PURPOSE

As required by Company internal *QA – Construction-Commissioning Quality Requirements (Cdn-US-Mex)* (Item ID: 1014063455), this Specification defines the minimum requirements for the development, review and implementation of inspection test plans (ITP) for fabrication and construction of pipelines and facilities, for all projects regardless of contracting strategy, completed in accordance with Company standards and drawings. ITP's are key components of quality management of a construction project and are used to collect meaningful data on failures and use these as a means of monitoring quality with a focus towards improvement. Effective ITP's should result in improved quality that directly impact asset integrity and the Company's ability to put the asset in-service.

SCOPE/APPLICABILITY

This Specification applies to all liquids and gas business units in Canada, the United States (U.S.) and Mexico.

This Specification applies to both new construction and replacement, expansion, and refurbishment of existing pipelines and facilities.

This Specification does not apply to maintenance activity occurring on an operational Company facility. Those activities shall be undertaken in accordance with the requirements of relevant TC Energy Operating Procedures (TOPs). It also does not apply to material or equipment vendors.

Within an Engineering Standards Collection (ESC) document, the following terms and definitions apply for requirements:

- "Company" means the TC Energy entity for whom work, services and/or materials are being provided.
- "Shall", "Must" or similar term is used to express a requirement (meaning a provision that the user is obliged to satisfy in order to comply with the ESC document or applicable standard).
- "May" is used to express an option or that which is permissible within the limits of the applicable standard.
- "Should" shall in all instances be interpreted in the same manner as "Shall", unless one of the following requirements has been met:
    - to the extent the Company has expressly waived in writing strict compliance with such standard in such circumstance; or
    - the Contractor has performed a detailed documented analysis provided to the Company in advance of taking action, which analysis justifies, on reasonable grounds, the action taken to a level consistent with the applicable standard.

Wherein governmental or regulatory requirements conflict with this Specification, the more stringent requirement shall govern.

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1 GLOSSARY

Activity

An individual inspection or testing activity listed as a line item on the ITP, to satisfy a specific requirement per the Agreement, Company specification, industry code, or other relevant specification to conduct Quality Control.

Area

Defined locations within a facility or pipeline for which construction activities take place.

Contractor

The party (including all subcontractors) under contract with the Company to perform fabrication and construction activities as specified in Company specifications and Agreements.

Definable Feature of Work (DFOW)

A task which is separate and distinct from other tasks and has separate control requirements. As a minimum, each unique specification could be considered as a DFOW. However, there may be more than one definable feature under a specification. A DFOW could also be defined as an activity in the project schedule that results in a physical product. The list shall be cross-referenced to the construction schedule and specification sections.

Evaluation

The process of examining and passing a judgment on the appropriateness or level of quality of workmanship or final product.

Examination

Inspection, investigation, or testing of materials, products, or services to determine their conformance to requirements.

Hold Point (H)

A point in the work process where further processing or operations shall not continue until approval or acceptance has been received from the Company.

Inspection (I)

Determination, according to requirements, that a product or service is able to be used for the specific intended use or application.

Inspection Test Plan (ITP)

A document that list the activities to be performed to control quality on a project. ITP's provide a means of formalizing the examination, evaluation, monitoring, testing and measuring activities at different stages to verify that products or services are being produced in conformance with the specified requirements. The results of these actions will assist in determining if the applicable process(es) are in control.

Quality Assurance (QA)

The part of quality management focused on providing the “confidence” that the quality requirements will be fulfilled (ISO 9001).

Quality Control (QC)

Focuses on activities confirming, via collecting measurable evidence, that quality requirements (e.g., procedures, regulations, codes) have been met.

Record

A record is a physical document verifying qualitative, quantitative and binary information. Records can fall under the category of Quality Control Records, Quality Assurance Records or Inspection Records.

Review (R)

The act of reviewing documentation associated with operations by the representative (company, contractor, subcontractor, etc.) specified in the ITP.

Representative

An authorized representative of the Company or the Contractor during fabrication and/or construction phases.

Stakeholder

Person or organization that can affect, be affected by, or perceive itself to be affected by a decision or activity (ISO 9001).

Surveillance (S)

Periodic review and/or monitoring of the process to ensure conformance to the control procedure, contract, standard, or specification.

System

A defined group of mechanical and/or electrical and interconnecting piping, cabling, instruments, and devices.

Test (T)

An examination, evaluation or observation procedure intended to establish conformity, performance, or reliability of the work or product.

Witness Point (W)

An identified point in the work process where the Representative may observe activities being performed.

2 ITP DEVELOPMENT

2.1 General Requirements

2.1.1 The Contractor shall complete and submit the ITP for review and acceptance by TC Energy (the Company) a minimum of 14 days prior to commencing any construction or fabrication activity, or as directed in the Agreement between the Contractor and Company.

2.1.2 The Contractor shall include, at a minimum, all quality inspections and tests in accordance with all applicable federal, provincial, state and territorial regulations, industry codes, Company specifications, standards, and project specific requirements as defined in the Agreements.

2.1.3 The Contractor shall include, at a minimum, all elements defined in Table 2-1.

2.1.4 The Contractor shall develop ITP's as separate documents for each definable feature of work. Depending on the pipeline and facilities project requirements, the number of ITP's may alternatively be defined in the project Agreements (e.g., Clearing ITP and Mulching ITP, or Clearing and Mulching ITP). The Contractor shall identify the definable features of work for each system or area. The numbers and the work items of the ITP's shall be reviewed and accepted by the Company.

2.1.5 The Contractor may reference the Company *Inspection Test Plan Template* (Item ID: 014266747) to develop their ITP's.

2.2 ITP Minimum Content

Table 2-1: ITP Minimum Content

1	Reference to the contract number of the Agreement
2	Contractor and Company name
3	Name of the Project for which the ITP applies.
4	The specific system or area of the facility or pipeline which construction activities take place.
5	Identification of the definable feature of work.
6	Project document control number, revision number and revision date.
7	Reference to all applicable standards, codes, specifications, regulations, and Agreements. Identification of inspection standards, processes, procedures and acceptance criteria for each inspection and test activity.
8	Identification of all critical inspection and test activities necessary to verify conformance. The Company will work with Contractor to ensure all required test activities are properly identified and are included in ITP (i.e. reviewed and accepted by TC).
9	Identification of all hold (H), inspect (I), test (T), witness (W), review (R), and surveillance (S) points.

10	Frequency of the inspection to identify the intervals or stages for which activities are to be inspected.
11	Notification period, as required, prior to activity commencement (e.g., hydrotest, welding).
12	Identification of applicable forms and records (e.g., QCR, QAR) that will be used in the specific activity of the ITP to document inspection has been completed and the results.
13	Identification of stakeholders responsible for an activity (e.g., Company inspection, Contractor inspection, third party verification organization).
14	Date of ITP sign-off by representatives from Company and Contractor
15	Areas for sign-off, for activity acceptance and final acceptance

2.3 Filling out Sample ITP

2.3.1 Title Section

Document No.:	← 1	**Inspection & Test Plan (ITP)**	Company:	← 5
Project No.:	← 2		Project Name:	← 6
Rev. Date:	← 3		System/Area:	← 7
Rev. No.:	← 4		Contract No.:	← 8

1. Document No. – assigned by the project document control numbering system.
2. Project No. – number assigned by the project for traceability.
3. Rev. Date – identifies amendments to the ITP. Use a consistent date and format where the day, month and year cannot be confused.
4. Rev. No. – used to manage changes between versions of the ITP.
5. Company – name of the company the work is being completed for (e.g., the company retaining a contractor).
6. Project Name – official name for activities and business development to which any portion of the Work applies.
7. System/Area – Defined areas within a facility or pipeline for which construction activities take place (e.g., station boundaries, KP 0+000 to KP 10+000, mainline block valve). System is a defined group of mechanical and/or electrical and interconnecting piping, cabling, instruments, and devices (e.g., fuel gas)
8. Contract No. – Project contract number of the Agreement

2.3.2 Activity Section

Activity No.	Description of QA/QC Inspection and Test Activity	Reference Document (Code/ Standard/ Specification)	Inspection/Test Procedure	Acceptance Criteria	Responsible Party

1. Activity No. – unique number assigned to each activity used for reference within the ITP.
2. Description of QA and QC Inspection and Test Activity – description of the inspection/testing activity that requires completion.
3. Reference Documents (Code/Standard/Specification) – The Code, Standard or Specification that requires inspection to validate the feature of work was completed as specified.
4. Inspection/Test Procedure – procedure to be implemented for inspection and testing. This can be a reference to a document or the testing procedure can be written out.
5. Acceptance Criteria – criteria based on a specification or standard that a system or component must satisfy to be accepted. The criteria shall reference a specific clause or requirement stated in the respective reference document.
6. Responsible Party – Organization responsible for performing the activity.

Verifying Document	Stage/ Frequency	Contractor Inspection Verification Point (H/I/T/W/R/S)			Company Inspection Verification Point (H/I/T/W/R/S)			Comments
		Type	Initial	Date	Type	Initial	Date	

7. Verifying Document – reference the quality control records (QCR) or quality assurance record (QAR) that document the test results.
8. Stage/Frequency – identify the timing requirements of the testing here. This can be the actual number or a reference to a specification or code.
9. Contractor Inspection Verification Point (H/I/T/W/R/S) – type of inspection required by the Contractor. The types are hold, inspect, test, witness, review, or surveillance. These levels are described in the terms section of the ITP. Contractor inspectors shall initial and date when the inspection activity is completed and/or quality control records are reviewed and accepted. For example, for concrete foundations, the ITP shall be initialed and dated as activities are progressively completed. For mainline activities like ditching, the ITP will be initialed and dated accepting the area when quality records have been completed and satisfies requirements.

10. Company Inspection Verification Point (H/I/T/W/R/S) – type of inspection required by the Company. The types are hold, review, witness or surveillance. These levels are described in the terms section of the ITP. Company inspectors shall initial and date when the inspection activity is completed. For example, for concrete foundations, the ITP will be initialed and dated as activities are progressively completed. For mainline activities like ditching, the ITP will be initialed and dated accepting the area when quality records have been reviewed and accepted.
11. Comments – this section allows the Contractor or the Company to add any additional comments which may provide clarity to the inspection activity. It may also be used for comment at the time of ITP sign-off to indicate or note deficiencies/punch list items.

2.3.3 Reference Section

Documents Referenced		
Number	Title	Revision

1. Documents Referenced – documents referenced for an activity are listed in this section. Write out the full title and the revision identified.
2. Number – document number that are listed on the ITP in the Reference Document section or Inspection/Test Procedure section.
3. Title – full title of the referenced document (e.g., CSA Z662 *Oil and Gas Pipeline Systems* vs CSA Z662).
4. Revision – latest version of the referenced document or the revision year.

2.3.4 Terms Section

Terms
H – HOLD POINT: Further processing or operations for specified hold point shall not continue until approval has been received. The contractor shall notify, in writing (email), the Company's representative in advance of the start of the activity as stated in the Agreement;
I – INSPECT: Activity completed to ensure the work is performed in accordance with the test procedure and meets acceptance criteria.
T – TEST: Activity to examine and evaluate the performance of the work, or reliability of the product.
W – WITNESS: A representative shall always be present during the testing process. May only be waived in writing. Contractor shall notify, in writing (email), the Company's representative in advance of the start of the activity as stated in the Agreement.
R – REVIEW: Documentation associated with operation will be periodically reviewed.
S – SURVEILLANCE: Periodic surveillance and/or monitoring of the process to ensure compliance to the control procedure, standard, or specification.

1. Terms – this section contains the definitions of the levels of inspection.

2.3.5 Approval of ITP Section

Approval of Inspection & Test Plan			
Contractor		Company Representative	
Print:		Print:	
Signature:	Date:	Signature:	Date:

1. Approval of Inspection & Test Plan – this is the approval section for both the Contractor and the Company representative to accept the ITP.

2.3.6 Final Acceptance Section

Final Acceptance			
All inspection activities associated with this Inspection and Test Plan have been completed and all associate records have been reviewed and are hereby accepted from Contractor.			
Contractor		Company Representative	
Print:		Print:	
Signature:	Date:	Signature:	Date:

1. Final Acceptance – provides confirmation of acceptance by the Company that all inspection activities associated with the ITP have been completed and all associated records have been reviewed and are accepted from the Contractor.
2. Statement – statement below the Final Acceptance field signifies that stakeholders have all read, understood and verified the contents of the turnover deliverables.
3. Contactor and Company representative shall have reviewed and signed off on all the line items of the ITP, signifying acceptance of respective activities, before the final acceptance of the ITP. If there are unresolved items associated with this ITP, such as a Non-Conformance Report (NCR), a plan shall be developed between Contractor and Company to close out the remaining items before final acceptance of the ITP.

3 DEFINABLE FEATURES OF WORK REQUIRING ITP AND HOLD POINTS

3.1 DFOW Requiring ITP

Inspection Test Plans shall be developed and implemented for the pipeline and facilities construction and fabrication work tasks listed in *Inspection Test Plan Master Index* (Item ID: 014266746), which is not all inclusive.

3.2 Mandatory Hold Points

Hold points are inspection or test points where work cannot proceed without Company Representative and/or Contractor Representatives verifying mandatory submittals have been accepted, or the work is completed and meets minimum requirements per codes, specifications, procedures, and agreements. They are defined by mutual agreement between Company and Contractor. Respective

disciplines from the Company and the Project Quality Representatives shall agree and align on the hold points, the acceptance criteria applied, and the sign off process. A hold point is necessary because it involves a critical activity, which has an impact on compliance with regulation requirement, the integrity of the asset, or has a higher risk of safety prevention. Examples of hold points include, but not limited to, ITP acceptance, material acceptance, certifications or qualifications of personnel, construction plans, test acceptance, final signoff of ITP.

4 ITP EVALUATION & ACCEPTANCE PROCESS

4.1 Evaluation Criteria

- All activities described in the ITP must include an associated inspection level (e.g., H, I, T, W, R, S) and use the definitions provided in this Specification.
- The Contractor shall issue verifying documents for review and acceptance by the Company.
- Company and Contractor inspection representatives shall accept the work items as compliant and complete by initialing and dating activities as they are progressively completed, or quality records are complete, reviewed and accepted.

4.2 Final Sign-Off & Acceptance of Completed ITP

- The final sign-off provides confirmation of acceptance by the Company that all inspection activities associated within the ITP have been completed, and all associated records have been reviewed and are Company accepted.
- If there are any non-conformances recorded, they shall be addressed and closed out before the final sign-off & acceptance of the completed ITP.

5 VARIANCES

Any deviation shall follow the Company *Controlled Document Library Variance Procedure (CDN-US-MEX)* (Item ID: 007728702). Contractors shall contact the Company for variance approval.

6 ROLES AND RESPONSIBILITIES

Table 6-1 outlines the roles and responsibilities required for the use of this Specification.

Table 6-1: Roles and Responsibilities

Role	Responsibilities
Company Project Manager (PM)	• Verifies ITP's have been reviewed and accepted by Company SMEs prior to work commencing. • Verifies all ITP's have received final sign off by the Contractor and designated Company Representative.

Role	Responsibilities
Company Construction Manager (CM), Assistant Construction Manager (ACM)	• If designated by the Company, reviews and accepts the ITP • Monitors that ITP's are being implemented as written. • Report and document any quality observation and non-conformance. • If designated by the Company, complete final sign off and acceptance of ITP upon completion of final work.
Company Inspector	• Carry out activities as required by the Company • Verifies that ITP's are being implemented as accepted • Report and document any quality observation and non-conformance.
Contractor	• Develop ITP's for review and acceptance by the Company based on scope of work and agreement documents. • Ensure completion of inspection, testing and documentation per the terms decided on the ITP • Submit documentation as required in the ITP for acceptance by Company. • Report and document any quality observations and non-conformances to the Company representative. • Final sign off and acceptance of ITP after work is completed
Quality Advisor, Quality Manager	• Provides a detailed review and comments for all submitted ITP's to ensure all critical project requirements have been included. • Receive and process quality observations from Company CM, ACM, and inspector. • Initiate, process and close-out any NCRs identified during the execution of the ITP by working closely with the Company Inspectors, CM, and Contractor. • Work together with Project Team to accept documentation per ITP, and final sign off of the ITP
Subject Matter Expert (SME)	• Work together with Company project team to review for content, referenced acceptance criteria, work activity inspection levels and frequency of inspection. • Provide support on resolving any NCRs identified during the execution of the ITP.

7 REFERENCES

This document relies on several references to regulation, industry codes and standards, general industry guidance as well as internal references. These documents are listed in Table 7-1, Table 7-2 and Table 7-3. Use the latest document revision, unless otherwise approved by the Company.

Table 7-1: Regulatory References

Organization/Document No.	Title
For this Specification, there are no specific regulatory references.	

Table 7-2: External Industry References

Organization/Document No.	Title
CSA Group (CSA)	CSA Z662 *Oil and Gas Pipeline Systems*
International Organization for Standardization (ISO)	ISO 9001*Quality Management Systems – Requirements*

Table 7-3: Internal References

Document No.	Title
Item ID: 007728702	*Controlled Document Library Variance Procedure (CDN-US-MEX)*
Item ID: 014266746	*Inspection Test Plan Master Index*
Item ID: 014266747	*Inspection Test Plan Template*
Item ID: 1014063455	*QA – Construction-Commissioning Quality Requirements (Cdn-US-Mex)*

8 DOCUMENTATION AND RECORDKEEPING

The required documents as listed as part of bid package or the Vendor Technical Document Requirements List (VDRL), are reviewed and accepted by Company Representatives.

In addition, all required documentation (e.g., QCR) per the ITP shall be reviewed and accepted by Company representatives, this includes, but not limited to, inspection forms, plans, test records, certification package.

9 DOCUMENT HISTORY

Rev.		
00	**Description**	**Effective Date**
	New document.	2020-Oct-01
	Rationale Statement	**Responsible Engineer**
	This document was developed in order to address the following requirements: • consistency in key terminology for inspection test plans • consistency in the development and review of inspection test plans	Colin Stone
	Impact Assessment Summary	**Document Owner**
	The intent of this document is to provide a standardized approach for the development, implementation and use of ITP's for fabrication and construction purposes. This document is intended to create a simple methodology that can be followed by all stakeholders, while ensuring the process does not become too onerous.	Construction and Commissioning Excellence

10 DESCRIPTION OF CHANGE

Section	Description of Change
Regulatory	
N/A	N/A
Industry Standards	
N/A	N/A
General	
N/A	This Specification is a new document.

11 APPROVALS

APPROVALS	
Document Contact	Colin Stone Facilities Construction Engineer Construction & Commissioning Excellence
Document Owner Manager	Michelle Caren Manager Construction & Commissioning Excellence
Discipline Checker	Andrew Sorensen, Senior Quality Engineer Quality Assurance
Responsible Engineer	Colin Stone P. Eng. Facilities Construction Engineer Construction & Commissioning Excellence PROFESSIONAL ENGINEER ALBERTA COLIN J. STONE September 30, 2020 Signature/Date
Responsible Member Validation	Sukhi Gill, P. Eng. Pipeline Construction Engineer TC Energy APEGA PERMIT TO PRACTICE P7100 MEMBER 170972 Corporate Authorization & Date 10/1/2020