BUILDING BRIDGES

WITH THE PUBLIC

Darryl McMahon, (RESTCo.), and Dr. Ian Stewart (King's College, Halifax), Canada, highlight the importance of including and considering the views of local interests during pipeline planning.

Gaining and maintaining public confidence in the pipeline industry's capacity to effectively and safely transport petroleum and derivatives is an increasing concern for the industry. This article offers a Canadian-informed perspective on the role that a combination of community engagement and technology choice can play in securing that confidence. Two perspectives are in play here: of a science and technology historian and of a spill response consultant regarding existing and new technologies at various stages of product development. The term social license to operate (SLO) is used as an industry goal. This article suggests considerations that can guide the direction of technology choices and research directions, which

may enhance SLO going forward. In particular, the article connects two considerations that tend to be kept separate: stakeholder community engagement and potential for technology innovation.

Since three major pipeline projects for moving diluted bitumen (dilbit) from northern Alberta to tidewater are in different stages of review, and given the prominent role played by the threat of oil leaks in shaping negative public opinion, the stakes for public confidence for Canada's pipeline industry have – arguably – never been higher. Investment in innovations for both early detection and pipeline integrity are clearly a priority for the industry and regulators. However, there are still spill events. Spill response that is demonstrably and reliably effective should be added as a priority. The Canadian Pipeline Technology Collaborative (CPTC) has identified all three as key technology innovation priorities. As many events in the past have made clear, future incidents will merely compound the confidence problem created by the legacy of insufficient clean ups of past pipeline spills.

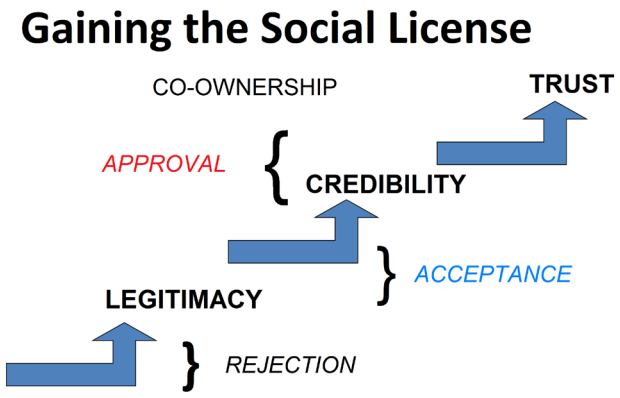

Figure 1. Diagram showing the progressive stages of SLO. Reproduced from the original by Ian Thomson with permission.

SLO is a term increasingly used by academics, consultants and practitioners who analyse industrial/societal relations. SLO refers to the varying perceptions that members of society – both as a whole and locally affected stakeholder communities – have of industrial operations. Perceptions identified in SLO (in ascending scale) range from absence of license (either withheld or withdrawn) to approval to strong identification with and active support for the project.

Three key components are typically used to describe progressive stages of SLO: legitimacy is gained when the social norms and expectations of a community are met by industry; credibility is based on clear and trustworthy communication and actions; and trust is the end result of robust social license, marking a sense of shared undertaking and co-ownership of both risks and rewards.

Figure 2. Enzymatic bioremediation formula was used on spill in Colombia in July 2016. The cleanup was completed in 14 days.

Figure 3. Concentrated enzymatic bioremediant solution can be stored locally, taking minimal space. It is available for immediate use.

Pipeline projects increasingly need SLO to proceed from proposal to operations. However, they face particular challenges in achieving this, often due to inherent and thus unavoidable features of the industry. The first challenge (the geospatial challenge) is that, unlike point-source industries such as mining, forestry or agriculture, pipelines generally merely cross through (or end up at) communities, their valued ecosystems and their resources.

The second challenge is a geo-temporal challenge. With passage of time 'no news' is not the only good news needed for social license. Unlike point-source industries, which are more locally visible to communities by way of tangible, ongoing rewards (jobs, infrastructure

investments, population increases to communities), the successful and incident free presence of pipelines over time does not sustain SLO on its own. Ironically, because pipelines are largely seen and not heard, when there are incidents, the actual level of SLO that a project enjoys is made explicit and more easily threatened. Partly through the explicit media strategies of many environmental non-governmental organisations (NGOs), spill incidents and poor response records from anywhere in the world can negatively impact even the most carefully nurtured efforts at local community engagement and regulatory compliance.

Both of the above challenges place a heavy premium on the need for engagement of local communities in both spill response planning and the execution of those plans along the route. Although investments in prevention are necessary, cost-effective and environmentally responsible, it is through community engagement in spill response planning and execution that SLO will be most enhanced.

This is clearly understood by Kinder Morgan, for example, as evidenced by its extensive community engagement work for the proposed Trans Mountain project in British Columbia (Canada): "At Trans Mountain, we believe in maximising local knowledge and input in developing our emergency response plans. This helps us create a safer, stronger and more responsive emergency management programme. As part of the Trans Mountain Expansion project [...] we're incorporating local feedback and concerns into our updated plans," commented Jamie Kereliuk, Director of Emergency Management at Kinder Morgan Canada.

This is consistent with recent statements by the API and IPIECA that recognise the importance of local community involvement in oil spill preparedness and response. Analysis of major spill incidents in the US have generated considerable discussion within academia, government and industry circles regarding the role that spill response preparedness on the part of local communities can play in contributing to resilience in the event of accidents.

The effect of this on risk analysis is also considerable. One element in risk assessment, assessment of consequence, includes a community's social resilience, alongside environmental and economic factors. Research conducted in response to the 1989 Exxon Valdez spill has shown that resilience demonstrably increases when affected communities are involved in both spill response preparation and execution. Inevitably, local first responders will be the first on scene.

Community engagement in spill response planning and execution can be extremely difficult and time consuming. Moreover, some would argue that Canada is relatively new at the job, including in its work with First Nations communities.

"The traditional oil spill response model in Canada has relied heavily on industry-led planning and response, leaving communities and First Nations to bear the consequences of risks they have no means to control. Bringing communities to the table early and providing them with a tangible role and capacity to participate in spill mitigation and response is not only empowering to the impacted communities, but it may reduce the 'us vs them' mentality that often erupts when a spill occurs," Elise DeCola, Operations Manager at Nuka Research and Planning Group, highlighted.

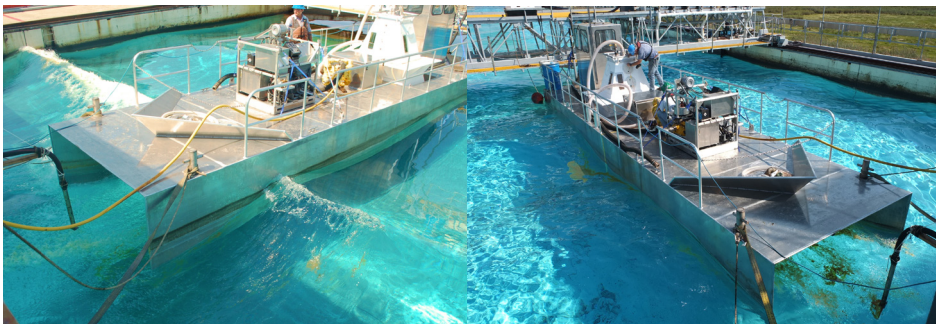

Figure 4. Gravity skimmer 12 m prototype testing at Ohmsett.

Figure 5. Adsorbent fabric fences prevent oil from crossing the barrier but water can pass through for drainage.

At both provincial and federal levels, unions of municipalities have recently resolved demands for involvement in and remuneration for incident response. In turn, federal and provincial government initiatives have committed to re-examining spill response planning. However, questions still remain: where does technology choice fit in? And how does it help with SLO?

Spill response and SLO

The choice of spill response technologies is usually driven by environmental, logistical and economic considerations. Given the importance of community engagement in spill response planning and execution for achieving SLO, technology choice will also need to reflect such engagement. Therefore, at both the planning and execution stages, local involvement in technology choice will increasingly be necessary. Involving locals in discussions that relate to response trade-offs and cleanup endpoints can create common ground for community stakeholders in the interest of developing and sustaining SLO.

However, are there ways that community engagement could impact the innovation directions that have been taken by the industry? Moreover, what would be the consequences to SLO if industry were receptive to collaborating with stakeholders on spill response technology innovation that reflected such engagement? Below are some points worth considering, which apply to many jurisdictions within Canada and likely outside of Canada too:

- There is increased literacy amongst potentially affected communities concerning the real challenges that face existing technologies for effective oil spill response.
- High profile examples of weaknesses in regulatory oversight can easily undermine public confidence in government and industry assurancs of technological competence.
- Community expectations and priorities may differ from industry and regulators' standards with respect to detection thresholds, response times or cleanup endpoints.
- Communities, including First Nations, may place different values on ecological, social, cultural or economic resources than industry or other levels of government.
- For all oil types, rapid response is crucial. This requires distributed response technologies that are suited to the first response capacities of locally affected communities. These must be able to be rapidly, safely and effectively implemented.
- Response technologies that are adaptations or implementations of technologies already known and in regular use by local communities offer a natural route for integrating technology innovation and SLO.
- Continued industry improvements in detection technologies will improve local response capacities and thereby community confidence. Inclusion of local response communities in early detection will enhance SLO.
- Some environmental NGOs offer collaborative opportunities for community engagement but also response technology innovation. For example, the Lawrence Anthony Earth Organization (LAEO).

Figure 6 . Pipe construction.

"LAEO wants to collaborate with all parties to fix the response system. LAEO has, and will continue to, publicise, feature and highlight companies and technologies, which are improving response and remediation effectiveness," Diane Wagenbrenner, Science and Technology Advisory Co-ordinator at LAEO, commented.

The reality is that most of the major innovations in oil spill cleanup technology have been industry driven, based on regulatory or operational drivers. Bringing community stakeholders into the discussion and, therefore, considering response challenges through a local lens, may bring to light opportunities for technology innovation, research and development.

Current social licence challenges that are being faced by pipeline infrastructure projects in Canada suggest that fresh thinking is both possible and necessary in the spill response technology sector. It is a constantly repeated lesson of history that successful and sustainable technologies answer to communities' sense of well-being, including their relation to the natural environments that sustain them.

Remote Energy Security Technologies Collaborative (RESTCo) has identified three classes of technology that show innovation promise: skimmers, bioremediants and reusable adsorbents. An example from each class can be seen in Figures 2, 3, 4 and 5.

A non-toxic, user friendly enzymatic bioremediant can be sprayed on oil products in water or on soil. It detoxifies the oil on contact and keeps it on the surface (floating) throughout the remediation process. Its mechanism of action enables oil eating microbes to digest the hydrocarbons. Full remediation can take just a few weeks, depending on the instance. For saturated soils, multiple applications and aeration/turning of the soil may be required to speed the remediation process. The endpoint is hydrocarbons are reduced to CO_2 and water. This product is US EPA listed.

This gravity skimmer (Figure 4) system can be fitted to multi-purpose vessels ranging from 5 - 100 m, or perhaps more, in length. The hull design means that vessels can serve as tugboats or industry service vessels, research vessels or fishing vessels that can be converted into dedicated spill response vessels within an hour. They offer rugged and high collection capacity in typically tough marine conditions that defeat other skimmers. The vacuum effect of the collection tower above the vessel deck effectively eliminates free surface effects, decants oil from water without bringing the water on board and isolates crew from direct oil exposure entirely. Collected oil can be stored in tanks in the hull or pumped into floating storage tanks/vessels of opportunity.

The adsorbent fabric (Figure 5) can be supplied and used in various form factors to suit the application. The fabric can be collected and the oil extracted by mechanical means. It can then return to service in a spill event situation. The fabric can be washed (commercial laundry), dried and put into storage for future reuse. This product is US EPA listed.

Acknowledgements

Dr. Ian Stewart does not endorse any of the products described in this article and has no affiliation with RESTCo.