

Oil spill management and salvage in the Indian Ocean

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Accidents happen. And once they happen, time is of the essence when it comes to rescuing victims, salvaging damaged goods and property and the subsequent clean-up. This is especially true at sea where there can be treacherous and changing conditions. Marine weather forecasts and predictions, crucial for such efforts, can involve a range of national, regional and international entities. That was the case on 25 July 2020, when the bulk carrier *Wakashio* ran aground on a coral reef near the Pointe d'Esny, in southern Mauritius in the Indian Ocean.



The Wakashio wreck at the south of Mauritius, 21 August 2020 (©Cedre)

The vessel, with some 20 crew, contained 3 800 tons of fuel oil (VLSFO), 200 tons of marine diesel and 90 tons of lubricant, but no leaks were observed when the wreck occurred. Nonetheless, danger was imminent and an emergency response protocol was put into action. Meteorological service played a critical role.

The Mauritius Meteorological Service (MMS), within minutes of learning of the wreck, provided all authorities concerned with information on the state of the sea at the time of wreck and 3-day weather forecasts for the wreck area, which included wind and wave parameters. The Mauritian authorities

activated the national anti-pollution plan and alerted neighbouring countries, including France (Reunion Island). A first oil drift calculation, made with the MOTHY drift model of Météo-France, showed that a leak could reach the Mauritian coast very quickly, however, the risks for Reunion Island seemed limited. MMS continued to report twice daily to relevant authorities with 3-day forecasts for sea-state, wind and wave. Wave observations from the waverider buoy off Blue Bay (a couple of km from the wreck) were closely monitored and regularly communicated to all parties concerned.

Then, a few days after the shipwreck, the Mauritian Coast Guard detected small oil leaks in the lagoon and deployed preventative anti-pollution booms around the *Wakashio*. Despite considerable resources, it was impossible to refloat the vessel.



A mangrove impacted by pollution at Anse Fauvelle, Mauritius (©Cedre)

The critical role of marine weather and ocean forecasting

On 6 August, the situation deteriorated: the vessel was leaking and an oil slick was observed on the sea surface. MMS increased their reporting frequency to 3 times daily of 5-day forecasts of weather at sea, wind and wave. The 5-day forecasts were based

1 Météo-France

2 Mauritius Meteorological Service (MMS)

mainly on the U.S. National Oceanographic and Atmospheric Administration's (NOAA) Wavewatch III and real-time observation of the wave and wind at sea from the MMS station at Blue Bay to develop accurate forecasts of local sea conditions. The Director of MMS provided daily marine weather briefings to the National Crisis Committee (NCC), as well as twice weekly briefings to the National Crisis Management Committee, chaired by the Prime Minister. The marine forecasts informed all decisions taken to manage the oil spill and manage the wreck.



First storage location for recovered waste which was stored in barrels (©Cedre)

The Commander of the Southern Indian Ocean Maritime Zone requested the assistance of Météo-France and alerted the Drift Committee, led by Cedre³, including experts from Météo-France, the Service Hydrographique et Océanographique de la Marine (Shom) and the Institut français de recherche pour l'exploitation de la mer (Ifremer)⁴. Drift predictions of the extent of the pollution in the lagoon were made by Météo-France to estimate the risks to the coasts of Reunion Island.. Outside the lagoon, ocean current forecasts from the Copernicus Marine Service were used.

Most of the fuel oil was pumped out of the wreck on 12 August and the clean-up of the coasts began with many local volunteers.

On the 15 August, the *Wakashio* broke in two during a towing attempt. The drift forecasts then included drifts of ship debris. On the 17th, the front part of the vessel was towed out to sea, while the Mauritian authorities considered where to sink it. Météo-France made drift forecasts for several geographical positions to determine which locations may have a pollution risk for Reunion Island. The place of immersion was shifted northwards following this analysis.

The bow sank on the 24 August. The stern is still on site. No pollution has affected the coasts of Reunion Island. The pollution that has affected Mauritius is estimated at between 600 and 1000 tons. The MMS continue their daily 5-day outlooks for the NCC and NCMC. All weather and sea data for the event are being archived for further analysis and studies.

3 Centre of Documentation, Research, and Experimentation on Accidental Water Pollution

4 French Research Institute for Exploitation of the Sea (French: Institut français de recherche pour l'exploitation de la mer)