

EVO1: Bharat Suresh Mhatre

Amit Kiran Sowani

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Title:

Pollution controller and Fuel collector

Description:

Efficient method proposed to recover oil spilt on the ocean surface.

POLLUTION CONTROLLER AND FUEL COLLECTOR

In this project we are making use of various methods to give a system called pollution controller and fuel collector for effective recovery of spilt oil.

The method used by us is as follows:

When the oil is spilt at first a set of booms is used to prevent the spreading of it on the surface of the sea.

The booms will encircle the layer of oil.

Outside the booms a layer of absorbing material, which consists of, a roll of mat made from straw and sawdust. These together act as an excellent absorbing system, which has a great affinity for oil.

This layer is put behind the booms so as the very thin layers of oil that may escape through the booms is absorbed and thus prevent is further spreading.

Through these two methods the oil is restricted in a limited area.

Fig 1: Figure displaying collection of oil in the deep sea.

Our first proposed model for collection of oil spilt in the deep sea.

This model is a disc skimmer.

The discs that are used in the above project are made of aluminum as the adhesive force between crude oil and aluminum is maximum so oil gets adhered to it.

At first a part of metal discs is immersed in oil due to which that part of the disc gets adhered with oil

When the discs are rotated that part of the discs throughout the disc get covered with oil.

Further the oil is removed by scraping it with the Teflon scrapers, which attached to the panels, which further take it to the collection tank.

Thus the oil can be collected in an efficient manner.

This model will operate in the region between the booms.

Fig 2: Disc skimmer

Our second proposed model for collection of oil spilt near the shore: (please see figure 3)

Near the shore due to the rough terrain it is difficult to collect oil and also disc skimmer cannot be used.

SO we are proposing a different model for this purpose:

The model is a brush skimmer.

The brush used in this model is made up of polypropylene. The skimmer frame is made up of marine grade aluminum. Oil pickup occurs as the rotating brush passes through the oil, which adhered to it. The oil is continuously scrape doff the brush and is collected in the collecting chamber at the back of the skimmer from where it is pumped away. The brush is rotated by a motor. The process occurs fast and the oil is collected easily on a large scale.

Fig 3: Figure displaying method of collecting oil near the shore.

Enhanced biodegradation

The oil that is absorbed by the layer of straw and sawdust, which acts, as an absorbing layer is further disposed by biodegradation.

The layer on the whole which consists of absorbed crude petroleum oil is buried in the soil and various microorganisms capable of degrading petroleum components are added to the soil.

These bacteria are of various types however on group of bacteria belonging to genus *Alcanivorax* becomes predominant in the degrading process.

The sawdust and straw being easily biodegradable get degraded and thus oil is disposed efficiently in an Eco-friendly manner.

Conclusion:

To be effective, an oil spill recovery operation must be seen as a whole. From the time that a spill is reported until the operation is completed, all the various activities must be fully coordinated. For this, a skilled and well-practiced team and effective equipment are required. The team knows its terrain and should know what to do without any delay. It is evidently not possible to define beforehand all the circumstances of a spillage. However, it is possible to identify in general terms the problems of deployment and operation, which will arise despite the individuality of spills that specify the details in each case. Since an oil spill usually spreads quickly and in doing so rapidly escalates the scale of the recovery problems, speed of action is crucial. An accurate assessment of the situation is required as soon as possible. Knowledge is required of the source of the oil, estimates of the amount that has already leaked and of the possible maximum amount of oil at risk, and a summary of the present position of the slick. An assessment is also needed of relevant factors such as currents and tides, state of the sea, the weather forecast, depths of water, possible obstacles.

Oil spills cannot be stopped, but one can hope that through adequate preparation, oil spills and be effectively contained and recovered thus minimizing its effect on the environment.

Mechanical containment and recovery provide the appropriate cleanup method, but the choice of which equipment to use is a crucial factor in the cleanup process.

In our project we have tried to take all these factors into consideration hoping to give a soundproof system called "POLLUTION CONTROLLER AND FUEL COLLECTOR" for effective recovery of oil.