



Proposed Revisions to Guide E of the NEB Filing Manual

Guide E - Change in Class Location (OPR S.42)

Section 42 of the OPR states:

If the class location of a section of a pipeline changes to a higher designation that has a more stringent location factor, the company shall, within six months after the change, submit the proposed plan to deal with the change to the Board.

A class location change is a change from a previous class location designation (not design class location) to the current higher class location designation as defined by CSA Z662.

Filing shall occur within six months after the change occurred. The operator is responsible for monitoring pipeline segments that may be subject to a class change with sufficient frequency and for maintaining consultation/communication with local authorities or developers in order to be aware of the time of change.

Goals

The submission includes a plan that describes how the company proposes to deal with class location changes to a section(s) of its pipeline to a higher class location designation.

The plan is submitted in a timely fashion within six months after the change of class location.

Identifying Assessment and Filing Requirements

When the section of the pipeline with the change in class location meets CSA Z662 requirements for a new class location, only a **primary assessment** shall be filed (as described in E.1) with the Board for approval within six months of the change in class location.

When the section of the pipeline with the change in class location does not meet the CSA Z662 requirements for a new class location, the non-compliance may be resolved by applying the design requirements of CSA Z662, Clause 4, or an Engineering Assessment (EA) (as described in E.2) shall be carried out according to CSA Z662 to determine the suitability for continued service at the new class location designation. In these circumstances, either (1) or (2) below, as appropriate, shall be filed within six months of the change in class location:

1. Correction of a non-compliance following the design requirements of **CSA Z662, Clause 4** shall be described in the proposed plan¹ with a proposed timeline for completion:
 - a. The company shall file the **primary assessment** (as described in E.1, and filed with the proposed plan) and the **interim corrective and mitigative measures**, as applicable and as described in E.3, with the Board for approval.
2. When an **EA is carried out** to determine the suitability for continued service of the pipeline segment at the new class location designation:
 - a. The company shall file the **primary assessment** (as described in E.1, and filed with the proposed plan), the **EA** (as described in E.2) and the **long term and interim corrective and mitigative measures** (as described in E.3) with the Board for approval.
 - b. In the event that an EA cannot be completed within six months, the company shall include in the proposed plan the timeline for completion of the EA and provide the interim measures that it will implement to safeguard the public.

E.1 Primary Assessment

Filing Requirements

The company shall file with the Board a primary assessment of the pipeline segment that is subject to the class location change that includes the following requirements:

1. Identification of changes in circumstances that have occurred and resulted in the change of class location, including:
 - a) Maps of current and previous circumstances in a large enough scale to clearly indicate the following:
 - i. North arrow;
 - ii. Scale indicated and scale bar;
 - iii. reasons for the change in class location;
 - iv. the impacted length of pipeline, start and end locations of pipeline;
 - v. location of any crossings;
 - vi. location and spacing of valves;
 - vii. class location assessment area;
 - viii. area of potential impact;

¹ Consult the document, Operations and Maintenance Activities on Pipelines under the National Energy Board Act - Requirements and Guidance Notes to determine if a separate application is required.

- b) Description of development within class location assessment area and area of potential impact, including number, type and occupancy of dwelling units, outside areas or buildings as described in CSA Z662 for class location designations;
 - c) Date when the class location change occurred;
2. Requirements of CSA Z662 for a change of class location, including:
- a) Design factor or location factor, as applicable:
 - i. effect of the new location factor(s) on design pressure and hoop stress used in stress analyses for any location on the pipeline system, including road and railway crossings;
 - b) Valve spacing;
 - c) Depth of cover (DOC) and clearance (comparison of minimum requirements versus actual depth of cover and clearance):
 - i. results of recent depth of cover survey and survey date;
 - d) Pressure testing
 - i. The company shall report field pressure test records, including the date, test pressure, duration, medium, any experienced failures, and test intervals;
 - e) Evaluation and repair of imperfections as specified in CSA Z662:
 - i. The company shall report if it has incomplete records or no records of assessed/repared imperfections on the affected portion of the pipeline;
 - ii. The company shall report if a pipeline is not piggable to accommodate maintenance and inspection tools. If the pipeline is piggable, the company shall report the dates of the last inspections for corrosion, dents, cracks, and pipe movement.
3. Consultation activities for the change of class location, including a description of the design of the project-specific consultation activities and the outcomes of the project-specific consultation activities, as per the Board's expectations laid out in the Filing Manual:
- a) If no project-specific consultation activities are implemented, an explanation is required;
4. Design basis of the pipeline system, including service fluid, operating pressure and temperature range, and the site-specific loading and operating conditions that are anticipated throughout its design life:
- a) The company shall report if the pipe is carrying high vapour pressure (HVP) or sour service products;
5. Material specifications and pipeline properties (including year of construction, seam weld, outside diameter, wall thickness, specified grade, yield strength, tensile strength and toughness):
- a) In the absence of a complete mill test certificate, representative samples of the pipeline segment may be obtained and tested to provide the missing material data;

6. Coating type and condition of pipe body, girth welds, and repairs:
 - a) The company shall report information based on any available assessments, including inference from specification, construction records, and indirect inspection (e.g. in-line inspection (ILI), electromagnetic acoustic transducer (EMAT) inspection, above-ground inspections (e.g. direct current voltage gradient (DCVG), alternating current voltage gradient (ACVG), alternating current coating attenuation (ACCA), etc.)), and excavation results;
 - b) The company shall apply additional inspection and testing if information is lacking;
 - c) The company shall perform additional coating condition assessments or apply additional safety measures depending on how effectively the coating protects the pipe or depending on the probability that it may support the presence of a corrosive environment on the pipe;
7. Level of cathodic protection (CP):
 - a) The company shall report the date of the last potential survey (e.g. test lead survey, closed interval survey (CIS), etc.);
8. Confirmation that girth welds of the affected portion of the pipeline were subjected to 100% Non-Destructive Examination (NDE) with supporting NDE records;
9. The damage prevention activities at the location of the pipeline segment subject to the increase in class location;
10. The presence of a school, hospital, daycare, seniors' residence, prison, work camp, campground, playground or other facilities occupied by 20 or more persons during normal use and that may be difficult to rapidly evacuate **and/or** where evacuation from such facility can only be achieved by entering the areas of potential impact; and
11. Failure history of the valve section containing the affected portion of the pipeline.

E.2 Engineering Assessment

Filing Requirements

When the requirement for an EA has been identified, the company shall file with the Board an EA that includes:

1. Primary assessment; the company shall provide a NEB filing identification if previously submitted.
2. The EA shall meet CSA Z662 requirements for engineering assessments of existing pipelines, including:
 - a) Manufacturing process and installation method;
 - b) Construction and testing specifications;
 - c) The physical configuration and constraints of the affected portion of the pipeline that is the subject of the engineering assessment;

- d) Condition of the piping, including types of imperfections, dimensions, and dimensional uncertainty;
 - e) Mechanism or mode of imperfection formation, growth, and failure;
 - f) Service, operating, failure, and maintenance history, including a CP effectiveness evaluation;
 - g) Rationale for repair methods used;
 - h) Interaction of identified hazards;
 - i) Consideration of combined stresses, for example:
 - i. Where existing pipelines are crossed by roads or railways, the pipelines shall be either upgraded to meet the applicable design requirements for the new class location or be subjected to a detailed analysis of all loads expected to be imposed on the pipeline during operation of the crossing and the resulting combined stresses in the pipeline with consideration of the condition of the pipeline. Fatigue stress or fluctuating stress shall be considered if heavy equipment crosses the pipeline at high frequencies.
3. Specifically, with regard to the condition of the piping, a comprehensive hazard identification and assessment is required by a professional engineer who is competent in assessing the hazard, considering as a minimum:
- a) Corrosion (e.g. external, internal, microbiologically influenced corrosion (MIC), alternating current induced corrosion, etc.);
 - b) Cracking (e.g. environmentally-assisted, fatigue, etc.);
 - c) Mechanical damage (e.g. dents, wrinkles, buckles, and gouges):
 - i. A dent assessment shall include the CSA Z662 criteria for dents in pipe to be considered as defects;
 - ii. All dents on the top half of the pipe (8 o'clock to 4 o'clock), in addition to all sharp dents (length/depth <20) shall be visually inspected for cracks, gouges, and interaction with welds;
 - d) Geohazards (e.g. soil movement, seismically-triggered hazards, scour, erosion);
 - e) Manufacturing and construction-related imperfections (e.g. imperfections in welds, in the pipe, or imperfections of pipeline components);
 - f) Equipment malfunction (e.g. malfunction of control or relief equipment as a result of ice formation in cold weather);
 - g) Incorrect operation (e.g. overpressure, incorrect operating procedures, introduction of out of specifications fluids);
 - h) Potential stresses as a result of thermal expansion or contraction;
 - i) Material-related issues (e.g. low toughness).

A hazard assessment using ILI results shall include the tool performance specification and tool performance validation. Unity plots shall include all excavation results on the pigged pipeline section and all false negatives.

Performance history alone is not an adequate hazard evaluation technique; the absence of a previous leak or rupture caused by a hazard on the pipeline is not proof of the absence or control of a hazard.

All imperfections identified in the assessment of the condition shall be evaluated and repaired as needed. The repair shall meet the requirements of CSA Z662 Clause 10 and be scheduled appropriately, independent of the EA timeline.

4. The EA shall consider the potential for collateral damage to pipelines or other buried facilities caused by the failure of adjacent pipelines (e.g. thermal radiation causing coating damage or reducing the strength of adjacent pipe).
5. A valve spacing engineering assessment is required when the valve spacing requirement as per CSA Z662 is not met for the higher class location designation. This assessment shall follow CSA Z662 and shall include:
 - a) A listing of the upstream and downstream sectionalizing valves, including a map that shows the spacing of the valves;
 - b) A listing and a schematic of the current configuration of the branches, cross-overs, risers and other piping that feed service fluid between the two sectionalizing valves, including:
 - i. Confirmation that the additional feed from each source is accounted for in the calculation of the blowdown volumes;
 - ii. Details on the cross-over valve assembly;
 - c) Information on both a) and b), including:
 - i. Valve mechanism (remote, automatic or manual);
 - ii. Valve setting (normally open/close, etc.);
 - iii. Clarification whether valves are equipped with emergency shutdown mechanisms; and
 - iv. Valve maintenance frequency.
6. The company shall submit a relative risk assessment that identifies and quantitatively demonstrates that the risks of the existing pipeline are equal to or lower than the risks of a pipeline that is at least at the DOC of the existing pipeline and meets all the requirements of the OPRs and CSA Z662 (e.g. the latter may refer to a pipeline with a heavier wall, constructed of a higher grade, or operating at a lower pressure). Examples of quantitative risks for gas pipelines are individual and societal risks. The relative risk assessment shall include:

- a) A reliability or probability of failure (POF) assessment that includes:
 - i. All identified hazards and potential interactions;
 - ii. The source of failure probabilities (i.e. references) used in the assessment, where the methodology shall be representative and be specified;
 - iii. Long term plan on maintaining the reliability of the POF level;
- b) A consequence analysis and results:
 - i. For HVP and sour service pipelines, the consequence assessment shall consider the potential effects of fire and the potential effects of drifting hazardous gas mixtures beyond the area of potential impact prior to ignition;
- c) Identification of long term mitigative measures that the company identifies as necessary to achieve an acceptable risk level:
 - i. The company shall document the evidence supporting the effectiveness of the mitigation methods and measures considered and proposed, and provide this with the EA.

E.3 Long Term and Interim Corrective and Mitigative Measures

Filing Requirements

1. The company shall provide a description of long term corrective or mitigative actions and an implementation plan with timeline for completion, where applicable, to address the identified potential concerns. Long term corrective or mitigative measures shall be implemented as soon as practicable.²
2. The company shall provide a description of interim corrective or mitigative measures taken until the non-compliance to CSA Z662 can be corrected, or long term mitigative measures are implemented. Interim corrective or mitigative measures shall be implemented as soon as practicable. Furthermore, the company shall include:
 - a) Explanations as to why each interim measure was determined to be appropriate to ensure continued safe operation until the completion of the long term corrective and mitigative measures;
 - b) Confirmation that each recommended interim measure was implemented, and will stay in place until the completion of the identified long term corrective or mitigative measures:
 - i. If a recommended interim measure has not been implemented, the company shall provide a plan for implementation;
 - c) An assessment that demonstrates that the pipeline sections can be operated safely without any additional interim measures until the completion of the identified long term corrective or mitigative measures, if no interim measures are recommended.

² Practicable means that something can and will be done even if it may not be practical (OPR Guidance Notes)

Corrective or mitigative measures may include:

- a) Modifications to the pipeline system, which may include consideration of pipeline replacement;
- b) Reduction of the operating pressure to that specified for the changed class location:
 - i. The company shall reduce the operating pressure as a corrective or mitigative measure as soon as practicable following its decision, with an explanation as to what was considered in assessing the timing of the practicability of implementation;
 - ii. The company shall file for an adjusted licensed Maximum Operating Pressure (MOP) within a reasonable timeframe when a reduction of operating pressure is applied as a long term corrective/ mitigative action as per the proposed plan pursuant to OPR s.42;
- c) Increased public communications on the location of the pipeline;
- d) Installation of structures or materials (e.g. concrete slabs, steel plates) for mechanical damage protection or for protection against other external loads;
- e) Increased integrity assessments (e.g. ILI inspections), and repairs;
- f) Restricted access to the pipeline right-of-way; and
- g) Increased signage and right of way patrols frequency.