



Introduction

1. Actual situation

After the Containership accident the situation is, the sea will be polluted very strongly by heavy oil .

An accidental oil spill, whether in the sea or harbor or lakes, will not only contaminate the water but also cause serious damage to the coast and beaches. The resulting environmental disaster not only kills fish and birds but also destroys coral reefs for a very long term . Not to forget the dramatically economical losses in tourism and fishing industry.

2. FREYLIT has the technology and offers the solution to clean up the oil spill which caused the accident of the container ship.

3. The Technology of FREYLIT OIL Spill Units

All OIL SPILL SOLUTIONS include the components specially developed or incorporated into the System by FREYLIT

- a) The special FREYLIT floating Oil Skimmer which collects the oil from the water surface by using a floating flap gate
- b) A unique positive displacement pump (Pit Bull Pump) to transfer the oily water from the skimmer to the oil separator. The special feature about this pump is :
Pumping of oil water mixture with only slightest turbulence (mixing) .
- c) Solid screens are installed in the initial separator which is situated before the FREYLIT Mineral oil and Residual oil separator. This screens keeps grass, reeds and other floating debris which also enter with the oil-water mixture away from our oil separator
- d) The FREYLIT Mineral oil and Residual oil separator (coalescent plate oil water separator) which will separate the oil from the water mechanically. The plate material is polypropylene and the spacing between plates can be either 6mm or 12mm. The cleaned water with an oil content below 5ppm can then be discharged back to the sea or lake.

4. TARGET –SOLUTION TROUGH USE OF FREYLIT OIL-WATER –SEPARATORS

FREYLIT will offer **3 solutions** for the accident in New Zealand.

4.1 CATAMARAN SOLUTION (flow rate : 630 l/s) see Appendix B.1

The catamaran solution is based on the idea of our floating skimmer solution
see <http://youtu.be/j8GD5520mGg>

- 1) A big skimmer with a floating flap have to be installed on a catamaran .
The construction of the oil skimmer allows to skim oil not only from the surface but also 30 cm below the water surface.
On the bottom of the Skimmer 5 positive displacement pumps are installed and an air compressor operate the pump.
- 2) The oil water mixture will be pumped from the skimmer over 5 hoses to a Barge where our FREYLI Mineral oil and Residual oil water separator is installed . We separate the oil and water by using our coalescing plates .Oil Outlet concentration below 5 ppm can be reached.
The clean water can be discharged back to the sea and the separated oil has to be discharged in an oil tank which is installed on the Barge.

4.2 SHALLOW WATER SOLUTION with 1 SMALL BOAT (flow rate : 60 l/min) see Appendix B.2

This solution should be used at shore and in shallow water

This will require a boat with a low penetration depth

On this boat a FREYLIT Mineral Oil –and Residual Oil Separator Type M + R 3PSF, a double Chamber Pit Bull Pump and a small compressor with a gasoline engine have to be installed
Furthermore a FREYLIT floating skimmer with approximately 10 m hose is also a component of our equipment.

Operation:

One Man moves the FREYLIT floating skimmer to the point where oil floats on the water surface. The oil from the water surface will be sucked with the pump through the skimmer and to the FREYLIT Mineral oil and Residual oil separator . Two solid screens (stainless steel screens) are installed in the initial separator which is situated before our oil separator .This screens keeps grass, reeds and other floating debris which also enter with the oil-water mixture away from our oil separator.

Our Corrugated plates inside our Mineral oil and Residual oil separator separate the oil out of the water . The pure oil will float to the surface of the oil separator . In the separator, an oil alarm is installed, which sends an acoustic signal if an oil layer of 15 cm is reached on the surface of the oil separator .

Afterwards, the employee has to open the three oil drain valves in the oil separator by hand to discharge the pure oil from the surface into the oil collection tank.

The cleaned water with an oil content less than 5ppm is automatically running back into the sea .

4.3 BARGE WITH 5 SMALL BOATS SOLUTION (flow rate : 300 l/min) see Appendix B.3

For this solution, 5 small boats and a barge or a larger boat is required.

Each of these small boats are using a FREYLIT floating skimmer and on each boat one man has to handle the skimmer.

On the barge, a FREYLIT Mineral oil and Residual oil separator Type M + R 15PSF, a double chamber Pit Bull pump and a compressor with a gasoline engine have to be installed

Operation:

The five small boats move to the place where oil floats on the water surface. The oil from the water surface will be sucked with the pump on the Barge through the 5 Skimmers and to the FREYLIT Mineral oil and Residual oil separator which is also located on the barge.

Two solid screens (stainless steel screens) are installed in the initial separator which is situated before our oil separator .This screens keeps grass, reeds and other floating debris which also enter with the oil-water mixture away from our oil separator.

Our Corrugated plates inside our Mineral oil and Residual oil separator separate the oil out of the water . The pure oil will float to the surface of the oil separator . In the separator, an oil alarm is installed, which sends an acoustic signal if an oil layer of 15 cm is reached on the surface of the oil separator .

Afterwards, the employee has to open the three oil drain valves in the oil separator by hand to discharge the pure oil from the surface into the oil collection tank.

The cleaned water with an oil content less than 5ppm is automatically running back into the sea .

5. THE DELIVERY SCOPE OF FREYLIT FOR THIS 3 FREYLIT SOLUTIONS and

WHAT HAS TO BE PREPARED LOCAL (SUPPLIED BY CUSTOMER) see Appendix A.1, A.2 and A.3

6. Alternatives to FREYLIT's Oil Spill accident remedy equipment are :

- A) **There are 2 types of CHEMICALS** which are released from airplanes onto the oil spill.
- a) **DISPERSE CHEMICALS** : This chemicals disperse the oil and break the surface tension. An emulsion is created. This means that you do not see the dark oil layer on the water surface any more, but the oil itself has not been removed and is still present in the water.
 - b) Another type of chemical will make the oil sink to the bottom of the sea. This technology was used in the “Deepwater Horizon” accident in the Gulf of Mexico.

In both above mentioned methods the oil is actually not removed, but is either only dispersed or remains on the sea bed, causing the environmental long term damage to the flora and fauna just the same.

- B) **Floating oil skimmers which use oleophilic cylinders to attract the oil.**
Scrapers then remove the oil from these cylinders. Drawback is that these cylinders have limited surface area and can only remove relatively small amounts of oil.

C) **OIL BINDER**

There are many different oil binders such as oil binding cloths, oil binding granulate or oil binding flakes on the world market. The disadvantage is that the oil binding flakes and oil binding granulate which is drawn with oil must be disposed of afterwards. By purchasing the oil binder and the subsequent transport and disposal costs for the waste disposal itself creates huge costs. There are oil-binding cloths that you can wring out several times, if they are saturated with oil. This wringing requires high personnel costs and in addition, also these cloth must be disposed of afterwards. By purchasing the oil cloth and the subsequent transport and disposal costs for the waste disposal itself creates also huge costs.

- 7. Details of all cost you **will get immediately after your feedback and information what kind of solution you have interest to use.**
- 8. **BY USING FREYLIT OIL-WATER-SEPARATORS YOU CAN MINIMIZE THIS ECONOMIC LOSSES AS WELL AS PREVENT FURTHER DAMAGES TO THE ENVIROMENT AND MINIMIZE THE COST BECAUSE THE OIL WILL BE SEPARATED ON SEA AND THE SEPARATED OIL CAN BE REUSED.**
- 9. **ALL 3 SOLUTIONS CAN BE USED LATER TO KEEP THE DIFFERENT SHIP PORTS CLEAN**