

**The *Prestige* Oil Spill Response in the French Coastal Waters:
Setting Up a Second-line Response System**

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Abstract

In the first half of 2003, fuel oil from the *Prestige* threatened the French coastline, notably the Aquitaine coast, a sensitive area of nearly 250 km of sandy dunes lying south of the Gironde estuary and heavily dependent on its tourist economy. North of the estuary is the maritime region of Charente. Of particular concern during the spill were the two tourist islands, Oléron and Ré, which shelter a vast area of mudflats. These mudflats are rich in marine life and are the habitat of the famous Marennes-Oléron oysters. The juvenile eel fisheries in the local estuaries were also considered of prime importance.

To limit the impact of the fuel oil on these highly sensitive areas, the Maritime Affairs Department, with technical advice from Cedre, decided in the early stages of the spill to set up an oil spill response system specifically adapted to the local environmental features: strong tidal currents and muddy waters in which fuel patches or tar balls expected to arrive in scattered and sub-floating forms would not be visible.

The response system was constructed with both dynamic and static components. Fishing boats were requisitioned for dynamic response. Small trawlers with dedicated oil-trawling nets were positioned on the ocean side of the islands and were supplemented by smaller fishing crafts equipped on both sides with eel-fishing nets mounted on a 7 m²-opening and depth-adjustable frame.

The system was completed with a stationary system made up of 'sentry' nets, hung in strategic places and recovered daily for warning of oil arrivals and with protective nets, submerged across the channels and creeks that feed water into the oyster beds. An organization for logistics, warning, and call-on procedures was defined and tested, but fortunately never had to be activated.

1 Introduction

During the *Prestige* heavy fuel oil spill, faced with the complexity of the at-sea response to the pollution scattered in the Biscay Bay, the French authorities decided to build a double-line response strategy. This two-tiered strategy was envisaged in the wake of the *Erika* oil spill in 1999 (Le Roux, 2000) and was implemented for several weeks in Spanish waters in the wake of the *Prestige* spill.

The first-line response system consisted of the at-sea response in the open sea of the Biscay Bay using oil recovery vessels from France and other European

countries that first worked on slicks, then on accumulations of patches and tar balls (Cedre, 2004). A fishing fleet, equipped with specific oil recovery trawls (Seynip or ThomSea types), soon reinforced this international fleet. A second-line response system consisting of smaller fishing boats was also planned to operate in the coastal waters.

Oil pollution from the *Prestige* posed a potential long-term threat to the French coastline north of the Gironde estuary, although oil never actually beached there to any significant degree. In early January, 2003, however, scattered tar balls began to wash ashore on the Charente Maritime and Vendée coastline. Because of this threat, the local population and authorities feared the worst due to the high potential impact of oil pollution, even minor, on the two key activities of the regional economy: beach-resort tourism which is the backbone of the local economy, notably on the islands of Ré and Oléron, and shellfish farming, which is among the best in Europe.

The Charente Maritime region produces more than 40,000 tons of oysters annually, 30,000 in the Marennes-Oléron basin alone, and 10,000 tons of mussels per year, mainly from the Baie d'Aiguillon mudflats in the northern part of the region. This fishery directly employs 8,000 people, including 4,000 temporary workers, and produces 245,000,000 € annually.

The low and rounded coastline is protected from the sea by two large islands which define a relatively closed water body. This sheltered strait is characterized by three or more confined narrows through which high currents flow on the sea side and by two rivers on the land side, where an important winter fishery is located. It consists of shallow, brackish, and muddy water with mudflats at the bottom of bays or behind the islands, which shelter the shellfish farming activity.

Waters in the Gironde Estuary and other river outfalls on the Aquitaine coast are highly turbid and low in salinity, especially in the winter storm season. In these muddy waters, the oil tended to sink and sub-float, making it impossible to survey from either boats or helicopters.

Given the ecological and economic interests in the Charente Maritime coastal waters, the high-effectiveness, multi-layer response system was very desirable. The administration of the French Maritime Affairs, with help from Cedre, organized a warning and response system specific to the *Prestige* response action based on local resources, knowledge, and practices. This original system, described here, was also organized in two to three layers.

2 Strategy for Responding in Coastal Waters

A first line of response was planned for the coastal waters along the islands on the sea side as well as in the opening of the narrows. This was made up of large trawlers, more than 16 m long, located in the main port of Oléron Island and in the port of La Rochelle.

2.1 Trawlers and Eel-fishing Boats

Trawlers and eel-fishing boats were equipped with the same specific oil recovery trawls used by the trawlers working in the open sea with the French Navy. A local netting device was also tested. The so-called 'Rochelle frame' consists of a

square metal frame dragging funnel-shaped netting and is used as a surface trawl along the side of the trawler.

This line would be reinforced with a dynamic boom-sweeping system by using one pair of oyster barges or pontoons pulling a 200- or 300-m floating boom. This plan had been successfully tested by the oyster farmers of the Aiguillon Bay to combat the oil pollution from the *Erika*.

A second response line was planned for intervention in the shallow waters beyond the islands and at the entrance to the estuaries. It consisted of a flotilla of small boats (less than 12 m long), fitted out for fishing eel alevins (locally called "civelle" or "pibale"), a traditional local fishery. For this very lucrative fishery, most of the local small trawlers, oyster or mussel barges, and pontoons are equipped on both sides with fine-meshed and sock-shaped netting hung on a metal frame, called a "pibalour".

The netting attached to the frame is a short funnel into a bag or trawl cod end, consisting of a cylindrical net, about 40 cm in diameter and 3 to 4 m long, closed at the end by a loop of rope. The net bags are removable and easily interchangeable. The trailing end of the bag is regularly pulled out of the water by a line at the back of the boat to check its contents and to empty it if necessary by loosening the rope.

The frame opening is regulated to be less than 7 m², but the frame shapes vary according to the sea-bottom in the fishing zone. Horizontal rectangular frames, 1 m deep by 7 m wide, are used in the estuary edges, to square frames of about 2.6 m for fishing in deeper water zones. The frames are fixed to the boats, but can slide vertically to the desired depth, to a maximum depth of approximately 3 m.

The ability of these devices to work at these depths, 1 to 3 m beneath the surface, made them very useful for catching submerged and over-washed oil. When operated by experienced fishermen and shellfish farmers familiar with the local waters, this fishing gear exactly met the needs of the expected oil response.

2.2 Implementation Strategy

In collaboration with representatives of the affected marine activities and with the support of Cedre, the Maritime Affairs Department soon took the administrative, logistical, and technical steps to adapt and organize the available response force. An agreement for requisitioning of services and equipment was put in place and approximately 50 fishermen were made ready for response actions.

It was decided that fishermen would, at least at first, use their own eel-fishing nets, starting with the used ones. As it was expected that the fishing nets would quickly become fouled with oil, it was estimated that three pairs of trawl cod ends would be necessary for each boat. To allow the fishing nets to be reused, a washing unit in La Rochelle harbour was considered. The high cost of the eel-fishing nets (about 600 € for the entire funnel/trawl cod end and about 150 € for the cod end alone) led to the making of cheaper disposable units; 40 units of this type were ordered and 80 others were on reserve order.

The safety of both the boats and response personnel had to be assured. Personal protection equipment was given to the crew. The bridge and sides of the boat were covered by Bidim® geotextile cloth and an outer layer of polyan film. Anti-skid mats were also installed to ensure safety of the personnel. This equipment

had to be available in specific stockpiles located in the various harbours to which boats had access.

2.3 Alert Scheme: Sentry Nets

Activation of the response system was based on quick transmission to the response coordinator of all pollution observations in the coastal waters, in the narrows, between islands, and on the shoreline. Information was sent to fishermen and shellfish farmers and other marine professionals who had to report all pollution observed following a specific procedure. Similar procedures were followed for the shoreline, including a daily inspection by firefighters, police officers, or Cedre officials.

Because of the high water turbidity, the visual inspections were supplemented by a monitoring network of 'sentry' nets. These were weighted straight nets, approximately 100 m long and 2 or 3 m wide, on a floating line and hung in a dozen strategic sectors. The precise location was defined by fishermen and oyster farmers in agreement with Maritimes Affairs. Approximately 30 such nets were deployed. Fishermen were assigned to check all the nets in a particular sector daily. Nets were identified with numbers on the floaters and their positions communicated to the local fishermen and sailors. A navigation notice was to be issued if a net was lost.

To further enhance the alarm network, smaller nets, anchored by one end on beaches, were set to catch drifting fuel oil close to the shoreline.

2.4 Activation and System Implementation

Activation procedures were selected to ensure that the system was sufficiently responsive. Maritimes Affairs, in agreement with local fishermen and shellfish farmers, decided to use the pre-existing networks and organizations for each profession, e.g., trawlers, oyster farmers, and mussel farmers, in all three sectors (Gironde, Marennes, and Baie d'Aiguillon).

Immediately after an alert, an operational committee of Maritime Affairs and fishermen and shellfish farmers were to go quickly to the alert site in an assigned coordinator's boat.

The captains of about 40 fishing vessels volunteered to put their boats at the immediate disposal of the response effort. At first alert, 14 eel-fishing boats were to be mobilized in less than 3 or 4 hours, reinforced, as necessary, by another 26 volunteers.

The flotilla was to be positioned abreast or in a cross-formation in locations where the probability of finding tar balls was the highest, e.g., in the main current flow. These locations were changeable with the tides. Positioning was determined by the fishermen and shellfish farmers who knew the sector.

2.5 Waste Management

The storage, transfer, and treatment of oily waste were controlled. For the first response line, the French Navy provided a support vessel to transfer the full trawl nets used in the open sea and coastal waters.

For the second response line, it was decided to provide the eel-fishing boats and barges with a 300-L PVC container into which the recovered oil would be poured. A large mussel-barge with a storage capacity of 400 tonnes and equipped

with a crane was provided as an on-site support to collect the full containers, resupply the ships with empties, and off-load the full containers at the reception ports identified in the at-sea response plan as either La Rochelle-Chef de Baie harbour or Le Verdon.

The available oily waste treatment procedures were assessed at local, regional, and national levels for each type of oily waste: fuel oil and contaminated equipment such as nettings, personal protective equipment, geotextile cloth, as well as caught fish.

3 Stationary Protection Devices in Channels

As the final line of the on-water response system and to prevent tar balls from entering the oyster basins, stationary protective devices were installed in the channels that feed the basins with salt water. These channels were protected by a series of floating booms and nets, deployed by systematic assessment. The nets used were fine-meshed and straight, weighted along their bottoms with sinkers. The nets were deployed across the channels to form multi-layered barriers at various levels to limit the tension in the nets and to prevent the needless catching of fish.

As a final precaution, the water-intakes of some oyster basins were protected by installing specific devices, operated by gravity or by filtration, which prevented the oil particles from entering the fill channels.

4 Conclusion

A novel second-line response system was developed to protect the region of Charente during the *Prestige* incident. It differed significantly from that used in the Arcachon basin, another shellfish farm sector farther south, which relied mainly on fixed netting devices (Cedre, 2004).

The Charente response effort was a dynamic system that relied primarily on strongly motivated and concerned local fishermen and shellfish farmers who operated with their own equipment and tools. Their knowledge of the local waters combined well with their irreplaceable technical know-how for using a tool that appears to be well adapted for heavy fuel oil recovery.

The Maritime Affairs Department took responsibility for activating and coordinating this fleet, under the authority of the Préfet Maritime. While this system never needed to be activated, it was partly validated through tests on the technical aspects as well as at the operational level, including the 'pibalours' netting device, the sentry nets, and the alert scheme.

The system was scrupulously defined, step by step, in close cooperation between Maritime Affairs, local fishermen and shellfish farmers, and Cedre. It was defined and validated in a few days thanks to the strong motivation and high level of involvement of the local residents.

As Maritime Affairs is an administration in close contact with the field, its agents have practical knowledge of the local fishing and shellfish farming world. This was a key factor when defining the strategy for intensifying the protection and response against the *Prestige* oil pollution in the brackish and shallow coastal waters of the Charente maritime region of France.

5 References

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