



PROJECT ID:
597

Alternative Oil Skimming Technologies for Afloat Oil Spill Response: Down-selection and Demonstration at a Navy Port



Sailors conduct facility response training which includes a simulated oil spill and oil spill recovery using two utility boats, a dedicated skimmer boat and oil booms to contain the spill. Alternative skimming technologies would greatly reduce the number of manhours required for spill cleanup. (Photo Credit: Seaman Jasmine Ikuseibiala)

OBJECTIVE

The goal of this effort is to determine if remotely operated oil spill response (OSR) skimming equipment and other alternative technologies can respond to on-water oil spills more effectively than existing equipment with respect to safety, cost, speed, oil recovery rate and maneuverability.

PROBLEM STATEMENT

When an oil spill occurs, time is of the essence. Facility Response Teams (FRT) need remotely operated and/ or compact oil spill equipment to rapidly deploy from an oil spill response boat or port location to contain and clean up spills quickly and effectively. In particular, the equipment may need to access tight spaces and maneuver within them while maintaining heading against currents.

DESCRIPTION

There are various types of alternative skimming technologies and OSR equipment on the market. The candidates for this demonstration generally fall into one of the following six categories:

1. Small skimmer: launched by an individual from a response boat or from a port location.
2. Medium to large skimmer: launched from a barge, pier, or quay wall by a crane. The skimmer is then operated remotely.
3. Separate drones that can tow or push equipment (i.e., a skimmer or spill containment boom).
4. Enabling remote control of an existing Navy oil skimming boat.
5. Remotely operated vessel with high-pressure seawater jets for pulverizing oil into tiny droplets that naturally occurring bacteria can easily consume.



6. Adding a grooved disc skimmer to an existing platform boat from the Naval Facilities Engineering Systems Command's Oil Spill Response Program (OSRP).

Many of the candidate technologies for demonstration have been tested and evaluated under controlled conditions at the Oil Spill Response Research and Renewable Energy Test Facility, also known as Ohmsett, which is the recognized independent performance evaluation organization for the oil spill response industry.

It is anticipated that two or three technologies will be selected and demonstrated at two to three Navy sites. Criteria will include effectiveness, ease of use, responsiveness of controls, maintainability and reputation of the vendor. The selected technologies will then be rigorously evaluated by experienced FRT leaders.

RETURN ON INVESTMENT

For each proposed technology that appears viable and/or available as late January 2022, the team has calculated simple return on investment (simple ROI) as the annual operating cost of existing technology minus the annual operating cost of the new technology divided by the capital cost for the new technology.

- Lamour drones and skimmer: Simple ROI: 0.66/unit, Payback period: 1.52 years
- Elastec X30 skimmer attachment: Simple ROI: 0.8/unit, Payback period: 1.24 years

- Small remote-control skimmer: To be determined

Note that the majority of prospective savings will be incurred due to the reduction in manhours required (as discussed below).

NAVY BENEFITS

Faster response times could be achieved with fewer crew and pieces of equipment to coordinate. This translates to less manpower as well. Whereas a traditional small spill response requires three boats, with three crew members each, two of the chosen technologies will likely require a crew of one to three personnel and no boats. And enabling faster responses reinforces the view of the Navy as a responsible steward of the public trust.

Avoiding the use of boats has other advantages as well. FRT members that would normally operate skimmer boats are now available for other important duties, and boating operations, always hazardous in a crowded harbor, would be eliminated. Last but not least, the crew would no longer be exposed to noxious fumes, oil, or any other hazardous materials.

One of the technologies (the Elastec X30 skimmer attachment), if successful will allow an existing OSRP platform boat to double as a skimmer boat at a fraction of the cost of a new skimmer boat. Several sites do not have nor are eligible to receive expensive dedicated skimmer boats

but in many cases can purchase the low-cost attachment and improve their capabilities.

It is also possible that in the future sites with dedicated skimmer boats will elect to purchase the skimmer attachment in lieu of a new skimmer boat. This will result in significant cost savings.

TRANSITION DESCRIPTION

For demonstrated technologies that meet the stated requirements, personnel from the Naval Facilities Engineering and Expeditionary Warfare Center (EXWC) will deliver a report and a combined guidance document /procurement package to NAVFAC's Oil Spill Response Program. Provided they approve, the equipment will be added to the list of OSRP-approved equipment. EXWC will then notify the Navy On-Scene Commander Media Field Team, which will communicate the availability of the equipment to FRTs in their regions.

All approved new oil skimmer system(s) would be shipped directly from the equipment vendor to the Navy installation FRTs.

CONTACT

For more specific information about this project, contact the Principal Investigator at 805-982-2669.



ABOUT THE NESDI PROGRAM

The Navy Environmental Sustainability Development to Integration (NESDI) program is the Navy's environmental research and development, demonstration and validation (6.4) program, sponsored by the Chief of Naval Operations, Energy and Environmental Readiness Division (OPNAV N45) and managed by the Naval Facilities Engineering Systems Command (NAVFAC) out of the Engineering and Expeditionary Warfare Center (EXWC) in Port Hueneme, CA.

The mission of the program is to provide solutions by demonstrating, validating and integrating innovative technologies, processes, materials, and filling knowledge gaps to minimize operational environmental risks, constraints and costs while ensuring Fleet readiness and lethality. The program accomplishes this mission through the evaluation of cost-effective technologies, processes, materials and knowledge that enhance environmental readiness of naval shore activities and ensure they can be integrated into weapons system acquisition programs.

The program is the Navy's complement to the Department of Defense's Environmental Security Technology Certification Program which conducts demonstration and validation of technologies important to the tri-Services, U.S. Environmental Protection Agency and Department of Energy.

For more information, visit the NESDI program web site at www.navfac.navy.mil/nesdi or contact Ken Kaempffe, the NESDI Program Manager at 805-982-4893, DSN: 551-4893 or kenneth.c.kaempffe.civ@us.navy.mil.

Distribution Statement A: Approved for public release; distribution is unlimited. Mention of any product or service does not constitute an endorsement by the U.S. Navy.