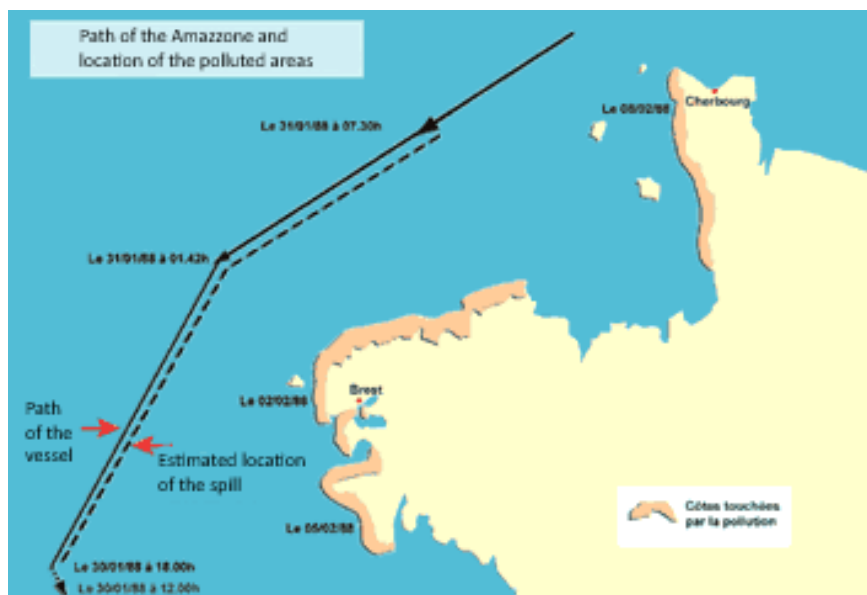


Incident Information Sheet: AMAZZONE 1998



PATH of the Amazzone and location of the polluted areas ©CEDRE

The incident

During the night of 30 January 1988, 60 nautical miles (110 km) off Penmarch on the west coast of Brittany, the Italian tanker Amazzone got caught in a storm coming from the North-West. The vessel left Libya with more than 32,000 tonnes of paraffin base crude oil in cargo and was headed to Antwerp (Belgium) through the Ushant rail. Waves up to 10 or 12 m and a wind force 12 from the west shook the vessel.

The sea waves hit the deck violently on the bow of the ship and detached steel cables. The latter behaving like whips ripped off the lids of 14 Butterworth covers used to clean the tanks. Pushed up by the penetrating water, viscous black oil started to flow out of the tanks through these openings into the Pointe du Raz. The crew of the tanker only noticed the damage in the morning.

Less than 50 nautical miles from the coast, the captain kept on going through the storm. He did not alert the Cross Corsen or the maritime prefect, as required by the law. The tanker went through the Ushant rail and did not stop in Brest to repair the damage. The insurers of the vessel waited 12 hours after noticing the incident to alert the French authorities who were powerless against the pollution spread in the wake of the Amazzone. 2,100 tonnes of oil were spilled on nearly 300 km. Le paraffin rich product was heated to 60°C in the tanks of the Amazzone. It cooled down and emulsified at the contact of the rough sea. The slicks broke into small parts and, pushed by the violent winds, rapidly drift towards the French coast.

The pollution reached the North Finistère on 2 February and South Finistère on 5 February. The Cotentin coastline was not spared and pollution reached it on

8 February. The following weeks, 450 km of coastline, from South Finistère to Cotentin, were affected by pollution. The coastlines of the Channel Islands of Jersey (15 km) and Guernesey (10 km) were also polluted. The Polmar-Sea plan for the Atlantic and the Polmar-Land plans for the Finistère, Côtes d'Armor, and Manche departments were activated.

The arrivals of oil on land spread for three to four weeks after the incident. The oil arrived on shore in the form of tar patties, balls, and scattered patches of mousse. The viscous and thick pollutant, which was the same colour as algae, soiled the rocks, and created a thick mixture with sand and algae. In total, almost 3,000 tonnes of viscous product polluted the shores.



Shores polluted by the oil from the Amazzone ©CEDRE



Birds killed by the pollution of the Amazzone ©CEDRE

Nature and characteristics of the pollutant

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Nature	Libyan oil, paraffinic
Quantity	2,100 tonnes spilled from a cargo of 32,000 tonnes
Form	Reverse emulsion (65 % water) not chemically dispersible
Viscosity	27.9 cSt at 82.2°C 110.5 cSt at 50°C
Behaviour at 20°C	Solid at room temperature
Relative density	High at room temperature
Flash point	36°C

The impacts

Ecological impact

The fauna and flora visibly suffered only lightly. The algae visible at low tide in the Northern part of Finistère might have been polluted. The floating booms set up to protect the oyster farms from pollution in Abers were not infallible. The waves could push the oil above the booms. Questions were raised regarding the long-term effects. The scientific and technical programmes implemented after the incident of the Amoco Cadiz were triggered once again and collaborations were set up. Multiple articles were written but no global ecological assessment was carried out.

Birds

The first oiled birds appeared in Ushant on 1 February, and later on the continent. Most of the marine birds originated from Ushant. According to the ornithological station of Ile Grande, these birds were mostly northern gannets (*Sula bassana*), juvenile murrelets, and razorbills (*Alca torda*). The consequences of this oil spill on the latter were even worse as they were breeding birds.

The counting and rescuing were organised by volunteers from the SEPNE (nature protection society of Brittany), and the LPO (Birdlife France). In clinics from Pleumeur-Bodou and Lannion, a particularly high mortality rate was noted. A cleaned bird had low survival chances as the viscous oil not only sticks to the feathers but also attacks the bird's tissues. In total, the oil spilled by the Amazzone killed around 5,000 birds

Economic impact

As a safety measure, the products from exposed mariculture or fishing sites were banned from sale. Following an alert on the high mortality rate of clams and cockles in the Bay of Douarnenez, fishing was temporarily interrupted. To protect the consumers, the stocks of fishes, crustaceans, shellfish, algae... were destroyed.

Thanks to floating booms, fish farms were barely exposed. In the Bay of Brest, deep-water oyster farms were not impacted. In some cases, crates or fishing boats were soiled by the oil.

Although most of the oil arrived stuck in algae, the industry did not suffer as the algae replenished before the harvest.

The tourism sector was more at risk, as professionals feared a decrease in activity. Moreover, repeated depollutions have sometimes reduced the offshore bar. Some beaches, such as those in Audierne, "melted". The image of the coast was tainted. But the shores were cleaned before summer and the effects on the tourism sector were finally small.

Pollution response

A particularly difficult response

The morning of 1 February, the maritime prefecture was mobilised and activated the response team from CEDRE.

It was particularly hard to detect the oil, evaluate its nature and its volume because of the harsh weather that complicated aerial monitoring. It was almost impossible to be sure of the predictions regarding the arrival of the pollution on land as the slicks were spread on hundreds of nautical miles.

However, a helicopter from the Navy air force was able to collect the first samples of oil at sea. EPSHOM confirmed that the sample was crude oil of high viscosity, with a pour point of 36°C. Neither pumping nor chemical dispersion could be considered. Aerial spreading of dispersing agents was out of the question.

Air operations multiplied. Starting on 2 February, the Polmar-Land plans were triggered in the Finistère and Côtes d'Armor departments. The launch of the Polmar-Sea plan was delayed due to bad weather but all devices were on the alert. It was triggered on 3 February. A network of response centres communicated with the impacted municipalities. The Manche department, which was not yet impacted, was ready.



Protecting the Aber Benoit with a floating boom ©CEDRE

Response at sea

On 3 February, as the weather started to improve, the maritime prefect for the Atlantic triggered the Polmar-Sea plan. On 6 February, vessels from the French Navy tried using trawling nets to collect the pollutant in the Brest and Douarnenez Bays. This method was quickly abandoned since tar balls went through the nets. The deployment of recovery barges, Sirene 20 skimmers and Pollutank floating storage tanks organised by two patrol boats of the French Navy failed. The Polmar-Sea plan ended on 9 February.

Response on the shoreline

Operators from the DDE (Direction Départementale de l'Équipement) set up mooring posts and floating booms (5 km in total) provided by the Brest and Saint-Nazaire Polmar stockpiles. They are assisted by divers from the French Navy and local fishermen. This was done to protect port entries, the Brest Bay, estuaries in the Finistère and Côtes d'Armor departments, the abers area, the Ile Grande nature reserve (located in Ploemeur-Bodou), and fragile aquacultural sectors.

Manual and mechanical recovery started on 3 February after the first arrivals of oil in North Finistère. Shovels, buckets, and forks were the only effective methods for the collection of tar balls caught in the seaweed. Public construction machinery was used to collect this litter. Municipalities from Pointe Saint Mathieu to Cléder asked for support. Responders included volunteers, fire-fighters, military personnel, civil protection personnel, and DDE operators.

They added up to a total of 800 responders on 10 February. The municipality of Porspoder was the first one to be impacted and contracted a private company to clean up the fresh oil on walls, quays, and ripraps.



Cleanup site of pollution caused by the Amazzone: manual recovery ©CEDRE

A logistical pollution response was also developed in South Finistère, then in the Manche department. The equipment from the DDE and the Polmar stockpiles were also mobilised. The Polmar centre in Brest provided a ROLBA beach scraper on 6 February to quickly and efficiently collect the viscous oil on the beaches of Audierne and Crozon. But it proved less efficient than manual collection.

Later, the mobile pebble cleaning equipment designed by the IFP (Institut Français du Pétrole), the Laboratoire Central des Ponts et Chaussées, and CEDRE was used successfully in the Audierne Bay. This new method helped keep the pebble cordons that acted as protection for the site.

In the Côtes d'Armor department, the pollution level was lower but still spread from Est to West between 11 and 25 February. Cleaning operations were decided and carried out by municipalities. Pleubian, the municipality which suffered the most from pollution, asked for support from volunteers.

Waste management

Heavy machinery, tractors, excavators and trucks transported the polluted materials towards temporary or intermediary storage sites. Regarding sites which were not accessible, helicopters from the Navy air force and flat bottom boats were tasked with the recovery of waste bags from manual collection.

Seaweed, sand, pebbles, and debris were cleaned on site, transported to the cleaning station in Brest or to other treatment sites. In North Finistère, 2,100 cubic metres of lightly oiled waste (less than 5 %) were buried in the Spérnot dump in Brest. All of the waste of the south coast (4,375 cubic metres) as well as 300 cubic metres of waste from the partial cleaning operations on the north coast were piled on the platform of the trade port in Brest. The lime treatment operations of the waste spread from 17 February to 21 April.

In total, close to 10,000 tons of waste were collected in the coasts of Brittany, and between 2,000 and 3,000 tons on the coasts of Normandy.

Lime treatment operations

On each polluted site, the nature of the coastline defined the treatment operations... Tests were carried out on oiled seaweed in the port of Brest. Specialists from CEDRE, the IFP, and the Centre d'Etude et de Valorisation des Algues chose this option for the 200 tons collected close to Melon-Porspoder. The company chosen for these operations was supported by operators from the Chamber of Commerce and Industry in Brest. The oiled clumps were crushed and mixed with "granula". This high-calcium quicklime fixed the oil. This treatment method was already a success during the AMOCO CADIZ incident. It consists in spreading the oiled seaweed in layers of 20 cm, mix it well to have a homogeneous mixture, spread quicklime on it with a spreader, then mix it again and press it with a steamroller. A lab was in charge of controlling the quality of the lime and the water rate of the waste. The final product could be recycled into embankment material or garden fertilizer.



Lime treatment of the oiled seaweed ©CEDRE

In South Finistère, the oil was stored as compact sheets. It was decided that they were to be burned.

Cleaning pebbles

In the Audierne Bay, the pebble cordon that protected inland marshes was oiled. An estimated volume of 1,200 cubic metres had to be cleaned and put back in place before the high tides as it was needed for the protection of the dunes. CEDRE and the IFP suggested an innovative cleaning technique: a mobile cleaning station.

All of the cleaning operations were done by the end of February. Pebble cleaning was carried up to the month of March.



Mobile cleaning station for pebbles ©CEDRE



Cleaned pebbles ready to be replaced on the shoreline ©CEDRE

Intermediary storage

CEDRE proposed to regroup waste in one or two points for the sectors of the Finistère area in order to make evacuation easier. Agricultural machinery was used to directly place the waste on tarps (Baie des Trépassés), in specially made trenches (Kersiguenou en Crozon), or in skips in parking lots (Sainte Anne La Palud).



Waste evacuation by the air ©CEDRE

Airlifting of waste

On 16 February, the French Navy SA.321 “Super Frelons” helicopters arrived on sites to evacuate waste bags from hard-to-reach beaches. This included the beaches of Penhat and Lanroz Camaret) as well as the beach of Trez Bihan (Telgruc). These sites are surrounded by high cliffs, or limited by rocky outcrops that make access by land impossible, even at low tide. It became urgent to collect the litter before it got carried away by the growing tides and bad weather coming from the west.

The Trez Bihan site was also a potential pollution source for other nearby sites that were not polluted or had already been cleaned. Considering the high cost (55,000 French francs per hours), discussions were organised between insurers and authorities in charge of response operations. More than 900 bags weighting each 40 kilos were finally airlifted to the top of the cliffs (35 rotations during 5 hours). Over 30 m³ were evacuated towards treatment centres.

Maritime evacuation of waste

Regarding the Perzic site, the evacuation of 5 m³ of waste was carried out by sea. Two barges were brought by road to the beach of Kerloc’h. For 6 hours, they operated round trips to transport waste bags. Although these flat hulled barges were not fully suited for this type of operation, all of the bags were collected.

Financial compensation

The framework

The implementation of the Polmar plan includes financial coverage for the costs incurred by territorial collectivities as well as exceptional expenses for State departments through a particular Polmar funds. On 8 February, the State released two million francs for the Finistère area. The costs were high, particularly for cleaning operations on the coastline and in ports and for the rehabilitation of damaged access roads. Financial help was also required for fishermen, fish farmers, goémoniers, and stakeholders from the tourism sector to compensate for their economic losses.

Following the operating conventions, the shipowner was responsible for the financial compensation of all victims, through the franchise of its insurance plan, then through its mutual insurer, the Standard Protection and Indemnity Club (standard P&I), up to a limit decided by the tonnage of the ship. To ensure payment, the Club chose to deposit the money to the Tribunal de Grande Instance (district court) of Brest. this is the **"limitation fund"**, 13.86 million francs that were to be shared between professionals and municipalities. The **IOPC Funds**, interstate organism created in 1978 as part of the International Maritime Organisation, will provide additional compensation up to a second limit decided by the tonnage of the ship.

Compensation claims

It took almost two years for the French State to file a compensation claim. The estimates for cleaning costs, loss of amenities, tourism decline, damages to natural resources, were long and difficult to make.

The overall sum for the government's claim, estimated at first to 22.255 million francs, was finally brought down to 20.960 million francs. The Côtes d'Armor department and twenty-five of its municipalities as well as the Calvados department and fifteen of its municipalities estimated their claim to a total of 1.276 million francs. Five French fishermen and one private entity in charge of cleaning the oiled birds filed a claim for 300,000 francs. This brought the total up to 22.5 million francs. The authorities for the Channel islands of Jersey and Guernesey filed a claim for 24,776 £ due to cleaning costs.

Amicable settlement

Each claim was studied by experts from the Standard Club and the IOPC Funds. The insurer, followed by the compensation fund, pay the sums after removing the costs linked to operations judged excessive, an including interest when appropriate.

Between 1988 and 1992, the departments and municipalities were compensated up to 1.09 million francs including interest, while fishermen and the bird cleaning company were compensated up to 197,000 francs. The French government saw its claim accepted up to 17.15 million francs (83 % of the total claim) and received, in November 1992, 18.755 million francs including interest.

The judicial procedure

Since the pollution was due to proven misconduct, the IOPC Funds and the French State decided to sue the potentially responsible parties. Experts were designated by the Business Court of Antwerp, the French State, the IOPC Funds, and the municipalities. The inspected the vessel once it arrived in Antwerp. The on-board documents and the state of the ship were checked. Clues pointing towards negligence were found against the shipowner and the charterer.

The administrator for the IOPC Funds and the French Government took legal action. The tribunal in Cherbourg assessed the exact responsibilities of each stakeholder. It was established that the shipowner was personally responsible for the spill. The charterer was found guilty for insufficient maintenance of the Butterworth covers that caused the spill.

The French State claimed 20,960,056 francs plus interest, since the IOPC Funds compensation was not yet settled at the start of the legal proceedings. It withdrew its claim in November 1991 once the IOPC Funds compensation was received. The IOPC Funds carried out the legal action and asked for compensation of the sums that it had already or still had to pay.

The legal action ended in June 1992. After three months of negotiations, a settlement was signed. The IOPC Funds was compensated up to 4.5 million francs by the shipowner, the charterer, and their insurers.

The repercussions of the incident

Technical evolution

The pollution caused by the Amazzone was overall diffuse even if the configuration and exposition of some areas encouraged a massive oil spill. This incident had a large impact on the coastline compared to the amount of oil spilled.

The extreme weather conditions of the first days rendered the pollution protection measures almost useless. They lead to the fragmentation of the cold oil slicks and encouraged the spread of small “clusters” on 450 kilometres of coastline. The viscous nature of the oils on board of the Amazzone and the delayed and complicated response operations at sea made the pollution on land even worse. The cleaning operations were notably hard due to the spread of the oil slick and the changing nature of the coastline. These conditions forced the antipollution stakeholders to implement a multitude of adapted response measures.

Scientists gained knowledge on the chemical behaviour of the oils. As all usual response methods (pumping at sea, chemical dispersants, dredging) were impossible to use, they had to come up with new techniques on land. CEDRE supported the municipalities in their choices for the selective recovery and treatment of a particularly viscous oil. These specialists suggested manual and mechanical methods for the collection and elimination of the oiled seaweed. For the first time, a pebble cleaning machine *in situ* was used and allowed to place the sediment back in its environment. The pebble cordon of the Audierne bay was therefore maintained. The use of adapted evacuation methods (helicopters and flat-hulled barges) was necessary for sites that were hard to access.

No major measures

As it benefited from a large media coverage, this spill left its mark in the history of pollutions in Brittany. It had a positive impact on the evolution of pollution response. The importance of an information network regarding oil spills was highlighted. The lessons learned were also essential in the revision of the Polmar-Land plan for Finistère, which was started a year before. The necessity to develop the pollution response material and improve the response strategy on land were revealed. Research projects were launched on issues related to the evacuation of waste in hard-to-reach areas.

But no change was operated regarding prevention and general policies on risks linked to passing vessels. Maybe because, 10 years later, the memory of the AMOCO CADIZ oil spill was still too vivid for a 2,000-tonne pollution to induce major changes.