

February 7, 2022

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 3-2022-015-NOA

Dear Mr. Ochs,

From July 19 to September 17, 2020, representatives of the Pipeline and Hazardous Materials Safety Administration (PHMSA), pursuant to Chapter 601 of 49 United States Code, inspected Enbridge Energy, Limited Partnership's (Enbridge) procedures for Control Room Management (CRM) in Edmonton, Alberta, Canada. On January 7, 2022, PHMSA issued the above-referenced Notice of Amendment (NOA) focusing on discrete sections of Enbridge's CRM procedures. On the same day, PHMSA also issued a Notice of Probable Violation (NOPV) (CPF 3-2022-016-NOPV) regarding the same CRM procedures.

In response to the NOA, Enbridge submits its amendments to the sections of the CRM procedures at issue. Enbridge also offers comments and an explanation, set forth below, regarding each of the sections at issue. Enbridge also submits a separate response to CPF 3-2022-016-NOPV, and cross-references its response to the NOPV herein.

Enbridge believes that its amendments to the CRM procedures address PHMSA's concerns and are compliant with 49 CFR § 195.446. We respectfully request that PHMSA accept Enbridge's amendments to the CRM procedures and close this matter.

To the extent that PHMSA believes that Enbridge's amendments to the CRM procedures are not adequate, Enbridge would like to set up a virtual meeting with PHMSA to address any such concerns, and Enbridge reasonably anticipates that PHMSA and Enbridge will be able to reach a consensus on the amendments to the CRM procedures. In the unlikely event, however, that PHMSA and Enbridge are not able to reach a consensus on the adequacy of Enbridge's amendments to the CRM procedures, and to ensure that Enbridge does not waive its procedural rights, Enbridge requests a hearing.

PHMSA Finding:

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. The procedures required by this section must be integrated, as appropriate, with the operator's written procedures required by § 195.402. An operator must develop the procedures no later than August 1, 2011, and must implement the procedures according to the following schedule. The procedures required by paragraphs (b), (c)(5), (d)(2) and (d)(3), (f) and (g) of this section must be implemented no later than October 1, 2011. The procedures required by paragraphs (c)(1) through (4), (d)(1), (d)(4), and (e) must be implemented no later than August 1, 2012. The training procedures required by paragraph (h) must be implemented no later than August 1, 2012, except that any training required by another paragraph of this section must be implemented no later than the deadline for that paragraph.

Enbridge's Control Room Management Plan (CRM), Version 11.0, Point to Point (P2P) procedure was inadequate to thoroughly verify between SCADA displays and related field equipment when field equipment is added or moved and when other changes affecting pipeline safety are made to field equipment, as required by §195.446(c)(2). The procedure did not adequately address checking alarms to verify the correct set points were established and the point presented, as required when those set points were reached in SCADA or received from the field. Verification of the alarm presentation included alarm priority levels, color presentations, audible alerts, and messaging; however, while in practice these were checked, the procedure did not include this requirement nor require recording it. Also, alarms often present to the controller on different screens, in addition to the main alarm event screen, for all screens and for new points, are required to be documented and verified. There were three checks performed during a P2P that were described in the verbal explanation of the process; these three checks were included in the procedure. The procedure needs to be amended to include instruction for a more thorough P2P verification that also includes thorough documentation of P2P verification checks.

Enbridge Response:

Enbridge's SCADA Point to Point Verification procedure version 10.0 includes more thorough instructions for P2P verification and the documentation of P2P verification checks. Modifications include additional clarity for verification and documentation of set points and alarms. Step 10 of the procedure was added to provide even further accuracy and clarity. As well the P2P checklist was enhanced to capture more evidence.

10. SCADA Analyst verifies each alarm to ensure accuracy: text, priority, colour, asset location, and setpoint (as applicable).

ALARM VERIFICATION				DISPLAY VERIFICATION
Limits	Priority	Symbols	SCADA Alarm Desc	
<Limit with Units or N/A>	<e.g. S6, S8>	<e.g. valve, pump>	<Y or N >	<display name(s) verified from>

- Record values or states for the point. If the point is on a display, visually confirm each display reacts as expected. Point values can easily be recorded by pressing the arrow to record the current value into the value box in the **Value Record Fields (B)**.
 - Capture 4 values (As Found, Low, Mid, High) for analogs.
 - Capture all possible states for enumerations, including "As Found". If more room than the 4 fields provided are required, an additional record can be created.
 - Visually confirm on the displays and Lineout tool that any associated alarm states are accurately displayed.
- If the point is commanded from SCADA to the field, check off the "Commanded" box (C)
- When the point value has been confirmed and the displays validated, click "Pass" on the relevant "Checks OK" flags (D):

Cygnets line out tool Procedure section 6.1.2.1 and 6.1.3 includes checking for alarms, set points and confirming each display is checked. This procedure was put into effect December 15, 2020.

6.1.3 Additional Information

6.1.3.1 Alarms

- Any points whose value evaluates to an alarm state will have their severity token captured, which signifies the alarm state was triggered, and this is included in the Lineout export.

OASyS SCADA Point Verification Tool procedure sections 5.2 and 5.4.7 had additional steps or enhancements added for display verification and alarms.

- **List** of displays used to verify values/alarms for this device. This list should contain the key displays on which this device is contained. In addition to a list of displays, this field can also be used to log general comments during point to point verification. In case a point rename triggers the point to point verification, the old point name should be logged under this field to establish a link between the point to point records.

5.4.7 Statuses/Alarms

- In addition to the regular commissioning panel, Status points have an individual summary display with more information listed that can help facilitate the commissioning,
 - Open with model and select: **SUM_COMMISSIONING_REQ_STATUS**
- For Alarms, verify description, priority, colour, and severity before completing the verification of the point.
 - Add Alarm Summary to the Displays section.

PHMSA Finding:

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. The procedures required by this section must be integrated, as appropriate, with the operator's written procedures required by § 195.402. An operator must develop the procedures no later than August 1, 2011, and must implement the procedures according to the following schedule. The procedures required by paragraphs (b), (c)(5), (d)(2) and (d)(3), (f) and (g) of this section must be implemented no later than October 1, 2011. The procedures required by paragraphs (c)(1) through (4), (d)(1), (d)(4), and (e) must be implemented no later than August 1, 2012. The training procedures required by paragraph (h) must be implemented no later than August 1, 2012, except that any training required by another paragraph of this section must be implemented no later than the deadline for that paragraph.

Enbridge's Control Room Management Plan (CRM), Version 11.0, for manual operation failed to provide requirements for testing the 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).

Procedure 4.3.1 of the CRM Plan stated, in the event of a communications failure, including failure modes related to SCADA equipment other than telecommunications, the affected pipeline systems are shut down manually, with no attempt to continue operations other than to conduct an orderly shutdown.

Enbridge's testing of the internal communication plan consisted of a process called "Qualified Individual Notification Exercise." This spontaneous exercise contacted individuals who would be responsible to respond to a manual system shutdown to verify correct contact information and test the individual's knowledge and capability to take the appropriate actions to affect shut down for a specific facility. It did not include any actual or mock exercise in shutting down or manual operation of the pipeline.

Enbridge stated it would not manually operate the system after an orderly shutdown. However, in the event of total loss of SCADA or major communication failure, the only

way to affect an orderly shutdown is manually. In the procedure titled Communications Failure – Pipeline, the procedure indicated that in the event of a single facility PLC failure or if a segment lost communication Enbridge would continue to operate. In such an event, field personnel would respond and report to the controller on a periodic basis, every 10-30 minutes. Enbridge had not developed plans to test these scenarios. Providing for individual notification was not adequate to test the operational process of manual shutdown, or manual operation of a pipeline segment. The procedure needs to be amended to include testing and verifying the manual operation of the pipeline system.

Enbridge Response:

The manual operation as referred by Enbridge, is limited to manually and safely shutting down the affected asset or pipeline with no attempt to continue operations. Although Enbridge is confident in the safe execution of these procedures, when required, enhancements have been made to the testing of appropriate scenarios.

Enbridge's Control Room Management Plan (CRMP), Version 12.3, Section 4.3.1, Manual Operation has been updated to add clarity about manual operation on Enbridge's Liquid Pipelines system and the testing and verification of procedures which may require field intervention.

On July 6, 2021, the Qualified Individual Notification Exercise (QINE) was enhanced to test and verify the contact information of field personnel, confirm their ability to manually shut down the selected facility, safely perform updates on the facility's status and include any lessons learned from the exercise. This test is performed on a quarterly basis and the selection of field personnel to perform a tabletop discussion is performed to ensure different contacts participate in each test. See attachment titled, Quarterly Qualified Individual Notification Exercise (QINE) procedure.

In 2021, Enbridge's Control Center Operations (CCO) prepared and executed a manual operations tabletop exercise. This exercise took place on November 17, 2021 and included CCO controllers and relevant CCO and field personnel. The purpose was to simulate a manual shutdown to ensure that field personnel can locate pipeline assets and execute a manual shutdown. This process is documented in the above section of the CRMP. Future manual operations tabletop exercises will include CCO controllers, relevant CCO, field and SCADA personnel, and other stakeholders depending on the CCO procedure selected for the simulation. The CCO procedure for each tabletop exercise is selected from the list of abnormal operating procedures listed under References in the CRMP section 4.3.1. The tabletop exercise includes communicating the objective, scope, and expectations from each member involved. Minutes, corrective actions, and continuous improvements are noted and tracked appropriately resulting from the tabletop exercise.

Please see attachments titled, Control Room Management Plan version 12.3, Section 4.3.1 Manual Operation and the Quarterly Qualified Individual Notification Exercise (QINE) Procedure.

PHMSA Finding:

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. The procedures required by this section must be integrated, as appropriate, with the operator's written procedures required by § 195.402. An operator must develop the procedures no later than August 1, 2011, and must implement the procedures according to the following schedule. The procedures required by paragraphs (b), (c)(5), (d)(2) and (d)(3), (f) and (g) of this section must be implemented no later than October 1, 2011. The procedures required by paragraphs (c)(1) through (4), (d)(1), (d)(4), and (e) must be implemented no later than August 1, 2012. The training procedures required by paragraph (h) must be implemented no later than August 1, 2012, except that any training required by another paragraph of this section must be implemented no later than the deadline for that paragraph.

Enbridge's Control Room Management Plan, (CRM) Version 11.0, for Team Training was inadequate because it did not fully establish who, regardless of location, operationally collaborates with control room personnel as required by §195.446(h)(6).

Enbridge focused Team Training on the control room core group (Controller, Sr. Tech Advisor, Shift Supervisor, Leak Analyst and Control Room Administrator). Individuals, such as schedulers, SCADA designers, field personnel, and engineers are others who collaborate with controllers, but were not included in the Team Training and not listed in the procedure.

Also, Enbridge's procedure failed to specifically define how they addressed all operational modes of normal, abnormal, and emergency in the training. It does address abnormal and emergency through a variety of mediums (incident reviews, tabletop exercises, etc.) however, normal operating conditions were not addressed in the exercises. The training needs to address all operational modes.

The procedure needs to be amended to require team training to include others, defined by the operator, who would reasonably be expected to operationally collaborate with controllers (control room personnel), and include content addressing all operational modes of normal, abnormal, and emergency in the training.

Enbridge Response:

To address the NOA issued by PHMSA, Enbridge has identified the following changes:

Enbridge has added the following text to section 8.2 of the CCO Training Process document:

- Tabletop exercises and/or simulation of abnormal and emergency operating conditions include normal operations. Operators start in the normal operation mode and will perform normal operation maneuvers such as, but not limited to, tank swings, line start-ups, line rate reductions, etc.
- Normal operations are also covered under topics such as Hydraulics and Technical Training Topics, and Team Training with aspects of Crew Resource Management.

Enbridge has added the following text to our CRMP to define the roles and responsibilities of other individuals who would reasonably be expected to operationally collaborate by providing input to controllers. Enbridge has defined Other Individuals in the definitions section of the CRMP as the following:

- ‘Other Individuals’ who would reasonably be expected to operationally collaborate by providing input to Operators, STAs and/or Shift Supervisors during normal, abnormal or emergency situations, including: Field Technical and Operations staff, SCADA staff, Controls staff, Dig Coordinators, Service Delivery staff, Integrity staff, Measurement Services and Loss Management staff, and Petroleum Quality Staff (see Roles and Responsibilities).

Enbridge has defined the roles and responsibilities of other individuals as follows:

Other Individuals

Field Technical and Operations staff

- Respond to potential normal, abnormal and emergency conditions when required.
- Perform field integrity investigations and enhanced field analysis.
- Identify leaks.
- Validate integrity.
- Provide input to the creation of ‘plan to manage’ activities and perform ‘plan to manage’ activities as required.

SCADA staff

- Respond to potential normal, abnormal and emergency conditions when required.
- Advise CCO staff of the status of the SCADA systems.
- Analyze and fix any issues with SCADA to ensure accurate information and control capabilities are available for CCO staff.

Controls staff

- Respond to potential normal, abnormal and emergency conditions when required.
- Advise CCO staff of the status of controls systems.
- Analyze and fix any issues with Control Systems to ensure accurate information and control capabilities are available for CCO staff.

Dig Coordinators

- Respond to potential normal, abnormal and emergency conditions when required.
- Act as a single point of contact during COPAS field work.
- Ensure the CCO Operators have all the required information and contacts to assist monitoring of the system while field work is ongoing.

Service Delivery staff

- Respond to potential normal, abnormal and emergency conditions when required
- Provide pumping instructions through pump orders to CCO Staff.
- Make changes to the pump orders as required based on operational changes or equipment issues.

Integrity staff

- Respond to potential abnormal and emergency conditions when required.
- Provide input to enhanced engineering analysis process.
- Provide input to integrity validation decisions.
- Agree to restart decisions after over pressures that exceed 110% MAOP occur.

Measurement Services and Loss Management staff

- Respond to potential abnormal and emergency conditions when required.
- Advise CCO Staff of the status of measurement systems.
- Analyze and fix any issues with the measurement systems to ensure accurate information is provided to CCO staff.

Petroleum Quality Staff

- Respond to potential abnormal and emergency conditions when required.
- Provide guidance on how to handle quality related issues to ensure products remain within established specifications.

Enbridge has also defined prohibitions for 'Other Individuals' as follows:

Other Individuals

- Prohibited from directing or superseding Operators in the execution of an OQ covered task. Guidance must be limited to referencing documented procedures, training or technical information rather than specific operational instructions.
- Prohibited from accessing and executing console commands when unqualified.
- Prohibited from directing Operators to continue running a pipeline.
- Prohibited from directing Operators to delay or defer the execution of any emergency procedure.
- Prohibited from directing Operators to restart a pipeline following a shutdown for a confirmed or suspected emergency without authorization in accordance with CCO procedures.

In addition to the comprehensive semi-annual team training and exercise program that Enbridge currently conducts to prepare our core control center decision making staff to perform as an effective team when making critical operational decisions, Enbridge will establish a secondary computer-based training program that will focus on communicating CRM roles, responsibilities, and prohibitions, to 'Other Individuals' as defined in the Enbridge CRM Plan.

This training will be completed once for each employee designated as an 'Other Individual,' and will include all new staff hired into applicable roles. Additionally, representatives from the 'Other Individual' groups will be invited to participate in one control room team training and exercise session each year.

Please see the attached documents:

Control Room Management Plan version 12.3:

- Section 2 Definitions, Other Individuals
- Section 3.3.6, Other Individuals
- Section 3.4.6 ...Other Individuals

CCO Training Process version 7.2:

- Section 8.2, Overview

As stated, Enbridge respectfully believes that its amendments to the CRM procedures are compliant with 49 CFR § 195.446, and we request that PHMSA close this matter. Should you have any questions or require further information, or if you would like to set up a virtual meeting to address the amendments to the CRM procedures, please contact me.

Sincerely,

A handwritten signature in blue ink, appearing to read "David Stafford", is written over a horizontal line.

David Stafford
Manager, US Pipeline Compliance

Attachments:

CCO Control Room Management Plan.pdf

CCO Training Guidelines.pdf

Quarterly Qualified Individual Notification Exercise QINE Procedure.pdf

SCADA Point to Point Verification Procedure.pdf

Cygnets - SCADA Point Verification Lineout Tool.pdf

OASyS - SCADA Point Verification Tool.pdf