Directive 026: Setback Requirements for Oil Effluent Pipelines

September 22, 2005

Effective June 17, 2013, the Energy Resources Conservation Board (ERCB) has been succeeded by the Alberta Energy Regulator (AER).

As part of this succession, the title pages of all existing ERCB directives now carry the new AER logo. However, no other changes have been made to the directives, and they continue to have references to the ERCB. As new editions of the directives are issued, these references will be changed.

Some phone numbers in the directives may no longer be valid. Contact AER Inquiries at 1-855-297-8311 or inquiries@aer.ca.

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Effective January 1, 2008, the Alberta Energy and Utilities Board (EUB) has been realigned into two separate regulatory bodies, the Energy Resources Conservation Board (ERCB), which regulates the energy industry, and the Alberta Utilities Commission (AUC), which regulates the utilities industry.

As part of this realignment, the title pages of all existing EUB directives now carry the new ERCB logo. However, no other changes have been made to the directives, and they continue to have references to “EUB.” As new editions of the directives are issued, these references will be changed.

ENERGY RESOURCES CONSERVATION BOARD
Directive 026: Setback Requirements for Oil Effluent Pipelines

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Published by
Energy Resources Conservation Board
640 – 5 Avenue SW
Calgary, Alberta
T2P 3G4

Telephone: 403-297-8311
Fax: 403-297-7040
Publications@ercb.ca
Web site: www.ercb.ca

EUB Alberta Energy and Utilities Board

640 - 5 Avenue SW Calgary, Alberta Canada T2P 3G4 Tel 403 297-8311 Fax 403 297-7336 www.eub.gov.ab.ca

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Setback Requirements for Oil Effluent Pipelines

1 Introduction

Setback requirements for pipelines that transport natural gas containing greater than 10 moles of hydrogen sulphide (H_2S) gas per kilomole of natural gas are set out in the Alberta Energy and Utilities Board (EUB) *Directive 056: Energy Development Applications and Schedules.* A setback is the minimum distance that must be maintained between an energy facility and various surface developments for land-use and public safety purposes. That distance is determined by the level of the facility, as described in EUB *Interim Directive (ID) 81-03: Minimum Distance Requirements Separating New Sour Gas Facilities from Residential and Other Developments*. Levels for pipelines are determined by the cumulative release volume of H_2S in cubic metres (m^3) that could be released from a pipeline in the event of a leak or rupture.

As stated in *Directive 056*, setback distances must be met for natural gas pipelines containing greater than 10 moles of H_2S gas per kilomole of natural gas. However, in the past these setback requirements have not been applied to oil effluent pipelines.

Prior to the publication of EUB *Directive 071: Emergency Preparedness and Response Requirements for the Upstream Petroleum Industry* in June 2003, the EUB did not have in place a requirement for industry to determine H_2S release volumes for oil effluent pipelines containing H_2S. For the purpose of determining emergency response planning zones, *Directive 071* now requires that potential H_2S release volumes for oil effluent pipelines be calculated using the equation provided in *Directive 071*.

It has been determined that under certain operating conditions, oil effluent pipelines can have H_2S release volumes similar to those of pipelines that transport natural gas containing greater than 10 moles of H_2S gas per kilomole of natural gas. In such cases, setback requirements must be met in accordance with *Directive 056.*

This directive provides interim measures to ensure that setback requirements are applied in a consistent manner to all pipelines that may have a potential H_2S release volume greater than 300 m^3 by introducing the setback requirements in *ID 81-03* and *Directive 056* to oil effluent pipelines containing greater than 10 moles of H_2S gas per kilomole of natural gas. Direction regarding H_2S release volume calculation and level determination is also provided.

This directive is not intended to take the place of any Public Safety and Sour Gas (PSSG) recommendations currently being reviewed, specifically PSSG Recommendations 52 and 53, regarding the current criteria for sour gas setbacks and the implications of setbacks on surface development.

2 H_2S Release Volume Determination

The potential H_2S release volume of an oil effluent pipeline segment is determined by the following equation:

$$V = 0.785 \times 10^{-6} D^2 L \frac{(GLR \times GVF)}{(GLR + GVF)} \times H$$

where

V = potential H_2S release volume at standard conditions (m^3)

GLR = produced gas-liquid ratio at standard conditions ([standard m^3 gas]/[stock tank m^3 liquid])

GVF = ratio of produced gas volume at standard conditions to the volume of gas at maximum operating pressure (MOP) (m^3/m^3)

H = licensed H_2S content (moles/kilomole) for the pipeline

D = internal diameter of pipe in millimetres (mm)

L = length of pipeline between sectionalizing valves (km)

When using this equation, it is assumed that the amount of gas and liquid in the system is in proportion to the produced gas-liquid ratio and that all of the gas is out of solution.

3 Determination of a Level

A level, as described in *ID 81-03*, must be determined using the cumulative potential H_2S release volume of the pipeline segment.

The cumulative potential H_2S release volume of a pipeline segment is the combined sum of H_2S release volumes from all upstream and downstream pipeline segments that are not isolated from the pipeline by emergency shutdown valves (ESDs) or check valves and that would drain in the event of a leak or rupture.

4 Setback Requirements

All pipelines containing greater than 10 moles of H_2S gas per kilomole of natural gas must meet the setback requirements in *Directive 056* and *ID 81-03*.

This directive must be consulted when filing *Directive 056* pipeline licence applications for new construction and for amending existing oil effluent pipelines which would result in the conveyance of oil effluent containing greater than 10 moles of H_2S gas per kilomole of natural gas.

For *Directive 056* application and participant involvement requirements, see "*Directive 056* Process Clarification for Oil Effluent Pipelines Containing Greater Than 10 Moles of H_2S Gas per Kilomole of Natural Gas," located on the EUB Web site at www.eub.gov.ab.ca. To obtain a hard copy, contact the Facilities Applications Help Line at (403) 297-4369.

Licensees are encouraged to work with landowners to mitigate the impact of setbacks and to keep the landowners fully informed of the implications setbacks may have on property development.

5 Existing Oil Effluent Pipelines

Licensees must determine a level and associated setbacks for all existing oil effluent pipelines that contain more than 10 moles of H_2S gas per kilomole of natural gas using the same calculation method as for new oil effluent pipelines that contain more than 10 moles of H_2S gas per kilomole of natural gas. If the minimum distance to a surface development is less than that required to satisfy the setback distance, as a temporary measure the licensee must assess the options to address the situation, consult with the landowner to resolve the situation to the satisfaction of both parties, and notify the EUB Operations Group, Pipeline Section, at (403) 297-8536. The licensee must determine the level and what surface development exists within the associated setback prior to September 30, 2006, unless otherwise approved by the EUB. In conjunction with industry's review of existing oil effluent pipelines that contain more than 10 moles of H_2S gas per kilomole of natural gas, the EUB will assess the inventory of such existing pipelines in the province and monitor efforts being made by licensees to meet setback requirements.

For new land-use developments under the jurisdiction of the *Municipal Planning Act*, the EUB requires licensees to provide to the subdivision or development approving authorities the level designations for oil effluent pipelines that contain more than 10 moles of H_2S gas per kilomole of natural gas and that may affect proposed subdivision or development applications. If it is found that such an existing oil effluent pipeline segment results in a setback restriction that affects a subdivision or development application, the licensee must assess the options to address the situation and consult with the landowner to resolve the situation to the satisfaction of both parties. This can be achieved by various means, such as reducing system pressure or licensed H_2S content or installing ESDs or check valves. Alternatively, the proposed development could be modified in a manner mutually acceptable to the developer and the pipeline licensee.