



## CONTRIBUTED ARTICLE

### PROPOSED NEW LOCALLY-BASED LEVEL OF OIL SPILL RESPONSE – TIER 0

(An article submitted by Dr Bill Adams to the International Spill Control Organization (ISCO) for inclusion in the ISCO weekly electronic Newsletter)

This is RESTCo's first contribution to the ISCO Newsletter, and as a new member of ISCO, we are pleased to reach our fellow members of the international oil spill response community through this medium. RESTCo is a Canadian corporation that has conducted in-house oil spill research and contributed to ISO standards work associated with Canadian and Arctic oil spill response. For additional information please see our web page at [restco.ca](http://restco.ca).

RESTCo has spent more than a decade reviewing existing oil spill response regimes and technologies, noting weaknesses and failures as well as recognizing the efforts of many individuals and companies to improve the ability of our industry to respond to spills. We have also studied innovation in this space as well as more successful approaches. RESTCo has also developed a protocol for community-based rapid response to oil spills using a novel technology and local resources.

We call this a Tier 0 response: rapid response sized to 'small' spills, or a first-on-scene response for larger spills before the oil industry's Tiers 1, 2 and 3 are typically deployed.

We have concluded that the current oil industry tiered response system (Transport Canada, 1995; IPIECA, 2015) misses two fundamental realities:

- a) small spills are a big problem (Lee et al., 2015); and
- b) A local response to the threat of an oil spill is natural and this has to be acknowledged and embraced (Adams et al., 2021a and 2021b)

The current oil response system is based on regionally located equipment with trained personnel on standby, able to respond in a time frame determined by the distance to the spill, often up to a day or more. For large spills or the risk posed by a grounded ship, this makes sense, since the equipment is capable of pumping and storing large volumes of oil, a capability that is essential in a large-spill situation. In the case of small spills, however, what is lacking is a response within a short time, before the oil spreads so widely that skimming technologies are no longer effective. Thus, the oil is not removed from the environment before it reaches shorelines, where damage is most severe and the costs of removal escalate. In a 1999 study of oil spill costs (Etkin, 1999), it was estimated that the cost per tonne to clean up oil from shorelines is about 7 times higher than from the water.

The large crews involved in shoreline cleanup add to the monetary cost as well as the severe health impact on crews. Many of the workers involved in the Exxon Valdez cleanup work in 1989 and the BP *Macondo* spill in 2010 are now dead or suffering disabilities from exposure to the crude oil and dispersants; this has been well documented (O'Neill, 2003; Ott, 2008, 2011).

Here are two examples that validate the necessity of adding a Tier 0 level to the current oil spill response system:

1. The October 2016 sinking of the Kirby tugboat *Nathan E. Stewart* (TSBA, 2018) in the waters of the Heiltsuk Nation located on the beautiful west coast of Canada, close to Bella Bella, B.C. (see Figure 1), is a sobering example of the inability of our current system to respond rapidly to a spill scenario that was predictable, given the ship traffic. Although the sinking occurred relatively close to oil spill response facilities, the traditional waters of this community were greatly impacted. The local mariners rescued the crew, but couldn't help with the oil spill cleanup, as the Canadian Government allows only certified oil spill organizations to clean up oil spills. The response equipment had to travel from various bases to the spill site. The regulations allow a period of 18 hours plus travel time after notification of the spill until cleanup activities begin. In this instance, the Response Organization started deploying booms 8 ½ hours after being notified of the event. The Heiltsuk Nation has subsequently worked to improve the response system by issuing a number of reports, and recommending that they, the local community, become a key part of the system in future, based on local people playing a central role at the earliest stages of a spill incident (Slett, 2020). Other Canadian agencies and groups such as the National Collaborating Centre for Environmental Health have recognized that the aboriginal peoples of coastal Canada need to play a role in emergency response, especially to oil spills, with regard to planning, response and recovery. These coastal communities depend on the fish and shellfish harvest for their daily requirements as well as for commercial sale, so the contamination of these waters is having a dramatic and long-lasting impact on both health and economic activities (Adams et al., 2021). Recently (March 2021) the Heiltsuk Nation and the Canadian Federal Government signed a memorandum of agreement to collaborate in developing a marine emergency response team (Government of Canada, 2021).

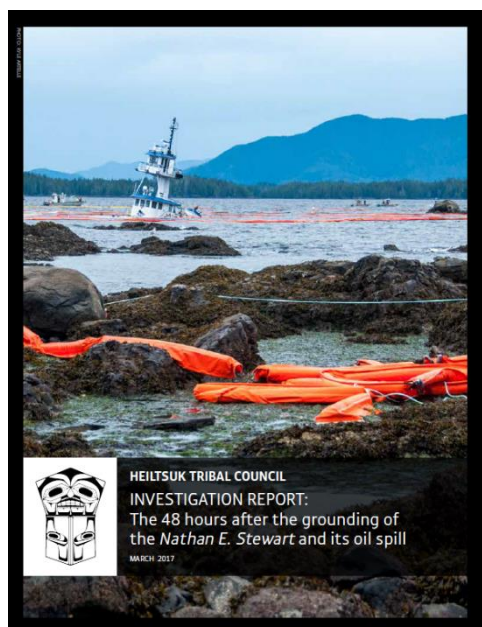


Figure 1 (left) – Local response of the Heiltsuk community to the sinking of the Kirby tugboat *Nathan E. Stewart* in British Columbia in October 2016 (Adams et al., 2021).

2. On July 25, 2020, a cargo ship, the MV *Wakashio*, grounded on a shoal off the coast of Mauritius. Oil began to leak from the wrecked ship within two weeks and contaminated coastal areas in the southeast of the island critical to the local communities for fishing and tourism (see Figure 2).

According to local people, the government was unable to respond because it had no cleanup equipment. Within a short time, people in the community closest to the spill, Mahebourg, worked together to create homemade booms to collect oil and prevent it from damaging their shoreline.

In a massive local effort, hundreds of people worked together in a newly created “factory zone” until mid-September to build and deploy booms. The spill attracted international attention and oil spill response teams from several countries arrived over the summer. Unfortunately, due to exposure to oil during this effort, many local people are now suffering health effects (Rungo, 2021).

Figure 2 (below) – Left: Satellite image showing the grounded cargo vessel MV *Wakashio* off the coast of Mauritius with thin steams of oil slick being carried by tidal currents (Associated Press, August 8, 2020). Centre: View of thin steams of oil slick from the MV *Wakashio* being carried by tidal currents. Right: Local residents attempting to prevent the spreading oil from reaching the shoreline (Rungo, 2021).



### What are the requirements for local communities to participate in a Tier 0 response?

Implementing a Tier 0 level of response, which is based on empowering coastal communities somewhat like a local fire department, will require the creation of an organization that provides appropriate equipment, ensures that the equipment is maintained and

kept ready for deployment within 1–2 hours of a spill being reported, and sustains a training program for local personnel. Perhaps the most difficult aspects associated with the human resources are liability and maintaining community interest and focus, since spills are intermittent occurrences somewhat like fires.

RESCo is working on vessels equipped with oil spill response technology that can be made available in communities along coasts and can be operated by such communities, thus reducing cleanup costs by more than the cost of these skimmers. By virtue of the oil recovery technology on these vessels, crews are isolated from the collected oil, which helps to prevent health impacts usually experienced by personnel working on oil spill response, especially when they are not trained and equipped, as was the case in Mauritius described above. The vessels are small enough to be easily trailered to the site of spills should several vessels be required. These vessels will be multipurpose workboats used regularly in the communities so that the cost of the oil spill function will be less than that of totally dedicated vessels used only intermittently when responding to oil spills.

Adding a local, community-based Tier 0 level of response to the existing Tiers of response currently recognized by industry and governments provides an opportunity for our industry to improve our oil spill response system. Furthermore, significant improvements can be gained both in the costs associated with oil spill response and in environmental protection for our coasts (McKenna, 2021).

We hope that this article and a visit to the RESCo web site ([restco.ca](http://restco.ca)) will stimulate further discussion on this Tier 0 concept and we look forward to hearing from anyone on the topic.

### References

Adams, William A., Christopher Ives, Darryl McMahon, Peter A.G. Russell, and Wesley Gerrish, “Empowering coastal communities to be first responders to oil spills to protect local waters and economies from pollution”, presented at the 12<sup>th</sup> NALMS Conference, April 19, 2021a.

Adams, William A., Christopher Ives, Darryl McMahon, Peter A G Russell, and Wes Gerrish, “How multiple small skimmers quickly responding to oil spills could create an effective Tier 0 level to enhance existing approaches”, A RESCO White Paper, 2021b. (see [www.restco.ca](http://www.restco.ca).)

Etkin, Dagmar Schmidt, “Estimating cleanup costs for oil spills”, Oil Spill Intelligence Report, Cutter Information Corp., Arlington, Massachusetts, U.S., International Oil Spill Conference, 1999.

Government of Canada News Release, “Government of Canada and Heiltsuk Nation collaborate to develop a local Marine Emergency Response Team”, March 16, 2021, <https://www.canada.ca/en/canadian-coast-guard/news/2021/03/le-gouvernement-du-canada-et-la-nation-heiltsuk-collaborent-a-la-mise-sur-pied-dune-equipe-locale-dintervention-durgence-maritime.html>

International Petroleum Industry Environmental Conservation Association (IPIECA), “Tiered preparedness and response – Good practice guidelines for using the tiered preparedness and response framework”, IOGP Report 526, 2015.

Lee, Kenneth (chair), Michel Boufadel, Bing Chen, Julia Foght, Peter Hodson, Stella Swanson, Albert Venosa, Expert Panel report on the behaviour and environmental impacts of crude oil released into aqueous environments. Royal Society of Canada, Ottawa, ON, 2015. ISBN: 978-1- 928140-02-3 [https://rsc-src.ca/sites/default/files/OIW%20Report\\_1.pdf](https://rsc-src.ca/sites/default/files/OIW%20Report_1.pdf)

McKenna, Cara, “B.C. relying on the federal shoreline protections for Trans Mountain pipeline it previously called inadequate”, The Narwhal, 30 March 2021 <https://thenarwhal.ca/trans-mountain-pipeline-bc-permits/>

O’Neill, Annie K., “Self-reported exposures and health status among workers from the Exxon Valdez oil spill cleanup”, Master of Public Health thesis, Department of Epidemiology and Public Health, Yale University, New Haven, 2003.

Ott, Riki, “Not one drop: Betrayal and courage in the wake of the Exxon Valdez”, <https://rikiott.com/books/>, 2008.

Ott, Riki, “Human health tragedy in the making: Gulf response failing to protect people”, HuffPost, May 25, 2011.

Rungo, Usha Reena, “In Mauritius, locals united to keep an oil spill at bay”, 4 April 2021, Undark. *This story was originally published by Atlas Obscura and is reproduced here as part of the Climate Desk collaboration* <https://undark.org/2021/04/06/mauritius-locals-fight-oil-spill/>

Slett, Marilyn, "Our Fight for Justice", Heiltsuk Nation Report on the Nathan E. Stewart incident, 2020  
<http://www.heiltsuknation.ca/the-nathan-e-stewart-oil-spill/>

Transportation Safety Board of Canada (TSBA) report M16P0378, "The Nathan E. Stewart incident", 2018.  
<https://www.tsb.gc.ca/eng/rapports-reports/marine/2016/m16p0378/m16p0378.html>  
(This report does not consider the impacts on the community.)

Transport Canada, TP 12401 E, 1995, "Response Organization Standards",  
<https://tc.canada.ca/sites/default/files/migrated/tp12401e.pdf>