Plains Midstream Canada Audit

August 25, 2014

Acknowledgement

The AER acknowledges the cooperation of PMC management and staff for their assistance in its review. The AER received assistance from PMC management and staff to understand the business processes and systems involved and to confirm that the information obtained was relevant to the areas being reviewed. This assistance included providing supporting documentation, identifying information sources, interpreting information, participating in interviews, conducting walk throughs, and discussing conclusions. PMC provided unfettered access to management, staff, and consultants as well as any system access or documentation requested by AER in a timely manner and was fully cooperative in its interaction with AER staff conducting the audit.

PMC also acknowledges the findings within this report and confirms that it has no significant disagreements. PMC has undertaken a number of improvements and initiatives prior to the audit that PMC will continue to advance to address audit findings requiring action. PMC commits to providing the AER with formalized corrective action plans and timeframes for the audit findings.

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Executive Summary

On July 4, 2013, the Alberta Energy Regulator (AER) issued an order under section 22 of the *Oil and Gas Conservation Act*, RSA 2000, c. O-6. In the order, the AER committed to conducting a full audit of Plains Midstream Canada's (PMC) operations regarding emergency planning and response, integrity management programs, risk assessment and mitigation, communications and stakeholder relations, regulatory reporting, and progress in connection with action plans that are required in response to enforcement actions.

On December 11, 2013, the AER held an entrance meeting with the PMC executive team, and detailed audit work proceeded between December 12, 2013, and April 22, 2014. The purpose of the audit was to determine the effectiveness of PMC's various management, oversight, and reporting programs. A summary of the audit results is provided below. A complete discussion of audit results is in section 6 of this report.

There is evidence that PMC has communicated requirements within the organization to go beyond compliance by

- implementing an organizational operational management system,

- developing an emergency management policy, and

- adopting US Transportation Department Pipeline and Hazardous Material Safety Administration requirements for the control room and more conservative emergency planning zones.

PMC has also increased management scrutiny over regulatory reporting requirements and maintains an organizational philosophy of "when in doubt, report". However, there are areas for improvement, as not all audit criteria were met. Of the 55 audit criteria that were direct quotes from legislated requirements,

- 37 were met,

- 16 were partially met, and

- 2 were not met.

Of the 58 audit criteria that were based on benchmark practices or developed through interpretation of legislated requirements,

- 22 were met,

- 31 were partially met, and

- 5 were not met.

Despite the AER's findings that PMC did not meet or only partially met a number of audit criteria, as a result of improvements and initiatives undertaken by PMC over the last year, the AER's overall conclusion is that PMC has and maintains many formal and informal processes in place to

ensure that it can operate in compliance with applicable regulatory requirements on a long-term, sustainable basis.

Testing of the audit criteria within the PMC organization has indicated that it is focused on implementing benchmark practices and setting a goal to go beyond compliance with minimum requirements. PMC has asserted, in documentation of current and future process improvements, that it's developing more mature processes to address compliance with legislated requirements and is moving towards building more rigor into its organization. In consideration of these activities, and as long as PMC ensures that these criteria are addressed by implementing systems currently under development, the AER is comfortable that the legislated criteria that were identified as partially met should not have material effect on PMC's ability to maintain ongoing compliance.

The audit review highlighted the following areas of PMC's operational activities:

- PMC was assessed to be carrying out the following processes consistently:

    - management of change for operational changes

    - training control centre operators

    - control centre procedures

    - processes for managing vendor competency

    - design and operational controls

- PMC has hired several highly experienced staff in the past $2^1/_2$ years and increased its capacity within the management oversight area. However, the experience of staff does not negate the need for well documented processes to ensure consistency in meeting requirements. Also, due to the relatively recent acquisition of assets from British Petroleum, PMC has many procedures that have not been updated or are not currently in place.

- While PMC has many experienced staff in place, it appears that the organization's requirements with regards to following defined processes may be weakened by staff drawing on personal experience versus organizational procedures. While PMC may be able to operate in compliance to regulatory requirements it should strengthen management oversight controls with regards to ensuring that staff adheres to procedures. This is especially important in PMC's risk assessment processes where documentation of procedures and management oversight could also be strengthened to ensure increased process control in this area.

PMC has demonstrated that it has and maintains management commitment to implementing organizational change necessary to achieving regulatory compliance. The AER recognizes that if PMC had previously implemented these control activities there would have been a reduction of risk within PMC operational activities.

The draft findings and recommendations were presented to PMC between April 16 and April 29 of 2014. Subsequent to reviewing additional supporting material provided to the AER, final findings were provided to PMC. PMC indicated disagreement about the conclusion drawn with regards to the *Pipeline Act* and section 7 of the *Pipeline Rules* [Alberta Regulation 91/2005] that no corporate operations and maintenance manual is consistently used for all AER regulated pipelines. With the exception of this item, no substantive exceptions were noted with regards to the veracity of the findings and opportunities for improvement presented.

Although this audit has been completed, the AER confirms that it will continue its ongoing interaction with PMC to confirm that PMC's risk reduction activities identified during the course of the audit are implemented. The AER will follow up on the results of the audit and PMC's assertions about the progress of implementation of programs and processes that it is intending to implement within the 2015 year.

1 Background

On July 4, 2013, the Alberta Energy Regulator (AER) issued an order under section 22 of the *Oil and Gas Conservation Act*, RSA 2000, c. O-6 (section 22 order). In the order, the AER committed to conducting a full audit of Plains Midstream Canada's (PMC's) operations regarding emergency planning and response, integrity management programs, risk assessment and mitigation, communications and stakeholder relations, regulatory reporting, and progress in connection with action plans that are required in response to enforcement actions.

The AER issued the order due to the significant number of noncompliance events that stemmed from pipeline incidents and AER compliance assurance activities between January 1, 2011, and July 4, 2013. During this period, the AER issued and identified 19 high and low risk deficiencies and regulatory noncompliant events, including 14 high risk and 5 low risk in connection with PMC's AER-licensed pipelines and facilities.

The following significant events preceded the AER's decision to conduct this audit:

- April 29, 2011: Pipeline failure and release of approximately 4500 m^3 of sweet crude oil from PMC's Rainbow pipeline northeast of Peace River.

- June 7, 2012: Pipeline failure and release of approximately 463 m^3 of crude oil from PMC's Rangeland pipeline near Sundre.

- February 26, 2013: Investigation completed and a High Risk Enforcement Action (HREA) issued against PMC for the April 2011 Rainbow pipeline failure.

- July 4, 2013: As part of its investigation into the 2012 Rangeland pipeline failure, the AER issued four HREAs against PMC, including

  - failure to conduct annual inspections at pipeline water crossings,

  - failure to complete an engineering assessment to determine suitability of continued operation of the Rangeland pipeline,

  - failure to demonstrate an emergency response plan management process and keep emergency response plans up to date, and

  - failure to conduct a public awareness program every two years.

Completion of this audit is aligned with the commitments made by the AER in response to the *Alberta Pipeline Safety Review—ERCB Response to the Minister of Energy, March 2013*. Some of these commitments include reviewing the role and frequency for auditing integrity management programs and evaluating opportunities for using performance-based requirements where compliance is evaluated through the assessment of management systems and operating performance.

2 Objective

The objective of the audit was to determine whether PMC has processes, practices, and demonstrated management commitment to provide reasonable assurance to the AER that PMC can operate in compliance with applicable AER regulatory requirements.

To achieve this objective, the AER examined PMC with respect to assessing the following:

- A risk management program is in place and integrated throughout strategic and operational activities. Significant risks are identified and assessed, particularly those risks to maintaining safe operations and achieving regulatory compliance. Relevant risk information is captured and communicated in a timely manner across the organization and to appropriate parties, including the parent company.

- Appropriate risk responses are selected that address intolerable risks to operating performance and achieving regulatory compliance. The status of risks and the actions taken to address them are monitored by appropriate management.

- An emergency preparedness and response process is in place that proactively identifies risks and reduces the likelihood and impacts of incidents that could jeopardize public safety and the environment. An effective level of preparedness to implement emergency response plans exists, including trained personnel and equipment, to carry out an effective emergency response to incidents.

- Appropriate emergency response plans (ERPs) are in place to respond to incidents that present significant hazards to the public and the environment. Business continuity plans and environmental remediation plans are in place and working as intended once the emergency is concluded.

- Noncompliances and subsequent enforcement actions are managed in a manner that ensures corporate executive awareness and fosters a sustained improvement in compliance performance. Changes in regulatory requirements are monitored and communicated to the appropriate personnel in an efficient and effective manner. Processes are also in place to ensure business practices are altered as appropriate in response to regulatory change.

- Communications and performance measurement processes are in place to ensure that regulatory information is tracked and reported to the appropriate internal and external parties. Information related to operating conditions, risks, and hazards is monitored and communicated to the appropriate parties in order to enable proactive issue resolution and regulatory compliance.

- Organizational structure, with well-defined responsibilities and authorities, and resource allocation are optimized to the extent that they reduce operational risk and contribute to achieving compliance. This includes ensuring that staff is competent, trained for their roles, and is accountable for mitigating operational risk.

- Standards, quality assurance/control, and integrity and loss management programs are in place during design, construction, operation, and maintenance activities that reduces risk of incidents and noncompliance.

- Adequate evaluation processes and accountability structures have been established for the review and implementation of proposed changes during design, construction, operation, and maintenance activities. This includes evaluation practices when acquiring assets from other organizations.

- Operations and practices are constantly and consistently measured and monitored in order to strive for improvement in meeting safety and regulatory compliance objectives.

- Efficient and effective decision-making and accountability structure is in place in addition to ensuring that achieving compliance with laws and regulations is incorporated into business objectives. Senior management establishes the tone at the top by having a clearly articulated policy and leadership commitment regarding the importance of internal control and expected standards of conduct.

- Communication occurs both internally and externally in a manner that provides target audiences with the information they need to make informed decisions and carry out their responsibilities. Information should be managed in a manner that ensures accuracy and availability.

- Ongoing and/or separate evaluations are conducted to ascertain whether effective business programs and controls are in place and performing as intended. Outcomes are measured and the results of monitoring activities are communicated to the parties responsible for taking corrective action.

3 Scope and Criteria

3.1 Scope

To achieve audit objectives, the AER reviewed PMC's internal processes and practices to determine whether they are sufficient and effective to reasonably satisfy the AER that PMC can operate in compliance with applicable regulatory requirements on a long-term and sustainable basis. The scope of the audit was the PMC's pipelines that are regulated by the AER and included review of the following eight audit areas (numbered as they are in appendix 1):

- Operations Resource Management (1)

  – Staff Training and Competency (1.1)

  – Vendor Qualification (1.2)

- Operational Controls (2)

  – Corrosion (2.1)

  – Design (2.2)

- – Installation (2.3)

- – Materials (2.4)

- – Operations (2.5)

- Operations Change Management (3)

  - – Management of Change (3.1)

  - – Acquisitions (3.2)

- Operations Continuous Improvement (4)

- Risk Management (5)

  - – Integrated Risk Management (5.1)

  - – Risk Assessment and Evaluation (5.2)

  - – Risk Communication (5.3)

  - – Risk Treatment and Monitoring (5.4)

  - – Business Continuity Planning (5.5)

- Regulatory Reporting (6)

  - – Noncompliance and Enforcement Management Practices (6.1)

  - – Regulatory Change Monitoring and Administration (6.2)

  - – Regulatory Reporting Monitoring and Administration (6.3)

- Emergency Planning and Response (7)

  - – Emergency Management Program Roles, Training, and Competency (7.1)

  - – ERP Updates, Exercises, and Communication of Results (7.2)

  - – Lessons Learned (7.3)

  - – Emergency Operations Response and Remediation (7.4)

  - – Stakeholder Relations and Communication (7.5)

- Management Oversight and Internal Controls (8)

  - – Standard Operating Procedures (8.1)

  - – Internal Communications (8.2)

Summary findings for the various scope areas are referenced in sections 6.1 to 6.5. The AER conducted a review of the 19 high and low risk enforcement actions that were referenced in the section 22 order. The

results are in section 6.6. The AER also carried out an assessment of PMC's control centre in Olds, Alberta. The assessment verified the status of implementation for various types of improvements to the control centre based on the recommendations in a consultant's report entitled *Bow Tie Analysis and Point-by-Point Comparison of Old and New Rainbow NPS 20 Pipeline Leak Detection and Pipeline Restart Procedures*, dated November 2011. The results of the assessment are in section 6.7 of this report.

3.2 Criteria

Criteria used for testing throughout the audit were identified from several sources, including legislative sources, industry-wide reference standards, and industry best practices. The criteria sources are listed in appendix 4.

Although clauses from legislated requirements were used as audit criteria for various audit areas, this was done for purposes of arriving at conclusions and not for determining compliance with legislated requirements.

Audit criteria for testing certain PMC management system elements were developed from Canadian Standards Association (CSA) requirements and PMC's own policies and procedures. These management system elements were assessed only for conformance to the audit criteria and were not assessed for effectiveness.

3.3 Limitations

Due to the breadth of the scope of this audit, the AER did not expect that all data or systems would be identified and reviewed. Testing of controls was also limited as review procedures were mainly focused on information gathering and analysis.

3.4 Approach

This audit used a sampling approach that assessed a representative cross-section of operations. A sampling of management system elements was selected based on those elements that were related to the audit areas and whether the element was considered to have been developed within PMC.

4 Highlights of Findings

During the course of the audit, the AER found that during 2013 and 2014 PMC significantly increased management oversight as well as allocation of financial and human resources to address gaps that PMC had identified could potentially impair its ability to operate in full compliance with applicable regulatory requirements. The AER ascertained that PMC has many significant corporate initiatives underway that will address these identified gaps, such as implementation of an operations management system (OMS), which includes an operational risk management (ORM) policy, an emergency management (EM) continuous improvement (CI) plan, a stakeholder relations framework, and public awareness (PA) programs when and if they are fully implemented.

PMC is also in the process of implementing information technology (IT) system controls, including the supplier information performance system (SIPM) and the contract management system (CMS), and is expanding or strengthening current control systems such as the Plains incident notification system (KMI/PINS), management of change (MOC) systems: P2 and Maximo; and the dynamic risk integrated management system (IRAS). These systems will help strengthen controls over pipeline integrity risk management.

Testing of the audit criteria within PMC has indicated that it is focused on implementing benchmark practices and setting a goal to go beyond compliance within the organization. PMC has asserted, in documentation of current and future process improvements, that it's developing more mature processes to address compliance with legislated requirements and is moving towards building increasing rigour into its organization. In consideration of these activities, and as long as PMC ensures that these criteria are addressed by implementing the key systems currently under development, the AER is comfortable that the legislated criteria that were identified as partially met should not have material effect on PMC's ability to maintain compliance.

The audit review highlighted the following areas of PMC's operational activities:

- PMC has hired several highly experienced staff in the last $2^1/_2$ years and increased its capacity within the management oversight area. However, the experience of staff does not negate the need for well documented processes to ensure consistency in meeting requirements. Also, due to the relatively recent acquisition of British Petroleum's (BP's) assets, PMC has many procedures that have not been updated or are not currently in place.

- While PMC has many experienced staff in place, it appears that the organization's requirements with regards to following defined processes may be weakened by staff drawing on personal experience instead of applying organizational procedures. While PMC may be able to operate in compliance with regulatory requirements, it should strengthen management oversight controls to ensure that staff adheres to procedures. This is especially important in PMC's risk assessment processes where documentation of procedures and management oversight could also be strengthened to ensure increased process control in this area.

4.1 Control Strengths

PMC was assessed to be carrying out the following processes consistently well:

- Management of change for operational changes
- Training for control centre operators
- Procedures for the control centre
- Processes for managing vendor competency
- Design and operational controls

4.2 Audit

For each of the audit areas, appendix 1 contains audit findings of met, partially met, and not met. Section 6 is a summary of audit findings, including audit findings and opportunities for improvement based on the total number of criteria for each audit area. The information that supports the findings is outlined in appendix 1. Of the 55 audit criteria that were direct quotes from legislated requirements

- 37 were met,

- 16 were partially met, and

- 2 were not met.

Of the 58 audit criteria that were based on benchmark practices or developed through interpretation of legislated requirements,

- 22 were met,

- 31 were partially met, and

- 5 were not met.

4.3 Potential Noncompliance Areas

Although the objective of the audit was not to determine potential gaps in the regulatory requirements that apply to PMC's operations, during the course of the audit it was noted that three regulatory requirements may not have been fully met. These have been referred to the AER's Enforcement and Surveillance department to be investigated further. They are described below:

- Currently, PMC does not have an operation and maintenance (O&M) manual that applies to AER-regulated pipelines. An O&M manual would help consolidate the standard operating procedures (SOPs) and ensure that there is common understanding on which SOP is to be used and in what situation. A manual would also provide one location for describing document management practices for version control, approvals, and frequency of procedure reviews. The O&M manual inherited from the CO-ED pipeline system is a good example of an approach that could be used as a model for developing an O&M manual for all of PMC's AER-regulated pipelines (a possible noncompliance with Alberta's *Pipeline Act* and section 7 of the *Pipeline Rules* [Alberta Regulation 91/2005]).

- Lessons learned from incidents and exercises are discussed and documented. However, action items are not always created and assigned to personnel for follow-up. Further, a formalized process for conducting lessons learned reviews, documenting and tracking lessons learned, and creating and tracking related action plans and incorporating them into ERPs is not in place (a possible noncompliance with section 14.11 of *Directive 071: Emergency Preparedness and Response Requirements for the Petroleum Industry*.

- There are no formal screening criteria, checklists, or records of the relevancy of a regulatory change to PMC business. The responsibility to identify and determine whether a regulatory change affects

PMC operations and the relevancy to the organization is primarily left to the experience and expertise of regulatory affairs staff (potential noncompliance associated with *CSA Z662-11*, *N.6.2).*

5 Conclusion

As a result of improvements and initiatives undertaken by PMC over the last year, the AER's overall conclusion is that PMC has many formal and informal processes in place to ensure that it can operate in compliance with applicable regulatory requirements on a long-term, sustainable basis. PMC has demonstrated that it has and maintains management commitment to implementing organization change necessary to achieving regulatory compliance. There is evidence that PMC has communicated requirements within the organization to go beyond compliance with minimum regulatory requirements through initiatives such as the implementation of an organizational operational management system, development of an emergency management policy, adoption of US Transportation Department Pipeline and Hazardous Material Safety Administration requirements for the control room, and more conservative emergency planning zones. PMC has also increased management scrutiny over regulatory reporting requirements and maintains an organizational philosophy of "when in doubt, report."

The AER requires that PMC submit to the AER semiannual update reports on overall progress on implementation and key program deliverables for the stakeholder relations framework and for the public awareness programs. This requirement will continue until the AER is satisfied that PMC is conducting a public awareness campaign every two years on AER-regulated pipelines and that the implementation of the program is sufficiently integrated into the organization to ensure continued ability to meet the regulatory requirements. Also, due to the potential for a noncompliance with legislated requirements, the AER requires that PMC formalize the process for conducting ERP lessons learned reviews with all applicable staff. This includes documenting and tracking lessons learned and creating and tracking related action plans, incorporating them into ERPs, and communicating the results to staff.

Except for the required AER reporting and the resolution of the lessons learned potential noncompliance required above, and in consideration of the work completed and in progress, there currently is no recommendation about the process for implementing PMC's initiatives and systems controls. PMC is encouraged to have appropriate oversight such that the intended benefits are realized.

PMC should take note of the opportunities for improvement and the observations noted in areas that were reviewed during the course of the audit. The AER will follow up in 2015 to verify that these initiatives are achieving desired objectives and addressing risks in terms of providing reasonable assurance that Plains can operate within compliance of the AER's regulatory requirements.

6   Observations and Improvement Opportunities

6.1   Integrity Management Programs

AER's review of controls related to the 55 criteria associated with integrity management programs identified that 35 were met, 17 were partially met, and 3 were not met. Details are in appendix 1, sections 1–4.

During the audit, the AER noted that in clause 3.1 of *CSA Z662-11* clause 3.1, discussion of the key elements of a safety and loss management system is written at a very high level without details or guidance. This may cause confusion for the pipeline industry if clause 3.1 is not linked with annex A of *CSA Z662-11*. The AER should consider adopting annex A of *CSA Z662-11*, annex A, which identifies recommended practice for a safety and loss management system.

For the audit areas, training and competency and management of change, the findings were different for the control centre, field locations, and head office. For these areas, the findings are in table 1 below.

Table 1. Summary of audit findings—number of findings

	Resource management		Operational controls					Change management		Continuous improvement
	Staff training and competency	Vendor* qualification	Corrosion control	Design	Installations	Materials	Operations	Management of change	Acquisitions	Continuous improvement
Met	1	5	3	7	4	2	8	0	2	3
Partly met	2	0	5	0	2	2	0	4	2	0
Not met	1	0	1	0	0	0	0	0	0	1
Total	4	5	9	7	6	4	8	4	4	4

*PMC defines vendors to include contractors, suppliers, consultants, and service providers.

6.2   Risk Assessment and Mitigation Practices

The AER's review of controls related to the 19 criteria associated with risk assessment and mitigation practices identified that 7 were met, 10 were partially met, and 2 were not met. Details are in appendix 1, section 5. The following are features of PMC's risk assessment and mitigation practices:

- PMC has created several risk management programs and documents within the last year, which indicates a willingness to be proactive in addressing the issues identified in the section 22 order instead of waiting for the results of the audit. However, these programs are major organizational undertakings and are not fully implemented at this time, nor are they necessarily aligned with each other.

- The current risk management framework has been ad-hoc, and there has been a lack of consistency. PMC has identified this as an issue, and it is being addressed through the OMS and its associated ORM policy.

- PMC is implementing an OMS as a bridge between corporate strategy and operational execution in addition to helping identify specific areas at risk for facilitating effective decision making. However, specific risk tolerance levels still need to be determined as there may be varying perspectives on what the priorities are. If the amount of risk the organization is willing and able to accept in pursuit of value is not defined clearly, it becomes more challenging to determine where best to allocate resources and mitigate risks.

- PMC has established a governance structure for the OMS at the corporate, strategic, operational, and site management levels, including an Executive Operations Leadership Team (EOLT) terms of reference. A draft RACI chart has also been created that identifies the accountabilities for the various elements of the OMS. The executive vice president (EVP) of Operations is accountable for risk assessment and management.

- PMC had established a steering committee, composed of senior management, to monitor the OMS implementation. PMC has stated that they are currently testing the ORM policy risk assessment process to determine if it is "fit for purpose."

- PMC's approach to risk management for asset integrity is in a state of flux as the Asset Integrity Department is still developing its new process and has yet to align it with OMS risk management practices, which are also still under development. Even though PMC provided documentation that indicates the existence of a process for assessing asset integrity risk, it straddles the current and future methodologies.

  Consequently, PMC did not clearly demonstrate a uniform end-to-end asset integrity risk assessment process that is aligned with other PMC risk assessment processes. PMC's plan is to address this by June 2014. There is merit to having some flexibility in the alignment of risk assessment processes if a risk assessment result from the OMS process needs to be adjusted based on other factors such as ensuring that minimum CSA standards are met for pipeline integrity.

- Risk management practices are currently varied between field areas. However, the OMS implementation is intended to achieve alignment, in particular between LPG and crude oil operations. Alignment of current and new procedures is incomplete, but will be completed on a priority basis as part of the OMS capability transfer process.

- Given the changes in PMC's operations and asset base in the last three years (e.g., closure of a $1.67 billion BP asset acquisition in April 2012), the frequency with which PMC is conducting and has conducted industry hazard analyses (IHA) is not in accordance with what is prescribed in its environment safety management system (ESMS) manual that has been in place since July 2010. Using the ORM policy, PMC's plan is to replace this IHA process through the development of risk registries by operational area and functional group.

- According to PMC's life rules and code of conduct and within the safe work permit process, it is the responsibility of all workers to communicate any observed unsafe work condition or action, safety concern, or inability on their part to understand safe work procedures or processes to their supervisor. Inconsistencies across field offices in the how the safe work permit process was used were noted during the audit. A new safe work permit process and form has been developed and is currently being tested for six months, at which time it will be evaluated. As part of the implementation, awareness and training sessions for PMC staff will be delivered.

- PMC's PA strategy was designed in the fall of 2013 and is intended to evolve and change relative to stakeholder input, stakeholder needs, measurement results, and business realities. However, brochures and communications plans for all of the pipeline systems are not complete at this time. Even though principles and commitments are identified in the PMC stakeholder relations framework, it and the associated PA program are still under review and have not been completely implemented.

- PMC uses various systems to ensure that risk information is recorded, readily accessible, monitored, periodically reviewed, and reported internally and externally as appropriate. Three key technology-based control systems are KMI (also known as PINS), the MOC system, and the enterprise asset management system (EAM). However, alignment of workflow tracking information from incident to corrective action is not consistent, and there is a system gap in KMI that allows information to be excluded for an "Incident" entry that would normally be required.

- Currently, there is no business continuity program at PMC; however, there are components of business continuity practices within PMC, such as disaster recovery plans. PMC has indicated that it recently held preliminary discussions regarding the development of a business continuity plan (BCP).

6.2.1 Opportunities for Improvement

In consideration of the work completed and in progress, the AER has not formally identified opportunities for improvement for OMS. However, PMC should take note of the observations made during the course of the audit. The AER will follow up to verify that PMC's initiatives are achieving objectives and addressing risks in terms of providing reasonable assurance that Plains can operate within compliance of the AER's regulatory requirements. The AER identified the following opportunities for improvement within PMC's risk management practices:

- Risk management practices developed throughout the organization should be fully implemented, aligned, and used consistently in a manner that does not compromise the quality and reliability of results for each individual process.

- Processes should be put in place to ensure that incident and corrective action information is adequately referenced and entered consistently across the related record systems.

- Risk-ranking methods and results documentation should be complete and aligned across data sources that track contractor suitability in addition to ensuring that exceptions to policy are appropriately approved and documented.

- Risk communication processes and practices should be completed consistently in addition to ensuring that accurate records are kept to demonstrate that risk-related information has been communicated and followed up on by the appropriate personnel. If key messages, information, and processes originating from corporate headquarters are not continuously reinforced at the field level, it can become more challenging to maintain a risk-aware culture where risk management practices are consistently applied.

6.3 Regulatory Reporting Processes

6.3.1 Observations and Findings

AER's review of controls related to the 18 criteria associated with regulatory reporting practices identified that 5 were met, 12 were partially met, and 1 was not met. Details in appendix 1, section 6. The following are features of PMC's regulatory reporting practices:

- The designation of a single, visible vice president of regulatory affairs in 2012 has introduced frequent and consistent reporting of compliance management throughout the organization. PMC complied with applicable regulatory requirements regarding notification to the AER of relevant releases and incidents in 2013.

- While there has been significant effort to build more rigour in regulatory reporting processes in the last year, many of these processes can be considered reactionary. Further monitoring and review, as well as development and refinement of existing processes would enable PMC to better use quality information for analysis, trending, and staff development to move toward proactively mitigating compliance risk.

- The development and implementation of systems and processes to capture PMC submission information through various submission tracking sheets has improved the organization's ability to manage regulatory information. This practice originated with senior management as a commitment to have visible submission and reporting tracking throughout the organization after the section 22 order was issued. Generally, all *Directive 056*: *Energy Development Applications and Schedules* (*Directive 056*) applications from August 2013 to January 2014 had an adequate success rate in meeting AER requirements. There was improvement after the global refer where applications went from 83 per cent acceptance rate to 15 per cent acceptance rate in less than a few months. However, there is no evidence indicating the use of AER manuals or any SOPs as training tools for specific submission processes for *Directive 056*, digital data submission (DDS) notifications, or other submission requirements. Staff typically relies on colleagues' expertise and experience.

- Many tracking tools have been put in place for compliance management, with varying levels of formal and informal procedures (meetings, spreadsheets, MOC systems, scoping documents, PINS/KMI, SOPs) to capture and monitor regulatory noncompliance (and potential noncompliance) and corrective actions. There are no formal screening criteria, checklists, or records of the relevancy of a change to PMC business. The responsibility to identify and determine whether a regulatory change affects PMC operations, and the relevancy to the organization, are left to experience and expertise of regulatory affairs staff.

- While a review of the regulatory monitoring tracking sheet identified a variety of jurisdictional regulatory changes affecting PMC, several AER regulatory changes since 2013 were not captured in this spreadsheet.

6.3.2 Opportunities for Improvement

The AER noted the following areas in which PMC could strengthen its regulatory reporting processes:

- To improve staff's ability to ensure that all relevant regulatory changes are captured for the organization, implementation of more formalized screening criteria for relevancy of regulatory changes upon PMC business should be considered. The impact of those changes should be more comprehensively identified, documented, and communicated with the resulting actions noted. Documentation and critical assessments regarding impacts on the current business are not yet obvious and accessible in a single source for review.

  – The AER weekly publication, "Regulatory Change Report," could be used as an additional resource to identify current and upcoming regulatory change that could impact PMC operations.

  – All PMC staff should have access to the regulatory monitoring tracking sheet spreadsheet for review.

- PMC should develop training and operational documentation that helps staff identify noncompliance with energy-related regulatory requirements. Specific to the AER's jurisdiction and relative to PMC's operation, incorporating the need to become familiar with AER information, such as the information found in directives, manuals, the risk assessed noncompliance spreadsheet, is invaluable in supporting staff to identify, report, and maintain compliance with regulatory requirements.

- Reviews and assessments should be in place to confirm that staff understand and can identify noncompliance with regulatory requirements. Noncompliance with AER requirements is frequently associated with a hazard or safety risks—and an increase in awareness and understanding of these requirements, combined with the ability to identify and report noncompliance, will contribute to the PMC continuous improvement process regarding safety and environmental programs.

- PMC should develop and maintain a formal tracking system for submission and progress of applications. PMC should continue with the practice of having visible submission and reporting tracking throughout the organization.

6.4   Emergency Planning and Response Practices

6.4.1 Observations and Findings

The AER's review of PMC's controls related to the 19 criteria associated with emergency planning and response practices identified that 12 were met, 6 were partially met, and 1 was not met. Supporting detail is provided in appendix 1, section 7. The following are features of PMC's emergency planning and response practices:

- The AER's review of PMC's emergency planning and response practices found that objectives for the desired level of preparedness have been set and communicated to employees through issue of an EM policy in January 2014. These objectives include a stated objective of exceeding applicable regulatory requirements. As well, management is in the process of implementing a 2014 emergency management CI program at PMC.

- PMC has developed a stakeholder relations framework, PA ambassador training, and a PA and education program and is in the process of implementing these programs. Stakeholder meetings and resident consultation are included in the CI plan. However, interviews indicate that no PA schedule is currently in place.

  - Capturing and managing any major issues with the external stakeholders such as landowners is done using the PINS/KMI system. This allows consistent, visible, and traceable management and progress of the corrective actions associated with an issue. This system also contributes to visible and clear responsibility across divisions in addressing corrective actions, including reporting and communicating with the external stakeholders. The PA program and dispute tracking are new, therefore its effectiveness was not observed.

- From October 2013 to February 2014, PMC reformatted and updated all of its ERPs and provided them to the AER. PMC has developed a project summary for the regulated ERPs that identify the next completion dates required. PMC hired an emergency planning and security specialist with responsibility for monitoring the plans in October 2013. Records indicate that PA campaigns have occurred on all AER-regulated pipelines prior to developing the new ERPs. Records of resident concerns are developed, addressed internally, and then resolved with the resident. Public information packages have operational specific information related to the areas where they were distributed.

- The AER reviewed six ERP exercise lists and summaries dated from 2010 to 2013 and identified that all required exercises have occurred on AER-regulated pipelines. PMC requires findings and lessons learned to be identified along with corrective action recommendations as part of each tabletop or full-scale exercise. It also requires recording of lessons learned from risks and incidents and distribution of related safety alert bulletins within and outside the organization.

  - Review of exercises and incident responses and interviews identified that PMC does retain incident and exercise records and maintains a records retention policy.

- PMC uses incident command system (ICS) training models, and evidence indicates that training is widely provided to the organization and all but one plan responder had received training in ICS. Through training, PMC also educates responders about resource requirements for emergencies.

  - Lessons learned from incidents and exercises are discussed and documented. However, action items are not always created and assigned to personnel. Further, a formalized process with regards to conducting lessons learned reviews, documenting and tracking lessons learned, or creating and tracking related action plans and incorporating them into ERPs is not in place.

- Review of the submitted remediation plans and the interview comments from the Alberta Environment Support and Emergency Response Team (ASERT), AER, and Alberta Environment and Sustainable Resource Development (ESRD) staff members who were directly involved in the Glennifer Lake and MP188 incidents indicated that Plains met the requirements of the *Environmental and Protection Enhancement Act* (*EPEA*) sections 112(1)(a)(i) and (ii). The releases were assessed early in the response, and containment measures were implemented within a reasonable time frame.

- Testing of two incidents that occurred in June and July of 2013 found that PMC proactively identified potentially impacted residents and informed affected stakeholders.

6.4.2 Requirements

The AER requires that PMC formalize the process with regards to conducting lessons learned reviews, documenting and tracking lessons learned and creating and tracking related action plans and incorporating them into ERPs.

Also, the AER requires that PMC submit to the AER on a semi-annual basis update reports with regards to overall progress on implementation and key program deliverables for the stakeholder relations framework and the PA programs. This requirement will continue until the AER is satisfied that PMC is conducting a PA campaign every two years on AER-regulated pipelines and that the implementation of the program is sufficiently integrated into the organization to ensure continued ability to meet the regulatory requirements.

6.4.3 Opportunities for Improvement

The AER has also identified the following areas in which there is opportunity for improvement within PMC's emergency preparedness and response practices:

- PMC should continue following its 2014 continuous improvement plan in order to improve and enhance the emergency management program and allow PMC to develop consistent training material and training schedules.

- PMC should continue with its plans to develop a training and exercise schedule in order to effectively monitor who requires training and which ERPs require an exercise and when, as per the 2014 CI plan.

- PMC should incorporate into its CI program a formal process for sharing exercise results with relevant internal and external stakeholders, and it should update its ERPs accordingly as part of the annual review process.

- PMC should consider developing a schedule for conducting a PA program and incorporate it into its CI program.

6.5 Management Oversight and Internal Controls

The AER did not specifically designate criteria for testing PMC's management oversight and internal control systems as most of the 111 criteria tested included some component of management oversight programs or good practices and processes with regards to internal controls. These criteria would be related to the following audit objectives:

- Efficient and effective decision-making and accountability structure is in place in addition to ensuring that achieving compliance with laws and regulations is incorporated into business objectives. Senior management establishes the tone at the top by having a clearly articulated policy and leadership commitment regarding the importance of internal controls and expected standards of conduct.

  - Therefore, the AER believes PMC has appropriate rigour in its internal controls and management oversight to ensure ongoing compliance with regulatory requirements.

- Communication occurs both internally and externally in a manner that provides target audiences with the information they need to make informed decisions and carry out their responsibilities. Information should be managed in a manner that ensures accuracy and availability.

  - The AER developed two criteria for internal communications practices. The results of the testing of these criteria are identified in section 8.2 of appendix 1. The AER's review assessed both of these criteria as partially met.

  - Ongoing and/or separate evaluations are conducted to ascertain whether effective business programs and controls are in place and performing as intended. Outcomes are measured and the results of monitoring activities are communicated to the parties responsible for taking corrective action.

Through the course of the audit, AER staff made numerous observations of management practices. Some of the observations were identified through review of PMC SOPs and management programs. Any deviations from the governing documents, or in some cases from legislated requirements, were noted and provided to PMC as a component of findings provided at the audit exit meetings. AER staff also made

observations of potential improvements. The observations were provided to PMC regardless of whether they deviated from any governing documents. Details of these observations are in appendix 1, section 8.

The following is not meant to be a comprehensive listing of all management controls identified. It is provided for context in areas where management controls intersect with numerous scope areas.

- PMC has a number of systems and protocols under development or newly developed for exchanging risk information. These include the OMS, crisis communication plan, stakeholder relations framework, public awareness and education program, public ambassador training programs, and the 2014 emergency management continuous improvement plan

- There appears to be little communication and follow-up between the field and office personnel. It appears to be more of a linear process involving the passing of information and data, with no follow-up discussions, reviews, or sharing of learnings after that.

- The AER's review of PMC's various management and IT systems noted that they provide the ability to ensure that risk information is recorded, readily accessible, monitored, periodically reviewed, and reported internally and externally as appropriate and are relatively effective. However, there are some areas where controls could be strengthened. The systems that govern PMC incident and risk reporting and communications mechanisms include identification of roles and responsibilities. The primary systems are ESMS, MOC, HazIDs/HazOPs, KMI/PINS, corporate emergency response plan (CERP) and safety bulletins.

- The senior leadership at PMC (directors and vice presidents) across all divisions receive information and performance statistics through formal communication processes.

- Through quarterly, biweekly, and weekly management meetings as well as safety meetings, reports, KMI/PINS, and an open-door communication culture, staff is encouraged to share and report identified hazards or risks. The AER tested the sharing of risk information at the field level through review of monthly safety meeting minutes. Although there is inconsistency in meeting format, this test found that hazards and risks are regularly discussed, and being aware of hazards and risks appears to be a part of the workplace culture.

- Several weekly, biweekly, monthly, and quarterly meetings are held (formal and informal) with various levels of the organization to raise awareness and determine status of regulatory matters. Cross-divisional communications on compliance performance and regulatory matters are more informal, although an increase in usage of systems, tools, and engagement by regulatory staff has been a compensating mechanism. The amount of regulatory information reported in meeting minutes significantly increased in late 2013, consistent with PMC's increase in its ability to capture, understand, and communicate compliance and noncompliance matters. PMC follows a "when in doubt, report" philosophy.

- The SOPs contain critical procedures that have not been updated as required by the *Pipeline Integrity Management Manual* (*PIMM*). Critical SOPs are not being reviewed annually as recommended by the ESMS. SOPs are not reviewed on a regular basis and critical procedures are not reviewed annually. For example, PMC pipeline coating replacement critical procedure 6.48, effective April 3, 2009, has not been reviewed yet. Also, PMC pigging procedure 6.110 was effective April 1, 2009, and was reviewed February 1, 2012. There is currently no consistent process in place to initiate updates or amendments to critical operational procedures.

- Although some of PMC's SOPs are in place, they do not appear to be followed consistently, leading to potential internal nonconformance and regulatory noncompliance issues. With the exception of the control centre where robust procedures are in place, PMC seems to be largely relying on the experience and competence of its field personnel for executing field tasks. While it is obviously beneficial to have experienced and competent personnel, this doesn't negate the need to have well-developed, complete, and purpose-built procedures in place.

- There are many procedures in place at PMC that pertain to regulatory requirements but do not identify specific AER requirements. The ability of PMC staff to connect possible noncompliance through these procedures is based on expertise and knowledge of the AER requirements.

- PMC's 2010 ESMS environmental governing system identifies a corrective action process that identifies, reports, and tracks noncompliances. There is no evidence that this formal process was implemented at PMC, although the MOC and PINS/KMI systems have accomplished the same purpose. PMC has two regulatory SOPs in draft and outstanding for some time, which is evidence of a lag in implementing a formal process for identifying, reporting, and tracking noncompliances.

- PMC's *PIMM* is not followed consistently and has not been reviewed regularly and is now under review and had an anticipated January 2014 release. This release is now delayed.

  - Pipeline asset integrity audit conducted by WorleyParsons had findings, and the *PIMM* will be updated as a result.

  - Programs identified as missing or lacking in the audit will be developed in 2014; however, this work will not be conducted until after the AER audit.

- PMC is a very dynamic organization with ongoing organizational changes. Organizational changes are not following a formal management of change program, which can affect the successful execution of various programs.

- There was a preventative maintenance requirement generated in an early 2013 in line inspection (ILI) run, and more than a year later it remained unclosed. It's not clear whether the work was completed.

- No MOC was found for the decision to modify dig criteria from 1.39 maximum operating pressure (MOP) to 1.25 MOP.

6.5.1 Opportunities for Improvement

The AER has also identified the following areas where there is opportunity for improvement within PMC's management oversight and internal controls practices:

- Plains should increase rigour around SOP development and implementation, relevancy, and currency of content to support the compliance program, given that staff predominantly relies on SOPs as process and procedural guidance in performing their roles. This includes documentation, communication to staff, education where applicable, and follow-up. PMC should review their SOPs inherited from previous owners/operators to determine their continued applicability to PMCs current operational environment.

- Some of PMC's documents, such as the Pipeline Integrity Management Manual and the various phases of the OMS, contain good concepts and intentions. PMC is encouraged to take appropriate action to ensure that these are updated, followed through with, and implemented.

- PMC should consider areas of improvement in the relationship between the Document Control and Regulatory Change Teams. There is an opportunity to better ensure that groups that are informed of changes act upon those changes and confirm that related changes are being managed.

- Risk communication processes and practices should be completed consistently in addition to ensuring that accurate records are kept demonstrating that risk-related information has been communicated and followed-up on by the appropriate personnel.

- Awareness and transparency of the noncompliance tracking and the process of corrective actions should be continued through meetings and reporting. The organization's exposure to the tracking sheets should be considered another informational tool to ensure that staff from appropriate disciplines is attuned to the status and progress of compliance issues and their corrective actions. PMC should continue to communicate to the organization its "when in doubt, report" philosophy.

6.6   Status of Enforcement Actions

The AER issued 14 high and 5 low risk enforcement actions against PMC between January 1, 2011, and July 4, 2013. The AER identified that PMC has satisfactorily addressed 15 of the enforcement actions. It is important to note that achieving compliance may be defined by the AER as "response received" or "action plan accepted" and does not necessarily mean that the AER has followed up to ensure that action plans have been implemented by PMC.

The 4 enforcement actions that have not been resolved are for the Rangeland pipeline failure and release into the Red Deer River, which occurred on June 7, 2012. The AER is currently processing three PMC appeals for the following HREAs related to this incident:

- Failure to annually inspect pipeline water crossings

- Failure to complete an engineering assessment to determine the suitability of continued operation of the Rangeland pipeline

- Failure to conduct a public awareness program every two years

One of the HREAs, failure to demonstrate emergency response plan management process and keep emergency response plans up to date, is not closed by the AER at the time of writing this report.

In the process of collecting information about the enforcement actions against PMC, AER staff noted the absence of a centralized AER repository of enforcement information. AER staff was required to search various databases and confirm information throughout the AER in order to follow up on the 19 enforcement actions. Moreover, it was noted that in several instances files had neither been updated nor closed appropriately in the various AER databases. It is recommended that the current AER process of storing enforcement action records and information in separate databases be improved by ensuring that all AER branches document enforcement actions in a central database and update that information regularly.

6.7   PMC Control Centre

The AER's assessment of PMC's control centre consisted of reviewing three PMC documents and interviewing the control centre team at the control centre in Olds, Alberta. The required actions from the *Bow Tie Analysis and Point-by-Point Comparison of Old and New Rainbow NPS 20 Pipeline Leak Detection and Pipeline Restart Procedures* dated November 2011 have been implemented.

Details about the various types of improvements to the control centre are in appendix 3. That the recommendations were implemented was verified by a walk-through demonstration of the leak detection, shutdown, and restart procedures by the control centre team and a documentation review.

Appendix 1   Detailed Findings

1.0 Operations Resource Management

1.1 Staff Training and Competency

Audit Criteria:

1.1.1   Organizational structure enables the organization to effectively communicate the roles, responsibilities, and authority of all management and staff. Audit criterion is based on general concepts from *CSA Z662-11* clauses 3.1.2, A.4.4.1, and A.5.2.1 and is not a direct quote from these sources.

1.1.2   Individuals are trained and sufficient to ensure that the organization can design, construct, operate, and abandon its facilities in a manner that fosters safety and environmental protection. Audit criterion is based on general concepts from *CSA Z662-11* clauses 3.1.2(c), A.5.2.1, E.5.1, and N.7.1 and is not a direct quote from these sources.

1.1.3   Training programs and requirements are in place to ensure that staff has the appropriate competencies to fulfill their duties on an ongoing basis. Audit criterion is based on general concepts from *CSA Z662-11* clauses 3.1.2(c), A.5.2.1, N.7.1, N.7.2, and N.7.3 and is not a direct quote from these sources.

1.1.4   Individuals are held accountable for their responsibilities in the pursuit of safe operations and regulatory compliance. Audit criterion is based on general concepts from *Pipeline Rules* [Alberta Regulation 159/2013], *CSA Z662-11* clauses 3.1.1, 10.2, N.7.1 and is not a direct quote from these sources.

References	Assessment	Have criteria been met?
1.1.1	Changes to organizational structure are ongoing, though communication of those changes is not always distributed through the organization. Training and competency requirements were not defined in the job descriptions provided. Accountabilities are not defined (e.g., the change of a MOP decision was taken without a formal sign-off and communication).	Partially met
1.1.2	Control centre procedures are complete, implemented, and supported by training. In the field and office there are some guidelines and procedures and a review process in place and experienced people, but there is a lack of standard procedures to train people to. Mentorship, supervised work and hands-on training provided by senior pipeline operators/ supervisors are the primary training methods. Supervisors assess competency and identify gaps in training/competency (for supplementation with courses, workshops, etc.) based on the supervisor's experience and in conjunction with the individual's input. Quarterly performance assessment is a grading of soft skills only; therefore, competency at specific tasks could not be assessed for office and field personnel. Development plans are reviewed annually. (A training and competency program is in place, but it is not a structured program. At this point there is not a good industry system for training and competency for operations—this is a work in progress for many organizations.)	Met (control centre) Partially met (office) Partially met (field)
1.1.3	The training program is more formally developed for control centre personnel than for office or field personnel. No formal matrix for technical competency requirements for the office and field engineering was found in place at the time of the audit. The control centre has current, complete, documented, and accessible industry-leading processes for start-up and shutdown. While groups interviewed are aware of the existence of SOPs, a sampling	Met (control centre) Not met (office) Not met (field)

	of procedures reveals that they are not up-to-date (e.g., referencing outdated CSA versions, incorrect, incomplete). Many training and competency programs are newly implemented or in early stages of implementation. Interviewees gave the sense that there is a good understanding of roles and responsibilities, processes, and handoffs between PMC groups.	
1.1.4	General orientation and site-specific orientations provide instruction for accountabilities regarding safety considerations. Safety programs include work authority instruction that applies not only to employees but also to contractors.	Met

1.0 Operations Resource Management

1.2 Vendor Qualification

Audit Criteria:

1.2.1. Operator should develop and implement a process such that contractor services are performed in a manner that conforms to the requirements of the safety and loss management system. Audit criterion is based on general concepts from *CSA Z662-11* clauses 3.1.2, A.5.2.2, and N.7.2 and is not a direct quote from these sources.

1.2.2. Contractor services should be evaluated and selected on the basis of the contractor's ability and qualifications to perform the specified duties in a safe and environmentally sound manner, and in conformance the requirements of the safety and loss management system. Audit criterion is based on general concepts from *CSA Z662-11* clauses 3.1.2 (c)(iii), A.5.2.2, and N.7.3 and is not a direct quote from these sources.

1.2.3. Performance requirements and expectations are defined and communicated to the contractor. Audit criterion is based on general concepts from *CSA Z662-11* clause A.5.2.2 and is not a direct quote from these sources.

1.2.4. There is a system for monitoring and assessing contractor performance, providing feedback, and ensuring that deficiencies are corrected. Audit criterion is based on general concepts from *CSA Z662-11* clauses 3.1.2(c)(iii) and A.5.2.2 and is not a direct quote from these sources.

1.2.5. Operator should ensure that a contractor is meeting performance requirements and expectations and addressing deficiencies. Audit criterion is based on general concepts from *CSA Z662-11* clauses 3.1.2(c)(iii) and A.5.2.2 and is not a direct quote from these sources.

References	Assessment	Have criteria been met?
1.2.1	Corporate systems and programs related to vendor competency management, operations management, and pipeline management were under revision or development at the time of the audit. The Construction group was created in 2012 to provide guidance and implement best practice as it relates to construction. This includes contractor competency evaluation, verification, and contractor training. Master service agreements are used to communicate PMC's terms and conditions to contractors.	Met
1.2.2	PMC obtains and evaluates a contractor's safety and environmental policies, procedures, and performance, and verifies contractor employee abilities and qualifications through financial and shop audits. PMC's subject matter experts (SMEs) provide input into the contractor strategy. Designated SMEs are responsible for reviewing third-party procedures against PMC's requirements and standard procedures, where a procedure exists, and regulatory requirements.	Met
1.2.3	Contractor acceptance of PMC's terms and conditions in the master service agreement is tracked. Requirements and expectations are defined and communicated to the contractor through project files and inspection test plans	Met

	and on-site meetings. According to the construction manager, PMC is currently developing an online portal for contractors for easy access to regulations and guidelines. The Construction group is building a standardized project file, including templates and forms to assist contractors and PMC groups with document responsibilities. Contractors are notified in writing of their nonconformances with contractual requirements.	
1.2.4	Construction contractors are being enrolled in a competency management and development system that will allow PMC to more easily track training completed and competencies required for specific roles and responsibilities. Identification of competency gaps has led to the development or enhancement of some competency profiles. Vendor requalification occurs through quarterly feedback surveys competed by various PMC groups. Vendor grades are tracked and trended; nonconformances with contractual requirements are investigated according to a documented process.	Met
1.2.5	The Construction group provides liaison between field and office and manages a contractor training matrix and certification expiry notification. Contractor performance is reviewed through site visits by the construction group and upper management at various points of completion of a project. Verification of the individual competency of vendors occurs through site audits and during observation. Those signing off on vendor performance complete industry-validated training.	Met

2.0 Operational Controls

2.1 Corrosion Control

Audit Criteria:

2.1.1   *CSA Z662-11* clause 9.1.3: Operating companies shall establish and maintain the procedures necessary to satisfy the requirements of Clause 9, except when an engineering assessment determines that specific corrosion control practices are not necessary. Corrosion control procedures shall be included in the operating company's operating and maintenance manuals.

2.1.2   *CSA Z662-11* clause 9.3.1: Coating materials and procedures intended to be used for selected coating systems shall be qualified prior to application to demonstrate that they are capable of providing the required coating properties and performance characteristics.

2.1.3   *CSA Z662-11* clause 9.3.2: Coatings shall be applied in accordance with documented procedures and an appropriate quality program. Such procedures, as applicable, shall address

(a) personnel qualification;

(b) material quality assurance (coating and abrasives);

(c) environmental controls and monitoring (ambient temperature, steel temperature, humidity, etc.);

(d) surface preparation techniques and controls;

(e) application techniques and controls;

(f) curing;

(g) finished coating inspection and testing;

(h) repair techniques; and

(i) record-keeping.

2.1.4   *CSA Z662-11* clause 9.9.1: At regular intervals, operating companies shall verify the satisfactory operation of their cathodic protection systems. CGA

OCC-1-2013 (Canadian Gas Association Recommended Practice), Section 4, shall be considered for monitoring and frequency guidelines.

2.1.5 *CSA Z662-11* clause 9.9.2: Operating companies shall establish, by means of surveys that their cathodically protected pipeline systems meet the criteria selected for cathodic protection. Such a satisfactory state of cathodic protection shall be verified at regular intervals and the operating company shall take remedial action to correct any deficiencies found in such surveys.

2.1.6 *CSA Z662-11* clause 9.1.6: Except where allowed by clause 9.1.3; cathodic protection shall be provided and maintained on existing coated piping that is buried or submerged.

2.1.7 *CSA Z662-11* clause 9.7: Tests shall be carried out to determine the presence or absence of stray direct currents. Where stray direct currents are present, measures shall be taken to prevent external corrosion and other detrimental effects…

2.1.8 Documented procedures are available for preservation of material and handling of piping during installation and commissioning and include preservation of stock items. Audit criterion is based on general concepts from *CSA Z662-11* clause 10.11.3(c) and is not a direct quote from this source.

2.1.9 *CSA Z662-1*1 annex D.7: The operating company shall, using the inspection report provided by the inspection contractor, identify those corrosion imperfections whose reported dimensions would make them defects (see clause 10.10.2), taking into account allowances for errors in the reported dimensions based upon the expected inspection performance. The excavations of such reported imperfections shall be prioritized, taking into account their relative severity, their accessibility, and the potential consequences of failure.

References	Assessment	Have criteria been met?
2.1.1	PMC does not maintain corrosion control procedures (except one procedure for sampling) as part of the SOPs. PMC has stated that their O&M manual is the SOP manual.	Not met
2.1.2	In a document response to an information request, PMC made the following statement: "PMC has evaluated and selected RD-6 coating as the predominant repair coating following pipe inspection and repair. This coating has demonstrated excellent performance in arresting external corrosion while permitting cathodic protection to reach the pipe surface. This coating type requires that the pipe surface be prepared to the standard profile as recommended by the coating manufacturer and that the coating be applied according to the recommended practice."	Met
2.1.3	Between two PMC procedures: Painting & Coating and Replacing Pipeline Coatings, all the requirements of *CSA Z662-11* are met; however, the two procedures do not cross-reference one another or could be combined into one procedure to ensure that all key points are addressed.	Partially met
2.1.4	The regular inspection/monitoring frequency for pipe-to-soil potential surveys, rectifier readings, bond current surveys, and stray current surveys are in line with the Canadian Gas Association (CGA) Recommended Practice OCC-1-2013.	Met
2.1.5	The regular inspection/monitoring frequency for pipe to soil potential surveys, rectifier readings, bond current survey, and stray current survey are in line with the CGA Recommended Practice OCC-1-2013. However, frequencies noted as "when applicable" or "as required" leave room for individual discretion. Malfunctioning rectifiers are not addressed in the procedure.	Partially met
2.1.6	A cathodic protection (CP) system is in place. There are some gaps identified in direct current (DC) and alternating current (AC) current interferences. Some of	Met

2.1.7	the recommendations to address CP deficiencies have not been addressed and continue to reoccur as noted in the annual CP surveys.	Partially met
2.1.8	PMC does not maintain a pipe storage procedure and uses instead a Shaw pipe protection preservation procedure. Although the procedure addresses preservation of pipe at site, it does not address elements of preservation such as preservation of stock item or standby, etc.	Partially met
2.1.9	Documentation provided for review shows the ILI report identified defects were addressed based on likelihood, and digs were executed. The basis for prioritization of digs, accounting for their relative severity, their accessibility, and the potential consequences of failure, have not been addressed in any document made available for review.	Partially met

2.0 Operational Controls

2.2 Design

Audit Criteria:

2.2.1   *CSA Z662-11* clause 4.3.3: Class location designations shall be as given in Table 4.1.

2.2.2   *CSA Z662-11* clause 4.2.1.1: The design pressure for each segment of the pipeline system shall

(a) be specified by the designer;

(b) be not less than the intended maximum operating pressure for that segment; and

(c) include the pressure required to overcome static head, friction loss, and any required back pressure.

2.2.3   *CSA Z662-11* clause 4.2.1.2: The effect of external pressures and loadings on the pipe during installation and operation shall be accounted for using good engineering practice. The pipe wall thickness selected shall provide adequate strength to prevent excessive deformation and collapse, taking into consideration mechanical properties, wall thickness tolerances, ovality, bending stresses, and external reactions.

2.2.4   *CSA Z662-11* clause 4.2.1.3; Fluid expansion effects on pressure shall be considered for exposed piping and pressure-relieving devices shall be installed where required.

2.2.5   *CSA Z662-11* clause 4.2.2.1; The design temperature range for each segment of the pipeline system shall be specified by the designer for the conditions expected during installation, pressure testing, start-up, and operation.

2.2.6   *CSA Z662-11* clause 4.2.3; The weight of pipe, components, contents, insulation cover, wind loading, and other sustained forces shall be considered in stress analysis for the various piping support circumstances encountered during pressure testing and operation.

2.2.7   *CSA Z662-11* clause 4.6.2; Due to the fundamental differences in loading conditions and structural behaviour for restrained portions of pipeline systems and unrestrained portions not subject to substantial axial restraint, different limits for allowable longitudinal expansion stresses and analysis methods are necessary, and such limits and methods shall be as specified in clauses 4.7 and 4.8.

References	Assessment	Have criteria been met?
2.2.1	The design basis memorandum (DBM) for the Rainbow West Pipelines Project identifies the class locations for the project.	Met
2.2.2	The design pressure for the pipeline system is contained in the DBM for the Rainbow West Pipelines Project. Rainbow West Pipelines Project preliminary steady-state hydraulic analysis shows elevation profiles, back pressure, and pressure loss. PMC notes that "the pipeline does not have different pressure segments, therefore the design pressure is the same for the entire length of the pipeline."	Met
2.2.3	The effect of external pressures and loadings on the pipe during installation and operation is taken into consideration in the DBM for the Rainbow West Pipelines Project.	Met
2.2.4	Hydraulic analysis and pressure-relieving devices were included in the design studies. Pressure-relieving devices are also part of the study.	Met
2.2.5	Minimum, normal, maximum, and design operational temperatures for the pipeline are addressed in the documents.	Met
2.2.6	It is mentioned in the design document provided for review that stress analysis will be performed for below- and above-ground piping within facilities following completion of detailed design and that a preliminary analysis will be undertaken to assist in the layout and planning of pipe restraints.	Met
2.2.7	The audit criterion is not specifically contained in the DBM document, although it addresses the effect of external pressure and loadings on the pipe. The DBM document indicates that stress analysis will be included as part of the stress analysis studies that will be carried out following completion of the detailed design. NOTE: Implementation of the design as stipulated in the design basis memorandum was not verified.	Met

2.0 Operational Controls

2.3 Installations

Audit Criteria:

2.3.1 *CSA Z662-11* clause 6.2.2: Care shall be taken in the selection of equipment and methods used in handling, transporting, stockpiling, and placing of pipe and components to prevent damage to the pipe, coating, and any lining.

2.3.2 *CSA Z662-11* clause 10.11.4.1: Repair sleeves may be used as permanent repairs, provided that the following is applicable:

(ii) design compatibility of repair sleeves and piping materials;

2.3.3 *CSA Z662-11* clause 6.2.6.2: Ditch depths shall be sufficient to ensure that the applicable depth of cover specified in clause 4.11 can be achieved.

2.3.4 *CSA Z662-11* clause 6.2.7.1 Backfilling shall be performed in such a manner as to prevent excessive subsidence or erosion of the backfill and support material.

2.3.5 *CSA Z662-11* clause 6.2.11.1: Prior to commencement of horizontal directional drilling, designed in accordance with clause 4.22, a written drilling execution plan shall be developed that outlines the procedures to be used in the completion of such drilling. The plan shall include, as a minimum, (a)

… (i)

2.3.6 *CSA Z662-11* clause 6.5.4: Pipe and components shall be inspected for defects. Such inspection shall include, but not be limited to, inspection for flattening, ovality, straightness, pits, slivers, cracks, gouges, dents, defective weld seams, and defective field welds.

References	Assessment	Have criteria been met?
2.3.1	PMC has a procedure that describes how material is handled manually and mechanically that includes the stacking and loading of material at the work site. Documents reviewed provide information regarding Rainbow Pipeline II Project – Part 6 – Construction Specifications. Section 6: Loading, Hauling, Stringing, Stockpiling, and Storing of Pipe and Other Materials addresses precautions for pipe loading, hauling, stringing, and stockpiling.	Met
2.3.2	"Installation of sleeves" SOP document number 6.46, page 2, section "Installation Planning Guidelines" considers design compatibility of repair sleeves and piping material. However, this SOP refers to CSA Z662-03 instead of the *CSA Z662-11*.	Partially met
2.3.3	Ditch depths are identified in the excavating and trenching procedure; however, the procedure does not address depths of cover required for different scenarios.	Partially met
2.3.4	The backfilling procedure meets the requirements of *CSA Z662-11*.	Met
2.3.5	The horizontal directional drilling (HDD) procedure addresses the process to be used for workspace restrictions and drilling requirements. The AER reviewed the PMC documents, Drill Fluid Control Plan, HDD Execution Plan Cremona-Coed Red Deer River, Frac Out Contingency Plan Enbridge Terminal, HDD Material Safety Data Sheets (MSDS) Manual, HDD Execution Plan, Mitigation Plan for HDD Work Enbridge Terminal, HDD Program Environmental Protection and Compliance Plan. The data reviewed addressed the environmental protection and monitoring plan, spill or fluid loss contingency, response, cleanup, and mitigation plans.	Met
2.3.6	Rainbow Pipeline II Project – Part 6: Construction Specifications, Pipeline Welding Procedure Specification, and Welding Procedure Qualification Record. The sample data addresses defects in relation to welding and preparation for welding.	Met

2.0 Operational Controls

2.4 Materials

Audit Criteria:

2.4.1 *CSA Z662-11* clause 5.1.1: Materials and equipment that will become part of pipeline systems constructed as specified in this Standard shall be suitable for the conditions to which they are to be subjected.

2.4.2 *CSA Z662-11* clause 5.1.2: Materials that comply with applicable standards or specifications listed in this Standard may be used for appropriate applications…

2.4.3 *CSA Z662-11*, clause 3.1.2(f): The safety and loss management systems shall include the following elements: (f) operational controls, including the development of procedures for… design and material selection…

2.4.4 *CSA Z662-11* clause 5.2.5.1: Steel fittings, flanges and valves shall be made to a standard or specification given in Table 5.3; with the acceptable materials and limitations indicated…

References	Assessment	Have criteria been met?
2.4.1	PMC provided a HDD on the Co-Ed pipeline as an example of the material selection process. Data provided shows certificates of testing, including chemistry-tensile report, Charpy report, macro and micro hardness report, pipe coating tally.	Met
2.4.2	Petrosleeve repair quality control (QC) report for 12" Rangeland Pipeline (Sundre to Hartell) was provided as a sample. The document indicates that sleeve data, pipeline and defect data, pipeline operating conditions at time of installation, installation data and notes, and design & installation analysis were considered.	Met
2.4.3	No documentation related to the selection of suitable materials (field purchases such as small parts) was made available for review during the office or field interviews. Experienced operators are selecting small parts based on their experience with the system.	Partially met
2.4.4	Valve data provided meets the requirements of *CSA Z662-11*. No documentation on the standard or spec to which fittings and flanges were made was available for review.	Partially met

2.0 Operational Controls

2.5 Operations

Audit Criteria:

2.5.1   CSA Z662-11 Clause 10.3.3.2; Operating companies shall periodically review their leak detection programs to confirm their adequacy and effectiveness.

2.5.2   CSA Z662-11 Clause 10.4.2; Records that provide the following information, as applicable, shall be maintained for the life of the pipeline system.

a.   locations of the pipelines and major facilities (e.g., compressor or pump stations, measuring stations, terminals, tank farms, water crossings, roads, railways, major utility crossings, block valves, and cathodic protection rectifiers);

b.   technical data related to the following…

c.   pipes—locations and lengths for each pipe diameter installed, noting wall thicknesses, grades and standards or specifications, field test pressure, and where practical, burial depth;

d.   stations and other facilities — maximum operating limits and the specifications and nameplate data of major equipment;

e.   valves—locations of valves designated as emergency valves, with complete information about the dates of inspection and maintenance, and the current intended operating position, whether open or closed;

f.   components—locations, types, and pressure ratings;

g.   crossings—locations and details of any crossings of water, roads, railways, pipelines, and other major utilities;

h.   appurtenances—locations and details of appurtenances such as corrosion control devices and weighted sections;

i.   special design and construction methods—locations and details of special design and construction methods;

j.   repairs—locations and details of repairs; and

	k. coating system—evaluation, selection, and application records.	
2.5.3	CSA Z662-11 Clause 10.2.1; Operating companies shall have safety training programs for employees. Such programs shall be directed towards the operation and maintenance of pipeline systems in a safe and effective manner and shall include provision for the safety of the public.	
2.5.4	CSA Z662-11 Clause 10.2.6.1; Personnel on work sites shall be informed of the hazards involved, the requirements for the safe conduct of their work, and their responsibilities in the event of an emergency.	
2.5.5	CSA Z662-11 Clause 10.3.6; Operating companies shall investigate damage incidents related to external interference and failure incidents to determine their causes. Measures to prevent the occurrence of incidents due to similar causes shall be identified and implemented.	
2.5.6	CSA Z662-11 Clause 10.3.2; Operating companies shall establish effective prevention and control measures to maintain the effect of pipeline system operations upon the environment within acceptable levels.	
2.5.7	CSA Z662-11 Clause 10.6; Operating companies shall periodically patrol their pipelines in order to observe conditions and activities on and adjacent to their rights-of-way that can affect the safety and operation of the pipelines …	
2.5.8	CSA Z662-11 Clause 10.3.1.1; Where the operating company becomes aware of conditions that can lead to failures in its pipeline systems, it shall conduct an engineering assessment to determine which portions can be susceptible to failures and whether such portions are suitable for continued service.	

References	Assessment	Have criteria been met?
2.5.1	A walk through and demonstration of the Olds control centre procedures established that the procedures for leak detection and start-up are available, adequate, and effective. The procedures have been timely reviewed, the last revision carried out in 2013.	Met
2.5.2	In accordance with the *PIMM*, records are to be available in either hard copy or electronically at each operating location for the pipelines in that area. During field interviews, due to the time constraints, the records were not reviewed. Documentation that was provided for take away (e.g., valve documentation, coating system, location, and details of repairs) meets *CSA Z662-11* clause 10.4.2 requirements. Records provided illustrated block valve service, pressure safety valve (PSV) service reports, and annual PSV inspection/certification reports.	Met
2.5.3	There were several standard operating procedures related to safety and training provided for review. The procedures detail the safety training programs for employees and address measures to operate and maintain pipeline systems in a safe and effective manner.	Met
2.5.4	PMC has several health & safety procedures that identify hazards and the training required at site. The procedure related to personal protective equipment (PPE) identifies the different PPE available and their application.	Met
2.5.5	Pipeline Re-Starting Protocol Procedures addresses activities before re-start as well as re-start with/without conditions. It is noted that a revised site inspection template and the communication of safety alerts were carried out in response to incidents.	Met
2.5.6	PMC has a set of standard operating procedures that detail prevention and control measures to maintain the effect of pipeline system operations upon the environment within acceptable levels.	Met
2.5.7	PMC has documented procedures for right-of-way (ROW) inspection and maintenance. The procedures address inspection of river crossings, aerial surveillance, easement maintenance, pipeline block valves, and signage.	Met

	Documents reviewed in the Sherwood Park Office confirmed that ROW inspection is carried out by the operators. The frequency of inspection is documented and is being carried out as per the procedure.	
2.5.8	The AER reviewed Milk River Wascana Engineering Assessment and Windsor-Detroit Engineering Assessment and identified that PMC has carried out engineering assessments for their assets.	Met

3.0 Operations Change Management

3.1 Management of Change

Audit Criteria:

3.1.1   Operator should have a documented change management process with accountabilities defined and the process supported by training. Audit criterion is based on general concepts from *CSA Z662-11* clauses 3.1.2 (g), A.3.4, and N.6.1 and is not a direct quote from these sources.

3.1.2   Changes in a specification, standard, procedure, or company organizational structure are evaluated and actively managed to limit adverse and unintended operational impacts. Audit criterion is based on general concepts from *CSA Z662-11* clauses A.3.4.1, and N.6.1 and is not a direct quote from these sources.

3.1.3   Procedures for internal and external communications are in place to ensure that employees and stakeholders receive the information they need regarding operational changes to ensure safe operations and environmental protection. Audit criterion is based on general concepts from *CSA Z662-11* clauses A.3.4.2, and A.4.3.2 and is not a direct quote from these sources.

3.1.4   If imperfections are found in operating assets, evaluations are made to determine the suitability of that asset and similar assets for continued service. Audit criterion is based on general concepts from *CSA Z662-11* clauses 10.10.1.1, and N.13.1 and is not a direct quote from these sources.

References	Assessment	Have criteria been met?
3.1.1	There is a documented MOC process and formal training program in the Calgary office and field locations to evaluate and manage changes in specification, standards, and procedures. Additionally, Crude Operations has a specific documented process to support the general MOC procedure. The MOC software is not used for organizational changes, although PMC documents indicate explicitly that this type of change is within MOC scope. Management documents state that PMC follows *CSA Z662-11* annex N, which requires implementation of an organizational change program. The organizational change process in use at the time of the audit is informal. Access to the MOC software and procedures are available to employees on the PMC intranet, and although there are visual reminders throughout PMC offices and field offices, MOC use is not evaluated as part of individual performance assessments.	Partially met
3.1.2	Risk evaluation workflow is managed through the MOC software; it requires an assigned coordinator and assignment of a subject matter expert who must comment on the implication of the change on their area of expertise and/or complete template checklists of pre-identified considerations. There is provision in the software to generate custom checklists. A sampling of procedures owned by the office and field, which PMC defines as "critical", were found to be nonconforming with respect to review frequency requirements as outlined in PMC's pipeline maintenance manual.	Met (control centre) Partially met (office) Partially met (field)

3.1.3	PMC tracks, trends, and reports to upper management on the number of overdue MOC. There was no evidence that there is trending of MOC data—e.g., recurring types of MOC.	
3.1.3	When a user provides updates within a particular MOC file, the MOC software automatically and immediately sends an e-mail to notify all of the SME identified in that MOC. Throughout PMC, changes are communicated verbally, via mass e-mails, and via intranet announcements. In a sampling of MOC reviewed, supporting documents were on occasion not attached to the MOC file.	Partially met
3.1.4	At the time of the audit, the PMC risk assessment process was undergoing changes. There was no formal evaluation process available for review for change management purposes. Data reviewed provided an overview of an MOC used to generate an MOP reduction due to a crack feature identified by the ILI tool (15.5 km downstream of Mitsue – 24" Rainbow pipeline); the process presented via e-mails indicated good handling of the situation from the time the feature was identified until the validation dig and repair was performed, and another MOC was used to remove the pressure restriction.	Partially met

3.0 Operations Change Management

3.2 Acquisitions

Audit Criteria:

3.2.1 Operator should have a documented acquisition process/procedure that describes Asset Integrity's role in evaluating assets for potential purchase. Audit criterion is based on general concepts from *CSA Z662-11* clause 3.3.3.3 and the Center for Chemical Process Safety's Guidelines for Acquisition Evaluation and Post Merger Integration and is not a direct quote from these sources.

3.2.2 Operator should conduct an assessment to generate a baseline understanding of the integrity of the asset for purposes of

- determining whether the pipeline is safe to go into operation;
- determining a technically justifiable MOP; and
- whether remedial work is required.

Audit criterion is based on general concepts from *CSA Z662-11* clauses 10.3, and N.11 and the Center for Chemical Process Safety's Guidelines for Acquisition Evaluation and Post Merger Integration and is not a direct quote from these sources.

3.2.3 Operator should develop an asset-specific Integrity Management Plan (IMP) or ensure that the asset is included in an existing IMP. Audit criterion is based on general concepts from *CSA Z662-11* clauses 3.2, 3.3.3, N.2, and the Center for Chemical Process Safety's Guidelines for Acquisition Evaluation and Post Merger Integration and is not a direct quote from these sources.

3.2.4 Operator should carry out necessary remedial work prior to placing the asset in operation. Audit criterion is based on general concepts from *CSA Z662-11* clause N.11.4 and the Center for Chemical Process Safety's Guidelines for Acquisition Evaluation and Post Merger Integration and is not a direct quote from these sources.

References	Assessment	Have criteria been met?
3.2.1	The Asset Integrity group has a role in the acquisitions process through a representative in the acquisition's subject matter expert group. Areas of responsibility are documented in a checklist. Integrity data is gathered from records and data review, site visits, and meetings with seller representatives to understand the monitoring, mitigation, and inspection program and history of the asset. Financial strategists and decision makers include costs and operating expenses projected by Integrity in their decision about whether to proceed.	Met
3.2.2	MOP is justified through projections of corrosion growth and remaining wall thickness. These projections also determine remedial work (i.e., excavation) priority. On an acquisition sampled, analysis of integrity items was performed in accordance with PMC's requirements, and results were documented. For the two acquisitions sampled, data shows acquisitions due diligence reports that include an engineering and operations evaluation of proposed acquisition, risk summary, and recommended capital expenditures to bring the facility to safe operating conditions.	Met
3.2.3	The risk assessment process for pipeline safety is informal. It is based on gathered working knowledge and operating procedures that are housed in PMC's intranet. At the time of the audit, an IMP was in place but not updated as required. Documents were not provided as evidence of use of the PMC risk matrix to demonstrate that PMC takes into account the results of risk assessments and engineering assessments.	Partially met
3.2.4	A report of pipeline integrity recommendations for acquisitions sampled was not provided at the time of the audit. A due diligence report sampled provides evidence of consideration of and budgeting for integrity activity. Inspection activity (e.g. ILI) for acquisitions sampled was carried out within the timeframe required under PMC's pipeline integrity management manual. No evidence was provided at the time of the audit that other issues identified in the due diligence of sampled acquisitions were followed up on (e.g., sleeve excavation and inspection, depth-of-cover rectification, aerial inspection program re-evaluation, etc.). Interviews indicated that there is a process to evaluate integrity prior to acquisition and to budget for follow-up remediation.	Partially met

4.0 Operations Continuous Improvement

Audit Criteria:

4.0.1 Management can demonstrate its commitment to the continuous improvement of quality, safety, and loss management systems and programs. Audit criterion is based on general concepts from *CSA Z662-11* clauses 3.1.2(h), A.7.1 and is not a direct quote from these sources.

4.0.2 Operational performance is reviewed and monitored, including ensuring sustainable actions are taken to correct any deficiencies identified. Audit criterion is based on general concepts from *CSA Z662-11* clauses A.7.2 and A.7.3 and is not a direct quote from these sources.

4.0.3 Trends in hazards, incidents, and near misses are monitored and acted on if safety and regulatory compliance objectives are at risk. Audit criterion is based on general concepts from *CSA Z662-11* clauses A.7.3, N.15.2 (e), and N.15.5 and is not a direct quote from these sources.

4.0.4 Quality, integrity, and safety and loss management programs are reviewed at planned intervals to ensure their continuing suitability, adequacy, and effectiveness. Audit criterion is based on general concepts from *CSA Z662-11* clauses 3.1.2(h)(i) and (iii), N.15.1, and N.15.2 and is not a direct quote from these sources.

References	Assessment	Have criteria been met?
4.0.1	Management has created positions to fill gaps in resources and competency (e.g., engineering supervisor, construction manager). Many new management programs and initiatives are new within 2–3 years, planned, under revision, or currently being rolled out in phases. These programs relate to MOC, training and competency tracking, vendor prequalification, health and safety, operations management, pipeline management, and development of a pipeline risk algorithm. Third-party experts are engaged for the development of these programs.	Met
4.0.2	PMC conducts monthly internal site inspections and quarterly inspections; sites are selected on a rotating basis. Standard procedures describe roles and responsibilities and the process to identify and report incidents. PMC uses a database to administrate incidents, near misses, hazard identification, and nonconformance.	Met
4.0.3	Key performance indicators (KPI) related to occupational health and safety are communicated to upper management through biweekly and quarterly reports; additionally, operations weekly reports include a section dedicated to high risk incident, near misses, and hazard identification. Examples of action taken to follow up on deteriorating KPI trends provide evidence of performance monitoring, measurement, analysis, and improvement. Actions were generated and implemented and performance continued to be tracked even after implementation of corrective action. Employees are familiar with the documented nonconformance process. Nonconformances themselves are documented. There is evidence of strong effort over the last two years to improve vendor qualification. Internal audits are conducted annually by Plains All American (PAA). Audits follow a documented program that describes the process related to organizational policy, scope, objectives, audit results, analysis of data corrective, and responsibility for preventative actions.	Met
4.0.4	PMC's *PIMM* section 1.3.11 (page 20) states "The Plains Pipeline Integrity Management Program shall be reviewed at least once a year by the Director, Asset Integrity and Vice President, Crude Oil Operations. The review shall address the effectiveness of Pipeline Integrity Program." There was no evidence that the *PIMM* was reviewed. Asset integrity interviews identified that development is in progress with a target of June 2014 It is unclear whether PMC's internal audit program is aligned with outputs of the risk management program because program development is in progress. No documents related to targets or outputs were seen at the time of the audit. Critical procedures are to be updated annually, according to PMC standard document 10.02 Document Control Guideline, dated 01-Oct-2013—"Critical Safe Operating Procedures are subject to a scheduled review process once a year." Documents tested do not conform to PMC's requirements.	Not met

5.0 Risk Assessment and Mitigation Practices

5.1 Integrated Risk Management

Audit Criteria:

5.1.1   Risk management is integrated with the organization's governance structure such that risks are considered in terms of their potential impact on objectives (ISO 31000 section A.3.5)

5.1.2   Strong and sustained commitment from management that sets the organizational attitude regarding risk and establishes risk tolerance levels

5.1.3   Risk management policy in place, appropriately communicated, and clearly states objectives, accountabilities, and responsibilities (ISO 31000 section 4.3.2)

5.1.4 Internal and external context of the organization is understood and accounted for in the design of the risk management program (ISO 31000 sections 4.3.1 and 5.3)

5.1.5 Organizational structure supports the effective implementation of the risk management program and ensures that responsibilities and authorities are defined and communicated within the organization (ISO 31000 section 4.4.1)

5.1.6 Risk management is embedded into the policy development, business and strategic planning and review, and change management processes (ISO 31000 section 4.3.4)

5.1.7 Appropriate resources and infrastructure are allocated to risk management activities (ISO 31000 section 4.3.5)

5.1.8 The risk management program is monitored to ensure that it is performing as intended (ISO 31000 sections 4.5 and 4.6)

References	Assessment	Have criteria been met?
5.1.1	Governance structure has been established at the corporate, strategic, operational, and site management levels, including a terms of reference for the EOLT. The OMS is intended to overlay the processes in the governing document ESMS manual, but some components (e.g., critical task analysis) of the ESMS will no longer be in use once the OMS is completely implemented. However, the ESMS must be followed until the OMS implementation is complete. According to the ESMS, the Environment, Health, Safety, Land and Regulatory Department (EHSL&R) is responsible for developing and maintaining the company's hazard identification and assessment processes. Plains All American conducts periodic strengths, weaknesses, opportunities, and threats (SWOT) exercises and have identified the following threats related to risk management practices (as of December 2013): • #1: Environmental and compliance issues/catastrophes • #2: Risk management breakdown • #5: Process safety management risk • #11: Reduced availability or increased cost of insurance PAA Governance Guidelines state that directors must participate in orientation processes covering strategic plans, financial and risk management issues and policies, compliance programs, and code of business conduct.	Met
5.1.2	All elements of phases 3 and 4 for the OMS are being implemented, and funds for 2014 have been approved by the EVP, Operations, and the President. Phase 3 work for OMS and the accompanying operational risk management policy is on target with completion targeted for end of 2014. This includes completion of a pilot operational risk assessment, the corporate risk registry, and field risk registries. PMC has created several risk management programs and documents within the last year, and this has indicated a willingness to be proactive in addressing the issues identified in the section 22 order instead of waiting for the results of the audit. However, these programs are major organizational undertakings and are not fully implemented at this time. The PMC President sends an annual letter to staff about performance and areas for improvement. This letter also includes messaging about Plains' commitment to operating in a way that protects staff, contractors, the public	Met

	and the environment, health, safety and environment goals. In terms of risk tolerance, the operating ethic of "if in doubt, shut it down" is also reinforced. However, through the OMS implementation, more specific risk tolerance levels still need to be determined.	
	A code of business conduct is established and documented, and employees evidence their acknowledgement at the commencement of employment. The code includes commitments to compliance with applicable environmental, health, and safety rules, laws, and regulations in addition to intolerance of unsafe practices and risky behaviour.	
5.1.3	The current risk management framework has been ad hoc, and there has been a lack of consistency. PMC has identified this as an issue, and it is being addressed via the OMS and its associated ORM Policy. The emerging issue/risk of operating under multiple operating management systems was identified by Plains in April 2013.	Partially met
	The ORM policy currently being implemented by Plains includes ensuring that risk management practices are embedded and integrated throughout the organization. Progress has also been made in the last year with regards to developing a risk assessment process specific to pipeline asset integrity. However, these programs are major organizational undertakings and are not fully implemented at this time, nor are they aligned with each other.	
	A draft RACI chart has been created that identifies the accountabilities for the various elements and sub-elements of the OMS and is primarily composed of EVPs, VPs, and directors. The EVP of Operations is accountable for risk assessment and management. Directors will be responsible for monitoring and mitigating risk, while executives will have the ultimate accountability for how well risk management practices are carried out under OMS.	
5.1.4	Workshops with staff were conducted in 2013 to gain a better understanding of how Plains operates and included an assessment of risk management practices. Risk management practices are currently varied between field areas, but the OMS implementation is underway to achieve alignment; in particular between LPG and crude oil operations.	Partially met
	Alignment of current and new procedures is in progress and will be completed on a priority basis as part of the OMS Capability Transfer Process. For example, the Critical Task Inventory and Analysis Procedure was a draft and not finalized prior to the decision to implement OMS. However, Plains is currently working towards adapting those practices within OMS elements.	
	The PAA SWOT exercise identified threats which are related to risk management practices. In order to achieve alignment in pipeline asset integrity practices, staff from PAA meet with PMC staff and this activity is reported to the PMC Executive and PAA Chief Executive Officer (CEO) and Chief Operating Officer.	
	Plains' approach to risk management for asset integrity is in a state of flux as the Asset Integrity department is still developing their new process and has yet to align it with OMS risk management practices which are also still under development. Some risk assessment processes are designed with specific desired outcomes and changing them directly to align with a broader framework without allowing for flexibility could have unintended consequences.	
	Principles and commitments are identified for the Stakeholder Relations Framework, including a commitment to minimizing and mitigating environmental impacts. Additionally, Plains' Environmental, Health, and Safety (EH&S) policies govern all activities. These corporate policy statements articulate the company's expectations to ensure all activities are conducted to protect the health and safety of its personnel and the public as well as the	

	environment and that their activities shall be compliant with applicable regulations and standards.	
5.1.5	For the OMS, a governance structure has been established at the corporate, strategic, operational, and site management levels, including an EOLT terms of reference.	Met
	A draft RACI chart has been created that identifies the accountabilities for the various elements and sub-elements of the OMS and is primarily composed of EVPs, VPs, and directors. The EVP of Operations is accountable for risk assessment and management. Directors will be responsible for monitoring and mitigating risk while executives will have the ultimate accountability for how well risk management practices are carried out under OMS. There will also be OMS representatives in the field to ensure consistency of OMS application.	
	The EHSL&R Department is responsible for developing and maintaining the company's hazard identification and assessment processes. The ESMS requires that Plains define, document, and communicate the roles, responsibilities, and authorities of personnel who have an influence on the EH&S risks of the organization's activities, facilities, and processes.	
	All Plains personnel have the potential to influence EH&S risks, so in 2013 Plains developed and implemented its life rules, which emphasizes the EH&S responsibilities of all staff working at Plains.	
5.1.6	The OMS is being implemented for the purpose of acting as a bridge between corporate strategy and operational execution in addition to helping identify specific areas at risk for facilitating effective decision making. However, specific risk tolerance levels still need to be determined as there may be varying perspectives on what the priorities are. If the amount of risk the organization is willing and able to accept in pursuit of value is not defined clearly, it becomes more challenging to determine where best to allocate resources and mitigate risks.	Partially met
	The Organizational Change Management Communication and Engagement Plan (preliminary draft) is in place and identifies the audiences, communication purpose, frequency, and type of communication being used for the OMS implementation.	
	Goals and key initiatives are established annually for the Operations and EHSL&R Departments. The PAA SWOT list (threats and risks) is reviewed three times a year during strategy sessions (including operations) with subsequent policy development occurring to address risks.	
	Given the changes to Plains in the last three years (e.g., closure of a $1.67 billion BP asset acquisition in April 2012), the frequency with which IHAs are conducted is not in accordance with what is prescribed in the ESMS, which has been in place since July 2010. Using the ORM policy, Plains' plan is to replace this process through the development of risk registers by operational area and functional group.	
	The PIMM requires that the risk assessment and a review of issues, trends, pipeline age, type of service, environment, inspection and monitoring results, and proximity to personnel or other third-party facilities are part of the annual pipeline analysis that results in an annual integrity plan and budget. Entering all Alberta pipeline data into the new risk model is identified in the Pipeline Asset Integrity Management Strategic Plan with a target completion date of June 1, 2014.	
5.1.7	Resources and effort are being directed at the following initiatives: • All elements of phases 3 and 4 for the OMS are being implemented, and funds for 2014 have been approved by the EVP, Operations, and President.	Met

	• Entry of all Alberta pipeline data into the new risk model. • Resources have been allocated to the public awareness program and are included in the Plains budget. Land agents assigned to the district areas have been helpful to the operations staff as they have more negotiation skills when dealing with landowners. • A SIPM system is being implemented to scorecard vendors and is phase 2 of the CMS project that began in 2013. District managers are responsible for monitoring the status of staff certifications, and the test sample revealed that 96 per cent of the required certifications are current. However, safe work permit designated issuers were identified by department level in the information provided by Plains, not by individual role.	
5.1.8	A steering committee has been set up that monitors the implementation of the Operations Management System (OMS). Phase 3 work is on target which includes completion of a pilot operational risk assessment, the corporate risk registry and field risk registries. Plains has stated that they are currently testing the ORM risk assessment process to determine if it is "fit for purpose." To ensure continuous improvement, the Plains OMS will be reviewed on an annual basis by Operations Leadership, with input from all operational areas, to ensure ongoing relevancy and alignment to risks and performance expectations. Workshops were conducted in 2013 which included an assessment of risk management practices. Areas for improvement were identified and are being addressed via the ORM policy. ESMS has requirements for the establishment of an audit program stating that systems shall be established to verify that the EH&S management programs and procedures are effective and that actual practices are consistent with these programs, procedures, and all applicable rules and regulations.	Met

5.0 Risk Assessment and Mitigation Practices

5.2 Risk Assessment and Evaluation

Audit Criteria:

5.2.1   Risk assessment forms a component of the broader process of risk management and includes the steps of risk identification and evaluation (ISO 31000 sections 5.4.3 and 5.4.4).

5.2.2   Risk evaluation methodologies and criteria are defined and reflect the organization's objectives and operations (ISO 31000 section 5.3.5).

5.2.3   Identified risks are categorized and associated with operational and regulatory objectives with a consideration of interdependencies and cumulative effects (ISO 31000 section 5.4.2).

5.2.4   Risk analysis and evaluation methodologies account for differences in corporate and field-level environments (ISO 31000 section 5.3.4).

References	Assessment	Have criteria been met?
5.2.1	A corporate-level risk assessment process will use the OMS 5X5 risk matrix with the following consequence criteria: health and safety, business interruption (pipelines, facilities, and plants), financial, reputation, regulatory, and environment. Additionally, supply chain management (SCM) practices include considerations of risk when qualifying vendors.	Met
5.2.2	A general risk assessment matrix is in place, documented, approved by the EVP of Operations and the director of Health & Safety (effective Oct. 8, 2013). This risk assessment matrix is used to evaluate the hazards associated with the company's core business activities and includes criteria for "potential severity of hazard" and for "probability of occurrence." Even though documentation was provided that indicates the existence of a process for assessing asset integrity risk, it straddles current and future methodologies. There currently appears to be more attention paid to weighting and understanding the likelihood part of the risk assessment in comparison with weighting and understanding the consequence. The higher the consequences, the more effort and resources could be spent understanding and mitigating likelihood of failure. In the absence of a clear understanding of risk across the pipeline systems, it is difficult to move away from the traditional and reactive method of managing pipeline integrity in response to the ILI data only, and move towards being able to proactively understand and manage integrity. Consequently, it is not possible at this time to clearly demonstrate a uniform end-to-end asset integrity risk assessment process that is aligned with other Plains risk assessment processes. Plains' plan is to address this by June 2014. Based on the documents reviewed and office/field interviews, it appears that the process of identifying risk, re-evaluating risk, and developing action plans for risk reduction is not a coordinated effort between field operations and asset integrity groups. PMC is currently using ISNetworld (ISN) to monitor service contractor qualifications. A SIPM system is being implemented to scorecard vendors. Phase 2 of SIPM is a CMS project that began in 2013. SCM guidelines have been implemented, and a deviation process is in place.	Partially met
5.2.3	The ESMS risk assessment matrix is not consistently applied for each of the hazards in the industry hazard analysis for crude oil pipelines and there is a gap in information evidencing the final risk rating. Risk levels (low, medium, high, very high) are identified for each of the potential consequences (i.e. health, reputation), but the matrix does not provide any direction on how to use the results to determine a risk treatment nor is there a reference to a document that provides such direction. Given the changes to PMC in the last three years (e.g., closure of a $1.67 billion BP asset acquisition in April 2012), the frequency with which IHAs are conducted is not in accordance with what is prescribed in the ESMS, which has been in place since July 2010. Using the ORM policy, PMC's plan is to replace this process through the development of risk registries by operational area and functional group. High-risk HazIDs are currently entered into the KMI system while medium and low risk HazIDs are still recorded on paper. However, a project is underway to enable entry of all HazIDs into KMI. In regards to the new asset integrity risk assessment process, the methodology of how to segment the results from the risk matrix according to risk levels (i.e., high, medium, low) is not complete as asset integrity is waiting for implementation of OMS in order to ensure alignment.	Not met

5.2.4	See 5.1.4.	Partially met
	In accordance with the ESMS manual, several processes have been developed and implemented for the identification, assessment, and communication of safety and environmental hazards. These processes target workplace hazards at several levels.	
	Ensuring that CSA standards are maintained is considered the minimum level for corrective action regardless of what the OMS risk assessment results may be. For example, needing to ensure that a standard is adhered to may require elevating an existing "low" using the OMS method to a "high." There is merit to having some flexibility in the alignment of risk assessment processes if a risk assessment result from the OMS process needs to be adjusted based on other factors, such as ensuring minimum CSA standards are met for pipeline integrity.	

5.0 Risk Assessment and Mitigation Practices

5.3 Risk Communication

Audit Criteria:

5.3.1   Internal communication and reporting mechanisms are in place that support and encourage accountability and ownership of risk (ISO 31000 sections 4.3.6 and 5.2).

5.3.2   External communication and reporting mechanisms are in place that support the exchange of risk information and achievement of regulatory compliance (ISO 31000 sections 4.3.7 and 5.2).

5.3.3   Systems and practices are in place to ensure that risk information is recorded and readily accessible (ISO 31000 sections 4.3.6, 4.3.7, 5.7, and A.3.4).

5.3.4   Stakeholder expectations are identified so that outcomes of risk management activities are communicated appropriately internally and externally (ISO 31000 sections 4.3.6, 4.3.7, and 5.2).

References	Assessment	Have criteria been met?
5.3.1	It is the responsibility of all workers to communicate to their supervisor any observed unsafe work condition or action, safety concern, or inability on their part to understand safe work procedures or processes. In the event that an employee identifies an unsafe condition or action and is uncomfortable communicating using normal channels, fearing repercussions, the employee may report the unsafe condition or action anonymously using the whistle-blower hotline.	Met
	There are multiple meetings held by PMC staff at all levels to communicate risks and the corrective actions being taken to address them. Many of these meetings are cross-functional to ensure that information and perspectives are shared between groups that don't necessarily work together daily. There are also several reporting processes that Plains uses to communicate risks and the actions being taken to address them.	
5.3.2	PMC has established processes for issuing safe work permits and conducting pre job safety meetings. Project managers use the safe work permitting process to engage and train contractors early to establish plans, and they also notify land administration. The safe work permit process has recently been streamlined, and as part of the implementation, awareness and training sessions for PMC staff will be conducted.	Partially met
	PMC and PAA websites are used to communicate information externally about risks, environmental protection,	

	and regulatory compliance; for example, information about major spills communicated during PAA quarterly conference calls, included in quarterly reports, and in the 2011 chairman and president's letter.	
	Brochures and communications plans for all of the pipeline systems are not complete at this time, but PMC provided examples of the types of documentation that will be completed. The stakeholder relations framework and PA program are still under review and have not been completely implemented.	
	The information provided in the PMC EH&S section of the website is not as comprehensive when compared to PAA's website in the following areas: pipeline safety, emergency response, and public safety and awareness.	
5.3.3	The stakeholder information management system project draft business requirements acknowledge the lack of integration between systems with stakeholder-related information. Issues with data alignment and access may persist if the single-system project doesn't go ahead. However, part of this project is completing a gap analysis and exploring the need for compensating controls if the project is shelved.	Partially met
	Two key technology-based control systems are KMI, alternatively referred to as PINS, and EAM. KMI/PINS is a key risk management system and is used to document incidents, HazIDs, near misses, and information that may be of interest in addressing risk and preventing incidents. The EAM is a work order system used to document and track physical corrective actions that need to be undertaken.	
	Although the safe work permits are documented, they are not archived electronically for many of the field offices and are kept in hard copy only. There is no evident method of analyzing the information centrally for trending and performance against what are required safe work permit procedures. The testing revealed a total of seven different safe work permit formats currently in use.	
5.3.4	The PA strategy was designed in the fall of 2013 and is intended to evolve and change relative to stakeholder input, stakeholder needs, measurement results, and business realities. Roles and responsibilities are identified for the PA program, including the "area land agent" role whose position is to integrate land and public awareness into the field operations process. However, the stakeholder relations framework and associated PA program are major organizational undertakings and are not fully implemented at this time.	Partially met
	PMC is involved in various synergy groups, and attendees are usually Operations staff. The goals are to exchange information, conduct training, and complete emergency exercises. PMC staff will regularly attend seminars to monitor changes in subjects related to pipelines and regulations. Senior management will also periodically meet with peers, competitors, and customers to gather information and possibly collaborate.	

5.0 Risk Assessment and Mitigation Practices

5.4   Risk Treatment & Monitoring

Audit Criteria:

5.4.1   Decisions on risk treatment options are made in accordance with regulatory requirements and include consideration of the risks borne by stakeholders other than the organization that could benefit from the risk (ISO 31000 sections 5.4.4 and 5.5.2).

5.4.2   Results from risk management activities should be recorded, monitored, periodically reviewed. and reported internally and externally as appropriate (ISO 31000 sections 5.6 and 5.7).

References	Assessment	Have criteria been met?
5.4.1	Meeting the *CSA Z662* standards dictates the minimum response required for risk treatment. The message from management is to not take risks with unclear data—if in doubt, shut it down, excavate, and repair. Due to some recent incidents, more funds have been made available to complete additional pipeline integrity work. A script has been created for communicating information to stakeholders, including outlining the hazards of the pipeline and concerns regarding public safety. PMC also participates in regional meetings that are jointly held with the AER and local pipeline operators, and any concerns raised within these meetings are addressed accordingly. Environmental protection zone notifications also involve communication of risk. See sections 6.1.7, 6.2.2, and 6.3.4	Partially met
5.4.2	The AER's review of PMC's systems noted that they provide the ability to ensure that risk information is recorded, readily accessible, monitored, periodically reviewed and reported internally and externally as appropriate. For example, the EHSL&R Department monthly report includes high-risk incidents, regulatory matters such as noncompliances, progress on projects, and status of the environmental program. However, there are some areas where controls could be strengthened. It is recognized that standardized controls and risk reduction options are not always selected due to site-specific circumstances, and there is no documented method for managing pipeline risk at this time. However, not documenting site-specific risk reduction decisions could make it more difficult to duplicate successful risk mitigation options in the future or avoid those options that are not as successful. There is also the benefit of knowledge transfer should there be turnover of experienced staff over time. It is also not clear how the risk scoring is used to trigger mitigation decisions in relation with mitigation and monitoring programs data. The audit team understood that the ILI is used exclusively to trigger mitigation decisions. Although interviews with PMC staff and a review of obtained minutes for some meetings indicated risks and issues are being discussed, the action items and follow-up on progress are not being recorded in a formal manner in all cases. The KMI system is used to record incident and hazard data, but there is a gap that allows information to be excluded for an "Incident" entry that would normally be required. Alignment of workflow tracking information from incident to corrective action is not consistent, and there is a lack of clarity for staff so they can differentiate between "corrective action" and "lessons learned." If corrective action deadlines are not tracked consistently and clearly, it becomes more difficult to measure performance and ensure correction actions are being completed in a timely manner.	Partially met

5.0 Risk Assessment and Mitigation Practices

5.5 Business Continuity Planning

Audit Criteria:

5.5.1   *CSA Z1600.08* clause 6.10: The entity shall develop and implement business continuity strategies to continue critical operations following an emergency. The business continuity strategies shall be based on the results of the business impact analysis described in clause 5.1.3. The business continuity strategies shall include the identification of time-sensitive critical functions and applications, associated resource requirements, and interdependencies. The business continuity plans shall be developed based on the business continuity strategies.

References	Assessment	Have criteria been met?
5.5.1	Currently, there is no business continuity program at PMC; however, there are components of business continuity practices within PMC, such as disaster recovery plans. PMC has indicated that there have been preliminary discussions about the development of a BCP.	Not met

6.0 Regulatory Reporting Processes

6.1 Non Compliance and Enforcement Management Practices

Audit Criteria:

6.1.1   The operating company shall establish and maintain procedures for defining responsibility and authority for handling and investigating non-conformances, taking action to mitigate any impacts, and for initiating and completing corrective and preventive action (*CSA Z662-11*, clause N.15.5).

6.1.2   …a continual improvement process including; performance monitoring for the ongoing assessment of conformance with the requirements of the Safety and Loss Management System, and the mechanisms for taking corrective and preventive measures in the event of non-conformance… (*CSA Z662-11*, clause 3.1.2(h)(i)).

6.1.3   Non-compliances and subsequent enforcement action are managed in a manner that fosters a sustained improvement in compliance performance. Non-compliances are resolved within timeframes established by the AER with management and protection programs updated as appropriate (developed from *Directive 019* sections 4 and 6 and ISO 10002:2004 (E) 8.5.2).

6.1.4   Non-compliances corrected in the normal course of work are recorded and documented. This data provides valuable information for a continuous improvement process (ISO 9004:2004(E) 8.3.1).

6.1.5   Staff from appropriate disciplines should participate in the corrective action process (ISO 9004:2004(E) 8.3.2).

6.1.6   Review of noncompliance should be performed by authorized people to determine if any trends or patterns of occurrence require attention (ISO 9004:2004(E) 8.4).

6.1.7   Non-compliance information is accurate, accessible and available along with the details of the actions taken (ISO 10002:2004(E) 4.3).

6.1.8   The noncompliance review should be inputted to the management review process for performance evaluations and for consideration of resource needs (ISO 9004:2004(E) 8.3.2).

References	Assessment	Have criteria been met?
6.1.1	ESMS is the governing document for regulatory matters, but it is not consistently followed. OMS is to be the governing management system document when it is implemented.	Partially met
6.1.2	There is limited indication of developmental programs or associated staff assessment programs that are directed towards AER regulatory compliance (corporate or operational). Voluntary self-disclosures, incidents, and releases that were originally identified through the MOC and PINS/KMI systems reported to the AER are confirmed on the tracking sheets. Time frames in addressing noncompliance established by PMC and AER are tracked and monitored through the various tracking sheets. Review of voluntary self-disclosures received by the AER via PMC-verified noncompliance deadlines and corrective actions are tracked for progress. Evidence of deadlines established by the AER being met by PMC for 15 enforcement actions that have been resolved with the AER are documented as "response received" or "action plan accepted." PMC's dispute-tracking sheet potentially could identify a noncompliance regarding public notification issues. The Land Complaints & Dispute Tracking Sheet includes information starting in mid-2013. Effectiveness of this process could not be determined.	Partially met
6.1.3	Many tracking tools have been put in place for compliance management, with varying levels of formal and informal procedures (meetings, spreadsheets, MOC systems, scoping documents, PINS/KMI, SOPs) to capture and monitor regulatory noncompliance (and potential noncompliance) and corrective actions. The capturing of AER low risk noncompliance information (identification, deadline, and follow-up) is not noted in the applicable compliance tracking spreadsheets. Increases in dedicated and knowledgeable compliance and monitoring staff since mid-2013 have augmented the frequency of identifying, communicating, and reporting of noncompliance. The results are increased oversight and scrutiny of PMC's senior management on regulatory matters.	Partially met
6.1.4	Audit programs such as the audit of PMC's Joarcam system are positive steps to identify licensing gaps between the AER's licensing information and PMC's operation information to determine compliance with regulations. Integrating other audit or inspection programs may also be a good source of reviewing information to determine compliance with AER regulations. While there has been significant effort to build more rigour in these processes (within the last year), many of these processes can be considered "reactionary" as tools to track, inform, and communicate regulatory compliance matters at this time. Further monitoring, review, and development (and refinement) is needed to refine its contribution to a compliance management system – to better utilize quality information for analysis, trending, staff developmental purposes, etc., and move towards proactively mitigating compliance risk. There is limited indication of developmental programs or associated staff assessment programs that are directed towards AER regulatory compliance (corporate or operational).	Partially met
6.1.5	The development and implementation of capturing regulatory information by a single group (Regulatory Compliance) through various tracking sheets has improved the organization's ability to manage compliance and regulatory information. Staff within various divisions is aware of and have access to the tracking sheet process. Communications of identified noncompliance are directed to the Regulatory Compliance Team.	Met

	Tracking sheets identified within PMC for regulatory affairs are as follows: • Noncompliance Tracking Sheet • Regulatory Monitoring Tracking Sheet • Regulatory Deadline Tracking Sheet • Regulatory Submissions Tracking Sheet (2013) • Regulatory Submissions Tracking Sheet (2014) • Land Complaints & Dispute Tracking Sheet • Environment Submissions Tracking Sheet Regulatory scoping memos are used by the regulatory team to identify risks and potential for noncompliance. Recommendations are made to appropriate personnel on regulatory matters.	
6.1.6	Increases in authorized and knowledgeable compliance and monitoring staff since mid-2013 has augmented the frequency of identifying, communicating and reporting of noncompliance. The results are increased oversight and scrutiny from PMC's senior management with regards to regulatory matters. The responsibility to identify and determine whether a regulatory change affects PMC operations and the relevancy to the organization are left to the authority and expertise of regulatory affairs staff.	Met
6.1.7	There is no evidence indicating the use of AER manuals as a training tool (specific noncompliance listed), or other AER directives. PMC staff typically rely on their colleagues' expertise and experience, as well as knowledge that information can be found within their SOPs, other documents located in the OpsLibrary (eStream portal area), or on the AER website. PMC's use of MOC systems (P2 and Maximo) and PINS/KMI contribute to consistent, visible, and traceable management and progress of the corrective actions associated with a noncompliance. These systems also contribute to visible and clear responsibility across divisions in addressing corrective actions. Use of these systems and other mechanisms engage the Regulatory Compliance Team to determine whether an MOC or incident is identified as a noncompliance.	Partially met
6.1.8	The designation of a single and visible member of management to ensure responsibility and authority in 2010 was recognized in the ESMS regarding established processes and communications needed for compliance management and stakeholder reporting. Although this position was recognized in 2010, no visible assignment was given until 2012. The designation of a single, visible vice president in 2012 has launched PMC into frequent and consistent reporting of compliance management throughout the organization.	Partially met

6.0 Regulatory Reporting Processes

6.2 Regulatory Change Monitoring and Administration

Audit Criteria:

6.2.1   The operating company shall develop, document, and implement a change management process for changes that might affect the integrity of the pipeline system or the ability to manage the integrity of that system. This shall include the following types of change, as appropriate for the type of pipeline system:

- (b) those that are not initiated and not controlled by the operating company, such as changes in…
- (i) technical requirements (e.g., industry standards, industry recommended practices, and regulations);

(*CSA Z662-11*, clause N.6.1)

6.2.2 The change management process shall have procedures in place to address and document the following, as appropriate for the type of pipeline system:

- method of monitoring to identify anticipated and actual changes that could affect the integrity of the pipeline system;
- identification of responsibilities for approving and implementing changes;
- reasons for the changes;
- analysis of implications and effects of the changes;
- method of communication of changes to affected parties; and
- timing of changes (e.g., dates of approvals and completions).

(*CSA Z662-11*, clause N.6.2)

6.2.3 The operating company shall establish a process for the management of changes that could have a significant impact on safety or the effectiveness of the safety and loss management system, including:…(d) changes to technical requirements, such as industry standards, industry recommended practices, and regulations; and…(*CSA Z662-11*, clause A.3.4.1).

6.2.4 Regulatory changes are identified, collected and disseminated throughout the organization in an appropriate timeframe (ISO 9004:2004(E) 8.3.10).

6.2.5 The management of change process shall include:

- the identification of changes that could affect the safety and loss management system;
- setting responsibilities and authorities for the review, approval, and implementation of changes;
- documentation of reasons for the changes;
- analysis of implications and effects of the changes;
- communication of changes to affected parties; and
- the timing of changes.

(*CSA Z662-11*, clause A.3.4.2)

References	Assessment	Have criteria been met?
6.2.1	There are no formal screening criteria, checklists, or record of the relevancy of a change to PMC business. The responsibility to identify and determine whether a regulatory change affects PMC operations and the relevancy to the organization are left to experience and expertise of regulatory affairs staff.	Not met
	Confirmation that a regulatory change may generate an initiator of change to an existing or required SOP through to Document Control is not clear. SOP 10.02 Document Control – Workflow Management indicates that 'document initiation' can be raised as a result of a regulatory change. It is not clear if there is a connection between any regulatory changes identified by the regulatory coordinator (as change initiators) through to Document Control.	
	Senior PMC management recognized the need to allocate resources to regulatory monitoring by hiring a	

6.2.2	regulatory coordinator in January 2014 who directly reports to the director of Environment and Regulatory Affairs (and indirectly to related managers). This role's responsibility is to focus on identifying, capturing (on the regulatory monitoring tracking sheet), and communicating regulatory change for the organization. This dedicated resource could improve PMC's ability to identify and capture regulatory change, but this role has only been in place for a short period.	Partially met
6.2.3	The "Regulatory Monitoring Tracking" sheet is a single source for tracking regulatory changes. The information is communicated across divisions through e-mails and during meetings to senior management through the weekly, biweekly, and quarterly reporting.	Met
6.2.4	A review of the regulatory monitoring tracking sheet identified the comprehensive capturing of a variety of jurisdictional regulatory changes affecting PMC. However, several AER regulatory changes since 2013 were not captured in this spreadsheet.	Partially met
6.2.5	Regulatory scoping memos for new projects or MOCs are used to identify regulatory requirements by the regulatory team, identifying risks and potential for noncompliance and required monitoring and reporting actions with regards to these activities. Recommendations are made to appropriate personnel on regulatory matters. There are no formal screening criteria, checklists, or records of the relevancy of the changes to PMC business. The responsibility to identify and determine whether there are regulatory impacts of operational changes and the relevancy to the organization are left to the experience and expertise of staff. Once aware of regulatory change information, the regulatory coordinator is required to forward this information to applicable groups. This is done primarily by e-mail or verbal communication. An assessment or presence of a feedback loop to ensure receipt of messaging and its impact on the business has not been seen. While an exception resulted from a recent Limited Liability Rating change, this notification and resulting assessment were initiated after an AER request of March 31, 2014.	Partially met

6.0 Regulatory Reporting Processes

6.3 Regulatory Reporting Monitoring and Administration

Audit Criteria:

6.3.1   A process is in place to ensure AER information submission requirements are met, including but not limited to the following regulatory requirements:

- Notice of maintenance activity (*Pipeline Rules*, section 57)
- Commencement of construction (*Pipeline Rules*, section 6)
- Notice to regulator of pressure test (*Pipeline Rules*, section 24)

6.3.2   If a leak, break or contact damage has been reported to the Regulator in accordance with section 35 of the Act or section 27 of these Rules, the licensee shall on request submit to the Regulator a written report indicating…(a) - (g)… (*Pipeline Rules*, section 76).

6.3.3   Unless otherwise authorized by the Regulator, a licensee who is required to notify the Regulator under these Rules shall send the notice electronically through the Regulator's digital data submission system (*Pipeline Rules*, section 2(1))

6.3.4   The handling process of non-compliances is easy to understand and use within the organization, including the regulator and other interested parties (receive complaints or non-compliances through regulators and stakeholders (ISO 10002:2004(E) 4.4).

6.3.5	The organization should ensure that accountability for actions and decisions with respect reporting non-compliances and enforcement handling is clearly established (ISO 10002:2004(E) 4.4).	
References	**Assessment**	**Have criteria been met?**
6.3.1	The development and implementation of capturing submission information through various submission tracking sheets has improved the organization's ability to manage regulatory information. Staff within various divisions is aware of and have access to the tracking sheet process. This practice was generated through senior management as a commitment to have visible submission and reporting tracking throughout the organization after the section 22 order was in place. Tracking sheets identified within PMC for regulatory affairs are as follows: • Regulatory Submissions Tracking Sheet (2013) • Regulatory Submissions Tracking Sheet (2014) • Environment Submissions Tracking Sheet • Regulatory Deadline Tracking Sheet • Regulatory Monitoring Tracking Sheet • Land Complaints & Dispute Tracking Sheet • Noncompliance Tracking Sheet	Partially met
6.3.2	PMC has complied with applicable requirements for notification of the AER of relevant releases and incidents in 2013. The use of PINS/KMI and other mechanisms to engage the Regulatory Compliance Team has contributed to the timely and effective management of notifying the AER and other external stakeholders of incidents and releases. Regulatory SOPs such as draft SOP 3.05 Incident Reporting and draft SOP 3.06 Release Reporting are evidence of some lag in implementing a formal process for identifying and reporting releases and incidents to the AER.	Met
6.3.3	All DDS identified by PMC were appropriately entered in the DDS system for the period of Jan 1, 2013 to date for hydro/methanol test, construction, and internal inspection tool for HVP lines. PMC has ensured the reporting of hydro and methanol testing, which are commonly overlooked areas. Generally, all *Directive 056* applications from August 2013 to January 2014 had adequate success rates in meeting AER requirements. There was improvement after the imposition of global refer status where applications went from 83 per cent acceptance rate to 15 per cent acceptance rate in less than a few months. Currently, PMC is maintaining an acceptable closure rate. Contribution to this success is attributed to an increase in staff and expertise related to application submission requirements. The practice of reconfirming information on application checklists prior to AER submission may also be contributing to the success rate.	Met
6.3.4	An increase in voluntary self-disclosures to the AER since mid-2013 demonstrates PMC's commitment to communicate with its Alberta regulator the state of compliance with AER requirements. All PMC voluntary self-disclosure timelines to submit and deadlines met for corrective actions documented by the AER matched the obligations tracker information. A single source of tracking and monitoring data managed by dedicated resources has contributed to the success of these deadlines being met and the accuracy of information. There is no evidence indicating the use of "AER Manuals" or SOPs (which do not exist) as a training tool specific to submission processes for *Directive 056*, DDS notifications, or other submission requirements. Staff typically rely on their colleagues' expertise and experience. There is a commitment to perform an administrative review of	Partially met

	PMC systems to identify licensing gaps between the AER's licensing information and Plains' operation information to determine compliance with regulations (e.g., *Manual 005*, referencing the *Pipeline Act*, *Pipeline Rules*, *Directive 056*, *Directive 071*, etc.). The review of the Joarcam system is an example of using review information to further reinforce and improve PMC's application submission process.	
6.3.5	Formalized feedback processes and communications are not in place regarding reasons for closures of *Directive 056* submissions. Cross-divisional communications on submission performance are more informal, although increase in usage of systems, tools, and engagement by regulatory staff has been a compensating mechanism. There was no formal tracking system from a single source (regulatory projects) on the submission and progress of applications observed.	Partially met
	Generally, all *Directive 056* applications from August 2013 to January 2014 had adequate success rates in meeting AER requirements. There was improvement after the global refer where applications went from 83 per cent acceptance rate to 15 per cent acceptance rate in less than a few months. Currently, PMC is maintaining an acceptable closure rate. Contribution to this success is attributed to an increase in staff and expertise related to application submission requirements. The practice of reconfirming information on application checklists prior to AER submission may also be contributing to the success rate.	

7.0 Emergency Planning and Response

7.1 Emergency Management Program Roles, Training and Competency

Audit Criteria:

7.1.1   Objectives are established by management for the desired level of preparedness and are communicated to employees a) Preparedness objectives are aligned with regulatory requirements b) Management commitment to continuous improvement to emergency management program
(*CSA Z1600*-4, A.8).

7.1.2   Roles and responsibilities identified in ERPs are appropriate and regularly reviewed with staff (CSA Z2731-4.7, Directive 071- section 5.9)

7.1.3   Performance objectives and accountability for training and competency requirements are established, measurable and communicated to employees
(ISO 31000-4.3.5 and 4.4.1, *Directive 071* – section 14.9).

7.1.4   Training programs are in place and are directed towards proactively identifying risks that could jeopardize public safety and the environment
(ISO 31000-4.3.5 and 4.4.1, *Directive 071* – section 14.9).

References	Assessment	Have criteria been met?
7.1.1	The AER's review of PMC's emergency planning and response practice found that objectives for the desired level of preparedness have been set and communicated to employees through issue of an EM policy in January 2014. These objectives include statements as to the intent of exceeding the regulatory requirements. The CERP also encourages and allows for a CI feedback loop through a dedicated e-mail. As well management is in the process of implementing a 2014 emergency management CI program at PMC.	Met
7.1.2	The ESMS identifies that the roles and responsibilities of the emergency response team are communicated to potential members through periodic review of emergency response procedures during tabletop exercises. Testing indicated that ERP roles and responsibilities are sometimes discussed in monthly safety meetings and are	Met

	practiced or discussed during emergency exercises.	
7.1.3	The ESMS identifies the requirement to set and define performance targets for individuals within the EHSL&R Department at the beginning of each quarter.	Met
7.1.4	ICS and PINs training is emphasized at PMC; however, training and exercise schedules are currently not being monitored with relation to emergency planning, although attendance lists and sign-offs are in place at individual exercise and training events. The AER tested ICS training of 72 ERP-named positions. One responder identified in ERP 2445 had not received ICS training. During the period between request and receipt of training records for individuals, two responders identified in ERP 2237 received training. A component of PMS's 2014 CI plan sections identifies requirements for developing a training matrix to identify courses required to become competent responders as well as training materials, plans, and schedules.	Partially met

7.0 Emergency Planning and Response

7.2 Emergency Response Plans: Updates, Exercises and Communications of Results

Audit Criteria:

7.2.1   Table top and live field exercises are held as per *Directive 071* requirements to test ERPs (2) Identified primary responders actually attend exercises (*Directive 071*- section 14.10, section 14.11).

7.2.2   Call-down lists in ERPs are kept current (*Directive 071*- section 5.6).

7.2.3   ERP exercise results are communicated to all relevant internal and external stakeholders (CSA Z2731-K2.5, *Directive 071*- section14.11).

References	Assessment	Have criteria been met?
7.2.1	The AER reviewed exercise documentation to verify that ERP exercises are conducted. From October 2013 to February 2014, all ERPs were reformatted and updated and were provided to the AER. PMC has developed a project summary for the regulated ERPs that identify the next completion dates required. An emergency planning and security specialist with responsibility for monitoring the plans was hired in October 2013.	Met
7.2.2	Testing of the 24-hour emergency lines identified in PMC's AER-regulated ERPs by the AER was conducted on March 15, 2014. This testing was intended to verify that the numbers in the ERPs were accurate and that the calls were answered in a timely fashion. All calls were answered immediately by PMC staff. No issue with the timeliness of the call-down lists was identified.	Met
7.2.3	PMC ESMS identifies *Directive 071* exercise requirements; although no formal tracking system is currently in place. Exercise results are documented; however, there is no tracking process in place to monitor the exercise and related communications. PMC has recognized that the monitoring process for training and exercises was insufficient and has identified this as a requirement of the 2014 continuous improvement plan. It appears that there is a lack of organizational clarity with regards to roles and responsibilities to schedule and monitor exercises.	Partially met

7.0 Emergency Planning and Response

7.3 Lessons Learned

Audit Criteria:

7.3.1   Lessons learned from previous incidents are shared throughout PMC and with other stakeholders (ISO 31000-5.6).

7.3.2   A formal process exists for incorporating lessons learned into existing ERPs and operations (ISO 31000-5.6, *Directive 071-* section 14.11).

7.3.3   Areas for improvement identified through ERP exercises are implemented in the areas of greatest risk (*CSA Z1600-*A.7).

7.3.4   Records shall be maintained to assist in the development of procedures for use during pipeline emergencies and also enable each incident to be analyzed (*CSA Z662* 10.4.3).

References	Assessment	Have criteria been met?
7.3.1	Lessons learned from incidents and exercises are discussed and documented; however, action items are not always created and assigned to personnel.	Partially met
7.3.2	A formal process for conducting lessons-learned reviews, documenting and tracking lessons learned, or creating and tracking related action plans and incorporating them into ERPs is not in place.	Not met
7.3.3	ESMS requires that findings and lessons learned are to be identified along with corrective action recommendations as part of each table-top or full-scale exercise. It also requires recording of lessons learned from risks and incidents within and outside the organization and distribution of related safety alert bulletins.	Partially met
7.3.4	Review of exercises and incident responses and interviews identified that PMC does retain incident and exercise records, and a records retention policy is in place.	Met

7   Emergency Planning and Response

7.4 Emergency Operations Response and Remediation

Audit Criteria:

7.4.1   Emergency operations are directed out of an established location(s) (e.g., corporate emergency operations centre [EOC], incident command center) with an appropriate command structure in place (*CSA Z2731* – 5.3.2, *Directive 071* – section 2.1.4).

7.4.2   Documentation of response processes and performance measures is complete to the extent that it adequately communicates critical information and ensures continuity of safe business practices (*CSA Z3731-*5.2, 5.3)

7.4.3   Appropriate responders and resources are activated based on the incident type and scale (*Directive 071-* section 14.4, A4, *CSA Z2731-*5.4.3).

7.4.4   Where a substance that may cause, is causing or has caused an adverse effect is released into the environment, the person responsible for the substance shall, as soon as that person becomes aware of or ought to have become aware of the release….(Met).

•   take all reasonable measures to repair, remedy and confine the effects of the substance (*EPEA* section 112 (1) (A) (i)).

•   remediate, manage, remove or otherwise dispose of the substance in such a manner as to prevent an adverse effect or further adverse effect

	(*EPEA* section 112 (1) (A) (ii)).	
References	**Assessment**	**Have criteria been met?**
7.4.1	PMC has a full-time dedicated corporate (EOC in order to respond quickly and effectively in the event of an emergency.	Met
7.4.2	Area ERPs identify response procedures. In the event the Olds control centre requires evacuation, there is a back-up control centre at an alternate location in Alberta that is an identical replica of the Olds control centre. Copies of the emergency response plans are available electronically in the supervisory control and data acquisition (SCADA) system and in hard copy at the control centre. The 2014 CI plan identifies the need to conduct a risk and vulnerability assessment, determine accountability, develop dashboards, and review the document management process.	Met
7.4.3	The CERP identifies levels of emergencies and various planning objectives and procedures and outlines responsibilities for information management and information services and communication procedures. PMC uses ICS training models, and evidence indicates that training is widely provided to the organization, and all but one plan responder had received training in ICS. Through training, PMC also educates responders about resource requirements for emergencies.	Met
7.4.4	Review of the submitted remediation plans and the interview comments from ASERT, AER, and ESRD staff members who were directly involved in the Glennifer Lake and MP188 incidents indicated that Plains met the requirements of *EPEA* sections 112(1) (a) (i) and (ii). The releases were assessed early in the response, and containment measures were implemented within a reasonable time frame.	Met

7.0 Emergency Planning and Response

7.5 Stakeholder Relations and Communications

Audit Criteria:

7.5.1   Public awareness program is in place and executed at least every two years (*Directive 071*- section14.6). Communicated documentation should include relevant plans and procedures (ISO 31000-5.2).

7.5.2   Applicable stakeholder groups are proactively informed during and after an incident has occurred

   a.   Timing and medium of communication is appropriate
   b.   Communications materials and direct engagement programs are in place and activated when appropriate (e.g. community information sessions, web site, media releases)
   c.   Communicated information and format is consistent and readily available
   (*CSA Z2731*-5.4.6, 5.4.9, *CSA Z1600*-6.6, and *Directive 071*- section 2.1.2)

7.5.3   Post incident reporting is timely and accurate (*CSA Z2731*-5.5).

7.5.4   External communication and reporting mechanisms are in place which supports the exchange of risk information and achievement of regulatory compliance (ISO 31000-4.3.7, 5.2).

References	Assessment	Have criteria been met?
7.5.1	Records indicated that public awareness campaigns have occurred on all AER-regulated pipelines prior to developing new ERPs. PMC's process is that records of residents' concerns are developed, addressed internally, and then resolved with the resident. Public information packages have operational-specific information related to the areas where they were distributed. The PMC stakeholder framework and PA program describe mechanisms such as the dispute tracking issues as a viable avenue to ensure engagement with the local communities and their concerns. Capturing and managing any major issues with the external stakeholders, such as landowners, is through the PINS/KMI. The PINS/KMI system contributes to consistent, visible, and traceable management and progress of the corrective actions associated with an issue. This system also contributes to visible and clear responsibility across divisions in addressing corrective actions including reporting and communicating with the external stakeholders. The public awareness program and dispute tracking is in its infancy, therefore its effectiveness was not observed. Stakeholder meetings and resident consultation is included as a component of the continuous improvement plan. However, interviews indicate that no PA schedule is currently in place.	Partially met
7.5.2	Testing of two incidents in June and July of 2013 found that PMC proactively identified potentially impacted residents and informed affected stakeholders. A new crisis communication plan developed in July 2013 and was developed to inform impacted stakeholders of PMC's response plans to help minimize disruptions and to protect the safety of those in the area. This also identifies a disclosure committee, which includes executive leadership of PMC. Interviews indicate that this plan is in the process of being enhanced. CERP outlines external communications procedures, including contact information. The crisis communication plan is used in conjunction with the CERP to help guide the communications response to incidents.	Met
7.5.3	PMC has a dedicated specialist of emergency preparedness and security to ensure that post-incident review is completed. PINS is used to report and provide information about incidents. The emergency planning and security specialist is consistently included in e-mails from PINs and involved in MOC reviews involving emergency management.	Met
7.5.4	CERP outlines external communications procedures, including contact information. PMC has developed a stakeholder relations framework, PA ambassador training, and a PA and education program and is in the process of implementing these programs.	Partially met

8.0 Management Oversight and Internal Controls

8.1 Standard Operating Procedures

Audit Criteria: Identified through review of other criteria areas or PMC's governing documents

- *PIMM* 1.3.3.1: The Director, Asset Integrity shall review the procedures for the creation, updating, retention, and deletion of records for the Pipeline Integrity Management Plan (IMP) on an annual basis. This process shall be audited on an annual basis. The audit results, including a review with the VP, Crude Oil Operations shall be documented. 1.3.3.2 The controlled copy of this manual is available on eStream. This document is scheduled to be reviewed and updated annually.

- *PIMM* 1.3.3.1: For pipeline integrity risk management, Dynamic Risk's IRAS is used to align and overlay different integrity-related data using a common

centreline reference system.

- *PIMM* 1.3.4: The Director, Asset Integrity shall review the methods used to evaluate the knowledge and skills of their personnel, contractors, and consultants. Any recommended changes to these methods shall be submitted to the VP, Crude Oil Operations for approval. Results of this review and any changes shall be included as a documented manual update.

- *PIMM* 1.3.5: Plains utilizes MOC procedures (Document 10.01) to identify, document, evaluate, and approve changes affecting: Ownership, organization, and personnel.

- *PIMM* 1.3.7: A qualitative risk assessment shall be performed for each operating pipeline. The hazard assessment, risk assessment, and evaluation of risk reduction options shall be documented. The assessor shall prepare a task list to communicate the specific controls, the procedures, the frequency of application and the compliance documentation requirements. The hazard assessment, risk assessment and evaluation of risk reduction options shall be documented. The Integrity Department shall update the pipeline integrity risk assessments on an annual basis.

- ESMS, p.97: Each year, critical SOPs should be reviewed to ensure they remain accurate and adequate for the tasks being completed.

- OMS Manual appendix 2ad, 4.1.3: Monitor that operational area procedures are up-to-date, understood, and consistently followed, and take corrective actions when gaps are identified. 4.1.4 Review and update operational area procedures at defined intervals, confirming that they are sufficient to control the related risks.

- *CSA Z662-11* clause 10.5.1.1: Operating companies shall

    a.   Operate and maintain their pipeline systems in accordance with documented procedures that meet the requirements of clause 10.5.1.2;

    c.   Keep records necessary to administer such procedures properly.

- *CSA Z662-11* annex N.6.1: The operating company shall develop, document, and implement a change management process for changes that might affect the integrity of the pipeline system or the ability to manage the integrity of that system. This shall include the following types of changes, as appropriate for the type of pipeline system:

- (a)   those that are initiated and controlled by the operating company, such as changes to

    i.   Organization and personnel of the operating company.

- Alberta *Pipeline Act* and *Pipeline Rules* [Alberta Regulation 91/2005], section 7:

    a.   (1) A licensee shall prepare and maintain a manual or manuals containing procedures for pipeline operation, corrosion control, integrity management, maintenance, and repair …

    b.   (3) A licensee shall

        i.   Update the manual referred to in subsection (1) as necessary to ensure their contents are correct, and

        ii.   Be able to demonstrate that the procedures contained in the manual are being implemented.

- OMS phase 1 summary p.10: Strategic Assessment Management includes criteria to evaluate spare requirements.

References	Assessment
SOP General	Some SOPs have been inherited from previous owners/operators through the acquisition process. If PMC does not review, update, and implement these procedures in accordance with PMC objectives, there is significant potential for tasks to be carried out inconsistently and improperly. There is currently no "PMC's" way of managing SOPs. Given that staff predominantly relies on SOPs as process and procedural guidance in performing their roles, PMC should increase rigour around SOP development and implementation, their relevancy, and currency of content to support the compliance program. A component of the development of the OMS is a full cross referencing of procedures at PMC with inherited procedures, and formatting them into PMC standards.

Although some PMC's SOPs are in place, they do not appear to be followed consistently, leading to potential internal nonconformance and regulatory noncompliance issues. With the exception of the control centre where robust procedures are in place, PMC seems to be largely relying on the experience and competence of its field personnel for executing field tasks. While it is obviously beneficial to have experienced and competent personnel, this doesn't negate the need to have well-developed, complete, and purpose-built procedures in place.

A common approach communicated by management regarding the operation and management of PMC's pipeline assets is lacking. There is not a consistent PMC-endorsed approach but rather two different ways of operating and managing PMC pipelines:

• PMC's way, and
• the previous operator's way. |
| SOP 2.21
SOP 3.02
SOP 3.04
SOP 3.05
SOP 3.06 | Formalized procedures, such as SOP's 3.02 "Hazard Identification and Near Miss Reports", 2.21 "Environmental and Safety Inspection Program", and 3.04 "Incident Investigation and Reporting" do not reference AER requirements. The ability of PMC staff to connect possible noncompliance through these procedures is based on expertise and knowledge of the AER requirements.

The corrective action process, including identifying, reporting, and tracking noncompliances was described in 2010 within the ESMS. There is no evidence this formal process was implemented at PMC, although the MOC and PINS/KMI systems have accomplished the same purpose of the process described in ESMS. Regulatory SOPs, such as draft SOP 3.05 "Incident Reporting" and draft SOP 3.06 "Release Reporting" evidence a lag in implementing a formal process for identifying, reporting, and tracking noncompliances. |
| SOP 8.16 | SOP 8.16 "Managing and Monitoring Regulatory Change" was identified in the ESMS of 2010. The draft SOP 8.16 Managing and Monitoring Regulations regarding established processes and communications that are needed for managing regulatory change is intended to be the primary process tool used by the regulatory coordinator; however, it remains in draft form at the time of the audit. The SOP was used as a guideline and has not been formalized for several years. |
| SOP 8.1.9 | ESMS Critical Task Inventory and Analysis Procedure (SOP 8.19) was in draft and not finalized prior to the decision to implement OMS. PMC is currently working towards adapting those practices within the OMS. OMS element 3.0 (Risk), sub-element 3.1 (Risk Assessment & Management) will cover this procedure. The director of health and safety will decide how the critical task procedure will be replaced under OMS. |
| *PIMM* 1.3.3.1
PIMM 1.3.3.2 | The *PIMM* has not been reviewed annually in accordance with the requirement stated in the *PIMM*. The most recent date of the *PIMM* is September 2011. It is now under review and had an anticipated January 2014 release. This release is now delayed.

• A pipeline asset integrity audit conducted by WorleyParsons had findings, and the *PIMM* will be updated as a result.

• Programs identified as missing or lacking in the audit will be developed in 2014; however, this work will not be conducted until after the AER completes this audit. The Pipeline Integrity Management Manual is not followed consistently

Goals have been established, such as updating the *PIMM*, but no KPIs have been developed. It is acknowledged within PMC that KPI is an |

	area that needs improvement.
PIMM 1.3.3.1	IRAS is not yet fully implemented for managing pipeline integrity risk as documented in the *PIMM*. PMC is in the process of implementing IRAS, but it is not operational yet. Currently, PMC is using a risk assessment approach based mainly on managing the probability of failure and taking measures to reduce the probability of failure.
	PMC is in the process of developing and implementing risk assessment software with a third-party vendor. The current method of conducting risk assessments seems to be largely limited to consideration of likelihood. Consequences do not appear to be considered to the same extent.
PIMM 1.3.4	PMC has not documented its review of its methods used to evaluate personnel, contractors, and consultants as required in the *PIMM*. No documented manual update was found.
PIMM 1.3.5	Significant changes were noted between the November and December 2013 and February 2014 versions of the organizational chart. PMC is not using an MOC procedure to identify, document, evaluate, and approve changes affecting the organization and personnel as stated in the *PIMM*. There was one example of PMC's MOC process being used for an organizational change.
PIMM 1.3.7	There is very little documentation on how PMC carries out its hazard identification, risk assessment, and risk reduction decisions and activities. There is no formal risk assessment process in place. It is not clear how the risk scoring is used to trigger mitigation decisions and whether mitigation and monitoring program data is factored into the decisions. It is not clear how the risk is reviewed after reduction measures are implemented.
ESMS *CSA Z662-11* Clause 10.5.1.1	The SOPs contain critical procedures that have not been updated as required by the *PIMM*. Critical SOPs are not being reviewed annually as recommended by the E&SMS. SOPs are not reviewed regularly, and critical procedures are not reviewed annually. For example, pipeline coating replacement, critical procedure 6.48, effective April 3, 2009, has not been reviewed yet. Also, pigging procedure 6.110 was effective April1, 2009, and was reviewed February 1, 2012. There is currently no consistent process in place to initiate updates or amendments to critical operational procedures.
OMS 4.1.3 OMS 4.1.4	Based on documents reviewed and office and field interviews, operational area procedures found were not updated or used consistently as required in the OMS manual appendix 2ad.
OMS Phase 1 Summary	PMC does not have formal documented criteria for the evaluation of spare materials as the spare materials process is under construction.
Alberta *Pipeline Act* and *Rules* 91/2005 Section 7	Currently, there is no O&M manual/manuals applicable to all AER-regulated pipelines. An O&M manual would help consolidate the SOPs and ensure that there is common understanding about which SOP is to be used in what situation. A manual would also provide one location for describing document management practices for version control, approvals, and frequency of procedure reviews.
	PMC states that its O&M manual is the SOP's manual. One O&M manual was provided for the CO-ED pipeline system dated April 2006. Although this manual hadn't been updated since it was issued in 2006, its contents were in line with expectations of what an O&M manual should contain. The O&M manual inherited for the Co-Ed pipeline system is a good example of an approach that could be used as a model for developing an O&M manual for all of PMC's AER-regulated pipelines.
	One PMC field is using an O&M manual document authored by the former owner and obtained through acquisition. At the time of the audit there was no evidence that acquired processes were reviewed by PMC for continued applicability. O&M manuals were not known to be in existence for other PMC fields, according to field personnel. Various documents sampled were found to be outdated and/or not known to be consistently used by operations groups new to PMC. A consultant is assessing gaps across various acquired programs and manuals, with the aim to facilitate consistency of application of company-wide processes.

	The following was also noted during the course of the audit:
	• There was a preventative maintenance requirement generated in early 2013 (ILI run), and more than a year later it remained unclosed. It's not clear whether the work was completed.
	• No MOC was found for the organization's decision to modify dig criteria from 1.39 MOP to 1.25 MOP.
	• PMC has established the intent to actively monitor regulatory change and communicate this throughout the organization via the Environment & Regulatory Group. An informal process is in place to review current business processes and planning for changing business processes, SOPs, resources, capabilities, and cost to the organization. Documentation and critical assessments about impacts to the current business is not yet obvious and accessible in a single source for review.

8.0 Management Oversight and Internal Controls

8.2 Internal Communications

Audit Criteria:

8.2.1   Internal communication and reporting mechanisms are in place which supports and encourage accountability and ownership of risk (ISO 31000- 4.3.6 and 5.2).

8.2.2   Results of risk management processes are documented and provided to affected personnel. (ISO 31000-4.5 and 4.6).

References	Assessment	Have criteria been met?
8.2.1	PMC is a very dynamic organization with ongoing organizational changes. Organizational changes are not following a formal management of change program, which can affect the successful execution of various programs. There appears to be little communication and follow-up between the field and office personnel. It appears to be more of a linear process involving the passing of information & data, but no follow-up discussions, reviews, or sharing of learnings after that. Several meetings are held (formal and informal) with various levels of the organization to raise awareness and determine status of regulatory matters. The amount of regulatory information reported in meeting minutes has significantly increased in late 2013, consistent with PMC's increase in ability to capture, understand, and communicate compliance and noncompliance matters. PMC follows a "when in doubt, report" philosophy. The senior managers (directors and vice presidents) across all divisions receive information and performance data through the formal communication process. Cross-divisional communications on compliance performance and regulatory matters are more informal, although increase in usage of systems, tools, and engagement by regulatory staff has been a compensating mechanism. Formalization of the cross-divisional procedures and communications are currently being refined or created and implemented (e.g., draft regulatory SOPs). Tracking sheets for regulatory reporting requirements are not readily accessible and visible to the organization. MOC systems (P2 and Maximo) and PINS/KMI are compensating mechanisms as well as the biweekly reporting to the divisions to create visibility of compliance information. Biweekly reporting to the divisions to create visibility of compliance information is a compensating control. The	Partially met

	organization does not have a visible and accessible source to see all regulatory changes that impact the organization.	
	It is the responsibility of all workers to communicate any observed unsafe work condition or action, safety concern, or inability on their part to understand safe work procedures or processes to their supervisor. In the event that an employee identifies an unsafe condition or action and is uncomfortable communicating using normal channels fearing repercussions, the employee may report the unsafe condition or action anonymously using the Whistle Blower Hotline.	
	PMC staff holds many meetings at all levels to communicate risks and the corrective actions being taken to address them. Many of these meetings are cross-functional to ensure that information and perspectives are shared between groups that don't necessarily work together daily. PMC also uses several reporting processes to communicate risks and the actions being taken to address them.	
	Plains has established processes for issuing safe work permits and conducting pre job safety meetings. Project managers use the safe work permitting process to engage and train contractors early to establish plans, and they also notify Land Administration. The safe work permit process has been recently streamlined and as part of the implementation, awareness and training sessions that will be delivered to PMC staff.	
8.2.2	The AER's review of PMC's various management and IT systems noted that they provide the ability to ensure that risk information is recorded, readily accessible, monitored, periodically reviewed and reported internally and externally as appropriate, and relatively effective. For example, the Environment, Health, Safety, Land and Regulatory Department monthly report includes high risk incidents, regulatory matters such as noncompliances, progress on projects, and status of the environment program. However, controls could be strengthened in some areas. The systems that govern PMC incident and risk reporting and communications mechanisms, including g identification of roles and responsibilities, primarily are ESMS, MOC, HazIDs/HazOPs, KMI/PINS, CERP, and safety bulletins. PMC uses KMI/PINS to report incidents and make necessary notifications internally.	Partially met
	Through quarterly, biweekly, and weekly management meetings as well as safety meetings, reports, KMI/PINS, and an open-door communication culture, staff is encouraged to share and report identified hazards or risks. The AER tested the sharing of risk information at the field level through monthly safety meeting minutes. Although there is inconsistency in meeting format, this test found that hazards and risks are regularly discussed, and being aware of hazards and risks appears to be a part of the workplace culture.	
	Asset integrity anomalies are funnelled to emergency management through HazIDs and HazOps. ESMS requires records to be maintained for all incidents of emergencies level I to level III and requires transfer of information, knowledge, and experiences acquired as a result of the incident. AER interviews with PMC staff and incident documents indicated that ICS forms have been used for incident reporting.	
	PMC has a number of systems and protocols under development or newly developed to exchange risk information, including the OMS, crisis communication plan, stakeholder relations framework, public awareness and education program, public ambassador training programs, and the 2014 emergency management CI plan.	
	It is recognized that standardized controls and risk reduction options are not always selected due to site-specific circumstances. However, not documenting site-specific risk reduction decisions could make it more difficult to duplicate successful risk mitigation options in the future or avoid those options that were not as successful. There is also the benefit of knowledge transfer should experienced staff turnover over time.	

| | Although interviews with PMC staff and a review of obtained minutes for some meetings indicated risks and issues are being discussed, the action items and follow-up on progress are not being recorded in a formal manner in all cases.

The KMI system is used to record incident and hazard data, but there is a gap that allows information to be excluded for an "Incident" entry that would normally be required. Alignment of workflow tracking information from incident to corrective action is not consistent, and there is a lack of clarity for staff so they can differentiate between "corrective action" and "lessons learned." If corrective action deadlines are not tracked consistently and clearly, it becomes more difficult to measure performance and ensure that correction actions are being completed in a timely manner. | |

Appendix 2   Criteria Reference Sources

Province of Alberta *Pipeline Act*

Province of Alberta *Environmental Protection and Enhancement Act*

Pipeline Rules, Alberta Regulations 91/2005 with amendments up to including Alberta Regulation 159/2013

Alberta Energy Regulator *Directive 077: Pipelines-Requirements & Reference Tools*

Alberta Energy Regulator *Directive 056, Energy Development Applications and Schedules*

Alberta Energy Regulator *Directive 071: Emergency Preparedness and Response Requirements for the Petroleum Industry*

Alberta Energy Regulator *Manual 005: Pipeline Inspections*

CSA Z662-11: Oil and Gas Pipeline Systems

National Energy Board (NEB) *Onshore Pipeline Regulation*

Occupational Health Safety Act, Process Safety Management

API *Standard 1160, Managing System Integrity for Hazardous Liquid Pipelines*

British Standards Institute (BSI) *PAS 55 Asset Management*

CSA Z1600: 08 Emergency Management and Business Continuity Programs

CSA Z731: Emergency Preparedness & Response

ISO 9000-2005 Quality Management Systems Fundamentals

ISO 9001-2008 Quality Management Systems Requirements

ISO 9004: 2009 Managing for the Sustained Success of an Organization

ISO 14000- Environmental Management

Pipeline and Hazardous Materials Safety Administration (PHMSA) CFR 192

Pipeline and Hazardous Materials Safety Administration (PHMSA) CFR 195

American Institute of Chemical Engineers *Guidelines for Management of Change for Process Safety*

Canadian Society for Chemical Engineering (CSChE) *Process Safety Management Guide*

Center for Chemical Process Safety (CCPS) *Guidelines for Auditing Process Safety Management Systems*

Center for Chemical Process Safety (CCPS) *Guidelines for Hazard Evaluation Procedures*

Center for Chemical Process Safety (CCPS) *Guidelines for Preventing Human Error in Process Safety*

Center for Chemical Process Safety (CCPS) *Process Safety Leading and Lagging Metrics*

COSO Enterprise Risk Management Framework

COSO Internal Control – Integrated Framework

International Association of Oil & Gas Producers (OGP) *Report 415 Asset Integrity*

International Association of Oil & Gas Producers (OGP) *Report 456 Key Performance Indicators*

CSA Q850-97: Risk Management: Guideline for Decision Makers

ISO 1002:2004 Quality Management-Customer Satisfaction Guidelines for Complaints Handling in Organizations

ISO 1003:2007 - Quality Management – Customer satisfaction – Guidelines for dispute resolution external to organizations

ISO 31000 Risk Management Principles & Guidelines

Appendix 3   Abbreviations

AC	alternating current
AER	Alberta Energy Regulator
ASERT	Alberta Environment Support and Emergency Response Team
BCP	business continuity plan
BP	British Petroleum
CEPA	Canadian Energy Pipeline Association
CEO	chief executive officer
CERP	corporate emergency response plan
CGA	Canadian Gas Association
CI	continuous improvement
CP	cathodic protection
CSA	Canadian Standards Association
CMS	contract management system
DBM	design basis memorandum
DC	direct current
D056	AER *Directive 056*
DDS	digital data submission
EAM	enterprise asset management
EHSL&R	Environmental, Health, Safety, Land and Regulatory Department
EH&S	environmental, health, and safety
EM	emergency management
EOC	emergency operations centre
EOLT	Executive Operations Leadership team
EPEA	*Environmental Protection and Enhancement Act*
EPZ	emergency planning zones
ERP	emergency response plan
ESMS	PMC Environmental Safety and Management System v1- 05/07/2010
ESRD	Alberta Environment and Sustainable Resource Development
EVP	executive vice president
FTE	Full-time equivalent
HazIDs	HazIDs (hazard identification)
HazOps	HazOps (hazard and operability study)
HDD	horizontal directional drilling
HREA	High Risk Enforcement Action
ICS	incident command system
IHA	industry hazard analysis
ILI	In line inspection
IMP	integrity management plan
IRAS	Dynamic Risk integrated risk assessment system
IT	information technology
KMI	KMI (Plains incident notification system)

KPI	key performance indicator
LPG	liquefied petroleum gas
MOC	management of change
MOP	maximum operating pressure
MSDS	material safety data sheets
O&M	operations and maintenance
OMP	operations management programs
OMS	operations management system
ORM	operational risk management
PA	public awareness
PAA	Plains All American
PIMM	*Pipeline Integrity Management Manual*
PINS	Plains incident notification system
PMC	Plains Midstream Canada
PPE	personal protection equipment
PSV	pressure safety valve
QC	quality control
RACI	responsible-accountable-consulted-informed
ROW	right-of-way
SCADA	supervisory control and data acquisition
SIPM	supplier information performance system
SME	subject matter expert
SCM	supply chain management
SOP	standard operating procedures
SWOT	strengths, weaknesses, opportunities, and threats
WCSS	Western Canadian Spill Services

Appendix 4   Control Centre

Area reviewed	Evidence of implementation (based on recommendations in the consultant's report)	Assessment of status of recommendation
Roles and responsibilities/ oversight role of shift supervisor	New procedure clearly defines the responsibilities of the shift supervisor and console operators. New schedule ensures overlap coverage between supervisors and control room operators. Role of shift supervisor now requires them to check with all controllers and monitor all segments of leak detection.	Fully implemented
Staffing level	A shift supervisor is now on duty every hour of every day.	Fully implemented
Teamwork and task sharing among console operators and supervisors	There are now five shift supervisors, and the schedule ensures overlap coverage between supervisors and control room operators. Any unexplained alarm noticed by the console operator has to be raised to the shift supervisor. He then monitors the segment in question to further evaluate the potential cause. If the leak is confirmed, a call is placed to control centre supervisor, console supervisor, control centre manager, and district manager. If the leak detection system is noted to be returning to normalcy, the operator monitors the segment in question for 45–60 minutes to ensure that the leak detection system has in fact returned to normal operating conditions.	Fully implemented
Fatigue management	To address fatigue, the control centre is adopting Plains All American control room management processes, which consist of displayed signage to advise control centre personnel to take breaks, and the provision of exercise equipment in the control centre.	Fully implemented
Authority to shut down pipeline	The new procedure gives the control room operator the authority to shut down the pipeline if any abnormality is observed. If the control room operator is unsure about an alarm, the pipeline is shut down.	Fully implemented
Authority to restart pipeline	The new procedure documents the authorization process to restart a pipeline after a thorough investigation of leak and remedial actions. The shift supervisor is required to obtain clearance from the control room operator and get written approval from senior management before the pipeline is restarted.	Fully implemented
Accessibility of procedures	All critical procedures (e.g., leak, shutdown, and start-up) are now available to console operators in the SCADA system and are available in hard copy in the control room.	Fully implemented
Decision criteria for shutdown and restart	The new procedure contains specific time and flow-volume criteria to determine the urgency of response. Simsuite is regarded as the primary method of leak detection.	Fully implemented

Area reviewed	Evidence of implementation (based on recommendations in the consultant's report)	Assessment of status of recommendation
	Data from SCADA and Pipeline Monitor are also reviewed in conjunction with Simsuite to evaluate indications of a potential leak. The new procedure now includes time criteria that allows for calculation of the time required for stabilization and restart of the pipeline based on pipeline diameter, operating pressure, flow rate, etc.	
Definition of critical parameters	The new procedure clearly includes the definition of leak trigger and abnormal operating conditions as guidance to control room operators.	Fully implemented
Clarity of flow diagram	The new procedure contains descriptive text that clarifies the process flow charts for leak detection, shutdown, and start-up.	Fully implemented