

CASE STUDY SUMMARY

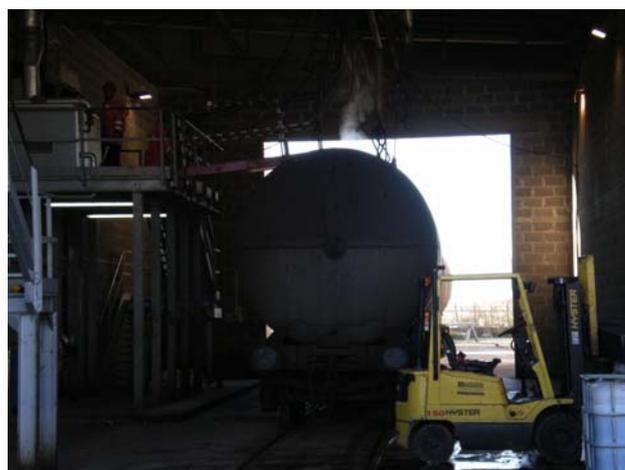
Customer : CARGO CHEMICA Srl
Country : Italy
Problem : Washing fuel oil tanks
Product : BFL Biosurfactant

SITUATION

The tanks (capacity 80m³) used for fuel oil transport on railways need to be cleaned from time to time as there is a build up of heavy fuel oil on the tank walls and bottom. The process involves the injection of steam at 180 °C into the tank for 8 hours. The tank is then left overnight and the oil released from the walls is drained off.

In order to remove the residual oil from the walls a high pressure (80 bar), hot water (80°C) with detergent is applied using a rotating spray head. This is fed using a high pressure, hot water pump with an inline mixer for addition of detergent. This is applied through the central access hatch on top of the tank to one side of the tank and then repeated on the other half of the tank. The first wash lasts for 1 hour on each half of the tank. This is followed by the second wash which again lasts for 1 hour on each half of the tank. The pump delivers 10,000 litres per hour. For the 4 hours cleaning cycle a total of 40,000 litres water and detergent is used.

The detergent currently used rarely gives good results which would satisfy the customer and pass inspection checks in France. In this case a penalty must be paid.



The objective of the trial was to follow the normal steam treatment with a high pressure and high temperature wash using BFL Biosurfactant. It is known that rhamnolipid biosurfactants (which is the active ingredient in BFL Biosurfactant) are very effective in solubilising and emulsifying oils and, in particular, heavy oils. Biosurfactants are natural microbial products and as such are readily biodegradable for subsequent biological wastewater treatment. They also have a neutral pH of 7.0 compared to the chemical products which have a pH of 13.0 and present health and safety issues for staff.



High pressure mixing pump

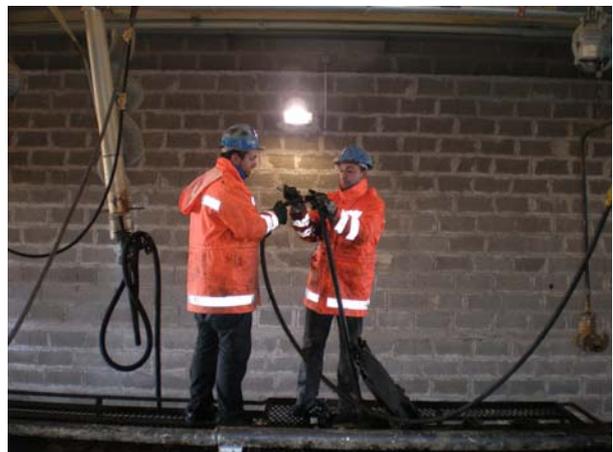


Feed tank for Biosurfactant/diesel blend

A blend of 50% BFL Biosurfactant and 50% diesel was used to mix with the hot water for injection into the tank. A programme of 3 minutes with product feed was followed by 5 minutes of water only. During the 3 minute period 2 litres of the BFL Biosurfactant/Diesel blend was used. This cycle was repeated during the application. During the first cycle the drain valve was closed and when it was opened the operators were impressed with the amount of oil being removed. It was noted that this was much better than with the chemical detergent. It was also noted that the wash water from the tank was removing most of the oil which had been deposited on the floor over many years.



High pressure rotating spray head



Fitting spray head to the tank

After 4 cycles of 3 minutes with BFL Biosurfactant/Diesel blend and 5 minutes of water only it was decided to inspect the inside of the tank. Fresh air was flushed through the tank to ensure there were no dangerous fumes from the oil in the tank. After 3 hours the air in the tank was checked to ensure it was safe and then operators entered the tank with complete breathing apparatus and inspected the tank walls on the cleaned half of the tank. The treated half of the tank was completely clean after only 4 x 8 minute cycles compared to 2 hours normally.



Drainage of tank after cleaning



Floor after draining tank



The operators prepare to inspect the tank



For each operator there are special respirator masks to avoid inhalation of vapours from the oil. The operators took some photos inside the tank to check the correct and efficient performance of the product.



These photos were taken inside the tank.
No presence of oil was found on the walls and on the bottom of the tank.
The cleaning performance of BFL Biosurfactant is very high.
This is the best detergent used for this application.

RESULTS

The use of BFL Biosurfactant proved to be very efficient in removing residual heavy fuel oil from the tank. It produced much better results in a shorter time frame than other detergents which have been tried. There are also health and safety benefits since it is not as aggressive and corrosive as the detergent currently being used. The shorter time frame for cleaning means there are productivity benefits from using the BFL Biosurfactant. The use of smaller volumes of water means that the loading on the wastewater treatment plant are reduced. The total quantity of the blend to clean the whole tank is 16 litres (8 litres BFL Biosurfactant and 8 litres diesel).

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