Maritime Buoy Pump

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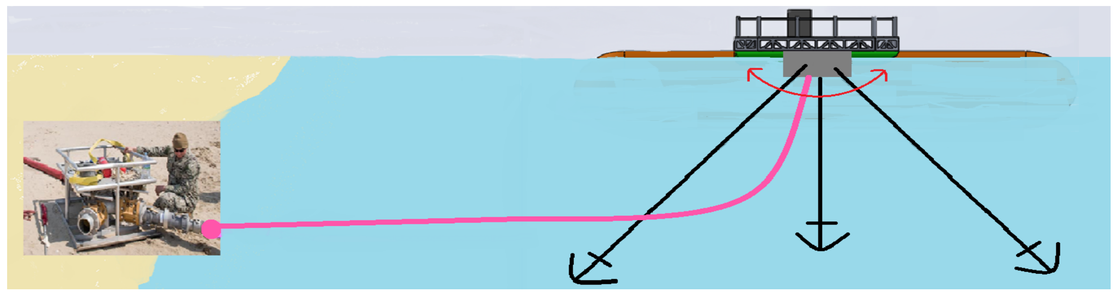
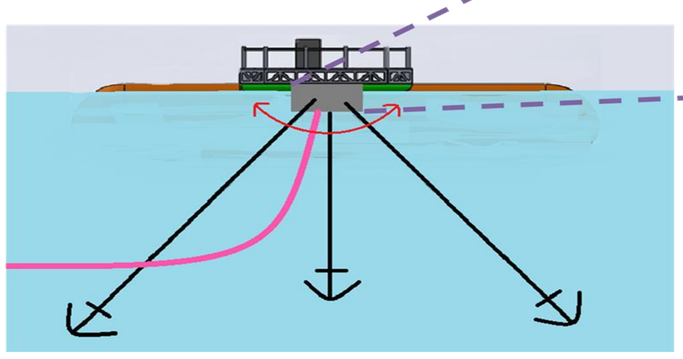
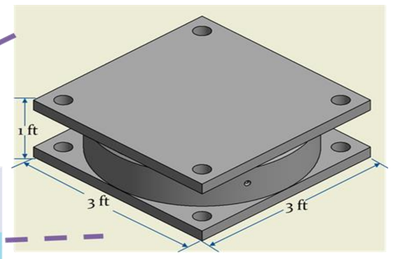
Introduction: The Navy currently uses the Offshore Petroleum Discharge System to fuel their assault missions. This linear system consists of a large singular fuel barge and hose that transports fuel to our troops stationed on hostile beachfronts, which makes the whole system vulnerable to adversary disruption. To mitigate enemy detection and increase the integrity of the fueling operation, we propose to deploy a distributed network of Maritime Buoy Pump (MBP) platforms that are low-profile and equipped with a three-point anchor system, fuel caches, and pump.



Mooring System





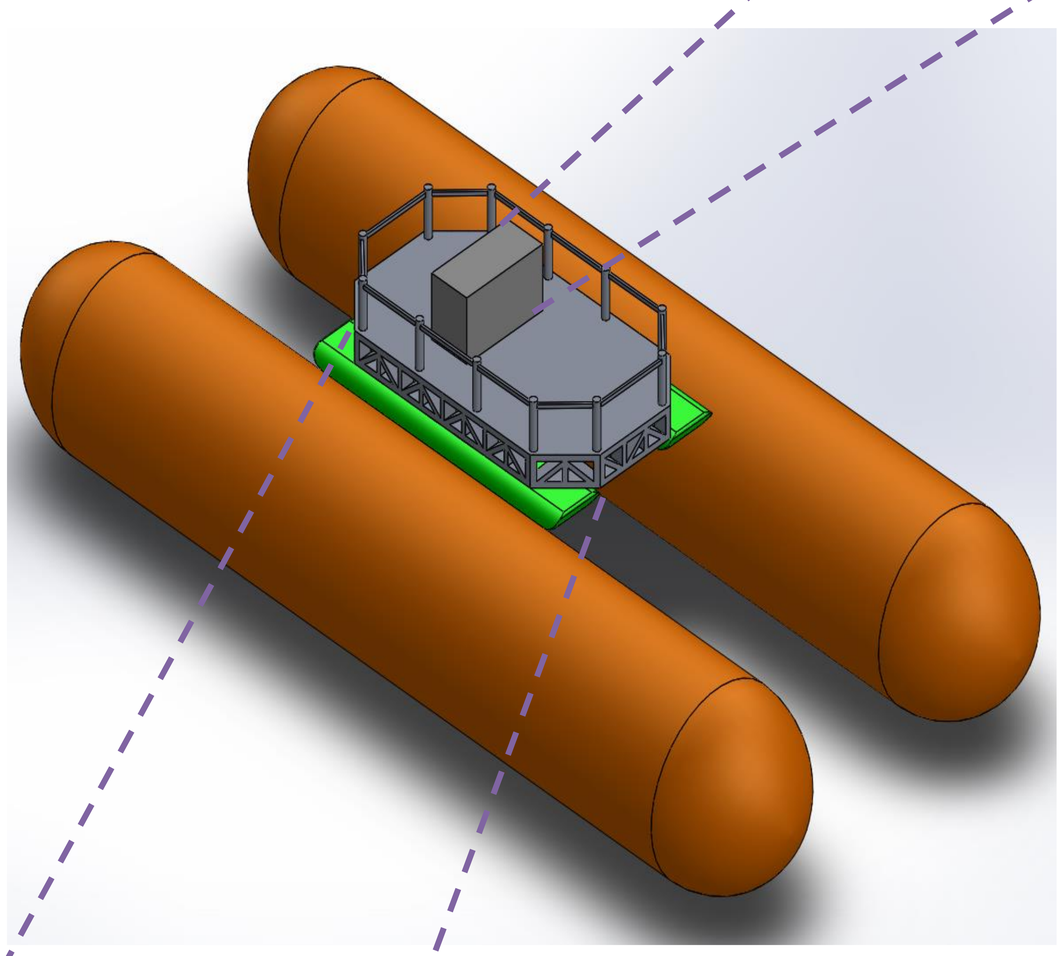
Bearing System

Due to current and wind forces, the platform will tend to rotate, causing the mooring chains and hose to entangle and prevent adequate fuel flow. We designed a bearing system located in the undercarriage of the platform that allows the base to rotate freely thereby preventing the entanglement of critical components.

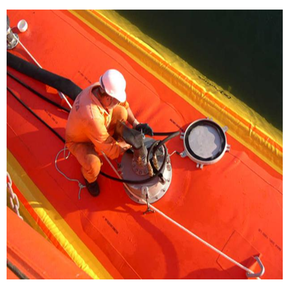
- Vesconite bearing system does not delaminate, corrode, or distort under high loads.
- Vesconite bearings are self-lubricating, which reduces maintenance.

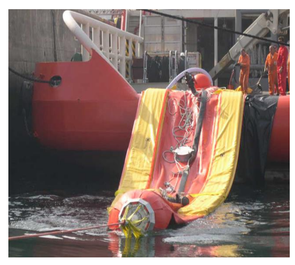
Pump

The pump is 115” x 41” x 71” and is located along the centerline of the platform due to its gross weight of 3,000 pounds. The pump is able to output a flow rate of 500 gallons per minute, which allows for consistent delivery of fuel to troops on shore.



Fuel Cache

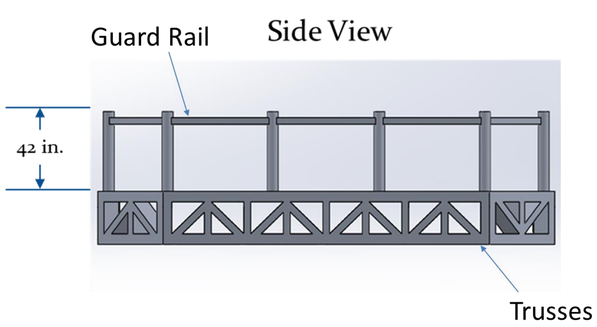


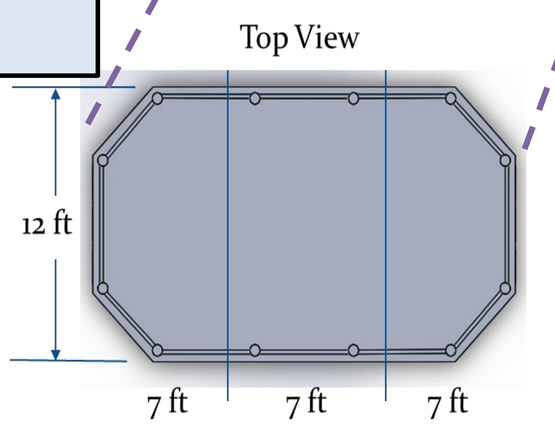


- Commercially available Canflex “Sea Slug” model FCB-150CM.
- Ability to store 39,650 gallons of fuel.
- Length: 67 feet & Diameter: 11.3 feet.
- Draft: 10.11 feet.
- Multiple fuel connection points with the ability to walk on.

Platform

- Modular platform to facilitate transportation.
- 42 inch tall safety rail due to OSHA requirements.
- Deck made out of Aluminum 6061.
- Trusses to reduce weight but maintain stability.
- Stainless Steel Bolts of grade 304 and 316.

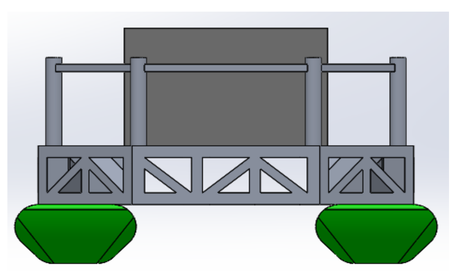




Multi-hull

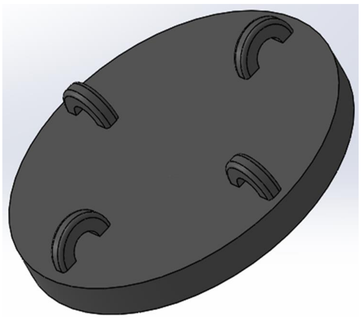
The pontoons will be made out of Polyethylene plastic and will be 22’ x 3’ in length. These pontoons increase buoyancy, stability, and resistance to platform rotation.

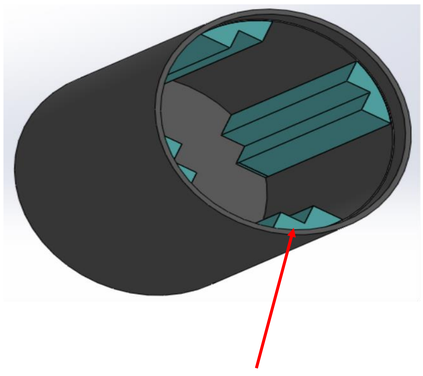
Multi-hull Catamaran



Beach Interface Unit

The land component of the MBP is the Beach Interface Unit (BIU). This unit is the interface between the platform and troop equipment onshore. It will be enclosed in a cylindrical housing to protect it from the surf zone and other hazards along its path to shore.





- Height: 58 inches, Diameter: 54 inches
- Stainless steel of grade 316 will be used due to its corrosion resistive properties
- Inner lining will be made out of rubber to help protect and stabilize the BIU while enclosed
- Handles will be attached to the lids, be lifted with a crane and dropped in water, and then pulled to shore.

Acknowledgements
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