Oil Whale™

Patent Pending

February 2010

OilWhale – oil away!

OilWhale is a recovery method innovated by Mr. Markku Järvinen. The starting shot for the innovation was an oil spill outside of Helsinki in the winter of 2003. Oil recovery processes available at the time and even today are based on a very slow and complex process, where oil is first heated, brushed to a collector bucket and then pumped into a tank. Two sophisticated oil recovery vessels (Halli and Hylje) can collect only 4 m^3 of oil in three days.

Mr. Järvinen came up with an idea to do the process in another way. He presented his idea to a few specialists who encouraged him to continue. The first pool experiments were carried out with a miniature prototype in Parainen (SW Finland) in the autumn of 2005. In the operation tests he used – among other materials – low viscosity low weight vegetable oil and high viscose heavy weight machinery grease. The test results were encouraging and he was awarded more funding from different sources to continue with the work.

The first full-sized prototype vessel designed to operate in shallow waters was test driven for the first time in October 2007. Additional experiments took place in ice conditions in November 2007 and at the Naantali refinery of Neste Oil Ltd. in March 2008. All the experiments carried out with the prototype vessel proved that the procedure functions well and as planned. Recent development work has made it possible to also recover debris and blue-green algae.

The OilWhale method does not require any mechanical contact to the recovered material like brushes and skimmers do. The Basic OilWhale construction includes one collection space – the collector. A more sophisticated OilWhale construction has two spaces: the collector, and a restoring space, the restorer. Both spaces are filled with water when the recovery process starts. The vessel or module is lowered to a recovery draft and the trim of the vessel is fixed with ballast water. The recovered material then floats into the collector through a gate which is opened and lowered below the water surface or the layer of the material that is being recovered. The recovered material enters the collector in exactly the same mode as it is in the water. The risk of mixing the materials and producing dispersion or emulsion during the recovery work can thus be minimized, and the material flow can be kept as laminar as possible during the whole recovery process. Nominal thickness of the recovered layer is usually 2–20 cm in calm weather, and 1–2 m in waves. The maximum recovery draft naturally depends on the size of the recovery vessel or the module being used.

The recovered material is transferred from the collector to the restorer(s) without any external transfer method, like pumps, skimmers or scrapers. Traditional methods using booms, brushes or skimmers mix water and oil. Thus, they increase the amount of water in oil, as well as dispersion and emulsion, which may require additional storage capacity onboard.

The remaining extra water is continuously removed from below of the Collector and Restorer. The removing process of the water is a natural "through pass flow", and no external pumps or similar methods are required during the operation. The movement of the vessel or the current acts as a pump during the recovery process.

The OilWhale procedure, which works well in all conditions from the tropics to the polar regions, can obtain a high recovery speed, capacity and efficiency. It can be applied to ships of varying size and type, such as small workboats, tugs, supply vessels and larger ships. An individual OilWhale module can be operated by any vessel. They may operate in harbours, at the coast, off-shore, in waves or waters covered with ice.

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The capacity of the OilWhale procedure is not dependent on mechanical transfer methods available. In principal, the thicker the oil layer is the higher the capacity of the OilWhale procedure. A capacity of over 1.000 t/h is possible with an OilWhale equipped vessel. The collected material can be off-loaded either to another ship or to a barge while the main ship is still recovering oil.

Neither does the temperature, pumpability, stiffness nor the viscosity of the material decrease the performance of the procedure. OilWhale can even recover dispersed and emulsified materials and process them. Thus, the material recovered is expected to fulfil only one requirement – it must float.

To confirm the functionality of the procedure in larger ship installations, versatile theoretical CFD (Computational Fluid Dynamics) studies were carried out for the OilWhale procedure by *Process Flow Oy Ltd*., Turku, Finland.

The first catamaran design OilWhale vessel was manufactured by RS-Planering Ltd., Parainen, Finland, and it is 13 m * 4 m * 1 m in dimensions.

The project has been funded by *The Foundation of Finnish Innovations* The *Centre of Expertise Programme* and *The Finnish Funding Agency for Technology and Innovation*.

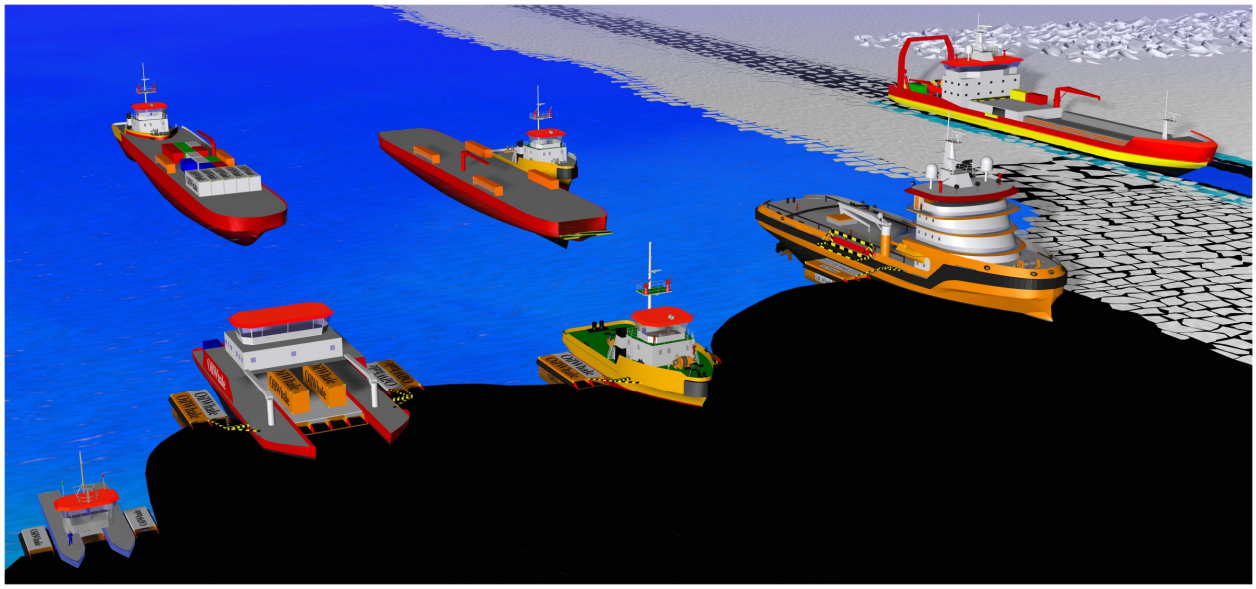
Several international applications for patents are pending for the OilWhale procedure.

For more information, please visit www.oilwhale.com, where tradeshow presentations, videos and other documents can be found.

High resolution pictures are available at http://www.oilwhale.com/press/HighRes_kuvat/

Yours sincerely,

Markku Järvinen



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