Oil Separation

Executive Summary

Project Subject: The technology of separation of fine oil-water emulsions containing solid admixtures

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Industries: Petroleum refining

Project Status: Pre-seed

Business Strategy: The proposed project is in the process of receiving the status of a project within a Technological Incubator under the guidance of the Office of the Chief Scientist, Israeli Ministry of Industry and Trade. Within the next two years, it intends to complete the development and testing of a pilot model on the basis of the innovative technology. The project also aims at seeking investment and establishing strategic partnerships for successful penetration into the Israeli and worldwide markets.

Business Description: The first stage of petroleum refining is a desalting stage, as the crude oil coming from tankers contains about 0.2% of water solution with highly corrosive salts present. Two problems are to be solved in petroleum refining stage: exclusion of oil loss and significant reduction of load on waste water treatment systems.

Product Description: The project offers a new technology for separation of fine oil-in-water emulsions containing solid admixtures. It is based on the results of long-run researches on emulsifying and coalescence conducted in Russia and Israel. The following characteristics are superior to those of existing methods:

- Unique applicability for emulsions containing solid particles
- High efficiency for separation of both 'oil-in-water' and 'water-in-oil' emulsions without addition of chemicals
- Low specific power consumption
- Possibility to patent the technology.

The device consists of a special coalescing mixer and a centrifugal pump, and can be installed in existing desalting installations without any significant expenses. The method underwent systematic laboratory testings. According to the results obtained in Ashdod and Haifa refineries, application of the technology reduces the quantity of a “non-separable” oil contents by 10-20 times. The solid admixtures are separated together with oil phase.

Market Opportunity: After application of the separation system, the oil loss in a single desalting unit will be reduced by 100–300 kg per hour. With the current oil prices, it corresponds to $100,000-400,000 per year for each electrodehydration system. This improvement will also reduce total energy consumption for flotation and aeration by at least 0.5-1 kW per cub.m. of waste water. It corresponds to about $100,000–200,000 yearly saving on energy consumption only. The price of a separation system is estimated to be not higher than $30,000.

Target Markets: The potential market for the project is extremely wide. The total number of crude oil desalting installations is more than 500, not including Eastern Europe, Russia and China. Another market sector for the new technique is separation of water from oil in oil pumping sites and sea platforms.