



Recovery of Low Sulphur Fuel Oils (LSFOs)

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New challenges in spill response

With the global transition to low sulphur fuels, oil spill responders now face new complexities. While **Low Sulphur Fuel Oils** (LSFOs, VLSFOs, ULSFOs) offer environmental benefits during combustion, their behavior in marine spills presents a distinct set of recovery challenges.



At Lamor, our mission is to empower response teams with proven technologies and field-tested strategies to effectively manage these emerging fuel profiles. Drawing from research and trials including the IMAROS 2 project, Lamor leads the way in adapting oil spill recovery for modern fuels.

Field validation through IMAROS 2 project



Lamor's innovations aren't theoretical. With over 40 years of experience, our technologies are tried and tested in the world's harshest conditions. The recent IMAROS 2 trials demonstrate:

- Possibility to recover in cold marine environments
- Capable of recovering both solid and semi-fluid LSFOS
- Enhanced operational control and reduced environmental impact



Read more about IMAROS 2 in our article



Technical challenges of LSFO Spills

Not all LSFOs behave alike and some variants exhibit properties that hinder traditional recovery techniques.



Common Behavioral Characteristics

1. Rapid solidification possible if water temperature is below average.
2. Forms tarballs or breaks into brittle chunks.
Hinders pumping and storage.
3. Oil behaves more like floating sludge or slush ice.
4. Difficult for skimmers to “grab” or maintain recovery.
Limits compatibility with common recovery equipment.
5. Lower evaporation
6. Dispersion is ineffective

Limited effectiveness of conventional response methods

Traditional spill response methods are often ineffective against LSFOs due to their unique viscosity, cohesion, and dispersion properties.



Effects on recovery operations

1. Can immobilize oil quickly, leading to reduced spreading.
2. Complicates containment and requires specialized handling.
Can obstruct pumping and clog storage systems.
3. Reduces flowability, hindering mechanical recovery.
4. Leading to inefficient collection and increased oil loss.
Demands customized recovery solutions due to difficulty of recovery.
5. Prolong environmental persistence and can increase cleanup timelines.
6. Limits chemical treatment options, increasing reliance on physical recovery methods.

Lamor's solutions purpose-built for challenging oils

Lamor has developed and field-tested specialized recovery technologies designed to handle the unique challenges of viscous and semi-solid LSFOS across varying environmental conditions.



Brush Chain Skimmer System

A novel brush chain enhancement integrated into Lamor skimmers, tested within the **IMAROS 2 project**, showing effective recovery of LSFOS with challenging consistencies.

- Improves oil adherence
- Minimizes loss during collection
- Increases recovery efficiency of semi-solid LSF0 layers
- Flow control from skimmer to pump

Modified Bucket Skimmer (Cold Conditions)

Ideal for icy waters and viscous LSFO spills leveraging movement dynamics and mechanical adaptation to scoop and retain heavier oils.

- Proven efficiency in cold-weather trials (Finland 2025)
- Can be deployed from vessels with minimal modification

Positive Displacement Screw Pumps

Standard centrifugal pumps often clog with viscous LSFOs. Lamor screw pump systems:

- Include inlet and outlet heating
- Are more reliable for viscous media transfer
- Maintain flow without emulsification

Heated Storage Solutions

For temporary storage at sea or shore, Lamor systems include:

- bladders and tanks with integrated heating to ensure oil remains pumpable and manageable throughout operations.

Oil Containment Booms

Designed to prevent oil from spreading and to guide the oil towards collection points for cleanup. Containment booms are usually constructed with durable materials such as PVC, neoprene, or polyurethane and filled with foam or air to provide buoyancy. Length and type dependent on conditions / use case.



Benefits for your special needs

Lamor offers more than equipment, we offer readiness:

- **Increased Recovery Rates** in difficult LSFO scenarios
- **Deployment Flexibility** across climates and conditions
- **Reduced Downtime & Fouling** of equipment
- **Support and Training** tailored to your needs



Let's clean the world

Lamor in brief

Lamor is one of the world's leading providers of environmental solutions. For four decades, we have worked to clean up and prevent environmental incidents on land and at sea.

Environmental protection, soil remediation and material recycling: Our innovative technologies, services and tailored solutions, ranging from oil spill response, waste management and water treatment to soil remediation and plastic recycling, benefit customers and environments all over the world.

We are capable of vast and fast operations thanks to our connected ecosystem of local partners, steered by our experts. Lamor's share is listed on the Nasdaq Helsinki (ticker: LAMOR). Further information: www.lamor.com