

## TC Energy Liquids Pipelines

# Restart Plan for STLCB MP14

December 21, 2022

### **Scope**

The intent of this document is to address TC Energy's current and proposed response to the Steele City MP14 incident as it pertains to returning the line to service, including:

- Review of the event, with reference to supporting documentation
- Outline the operating plan as well as the mitigation measures associated with the re-start of the Keystone Pipeline System.

### **Event Description**

On December 07, 2022, TC Energy experienced an in-service failure on the 36" Keystone Pipeline south of the Steele City Pump Station at MP 14 in Washington County, KS. There was no ignition, no fatalities and no injuries reported as a result of the failure.

The oil release was discovered approximately 14 miles south of the Steele City Pump Station, on the Keystone right of way. Upon receipt of leak indication alarming within the Liquids Pipelines Control Center (LPCC), TC Oil Pipeline Operations, Inc. (TC Energy) shut down the entire pipeline between Hardisty, Alberta and Cushing, Oklahoma. The segment of pipe between the Steele City Pump Station and the first downstream mainline valve STLCB-01A has been isolated by closing the valves at those locations (the "Isolated Segment").

### **Repairs and Inspections**

TC Energy has developed a repair plan for the permanent repair of the pipeline. This repair plan was previously submitted to representatives of PHMSA Central Region and AID for review and comment. The preliminary determination of the release feature will be determined by on site TC Energy engineers and in consultation with PHMSA AID. The restart of the pipeline will not commence until authorized to by the Director of the Central Region of the Pipeline and Hazardous Materials Safety Administration.

### **Interim Operating Plan**

#### **Line Pressure Control**

The "Affected Segment" has been identified as the 36" Keystone Pipeline segment from Steele City Pump Station to Hope Pump Station. Based upon current preliminary assessment, TC Energy will adjust line pressure control settings to impose a 20% reduction from the actual operating pressure the affected segment was at during the time of the accident. This will result in a reduction from the maximum pressure realized of 7952 kPa (1153 psi) to a new temporary MOP of 6362 kPa (923 psi). Details on how the pressure restriction is managed by the control systems and control room can be found in the referenced document 'Pressure Restriction Management for MP14 Derate'.

A review has been conducted of inline inspection data (features or anomalies) of the Affected Segment and no features exist that would impact the safe operation of the pipeline.

All setpoint changes will be implemented through TC Energy standard engineering processes and the associated management of change process.

### **Affected Segment Conditions Review**

A review of the Affected Segment for conditions similar to those of the failure was conducted of construction, operating and maintenance and integrity management records, ILI results, hydrostatic tests, root cause failure analysis of prior failures, aerial and ground patrols, corrosion, cathodic protection, excavations, and pipe replacements.

### **Introduction**

The failure site is located approximately 14 miles downstream of the Steele City Pump Station at a crossing of Mill Creek. The failure occurred on a section of piping on the south side of the creek where there is a combination of bends and piping to traverse the creek crossing.

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### **Construction**

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#### **Operating & Maintenance**

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#### **ILI Results**

A review of in-line inspection results within the affected segment indicated that there are no significant cracking features, no significant metal loss features, no significant girth weld anomaly features, and no significant dent features reported within the affected segment, nor associated with the failure feature.

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#### **Hydrostatic Tests**

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#### **RCFA of Prior Failures**

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#### **Aerial and Ground Patrols**

Aerial patrol is conducted 26 times per year, with no unauthorized activities having been recorded based upon either aerial or ground patrol records in proximity of the failure location, and accordingly aerial and ground patrol reports are not considered applicable to this assessment at this time.

#### **Corrosion and Cathodic Protection (CP)**

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#### **Geotechnical**

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### **Excavations and Pipe Replacements**

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### **Conclusion**

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### **Mitigation Measures**

#### Pre-startup

1. Active alarms exist as a result of the emergency shutdown process from the STLCB MP14 accident. All active alarms will be addressed once the system is cleared for restart. Resources have been scheduled and will be deployed to address all active alarms prior to startup.
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3. All LPCC changes follow TC Energy's Technical and Physical Management of Change Procedure & SAP E3 Notification process, and a NOC (Notification of Change) was sent to the KS qualified mainline controllers.
4. Leak Detection Engineering will calculate the loss of containment volume estimate and provide an updated slack volume calculation to the LPCC immediately prior to system startup.

5. Procedures and SCADA displays were updated to reflect the changes.
  - There will be a pre-approved variance to the Start-up Procedure that the LPCC is developing. This is to allow start-up into a blocked flow path and highlight any unique operations to the controllers performing the start-up. Example, monitoring slack conditions with support from Leak Detection Engineering and having field techs at critical locations prior to starting the pipeline.
  - (b) (7)(F) [REDACTED]
6. All LPCC changes follow TC Energy's Technical and Physical Management of Change Procedure & SAP E3 Notification process.
7. As part of Keystone's standard startup procedures denoted below, the Affected Segment will be confirmed to have full telemetry and functionality prior to startup.
8. Field personnel will be deployed along the affected segment prior to startup. Additionally, the Incident Command System for STLCB MP14 will be active during startup to respond to any emergency related to system operations, should it arise during startup.

### Startup

The restart of the pipeline and return to normal operations will be in accordance with TC Energy's operations, maintenance, management of change and emergency procedures, with specific attention to control room management, alarm management, computational leak detection and abnormal operations requirements.

1. The introduction of oil to reconstitute the Keystone Pipeline and pressurization of the affected segment will start during daylight hours.
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[REDACTED] TC Redaction [REDACTED]
3. Once aerial patrol and visual leak inspections along the affected segment have been cleared at minimum flows, the pressure can be increased by TC Redaction increments up to TC Redaction. Each pressure will be held for a minimum of 2 hours to confirm the system is performing as expected. After this point the system can be operated up to the maximum allowable discharge pressures determined by the Process Engineering Group. Flow rates are not to exceed a steady state of TC Redaction.
4. Aerial patrolling of the affected segment will be performed daily during the initial restart and for the next 72 hours. Additional patrols will be conducted on the Cushing Extension during movement of the v-plugs and the pig that remains in the pipeline. Pig/v-plug management plans are included in the Cushing Extension Startup Plan.
5. TC Energy will monitor the supported pipe daily with visual inspections for the first week following the restart, and then at intervals not to exceed three (3) days until the site is backfilled. In addition to the visual inspections, survey of the exposed girth welds in the vicinity of the elbow fitting will be completed at milestones (i.e., before line fill, after line fill and after restart) and when significant changes occur; however, not to exceed an interval greater than one week until the site is backfilled.
6. A compaction/backfill management plan will be developed and disseminated for PHMSA approval prior to backfill activities.
7. In addition to our standard leak detection remote monitoring console, a senior leak detection specialist will monitor the health of the leak detection system during start up from line pack and column reconstitution to steady state operations. And respond to any issues or questions regarding the model performance.
8. Advanced notice to local emergency response officials and landowners will occur.

9. Field resources will be deployed to critical locations along the Affected Segment for leak checks and confirmation of normal operations. These locations include:
  - a. Steele City Pump Station
  - b. Stopples location upstream of the repair
  - c. MP14 Release Site (Tie-in welds, Stopples, TOR's and exposed piping) at the repair site
  - d. STL CB-02A Mainline Valve Site
10. Critical Locations outside of the Affected Segment where resources will be deployed include:
  - Rock Pump Station

### **Revised Spill Volume Calculation**

A revised loss of containment volume estimate will be calculated and submitted to PHMSA. The calculation will include all oil injected during reflood and restart operations, the pipeline slack volume calculation and the subtraction of all oil removed from the pipe.

### **Restart Procedures**

Keystone Pipeline System will be restarted as per the following procedures:

<b>Procedure / Guideline</b>	<b>Applicability to STL CB MP14 Restart</b>
<b>Liquid Column Separation Procedure.</b> The purpose of this procedure is to describe the steps to be followed by Liquids Pipelines Control Center personnel if (b) (7)(F) (b)(7)(F) (b)(7)(F) in the Keystone Pipeline System (b)(7)(F) TC Redaction	The procedure was developed to be utilized in the event that control room operators recognize new or unplanned for slack volumes.
<b>Pressure Restriction Management for MP14 Derate</b>	Details how the pressure restriction is managed by the control systems and control room
<b>Start-Up Procedure.</b> The purpose of this procedure is to describe the required steps to be followed by Liquids Pipelines Control Center personnel when starting up the Keystone Pipeline System (TC Redaction) (TC Redaction).	<ul style="list-style-type: none"> <li>• This Procedure is applicable to every pipeline startup scenario and provides details on how the control room operators are to restart the pipeline.</li> <li>• The Liquids Pipelines Control Center will create a pre-approved variance to the Start-up Procedure to allow start-up into a blocked flow path and highlight any unique operations to the Controllers performing the start-up</li> </ul>
<b>Cushing Extension Startup Plan and References</b> <ul style="list-style-type: none"> <li>• Appendix Flood: Reflooding Procedure</li> <li>• Appendix PI: Pipe Integrity Tech Memos</li> <li>• Appendix LPC: Temporary Line Pressure Control (LPC) Settings</li> <li>• Appendix LDE: Leak Detection Engineering MOC for Application of TMOPs</li> <li>• Appendix AS: Auto Sectionalizing MOC</li> <li>• Appendix CS: List of Critical Locations</li> <li>• Appendix POC: Variance to Cushing Extension Pump Operating Restriction</li> <li>• Appendix ST: Post Restart Surveillance Tracking for a list of pressure restricted location</li> </ul>	This Plan outlines the startup plan for the Cushing Extension section of the Keystone Pipeline System.

Pressure Restriction Management for MP14 Derate

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