



June 27, 2016

ATCO Pipelines  
7210 - 42 Street  
Edmonton, Alberta T6B 3H1

Attention: Mr. Graeme Feltham, P. Eng.  
Vice President, Engineering & Construction

**ATCO Pipelines  
Radiographic Weld Inspections**

**Information request round 2**

Thank you for your information request responses of May 31, 2016. The AUC requests the following information clarification. Your response by July 18, 2016 is requested.

Should you have any questions, please contact the undersigned at 403-592-4434 or by email at [brian.shand@auc.ab.ca](mailto:brian.shand@auc.ab.ca).

Yours truly,

Brian Shand, P. Eng.  
Director, Gas Facilities  
Facilities Division

Attachment

cc: Mr. Howard Wallace  
Alberta Energy Regulator

## **ATCO Pipelines Radiographic Weld Inspections**

### **Alberta Utilities Commission Information Request Round 2 to ATCO Pipelines**

**ATCO-AUC-2016JUN27-001**

**Reference:** May 3, 2016 ATCO Pipelines letter and May 31, 2016 information request responses

**Issue:** Nature of the deficiencies

**Quote:** In ATCO-AUC-2016MAY13-001, ATCO responded:

- “(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.”

**Preamble:** Explanations of the specific nature of the deficiencies associated with the radiographic inspection films are requested.

Explanations of the specific nature of the deficiencies that are suspected or have been identified through re-inspections are requested. The Commission requires that information to assist in assessing the risk associated with any potential flaws associated with the welds.

**Request:**

- (a) Please clarify the specific deficiencies that have been identified with the radiographic films. Concerning radiographic quality, please provide a tabulation identifying weld numbers, date of original radiographic inspection and specific quality issues associated with each substandard radiograph for each weld. Examples of radiograph quality issues include: incorrect density range, incorrect image quality indicator (IQI), IQI not visible, IQI at wrong location, required sensitivity or definition not achieved, incomplete weld coverage, weld obscured by identification or location markers, processing marks, handling marks, wrong class or type of film, or required exposure technique not followed. Where radiograph quality does not permit a revised interpretation that should be indicated on the tabulation.
- (b) Please describe the specific weld deficiencies suspected or rejectable defects identified through examination of the original radiographic films or re-inspections conducted. Concerning weld defects, please provide a tabulation identifying weld numbers, dates of radiographic inspection (original and re-inspection), and weld defect types, locations, and dimensional characteristics associated with each rejectable weld. Weld defect types should be described using the terminology of CSA Z662 Clause 7. Weld defect locations should be described in terms of circumferential position, through-thickness (bead) location, if known, and upstream or downstream position (if known). Dimensional characteristics should be

described in terms of the CSA Z662 Clause 7 acceptance criteria (e.g., the measured length, depth, width or diameter as applicable, for each weld defect). CSA Z662-15 clauses 4.1.10, 5.8 and 10.1 should be consulted for additional information that may be necessary for engineering assessment of each non-conformance (or group of technically similar non-conformances). As a matter of clarity, it was noted that the ATCO voluntary self-disclosure uses the phrase “engineering evaluation”, and does not specifically mention the CSA Z662 defined terms “engineering assessment” and “engineering critical assessment” which should be utilized in the descriptions of the engineering work.

**ATCO-AUC-2016JUN27-002**

**Reference:** May 3, 2016 ATCO Pipelines letter and May 31, 2016 information request responses

**Issue:** Root cause factors

**Quote:** In ATCO-AUC-2016MAY13-001, ATCO responded:

“(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.”

**Preamble:** The AUC would like to identify the root cause factors that may have contributed to radiographic inspection deficiencies and would like to obtain more information with respect to the history of work execution and management processes to detect anything systemic that may have contributed to potentially substandard radiographic inspections from 2008 to 2015 including consideration of:

- method of managing welding and inspection work
- selecting welding procedures for joints
- assessing welder qualifications
- assigning welders to the work
- directing and monitoring welders
- coordinating radiographic inspection
- communicating radiographic inspection requirements
- reviewing qualifications and experience of radiographic service providers and radiographic technicians
- directing and monitoring radiographic inspection activities
- receiving and reviewing radiographic reports and film
- preparing repair lists
- documenting the status of completed welds

**Request:**

- (a) For radiographic technicians, including film interpreters, please describe the minimum ATCO requirements with respect to qualifications, training, and experience, including any training provided with respect to ATCO radiographic inspection requirements.
- (b) Please describe who approves the qualifications of radiographers and other inspectors (see CSA Z662 Clause 7.10.1.1).
- (c) Please describe who approves non-destructive inspection procedures (see CSA Z662 Clause 7.10.4.1).
- (d) For the period in question (2008 to 2015) please discuss if ATCO accepted radiographic inspection results as fully correct and compliant with CSA Z662 without further review or audit.
- (e) If radiographic inspection results were reviewed by ATCO, please describe the review process and provide any related procedures.
- (f) When weld repairs were identified, please describe how repair locations were identified on welds, and how repair completion was monitored and recorded.
- (g) The ATCO response implies that there was more than one radiography company and more than one radiographic technician. Please discuss how many radiographic companies, radiographic technicians, and film interpreters were involved with the radiographic deficiencies found between 2008 and 2015.
- (h) Please discuss what observations or conditions lead to investigation and discovery of the radiographic deficiencies.
- (i) Please discuss whether ATCO has audited any radiographic inspections prior to 2008 or after 2015 and the resultant observations.

**ATCO-AUC-2016JUN27-003**

**Reference:** May 3, 2016 ATCO Pipelines letter and May 31, 2016 information request responses

**Issue:** Results of re-inspections

**Quote:** In ATCO-AUC-2016MAY13-002 ATCO provided a table with 378 locations where 24 locations had been re-inspected. The maximum operating pressure at each of the 24 locations was derated.

In ATCO-AUC-2016MAY13-003, ATCO responded:

“(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.”

**Request:**

- (a) Please provide an ATCO system map indicating each of the 378 geographic locations having prefabrication welds with potential deficiencies.
- (b) Please provide an updated status on re-inspections that includes a complete listing of all affected pre-fabrication welds correlated to geographic location, with corresponding status (e.g., date assessed, assessment disposition and basis for decision, date re-inspected, re-inspection disposition, tentative repair date, repair status, final acceptance date).
- (c) Please explain whether the deration at all 24 of the re-inspected sites arose from weld defects identified at each of these locations or other factors.
- (d) Please explain the methodology utilized to analyze the individual defects.
- (e) Please explain the methodology utilized to establish the reduced operating pressure.