

Incident information sheet of ROKIA DELMAS 2006

On Tuesday 24 October 2006, around 4h00 in the morning, the container ship *Rokia Delmas*, in total black-out, loaded and pushed by harsh winds (100 km/h), was rapidly drifting towards the coast. After dropping an anchor around 5h00 in the morning, the vessel's stern touched the bottom of the sea off Ré island near the village of La Couarde-sur-Mer and stopped on a sand-rock area. It leaned port side (18 degrees), part of its cargo, composed namely of chopped wood and cocoa beans, broke loose. At first glance, no container was lost at sea. No pollution was observed. However, a water intake was quickly detected near the engine room. Couarde-sur-Mer. The vessel transported in its cargo cocoa beans, wood, and 600 tonnes of heavy fuel oil (IFO 380) and 50 tonnes of marine diesel. The crew was airlifted, the commander and 5 crew members stayed on board to help with the investigation of the response team.

The vessel was tilted to 20° and has water intake. No pollution was observed. The Polmar-Sea plan was triggered in Charente-maritime, as a precaution. CEDRE was immediately mobilised and two of its advisors were sent to the control centre in la Rochelle in the evening. The Alcyon, a rescue, support and depollution vessel, left Brest with containment and recovery equipment on board, as well as pumping equipment, to respond to an eventual pollution.



The container ships Rokia Delmas, ran aground on 25/10/06 ©CEDRE



Pollution response boom around the Rokia Delmas ©CEDRE

The same day, the first investigation on board showed that it was not possible to refloat the vessel during the evening's high tide. The following day, the dives carried out detect a breach of at least 20 m in length for 50 cm in width, confirming the impossibility of towing the vessel in this state.

The land prefecture decided to protect the oyster farms using booms. The oil floating in the ship's hold is pumped and stored in a barge. Two barges equipped with skimmers and with a 10 m³ storage capacity were deployed. Because of the proximity to the coast combined with the local currents, the Maritime prefecture alerted a drift

committee, delocalised to La Rochelle, placed under its authority and coordinated by CEDRE. On 30 October, 430 m³ of fuel were pumped out of the vessel and stored on the Alcyon.

Lightening and removal operations



Aerial view of the grounded Rokia
Delmas ©CEDRE

As a result of the grounding of the Rokia Delmas on 24 October 2006, the shipowner was issued a demand letter by the French authorities to ensure that all measures were taken to eliminate the danger that the ship represented for the French coastline.

Following the pumping operations (almost entirely carried out between 27 October and 3 November), the removal of the containers and wood cargo started on 10 November, knowing that the rhythm for the operations depended on the sea state, namely the intensity of the swell. Multiple openings were created to provide access to various decks and start removing the cargo stored there.

In February, SMIT Salvage, already in charge of the removal of the cargo, was chosen to remove the hull, in association with SCALDIS and LES ABEILLES INTERNATIONAL. SMIT was already well known for having removed the wreck of the [Tricolor](#) in Pas-de-Calais in 2003.

Alongside the salvage plan was a pollution contingency plan, which consisted of deploying a boom around the whole site and pre-positioning oil recovery equipment (skimmers, sorbents, booms etc.). This equipment was able to be deployed by a response team of 8 people, who could be on site within 45 minutes.

On 9 March, the company launched the lightening operations of the vessel, before starting the removal of the wreck.

On 2nd April, a fire started onboard the *Rokia Delmas*. The fire was caused by the oxycutting process used on deck 4 (directly in contact with the cargo of wood). No pollution or sheen was detected, other than some fleeting traces of soot due to the spirals of smoke. By 6 a.m. the following day, the fire was under control. The time lost for the salvage operations was no more than 48 hours.



One of the last pieces of Rokia Delmas ©CEDRE

The cutting up and removal of the superstructures carried on until September, bringing a close to phase I (removal of cargo and superstructures).

After the superstructures had been removed, it became obvious that the hull could not be refloated and removed as a whole due its deformation. Phase II therefore involved cutting the wreck into 5 vertical sections (steering section, engine section, front section and then middle section cut in two).

The following phase (III) involved the evacuation of each part of the hull to the port of La Rochelle using a crane barge, before final disposal at a demolition site. The last section of hull was hoisted out of the port of La Pallice on the evening of 28 November. An inspection dive took place on 17 December. Some residual debris was reported, and was then removed on 18 December by the worksite operator.

When all the sections of the wreck of the *Rokia Delmas* had been removed from the sea, the site where the vessel grounded had been returned to its original state and the risks of harm to the environment had been eliminated, the formal notice given to the shipowner was lifted. On 19 December, this final administrative act definitively closed the at sea phase of removal operations, which then continued on land.

Experiments on cocoa bean

Floatation test and behavioural assessment of cocoa beans

Three hundred 20-foot containers filled up to 80 % with cocoa beans (data from CMA CGM) were stored on the ship. By request of the maritime prefecture, CEDRE crafted an experiment to assess the behaviour of cocoa beans in case some of the containers fell overboard in the weeks following the incident. A sample was sent to CEDRE to study their behaviour in salt water and to answer questions regarding floatability and eventual risks for the environment.

A sample of cocoa beans was introduced in a dish filled with salt water on 31 October. Almost all of the beans in the sample floated. Only some beans sank. After 40 h in the salt water, almost all of the beans were still floating, they were however more submerged.



Dried beans during immersion in sea water ©CEDRE



Beans immersed in sea water for 40 hours ©CEDRE

On the third day, a considerable amount of suspended matter was noticed in the water, which became turbid. The beans were sticky to the touch, while still firm. The high content of fat (cocoa butter) might explain this behaviour. On the fourth day, settled matter was noted at the bottom of the dish. As time passed, more beans sank and a white film formed on the surface, indicating the release of lipids. There was still no noticeable gas release or rotting smell.



3rd day of immersion in sea water ©CEDRE



Rinsed bean after 14 days submerged in salt water ©CEDRE

After 14 days, some of the beans were collected and rinsed, observations showed that only the outer protective layer started to decompose while the bean itself remained intact.

Monitoring of gas emissions in an anaerobic environment

During a second experiment, beans were placed in salt water in an anaerobic environment. A system collected any gas emission.

At the beginning of the experiment, all beans were floating. Throughout the days, the beans started to sink. On the seventh day, numerous beans had settled at the bottom, but the exact amount is unknown due to the poor visibility in the water.

Quickly after the start of the experiment, gas emissions were observed. Four days after, a measure was carried out using a Draeger tube; no hydrogen sulfide was detected.



Experimental device for the collection of gas emissions ©CEDRE

The level of water in the vial progressively decreased as the level of gas increased. After 14 days of testing, an unpleasant rotting smell was noticed, followed by a diminution in the rate of gas released.

After 2 and a half months of test, new hydrogen sulfide measures were taken. They revealed the presence of said gas, generated by the fermentation of the cocoa beans which were kept in salt water in an anaerobic environment.

Feedback

Multiple previous examples showed that when it was impossible to quickly refloat a vessel, the process became delicate, long, and costly as it became more complicated.

For the container ship Melbridge Bilbao which ran aground on a sandbar in Molène in 2001, the refloating operations were quickly carried out at high tide.

The container ship Kini Kersten however, ran aground on a beach of Normandy in 1987 and it was impossible for tugs to approach and refloat it quickly. It was refloated only 2 weeks later following major work.

The bulk carrier Coral Bulker had to be cut up to be removed from a Portuguese pier, after long and delicate operations.

The Fenès, which sank in 1996 and lost its cargo of 2,650 tonnes of wheat shows that

food can also be a pollutant.

The rotting of the wheat accumulating on the sea floor lead to hydrogen sulfide emission, which led to removal operations. The recovery work had to be momentarily stopped to implement particular protection measures for divers. The collected wheat was dispersed in the sea to avoid issues with the transportation of rotten wheat by land.

Compared to this example, for the *Rokia Delmas*, the transport of cocoa beans in containers lowered the risks of major accumulations. The floatability of coca beans and the tidal currents in the Atlantic also favoured their dispersion in the event of a spill.

Regarding the cutting and refloating of a wreck, the example of the *Tricolor*, which sank off Dunkirk in December 2002 after an allision, comes to mind.