Herding Agents to Thicken Oil Spills in Drift Ice for In Situ Burning: New Developments

February 28, 2011

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ABSTRACT

In situ burning is an oil spill response option particularly suited to remote ice-covered waters. The key to effective in situ burning is thick oil slicks. In drift ice conditions (< 7/10th) oil spills can spread to become too thin to ignite. Fire booms can be used to maintain adequate slick thickness in open water; however, even light ice conditions make the use of booms challenging. Buist et al. 2008 presented the results of a successful experimental program on using a non-proprietary hydrocarbon based cold-water herding agent (called USN) to burn oil in drift ice. Since the 2008 paper:

- Field experiments were performed off Svalbard in May 2008 to test the ability of USN herding agent to thicken oil slicks on water among very open drift ice for subsequent burning: a 630-L spill of crude oil was released, allowed to spread to an unignitable thickness of 0.4 mm, herded to a thickness of 4 mm, ignited and efficiently removed;
- Experiments were carried out in the lab at various scales and in a large refrigerated test tank to determine if second-generation fluorosurfactants or silicone-based surfactants were better candidates than the USN formulation for cold-water applications: one new silicone formulation significantly outperformed the USN herder;
- Work on developing application systems for herders in drift ice situations was started.