



New Approaches to Oil Spill Technologies and Response Strategies in Remote Contexts

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Handout for 2017 AMOP Conference, Wednesday October 4th, 2017

Remote Energy Security Technologies Collaborative (RESTCo) is an independent science and engineering research and development consulting company based in Canada. Since 2011, RESTCo took a results-oriented approach to examining oil spills, consequences and approaches, including techniques and technology.

We have developed a philosophy for improved oil spill response, recovery and remediation, and a list of criteria for evaluating products and techniques.

The FAST (Full-suite Advanced Spill Technologies) suite includes:

- best practices of pre-response planning;
- innovative tools and products for recovery of spilled oil and remediation;
- on-going use of hydrocarbon sensors (test equipment) for endpoint determination;
- training for first responders on use of the equipment and materials; and,
- pre-deployment of equipment and material, including with first responders.

The RESTCo evaluation criteria for tools and techniques include:

1. Maximal pursuit of the **IDROS** standard: **i**mmEDIATE, **d**Efinitive **r**ecovery of **o**il **s**pills.
2. Restrict. Retard. Retain (R³): restrict evaporation of volatiles, retard weathering, and retain value of the recovered oil.
3. Rapid deployment (the fire department model).
4. Ease and safety for first responders that prioritizes minimal contaminants exposure.
5. Don't move one environmental problem (spilled oil) to the air, the water column or to benthic environments.
6. Cost effectiveness, including for responsible parties, affected communities and environments

What Drives Innovation?

Oil Spill Technology Adoption Workshop, August 11-12, 2015, Prince William Sound Oil Spill Recovery Institute (prepared by Nuka Research and Planning Group, LLC)
(<http://www.pws-osri.org/wp-content/uploads/2016/01/151021-OSRI-Tech-Adoption-Workshop-Summary.pdf>)

The group identified the primary drivers for the acquisition of new spill response-related technologies, whether by oil companies directly or by OSROs. *The primary drivers are:*

- 1) *complying with regulations and*
- 2) *maximizing efficiency.*



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- Overall, for both oil companies and OSROS, new equipment must meet a tangible and measurable need in order to warrant significant capital investment. The following related drivers were also noted:
- *Significantly* enhancing operational efficiency (i.e., by increasing oil recovery rates or efficiency, reducing storage requirements, or reducing transport requirements)
- Enhancing safety, i.e., by reducing exposures to risky operating environments
- Meeting need in a new operating environment, i.e., the Arctic
- Inability to maintain older equipment (i.e., replacement parts no longer available)
- Satisfying public demand/meeting public perception related to benefits of technology to risk mitigation

High Level Conclusions Arising from Recent Reports and Case Studies

1. Delayed response increases negative outcomes from oil contamination.
2. Removal of the oil from the environment needs to be the target outcome.
3. Effects of oil spill vary considerably. Best practices in pre-incident NEBA and adaptive management during response are critical.
4. There is an urgent need for the development and production of innovative, cost-effective and readily available spill prevention and response measures for use in Canada, including the Arctic.
5. Many response plans focus on consistent response by staging large amounts of equipment remotely.
6. Rapid recovery requires distributed response technologies already at or near point source. The best model is to utilize industry or community resources already in service.
7. The equipment and materials used need to be simple to learn and operate, be readily available when and where required, robust and dependable.
8. Engaging the community in the planning and response increases social licence and resilience.

The conventional tool box is not adequate to address the conclusions above. Better approaches and technology are available. We can do better if we choose to do so.

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