



Standards Council of Canada  
Conseil canadien des normes

## INDUSTRY SECTOR PROFILE

# Proposed Standardization Solutions Supporting Oil and Gas Sector Priorities

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Proposed Standardization Solutions  
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## About the Standards Council of Canada

SCC is a Crown corporation within the Industry Canada portfolio. With the goal of enhancing Canada's economic competitiveness and social well-being, SCC leads and facilitates the development and use of national and international standards. SCC also coordinates the efforts of Canadians in the development and use of national and international standards. Accreditation services are provided by SCC to approximately 500 customers, including various product certifiers and testing laboratories. SCC represents Canada at the International Organization for Standardization (ISO) and oversees the Canadian National Committee of the International Electrotechnical Commission (IEC). For more information on SCC, visit [www.scc.ca](http://www.scc.ca), or send inquiries to [info@scc.ca](mailto:info@scc.ca).

### **DISCLAIMER:**

This document is not an exhaustive reference; it is intended for informational purposes only. It is recommended that readers of this document consult with the Standards Council of Canada prior to pursuing specific standardization solutions and/or conformity assessment activities.

Proposed Standardization Solutions  
Supporting Oil and Gas Sector Priorities

# 1. Executive Summary

Standardization holds great promise to boost Canada's competitiveness and safeguard the health and safety of its citizens. Senior decision-makers from Canada's oil and gas sector are integral to strengthening Canada's standardization network and to creating opportunities for a more competitive Canada.



This document identifies standardization-specific solutions to address the challenges and priorities of Canada's oil and gas sector leaders. These challenges and opportunities were confirmed during the Standards Council of Canada's (SCC's) recent outreach activities to this sector's leaders. Within this document, opportunities within the following three specific areas of Canada's oil and gas supply chain are highlighted:

1. Labour mobility barriers, by proposing that operators' qualifications, competencies and certification be standardized.
2. Occupational health and safety standards, disparities across federal, provincial and territorial regulations, by harmonizing jurisdictions.
3. Pipeline import trade flows, by seeding Canadian pipeline design and construction standards internationally.

The critical path supporting implementation of standardization-specific solutions contained within this document relies heavily on Canada's oil and gas sector leaders to support the initiatives. SCC's underlying goal is to engage the oil and gas sector, so that SCC can:

- Obtain consensus and identify industry support for Canada's oil and gas industry standardization-specific goals and priorities.
- Create a robust and comprehensive way forward, to ensure that SCC is responsive and effective in supporting its oil and gas sector stakeholders with standardization expertise.
- Have constructive dialogues with senior business representatives from the oil and gas sector.
- Provide assurance that Canada is focused on the right areas to maximize the value of standardization efforts on behalf of Canadians.
- Have a united vision supporting key Canadian priorities within Canada's standardization system.

## 2. Background

Although not visible to the average Canadian, standardization is central to economic growth and social well-being. Over the past few decades, however, a number of trends has impacted standardization efforts in Canada, including:

- Reduced awareness of the role of standardization among decision-makers within government and industry.
- A smaller Canadian standardization base, due to resource constraints and diminishing technical expertise.
- Significant growth of international standardization activities, in contrast to an overall decline in Canadian participation.
- Greater complexity and cost related to standards development and its activities.
- An aging membership profile of experts who contribute to the development of standards in Canada.



Canadian industry must respect a growing system of national, regional and international standards-related requirements to gain access to the global marketplace. Approximately 80 per cent of world trade is impacted by standardization<sup>1</sup>. Research conducted in Canada indicates that from 1981 to 2004, standardization accounted for 17 per cent of the growth rate in national labour productivity. This translates into approximately 9 per cent of the growth rate in output (real GDP); real GDP would have been \$62 billion lower had there been no growth in standardization activities between 1981 and 2004.<sup>2</sup>

New strategies and enhanced coordination are required to respond to current challenges. Although senior decision makers are less aware of the value of standardization today than they were in previous decades, Canadian industry and regulators at the working level have steadily increased their reliance on Canadian and international standards. In addition, industry and regulators oversee a broadening scope of products manufactured outside of Canada. Significant standards development activity is taking place at the regional level. U.S.-based organizations like the American Society for Testing and Materials (ASTM), American Petroleum Institute (API), American Society of Safety Engineers (ASSE), Society of Automotive Engineers (SAE), American Society of Mechanical Engineers (ASME), and National Fire Protection Association (NFPA) develop and maintain thousands of standards, many of which are now routinely used by Canadian industry and by federal and provincial regulators.

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<sup>1</sup> ISO International Standards: *Today's State-of-the-art Global Solutions for CEOs*, ISO (2009) pg. 2; *Regulatory Reform and International Standardisation (1999)* pg. 10, Working Party of the Trade Committee, OECD.

<sup>2</sup> *Economic Value of Standardization*, SCC (June 2007).



Over the last two years, SCC has achieved greater awareness of standardization among government influencers. SCC is now engaging with industry sectors to determine standardization priorities and needs required for sectors of strategic importance to Canada. By working with both government and industry to identify and advance Canadian standardization priorities, the creation of a more effective standardization network will continue to help Canada's economic and social infrastructures thrive, and ultimately to be of value to Canada and all Canadians.

In 2012 SCC developed an industry engagement framework with the goals to:

- Obtain consensus on industry standardization priorities and goals;
- To have a robust and comprehensive way forward to ensure that SCC is responsive and effective in supporting Canadian industry with standardization expertise;
- Have constructive dialogues with senior business representatives;
- Provide assurance that Canada is focused in the right areas to maximize the value of standardization efforts on behalf of Canadians; and
- Ensure SCC has a united vision when it comes to Canada's standardization network supporting key Canadian priorities.

SCC's industry engagement framework aims to encourage Canadian industry to bring its experience and expertise, gained in relative sectors, to the standards development table. By doing so, SCC is helping the sector set and determine, on an annual basis, Canada's standardization priorities. SCC's sector engagement activities are part of the organization's ongoing focus on engaging its industry stakeholders to strengthen Canada's standardization network. These activities are also part of SCC's effort to help the Government of Canada achieve the goals of its Economic Action Plan, focusing on reducing red tape and barriers to trade.

Oil and natural gas are two of Canada's main energy sources and are key drivers of Canada's economy. Canada is the third-biggest producer of natural gas,<sup>3</sup> and the sixth-largest oil producer in the world<sup>4</sup>. In 2012, it was estimated that more than 195, 000 employments were directly related to the oil and gas sector. This number is expected to increase by nine to 20 per cent over the next 10 years.<sup>5</sup> Oil and gas companies make up 20 to 30 per cent of the value of the Toronto Stock Exchange (TSX). These companies account for about five per cent of Canada's GDP. In 2008, Canada's petroleum exports (crude oil and petroleum products) accounted for 19 per cent of all its exports.<sup>6</sup>

In 2012, SCC identified key stakeholders in the oil and gas sector (Annex A) that have since been working with SCC to identify standardization issues relevant to the sector, and to discuss possible solutions.

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<sup>3</sup> <http://www.nrcan.gc.ca/energy/sources/natural-gas/1557>

<sup>4</sup> <http://www.neb-one.gc.ca/clf-nsi/rnrgynfntn/prcng/cndnrgprcngtrndfct2011/cndnrgprcngtrndfct-eng.html>

<sup>5</sup> Petroleum Human Resources Council of Canada "The Decade Ahead: Labour Market Outlook to 2022 for Canada's Oil and Gas Industry"

<sup>6</sup> <http://www.nrcan.gc.ca/energy/publications/sources/crude/issues-prices/1223>

The following are some facts and figures<sup>7</sup> (March 2013) that provide context for the impact of standards on the oil and gas sector:

- Of 100 major Canadian federal regulations reviewed more than 20 per cent directly affect the oil and gas sector.
- Approximately three per cent of standards developed by SCC-accredited organizations affect the oil and gas sector – and about 60 per cent are approved as National Standards of Canada (NSCs).
- CSA Group is the leading contributor in Canada to standards in the oil and gas sector. Outside of Canada, the American Petroleum Institute (API) is one of the most important contributors of standards used by the oil and gas sector, followed by ASTM International.
- At the International Organization on Standardization (ISO), Canadians participate in more than 50 per cent of the technical standards development committees committed to the oil and gas sector.

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<sup>7</sup> Standards Council of Canada, "Facts and Figures 2013".

### 3. Stakeholder Outreach

In 2012, SCC developed effective bilateral working relationships with more than 10 national oil and gas sector association executive teams. These associations account for more than 150,000 companies and experts working in the industry. SCC cultivated relationships with a number of senior leaders from the member companies and independents.



Targeted stakeholders included those with primary interests in the exploration, production, transportation, processing, refining, storage, distribution and marketing of oil and gas – from the discovery of raw material to the selling of the end product. Consistent with SCC’s industry engagement strategy, national industry association heads were targeted as best positioned to help gather the appropriate groups of stakeholders, and in remaining instrumental to help shape the issues for discussion, as depicted in Figure 1, below. (See detailed list in Annex A.)

**Figure 1:** Oil and Gas Supply Chain – Targeted Stakeholders



In addition, SCC is working with Natural Resources Canada (NRCan) and relevant industry stakeholders to support the recommendations of the *Natural Gas Use in the Canadian Transportation Sector Deployment Roadmap*, published by NRCan in January 2011. SCC continues to provide support by performing research and analysis on standardization-related aspects of existing codes, standards and regulations pertaining to the use of compressed and liquid natural gas (CNG and LNG) in medium and heavy transportation vehicles (addressing such topics as the jurisdictional variances in safety signage, impact load testing, refueling infrastructure and fuel quality).

This work is expected to contribute to the harmonization of standards across relevant jurisdictions and to the safe deployment of natural gas as a viable vehicular fuel alternative across North America. Current SCC efforts involve reconciling regulatory requirements and jurisdictional variances with respect to pressurized equipment for use in Natural Gas Vehicles, in two ways. First, through an examination of the jurisdictional Canadian Registration Number (CRN) application process and variances. Second, through an assessment of the feasibility of implementing a harmonized process across Canada. SCC also participates in the Natural Gas Roadmap Technical Advisory Committee convened by NRCan.

## 4. State of Standardization for the Oil and Gas Industry

SCC began collecting a range of standards-related facts and figures in 2010 so as to identify key trends impacting Canada’s standardization network. The organization’s March 2013 baseline findings show that 1,712 standards are incorporated by reference in 100 Canadian federal regulations and five National Model Codes of Canada.

SCC’s March 2013 baseline findings include a comparative overview of the standards referenced in Canadian federal regulations affecting the oil and gas sector as follows:

**Table 1:** Standards referenced in federal regulations (March 2013)

| Standards in regulations  | Total | Impact on Oil and Gas (Extraction) |
|---|-------|------------------------------------|
| Number of federal regulations that incorporate standards by reference | 100   | 21                                 |
| Number of standards referenced in those regulations                   | 1,066 | 210 (20%)                          |

Of the 1,066 unique standards referenced in 100 federal regulations, 20 per cent of these standards have an impact on the oil and gas sector. These standards cover occupational safety (e.g. protection against fire, protective equipment, etc.); quality assurance, control, verification and inspection practices; and infrastructure installation requirements for on- and offshore structures.

Over the past several years, the oil and gas sector has been involved in a wide number of standards development activities at the national and international level. SCC grants accreditation to standards development organizations (SDOs) in Canada when these organizations demonstrate their ability to adhere to specific Canadian requirements and international guidelines. One of those requirements is that SCC-accredited SDOs have committee memberships that reflect a “balanced matrix” of interested and affected parties, so that no single interest category can dominate the standards development process.

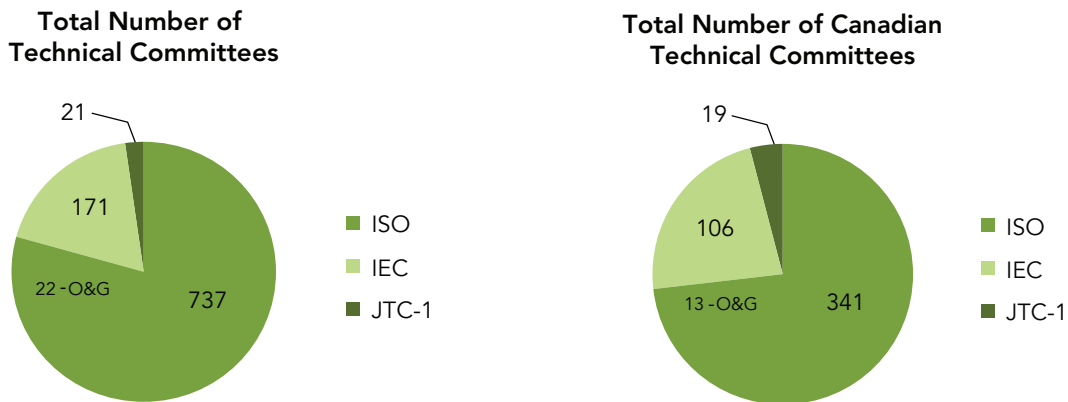


Based on data from Canada’s SCC-accredited SDOs and from SCC’s internal databases, it is known that the complete domestic standards catalogue published by SCC-accredited SDOs includes 2,940 standards.<sup>8</sup> Approximately three per cent (97) of these standards impact the oil and gas sector (excluding health and safety). CSA accounts for the majority (58 per cent) of all domestic standards developed and published by Canada’s SCC-accredited SDOs that affect the oil and gas sector.

<sup>8</sup> In accordance with CAN-P-1:2012 - Program Requirements for the accreditation of Standards Development Organizations and for the Approval of National Standards of Canada - November 2012

Canada participates in almost 60 per cent of all international technical standardization committees of the International Organization for Standardization (ISO), the International Electrotechnical Commission (IEC) and the ISO/IEC Joint Technical Committee 1 (JTC1) on Information Technology that are primarily focused on international standards development in oil and gas. The International Association of Oil & Gas Producers (OGP) promotes the development and use of ISO/IEC International Standards and are supportive of the work undertaken, for example, by ISO Technical Committee 67 *Materials, equipment and offshore structures for petroleum, petrochemical and natural gas industries*. In addition, the International Regulators' Forum (IRF) – the principal international regulatory forum for offshore safety, which includes offshore safety regulators from the United States, Canada, the United Kingdom, Norway, the Netherlands, Brazil, Australia, New Zealand, Mexico and Denmark – also supports ISO and IEC standards systems as the best ways to achieve globally agreed-upon offshore standards.

**Figure 2:** Total Number of Technical Committees (TCs) and Canadian TCs (March 2013)



Whether they operate in Canada, in the United States or abroad, standards technical committees focus on specific areas of interest. These committees may work on and publish one or many individual standards in a given year. In some cases, one person may participate in many technical committees. In Figure 2, the right-hand figure does not reflect the exact number of individual Canadians involved but reports on the number of technical committees involved in oil and gas international standards development where Canada participates.

## Stakeholder Feedback

In June 2012, SCC held a forum for oil and gas senior executives and experts, to discuss issues of standardization within the industry. Participants at the forum provided feedback on a number of challenges and opportunities the industry is facing, including:

### Challenges:

- Poor public perception of the oil and gas sector, due to misinformation/lack of understanding about the sector (not within the purview of this paper).

- The need to continue to remain competitive while finding ways to share intellectual property (IP) where appropriate. Industry expressed that current rules significantly impede sharing of IP and impede such innovation.
- The need to reduce labour mobility barriers, to enable qualified workers in one province to work in any other province or territory. In addition, there is a shortage of skilled labour and the need to train more skilled labour while bringing in skilled foreign workers.
- Coupled with occupational health and safety standards governed provincially and territorially, and the Canada Labour Code governed federally, there is a surplus of differences in regulations and standards making it challenging for industry to track and comply with all applicable rules.

## Opportunities

- Participants conveyed that harmonization in operator qualifications, competencies, certifications, and product compliance would be helpful. Moreover, instances where all operators have processes in common and where they have developed their own codes of practice could be explored for opportunities to convert codes of practice into industry standards.
- In recognizing that no matter how harmonized standards are domestically, the world is becoming ever more global. Currently there is a number of national, regional and international standards concerning pipeline design, construction and safety. Disparities among these standards, or among the requirements contained therein, can translate into additional costs to government, business and customers. There could be a unique opportunity for Canada to lead and propose the development of an integrated international standard combining safe and efficient practices from around the world. The outcome would facilitate reductions in design work and would potentially accelerate the development and deployment of pipelines here in Canada and internationally.
- Standards have taken on different shapes in more recent years. Specifically, management systems standards on quality and the environment, and guidance standards on social responsibility, are helping businesses meet economic, environmental and societal challenges in a changing world. It is not just standards on technical issues anymore, but on social and environmental issues as well. This is with the aim to have voluntary standards as a means to ensure compliance and to lessen the burden of *regulatory* compliance on industry while improving public perception.
- Canada is recognized as a world-class leader in developing technology, as well as in creating governance structures to manage safety and the environment, as they relate to developing technology. Canada's leadership position can influence international standards development, resulting in positive changes to international trade negotiations regionally and internationally. For example, to qualify for export orders, Canadian producers must comply with international standards. It is important to know what those standards are in order to monitor changes being made to those standards and, in some cases, to influence changes being made to those standards, if needed.

- Continued participation in international standards development technical committees is vital for information and intelligence-gathering purposes, to help government and industry identify areas where Canada needs to be a leader, and to leverage opportunities to promote Canadian expertise. However, participating in committees in the technical development of standards is both time-consuming and costly to industry. Industry stakeholders have communicated that additional funding is needed to enable participation in areas where Canada is taking a leadership role in standards development (e.g., Arctic operations and thermal well production).
- Industry stakeholders also noted that there is confusion between competing standards-setting bodies for the oil and gas industry – in particular, ISO and API. In addition, some countries are establishing domestic standards that may or may not be harmonized with ISO or API, leading to confusion regarding which standard takes precedence over another when determining market access. Industry stakeholders see this as an opportunity for Canada to help facilitate the discussion on determining which standards scheme is best suited strategically for the future of the sector.

The outcome of the June 2012 forum and the subsequent follow-up with relevant stakeholders was a clear identification of where Canada should focus its standardization development attention today and in the future. Stakeholders categorized priorities into *subject matter* priorities and *process-related* priorities. *Subject matter* priorities are issues that are content- or topic-oriented, and where standards need to be developed or updated. *Process-related* priorities are those where the means or way in which standards are developed, disseminated or understood requires attention.

**Table 2:** Oil and Gas Subject Matter Priorities and Process-Related Priorities

| Subject Matter Priorities - Today  | Subject Matter Priorities - Future  |
|--|---|
| <p>Standards for:</p> <ul style="list-style-type: none"> <li>• Shale gas micro-seismic fracturing operations and gas extraction</li> <li>• Reserve classification and estimation for oil sands, shale gas, bitumen and carbonates</li> <li>• CO<sup>2</sup> lifecycle</li> <li>• Environmental protection related to oil sands extraction</li> <li>• Fuel quality</li> <li>• Pipeline safety</li> <li>• Arctic operations</li> </ul> | <p>Standards for:</p> <ul style="list-style-type: none"> <li>• Thermal metering</li> <li>• Liquefied natural gas use in rural Canada</li> <li>• Liquefied natural gas and compressed natural gas</li> <li>• Use of natural gas as a transportation fuel</li> <li>• Arctic operations</li> <li>• Coal bed methane</li> </ul> |

| Process-Related Priorities – Today   | Process-Related Priorities – Future   |
|--|---|
| <ul style="list-style-type: none"><li>• Enabling labour mobility (trades in particular)</li><li>• Best practices and governance structures to enable appropriate and timely sharing of intellectual property</li><li>• ISO/API issue resolution</li><li>• Facilitation of cross-provincial/territorial dialogue on regulatory and standards harmonization</li><li>• Facilitation of engagement of regulator stakeholders</li><li>• Engagement of industry stakeholders to increase awareness and understanding of the value of standards and to involve them in the development of standards</li></ul> | <ul style="list-style-type: none"><li>• Conversion of international best practices to international standards</li><li>• Service and supply company compliance with oil and gas industry best practices</li><li>• Dissemination and engagement of universities, colleges and trade schools, to increase awareness of the role and value standards play in protecting Canadian safety, security and the environment</li><li>• Facilitate the development of synergy between designers and contractors for the development of standard</li></ul> |



## 5. Recommendations

In late 2012 and early 2013, SCC followed-up with senior oil and gas sector leaders to validate the sector priorities (outlined in Table 2) of those who attended the forum. As part of its ongoing engagement with Canada's oil and gas sector executives – and to further refine the standardization



priorities for the sector – SCC confirmed three possible oil and gas sector priorities that would benefit from standardization solutions.

- A. Worker mobility and labour needs;**
- B. National and regional harmonization; and**
- C. Pipeline trade flows.**

In its discussions with oil and gas leaders on setting standardization goals, SCC identified a number of common themes. Oil and gas stakeholders may wish to consider these themes as they establish their longer-term standardization goals. As the coordinating body of standardization activities in Canada, SCC is uniquely placed to facilitate the implementation of proposed standardization solutions for the oil and gas sector, in collaboration with sector supporters.

Enabling stakeholders to become better organized and orienting them toward common objectives are important first steps. To this effect, SCC and oil and gas sector leaders need to review current standards development processes nationally and internationally and to discuss common objectives regarding the deployment of oil and gas technologies. The aim would be, first, to attract new oil and gas stakeholders to the standardization system – to strengthen current relationships with participating stakeholders and ensure that the activities are coordinated – and, second, to encourage collaboration.

Some of the critical success factors and opportunities for the development of standardization strategies in these areas are described below.

### A. Worker Mobility and Labour Needs

Challenges exist in the labour market given current and projected shortages of oil and gas skilled workers. The time and costs associated with activities such as worker retraining could be considerably reduced if competencies and certifications were harmonized. These are key considerations for operator qualifications in areas such as field operators (poorly defined and encompass a number of business areas, such as offshore work, blaster licence, seismic blaster and oil well blaster certification, oil and gas well services operators), and non-steam-ticketed operators, steam-ticketed operators, supervisors, mining and quarrying, water and waste plant operators, crane operators, power engineers, welders, pipeline inspectors, and so forth. Similarly, harmonization of regulations relevant to skilled workers in the oil and gas sector across Canada

would benefit industry, operators and the public, in terms of increased safety, reduced costs and greater employer and worker mobility. In some areas, competencies do not exist in Canada or abroad, and this is an opportunity for Canada to become a leader in developing national competencies and promoting them internationally.

### **Standardization Option 1: Standardizing Operator Qualifications, Competencies and Certification**

Operator qualification and competency standards must be developed in those priority areas identified, (e.g., crane operators, field operators, non-steam-ticketed operators, steam-ticketed operators, supervisors, mining and quarrying, water and waste plant operators, and power engineers). Currently, there aren't any NSCs in these areas.

The first phase in addressing standardizing operator qualifications, competencies and certification would be to perform a study and analysis of priority areas leading to proposal submissions to respective Canadian SDOs. These proposals would be requests for the development of a new standard, following SCC CAN-P-1, *Program requirements for the accreditation of standards development Organizations and for the Approval of National Standards of Canada*. As previously discussed, when SCC-accredited SDOs develop a standard, the SDO forms a committee composed of volunteer members who represent various groups interested in, or affected by, the standard (i.e., business, industry, regulatory bodies, academia and consumers).

The SDO is a neutral third party, providing a structure and forum for developing standards. SDO committees are created through a "balanced matrix" approach, optimizing the expertise of its members, with no single stakeholder dominating the process. The views of all participants are considered by the committee, in order to develop the details of a standard by a consensus-based process. This process includes the principles of inclusive participation, and respect for diverse interest and transparency. All draft standards are submitted for public review and comment a minimum of 60 days before publication.

In addition to the development of an NSC, consideration should be given to the development of a certification scheme in support of operator qualifications and competencies, based on ISO/IEC 17024, *Conformity Assessment – General Requirements for Bodies Operating Certification of Persons*. ISO/IEC 17024:2012 is used around the globe to harmonize the procedures used for certifying personnel competence in different professions. This standard establishes an environment for the mutual recognition of personnel schemes and facilitates international mobility of personnel in the service sectors, such as healthcare personnel, financial planners, safety professionals and non-destructive testing operators. ISO/IEC 17024 is a globally recognized standard that serves as a benchmark for personnel certification, and can help reduce labour mobility barriers across different jurisdictions.

Lastly, SCC can help federal and provincial/territorial government regulators make the most of the proposed standard(s) and conformity assessment options. Once these solutions have

been developed, SCC could help facilitate the discussion with regulators about the successful integration of standardization solutions for operator qualifications, competence and certification into regulatory practices.

### **Benefits for Canada:**

- Integrates the standards development work with the goal of achieving the greatest practicable degree of commonality between the subject standards.
- Reduces the duplication of effort in the preparation of standards, and makes the most effective use of all resources available.
- Provides a single comprehensive source of information and expertise.
- Reduces constraints on activities and innovation.
- Standardizes requirements – specifies identical requirements.
- Could reduce duplication and overlap of regulatory programs.
- Could streamline regulatory processes on similar subject areas.
- Could standardize regulatory approach - less burdensome regulations.
- Facilitates trade.

## **B. National and Regional Harmonization**

Differences of standards incorporated by reference in safety regulations make it challenging for the sector to operate most efficiently. (See Tables 3 and 4.) The sector is challenged with different standards incorporated by reference in both federal and provincial/territorial regulations, yet concerning identical subject matter – causing industry to be caught between two paradigms. Opportunities for regional operations may assist in the standardization/harmonization of the training provided, for example, in key occupational health and safety (OHS) hazards, such as confined space and fall protection.

**Table 3: Federal, Provincial, Territorial Occupational Health and Safety Summary**

|  |            |
|--|------------|
| Total # of Safety Equipment Subject Areas (including sub areas) <sup>9</sup>   | <b>26</b>  |
| Total # of Standards Incorporated by Reference – Federal Oil and Gas OHS Regulations <sup>10</sup>   | <b>27</b>  |
| Total # of instances where a standard incorporated by reference in federal regulations is different than those incorporated in provincial and/or territorial regulations. (Refer to Annex B for list of regulations examined.) | <b>115</b> |

<sup>9</sup> Safety equipment subject areas explored: safety nets, sound level meters, hearing protection, protective headwear, protective footwear, eye and face protection, respiratory protection, fall protection systems, protection against drowning, fire protection equipment (i.e., fire extinguishers), portable electric tools, ground fault circuit interrupters, explosive actuated fastening tools, chain saws, abrasive wheels, wood working machinery, power press, drilling and production hoisting equipment, mobile equipment, conveyors, ropes, slings and chains.

<sup>10</sup> Instances where “no mention of the subject area” or “no standard was specified” in any given regulation examined were excluded from the analysis, given that the safety equipment standards may be incorporated by reference within a separate piece of federal/provincial legislation.

**Table 4: Federal, Provincial, Territorial Occupational Health and Safety by Region**

| Region*   | The Prairie Provinces and the West Coast (BC, AB, SK, MB) | Central Canada (ON, QC) | The Atlantic Provinces (NL, PEI, NS, NB) | The Northern Territories (YK, NWT, NU) |
|---|---|-------------------------|--|--|
| The approximate number of standards as per federal regulations that are different than those incorporated in provincial/territorial regulations** | 41  | 7                       | 45                                       | 24                                     |

\*Analysis is based on comparing each respective provincial / territorial regulations against federal regulations

\*\*Authorized safety equipment to given standards not permitted for use

## Standardization Option 2: Harmonizing Oil and Gas Occupational Health and Safety Regulations

Considering the harmonization of standards incorporated by reference in federal, provincial and territorial occupational health and safety regulations, a number of standardization options exist. Government and industry could integrate standards development work with the goal of achieving the greatest practicable degree of commonality between subject standards. At the same time, duplication of effort in the preparation of standards would be reduced, making the most effective use of all resources available.

Through harmonization of standards at the national and regional levels, it is possible to advance Canada’s trade objectives by reducing potential barriers to the exchange of goods and services. This is an important consideration for government in its selection and use of applicable standards in regulatory instruments, and for industry to avoid duplication of standards and certification requirements in the oil and gas sector.

Agreements are in place between Canadian, American and Mexican SDOs to support the development of both identical and equivalent standards between the countries. Any document



resulting from a harmonization process is normally used as a seed document by the responsible SDO in each country for further development and approval as a recognized standard for that country. The result can be bi-national (or tri-national) standards that have been submitted through the standards development process of, and published by, two or more SDOs. These standards are either equivalent or identical in nature.

SCC works extensively with national, regional and international standards bodies. There is a need for further exploration of what is the best strategic approach for Canada to participate in national, regional or international standards development relating to oil and gas technologies. As the three levels of standards bodies have significant interplay between each other, ultimately industry needs to help identify what solution will best fulfill current needs and requirements. Likewise, standards approaches will also need to reflect Canada's federal government, regulatory system and requirements.

As a first step to addressing this, SCC proposes further research on the process to harmonize oil and gas occupational health and safety regulations in each jurisdiction, and to investigate the feasibility of standardizing this process, across all jurisdictions, or regionally, with the support of the appropriate regulators and industry.

### **Benefits for Canada:**

- Reduced duplication and overlap in regulatory programs.
- Reduced constraints on activities and innovation.
- Streamlined regulatory processes on similar subject areas.
- Standardized requirements – specify identical requirements.
- Standardized regulatory approach by creating less-burdensome regulations.
- Enabled internal and global trade.

## **C. Pipeline Trade Flows**

Concerns have been raised regarding the future state of pipeline trade flows and Canada's continued recognition as an international leader in oil and gas. At the same time, opportunities for developing standards in critical research and development thrusts in the coming years have been identified. With the support of SCC, involving Canadian representatives in international activities at the ISO and IEC level, on the subject of oil and gas, could include the submission of Canadian research and standards as seed documents for international standards. At ISO, the first step in the development of an international standard is to submit a new work item proposal for vote by the members of the relevant technical committees or subcommittees, to determine the inclusion of the work item in the program of work. Often, a new work item proposal will include a draft document or "seed" document (a document that will help build the actual standard). A proposal is accepted if a majority of the participating members of a relevant technical or subcommittee votes in favour of it, and if at least five participating members commit to actively participate in the project.

ISO and IEC also have a "fast-track" method if a seed document has a certain degree of maturity at the start of a standardization project (for example, a standard being developed by another organization). Typically, this type of document is submitted directly for approval as a draft International Standard (DIS) to the ISO member bodies or, if the document has been developed by an international standardizing body recognized by the ISO Council, as a final draft International

Standard (FDIS), without passing through the previous stages of approval.<sup>11</sup> Canada's innovative research in oil and gas can play an important role in closing gaps where new technologies are not yet addressed in standards.

The widespread adoption of international standards based on Canadian research and technology means Canadian suppliers and businesses can develop and offer products and services meeting specifications that have wide international acceptance in their sectors. Therefore, Canadian businesses using international standards can compete in many more markets around the world.

The strong alignment between these standardization priorities and the critical research areas identified by the oil and gas sector will benefit both Canada and the international community. By working cooperatively, SCC and the oil and gas sector are able to further the development, standardization, and promotion of new and existing technologies that reduce this sector's environmental impacts, while creating important economic opportunities for Canada.

### ***Standardization Option 3: Seeding Canadian Pipeline Design and Construction Standards Internationally***

Canada's pipeline design and construction standards could be seeded internationally into ISO, where it is possible to advance the oil and gas sector's trade objectives by reducing potential barriers to the exchange of goods and services. As the facilitator and manager of Canada's participation in ISO and IEC, SCC has an exclusive avenue in addressing trade flow concerns where standards may be involved. The development of a national or international standard typically takes two to three years to complete, although seeding an already existing standard of practice produces, in most cases, quicker development times.



#### ***Benefits for Canada:***

- Development of new standards in the critical research and development thrusts that Canada will focus on in the coming years.
- Submission of Canadian research as seed documents for international standards.
- The widespread adoption of international standards based on Canadian research and technology means that Canadian suppliers and businesses can develop and offer products and services meeting specifications that have wide international acceptance in their sectors.
- Further development, standardization and promotion of new and existing technologies while creating important economic opportunities for Canada.
- Facilitation of trade.

<sup>11</sup> [http://www.iso.org/iso/home/standards\\_development/resources-for-technical-work/stages\\_of\\_the\\_development\\_of\\_international\\_standards.htm](http://www.iso.org/iso/home/standards_development/resources-for-technical-work/stages_of_the_development_of_international_standards.htm)

## Other Areas of Concern

Other notable areas of concern described by industry executives, but not explored in this document:

1. Technology is changing faster than regulations, where industry is constantly ahead of government in terms of logistics and understanding of operations. Technology is often proprietary and industry is often challenged with maintaining a level of confidentiality while meeting regulatory responsibilities.
2. Seismic considerations at one time were a pressure for the oil and gas sector in terms of its environmental footprint. In the last couple of years, seismic considerations have shifted to oil sands, and most recently, to pipelines and fracturing. Industry is often reactive to such issues, rather than being proactive.

## Risks and Dependencies

The development of standardization options for the oil and gas sector concerns a number of validated priority areas identified by senior-level sector executives. Success entails a clear articulation of a proposal for development of those standardization options identified. A critical path is needed to support the implementation of each priority. Key stakeholders must develop a collective understanding of, and must support, the actions that require implementation. In some cases, these action items include financial and human resources to move the targeted priority areas forward.

- Risks of not pursuing standardization strategies for the oil and gas sector:
  - A continuance of increased business costs for both equipment manufacturers and operators/users, longer time to market, higher inventory costs, and increased purchasing and shipping costs, as well as worker retraining needs.
  - Loss of Canadian participation in standards development nationally, regionally and internationally.
  - Introduction of unsafe products into Canada from other countries.
  - Redundant double testing of products and increases in opportunity costs from foregone profits to reduced efficiency costs.
  - Reductions in innovation and competition costs by requiring operations to be conducted in a particular way.
- Should the recommended priorities and their actions be pursued, some of the individual project risks could include:
  - Scope of projects is large: need to focus on a few pieces of the system of most value in demonstrating relevancy.
  - Need to develop new approaches and new strategic thinking.
  - Find solutions for challenges of operating in global context.
  - Establish balance between environmental safety and business practices, and incentives.

- Dependencies:
  - A strong commitment from oil and gas sector executives to support initiatives.
  - Increased communication with SDOs regarding standards development.
  - International product safety policies (including operating within a global marketplace).
  - Public support.

## Expected Results

The following are the expected results of implementing any one of the previously mentioned recommendations, and includes short-term outcomes (1-6 months), medium-term outcomes (6-18 months), and long-term outcomes (ongoing).

### Short-term outcomes:

- Confirmed alignment to federal government priorities – meetings with relevant government departments concerning Canada’s oil and gas occupational health and safety regulations.
- Developed and circulated standardization options comprising a number of approaches and solutions in addressing the afore-mentioned priority areas to oil and gas sector executives and leaders.
- Identification of industry supporters.

### Medium-term outcomes:

- Facilitation of the necessary interchanges between industry and government (federal, provincial and territorial) in addressing disparities across jurisdictions that are impeding worker mobility, and to coordinate the development of cross-jurisdictional competency standards that would alleviate barriers in labour mobility.
- Meetings with SDOs concerning identified and validated sector priorities and goals – to address the standardization of operator qualification, competencies and seeding Canadian pipeline standards internationally.
- Canadian proposal submitted internationally to ISO, on the development of pipeline design and construction standards.

### Long-term outcomes:

- Publication of international ISO standard on pipeline design and construction standards seeded on Canadian standards.
- Publication of new operator qualification and competency standards.
- Publication of revised new editions of occupational health and safety standards.
- Revisions made to government (federal, provincial and territorial) oil and gas regulations, specifically in the areas of occupational health and safety, and worker qualifications and competencies.



## 6. Next Steps

SCC is looking forward to continue engaging oil and gas sector stakeholders in:

- Reviewing and updating the information contained in this document.
- Agreeing on a way forward for those standardization initiatives that address sector priorities.
- Identifying supporters to drive key initiatives forward.
- Engaging in the future identification of oil and gas standardization priorities that SCC and accredited SDOs will aim to support.

Moving forward, this document will serve as a framework for guiding SCC and the oil and gas sector in their respective roles and responsibilities. This document will be adjusted to reflect ongoing discussion with the oil and gas sector, and may be updated thereafter.

Ideally, the process of identifying, supporting and updating oil and gas standardization priorities and goals would be communicated to SCC through a single forum for oil and gas executive leaders, who will have been designated by key oil and gas sector associations. SCC's lead for industry engagement is:

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Proposed Standardization Solutions  
Supporting Oil and Gas Sector Priorities

## Annex A – Sector Associations

Association of Professional Engineers and Geoscientists of Alberta (APEGA)

Canadian Association for Geophysical Contractors (CAGC)

Association of Professional Engineers and Geoscientists of Alberta (APEGA)

Canadian Association of Oilwell Drilling Contractors (CAODC)

Energy Council of Canada

ENFORM (Safety Association for Canada's Upstream Oil and Gas Industry)

International Association of Geophysical Contractors (IAGC)

Petroleum Human Resources Council of Canada

Canadian Association of Geophysical Contractors (GCAC)

Canadian Association of Petroleum Producers (CAPP)

Canadian Energy Pipeline Association (CEPA)

Canadian Heavy Oil Association (CHOA)

Canadian Hoisting and Rigging Safety Council (CHRSC)

Canadian Gas Association (CGA)

Explorers and Producers Association of Canada (EPAC)

Oil Sands Safety Association (OSSA)

Petroleum Human Resources Council of Canada

Petroleum Services Association of Canada (PSAC)

Petroleum Technology Alliance of Canada (PTAC)

## Annex B – Canadian Occupational Health and Safety Regulations Affecting Oil and Gas for the Purpose of Harmonization

SCC examined the following federal, provincial and territorial regulations:

- *Canada Labour Code, Oil and Gas Occupational Safety and Health Regulations*
- *British Columbia Workers Compensation Act, Occupational Health and Safety Regulations, Part 23 – Oil and Gas*
- *Alberta Occupational Health and Safety Act, Occupational Health and Safety Code, Part 37 – Oil and Gas Wells*
- *Saskatchewan Occupational Health and Safety Act, Occupational Health and Safety Regulations, Part 29 – Oil and Gas*
- *Manitoba Workplace Safety & Health Act, Workplace Safety & Health Regulations, Part 41 – Oil and Gas*
- *Ontario Occupational Health and Safety Act, R.R.O. 1990 Regulation 851, Industrial Establishments*
- *Ontario Occupational Health and Safety Act, R.R.O. 1990 Regulation 855, Oil and Gas – Offshore*
- *Quebec: Regulations respecting occupational health and safety, An act respecting occupational health and safety*
- *Newfoundland & Labrador Occupational Health and Safety Act, Occupational Health and Safety Regulations*
- *P.E.I. Occupational Health and Safety Act, General Regulations*
- *Nova Scotia Occupational Health and Safety Act, Occupational Safety General Regulations*
- *New Brunswick Occupational Health and Safety Act, Regulation 91-191*
- *Yukon Occupational Health and Safety Act, Occupational Health and Safety Regulations, Part 17 – Oil and Gas Industry*
- *N.W.T. and Nunavut Safety Act, General Safety Regulations R.R.N.W.T. 1990, c5.1*

## Annex C – About Standards Council of Canada

The Standards Council of Canada (SCC) is a Crown corporation established by an Act of Parliament in 1970 to foster and promote efficient and effective voluntary standardization in Canada. Although financed in part by Parliamentary appropriation, SCC policies and operations are managed independently of government. SCC is overseen by a governing Council whose membership includes government and private-sector representation.

SCC offers accreditation services to both standards development organizations and conformity assessment organizations. It coordinates the efforts of Canadians in the development and use of national and international standards, and offers a range of standardization-related programs and services that contribute to safeguarding the social and economic well-being of Canadians.

In addition, SCC serves as the government's focal point for voluntary standardization and represents Canada in international standardization activities. SCC sets out policies and procedures for the advancement of Canada's standardization network and for the accreditation of standards development organizations, product certification bodies, proficiency testing providers, testing and calibration laboratories, management systems certification bodies, inspection bodies, greenhouse gas validators and verifiers, and personnel certification bodies. SCC also administers the good laboratory practices initiative under the Organization for Economic Co-operation and Development.

SCC supports the principle of recognition of accreditation or equivalent systems as a means of decreasing the number of duplicate accreditations required of conformity assessment bodies.

### **SCC Standardization Services**

A range of SCC activities may be of value to federal government department in achieving their priorities, including:

- **Management systems**

In the procurement and delivery of services to Canadians, a given federal department may benefit from expanding the use and conformance<sup>12</sup> to existing management systems for quality, environmental, energy, food safety, and occupational health and safety purposes. In some instances, the requirement for use and proof of conformity to a particular management systems standard may be advisable for a supplier requirement.

- **Inspection services and/or Personnel Certification**

The department may employ and or/contract the services of auditors and inspectors. The use of SCC-accredited organizations for the delivery of inspection-related services may complement the department's mandate.

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<sup>12</sup> Management systems certification by an SCC-accredited conformity assessment body demonstrates that the certified organization has put the necessary management systems in place to consistently deliver products or services that conform to the applicable standard (e.g., ISO 9001, ISO 14001, ISO 22000). SCC is the only Canadian organization that accredits management systems certification bodies.

- **Greenhouse Gas Emissions**

Greenhouse gas (GHG) emissions reduction projects and inventories may benefit from objective assessments by GHG validation and verification bodies that can provide evidence-based statements and confidence that those GHG assertions are accurate. SCC accreditation program for GHG validators and verifiers, which is based on internationally recognized and accepted standards, provides assurance of a supplier's competence to perform GHG validation and verification.

- **Product Certification**

Approximately 35 agencies accredited by SCC provide product certification services to the Canadian marketplace for products ranging from electrical to personnel protective equipment to organic food. Establishing a policy for the use of products certified by SCC-accredited bodies would be a means of showing these bodies' commitment and dedication to quality and safety.

- **Laboratory Accreditation**

There are more than 350 laboratories accredited by SCC. In addition to the accreditation of testing and calibration laboratories, SCC offers accreditation for medical testing laboratories, proficiency testing provider accreditation and good laboratory practice recognition. Testing conducted by an accredited laboratory adds another level of assurance that a product meets industry-specific standards or regulatory requirements.

- **Participating in International Standardization**

SCC coordinates membership on standards development and conformity assessment committees that determine Canada's official position within various international bodies (such as ISO and EC).

- **Monitoring Standards in Regulations**

Standards represent a necessary complement, as well as an alternative, to Canada's regulatory framework. Using standards to achieve public policy objectives represents a good regulatory practice in line with the requirements of the *Cabinet Directive on Streamlining Regulations and World Trade Organization Technical Barriers to Trade Agreement*. SCC's monitoring service on the status and life cycle of standards incorporated by reference assists federal departments in assessing and ensuring the appropriateness and ongoing maintenance of the standards they use to pursue regulatory objectives.

- **Standards Roadmaps**

Participants within Canada's standardization network are mapping standards and conformity assessment strategies that support the growth of Canada's key economic sectors and/or that contribute to protecting Canadians' health and safety. This mapping involves working with affected stakeholders to identify existing standards and standardization gaps and opportunities that exist within each given sector domain, as well as key considerations and recommended solutions. While there has been significant support for the idea of sector roadmaps across government departments, the ability to secure federal funding has not always been possible.





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