

# Enhancing the Operational Efficiency of U.S. Ports : Portable Bulk Liquid Storage Bag

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**PORT OF THE  
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## Abstract

Cargo tanks and bulk holds require extensive cleaning between cargoes, creating costly downtime and operational delays.

Solution 1

A portable liquid storage bag isolates cargo from vessel steel surfaces, eliminating the need for tank or hold washing and enabling faster cargo turnover.

Dry bulk carriers frequently sail empty because vessels designed for solid commodities cannot transport most liquid cargoes on return voyages.

Solution 2

A portable containment system allows dry bulk carriers to transport compatible liquid cargoes without structural modification.

Ports and remote industrial sites often lack flexible or temporary liquid storage infrastructure.

Solution 3

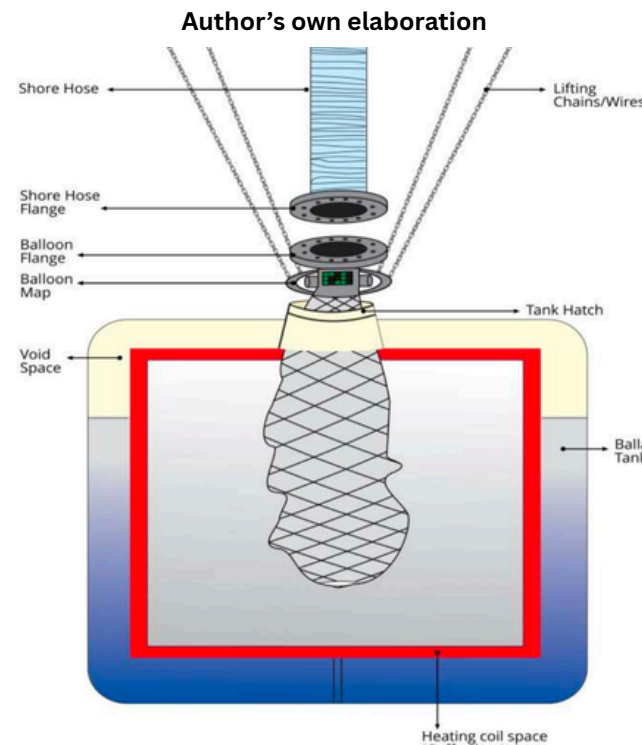
Portable storage bags provide rapidly deployable liquid storage without requiring permanent tank construction.

Sources



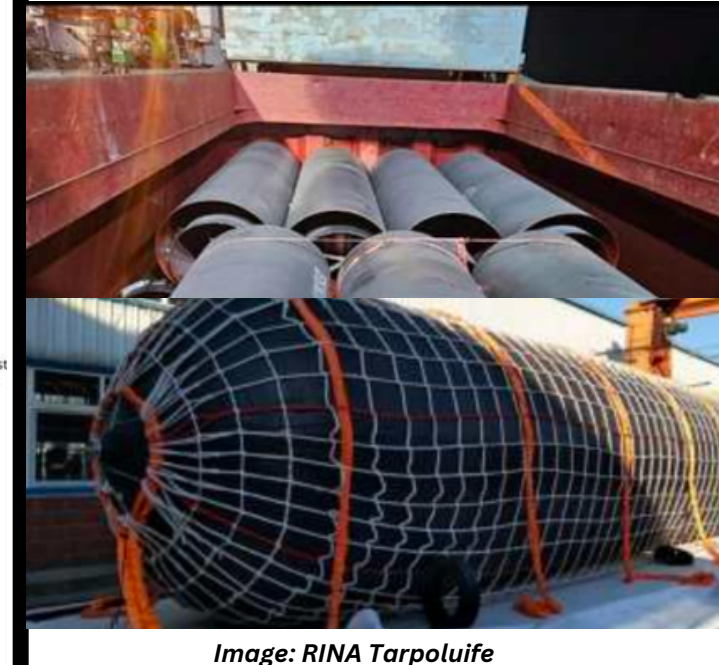
## Solution 1

Cargo tanks and bulk holds must be cleaned between cargoes to prevent contamination, creating operational delays and additional costs. A portable liquid storage bag isolates cargo from vessel steel surfaces, eliminating the need for tank or hold washing and enabling faster vessel turnaround between shipments.



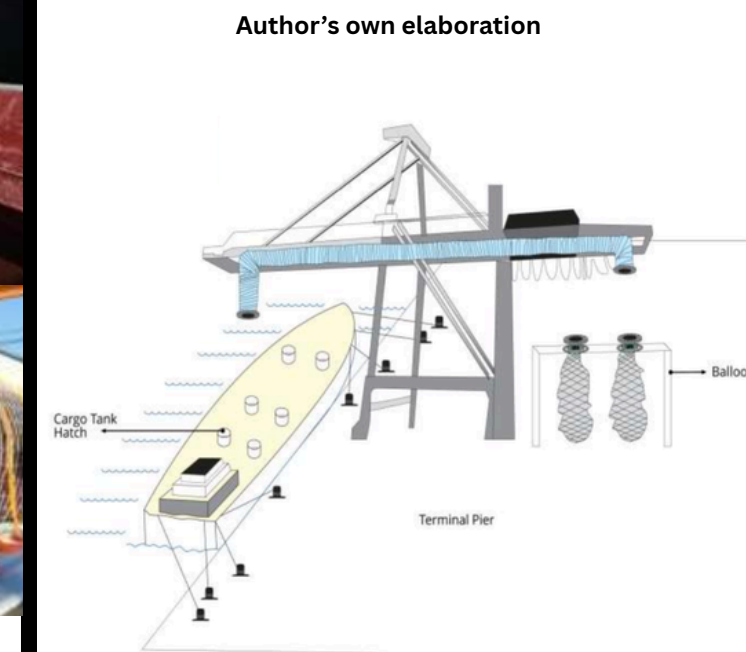
## Solution 2

Dry bulk carriers often return empty after delivering solid commodities because their cargo holds are not designed to transport liquid cargo. A portable containment system allows compatible liquids to be transported within the cargo hold without structural modification, improving vessel utilization and reducing empty return voyages.



## Solution 3

Ports and remote industrial operations often lack permanent liquid storage infrastructure, limiting operational flexibility. Portable storage bags provide rapidly deployable liquid storage that can be installed without constructing fixed tanks, enabling temporary storage for maritime, industrial, or offshore operations.



## Current Industry Approaches



### Dedicated Tankers

- Designed specifically for liquid cargo transport
- Require extensive tank cleaning between cargoes and cannot carry dry commodities



### Flexitanks

- Allow liquid transport in containerized systems
- Limited cargo capacity compared to bulk vessel volumes



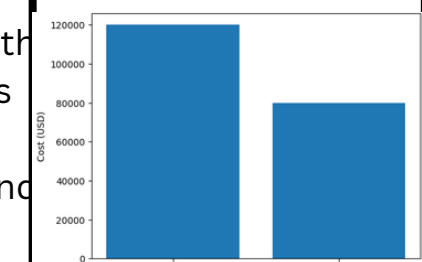
### (OBO)

- Capable of carrying both oil and dry bulk cargoes
- Limited flexibility, complex maintenance, and largely phased out of modern fleets

## Feasibility

### Cost

reduces cleaning-related operational costs by approximately 33% compared to traditional chemical tanker washing.



Author's own elaboration

### Operational Considerations

- Cargo Compatibility
- Handling and Installation Procedures
- Regulatory Compliance
- Structural Load Management
- Inspection and Maintenance