

AER Bulletin 2014-20

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Proration Measurement of Liquids-Rich Gas Wells

The Alberta Energy Regulator (AER), based on feedback from industry and its own ongoing processes to improve regulations, has identified an opportunity for gas well operators to minimize equipment costs while ensuring adequate measurement of produced fluids.

The AER currently requires a measurement system with dedicated three-phase separation and single-phase measurement for gas, hydrocarbon liquids, and water at each gas well producing at a liquid-to-gas¹ ratio of greater than 0.28 cubic metres (m³) of liquids per thousand (10³) m³ of gas (50 barrels per million standard cubic feet).²

Under current rules,³ the AER can approve site-specific applications to allow proration measurement of production from multiwell pads. This measurement approach allows the use of a single group separator and measurement system to measure production from one or more multiwell pads. Each multiwell pad would have a test separator and measurement system that would allow wells to be regularly tested to provide information for prorating group production measurements to individual wells.

This bulletin explains how licensees can apply for proration measurement of liquids-rich gas wells, provides information on criteria that the AER uses in deciding on such applications, and illustrates typical conditions of approval for proration measurement.

Reservoir, Well, and Facility Criteria

The AER can consider applications for proration measurement for specific sites and will apply the following criteria in assessing the applications:

- Production must be from liquids-rich gas reservoirs where the liquid-to-gas ratio for a well is greater than 0.28 m³ of liquids per 10³ m³ of gas.
- A multiwell pad development approach must be used where several wells are drilled at a single surface location.
- Each test separator must have a maximum of eight wells.

Typical conditions of approval are set out in appendix 1.

¹ "Liquid" includes both water and hydrocarbon liquids.

² *Directive 017: Measurement Requirements for Oil and Gas Operations (May 2013)*, figure 7.10.

³ *Directive 017: Measurement Requirements for Oil and Gas Operations (May 2013)*, section 5.2.

Applications for Proration Measurement of Liquids-Rich Gas Wells

inquiries 1-855-297-8311
24-hour
emergency 1-800-222-6514

Section 5.2 of *Directive 017: Measurement Requirements for Oil and Gas Operations* sets out current application requirements for using proration measurement for liquids-rich gas wells. These requirements are summarized as follows:

1. The application must be submitted to Directive017Applications@aer.ca by e-mail with searchable attachments.
 - 1.1 Clearly indicate “Application for Liquids-Rich Gas Well Proration Measurement” in the e-mail subject line.
2. The application must include information on the battery (well pad) as set out in section 5.2(1) of *Directive 017*.
3. The application must describe proposed measurement systems and briefly explain how these systems will address the typical approval conditions set out in appendix 1.
4. The application must include a contact name and information so that the AER can request additional information if required.

For more information, e-mail Directive017Applications@aer.ca or call the AER Customer Contact Centre at 1-855-297-8311 (toll free).

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Appendix 1 Typical Conditions of Approvals for Proration Measurement of Liquids-Rich Gas

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The following conditions have been included in AER approvals of site-specific applications for proration measurement of liquids-rich gas.

1. Well and facility developments must include the following features:
 - 1.1 Production systems must have one test separator and test measurement system for every eight wells.
 - 1.2 The commingled production from all of the tested wells at each pad must be connected by pipeline to a battery group separator where the well production from all pads is separated and each phase (gas, hydrocarbon liquid, and water) individually metered.
2. The battery must be reported as a Subtype 364 proration battery, and all wells producing to the battery must be classified as gas wells.
3. Each well must be tested not fewer than three times per month with each test being a minimum of 12 hours duration, and there must be a minimum of five days between tests. A well must be on test at all times except for reasonable purge times between tests.
4. Each well and the group separator must be sampled annually for analysis of gas and hydrocarbon liquids (condensate).
 - 4.1 Gas and condensate analysis for individual wells must be used to calculate the well gas and condensate gas equivalent volumes.
 - 4.2 The group gas and condensate analysis must be used to calculate the group gas and condensate gas equivalent volumes.
5. The battery group separator must be a three-phase separator and use electronic flow measurement (EFM)⁴ for the condensate and gas.
 - 5.1 The condensate measurement must use a mass meter and water-cut analyzer.
6. Test separators must have three-phase measurement.
 - 6.1 Test measurement systems may either use three-phase separators measuring gas, condensate, and water or may use two-phase separators with gas and liquid meters and a liquid-phase water-cut analyzer.
 - 6.2 The test separators must use EFM to measure the gas and condensate.

⁴ Directive 017: Measurement Requirements for Oil and Gas Operations (May 2013), sections 4.3.6 and 14.10

7. If condensate at the battery group separator is produced to a tank at the battery and not recombined with the gas and sent to a gas plant for further processing, then
 - 7.1 condensate tanks must incorporate a vapour recovery system to capture and conserve hydrocarbon vapours that would flash from the condensate;
 - 7.2 condensate must be stored in pressure vessels of sufficient pressure rating so that no vapours are vented; or
 - 7.3 condensate must be processed to ensure the vapour pressure complies with *Directive 060: Upstream Petroleum Industry Flaring, Incinerating, and Venting*, section 8.1(4) for atmospheric storage tanks vented to atmosphere.
8. The battery gas and condensate proration factors must remain within the target range of 0.95000 to 1.05000.
9. All wells flowing to the battery must have 100 per cent working interest ownership.
 - 9.1 If there are multiple working interest owners, then written notification must be given to all working interest owners with no resulting objection received.
10. If the wells flowing to the battery have a mix of crown and freehold royalties, then written notification must be given to all freehold royalty holders with no resulting objection received.
11. The licensee must keep a copy of this approval at the subject location or the respective field office and make it available to AER staff upon request.
12. All other conditions in AER *Directive 017: Measurement Requirements for Oil and Gas Operations* remain in effect.
13. Approvals will be granted based on the information contained in the respective applications. If the separation and measurement configuration is changed such that the requirements of AER *Directive 017* or the limitations set above cannot be met, the licensee must apply for approval prior to implementing any changes.
14. The AER reserves the right to rescind approvals for proration measurement at liquids-rich gas wells at its sole discretion.