CONFERENCE PROCEEDING

Remora Boat

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ABSTRACT

The background issue this project covers is mostly about water and sea pollution; focusing on spilled oil from boats, ships, etc. into the ocean water. This project could help remove the oil spills in the sea to avoid further damage to aquatic life. This project of ours can do the following task due to it having a section with vacuum pipes below it that is connected to a sensor which allows it to detect locations of spilled oil. As for the contaminated water that was vacuumed, it will undergo a gravity separation process inside our boat that will be done in a tank. This tank will help separate the water and the oil as there'll be a barrier in between. The clean water and the oil will be released separately as the process is done. This boat does not need any human supervision since it will be controlled automatically by a GPS and a sensor that is used to detect oil spills. Without any presence of human supervision means that it could help clean oil from the sea in a safer way compared to the old way.

Keywords: *sea pollution, oil spills, contaminated water, gravity separation process*

INTRODUCTION

Approximately 2.6 billion liters of waste oil find their way to the ocean annually with over 50% of that amount coming from waste disposal and land drainage including the improper disposal of motor oil that easily flows to the oceans through stormwater. Due to this, it has caused lots of damage to the environment. For example, oil can kill surface-dwelling animals and birds by poisoning or suffocation, as well as affect buoyancy and natural waterproofing. Contaminated food supplies mean animals may become malnourished or poisoned over time which causes bad effects on the food supply. Substances from oil spills can also do damage to humans. For instance, oil spillage causes adult fishes to experience problems with growth, enlarged livers, changes in heart and respiration rates, fin erosion, and reproduction impairment; while giving damage, great one to the respiratory, reproductive, and liver of human beings.

Thus, Remora Boat is designed to greatly help in reducing water pollution in the environment; focusing on oil spillage.

MATERIALS

(For the outer part); Aluminium that is used in normal boat making, PVC Pipes as the vacuum pipes to let oil gas and clean water out, a three-blade propeller, a microwave sensor, and a vacuum suction part that is cork-based.

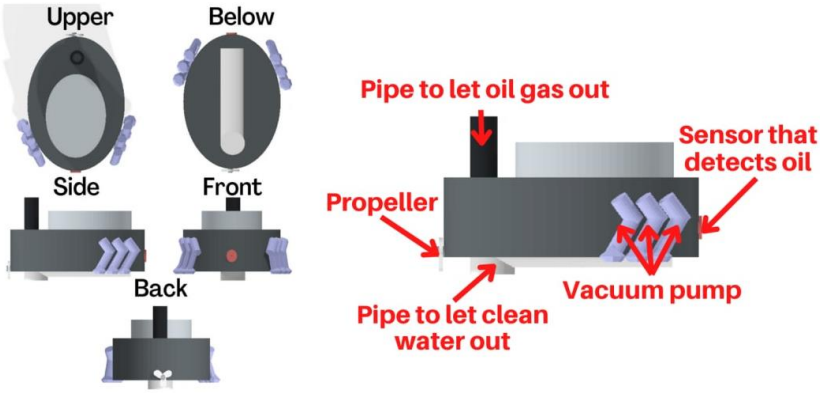

Figure 1: Outer part of the sensor

(For inner part); Another two microwave sensors and a barrier made up of steel to prevent any spillage of water into the other part of the tank that only contains the oil waste.

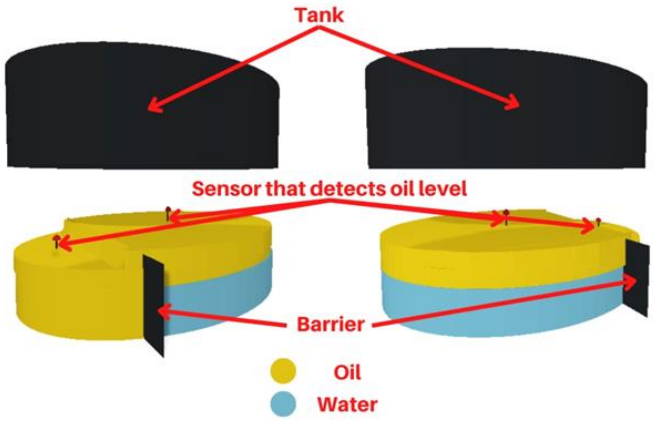

Figure 2: Inner part of the sensor

METHODS

On the outside of the boat, a microwave sensor that detects oil spills is put when it moves on the sea. This helps to scan the sea and at the same time find any presence of oil spills. After the scanning process is done, another process is started, which is vacuuming. When the sensor detects a foreign substance which in this case, is oil, the vacuum suction part sucks all the oil spills around that area. Right after that, a separation process boots inside the tank in the boat.

In this project, the gravity separation method is used. The gravity separation method is a way of separating oil and water by using distance. The hypothesis that has been gotten from this method is the larger the volume of oil and water, the quicker it takes for them to separate. This is why Remora Boat is created with an estimated volume of 6,750ℓ^3 so that it can fit oil and water in the tank.

RESULTS AND DISCUSSION

Most of the research about oil spills shows that the major causes of this problem are because of the loading and the spills (Sharma, 2021). To make sure that the sea is clean, the oil spills need to be removed from the sea. Vacuum pumps and also a tank to filter the oil spills in the sea are used in this project because of their effectiveness which could be seen based on the model that has been created. A microwave sensor is put outside the boat to make sure that all the oil spills are detected by Remora Boat.

Oil waste also has its benefit. Instead of just throwing them away, the recycling or reusing method can be used on the oil. For example, oil spillage could also become fuel for the propeller engine in the boat. This reduces the amount of money needed to spend to buy fuel for the boat to move. There is a refining process that is done in another tank with a certain temperature to get some specific product. As oil spillage is almost the same as crude oil, it would get many products, not just fuel (Abdel et al., 2018).

Based on the discussions above, the decision is the government should always run this boat on the sea as it greatly helps in sanitizing the contaminated water. Oil wastage is also not completely useless as it can be recycled.

CONCLUSION

To conclude, the sea pollution caused by oil spills could affect marine and human life. Thus, this project could help to decrease the problem which is removing oil spilled from boats and ships in the ocean water. This project could help clean up oil spillage in the sea in a much quicker amount of time taken compared to the original way. The most important thing is Remora Boat brings benefits to the environment and humans.

ACKNOWLEDGEMENT

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