

May 31, 2016

Alberta Utilities Commission
5th Avenue Place
400, 425 – 1st Street SW
Calgary, Alberta
T2P 3L8

Attention: Brian Shand, P. Eng.

**Re: ATCO Pipelines
Radiographic Weld Inspection**

Please find attached, ATCO Pipeline's responses to the Alberta Utility Commission's information clarity request received on May 13, 2016 regarding ATCO's radiographic weld inspections.

Should the AUC request further clarification or desire further information on this matter, please contact the undersigned at 780-420-7225 or by email at graeme.feltham@atco.com.

Sincerely,

Graeme Feltham, P. Eng, MBA
Vice President, Engineering & Construction
ATCO Pipelines

ATCO-AUC-2016MAY13-001**Topic: Historic Operation****Reference: May 3, 2016 ATCO Pipelines letter****Request:**

- (a) Please describe the location and ownership of the welding shop, and the procedural or contractual oversight arrangement utilized by ATCO Pipelines for use of the welding shop.
- (b) Please describe in detail the process that was utilized by the ATCO welding shop and by ATCO Pipelines between 2008 and 2015, and the procedural, training, or other factors that contributed to potentially substandard radiographic inspections that may have resulted in unidentified weld defects.
- (c) Please describe in further detail the specific nature of the deficiencies identified respecting the substandard radiographic inspections.
- (d) Please discuss how the 2008 through 2015 time frame for substandard inspections was determined and whether ATCO Pipelines considers prefabricated pipeline assemblies prepared prior to this time period to be at a similar risk.
- (e) Please provide an assessment of the reasons why the procedures utilized from 2008 through 2015 were not effective.
- (f) Please discuss the reasons why the radiographic inspections were only recently identified as deficient, and why the problems were not identified immediately after the radiographic inspections were completed.
- (g) Please discuss the oversight of radiographic inspections of field-installed pipelines and whether ATCO Pipelines considers those installations to be subject to similar threats to those associated with piping prefabricated in the ATCO welding shop.
- (h) Please discuss if ATCO considers that the contractor(s) engaged by ATCO may have been utilized by other facility owners and any action ATCO has taken to advise those other operators of potential concerns.
- (i) Please discuss the legislative framework and standards that ATCO Pipelines considers to be relevant with respect to the radiographic inspection process and how ATCO Pipelines has complied with those requirements.
- (j) Please discuss whether ATCO Pipelines considers that the pipelines containing welds with potentially problematic radiographic inspections meet the requirements of CSA Z662.

Response:

- (a) Certain welding shop services for ATCO Pipelines (AP) and ATCO Gas (AG) are provided through a welding shop owned and operated by ATCO Gas and Pipelines Ltd. The welding shop is located at the ATCO Gas Division, Heavy Equipment Repair Depot (HERD), 5623 - 82

Avenue Edmonton. The radiographic inspection of welds performed at the welding shop is contracted to independent, third party service providers. Please also refer to part (f) below.

- (b) Radiographic inspection and interpretation is a specialized skill, as a result, independent third-party radiography companies were hired through a competitive bid process to complete all radiographic weld inspections at the welding shop, using the third party radiography companies' own equipment and employees. The third-party radiography companies were required to provide independent inspection, review, and evaluation of the welds. Following an investigation, it was determined that third-party contractors commissioned to provide radiographic inspection services for pre-fabrication welding were not fulfilling their contractual or professional obligations as accredited radiographers.
- (c) The specific nature of the deficiencies identified respecting the substandard radiographic inspections included the following:
- The radiograph produced through the radiographic inspection process was not of a sufficient quality that a proper evaluation of the weld could occur, or
 - The presence of rejectable defects within pre-fabrication welds were not identified for remedial action.
- (d) Through ATCO's investigation, it was determined that certain radiography companies and associated radiographers were solely responsible for the substandard inspections in the period between 2008 and 2015. The associated radiographers did not perform radiographic services for ATCO prior to or after that period.
- (e) Please refer to ATCO-AUC-2016MAY13-001(b) and (c).
- (f) Due to the specialized nature of the work, ATCO depended upon third party accredited radiography companies to provide independent radiographic weld inspections. It was not general industry practice to provide "double inspections" (i.e. inspecting an inspector) when the work being performed is regulated through accreditation, as is the case with radiography work. In 2015, during the detailed as-built process where radiographs were being scanned and matched to the electronic asset record, a deficient radiographic x-ray was discovered and a detailed investigation followed.
- (g) As a result of the discovery of deficient radiographic x-rays, a third-party audit was conducted on the radiographic x-ray films for a sample of prefabricated and field installed pipeline assets. A similar problem was not found for field-installed pipelines through this audit. It was determined that the deficient radiographic x-rays were confined to third-party inspections conducted in the welding shop by individual radiographers. For field-installed pipelines, AP uses a complement of third-party radiography companies, and can confirm that it did not use the individual radiographers for its field inspections that were used in the welding shop.
- (h) AP does not know if other pipeline owners engaged the same contractors that performed the radiographic weld inspections in the ATCO welding shop. However, the specific radiographers responsible for the deficient welds were generally working full-time hours in

the ATCO welding shop, so ATCO believes it unlikely that these radiographers also performed services for other pipeline owners. It was important to ATCO to voluntarily self-disclose a deficiency related to the radiographic inspection of its pre-fabrication welds. In addition, ATCO is pursuing legal action against the contractors and radiographers responsible for the substandard inspections.

- (i) The Pipeline Act names CSA Z662 as the standard to be used for pipeline design in Alberta. Section 7 of CSA Z662 covers joining pipes, components, and non-pressure retaining attachments to piping. ATCO radiographs 100% of shop welds and hydrostatically pressure tests 100% of prefabricated piping and welds. Please also refer to ATCO-AUC-2016MAY13-001(b)
- (j) ATCO can confirm that some radiographs and some welds are not compliant with CSA Z662. As discussed in the May 3, 2016 letter from ATCO to the AUC, ATCO is continuing to investigate and taking appropriate remedial actions to achieve compliance.

ATCO-AUC-2016MAY13-002

Topic: Locations of Installations
Reference: May 3, 2016 ATCO Pipelines letter

Request:

- (a) Please provide a list of site locations where the subject prefabricated assemblies were installed including the maximum operating pressure, any operating pressure deration implemented, facility class location and size of piping.
- (b) For the above list, please identify any sites where re-inspections have been completed, the results of the re-inspection and any repairs or replacements conducted.
- (c) For the above list, please identify which are below-ground installations and the nature of those installations.
- (d) For the above list, please describe the hydrostatic testing undertaken including the duration and percentage above the intended maximum operating pressure.

Response:

- (a-b) Please refer to ATCO-AUC-2016MAY13-002(a) Attachment. Please note that the attached list of locations is still under review to ensure all potentially affected sites are given proper consideration. The list is fundamentally complete to the best of ATCO's knowledge at this time; however, the detailed review of sites potentially containing the subject prefabrication assets is still underway.
- (c) Through its investigation, ATCO determined that certain radiography companies and associated radiographers were solely responsible for the substandard inspections and that the deficient radiographic x-rays were confined to the inspections conducted in the ATCO welding shop. ATCO utilizes its welding shop facilities to complete prefabrication for station and assembly piping that cannot be hydrostatically tested in the field as per Clause 7.10.3.1 of CSA Z662. Although primarily utilized for above ground facility piping, each assembly or station facility may include transition components for below-ground installation. AP estimates that approximately 90 per cent of the affected welds are located above ground.
- (d) ATCO completes hydrostatic testing on all prefabricated piping to a minimum of 140% of design pressure for a minimum duration of one hour in a completely accessible state followed by a visual inspection of the piping as per CSA Z662 Clause 8.7.5.2 and 8.7.1.2.

ATCO-AUC-2016MAY13-003

Topic: Revised Operation
Reference: May 3, 2016 ATCO Pipelines letter

Request:

- (a) Please describe the revised procedures and controls that have been implemented to ensure that radiographic inspections of prefabricated piping assembled in the ATCO welding shop meet industry standards.
- (b) Please describe how ATCO will work to establish welding inspection procedures and ensure its contractors have demonstrated an ability to correctly interpret results.
- (c) Please describe how any pipeline operating pressure deration was determined, the intended duration of the deration and any associated ATCO system capacity and operational implications.

Response:

- (a-b) To ensure that radiographic inspections of prefabricated piping assembled in the ATCO welding shop meet industry standards and that AP's contractors have demonstrated an ability to correctly interpret results, AP has addressed the radiography issue by:
 - Retaining different radiographers
 - Engaging periodic third party review of weld inspection (i.e. inspecting the inspector)
 - Providing leading indicator feedback to welders
 - Enhancing the weld quality process and documentation
- (c) AP has prioritized the re-inspection of welds on a risk-based method that first targets large diameter welds in populated areas. As specific weld defects are identified during the re-inspection process, an analysis of the individual defect is completed and temporary pressure derations are placed, below the current Normal Operating Pressure (NOP), on the specific pipeline segment where the defect is determined to have the potential for pressure related risk at the NOP. Pressure derations are to be kept in place until either the specific defect is repaired or the weld is replaced.

ATCO-AUC-2016MAY13-004

Topic: Timing
Reference: May 3, 2016 ATCO Pipelines letter

Quote: "ATCO Pipelines has prioritized the re-inspection of large diameter welds in populated areas and expects to complete any necessary repairs to those by the end of 2016. The remainder will be completed prior to the end of 2019."

Request:

Please describe the reasons for the length of the period from 2017 through 2019 to complete the re-inspection, discuss the risks associated with that time period and comment on opportunities to expedite that process.

Response:

In terms of a risk assessment, AP derives comfort from the fact that:

- All of the welds in question have been performed by B-Pressure welders
- All the welds have successfully passed a hydrostatic test at 140% of MOP
- Most of AP's system operates at considerably less than MOP, when possible
- As AP works through its remediation plan, it is initiating temporary pressure deratings, as warranted, according to its risk assessments

In terms of the remediation schedule, AP has prioritized the re-inspection using a risk-based approach. AP has prioritized the re-inspection of large diameter welds in populated areas and expects to complete any necessary repairs to those by the end of 2016. The next priority is the pipelines of the oldest vintage. While the volume of work is significant, AP is committed to completing the program as soon as reasonably practicable. AP will continue to evaluate the risk assessment, required re-inspection and any necessary subsequent repair work, and will endeavour to complete the work earlier than 2019.

ATCO-AUC-2016MAY13-005

Topic: Other Locations
Reference: May 3, 2016 ATCO Pipelines letter

Quote: “We estimate that approximately 90 per cent of the affected welds are located above ground and most are installed at ATCO facilities.”

Request:

Please discuss what other locations aside from ATCO facilities have utilized the affected piping and what action or notification has been established.

Response:

All of the affected welds are located on ATCO assets. Approximately 90% are located above ground with 10% below ground. Most of the affected welds are located at AP’s station sites; some of the affected welds are located at AP’s valve assemblies. Valve assemblies are typically located on surface leased land. AP is contacting landowners when ground disturbance activities are planned.

AP does not believe that any general public notification is necessary as the risks involved are being appropriately mitigated as outlined in ATCO-AUC-2016MAY13-004.