines (410 approximately) have been used. Manual versions of this equipment had been previously tested in the National Park of the Atlantic Isles. They work by hurling sea water at low pressure and sea temperature to simulate the effect of the tide on the rocks. The equipment has then been used on the affected areas mainly on rocks near beaches and on cliffs; some changes such as the use of hot water at a high pressure have been introduced, triggering protests amongst the environmentalists.

At this point, the bioremediation technique meant a huge breakthrough. Scientists from the Institute of Marine Research in Vigo carried out tests in the Salvora Isle (Atlantic Isles) on request of the organization National Parks. The results of this research pointed to the fact that the oil can be removed from the rocks by using oil-degrading bacteria. The chosen methods have been submitted in June 03 to the Ministry of the Environment to decide which one of them is suitable for use in the Park of the Atlantic Isles. A second bioremediation project, carried out in Moreira and Cuño (Muxía) beaches by scientists of the Mine School of Madrid Polytechnic University and Oviedo University and funded by the "Consejo Superior de Minas" is awaiting results.

THE OIL REMOVAL

An effective way to remove the oil still trapped in the tanker's containers (some 37,000 tonnes) has not been found yet. The impact of the vessel on the seabed and the water pressure caused the hull to crack resulting in severe oil leaks. The Spanish Government hired the French mini-submarine *Nautile* to seal defective containers. In December 02 the ship was releasing an estimate of 125 tonnes of oil a day. Between 25th May and 4th June 03, date of its latest inspection, the *Nautile* reported a daily leaking of only 700 kilograms (amount confirmed by the French Institute of Research for the Exploitation of the Sea (Ifremer)).

The complete removal of all the oil presents a serious challenge, given the depth of the sunken tanker. This will be the first time ever that such a task is attempted under these circumstances. Repsol YPF, the company in charge of the operation, ruled out pumping oil out of the tanker as a valid option. The oil is highly viscose and there is no piping system strong enough to stand its weight 4,000 metres below the surface. Moreover, the use of pipes would severely damage the already weakened hull; it would also risk the chance of pumping water instead of oil. Eventually, it has been decided that "shuttle bags" would be most suitable to carry out the removal operation. Valves will be installed to connect the shuttle bags to holes opened on the containers' walls. Once full of oil, these bags will float to the surface by gravity.

Repsol has hired the ship *Polar Prince* as operational headquarters. It carries four robots (two of them are *Innovator*, made by the firm Sonsub-Saipem, and the other two are *G-4*, made by the company Thales) that are an innovation in underwater engineering. These prototypes broke the world submersion record when they reached the bow of the *Prestige* and proved the high level of resilience of the cord linking them to their launch pad. However, they still present some technical problems. The robots undertook the repair work on the cracks missed by the *Nautille* in mid July 03 and by the end of this same month the works were finished on the bow. The exact amount of oil leaked from the stern is unknown, but the estimates point to some 300 kilograms per day. Scientists from Huelva University proved that the oil stays fluid. Both the prow and stern hull have suffered very mild erosion and there are not ocean currents. If the initial shuttle bag tests are satisfying, the full operation may take place in the Spring 04, when the conditions of the sea surface are good. As for the oil remains left in the containers after the removal operation, it is hoped it will be treated using bioremediation techniques, currently under study. The main problem is how to find bacteria that can be kept active 4,000 metres below the sea surface standing a gravity of over 400 atmospheres.

As an alternative, if this removal system fails, a marquee shaped structure will be installed in the prow of the vessel, where the 90% of the oil is still lodged. The marquee shaped structure will be useful not only to keep the fuel confined to an area, but also to store it at the top in order to pump it via a pipe. A "mixing chamber" to heat the oil and mix it with solvents will be assembled over the structure. The robots have checked that the surface where the remains are located is strong enough to bear the weight of this structure.

As for the fuel lodged in the sea bed, after the inspections carried out by the submarine robot *Nereus IV* between April and May 03, the Spanish Institute of Oceanography estimates it amounts to approximately 283 tonnes. Cleaning it has been ruled out since it is scattered and due to its small amount it does not affect the marine fauna. The robot, on board the ship *Teneo*, has started a new inspection of the Galician and Cantabric coasts in order to locate the fuel at the beginning of August 03.

DAMAGE OF THE WILDLIFE AND SEALIFE

The Galician coast is a land of huge environmental richness in birds, fish and shellfish. The open sea where the tanker has sunk is home to a wide variety of marine species and the oil slick has deeply affected some protected coastal spaces. The full impact of the oil on the local ecosystem is still unknown.

According to a report published by the Spanish Society of Ornithology (SEO/birdlife) in the January-February 03 issue, the catastrophe of the *Prestige* has had the most devastating effects on the sea bird population in the European Atlantic, after the oil slick caused by the *Erika*. Up to the publishing time of the report, an estimated 100,000 to 200,000 birds had been killed or injured. These numbers include not only local birds, but also migrating species. The most endangered ones have been the common guillemot, the Atlantic puffin and the razorbill, closely followed by the Northern gannet, the yellow-legged gull and the shag. The oil not only destroys the permeability of their feathers, leaving them dangerously exposed to the cold, but also poisons the birds when they swallow it. Also, wet feathers make flying difficult, putting the bird at severe risk of drowning.

As for the fish and shellfish, the extent of the disaster is still being discussed. Fishing and shellfish gathering had to be banned in an area of 600 kilometres along the coast. However, the fishing grounds have been progressively opening since February 03. After the closed season ended in Costa da Morte, at the beginning of July 03, almost the whole of the Galician fishing fleet has resumed their work; as for the shellfish gathering, it is hoped the closed season will be totally over in August 03. However, a significant decrease in the numbers of some species such as the horse mackerel has been reported. There are also concerns relating to the presence of polycyclic aromatic hydrocarbon (PAH) in species used for the trade industry.

FURTHER CONSEQUENCES

In order to help the crippled fishing industry, so vital for the Galician economy, the Government has put various economic initiatives into practice. First, both the

Xunta de Galicia and the central Government approved bursaries of approximately 40 euros per day to be distributed among the fishermen, shellfish gatherers and ship owners. A second stage involved the development of "Plan Galicia", an investment scheme with a fund of 12,500 million euros. The Government has also passed a decree aiming at compensating the victims with a total of 160 million euros, provided they do not press for any type of claim at a later date. This money comes from the International Fund for Compensation for Damage Caused by Hydrocarbon (FIDAC). The EU has contributed 8.6 million euros from the European Solidarity Fund, but this has not been considered enough.

The tourist industry has been another sector under serious threat after the shipwreck. Promotional campaigns together with the initiative of private companies seem to have had a positive effect, since up to now no decrease in the number of visitors has been recorded.

This catastrophe has shaken Galician society. Huge numbers of people demonstrated to express their outrage and demanded a solution to the problem as well as preventive measures to avoid further disasters in the future. At a political level, the Government's performance during the crisis is under debate. The shipwreck of the *Prestige* also resulted in a legal war regarding who should be held responsible for the accident. The captain of the ship has been accused of disobedience to the Spanish authorities and of committing an environmental crime. The Spanish Government is suing the American Bureau of Shipping (ABS), the company that inspected the tanker, in the Federal Tribunal of New York. They accused the ABS of negligence and demanded a compensation of 700 million euros. On its part, the ABS countersued the Spanish Government. The Liberian company that owns the ship – Mare Shipping Inc.- and the managing company Universe Maritime with headquarters in Greece, both closely related between them, are also involved in the litigation, as well as the Swedish charterer Crown Resources, part of the Alfa Group, and the English Insurer P&I Club.

FINAL COMMENTS

The way things developed has revealed that Galicia needs more resources to successfully face disasters such as the one of the *Prestige*. Bigger, stronger and better-equipped tugs, antipollution resources such as safety barriers in the sea and antipollution vessels are some examples.

The disaster has also highlighted the need to introduce changes in current international regulations in order to avoid future spillage in the sea. Shortly after the shipwreck, on 27th November 02, France and Spain signed an agreement to ban mono hull tankers older than 15 years that carry heavy oil from sailing less than 200 miles from their coasts. The Council of Ministers of the EU took a similar decision in July 03 banning mono hull tankers carrying heavy oil from using European ports. The withdrawal of mono hull vessels from the EU before 2010 was approved once and for all. However, due to the pressure put by a group of countries led by Japan, the International Maritime Organisation has not adopted this last measure yet, which limits the effectiveness of the decisions taken by the EU.

It means a huge improvement the fact that the IMO has declared all the European Atlantic coasts from Scotland to The Algarve (Portugal) an Especially Sensitive Maritime Area (though dangerous ships have not been banned) and that the maritime security measures in Fisterra are being altered. Regarding the latter, the change involves expanding the space available to sail from two to four lanes, two of which will be exclusively used by vessels carrying dangerous substances (they will be 48 and 77 kilometres away from the coast). The IMO has also increased the fund to compensate for the damage caused by hydrocarbon from the current 171 million to almost 1,000 million euros in order to remedy the effects of future catastrophes.

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