Review of OPR Emergency Management Topic Paper

Executive Summary

This report provides a comprehensive evaluation of the Canada Energy Regulator's (CER) "C. OPR – Emergency Management Topic Paper," which proposes updates to strengthen pipeline emergency preparedness and response. The evaluation benchmarks the CER's proposals against industry best practices (including API RP 1173 Pipeline Safety Management Systems), findings from major incident investigations (NTSB recommendations and PHMSA lessons learned), and Professor Najmedin Meshkati's independent review of pipeline emergency management systems.

The analysis reveals that the OPR paper demonstrates a progressive approach to emergency management, particularly in its proposals to incorporate the Canadian Standards Association (CSA) Standard, *Emergency preparedness and response for petroleum and natural gas industry systems* (CSA Z246.2) by reference, broaden the scope of protection priorities, clarify stakeholder coordination requirements, and mandate Indigenous involvement in emergency management programs. However, significant gaps exist in several areas: the continuous improvement cycle (particularly post-incident learning), explicit adoption of the Incident Command System (ICS), integration of human factors and control room operations, and comprehensive recovery planning.

Six targeted recommendations are provided to enhance the regulatory framework, focusing on strengthening emergency planning and risk assessment, improving preparedness through training and exercises, formalizing incident management protocols, promoting continuous improvement, enhancing Indigenous engagement, and ensuring regulatory consistency. These recommendations aim to align the OPR with international best practices while addressing unique Canadian priorities, particularly meaningful Indigenous participation and protection of cultural resources.

1. Introduction

The Canadian Energy Regulator's "OPR – Emergency Management" topic paper proposes updates to strengthen pipeline emergency preparedness and response. This critique evaluates the paper's treatment of emergency planning, preparedness, response, and recovery against industry best practices, findings from major accident investigations, and insights from Professor Najmedin Meshkati's review of pipeline emergency management systems.

The analysis examines the paper's completeness, alignment with best practices, consistency with regulatory expectations, and the effectiveness of its proposed measures. Gaps or outdated practices are identified, and recommendations are provided to support the CER's regulatory review and implementation.

2. Strengths of the OPR Emergency Management Proposals

2.1 Incorporation of Industry Standards

The OPR paper proposes to incorporate CSA Z246.2 (Emergency Preparedness and Response for the petroleum industry) by reference, which would cement a comprehensive planning framework in regulation. This is a positive step for consistency, as CSA Z246.2 is a national standard developed with broad stakeholder input and is periodically updated. Making it mandatory would ensure companies plan according to current best practices and clarify any ambiguity about its applicability. This move aligns with API RP 1173's intent that emergency plans be based on applicable laws, regulations, and standards.

2.2 Broadened Protection Priorities

The paper proposes to broaden the scope of what must be protected in an emergency. It recommends that the regulation explicitly include protection of "people" (replacing narrower language like "safety of workers or the public") and add "sites of historic and cultural significance" as assets to be safeguarded. This change is responsive to extensive Indigenous feedback about protecting culturally important sites during incidents. It enhances completeness by acknowledging that emergencies can have not just safety and environmental consequences, but also socio-cultural and economic impacts on people.

2.3 Improved Stakeholder Coordination Framework

The OPR paper seeks to clarify and improve outreach requirements by replacing confusing terms like "liaison" and "continuing education" with clearer requirements for "Emergency Response Coordination" (with those who will respond) and "Emergency Management Information" (for those who may be impacted). This clarification should eliminate gaps where certain groups might have been overlooked due to terminological ambiguity. By explicitly focusing one program on responders and another on affected communities, companies will be better guided to engage all relevant parties.

2.4 Indigenous Involvement Requirements

The paper proposes a requirement for Indigenous Peoples' involvement in emergency management programs, pushing companies to think through how Indigenous communities will be notified, consulted, and possibly integrated into the command structure during an emergency. This is a progressive step that goes beyond U.S. regulations, which, while requiring public liaison, do not explicitly call out Indigenous peoples. The CER's 2022 Indigenous notification best practices further support this initiative.

To strengthen the role of Indigenous Peoples—such as the Lower Nicola Indian Band (LNIB)—and Indigenous Advisory and Monitoring Committees (IAMCs) in oil pipeline emergency management, a series of targeted recommendations aim to ensure culturally competent,

community-informed, and technically sound responses to pipeline emergencies (see the following section under Recommendations)

3. Critical Gaps in the OPR Paper

3.1 Limited Focus on Continuous Improvement and Learning

While the OPR paper addresses planning and preparedness, it lacks explicit provisions for continuous improvement and post-incident learning. API RP 1173 emphasizes learning from incidents as part of the "Check-Act" cycle—after an emergency, operators should evaluate response effectiveness and incorporate lessons learned. Professor Meshkati's review strongly underlines this point, asking what lessons have been learned from past spills and how those have been incorporated into emergency response plans. The absence of explicit requirements for post-incident review and program updates represents a significant gap in the regulatory framework.

3.2 No Explicit Reference to Incident Command System (ICS)

The OPR paper does not explicitly mention the Incident Command System (ICS) or Unified Command, even though it is industry practice. API RP 1173 explicitly expects operators to recognize and use ICS in their emergency response procedures, and most pipeline operators state that they use ICS to manage incidents. Professor Meshkati's review raised important questions about how well ICS is implemented in practice, including specific protocols, authority structures, and communication channels among all parties. Without explicit regulatory requirements for ICS implementation, companies might adopt inconsistent approaches to incident management.

3.3 Inadequate Integration of Human Factors and Control Room Operations

The paper does not address control room procedures during emergencies or human-factor considerations such as fatigue, decision support tools, and alarm management. NTSB investigations have found that controller actions or SCADA system issues were significant factors in a majority of serious pipeline accidents. Professor Meshkati's review found one operator's consideration of human error in spill detection/response procedures "woefully inadequate and cursory," stressing that human factors and safety culture issues "can affect...spill prevention, detection, response, all the way to consequence mitigation." The OPR paper's silence on these critical aspects represents a notable gap.

3.4 Absence of Recovery Phase Planning

The topic paper does not explicitly address post-response recovery beyond cleanup and damage payment. There is no mention of how companies should transition from emergency response to recovery operations, support affected communities during restoration, or maintain communication during the extended recovery period. Modern emergency management practices recognize recovery as a distinct phase requiring dedicated planning and resources. This omission could lead to inadequate preparation for long-term incident consequences.

3.5 Limited Technology and Resource Requirements

The paper does not discuss the use of technology such as improved leak detection, automatic shut-off systems, or incident management software as part of emergency management. NTSB and PHMSA have emphasized the importance of technological solutions in limiting incident consequences, particularly noting that inadequate or misallocated resources have hampered response efforts in past incidents. While some of these aspects might be considered under pipeline integrity, their omission from emergency management requirements represents a missed opportunity to ensure technological readiness.

3.6 Insufficient Safety Culture Integration

While the OPR paper implicitly acknowledges cultural elements, especially through its emphasis on involving Indigenous Peoples and external stakeholders, it lacks explicit requirements related to safety culture. Professor Meshkati notes that "human factors... and safety culture are... cross-cutting issues" that impact everything from prevention to response. Without explicit expectations that operators demonstrate leadership commitment to safety culture in emergency management, there is a risk that cultural readiness may lag behind procedural compliance.

4. Recommendations for Enhancement

Based on the gaps identified, the following recommendations are offered to enhance the OPR Emergency Management framework:

4.1 Strengthen Emergency Planning and Risk Assessment

1. **Mandate Worst-Case Scenario Planning:** Require companies to identify worst-case release scenarios (for all operating conditions and weather) and document specific response plans and resources for those scenarios. This ensures preparedness for low-probability, high-consequence events.
2. **Implement High Consequence Area Focus:** Direct companies to pay special attention to High Consequence Areas (HCAs)—densely populated areas, sensitive ecosystems, Indigenous lands—in their EM programs. Plans should detail protective strategies for these areas, including additional mitigative measures needed to protect them.
3. **Integrate Human Factors into Planning:** Require companies to factor human reliability into their emergency procedures, including provisions for control room operator backups during long-duration events, decision support tools to help recognize ruptures, and pre-defined criteria for when to call in additional help.

4.2 Enhance Preparedness through Training and Exercises

1. **Require Multi-Agency Emergency Drills:** Mandate annual full-scale or functional exercises involving local first responders and potentially affected Indigenous communities. These drills should use the Incident Command System (ICS) and Unified

Command structure. The CER should review exercise reports for participation and lessons learned.
2. **Implement Team Training for Control Center Staff:** Following NTSB's guidance, require that control room personnel receive team-based emergency response training at least twice a year. Trainings should include simulated leak/rupture scenarios using actual pipeline monitoring systems to improve recognition and response times.
3. **Conduct Public Awareness Effectiveness Checks:** Require companies to periodically survey or engage with communities and first responders to assess if they know how to recognize a pipeline emergency and whom to contact. For example, measuring how quickly a mock notification reaches the company can indicate if outreach has been successful.

4.3 Formalize Incident Management and Coordination Protocols

1. **Embed Incident Command System (ICS) in Regulation:** Explicitly require companies to use ICS or an equivalent incident management system compatible with local responders. Define expectations for Unified Command in large incidents to ensure smooth integration of multiple responders.
2. **Clarify Roles and Decision Authority:** Require EM programs to include an Emergency Response Organization Chart showing key roles and interfaces with external authorities. Companies should pre-designate liaison personnel and document any agreements with external agencies to prevent confusion during real events.
3. **Improve Notification Protocols:** Establish clear requirements specifying who must be notified immediately in an incident, including all potentially impacted Indigenous groups, landowners, first responders, and regulators. Set time frames for initial notifications to ensure timely information sharing.

4.4 Promote Continuous Improvement and Recovery Planning

1. **Mandate Post-Incident Reviews:** After any significant incident or annually at minimum, require companies to conduct documented reviews of their emergency response performance. These reviews should identify strengths and weaknesses, involve input from external partners, and list corrective actions.
2. **Require Regular Plan Updates:** Make emergency management program reviews and updates mandatory at least annually or when changes occur in pipeline operations, Indigenous knowledge, or technology. This ensures emergency plans remain current and incorporate new information.
3. **Develop Recovery and Community Reassurance Plans:** Require emergency management programs to include recovery activities, such as criteria for transitioning from emergency to recovery phase, community engagement during remediation, and ongoing stakeholder communication throughout the recovery process.

4.5 Strengthen Indigenous Engagement and External Stakeholder Coordination

1. **Define Indigenous Involvement Plan Requirements:** Specify key elements that an Indigenous Peoples Involvement Plan should contain, including identification of affected

communities, contact protocols, provisions for integrating representatives into response operations, joint training opportunities, and measures for respecting Indigenous knowledge in response.

2. **Support Capacity Building for Indigenous and Local Responders:** Encourage companies to invest in training and equipping Indigenous emergency response teams and local volunteer fire departments. This could include providing ICS training workshops or funding joint emergency equipment caches.
3. **Facilitate Regular Liaison Meetings:** Require companies to hold regular liaison meetings with external stakeholders to review emergency plans, share updates, and conduct tabletop exercises. These meetings maintain relationships and a shared understanding of response protocols.
4. **Ensure Transparent Communication During Incidents:** Establish clear public communication protocols through a Joint Information Centre in Unified Command. Indigenous communities and local authorities should participate in crafting and delivering public messages to ensure accuracy and cultural appropriateness.
5. **To Strengthen Indigenous Participation in Oil Pipeline Emergency Management:** IAMCs must immediately establish formal co-development processes for emergency response plans with operators and regulators. Start by securing Indigenous representation within Unified Command structures, ensuring equal decision-making authority alongside industry and government agencies during incidents. Simultaneously, implement comprehensive cultural competency training for all emergency personnel to improve communication during high-stress situations.
6. **Launch Indigenous Guardian Programs** that empower community members to actively monitor response activities and provide real-time feedback based on their unparalleled knowledge of local territories. Organize regular joint emergency drills in Indigenous communities that reflect realistic, locally-relevant scenarios and evaluate coordination effectiveness among all stakeholders. Ensure these drills include clear communication protocols that provide timely information to community members, including in Indigenous languages when appropriate.
7. **Establish IAMCs as Independent Oversight Bodies** with formal authority to review emergency management systems and participate in post-incident investigations. Require regular publication of IAMC emergency management performance evaluations to foster transparency and accountability. Through these integrated actions, Indigenous communities like the Lower Nicola Indian Band will achieve emergency management frameworks that simultaneously uphold technical excellence and Indigenous values, rights, and leadership—ultimately enhancing response effectiveness, environmental protection, and community resilience.

By implementing these measures, IAMCs and Indigenous communities like the LNIB can ensure that emergency management frameworks for oil pipelines reflect both world-class technical standards and Indigenous values, rights, and leadership. This will not only improve response effectiveness and public safety but also foster long-term trust, resilience, and environmental stewardship.

4.6 Ensure Regulatory Consistency and Oversight

1. **Consolidate and Communicate Requirements Clearly:** As the CER incorporates CSA Z246.2 and merges various orders into the OPR, provide industry with clear mapping of requirements showing how new OPR sections correspond to CSA clauses and which previous orders are superseded.
2. **Enhance Audit and Drill Oversight:** Increase CER's active oversight by observing company emergency exercises and conducting unannounced drills to test real readiness. Use findings to inform future regulatory improvements and address industry-wide weaknesses.
3. **Conduct Safety Culture Assessments:** Develop tools to assess company safety cultures as part of evaluating emergency management programs. This could include questionnaires, interviews, or third-party reviews focusing on leadership commitment, employee knowledge, and organizational attitudes toward continuous improvement.

5. Implementation Considerations

Implementing these recommendations will require careful planning and coordination with industry stakeholders, Indigenous communities, and other regulatory bodies. The following considerations should guide implementation:

5.1 Phased Approach

A phased implementation approach would allow companies to prioritize critical elements while developing more complex aspects of their emergency management programs. For example:

- Phase 1: Basic compliance with CSA Z246.2 and development of Indigenous involvement plans
- Phase 2: Enhancement of training programs and exercise requirements
- Phase 3: Full integration of continuous improvement mechanisms and advanced technologies

5.2 Performance-Based Regulation

While prescriptive requirements provide clarity, the CER should maintain a performance-based approach that allows companies flexibility in how they achieve emergency management objectives. This is particularly important for accommodating diverse operating environments and community needs across Canada.

5.3 Coordination with Other Regulatory Initiatives

Emergency management requirements should be coordinated with other OPR topic papers, particularly those addressing Human and Organizational Factors, Safety Management Systems, and Pipeline Integrity. Cross-references between these regulatory areas will ensure a comprehensive approach to risk management.

5.4 Monitoring and Evaluation

The CER should establish a framework for monitoring and evaluating the effectiveness of the new emergency management requirements. This could include:

- Tracking key performance indicators related to emergency preparedness and response
- Analyzing trends in exercise results and incident outcomes
- Surveying Indigenous communities and other stakeholders on their experience with company emergency management programs
- Periodically reviewing and updating requirements based on new lessons learned and technologies

6. Conclusion

The OPR Emergency Management Topic Paper demonstrates the CER's commitment to enhancing pipeline safety and emergency preparedness. The proposed amendments—including adoption of CSA Z246.2, clearer program priorities, better stakeholder liaison, and explicit Indigenous involvement—address important gaps in the current regulatory framework.

However, to fully align with international best practices and address lessons from past incidents, the recommendations outlined in this review should be incorporated. Particular attention should be paid to continuous improvement mechanisms, explicit adoption of ICS, integration of human factors considerations, and comprehensive recovery planning.

By implementing these enhancements, the CER will create a regulatory environment where pipeline operators plan for the worst, train to a high standard, involve those most affected, and continually refine their emergency programs. Such a framework not only meets regulatory consistency with North American standards and NTSB/PHMSA expectations but sets a benchmark for others by integrating cultural and organizational readiness into emergency preparedness.

Ultimately, effective emergency management hinges on preparedness, communication, and the willingness to learn and adapt. An enhanced OPR framework will support the CER's mandate of protecting people and the environment while promoting energy infrastructure that is safer and more trusted by all stakeholders.