



Science and Technology

EMERGENCY PREVENTION & RESPONSE

SELF-ORIENTING SUCTION POINT FOR FLUID TRANSPORTATION

A NOVEL MARINE ENGINE DESIGN TO MAINTAIN OIL PRESSURE AND PREVENT LOSS OF PROPULSION IN ROUGH SEAS.

When a ship pitches or rolls in heavy seas, the angle can cause a loss of lube oil pressure in the engine. When oil pressure is lost, alarms and automation will shut down the engines to prevent damage, and the ship loses propulsion. Without propulsion and collateral loss of steerage in rough seas, the ship risks capsizing and sinking, jeopardizing the lives of those onboard.

A cadet team at the US Coast Guard Academy invented the Self-Orienting Suction Point for Fluid Transportation (SSPFT), an apparatus and method for preventing or minimizing the loss of lube oil pressure in a ship engine. The invention is an engineering solution that allows lubrication systems to tolerate higher inclination angles when a ship pitches and rolls, thereby preserving lube oil pressure and preventing propulsion loss.

KEY BENEFITS

- + Improves ship maneuverability
- + Prevents loss of life and ship damage
- + Inexpensive to maintain and repair, with minimal moving parts
- + Allows retrofits to existing lubrication systems

STAGE OF DEVELOPMENT

Prototype

PARTNERSHIP SOUGHT

License

INVENTORS

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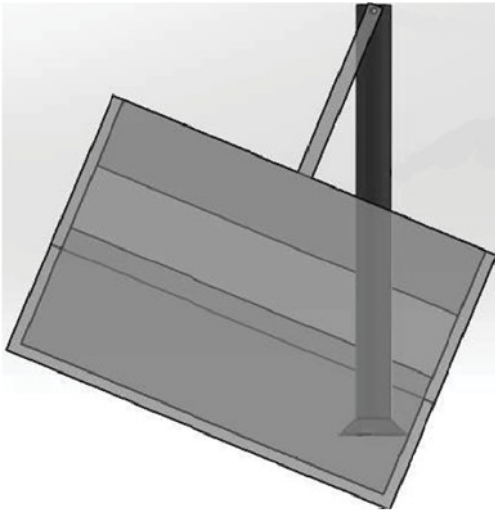
DHS COMPONENT

United States Coast Guard

THE TECHNOLOGY

The International Maritime Organization and US Code of Federal Regulations require that nearly all types of ships maintain propulsion and remain operable when listing to 15 degrees or when rolling to an average of 22 degrees. SSPFT allows ships to maintain lube oil pressure and propulsion at 30- to 45-degree inclinations, enabling them to withstand larger rolls without losing propulsion capabilities.

The SSPFT oil fluid transportation system includes an oil container and a suction pipe submerged in the fluid. The oil container is connected to the ship by the self-orienting suction assembly, allowing the container to pivot relative to the position of the ship as it heels. The self-orienting suction assembly remains submerged across the oil container, even as the ship rolls at large inclination angles.



The SSPFT fluid transportation system is composed of a lubrication fluid container fixed to the ship that allows the fluid suction pipe tube access to a consistent level of fluid despite the ship tilt angle. US Patent Application number 18/209,672, Figure 1

APPLICATIONS

The technology has several potential end use cases:

- + Oil tankers, bulk carriers, cargo, and container ships
- + Support vessels
- + Ferries and passenger ships
- + Fishing vessels
- + Military vessels

PATENT INFORMATION

US Patent numbers 12,071,214



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TECHNOLOGY SOLUTION

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<https://www.dhs.gov/science-and-technology/technology-transfer-program>

