C∆PP CANADA'S OIL & NATURAL GAS PRODUCERS

Guide

Critical Roles and Competency
January 2017

The Canadian Association of Petroleum Producers (CAPP) represents companies, large and small, that explore for, develop and produce natural gas and crude oil throughout Canada. CAPP's member companies produce about 85 per cent of Canada's natural gas and crude oil. CAPP's associate members provide a wide range of services that support the upstream crude oil and natural gas industry. Together CAPP's members and associate members are an important part of a national industry with revenues from oil and natural gas production of about $120 billion a year. CAPP's mission, on behalf of the Canadian upstream oil and gas industry, is to advocate for and enable economic competitiveness and safe, environmentally and socially responsible performance.

Overview

CAPP's Safe Operations Strategy *Enabling Zero* identifies objectives and collective initiatives CAPP can do to support members' efficient operations and improvement of safety performance. The strategy is a new approach including

- a more inclusive safety scope (people, process and product stewardship),
- high-risk focus (severity/consequence),
- and analysis based upon data-driven decision making.

The first foundational years of *Enabling Zero* includes the development of strategic guidance and a consistent systematic approach to assure the upstream oil and gas operations are planned and executed by competent personnel.

This document delivers CAPP's strategic guidance and systematic approach to competency in three parts:

1) The document provides background information on the importance and relevance of competencies in the Canadian oil and gas industry including the challenges faced by the industry.
2) The document outlines the overarching, goals and some of the possible objectives for future initiatives designed to improve the handling of competencies in the industry.
3) The document defines key terms and concepts as a foundation for future discussion of competencies within the industry.

Members are advised that it is up to each operator to apply the content of this guide in the context of their own operations and existing management system.

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1   Background

Protecting our people and the environment is a core value that is central to our operations. Oil and gas activities are potentially high risk and are often carried out in difficult and complex environments. Risk mitigation under these conditions requires the combined efforts of multiple personnel with a variety of competencies.

The oil and gas industry has a duty under multiple General Duty of Care legislated regimes to ensure personnel develop the combined and/or appropriate level of competency.

To be competent, personnel working individually, in teams and/or in organizations, must have the knowledge, experience and ability to carry out their assigned duties, to recognize their limitations and take appropriate action to mitigate risk.

The absence of standardized industry or corporate competency framework(s) and validation processes, may expose companies and individuals to potentially significant operational, legal, and personal risk.

2   Goals

Future initiatives designed to improve how the industry manages competency in the workplace will be developed to support one, or both, of the following strategic goals:

- Each organization should assess the risks and regulatory expectations associated with their operations to identify roles and associated competencies. Assessment and development of those competencies would benefit the safe and compliant execution of work.

- Each individual in a critical role should develop the necessary competencies that allow them:
    - To complete tasks that might reasonably be assigned
        - o   in normal operating conditions,
        - o   in abnormal conditions and
        - o   during changes in operations.
    - To respond and react accordingly, at the level that may reasonably be required, during an emergency.

2.1   Objectives

CAPP has identified the following objectives as foundational initiatives that would support the identified strategic goals:

- Provide a systematic risk-based approach to determine and identify roles, especially those considered "critical."

- Provide a sustainable competency management framework that corresponds with the size, nature, and complexity of the operations and activities (see Section 4 for detail).

- Encourage a safety culture that values competency.

- Explain how collective competency can improve efficiency, mitigate risk and satisfy regulatory expectations.

- Assist in improving HSE and operational integrity outcomes, and create business benefits.

3　Guiding Concepts and Definitions

The following guiding concepts and definitions act as a baseline for future discussions within the industry, and for CAPP initiatives in particular.

3.1　Guiding Concepts

- **Risk Mitigation**

  – Oil and gas activities are potentially high risk and are often carried out in difficult and complex environments. Under these conditions, the likelihood that a risk event will occur and/or reduction of the effect of a risk event if it does occur requires the combined efforts of multiple personnel with a variety of competencies.

- **Competency as Risk Mitigation**

  – Personnel, working individually, and/or in teams within an organization will have individual and collective competency contributions that can mitigate specific operational risk(s).
  – An organization must use a framework that allows for the identification of risk mitigation that is competency dependent and the roles that have control and/or influence over the identified risk(s).
  – Each risk mitigation dependent upon competency should be directly linked with the organization roles that have control and/or influence over the identified risk(s).

- **Critical Competencies as Risk Mitigation*:**

  A critical competency is a competency used as a mitigation of a risk that has a direct influence on HSE and operational integrity.

  – Critical competencies require objective assessments.
  – Each organization must assess the risks associated with their operations to identify their critical competencies.
  Note: Critical competencies can be identified and applied to individual, collective, or industry risk mitigation efforts.

- **Individual Competency:**

  – Individuals develop their competence over time through a combination of structured training, on-the-job experiences, mentorship, assessment feedback and formal qualification programs. As an individual's competency develops, their ability to work independently increases.
  – As competencies are developed, they progress from basic to advanced.
  – Training is not equal to, nor an indication of competency. Training should be considered one of the methods that can be utilized to assist individuals to develop competency.

- Qualifications and designations are issued to individuals to indicate a level of obtained knowledge with reference to identified standards. The competency of an individual within an organization must be based on the assessed competencies relevant to their role.

- **Collective Competency:**

  - Collective competency refers to the combined competency of individuals (e.g., crew, shift, team, organization etc.).
  - Collective competency expectations should be based upon the level/type of risk and the complexity of the operations to be executed. The process should accommodate both employee and contractor personnel. A critical point of competency assurance is at the work execution level (e.g., planning, supervision or oversight).
  - Where collective competency expectations do not meet the desired level of competency, gaps should be mitigated through the use of other team members, by contracting of specialist third party service providers, or through the utilization of other mitigating efforts.

- **Industry Competency:**

  - Industry competency refers to those critical competencies identified by the oil and gas industry for proactive workforce development.

3.2   Definitions

- **Competence:**

  - Is the ability to perform activities and to undertake work functions in accordance with organizational and regulatory expectations, and to do so under normal, inclement and emergency conditions.

- **Competency:**

  - Is a predictive ability to perform based on a combination of knowledge, practical and thinking skills, and experience. Acceptable competency depends upon the context, regulatory expectations and the environment in which the activity/function is being performed, and also on the organization's risk tolerance.

4   Competency Management Framework

One of the objectives cited in Section 2.1 is establishing a competency management framework.

The framework acts as a common set of definitions and concepts underpinning the development of future initiatives. The intent of a competency framework is to create alignment between critical competencies, existing regulations, HSE and operational integrity outcomes, and the continued improvement of expectations.

A competency framework must include:

- A method of identifying risks mitigated by personnel competency and determining the criticality to HSE and operational integrity.

- A defined competency assessment methodology that integrates a variety of data types (i.e., education, cognitive assessments, experience, observation assessments, self-perception, etc.)

- A method of achieving a consistent and evolving correlation to regulatory expectations

- A process ensuring competency targets are established for individual personnel and groups

- Defined metrics (key performance indicators) for the measurement of collective competency (percent of targets, annual improvement, effect of degradation etc.). Metrics should be flexible to accommodate organizational changes including scope of undertakings.

And may include but would not be limited to the following:

- A standardized lexicon or wordlist

- Standardized key concepts

- Industry-wide guidance for the identification of critical competencies associated and in relationship with specific roles (see Section 3.2)

- Guidance for the creation of functional competency expectations

- Defined approach to Competency Management Systems (CMS)

Once established, the framework should be adaptable. It should be able to expand to include identified risks in new and/or changing operations, and able to include personnel at all levels of an organization.

The framework should be able to be built / developed over time as critical risks are identified and prioritized. As the framework matures, the industry would not only start approaching competency management consistently, but also shed misconceptions related to competency. Two corrections stand out:

1) **There is no one-to-one relationship between training and competency**: Personnel may be trained for an activity or function, but still not be sufficiently competent. Conversely, personnel may be fully competent for a certain activity or function, and yet have no formal training.

2) **There is no definitive end to the process of assessing competencies**: Not only do personnel constantly build new skills, and lose or forget others, but the competencies required for specific activities or functions are constantly changing as equipment, regulations, personnel and organizational structures change.

Misconceptions such as these lead to unwarranted assumptions that carry operational risk. A well-understood and consistent competency management framework would clarify many of these issues for the industry.

4.1   Competency Management Systems

A Competency Management System (CMS) is a consistent risk-based systematic approach to assess, develop, and maintain workforce competencies. They are commonly used to formalize how organizations manage competencies. While they are not in of themselves a guarantees of attaining organization competency targets, they can enable effective and efficient management of workforce competency.

Essentially, a CMS is a system designed to track data on risk mitigation efforts reliant on personnel competency, determine competency expectations (individual and collective), assess to expectations and monitor developmental activities. When gaps exist in critical competencies, resources can be quickly mobilized to eliminate the gap and the resultant exposure to operational risk.

Additionally, the ability to quickly assess and compare the competency data of different personnel and/or groups to organizational competency targets is very valuable. It allows the organization to make the best use of the organization's talent pool and to allocate training resources more effectively.

Some of the key benefits of a CMS include:

- Enhanced safety, efficiency and effectiveness of operations

- Reduced potential for human error

- Improved adherence to evolving regulatory requirements on competency

- Improved assurance that employees have been properly selected, trained, developed, and retained

- Enhanced encouragement for individuals to develop their competency over time, in a way that is aligned with organizational targets

- Enhanced motivation, increased job satisfaction, and reduced turnover

- Enhanced and simplified personnel performance reviews

- Improved verification of training effectiveness

4.1.1   Developing a Competency Criteria Aligned with Operational Risks

For appropriate risk mitigation in an organization, a CMS organizes the competencies required for the risk reduction, the assessment results and the developmental efforts/achievement of the participating personnel.

Developing the competence criteria for a role starts with the identification of operational/individual risks by utilizing hazard identification / analysis techniques (i.e. job hazard analysis), determining appropriate mitigation for the hazards identified and where personnel have a role in the mitigation, the type/level of competency necessary for applicable personnel to effectively implement the reduction. The competence

criteria for a role are then the competencies that are required by a person to mitigate hazards of their work activities and/or operational risks under their responsibility.

This method has some advantages. For one, by first identifying hazards and the type of mitigation required, and then determining what competencies are required for the mitigation that is personnel dependent, efforts can be focused on critical risks and the information can be re-used for other roles with the same responsibility (i.e., it is a modular and standardized approach that can be readily expanded).

4.1.2   Assessing the Competence of Personnel in a CMS

Assessing employee competence relative to the competence criteria for their role is another function systematized within a CMS. Although an employee's past training, work experience and certifications may have contributed to the development of their competency they cannot be considered proxies for competence. Even though someone might have a training certification, years of experience or qualifications, he/she can still be lacking the desired competence for a role. To establish competency assessments must be performed and a CMS can be used to define the types of assessments required and record assessments results. Where further development is required, the system tracks the development plan and date of reassessment.

A defined assessment methodology must integrate a variety of data types to achieve a level of reliability (e.g., education, capability assessments, experience, observation assessments, self-perception, work product reviews, etc.).

4.1.3   Building a Risk-Based CMS

It is difficult, and sometimes unnecessary, to build and roll out a CMS that addresses the activities/functions of all personnel in an entire organization. Instead, a CMS should be developed and implemented in stages, focusing efforts on risk mitigation that is reliant on personnel competency (see Section 3.1). Subsequent phases may include non-critical risks and encompass additional roles. However, non-critical risks/roles do not necessarily require inclusion in a CMS, as they can be managed through the organization's performance management system.

Initial Phase:

3) Determine significant business and operational risks.
4) Identify where personnel are the method of mitigating this risk (Critical Roles).
5) Identify the critical competencies of personnel holding Critical Roles based on their responsibilities in mitigating the risk.
6) Identify any specific qualifications and experiences that would assist in the development of competency and or the individual's proficiency.
7) Assess the capability (thinking) and ability (doing) attributes of personnel in critical roles to determine competency levels. The level of risk should dictate the extent of assessment efforts.

8) Establish development plans and activities utilizing a formal 70:20:10 model with established developmental goals and reassessment dates.

a. 70 % being competency development through participation in challenging assignments, increases in work-scope, horizontal moves, new initiatives, turnarounds, etc.

b. 20 % being social based development that revolves around interactive work relationships i.e. mentors, coaches, networking, peers and superiors

c. 10 % being traditional coursework and training i.e. classroom-based virtual classroom events, simulations, videos, etc.

The flexibility of developmental methods is as a result of, and dependent on, the availability of objective competency assessment data and a multi-faceted assessment process (see Section 6.1).

9) Reassess and repeat developmental planning as required.

4.2   Critical Roles

Critical roles are those where a lack of competency can result in significant unmitigated operational risks. Critical competencies are competencies that, if present, create the capability within an individual or a group of individuals to be able to mitigate significant operational risks.

Critical roles will vary based upon the industry/process e.g., Mine Managers (Oil Sands Mining), Process Engineers (Upgrading), Construction Superintendents (large-scale construction). The following list provides an example of potentially critical roles in various operational sectors, but does not restrict in any way, the types of roles that an organization might include in its CMS:

Table 1: Example of Critical Roles in Industry

Operational Sector	Competency as Risk Mitigation	Critical Role (Position)
Drilling & Completions	Ignition of Sour Gas / LNG plume	- Drilling Engineer - Well Site Supervisor
Oil Sands Mining	Creation/Management of Mine Safety Plan	- Mine Manager
Refining	Process Safety Management Program	- Process Engineering Manager - Chemical Engineering Manager - Safety Engineering Manager
Pipeline	Leak Prevention and Detection Program	- Line Operations Manager
Construction	Developing/Managing Engineered Lift (Tandem)	- Lift Engineer - Lift Supervisor

5 Measuring Success: KPIs

5.1 Assessing Competency

As competency is the combination of both cognitive (thinking) and ability (doing) attributes, assessment activities must consider both.

- Capability (thinking) is most objectively and efficiently assessed using standardized processes (often computer based) that allow the assessment process to occur out of an at-risk workplace environment, and include scenarios that are unable to be assessed on a typical worksite (e.g. non-standard, infrequent, high risk and/or emergency conditions).

- Ability (doing) competencies are ones that can be assessed by observing the subject. As observational assessments can be highly subjective, the inclusion of multiple inputs minimizes subjectivity.

A designated and objective assessor can observe personnel in roles with limited diversity and/or work scope. Where a role is more complex, diverse and/or varied, cognitive assessments will have more weight and observational assessments will need to be augmented by monitoring existing performance measures.

5.2 Key Performance Indicators

Key performance indicators (KPIs) are objectively assessed and can be measured to demonstrate performance improvement. KPIs for initiatives stemming from this guidance document should focus on continual improvement and/or on achieving the collective competency necessary for the effective and consistent management of risk (see Section 3.1).