



File OF-Surv-OpAud-T241-2017-2018 01
7 March 2018

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Dear Dr. Ramsay:

**Notification of the National Energy Board's (Board or NEB)
Final Audit Report for: TransCanada Keystone Pipeline GP Ltd.**

The National Energy Board (NEB or the Board) has completed its Final Audit Report of TransCanada Keystone Pipeline GP Ltd. (TransCanada Keystone) NEB regulated facilities. The findings of the audit are based upon an assessment of whether TransCanada Keystone was compliant with the regulatory requirements contained within:

- the *National Energy Board Act* and its associated regulations, including;
- the *National Energy Board Onshore Pipeline Regulations (OPR)*;
- any conditions contained within applicable Board certificates or orders issued by the Board (collectively referred to as, Legal Requirements).

This audit was focused on 12 legal requirements primarily on, but not limited to, OPR sections 32-35 and 6.5 (1) (c), (d), (e), (f) and (t) as well as relevant clauses within CSA Z662 as presented in Appendix 1.

TransCanada Keystone was required to demonstrate the adequacy and effectiveness of the methods it has selected and employed within its management system and programs to meet the regulatory requirements listed above. The Board has enclosed its Final Audit Report and associated Appendices with this letter. The Board will make the Final Audit Report public and it will be posted on the Board's website.

Within 30 days of the issuance of the Final Audit Report by the Board, TransCanada Keystone is required to file a Corrective and Preventative Action Plan (CAPA), which describes the methods and timing for addressing the Non-Compliant findings identified through this audit, for approval.

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The Board also will make the CAPA public and will continue to monitor and assess all of TransCanada Keystone's corrective actions with respect to this audit until they are fully implemented. The Board will also continue to monitor the implementation and effectiveness of TransCanada Keystone's management system and programs through targeted compliance verification activities as a part of its on-going regulatory mandate.

If you require any further information or clarification, please contact Niall Berry, Lead Auditor, at 403-471-1921.

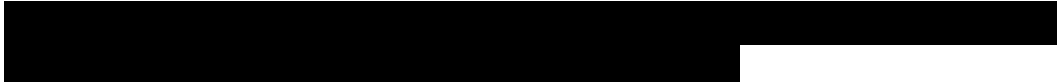
Yours truly,

Original signed by

Sheri Young
Secretary of the Board

Enclosure

c.c.



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Board



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TransCanada Keystone Pipeline GP Ltd.
Hazard and Risk Assessment as related to Emergency Management
File: OF-Surv-OpAud-T241-2017-2018 01

P.O. Box 1000, Station M
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7 March 2018



Executive Summary

In accordance with Section 49(3) of the *National Energy Board Act* (NEB Act), the National Energy Board (NEB or the Board) conducted a compliance audit of TransCanada Keystone Pipeline GP Ltd. (TransCanada). This audit took place from 12 September to 2 November 2017.

This audit is one in a series of focused audits that the Board is conducting to examine particular aspects of company emergency management programs related to the identification and mitigation of hazards. The key objective of this audit was to verify that selected companies are developing fundamental components of their Emergency Management Programs to be effective in the mitigation of the hazards and associated risks of their facilities and activities. In particular, this audit examined the identification and control of hazards within a company's:

- Emergency procedures manuals;
- Emergency related contingency and/or site-specific plans; and
- Emergency exercise programs.

The Board conducted the audit of TransCanada using the protocols attached in Appendix 1 of this report. During the audit, the Board assessed whether TransCanada's documentation, processes and activities complied with the legal requirements contained within:

- The *National Energy Board Act*;
- The *National Energy Board Onshore Pipeline Regulations* (OPR); and
- Canadian Standards Association Z662-15 – *Oil and Gas Pipeline Systems* (CSA Z662-15).

The audit focused on 12 legal requirements primarily focusing on, but not limited to, OPR sections 32-35 and 6.5(1) (c), (d), (e), (f) and (t) as well as relevant clauses within CSA Z662-15 as presented in Appendix 1. The Board did not identify any compliance issues within 10 of the sections. The remaining two sections where non-compliances were identified, the Board requires that TransCanada develop corrective and preventive actions plans.

The non-compliances noted are:

- TransCanada did not demonstrate that it has developed and implemented an explicit, systematic, documented process for identifying and analyzing all hazards and potential hazards that met the requirements of the OPR section 6.5(1)(c) for its Emergency Management Program. (Refer to Appendix 1 Protocol Item AP-07);
- TransCanada did not demonstrate that it has established and implemented a process for developing contingency plans for abnormal events that may occur during emergency situations that met the requirements of the OPR section 6.5(1)(t). (Refer to Appendix 1 Protocol Item AP-11)

Within the scope of the audit, the Board found TransCanada's Emergency Management program, manual, contingency plans and exercises addressed and controlled the majority and most significant of the company's emergency management related hazards and associated risks. The audit also determined that TransCanada conducts various activities and practices related to the identification and control of hazards in its Emergency Management Program. The two findings of Non-Compliance were related to the formal and adequate documentation of processes as required by the NEB OPR.

Within 30 days of the Final Audit Report being issued, TransCanada must develop and submit a Corrective and Preventative Action plan (CAPA) for Board approval. The CAPA must outline how TransCanada intends to resolve the non-compliances identified by this audit to prevent recurrence and the timeline in which corrective and preventative actions will be completed. The Board will verify that the corrective and preventive actions are completed in a timely manner. The Board will continue to monitor the implementation and effectiveness of TransCanada's management system and programs through targeted compliance verification activities as part of its ongoing regulatory mandate.

Table of Contents

EXECUTIVE SUMMARY	2
1.0 INTRODUCTION	5
1.1 AUDIT OBJECTIVE	5
1.2 AUDIT SCOPE	5
1.3 AUDIT CRITERIA	6
2.0 AUDIT PROTOCOL DESIGN.	6
3.0 COMPANY OVERVIEW	7
4.0 AUDIT FINDINGS ASSESSMENT	8
5.0 TABLE 1: AUDIT FINDINGS ASSESSMENT SUMMARY	8
6.0 CORRECTIVE ACTION PLAN SUBMISSION.....	11
APPENDIX I – HAZARD AND RISK ASSESSMENT AUDIT AS THEY RELATE TO EMERGENCY MANAGEMENT - AUDIT ASSESSMENT TABLES	12
APPENDIX II – AUDIT PROCESS OVERVIEW	31
APPENDIX III - TERMINOLOGY AND DEFINITIONS	34
APPENDIX IV - ABBREVIATIONS	38
APPENDIX V - DOCUMENTS AND RECORDS REVIEWED	39
APPENDIX VI – TRANSCANADA KEYSTONE – COMPANY REPRESENTATIVES INTERVIEWED.....	44
APPENDIX VII - BOARD DIRECTION AND GUIDANCE ON THE CORRECTIVE ACTION PLAN	45



1.0 Introduction

In accordance with Section 49(3) of the *National Energy Board Act* (NEB Act), the National Energy Board (NEB or the Board) conducted a compliance audit of TransCanada Keystone Pipeline GP Ltd. (TransCanada). An overview of the audit process and an explanation of definitions and abbreviations can be found in Appendices II – IV.

1.1 Audit Objective

The objective of this audit was to verify that TransCanada is developing key components of its required Emergency Management Program consistent with the hazards and associated risks of its facilities and activities for its federally regulated Keystone Pipeline assets (Keystone).

1.2 Audit Scope

The audit scope included the relevant requirements of the *National Energy Board Onshore Pipeline Regulations* (OPR) primarily focusing on, but not limited to, OPR sections 32-35 and 6.5(1) (c), (d), (e), (f) and (t), as well as relevant clauses within CSA Z662-15. The key components of the TransCanada Emergency Management Program that were reviewed during this audit were:

- the existence of an Emergency Management (EM) Program that is applied to the Keystone Pipeline;
- the emergency manual;
- contingency plans; and
- emergency exercises.

In addition, the audit examined the EM program in the context of TransCanada's Management System for Keystone. In particular, the scope of this audit included a review of the following requirements:

- Policies and Goals;
- Management of Change;
- Training and Competency;
- Document Control;
- Inspection and Monitoring
- Hazard Identification, Risk Assessment and Control;
- Hazard Inventory; and
- Contingency planning.

1.3 Audit Criteria

During the audit, the Board assessed whether TransCanada's documentation, processes and activities within its EM Program complied with the relevant legal requirements contained within:

- The *National Energy Board Act*;
- The *National Energy Board Onshore Pipeline Regulations* (OPR); and
- Canadian Standards Association Z662-15 – *Oil and Gas Pipeline Systems* (CSA Z662-15).

2.0 Audit protocol design.

The focused audit protocol used for this series of audits is based on the NEB Management system requirements found in Section 6 of the OPR.

In the audit protocol (Appendix I), TransCanada's EM Program was audited against the relevant legal requirements to answer the question:

- Is the company developing key components of its required emergency management programs to address the hazards and associated risks of its facilities and activities with a focus on its manuals, exercises and contingency plans?

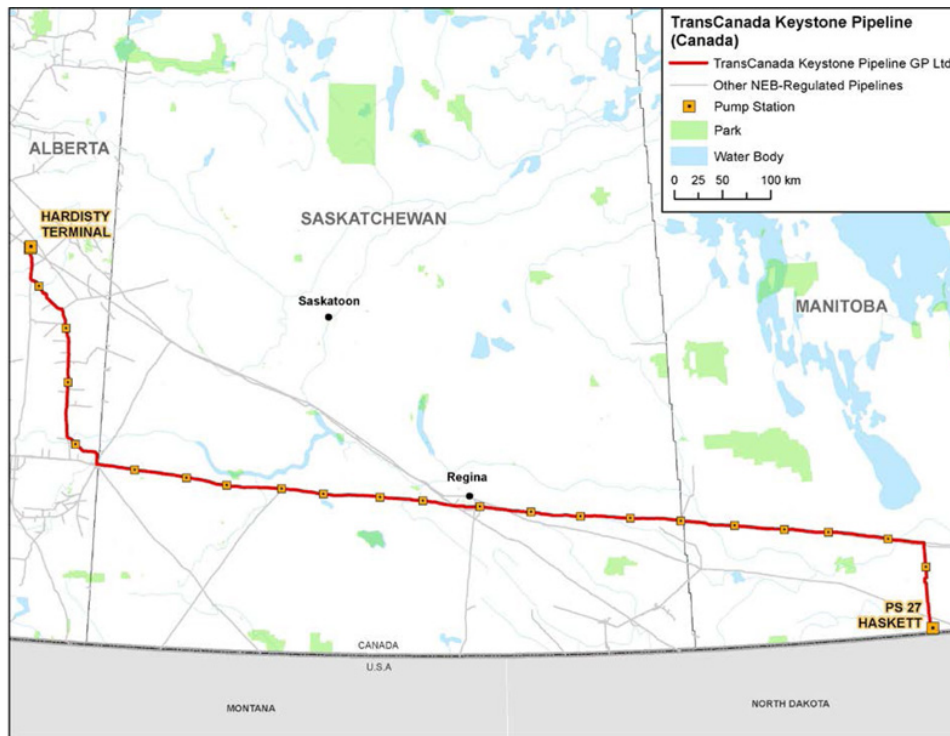
Audit Protocol (AP) questions were assigned a numbering system from AP-01 to AP-12.

As a focused audit, not all protocol items included an assessment of the management system process required in the OPR. For AP 01-06 and AP 12, companies were assessed based on the linkages that could be demonstrated between the emergency program and the management system process in place. The audit did not assess the adequacy or effectiveness of the corporate management system process itself. Rather, emergency management documentation was reviewed to verify that the all documents adhered to the requirements of the corporate document control process.

In the examination of AP-07-AP11, this audit assessed the management system processes as implemented within the EM Program. This assessment was done to verify that the company had implemented, documented corporate management system processes to drive the identification, analysis and mitigation of hazards and potential hazards as per OPR section 6.5.1(c) to (f).

3.0 Company Overview

The TransCanada Keystone Pipeline System (Keystone) is an oil pipeline system in Canada that extends into the United States. The pipeline was commissioned in 2010 and is owned solely by TransCanada Corporation. It runs from the Western Canadian Sedimentary Basin in Alberta to delivery points in Illinois and Texas, and then on to local refineries via third party pipelines. It also connects to oil tank farms and an oil pipeline distribution center in Cushing, Oklahoma. The Canadian portion of the pipeline runs from Hardisty, Alberta, east into Manitoba where it turns south and crosses the border at Haskett Manitoba into North Dakota.



4.0 Audit Findings Assessment

5.0 Table 1: Audit Findings Assessment Summary

Reference	OPR Requirement
AP-01 1.1 Policy and Commitment Statement	OPR s. 32(1): <i>A company shall develop, implement and maintain an emergency management program that anticipates, prevents, manages and mitigates conditions during an emergency that could adversely affect property, the environment or the safety of workers or the public</i> Status: No issues of non-compliance identified
	OPR s. 31(1.1): <i>The company shall develop an emergency procedures manual, review it regularly and update it as required.</i> Status: No issues of non-compliance identified
AP-02 1.1 Policy and Commitment Statement	OPR s. 6.3(1): <i>The company shall establish documented policies and goals for meeting its obligations under section 6, including (b) goals for the prevention of ruptures, liquid and gas releases, fatalities and injuries and for the response to incidents and emergency situations.</i> Status: No issues of non-compliance identified
AP03 3.2 MOC	OPR s. 6.5(1)(i): <i>establish and implement a process for identifying and managing any change that could affect safety, security or the protection of the environment, including any new hazard or risk, any change in a design, specification, standard or procedure and any change in the company's organizational structure or the legal requirements applicable to the company;</i> Status: No issues of non-compliance identified
AP04 3.3 Training and Competence	OPR s. 6.5(1)(j): <i>establish and implement a process for developing competency requirements and training programs that provide employees and other persons working with or on behalf of the company with the training that will enable them to perform their duties in a manner that is safe, ensures the security of the pipeline and protects the environment;</i> Status: No issues of non-compliance identified

<p>AP05 3.5 Documentation and Doc Control</p>	<p>OPR s. 6.5(1)(o): <i>establish and implement a process for preparing, reviewing, revising and controlling those documents, including a process for obtaining approval of the documents by the appropriate authority;</i></p> <p>Status: No issues of non-compliance identified</p>
<p>AP06 4.1 Inspection Measurement and Monitoring</p>	<p>OPR s. 6.5(1)(u): <i>establish and implement a process for inspecting and monitoring the company's activities and facilities to evaluate the adequacy and effectiveness of the programs referred to in section 55 and for taking corrective and preventive actions if deficiencies are identified;</i></p> <p>Status: No issues of non-compliance identified</p>
<p>AP07 2.1 Hazard ID</p>	<p>OPR s. 6.5(1)(c): <i>establish and implement a process for identifying and analyzing all hazards and potential hazards;</i></p> <p>TransCanada demonstrated that it has implemented several activities to identify hazards at the program level. These activities are performed by corporate staff, business unit staff, subject matter experts (including contractors) and field level staff.</p> <p>The audit found that the procedures and activities are not formally linked in a documented overview that would be considered explicit and systematic. Further, the NEB did not see an explicit systematic documented process step referencing how outputs of the hazard identification activities were integrated or applied in the development and maintenance of the EM Program.</p> <p>Status: Non-Compliant</p>
<p>AP08 2.1 Hazard ID</p>	<p>OPR s. 6.5(1)(d): <i>establish and maintain an inventory of the identified hazards and potential hazards;</i></p> <p>Status: No issues of non-compliance identified</p>
<p>AP09 2.1 Hazard ID</p>	<p>OPR s. 6.5(1)(e): <i>establish and implement a process for evaluating and managing the risks associated with the identified hazards, including the risks related to normal and abnormal operating conditions;</i></p> <p>Status: No issues of non-compliance identified</p>

<p>AP10 2.1 Hazard ID</p>	<p>OPR s. 6.5(1)(f): <i>establish and implement a process for developing and implementing controls to prevent, manage and mitigate the identified hazards and the risks and for communicating those controls to anyone who is exposed to the risks;</i></p> <p>Status: No issues of non-compliance identified</p>
<p>AP11 3.2 Operational Control-Upset or Abnormal Operating Conditions</p>	<p>OPR s. 6.5(1)(t): <i>establish and implement a process for developing contingency plans for abnormal events that may occur during construction, operation, maintenance, abandonment or emergency situations.</i></p> <p>The company was not able to provide a process that directs the appropriate expertise to be available in the Emergency Operations Centre (EOC), how the event is evaluated to determine what expertise is no longer available, and how contingency plans are developed , when and as required.</p> <p>Although TransCanada demonstrated that it has integrated contingency planning activities throughout its emergency response procedures, it has not provided a process for contingency planning that meets the requirements of the OPR s. 6.5(1)(t).</p> <p>Status: Non-Compliant</p>
<p>AP12 4.1 Inspection Measurement and Monitoring</p>	<p>CSA Z662-15 - clause 10.5.2.1 - CSA Z662-15 - clause 10.5.2.4</p> <p>Status: No issues of non-compliance identified</p>

Conclusion

The Board found TransCanada’s Emergency Management program, manual, contingency plans and exercises addressed and controlled the majority and most significant of the company’s emergency management related hazards and associated risk. TransCanada demonstrated that it is committed to its Emergency Management Program, and according to records reviewed, has been for many years. The two Non-Compliance findings, as presented in Table 1 and Appendix 1, were issues of incomplete documentation required by the OPR.



6.0 Corrective Action Plan Submission

TransCanada is required to develop a Corrective and Preventive Action Plan (CAPA) with timelines for completion to rectify the deficiencies noted in this report within 30 days of the date of this report.

The Board will post this Final Audit Report and the approved CAPA on its website.

Appendix I: Hazard and Risk Assessment Audit as they relate to Emergency Management - Audit Assessment Tables

Topic: National Energy Board Onshore Pipeline Regulations: Section 32 (1)

NOTE: Given the scope of this audit, the elements and regulatory requirements examined will be related to the hazards and potential hazards that would initiate emergency or contingency responses.

Regulatory Requirement: OPR s. 32 (1): A company shall develop, implement and maintain an emergency management program that anticipates, prevents, manages and mitigates conditions during an emergency that could adversely affect property, the environment or the safety of workers or the public

32 (1.1): The company shall develop an emergency procedures manual, review it regularly and update it as required.

Criteria Element 1:

Requirements:

- The company must establish and implement an emergency management program that anticipates, prevents, manages and mitigates conditions during an emergency.
- The company must establish and implement an emergency management procedures manual that anticipates, prevents, manages and mitigates conditions during an emergency.

Assessed Area: The outputs of the process as related to the development and maintenance of Emergency Management Manuals, contingency plans and Emergency Management exercises

Item Number	Indicators of Compliance	Assessment
AP-01	<p>Can the company demonstrate that they have developed, implemented, and maintains an emergency management program that anticipates, prevents, manages and mitigates conditions during an emergency?</p> <p>Can the company demonstrate that they have developed an emergency procedures manual that anticipates, prevents, manages and mitigates conditions during an emergency?</p> <p>Can the company demonstrate that they review the emergency procedures manuals on a regular basis and update the manuals as required?</p>	No issues of non-compliance identified.



Summary Assessment Notes

TransCanada's Operational Management System (TOMS) is the overarching management system framework that drives the mandated core programs including the EM Program. TOMS outlines expectations of how TransCanada's assets are designed, constructed, operated and decommissioned.

Under TOMS, standards are the minimum expectations or requirements for a specific function including the Emergency Management Corporate Program. According to its organizational structure, TransCanada's EM Program is developed and maintained at the head office and implemented in the regional offices with designated local staff.

TransCanada's EM Program documentation follows a tiered structure. At the corporate level, TransCanada has developed an Emergency Management Corporate Program Manual (The Manual) that describes the company's EM Program and the processes. This manual is considered a Tier 1 document and has been developed to guide Facilities, Regions, and Support departments in developing and executing emergency preparedness activities within each region.

The Manual outlines the high level program components and provides the framework and direction that triggers the business units such as TransCanada Keystone to develop Tier 2 Emergency response plans. Tier 2 Emergency Response Plans are designed to contain specific resources including contact information, procedures and maps for particular locations and facilities. All Tier 2 Emergency Response Plans follow the same outline across the company.

The Tier 2 Keystone Pipeline System Emergency Response Plan latest revision of 31 October 2016 includes a signed approval from the Vice President of Safety, Quality, and Compliance. The plan has been reviewed annually since its development in 2009. According to TransCanada EM staff, the Tier 2 plan document is updated when substantial changes are made to the pipeline system, when deemed necessary by the company, or as required by regulatory changes.

The corporate EM Program states that Emergency Response Plans must be created for all major facilities, U.S. and Canadian power facilities, gas storage facilities, compressor stations, metering stations deemed critical by the region/facilities and sensitive areas (pipelines). These site specific plans are categorized as Tier 3 plans.

Tier 3 Emergency Response Plans are maintained by at the region or facility level. When requested, the company's Emergency Management Team provides guidance and consultation during the development and maintenance of these plans.

The Board noted that TransCanada has developed three types of Tier 3 Emergency Response Plans:

- (1) Site specific Emergency Response Plans;
- (2) Geographic Response Plans; and
- (3) Facility Response Plans.

The Board verified through document review that TransCanada has developed and maintains an EM Program, and Emergency Management Plans, including a plan specific to the Keystone Pipeline System. Together, these plans address the functional areas to anticipate, prevent, manage and mitigate conditions during an emergency. The audit also verified that TransCanada tests each level of documentation during its emergency exercises.

Based on the review conducted and considering the scope of this audit, the Board did not identify any issues of non-compliance in relation to this requirement.

Topic: Management System Sub Element 2.3 - Goals, Objectives and Targets

NOTE: Given the scope of this audit, the elements and regulatory requirements examined will be related to the hazards and potential hazards that would initiate emergency or contingency responses.

Regulatory Requirement: OPR s. 6.3(1): The company shall establish documented policies and goals for meeting its obligations under section 6, including **(b)** goals for the prevention of ruptures, liquid and gas releases, fatalities and injuries and for the response to incidents and emergency situations.

Criteria Element 1: Requirement for the company to demonstrate that it has established documented goals for the prevention of ruptures, liquid and gas releases, fatalities and injuries and for the response to incidents and emergency situations.

Assessed Area: The outputs of the process as related to the development and maintenance of Emergency Management Manuals, contingency plans and Emergency Management exercises.

Item Number	Indicators of Compliance	Assessment
AP-02	Can the company demonstrate that it has developed goals related to its hazards and risks for its Emergency Management Manuals, contingency plans and Emergency Management exercises?	No issues of non-compliance identified.



Assessment Notes

TransCanada outlines its goals, objectives and targets (GOTs) for its EM Program within the Element 1: Leadership Commitment and Strategy of the TOMs manual. This section requires all mandated programs, including emergency management, develop GOTs in line with the overall corporate goals. For the EM Program, these GOTs are documented in The Manual. This document lists the EM Program goals as:

- Improved response effectiveness;
- Improved emergency preparedness; and
- Improved Stakeholder Relationships, and Compliance and Conformance.

The audit found that goals for improving the effectiveness of the response aligns with mitigating or reducing risks by addressing; exposure, public health and safety, environmental, and property damage.

TransCanada has also established several metrics to evaluate the effectiveness of the hazard and barrier identification related to its EM Program. For example, it tracks the percentage of EM Program related hazards listed within the Risk Registries for which barriers and mitigations have been implemented.

TransCanada demonstrated that it has developed GOTs related to the identification and mitigation of hazards for the EM Program.

Based on the review conducted and considering the scope of this audit, the Board did not identify any issues of non-compliance in relation to this requirement.

Topic: Management System Sub Element 3.3 – Management of Change

Regulatory Requirement: OPR s. 6.5 (1)(i): establish and implement a process for identifying and managing any change that could affect safety, security or the protection of the environment, including any new hazard or risk, any change in a design, specification, standard or procedure and any change in the company's organizational structure or the legal requirements applicable to the company;

Criteria Element 1: Requirement for the company to establish and implement a process for identifying and managing any change that could affect safety, security or the protection of the environment, including any new hazard or risk.

Assessed Area: The outputs of the process as related to the development and maintenance of Emergency Management Manuals, contingency plans and Emergency Management exercises.



Item Number	Indicators of Compliance	Assessment
AP-03	Can the company demonstrate that it has established and implemented a process for identifying and managing any change that could affect safety, security or the protection of the environment, including any new hazard or risk, as it relates to the ongoing development of Emergency Management Manuals, Contingency Plans and Emergency Management Exercises?	No issues of non-compliance identified.
Assessment Notes		
<p>The TransCanada Management of Change (MOC) Element Framework is one of nine elements within TOMS. The intent of this document is to provide a common framework for managing various types of changes, and assisting in maintaining consistent application of MOC principles, roles, responsibilities and terminology.</p> <p>As outlined within this document, the framework applies to three categories of change;</p> <ul style="list-style-type: none"> • Technical and Physical Change; • Document Change and Variances within controlled documents; and • Managing Design Changes. <p>The Manual, section 1.6.1, Management of Change, states that the EM Program is subject to TransCanada's Operations and Engineering Management of Change (MOC) Framework and the procedures prescribed in the MOC Framework and each associated procedure, shall be followed.</p> <p>During the audit interviews, the Board was informed that The Manual and Tier 2 Manuals (including the Keystone Pipeline System Emergency Response Plan) are reviewed annually at a minimum. These manual reviews incorporate input from stakeholders, and an assessment of new hazards or risks introduced through related MOC process.</p> <p>The Board reviewed the Document Change Request Form generated for the Keystone ERP - 2016 Update and the completed Document Modification Form, completed 2016/07/27 and closed 2016/10/21. These forms include summaries of the impact assessments, proposed solutions and signoffs.</p> <p>Based on the review of TransCanada's MOC Framework and associated procedures, The Manual, and records to demonstrate how new (potential) hazards and risks are introduced into EM manuals, contingency plans and exercises. Based on the review conducted and considering the scope of this audit, the Board did not identify any issues of non-compliance in relation to this requirement.</p>		

Topic: Management System Sub Element 3.4 – Training, Competence and Evaluation

Regulatory Requirement: OPR s. 6.5 (1)(j): establish and implement a process for developing competency requirements and training programs that provide employees and other persons working with or on behalf of the company with the training that will enable them to perform their duties in a manner that is safe, ensures the security of the pipeline and protects the environment;

Criteria Element 1: Requirement for the company to establish and implement a process for developing competency requirements and training programs that provide employees and others working with or on behalf of the company with the training that will enable them to perform their duties in a manner that is safe, ensures the security of the pipeline and protects the environment.

Assessed Area: The outputs of the process as related to the development and maintenance of Emergency Management Manuals, contingency plans and Emergency Management exercises.

Item Number	Indicators of Compliance	Assessment
AP-04	Can the company demonstrate that it has a process for developing competency requirements and training programs as required for, and within, the Emergency Management Program?	No issues of non-compliance identified.

Assessment Notes

TransCanada’s training for the EM Program is outlined within The Manual. It identifies specified required training hours and hours to provide demonstration of competency for positions including:

- First Responder - Awareness Level;
- First Responder - Operations Level;
- Hazardous Materials Technician;
- Hazardous Materials Specialist; and
- Incident Commander.

TransCanada's EM Team at head office is responsible for coordinating the training for the Incident Management Team, the regional Emergency Preparedness Coordinators and support departments to ensure that they understand their roles and obligations within the EM Program.

Competencies for each position are established and monitored through observation of and/or participation in training sessions. Training of external agencies also takes place during the exercises.

As outlined within the Keystone Pipeline System Emergency Response Plan, TransCanada must conduct drills to maintain compliance and each plan-holder must participate in at least one exercise annually. The plan lists the triennial exercise cycle for facilities to include:

- twelve quarterly qualified individual notification exercises;
- three annual equipment deployment exercises (facility-owned equipment);
- three annual response team tabletop exercises;
- three annual equipment deployment exercises (facilities with Oil Spill Removal Organization-owned equipment); and
- three unannounced exercises.

The Board verified through a document review of the Region/Facility EOC Exercise Hardisty B that the exercise includes participation from various positions, and provides emergency response training on scenarios applicable to the region or facility.

The Board verified through document review of the 2017 Training Matrix that the company has identified and established specified training requirements for persons expected to respond or support the response to an incident. In addition, TransCanada has specified detailed training requirements for persons with specific EM responsibilities within the company. The IMT Master Roster 2017, provided for Board review, lists all 32 TransCanada personnel trained and identified as Incident Commanders.

Based on the review conducted and considering the scope of this audit, the Board did not identify any issues of non-compliance in relation to this requirement.

Topic: Management System Sub Element 3.6 – Documentation and Document Control

Regulatory Requirement: OPR s. 6.5(1)(o): establish and implement a process for preparing, reviewing, revising and controlling those documents, including a process for obtaining approval of the documents by the appropriate authority;

Criteria Element 1: Establish and implement a process for preparing, reviewing and controlling documents.

Assessed Area: The outputs of the process as related to the development and maintenance of Emergency Management Manuals, contingency plans and Emergency Management exercises.

Item Number	Indicators of Compliance	Assessment
AP-05	Can the company demonstrate that it has established and implemented a process for preparing, reviewing and controlling documents and that it uses the process for the Emergency Management Manuals and Contingency Plans?	No issues of non-compliance identified.
Assessment Notes		
<p>TransCanada's document management process and procedures are outlined in Element 6: Information Management of the TOMs manual. This element requires all mandated programs including Emergency Management to follow the TransCanada Document and Records Management practices and policies. Changes to the Emergency Management Corporate Program Manual are done per the Management of Change Element Framework.</p> <p>TransCanada's Document Change Management Procedure defines the sequence through which changes to documents are initiated, evaluated, approved, implemented and followed up. In accordance with this procedure, all Tier 1 and Tier 2 EM documents are reviewed annually and include approval of the documents by the appropriate authority. Tier 3 documents do not require approval or signoff, however, these documents are also reviewed on a regular scheduled basis. Records reviewed during the audit confirmed that the review of Tier 3 documents takes place at the field level and is managed through a work order system.</p> <p>The Keystone Pipeline System Emergency Response Plan is a Tier 2 controlled document. As outlined within the Plan, the EM Team is responsible for maintenance and distribution of the Plan. The Plan resides as a web-based document which permits "authorized" corporate and field staff access to make appropriate revisions as required. At the time of the audit, TransCanada demonstrated that its emergency management manuals (Tier 1 and 2) were being subjected to the reviews and updates as required by its corporate document management process.</p> <p>Based on the review conducted and considering the scope of this audit, the Board did not identify any issues of non-compliance in relation to this requirement.</p>		

Topic: Management System Sub Element 4.1 – 1 Inspection, Measurement and Monitoring

Regulatory Requirement: OPR s. 6.5(1)(u): establish and implement a process for inspecting and monitoring the company’s activities and facilities to evaluate the adequacy and effectiveness of the programs referred to in section 55 and for taking corrective and preventive actions if deficiencies are identified;

Criteria Element 1: Establish and implement a process for inspecting and monitoring the company’s activities to evaluate the adequacy and effectiveness of the Emergency Management Manuals, contingency plans and exercises and for taking corrective and preventive actions if deficiencies are identified.

Assessed Area: The outputs of the process as related to the development and maintenance of Emergency Management Manuals, contingency plans and Emergency Management exercises.

Item Number	Indicators of Compliance	Assessment
AP-06	Can the company demonstrate that it has established and implemented a process for inspecting and monitoring the company’s activities to evaluate the adequacy and effectiveness of the Emergency Management Program and for taking corrective and preventive actions if deficiencies are identified?	No issues of non-compliance identified.

Assessment Notes

TransCanada’s TOMs, element 9: Performance Monitoring, Audit and Management Review, requires that the company has a process to evaluate the adequacy and effectiveness of the Management System, programs, standards and business unit activities. Internal and external audits assess compliance to business processes, procedures, standards and regulatory requirements at the Corporate and program levels. Given the scope of this audit, the NEB verified that the processes and activities described in element 9 are being applied to the Emergency Management Program’s documentation to the extent required.

TransCanada’s emergency management exercises are subjected to participant feedback and review and learns. This participant feedback is considered when updating the EM procedures and EM training.

The Board verified through document review that TransCanada is reviewing the Keystone Pipeline System Emergency Response Plan on a regular basis and updates it as required. Emergency drills and full scale emergency exercises are documented, which include debriefings to identify any deficiencies or possible improvements.

Based on the review conducted and considering the scope of this audit, the Board did not identify any issues of non-compliance in relation to this requirement.

Topic: Management System Sub Element 2.1 Hazards Identification, Risk Assessment and Control

Regulatory Requirement: OPR s. 6.5(1)(c): establish and implement a process for identifying and analyzing all hazards and potential hazards;

Criteria Element 1: Requirement for the company to establish and implement a process for identifying and analyzing all hazards and potential hazards;

Assessed Area: The outputs of the process as related to the development and maintenance of Emergency Management Manuals, contingency plans and Emergency Management exercises.

Item Number	Indicators of Compliance	Assessment
A07	Can the company demonstrate a process for identifying and analyzing all hazards and potential hazards?	Non-Compliant

Assessment Notes

Element 2 of the TOMs manual (Risk Management) outlines the foundations of risk management for the protection programs. The EM Program abides by the Risk Management Framework to ensure that identified risks are being addressed in emergency response plans. The Board verified through a review of the Manual, that each region and facility is responsible for the identification of hazards (both from internal and external sources) which may result in an emergency affecting TransCanada's operations. The Manual includes a list-of hazards deemed applicable to company operations categorized as asset based hazards, natural hazards, or technology based hazards.

TransCanada also demonstrated that it has implemented several activities to identify hazards at the program level. These activities are performed by corporate staff, business unit staff, subject matter experts (including contractors) and field level staff.

TransCanada explained that hazard identification is done within three streams.

Stream 1 – Observations and Existing Practices

Stream 1 has two process paths:



Path A –

1. Communication of identified hazards to the emergency management program via Hazard Barrier Inventory.
2. Emergency management program's consideration of identified hazards within the Hazard Barrier Inventory.
3. Communication of identified hazards to the emergency management program via the Risk Register.

Path B – Using Existing Practices and Information

The Hazard and Barrier Identification and Inventory Procedure describes the use of information generated by personnel during the following activities:

Job Safety Analysis (Job Safety Analysis Procedure)

- Facility Planned Inspections (Planned Inspection TOP)
- Facility Security/Threat Assessments (Facility Security Plan Drills and Exercises Offshore)
- Pre-Start-up Safety Reviews (Pre-Start-up Safety Review Procedure)
- Updating Project Risk Registers
- Reviewing issues lists or integrity management strategy/plan hazard/threat/risk/table
- Incident reviews

Stream 2 – Adaptable Tools and Procedures

In this Stream, Programs or Subprograms of the Liquids Business Unit or the Emergency Management Program use their subject-matter expertise and training to implement the program-specific hazard identification tools. Examples of these tools include the Systems Control Subprogram's Systems Control (Liquids Pipeline Group) Risk Management Program, and the EM Program's Emergency Event Analysis.

Stream 3 - Independent Ongoing Identification

In this stream, the Liquids Business Unit and the EM Program identify potential hazards or risks (as appropriate), through the ongoing review of their own Hazard Barrier Inventories and risk registers as required by the Risk Management Process.

The Board noted that, although TransCanada demonstrated that these activities were occurring, none of these paths or streams are referenced in the management system documentation.

“Although TransCanada conducts various hazard identification activities through various mandatory programs using multiple databases and collection media (XL spreadsheets), the Board did not see an explicit, integrated, coordinated and systematic process to identify the hazards and potential hazards for the EM Program.” In this case, the procedures and activities are not formally linked together in documented overview that would be considered explicit and systematic. Further, the Board did not see an explicit, systematic documented process describing how outputs of the hazard identification various activities were integrated or used in the development and maintenance of the EM Program.

Hazard identification is a primary planning requirement for the OPR management systems and a building block that establishes the foundation of the management system. During this audit, TransCanada did not provide documentation to explain how outputs of the hazard identification activities were integrated or used in the development and maintenance of the EM Program.

Although TransCanada demonstrated that it has established and linked hazard identification procedures and activities throughout its EM Program, it did not provide a documented overarching process that describes how all of the hazard identification activities and their resulting inputs and outputs are consistently managed.

As a result of the assessment, the Board has determined that TransCanada is in non-compliance with OPR s. 6.5(1)(c). The Board requires that a CAPA be developed to address this Non-Compliance.

Topic: Management System Sub Element 2.1 Hazards Identification, Risk Assessment and Control

Regulatory Requirement: OPR s. 6.5(1)(d): establish and maintain an inventory of the identified hazards and potential hazards;

Criteria Element 1: Requirement for the company to establish and maintain an inventory of the identified hazards and potential hazards;

Assessed Area: The outputs of the process as related to the development and maintenance of Emergency Management Manuals, contingency plans and Emergency Management exercises.

Item Number	Indicators of Compliance	Assessment
AP-08	Does the company have and maintain an inventory of the identified hazards and potential hazards?	No issues of non-compliance identified.

Assessment Notes

Element 2 of the TOMs manual (Risk Management) provides the foundations of risk management.

The Board verified through document review that TransCanada's Hazard and Barrier Identification and Inventory Procedure is used to prepare a Hazard and Barrier Inventory (Inventory). The Inventory maps hazards, hazardous situations, and threats for each of the protection programs. The Inventory also includes barrier effectiveness management to the areas of the company that are responsible for managing them.

The Board verified through document review that TransCanada's Risk Registry incorporates the inventory of identified hazards and potential hazards. In addition, TransCanada has incorporated into a Risk Management Process database which is used to categorize hazards and apply mitigations when required.

According to the Hazard and Barrier Identification and Inventory Procedure, the hazard inventory and the procedure are reviewed annually and revised as necessary by the Risk Management Element Owner. During the audit, the Board confirmed the inventory of hazards and potential hazards correspond with the hazards listed in The Manual. TransCanada also provided a demonstration and records to confirm that new EM hazards were being evaluated against the standing inventory within its consequence modelling tool.

Based on the review conducted and considering the scope of this audit, the Board did not identify any issues of non-compliance in relation to this requirement.

Topic: Management System Sub Element 2.1 Hazards Identification, Risk Assessment and Control

Regulatory Requirement: OPR s. 6.5(1)(e): establish and implement a process for evaluating and managing the risks associated with the identified hazards, including the risks related to normal and abnormal operating conditions;

Criteria Element 1: Requirement for the company to establish and implement a process for evaluating and managing the risks associated with the identified hazards, including the risks related to normal and abnormal operating conditions

Assessed Area: The outputs of the process as related to the development and maintenance of Emergency Management Manuals, contingency plans and Emergency Management exercises.

Item Number	Indicators of Compliance	Assessment
AP-09	The company must have a documented process for evaluating and managing the risks associated with the identified hazards, including the risks related to normal and abnormal operating conditions;	No issues of non-compliance identified.

Assessment Notes

Element 2 of the TOMs manual (Risk Management) provides the foundations of risk management.

The Board verified through document review that the Emergency Management Corporate Program Manual indicates that risk assessments will be conducted by each region and facility using the Emergency Event Analysis Procedure. Following completion of the risk assessment, each region and facility must ensure the Tier 2 or Tier 3 Emergency Response Plans address all critical, major, and serious risk type of emergencies per the Emergency Event Analysis.

As outlined in the Risk Management Process, programs including the EM Program should analyze the likelihood of events related to risk sources, the potential consequences of events, and then summarize the analysis in a risk estimate, taking into account the implementation and effectiveness of existing risk controls. TransCanada's IRAP consequence matrix is a tool to be used to assess consequences in the seven categories covered by the matrix. The IRAP matrix includes both qualitative and quantitative consequence descriptors and can be adapted to any type of analysis.

The Board verified through a review of TransCanada's Risk Registry, that the registry provides a methodology and a process to evaluate and manage risks associated with the identified hazards, including the risks related to normal and abnormal operating conditions. TransCanada demonstrated that this methodology is applied to the EM Program.

Based on the review conducted and considering the scope of this audit, the Board did not identify any issues of non-compliance in relation to this requirement.

Topic: Management System Sub Element 2.1 Hazards Identification, Risk Assessment and Control

Regulatory Requirement: OPR s. 6.5(1)(f): establish and implement a process for developing and implementing controls to prevent, manage and mitigate the identified hazards and the risks and for communicating those controls to anyone who is exposed to the risks;

Criteria Element 1: Requirement for the company to establish and implement a process for developing and implementing controls to prevent, manage and mitigate the identified hazards and the risks and for communicating those controls to anyone who is exposed to the risks;

Assessed Area: The outputs of the process as related to the development and maintenance of Emergency Management Manuals, contingency plans and Emergency Management exercises.



Item Number	Indicators of Compliance	Assessment
AP-10	The company must have a documented process a process for developing and implementing controls to prevent, manage and mitigate the identified hazards and the risks and for communicating those controls to anyone who is exposed to the risks.	No issues of non-compliance identified.
Assessment Notes		
<p>The mitigation of identified hazards generally lies within the operational programs such as Occupational Safety, Environmental Protection and Pipeline Integrity. Along with the hazards identified in the protection programs, the hazards that are identified for the EM Program include those that could impact an effective emergency response.</p> <p>Element 2 of the TOMs manual (Risk Management) provides the foundations of risk management.</p> <p>Element 3 of the TOMs manual, Operational Controls, sets high-level process guidance and parameters to efficiently and consistently execute day-to-day work.</p> <p>The Risk Register Process provides a tool and guidance to promote a consistent means of assessing risk quantitatively and a process to promote stakeholder engagement in risk management, peer review in the assessment of risk, and communication of risk information to responsible decision makers in senior leadership positions.</p> <p>Communication of Risk:</p> <p>The Risk Register Process is designed to document and communicate risk information, including prioritized listings of potential events related to hazards, hazardous situations, and threats identified in the Hazard and Barrier Identification and Inventory Procedure.</p> <p>The Risk Management Framework document, outlines the company's established formal means of communication within the feedback loop and includes a listing of processes, procedures and activities to support effective communication.</p> <p>The established formal means of communication within the feedback loop includes:</p> <ul style="list-style-type: none"> • The annual risk register process; • The stakeholder engagement and peer review requirements of the routine risk management processes and the annual risk register process; • Decision summaries and phase execution plans, Hazard identification and inventory procedures, and associated barrier/control management; and • Senior management communications on risk management strategy and performance. 		

Controls Development: (Risk Treatment)

Element 3 of the TOMs manual Operational Controls sets high-level guidance and parameters to execute day-to-day work.

This includes expectations to manage the risks associated with the design, construction, and operation and decommissioning of the companies energy infrastructure. Programs, standards, practices and procedures are designed to mitigate the risks.

Based on the review conducted and considering the scope of this audit, the Board did not identify any issues of non-compliance in relation to this requirement.

Topic: Management System Sub Element 2.1 Hazards Identification, Risk Assessment and Control

Regulatory Requirement: OPR s. 6.5(1)(t): establish and implement a process for developing contingency plans for abnormal events that may occur during construction, operation, maintenance, abandonment or emergency situations.

Criteria Element 1: Requirement for the company to establish and implement a process for developing contingency plans for abnormal events that may occur during construction, operation, maintenance, abandonment or emergency situations.

Assessed Area: The outputs of the process as related to the development and maintenance of Emergency Management Manuals, contingency plans and Emergency Management exercises.

Item Number	Indicators of Compliance	Assessment
AP-11	The company must have a documented process to establish and implement a process for developing contingency plans for abnormal events that may occur during construction, operation, maintenance, abandonment or emergency situations.	Non-Compliant

Assessment Notes

The Emergency Management Program is documented in the Emergency Management Corporate Program Manual (Tier 1) and the Keystone Pipeline System Emergency Response Plan (Tier 2). Throughout these documents, TransCanada refers to its reliance on the Incident Command System (ICS) for managing the emergency response.

During this audit, TransCanada pointed to the combined actions and efforts of the ICS as its process used for developing and implementing contingency plans for abnormal events that may arise during emergency situations. TransCanada also identified several activities and practices it has implemented to manage contingencies during emergencies in order to drive an effective

response to unforeseen or abnormal events during an emergency. TransCanada discussed that during emergency events, representatives from several areas of the business such as Aviation, Lands, and Human Resources are present, in person or via teleconference in the Emergency Operations Centers, in order to address issues arising from the event in a timely manner. Also, as part of ICS, TransCanada has identified the Operations Section Chief as the position responsible for contingency planning during an emergency event; however, TransCanada did not demonstrate that it has a process for contingency planning.

Although TransCanada demonstrated that it has integrated contingency planning activities throughout its response procedures, it has not provided a documented process for contingency planning that meets the requirements of the OPR.

As a result of the assessment, the Board has determined that TransCanada is in non-compliance with OPR s. 6.5(1)(t). The Board requires that a CAPA be developed to address this Non-Compliance.

Topic: CSA Z662-15 - 10.5.2 Pipeline Emergencies

Regulatory Requirement: OPR s. 4(1): When a company designs, constructs, operates or abandons a pipeline, or contracts for the provision of those services, the company shall ensure that the pipeline is designed, constructed, operated or abandoned in accordance with the applicable provisions of

- (b) CSA Z276, if the pipeline transports liquefied natural gas;
- (c) CSA Z341 for underground storage of hydrocarbons;
- (d) CSA Z662, if the pipeline transports liquid or gaseous hydrocarbons; and
- (e) CSA Z246.1 for all pipelines.

Criteria Element 1: CSA Z662-15 - 10.5.2 Pipeline emergencies clauses 10.5.2.1, 10.5.2.2, 10.5.2.3, 10.5.2.4

Assessed Area: The outputs of the process as related to the development and maintenance of Emergency Management Manuals, contingency plans and Emergency Management exercises.

Item Number	Requirements	Assessment
AP-12	CSA Z662-15 - clause 10.5.2.1 Operating companies shall establish emergency procedures that include:	No issues of non-compliance identified.



	<p>a) procedures for the safe control or shutdown of the pipeline system, or parts thereof, in the event of a pipeline emergency; and</p> <p>b) Safety procedures for personnel at emergency sites.</p> <p>Note: Appropriate emergency procedures related to the pipeline, as determined in conjunction with community agencies, should be included.</p> <p>CSA Z662-15 - clause 10.5.2.2</p> <p>Operating companies shall regularly consult and inform the public and agencies to be contacted during an emergency (e.g., police and fire departments), as appropriate, about the hazards associated with its pipelines.</p> <p>Note: If community emergency response plans exist, appropriate methods to consult and inform the public can be determined in conjunction with the community agencies.</p> <p>CSA Z662-15 - clause 10.5.2.3</p> <p>Operating companies shall prepare an emergency response plan and make relevant sections or information therein available to local authorities.</p> <p>Note: CAN/CSA-Z731 should be used as a guide for the preparation of emergency response plans.</p> <p>CSA Z662-15 - clause 10.5.2.4</p> <p>Operating companies shall have verifiable capability to respond to an emergency in accordance with their emergency procedures and response plans and shall demonstrate and document the effectiveness of such procedures and plans.</p>	
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Assessment Notes

AP 12-a) Emergency Shutdown Procedures

For the purposes of this audit, the NEB verified that TransCanada has emergency procedures that include the safe control or shutdown of the Keystone pipeline system or parts thereof in the event of an emergency. For its Liquids Pipelines, TransCanada provided its Incident Response and Isolation Plan and First Responder's Checklist for review. This document applies to all pipelines controlled at TransCanada's Oil Control Center. It is designed to apply to various types of emergencies including:



- a release to ground or water;
- a pipeline strike;
- a bomb; and
- a leak detection alarm.

Interviews confirmed that staff were aware of site emergency and safety procedures as well as “first on scene” documentation requirements. The audit verified that operational and hazards related to abnormal operation such as boat and equipment deployment were identified and addressed within the procedures. Given that the scope of the audit focused on the identification and control of hazards, it should be noted that, the adequacy and effectiveness of these procedures was not included in the review.

AP 12-b) Consulting and Informing public agencies / Availability of EM Plans

The Board verified through a review of TransCanada's documentation, and through interviews with TransCanada personnel that the company regularly consults and informs the public and agencies to be contacted during an emergency, as appropriate (e.g., police and fire departments) about the hazards associated with its pipelines. This stakeholder engagement is largely administered by TransCanada's Public Awareness Program. The EM program includes consultation and training with all agencies to be contacted or involved during an emergency.

Through a review of TransCanada's documentation and interviews with TransCanada personnel, it was determined that the company regularly makes relevant sections of the Emergency Response manuals or information therein available to local authorities. These manuals and information are provided in digital and/or hard copy, through a controlled system, to ensure the information is current.

AP 12-c) Emergency Response Exercises

At the time of the audit, the Board verified that TransCanada is conducting various types of emergency exercise drills to test and validate its EM Program and procedures. In cases where external agencies are involved in tabletops or full exercises, these agencies provide feedback with debriefs.

Through interviews and record review, (Debriefing - Portage La Prairie Drill Week September 2017) the Board determined that TransCanada regularly assesses its capability to respond to an emergency, in accordance with its emergency procedures and response plans. The company demonstrates and documents the effectiveness of procedures and plans, through management reviews, audits, exercises, drills and in the reviews following actual emergency events.

Based on the review conducted and considering the scope of this audit, the Board did not identify any issues of non-compliance in relation to this requirement.



Appendix II – Audit Process Overview

NEB Purpose and Audit Framework

The NEB's purpose is to promote safety and security, environmental protection, and efficient energy infrastructure and markets in the Canadian public interest within the mandate set by Parliament in the regulation of pipelines, energy development and trade. In order to assure that pipelines are designed, constructed, operated and abandoned in a manner that ensures: the safety and security of the public and the company's employees; safety of the pipeline and property; and protection of the environment, the Board has developed regulations requiring companies to establish and implement documented management systems applicable to specified technical management and protection programs. These management systems and programs must take into consideration all applicable requirements of the NEB Act and its associated regulations. The applicable Legislation and Regulations which come under the NEB's mandate, responsibilities and powers include:

- *National Energy Board Act* and associated regulations;
- *Canada Oil and Gas Operations Act* and associated regulations;
- *Canada Petroleum Resources Act* (sections 28 and 35) and associated regulations;
- *The Canada Labour Code, Part II*, and the *Canada Occupational Health and Safety Regulations*; and
- Any conditions contained within applicable certificates or orders issued by the Board.

To evaluate compliance with its regulations, the Board audits the management system and programs of regulated companies. The Board requires each regulated company to demonstrate that they have established and implemented adequate and effective methods for proactively identifying and managing hazards and risks. The Board's management system requirements are described within the NEB OPR sections 6.1 through 6.6.

Background

The NEB expects pipeline companies to operate in a systematic, comprehensive and proactive manner that manages risks. The Board expects companies to have effective, fully developed and implemented management systems and protection programs that provide for continual improvement.

As required by the OPR, companies must establish, implement and maintain effective management systems and protection programs in order to anticipate, prevent, mitigate and manage conditions that may adversely affect the safety and security of the company's pipelines, employees, the general public, as well as the protection of property and the environment.



During the audit, the NEB reviews documentation and samples records provided by the company in its demonstration of compliance and interviews corporate and regionally based staff. The NEB may also conduct separate but linked technical inspections of a representative sample of company facilities. This review enables the Board to evaluate the adequacy, effectiveness and implementation of the management system and programs. The NEB bases the scope and location of the inspections on the needs of the audit. The inspections follow the Board's standard inspection processes and practices. Although they inform the audit, inspections are considered independent of the audit. If unsafe or non-compliant activities are identified during an inspection, they are actioned as set out by the Board's standard inspection and enforcement practices.

After completing its field activities, the Board develops and issues a Final Audit Report. The Final Audit Report outlines the Board's audit activities and provides evaluations of the company's compliance with the applicable regulatory requirements. Once the Board issues the Final Audit Report, the company must submit and implement a Corrective Action Plan to address all non-compliances identified. Final Audit Reports are published on the Board's website. The audit results are integrated into NEB's risk-informed lifecycle approach to compliance assurance.

Audit Objectives and Scope

This audit evaluated the company against the legal requirements and scope outlined in the main body of the audit report.

Audit Activities

On 2 August 2017, the Board informed TransCanada of its intent to conduct this audit. Board staff then provided TransCanada with an overview of the NEB audit process, the audit criteria, a request for documentation and a list of questions to answer relevant to the objectives and scope of the audit. The NEB conducted its assessment based on the responses provided by the company and the evidence gathered during the audit. Board staff was in contact with company staff on a regular basis to arrange and coordinate this audit. TransCanada established a digital access portal for Board staff to review documentation and records.

On 12 September 2017, Board staff conducted an opening meeting with company representatives in Calgary to confirm the Board's audit objectives, scope and process. Subsequent to the opening meeting, interviews were held at the company's office in Calgary during the period 12 to 27 September 2017. Interviews were also conducted at the company's office in Hardisty, AB on 28 September 2017. Throughout the audit, Board audit staff provided company representatives with daily summaries, including action items where required.

On 17 October 2017, the Board held an audit pre close-out meeting with company representatives. At this meeting, Board staff and TransCanada staff discussed potential non-compliances identified during the audit. At that time the company was provided with the opportunity to present additional evidence to rectify these potential non-compliances. Supplementary evidence was received from TransCanada on October 23, 2017 and considered by the NEB.

On 2 November 2017, a close-out meeting was held to provide TransCanada with a description of the recommendations that staff would be bringing to the Board for decision.



Appendix III – Terminology and Definitions

(The Board has applied the following definitions and explanations in measuring the various requirements included in this audit. They follow or incorporate legislated definitions or guidance and practices established by the Board, where available.)

Adequate: The management system, programs or processes complies with the scope, documentation requirements and, where applicable, the stated goals and outcomes of the NEB Act, its associated regulations and referenced standards. Within the Board's regulatory requirements, this is demonstrated through documentation.

Audit: A systematic, documented verification process of objectively obtaining and evaluating evidence to determine whether specified activities, events, conditions management systems or information about these matters conform to audit criteria and legal requirements and communicating the results of the process to the company.

Compliant: The Company has demonstrated that it has developed and implemented programs, processes and procedures that meet legal requirements.

Corrective Action Plan: A plan that addresses the non-compliances identified in the audit report and explains the methods and actions that will be used to correct them.

Developed: A process or other requirement has been created in the format required and meets the described regulatory requirements.

Effective: A process or other requirement meets its stated goals, objectives, targets and regulated outcomes. Continual improvement is being demonstrated. Within the Board's regulatory requirements, this is primarily demonstrated by records of inspection, measurement, monitoring, investigation, quality assurance, audit and management review processes as outlined in the OPR.

Established: A process or other requirement has been developed in the format required. It has been approved and endorsed for use by the appropriate management authority and communicated throughout the organization. All staff and persons working on behalf of the company or others that may require knowledge of the requirement are aware of the process requirements and its application.

Finding: The evaluation or determination of the compliance of programs or elements in meeting the requirements of the *National Energy Board Act* and its associated regulations.



Implemented: A process or other requirement has been approved and endorsed for use by the appropriate management authority. It has been communicated throughout the organization. All staff and persons working on behalf of the company or others that may require knowledge of the requirement are aware of the process requirements and its application. Staff has been trained on how to use the process or other requirement. Staff and others working on behalf of the company have demonstrated use of the process or other requirement. Records and interviews have provided evidence of full implementation of the requirement, as prescribed (i. e. the process or procedures are not partially utilized).

Inventory: A documented compilation of required items. It must be kept in a manner that allows it to be integrated into the management system and management system processes without further definition or analysis.

List: A documented compilation of required items. It must be kept in a manner that allows it to be integrated into the management system and management system processes without further definition or analysis.

Maintained: A process or other requirement has been kept current in the format required and continues to meet regulatory requirements. With documents, the company must demonstrate that it meets the document management requirements in OPR, section 6.5(1) (o). With records, the company must demonstrate that it meets the records management requirements in OPR, section 6.5 (1) (p).

Management System: The system set out in OPR sections 6.1 to 6.6. It is a systematic approach designed to effectively manage hazards and reduce risk, and promote continual improvement. The system includes the organizational structures, resources, accountabilities, policies, processes and procedures required for the organization to meet its obligations related to safety, security and environmental protection.

(The Board has applied the following interpretation of the OPR for evaluating compliance of management systems applicable to its regulated facilities.)

As noted above, the NEB management system requirements are set out in OPR sections 6.1 to 6.6. Therefore, in evaluating a company's management system, the Board considers more than the specific requirements of section 6.1. It considers how well the company has developed, incorporated and implemented the policies and goals on which it must base its management system as described in section 6.3; its organizational structure as described in section 6. 4; and considers the establishment, implementation, development and/or maintenance of the processes, inventory and list described in section 6.5(1). As stated in sections 6.1(c) and (d), the company's management system and processes must apply and be applied to the programs described in section 55.

Non-Compliant: The Company has not demonstrated that it has developed and implemented programs, processes and procedures that meet the legal requirements. A corrective action plan must be developed and implemented.



Procedure: A documented series of steps followed in a regular and defined order thereby allowing individual activities to be completed in an effective and safe manner. A procedure also outlines the roles, responsibilities and authorities required for completing each step.

Process: A documented series of actions that take place in an established order and are directed toward a specific result. A process also outlines the roles, responsibilities and authorities involved in the actions. A process may contain a set of procedures, if required.

(The Board has applied the following interpretation of the OPR for evaluating compliance of management system processes applicable to its regulated facilities.)

OPR section 6.5(1) describes the Board's required management system processes. In evaluating a company's management system processes, the Board considers whether each process or requirement: has been established, implemented, developed or maintained as described within each section; whether the process is documented; and whether the process is designed to address the requirements of the process, for example a process for identifying and analyzing all hazards and potential hazards. Processes must contain explicit required actions including roles, responsibilities and authorities for staff establishing, managing and implementing the processes. The Board considers this to constitute a common *5 w's and h approach* (who, what, where, when, why and how). The Board recognizes that the OPR processes have multiple requirements; companies may therefore establish and implement multiple processes, as long as they are designed to meet the legal requirements and integrate any processes linkages contemplated by the OPR section. Processes must incorporate or contain linkage to procedures, where required to meet the process requirements.

As the processes constitute part of the management system, the required processes must be developed in a manner that allows them to function as part of the system. The required management system is described in OPR section 6.1. The processes must be designed in a manner that contributes to the company following its policies and goals established and required by section 6.3.

Further, OPR section 6.5(1) indicates that each process must be part of the management system and the programs referred to in OPR section 55. Therefore, to be compliant, the process must also be designed in a manner which considers the specific technical requirements associated with each program and is applied to and meets the process requirements within each program. The Board recognizes that a single process may not meet all of the programs; in these cases it is acceptable to establish governance processes as long as they meet the process requirements (as described above) and direct the program processes to be established and implemented in a consistent manner that allows for the management system to function as described in 6.1.

Program: A documented set of processes and procedures designed to regularly accomplish a result. A program outlines how plans, processes and procedures are linked; in other words, how each one contributes to the result. A company regularly plans and evaluates its program to check that the program is achieving the intended results.

(The Board has applied the following interpretation of the OPR for evaluating compliance of programs required by the NEB regulations.)

The program must include details on the activities to be completed including: what, by whom, when, and how. The program must also include the resources required to complete the activities.

Appendix IV - Abbreviations

AO: Accountable officer

AP: Audit Protocol

CAPA: Corrective and Preventative Action Plan

CSA Z662-15: CSA Standard Z662 entitled *Oil and Gas Pipeline Systems*, 2015 version

EHS: Environment, health and safety

ERP: Emergency Response Plan

MOC: Management of change

NEB: National Energy Board

OPR: *National Energy Board Onshore Pipeline Regulations*

SME: Subject Matter Expert

Appendix V: Documents and Records Reviewed

The following documents were reviewed as part of the audit:

CANADIAN LIQUIDS IMT
2016-17 CLFO Exercises
2017 Contractor Assessment - Exercise Debriefing 8-22 (2)
2017 EM Liquids Ops Hazard and Barrier Inventory
2017 EMS Training Curriculum and Audiences
2017 EMS Training Curriculum and Audiences (002)
2017 Work Order_ Tier 3 Plan Updates
AAR
Air Operations Branch Keystone ERP
Alternative Strategies Course
Appendix A - with Evidence - Contingency Planning Documentation
Appendix A - Liquids BU Risk Management Process Flow
Appendix B - with Evidence - Planning P Process
Appendix B - Evidence of Hazard Identification through Existing Practices
Appendix C - with Evidence - Role-Specific Training - Contingency Planning
Appendix D - with Evidence - Keystone Evidence – Freeman +4 Incident Supplemental Plans
Boat and Equipment Deployment - Water Operations
Booming Small Pond without Power Boat
Briefing Document
Calgary CEOC Support Department Role Descriptions
Canada and United States Liquid Operations Regional EPT 2017 Activity Plan
CANADIAN LIQUIDS IMT
CDN Liquids Response Time Assessment - Moosomin
Command Post Inspection
Containment Cell Using Ditch
Contingency Planning Process - Diagram
Control Point and GRP Development and Maintenance
Control Point Field Validation Task Package
Control Point Field Validation Task Package (DRAFT)
Controlled Document Variance Procedure
Copy of IMT 2017 - Behavioural Competencies
Copy of Q1 2017 EM GOTs Scorecard
Copy of Q2 2017 GOTS EM Scorecard
Course Agenda
Course description for 1442 and 1501
Culvert Blocking - Setting Up

Cushing MOC example
Debrief
Debrief Form
Debrief Template
Debriefing - Portage La Prairie Drill Week September 2017
Document Change Management Procedure
Document Index BR 2017-08-31
Document Modification Form-
 Keystone Pipeline System Emergency Response Plan (EDMS No. 009213528)
Document Modification Form (CDN-US-MEX) Keystone ERP August 2017
EM - Liquids Preparedness Org
EM 2017 signed GOTs
EM Program Database List
EM Steering Committee Agenda
EM Training Curriculum Application Implementation Process
Emergency Event Analysis template
Emergency Event Analysis US Liquid Ops 2-2016
Emergency Management Corporate Program Manual - Rev 20 - 2016 -09-30
Emergency Management Risk Management Summary -Narrative
Emergency Management System Maintenance Liquid Pipelines
Emergency Management Tactical Course Descriptions
Emergency Management - Risk Management Process
Emergency Response Planning
Emergency Response Plans Quarterly Updates Status 2017, Q1 and Q2
EMS Exercises
EMS Regional Facility EPC EPT Orientation
EPC 2016 year end meeting -Agenda
Establish Goals, Objectives and Targets (GOTs) Procedure
Everbridge Usage Summary
Exercise Authorization Form
Exercise JSAs
EXERCISES
Facility Integrity and Reliability Management Program (CDN-US-MEX) (Section 4 and 5)
Final 2017 EPC Agenda 2016
First Responder Checklist - Liquids
First Responder Checklist - Liquids 03.17.2017
[REDACTED]
Hardisty B Example
HARDISTY B FIRE INCIDENT PRE-PLAN
Hardisty Tank Application - excerpts demonstrating Emergency Response requirements
Hardisty Terminal Geographic Response Plan

Project Governance Program (EDMS 014273625)
Project Turnover Memorandum (EDMS 009967811)
Project Turnover Officer Signoff (EDMS 009971603)
Quality Assurance Audit Procedure (Cdn-US-Mex)
Regional EOC Inspection
REOC Exercise Hardisty B Debrief June 2017 (3)
REOC Inspection 2015
REOC Inspection 2016
Response Letter for Pre-Close Meeting Requests
Response to Observation_Oct 17_NEB Audit_ Keystone 2017 (Communication of Hazards to Programs)
Response to Observation_Oct 17_NEB Audit_ Keystone 2017 (Contingencies)
Response to Request and Observation_ 1_ SEPT 14_NEB Audit_ Keystone 2017
Response to Request 10_SEPT 13_ NEB Audit_ Keystone 2017
Response to Sep 19th Request 11 –
 Online Liquid Viscometer MicroMotion for Liquid Measurement Integrity Plan
Response to Sep 20th Request 12 Hazard ID conducted for Keystone Pipelines during construction
Response to September 19th Request 3 Tier 1 Hazard Identification
Response to September 27th request 1 – Written Reference for ICS Subject Matter Experts to Attend
Response to September 27th Request 2 - TOMS Self-Assessment
Reverse Weir or Underflow Dam
Risk Management Framework
Risk Management Process
Risk Management_MOD1_1442_EN
Risk Management_MOD2_1442_EN
Risk Management_MOD3_1442_EN
Risk Management_MOD4_1442_EN
Risk Mgmt for Field Employees_1501_EN
Risk Register Process
Risk Training Records Liquids Personnel RM 1442 Oct 6 2017
Risk Training Records Liquids Personnel RM 1501 Oct 6 2017
Role Description - EM Program Manger
Role of the Incident Management Team
Rural Guide for Pipeline_v3
Safety Management Plan Template
Sign in
Sign in - Field
Sign in - ICP
Sign in sheet
South Sask River GRP TCPs and First Responder Checklist
South Saskatchewan River GRP
Supplier Qualification Process



Tabletop Emergency Exercise Development

TCP AB-Red Deer River-1

TCP AB-Red Deer River-2

TCP AB-Red Deer River-3

TCP SK-Saskatchewan River-1

TCP SK-Saskatchewan River-2

TCP SK-Saskatchewan River-3

TCP SK-Saskatchewan River-4

TCP SK-Saskatchewan River-5

Technical and Physical Change Procedure

TEP-CPS-HSR-LIQ-CDN Procedure for Creating CPS and HSR Lists (CDN)

TEP-CPS-HSR-LIQ-CDN Procedure for Creating CPS and HSR Lists Rev 02

Third Party Contractor Assessment Exercise US Liquids

Tier 2 Emergency Response Plan Development and Maintenance Procedure (signed)

TOMS Fact Sheet

TOMS Framework

TOMS Illustration

TOMS Manual

TOMS Self-Assessment Emergency Management (2016)

Tracking Sheet for NEB Requests as of October 23

Trailer and Equipment Deployment Dryland Operations

Training Materials for 3rd Party Emergency Responders Canada

TransCanada 208 Site Specific Safety Plan - Crude Oil form

TransCanada Emergency Preparedness and Response Program Steering Committee Mandate

TransCanada-emergency-responders-oil

Trolley Line System

TTX Sign in

Appendix VI: TransCanada Keystone Pipeline GP Ltd. – Company Representatives Interviewed

Company Representative Interviewed	Job Title
[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]

Appendix VII – Board Direction and Guidance on the Corrective Action Plan