Friday, May 28, 2010

Relevant Applications

Electromagnetic boom and environmental cleanup application for used in conjunction with magnetizable oil.

The methods we describe are designed to work in conjunction with oil that has been rendered magnetic by inserting iron filings or magnetite (0.1 μm – 10 μm size) as described and demonstrated in previous documentation. See attached videos.

Application 1 – Electromagnet Boom/Pump

Oil on the surface of water that has been subjected to the iron filings methods previously described can potentially be controlled and pumped with magnetic boom rather than the passive boom methods deployed today (i.e. the Gulf). In this design the booms would consist of a combination of floats and attached solenoids as illustrated below. The longitudinal magnetic field of the solenoid would attract the oil and direct it towards one end of the device. Switching the magnets off and on periodically would serve the dual purpose of clearing the magnetic poles (to prevent shorting due to material build-up at the poles) as well as providing a pumping action. In the design example below a long boom composed of solenoidal coils capped with circular pole pieces alternate with flexible floats as illustrated. This assembly could be deployed from a ship or a dock. The distal end is equipped with directional thrusters to position it and sweep it transversely. The solenoids are wired in three groups which can be sequenced to provide a traveling field which will collect and drag ferromagnetic fluids to a collection point.

Application 2 – Wild-life cleaning

We have demonstrated that wildlife cleanup is possible with the methods described in the previous document. A bird covered with viscous oils was completely saturated with iron filings and a permanent magnet was used to remove the oily mixture. The principal of the method is shown in the demonstration video.

Application 3 – Inserting magnetizable material at the source of oil leaks

One simplified application of this process would be to pump the magnetic mixture directly into the source so that the resultant oil that makes it to the surface is readily magnetizable. In this case it can be readily manipulated with the magnetic booms and various magnetic sources.

ADDENDUM: Part 3 – Electromagnetic vacuum application

My vision for this application clearly goes beyond the spill in the Gulf. In principle one can also consider a further application that includes the coating of the ferrite filings with an environmentally safe oil absorbent material (many of which may already be readily available from industry) for use on land or water free surfaces (contaminated wild life etc.). In this case the magnetic force can be used to vacuum these contaminated surfaces (see second video).

-Arden Warner