

June 7, 2024

Sent Via Electronic Transmission

Mr. Gregory A. Ochs
Director, Central Region, Office of Pipeline Safety
Pipeline and Hazardous Materials Safety Administration
901 Locust Street, Suite 480
Kansas City, MO 64106

Re: CPF 3-2024-045-NOPV

Dear Mr. Ochs:

From September 18 to September 28, 2023, a representative of the Pipeline and Hazardous Materials Safety Administration (PHMSA), Office of Pipeline Safety (OPS), pursuant to Chapter 601 of 49 United States Code (U.S.C.), performed an on-site inspection of Enbridge Storage (Cushing), LLC's (hereinafter Enbridge Cushing) control room management records and procedures for the Enbridge Storage (Cushing) Control Room, in Cushing, Oklahoma.

As a result of the inspection, it is alleged that Enbridge Cushing has committed probable violations of the Pipeline Safety Regulations, Title 49, Code of Federal Regulations (CFR). The items inspected and the probable violations are:

1. § 195.446 Control room management.

(a) General. This section applies to each operator of a pipeline facility with a controller working in a control room who monitors and controls all or part of a pipeline facility through a SCADA system. Each operator must have and follow written control room management procedures that implement the requirements of this section. . . .

(c) Provide adequate information. Each operator must provide its controllers with the information, tools, processes and procedures necessary for the controllers to carry out the roles and responsibilities the operator has defined by performing each of the following:

(3) Test and verify an internal communication plan to provide adequate means for manual operation of the pipeline safely, at least once each calendar year, but at intervals not to exceed 15 months.

Enbridge Cushing failed to test and verify its internal communication plan in calendar year 2021 to provide adequate means for operation of the pipeline safely, at least once each calendar year, but at intervals not to exceed 15 months. Additionally, while the internal communication

plan was tested in calendar year 2020, it was not adequate to demonstrate compliance. In calendar year 2021, the plan was reviewed and greatly amended. The 2021 review and amendment included the procedure for the internal communication plan and testing the plan, but the test was not executed until November 15, 2022. Thus, Enbridge Cushing failed to test its internal communication plan in calendar year 2021.

After the inspection, Enbridge Cushing provided a test of its internal communication plan dated December 5, 2023. While the process and test were improved, more work is required to demonstrate compliance. The test primarily covered work inside the terminals related to different manifolds; the test did not cover the broader scope of pipeline operations. For example, the test did not include methods for leak detection or key monitoring points on pipeline segments. Therefore, Enbridge Cushing failed to test and verify an internal communication plan to provide adequate means for manual operation of the pipeline safely, at least once each calendar year, but at intervals not to exceed 15 months, as required by § 195.446(c)(3).

Enbridge Response:

The Cushing CCO executed and tested the Communications Failure – Terminal procedure 10/21/2021. Please see the attached 2021 Communication Failure test as evidence. The manual operations and communications testing was executed similarly to the test completed in 2020.

The Manual Operation Tabletop process, which further outlines testing activity and documentation expectations was published 09/23/2022. The Manual Operations Tabletop process was created as an ongoing improvement effort in response to the PHMSA finding of the Edmonton CCO audit in 2020. Please see the attached CCO Manual Operations Tabletop Process as evidence. The test executed by the Cushing CCO on 11/15/2022 followed guidance in this process. Please see the attached Activity Tracker 96, Activity Track 98/99, and CCC Manual Shutdown Findings 2022 as evidence.

The Cushing CCO's procedural guidance directs operators to shut down the system and bring the system to a safe state in the event of a communication failure that would result in the loss of SCADA monitoring capability. The manual monitoring of the shutdown system is what has been tested during the execution of our Internal Communications Testing of the Cushing assets. Manual facility monitoring procedures are in place that provide coordination with field operations to observe and report tank levels, sump levels, key terminal segments pressure transmitters, any visually observed abnormal or emergency operating condition and report this information back to the control center operators to effectively monitor the assets within the control of the Cushing CCO until the communications failure or SCADA issue can be resolved.

The Cushing control center operators do not operate pipeline segments outside of the terminal perimeter, except for the laterals connecting Grandstaff manifolds. Pipelines that land into or are injected out of the Cushing terminal assets are monitored by third party or Edmonton CCO control center operations. The Grandstaff terminal laterals connect the Northern manifolds to

the Southern manifolds and the leak detection methods utilized on these segments consist of field operations visual monitoring, SCADA setpoint monitoring (pressures, tank levels, temperatures, meter flow rates, etc.), and meter to tank or tank to tank balancing in our electronic movement tracking system, CMT. The Grandstaff laterals utilize the same leak detection methodologies used across the Cushing terminal assets and are not unique to the Grandstaff system.

It is Enbridge's position that the manual operations exercise completed 12/05/2023 effectively tested and captured asset monitoring and communications of the Cushing control center operations and field operations of the facility assets that are within the Cushing CCO's operational control and monitoring responsibility during manual operations testing scenarios. Please see the 2023 Manual Operation Communication Failure Tabletop Summary as evidence.

2. § 195.446 Control room management.

(a) General. This section applies to each operator of a pipeline facility with a controller working in a control room who monitors and controls all or part of a pipeline facility through a SCADA system. Each operator must have and follow written control room management procedures that implement the requirements of this section. . . .

(b)

(c) Provide adequate information. Each operator must provide its controllers with the information, tools, processes and procedures necessary for the controllers to carry out the roles and responsibilities the operator has defined by performing each of the following:

(1)

(2) Conduct a point-to-point verification between SCADA displays and related field equipment when field equipment is added or moved and when other changes that affect pipeline safety are made to field equipment of SCADA displays.

Enbridge Cushing failed to follow its procedure, CRM Plan section 4.3.2, to complete a point-to-point verification when it acquired the SCADA system from former operator BKEP Crude, LLC, OPID 32418 (Blue Knight), when the SCADA system was relocated to include creating an Operational Technology (OT) network for its Grandstaff assets, which were connected to the Blue Knight OT network, as required by § 195.446 (c)(2). Specifically, when Enbridge Cushing acquired Blue Knight, on March 1, 2021, Enbridge Cushing moved the relevant console from

Blue Knight's backup center to Enbridge Cushing's primary console center. Enbridge Cushing maintained the server at the original Blue Knight facility and designated this as the backup control room. Enbridge Cushing hired the Blue Knight controllers to work the console and verified the relocated and modified console against points in the backup SCADA system that

had not been relocated or modified. But Enbridge Cushing did not conduct any point-to-point verifications between SCADA and end devices following acquisition, which was required by § 195.446 (c)(2) and Enbridge Cushing's CRM Plan section 4.3.2. PHMSA's review of Enbridge Cushing's network mapping of the two SCADA systems identified that the systems were isolated from each other and that the Blue Knight system could not be accessed by any consoles except the designated console. Thus, to facilitate the relocation, a new OT network, including communications equipment and configurations, had to be installed and implemented. At a minimum, there should have been some level of additional testing to ensure alarms were being routed to the appropriate server and recording properly on the event log, per § 195.446(e)(1). However, Enbridge Cushing did not conduct this verification.

Enbridge Cushing's CRM Plan section 4.3.2, "Point-to-Point Verification," stated, "[p]oint-to-point verification is the process used to verify the physical location of devices, data values, status, and any alarm settings including alarm description and alarm set points." It also stated, "[p]oint-to-Point verification will be required whenever: (1) Safety related field equipment is added, changed, or moved (2) Change that affects pipeline safety is made to the SCADA display (3) Safety related SCADA component is changed." SCADA modification through installation of a new OT network and communication systems can affect how alarms are received at a console. Since many alarms were considered affecting safety, including loss of communications, the new OT network and communication system were considered a safety related SCADA component. Thus, Enbridge Cushing was required by section 4.3.2 to conduct point-to-point verification.

Additionally, Enbridge Cushing failed to conduct an audit of its SCADA system to verify API RP 1165 had been implemented, particularly section 5.3 "Display Response," as required by § 195.446(c)(1). This would have included a verification of call up time between the old and new configuration to ensure there was no degradation with the relocated consoles. Therefore, Enbridge Cushing failed to complete a point-to-point verification as required by § 195.446(c)(2) and its CRM Plan section 4.3.2.

Enbridge Response:

Upon reviewing the findings, Enbridge is taking the following corrective actions to address the point-to-point of the Grandstaff asset:

Complete Point-to-Point of the Grandstaff asset: Since the acquisition, we have generated preventative maintenance work orders, adhering to the testing intervals as defined in the operations and maintenance manuals, and have completed them as scheduled. Completion of the checks has validated functionality from field equipment to the Cushing Control Center Operator through the ICONICS SCADA system. To facilitate the point-to-point completion of the Grandstaff asset, we will incorporate additional point-to-point checks of the relevant equipment. In addition, the migration of Grandstaff assets from the ICONICS

SCADA system to the OASyS SCADA system is underway. By the first quarter of 2025, we will start the point-to-point verification of all CRM safety-related points as part of this migration process. Following Enbridge's established SCADA replacement and point-to-point processes and procedures, we will ensure the ICONICS and OASyS SCADA systems are accurately verified. This strategy aims to complete the point-to-point verification by, or before, the first quarter of 2025.

Documentation and Reporting: We will document all actions taken and verifications conducted during the execution of the point-to-point process of the Grandstaff assets.

Future Safeguards: We are establishing new protocols to prevent such oversights in the future, including a rigorous checklist for acquisitions and system integrations that align with Enbridge's procedures and regulatory requirements.

Enbridge has recognized that the API 1165 review of the ICONICS system was not completed at the time of its acquisition. However, a comprehensive review of the SCADA displays, including call-up times, was conducted in December 2022. Please note all nine issues found during the API 1165 review have been addressed. For verification, please refer to the attached documents: "Annual Review Summary - ICONICS System – 2022" and "Window Call-up Times – ICONICS 2022."

3. § 195.446 Control room management.

(a) General. This section applies to each operator of a pipeline facility with a controller working in a control room who monitors and controls all or part of a pipeline facility through a SCADA system. Each operator must have and follow written control room management procedures that implement the requirements of this section. . . .

(b)

(c) Alarm management. Each operator using a SCADA system must have a written alarm management plan to provide for effective controller response to alarms. An operator's plan must include provisions to:

(1)

(2) Identify at least once each calendar month points affecting safety that have been taken off scan in the SCADA host, have had alarms inhibited, generated false alarms, or that have had forced or manual values for periods of time exceeding that required for associated maintenance or operating activities;

Enbridge Cushing failed to have a written alarm management plan to provide for effective controller response to alarms. Specifically, Enbridge's procedure entitled "The Monthly Procedure Review Version 10.0," dated July 31, 2023, (Monthly Procedure Review), required Enbridge Cushing to count safety related disabled alarms and/or points each month. During the

inspection, Enbridge Cushing stated that it used the term “disabled” to cover off-scan, inhibit, forced and manual, but it could not demonstrate that this definition was the procedure’s intended interpretation. The Monthly Procedure Review did not contain a definition for “disabled,” nor was “disabled” referred to in the SCADA system in a manner that would justify this interpretation. SCADA systems normally have and record events related to off-scan, inhibit, forced or manual, even though those terms may vary depending upon the SCADA vendor.

Moreover, the plan failed to have sufficient provisions to facilitate the monthly review required by § 195.446(e)(2). Enbridge Cushing failed to conduct an adequate monthly review required by § 195.446(e)(2). Records of Enbridge Cushing’s Monthly Alarm Reviews for September 2020, June 2021, and June 2022 demonstrated that only disabled alarms were identified with no further information related to identifications of alarms taken off-scan or forced/manual.

In addition to these issues, Enbridge Cushing failed to include the Ionics (Console 96) alarm review in its monthly review for the months of March, April, and May 2022. All consoles must be included in the monthly review. Therefore, Enbridge Cushing failed to conduct an adequate monthly review as required by § 195.446(e)(2).

Enbridge Response:

Enbridge’s Monthly SCADA Alarm Review Procedure contains a Definitions section with the Term and the Applicable SCADA System (applicable to RTAP and ICONICS). This includes terms for Disabled, Forced or Manual Value and Inhibit (the ICONICS system does not use the term Inhibit). The Scope section of the Procedure also references the Disabling of Points Procedures for each SCADA environment to clearly state how that is applied for each SCADA system. Please note that the RTAP and ICONICS Disabling of Points Procedure, Terms and Definitions includes the different terminology as it pertains to the system to align with the Monthly SCADA Alarm Review Procedure.

Please see the attached documents titled, *Monthly SCADA Alarm Review Procedure*, *ICONICS Disabling of Points Procedure*, and *RTAP Disabling of Points Procedure*.

The historical alarm reporting software experienced a data collation issue during the transition from Blueknight to Enbridge. Monthly alarm reviews were commenced by Enbridge SCADA personnel in June 2022. To document this failure, Enbridge had created a Compliance Deviation.

The next two monthly alarm reviews for June and July 2024 and will be submitted to PHMSA.

4. § 195.446 Control room management.

(a) General. This section applies to each operator of a pipeline facility with a controller working in a control room who monitors and controls all or part of a pipeline facility through a SCADA system. Each operator must have and follow written control room management procedures that implement the requirements of this section. . . .

(b)

(c) Alarm management. Each operator using a SCADA system must have a written alarm management plan to provide for effective controller response to alarms. An operator's plan must include provisions to:

(1)

(5) Monitor the content and volume of general activity being directed to and required of each controller at least once each calendar year, but at intervals not exceeding 15 months, that will assure controllers have sufficient time to analyze and react to incoming alarms; and

Enbridge Cushing failed to complete the workload study for consoles 96, 98, and 99 in calendar year 2022, as required by § 195.446(e)(5). The workload study was not completed because Enbridge Cushing's workload data used for the analysis was not accurately captured in the analysis tool due to data gaps and duplications for consoles 98 and 99. Console 96 had no calculated data due to the workload (iDashboard) tool commissioning being delayed and server connectivity issues with the vendor.

Enbridge Response:

The deviation filed due to inaccuracies in the workload data for 2022 states: Consoles 98/99 have partial data from 01/2022-09/2022. Console 96 has no data due to the idashboard tool commissioning being delayed. Based on the existing data the workload projections are within target workload metrics outlined in the CCO Workload Assessment Plan.

The existing data for Consoles 98/99, which was data from 01/2022-09/2022 was reviewed and was within KPI targets. Console 96 had no workload data generated by the idashboard tool but did have available alarm data reviewed as per the monthly and annual alarm review procedures, as well as review of activity based on barrels moved within the operating asset. Enbridge acknowledges further detail should have been captured in the deviation to outline what data was reviewed in 2022 or a workload study completed with available data.

A workload analysis of the 2022 data for Consoles 96, 97, 98, and 99 were completed December of 2023. The workload analysis confirmed the data reviewed in 2022 and was within target workload metrics.

Enbridge and the Cushing CCO are implementing measures to prevent recurrence of these findings. The following amendments have been made to the CCO Workload Assessment Plan, Section 8.0 Reporting and Tracking to address data capturing issues and acquired assets that may not immediately report to the Power BI workload assessment tool:

8.0 Reporting and Tracking



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The Power BI workload assessment tool for critical tasks will be reviewed on a monthly, quarterly, and annual basis to verify the critical workload on each CCO operating console. Trends will be reviewed on a monthly basis, as per the CCO Control Room Management (CRM) Plan and CCO Safety Leadership Team meeting agenda.

During instances of workload assessment tool failure or SCADA systems which do not report critical tasks to the workload assessment tool, the critical tasks will be manually calculated utilizing the methodology described in this document to accurately assess critical workloads on each CCO operating console. The Power BI workload tool is not considered the workload assessment but a tool for automated compilation of critical tasks.

Should you have any questions or require further information please contact me.

Sincerely,

A handwritten signature in black ink that reads 'Steve Dahnke'.

Steven Dahnke
Acting Manager, US Pipeline Compliance