

*21st century oil spill technology for rough oceans and flowing Arctic ice pack*

## Extreme Spill Technologies Inc.

### The Challenges

Petroleum products are highly toxic and require that accidental oil spills be entirely removed from ocean and Arctic ecosystems as quickly as possible to avoid spreading. Vegetable oils are shipped worldwide in bulk tankers and also wreak havoc on ocean ecosystems when spilled. Although non-toxic, they will also kill massive numbers of furred and feathered creatures by compromising the insulation created by their feathers and fur. In Arctic ice pack, all oils will collect in the spaces between the ice floes where sea creatures surface to breathe or enter/exit the water.

Toxic oil spill dispersants and in-situ burning, first developed in the 1970s, do not remove the spilled oil from the environment. This has been confirmed by many ocean oil spills. Even non-toxic dispersants poison the ocean, by releasing the highly toxic compounds within the spilled oil itself. In-situ burning has no place in the 21st century because it creates vast plumes of black soot, and black soot is responsible for 30% of Arctic warming.

The International Tanker Owners Pollution Federation has this to say about all existing mechanical oil spill tools, first developed 50 years ago and essentially unchanged today:

- Skimmers function to remove oil from the water surface.
- The optimal skimmer design will depend on the viscosity of the oil to be recovered and the prevailing sea conditions. Because skimmers float on the water surface, they experience many of the same operational

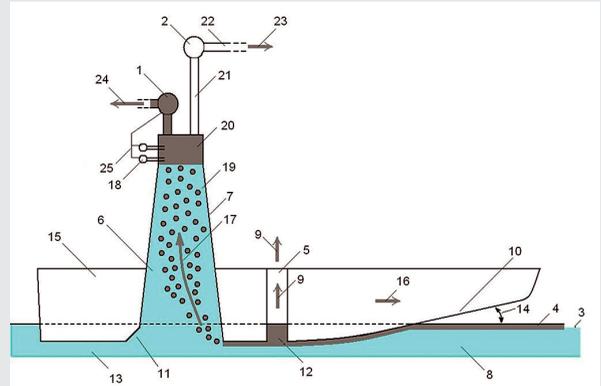


Figure 1: Extreme Spill Technology's mechanical oil spill recovery system.

difficulties as booms, particularly those posed by wind, waves, and currents. Even moderate wave motion greatly reduces the effectiveness of most skimmer designs.

- The simplest skimmers are suction devices which remove oil from the water surface directly or via a weir. These designs tend to pick up a lot of water at the same time as the oil unless operating in very calm conditions.

In the 2010 Deepwater Horizon blowout in the Gulf of Mexico, all these state-of-the-art tools were only able to recover 3% of the oil, which is about average.

### The Solution

Extreme Spill Technology (EST) has developed an innovative mechanical oil spill recovery system (Figure 1) which the Canadian Coast Guard calls the first truly innovative oil spill tool since the 1970s. EST is the solution to the above challenges faced by all existing mechanical oil spill tools:



Figure 2: RV *Triton* is an example of a suitable vessel for using the EST system.

**Viscosity:** Oil viscosity varies widely; during cleanups, the spilled oil weathers as the lighter elements evaporate and water is absorbed. Relying on viscosity to capture the oil requires a range of oleophilic tools, none of which are operable in all scenarios. EST is the optimal skimmer design because EST does not need to “grab” the oil in order to capture it. Viscosity of the oil is irrelevant to EST. Instead, EST utilizes gravity to capture the oil by creating an environment wherein buoyant oils float upwardly through a column of water to the powerful oil transfer pump that sends it to storage. Gravity captures any kind of floating oil, including 1 UM diesel sheen, thick bunker C, weathered emulsions, and dilbit.

**Rough water:** The EST system engages with the oil spill under the submerged bottom of the vessel where there are no waves to disrupt the removal of the oil from the sea. Unlike all existing technology, the EST system cannot be flooded with water in rough seas because it is designed to operate beneath the surface.

**Decanting the oil:** The EST gravity-based system automatically decants the captured oil before it is brought on board the oil spill vessel. EST does not produce discharged oily water. The Nuka report for BSEE confirms the advantages of the EST system. “Nuka Research

and Planning Group, LLC was contracted by the Bureau of Safety and Environmental Enforcement (BSEE) to determine the current state of demulsification and oil-water separation technology (Contract E17PS00129). A key finding includes: gravity separation remains the preferred approach to separating oil, water, and emulsions during spill response.”

**Flowing pack ice:** In a similar manner to the Lamor Sternmax system, the EST Arctic system incorporates an ice grate to submerge the oil-covered ice. This allows the buoyant oil to float upwardly, free of the ice, and be intercepted while allowing the ice to remain in the sea.

### **EST Ocean and Arctic Vessels**

While an EST system installed inside a regular platform supply vessel (PSV) will be vastly superior to floating booms and rotating brushes slung off the side, the performance of a modern EST trimaran ship on rough seas and in challenging ice will be far greater than an EST-equipped PSV. RV *Triton* (Figure 2) is a suitable type of vessel. An EST version can function as a tanker escort, offshore safety standby vessels, Arctic escort and patrol, search and rescue, etc.

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