Bureau of Land Management **(Updated 01/19/00)**
Final Rule
Federal Register / Vol. 54, No. 36, Friday, February 24, 1989, Rules and Regulation

Onshore Oil and Gas Operations, Federal and Indian Leases;
Onshore Oil and Gas Order No. 5, Measurement of Gas

I. Introduction.
- A. Authority.
- B. Purpose.
- C. Scope.

II. Definitions.

III. Requirements.
- A. Required Recordkeeping.
- B. General.
- C. Gas Measurement by Orifice Meter
- D. Gas Measurement by Other Methods or at Other Locations Acceptable to the Authorized Officer.

IV. Variances from Minimum Standards.

Attachment.
I. Sections from 43 CFR Subparts 3163 and 3165.

Onshore Oil and Gas Order No. 5;
Measurement of Gas on Federal and Indian Oil and Gas Leases

Effective date: March 27, 1989; this order is applicable March 27, 1989 for new facilities, August 23, 1989 for existing facilities measuring 200 MCF or more per day of gas, and February 26, 1990 for existing facilities producing less than 200 MCF per day of gas.

[54 FR 39528, Sept. 27, 1989]

I. Introduction.

A. Authority.

This Order is established pursuant to the authority granted to the Secretary of the Interior pursuant to various Federal and Indian mineral leasing statutes and the Federal Oil and Gas Royalty Management Act of 1982. This authority has been delegated to the Bureau of Land Management and is implemented by the onshore oil and gas operating regulations contained in 43 CFR Part 3160. Section 3164.1 thereof specifically authorizes the Director to issue Onshore Oil and Gas Orders when necessary to implement and supplement the operating regulations and provides that all such Orders shall be binding on the lessees and operators of Federal and restricted Indian oil and gas leases which have been, or may hereafter, be issued.

Specific authority for the provisions contained in this Order is found at: section 3162.7-1, Disposition of production; section 3162.7-3, Measurement of gas; and subpart 3163, Noncompliance and assessment.
[54 FR 39528, Sept. 27, 1989]

B. Purpose.

One purpose of this Order is to establish the requirements and minimum standards for the measurement of gas by the methods authorized in 43 CFR 3162.7-3, i.e., measurement by orifice meter or other methods acceptable to the authorized officer. Proper gas measurement ensures that the Federal Government, the general public, State governments which share in the proceeds, and Indian mineral owners receive the royalties due, as specified in the governing oil and gas leases.

Another purpose of this Order is to establish abatement periods for corrective action when noncompliance with the minimum standards is detected. The assessments and penalties that will be imposed as a result of noncompliance and/or failure to correct the noncompliance within the specified abatement period.

This Order also serves as notice to any party cited for noncompliance that it may request from the authorized officer an extension of the abatement period for any violation, provided that the request for extension is applied for and granted prior to the expiration of the abatement period previously allowed.

C. Scope.

This Order is applicable to all Federal and Indian (except Osage) oil and gas leases. In addition, this Order also is applicable to all wells and facilities on State or privately owned mineral lands committed to a unit or communitization agreement that affects Federal or Indian interests, notwithstanding any provision of a unit or communitization agreement to the contrary.

II. Definitions.

A. Authorized Officer means any employee of the Bureau of Land Management authorized to perform the duties described in 43 CFR Groups 3000 and 3100 (see 43 CFR 3000.0-5).

B. Business day means any day Monday through Friday, excluding Federal holidays.

C. Gas means any fluid, either combustible or noncombustible, which is produced in a natural state from the earth and that maintains a gaseous or rarefied state at standard temperature and pressure conditions (see 43 CFR 3000.0-5(a)).

D. INC means incident of noncompliance, which serves as a Notice of Violation under 43 CFR Subpart 3163.

E. Lessee means a person or entity holding record title in a lease issued by the United States (see 43 CFR 3160.0-5).

F. Major violation means noncompliance that causes or threatens immediate, substantial, and adverse impacts on public health and safety, the environment, production accountability, or royalty income (see 43 CFR 3160.0-5).

G. Minor violation means noncompliance that does not rise to the level of a major violation (see 43 CFR 3160.0-5).

H. Operating rights owner means a person or entity holding operating rights in a lease issued by the United States. A lessee also may be an operating rights owner if the operating rights in a lease or portion thereof have not been severed from record title.

I. Operator means any person or entity including but not limited to the lessee or operating rights owner, who has stated in writing to the authorized officer that it is responsible under the terms and conditions of the lease for the operations conducted on the leased lands or portion thereof.

J. Production unit means, for purposes of reporting production, a measurement unit of 1,000 standard cubic feet (Mcf).

K. Standard cubic foot" means the volume of gas contained in one cubic foot at a base pressure of 14.73 pounds per square inch absolute (psia), at a base temperature of 60 °F or 519.67° Rankine (see 43 CFR 3162.7-3).

III. Requirements.

A. Required Recordkeeping. The operator shall keep all test data, meter reports, charts/recordings, or other similar records for 6 years from the date they were generated, or if involved in an audit or investigation, the records shall be maintained until the record holder is released by the Secretary from the obligation to maintain them. The authorized officer may request these records any time within this period. Records submitted shall include all the additional information used to compute the volumes so that computations may be verified.

B. General.

All gas production shall be measured in accordance with an authorized method of measurement. As set out in 43 CFR 3162.7-3, gas measurement authorized for gas produced from leases, units, unit participating areas, and communitization agreements subject to the jurisdiction of the Bureau of Land Management, as such jurisdiction is defined in 43 CFR 3161.1, may be by orifice meter or other methods acceptable to the authorized officer. The requirements and minimum standards for gas measurement are set out below.

The requirements of this Order are based on the standards and specifications published by the American Gas Association (AGA), and officially designated as ANSI/API 2530 and AGA Committee Report No. 3, Second Edition, 1985, hereafter referred to AGA Committee Report No. 3. The AGA published standards and specifications are considered to be appropriate for proper gas measurement by both the Department of the Interior and the Oil and Gas Industry. The requirements set minimum standards necessary to promote conservation of natural resources and to ensure proper measurement of gas production for sales and allocation purposes, so that the Federal Government and Indian mineral owners will receive the royalties due under governing oil and gas leases.

All future sales and allocation facilities and sales or allocation facilities in existence on the effective date of this Order, unless covered by a valid variance, shall meet the minimum standards

prescribed in this Order; provided, however, that all gas produced from or allocated to Federal and Indian (except Osage) oil and gas leases wherein the gas is measured through sales or allocation meters handling an average of 100 MCF per day or less on a monthly basis are exempt from the minimum standards in Sections III.C.1., C.2., and C.4., of this Order. The authorized officer may, where appropriate and necessary for proper measurement, work with the operators in designating consolidated gas sales and/or allocation meter stations.

Meter installations constructed in accordance with the AGA Report No. 3 standards in effect at that time shall not automatically be required to retrofit if the standards are revised. The Bureau will review any revised standards and, when necessary, will amend the Order through the rulemaking process.

The intent of these minimum standards is to ensure that when equipment malfunctions that could result in inaccurate measurement occur, proper corrective actions are taken, the authorized officer is notified, and an amended production report is submitted.

Failure to comply with these minimum standards will be considered as noncompliance and an incident of noncompliance (INC) will be issued. Operators who discover noncompliance with these minimum standards and take immediate corrective action will not be issued an INC. If the authorized officer or his representative is present when an operator discovers a malfunction or uses incorrect procedures as specified in this Order, an INC will be issued unless immediate corrective action is taken. Failure of equipment will not be considered a violation. However, the incidents of noncompliance that may result from equipment failure are considered violations and a partial list of such incidents follows:

Failure to install equipment properly.

Failure to repair or correct equipment malfunction properly or in a timely manner.

Failure to submit report of alternate method of sales.

Failure to submit amended production reports in a timely manner.

Failure to adhere to the minimum standard procedures specified in this Order.

The use of improper equipment, when discovered, will be considered as a violation and a formal INC will be issued.

The use of improper procedures will be considered a violation and when witnessed by the authorized officer or his representative, immediate corrective action will be required. In the event that proper procedures are then used as required by this Order, and prior to completing the operation, calibration, or proving, the violation will be considered as properly corrected. In this case, although the violation will be documented in the Bureau's files, no INC will be issued.

A major violation, as defined in this Order, will generally require an immediate shut-in of the metering device. However, where the non-recoupable loss is not significant or where damage to the resource is likely to occur if a shut-in is required, an abatement period of 24 hours may be

given.

Where abatement is required "prior to sales or removal," action is required to be taken so that no gas can be removed beyond the measurement point until properly measured.

[54 FR 39528, Sept. 27, 1989]

C. Gas Measurement by Orifice Meter

The following are minimum standards for the measurement of natural gas using orifice meters:

1. The orifice to pipe diameter ratio (d/D), or the beta ratio, with meters using "flange taps," shall be between 0.15 and 0.70.

Violation: Major.

Corrective Action: Install an orifice of such size that subsequent measurements will be within the appropriate beta ratio range. If changing the orifice causes the differential pressure to be recorded in the lower one-third of the chart, then either the meter tube or the differential element shall be changed, sizing the straight pipe sections in a manner that will provide subsequent measurement within the appropriate beta ratio range.

Abatement Period: Prior to sales.

2. The orifice to pipe diameter ratio (d/D), or the beta ratio, with meters using "pipe taps," shall be between 0.20 and 0.67.

Violation: Major.

Corrective Action: Same as A.1. above.

Abatement Period: Prior to sales.

3. To obtain flow conditions as near optimum as possible and minimize the effects of turbulence in gas flow, the minimum length of straight pipe preceding and following an orifice and the use of straightening vanes, shall conform to those specifications detailed in Figures 4 through 9 of AGA Committee Report No. 3.

Violation: Major.

Corrective Action: Install proper length of pipe where appropriate or install straightening vanes in accordance with appropriate AGA Report No. 3 specifications.

Abatement Period: Prior to sales.

4. The orifice shall be sized to make the pen that records the differential pressure operate in the outer ⅔ of the chart range for the majority of the flowing period.

Violation: Minor.

Corrective Action: Size orifice to meter tube so that the differential pen will deflect and record in the outer ⅔ of the chart range and so that the measurement will be within the prescribed beta ratio range.

Abatement Period: 20 days.

5. The static element shall be sized to make the pen that records the static pressure operate in the outer ⅔ of the chart range for the majority of the flowing period.

Violation: Minor.

Corrective Action: Size static element so as to cause static pen to record in the outer ⅔ of the chart range.

Abatement Period: 20 days.

6. There shall be no pipe connections between the orifice and the nearest pipe fitting other than the pressure taps and/or thermometer wells as specified in AGA Committee Report No. 3.

Violation: Major.

Corrective Action: Replace entire length of pipe ahead of orifice meter with pipe of appropriate length and inside smoothness in accordance with AGA Committee Report No. 3.

Abatement Period: Prior to sales.

7. Continuous temperature recorders to measure the flowing gas temperature are required on all sales and allocation meters measuring 200 MCF per day or more on a monthly basis. All other sales or allocation meters shall have a continuous temperature recorder or an indicating thermometer to measure flowing gas temperature. Sales or allocation meters measuring between 200 and 500 MCF per day on a monthly basis may be considered for a variance by the authorized officer on a case-by-case basis.

Violation: Major.

Corrective Action: Install temperature measuring device as required.

Abatement Period: Prior to sales.

8. The internal diameter of the meter tube and the orifice fittings shall be the same or, if not, within tolerance limits set by AGA.

Violation: Major.

Corrective Action: Install properly sized meter tube.

Abatement Period: Prior to sales.

9. Meter tubes using flange taps or pipe taps shall have the pressure tap holes located as specified in AGA Committee Report No. 3.

Violation: Major.

Corrective Action: Install pressure tap as specified.

Abatement Period: Prior to sales.

10. Orifice plates shall be removed from the flange or plate holder, and inspected for visual conformance with AGA standards and specifications, at least semi-annually, during testing of the accuracy of measuring equipment.

Violation: Minor.

Corrective Action: Remove and inspect orifice plate for visual conformance with AGA standards and specifications.

Abatement Period: No later than next meter calibration.

11. Any plate or orifice that is determined not in conformance with AGA standards shall be replaced with one that is in conformance.

Violation: Major.
Corrective Action: Replace orifice plate.
Abatement Period: Prior to sales.

12. All connections and fittings of the secondary element (including meter pots and meter manifolds) shall be leak tested prior to conducting tests of the meter's accuracy.

Violation: Minor.
Corrective Action: Stop meter calibration and conduct leak test. When leaks are detected the meter setting shall be determined and recorded "as found", the meter calibrated, and readings recorded "as left".
Abatement Period: Prior to completion of calibration.

13. The appropriate "zero" positions of the static and differential meter pens shall be checked during each test of meter accuracy, and adjustments made if necessary.

Violation: Minor.
Corrective Action: Stop meter calibration and record "as found" readings; calibrate meter and record readings "as left".
Abatement Period: Prior to completion of calibration.

14. The meter's differential pen arc, the ability of the differential pen to duplicate the test chart's time arc over the full range of the test chart, shall be checked during each testing of the meter's accuracy and adjustments made if necessary.

Violation: Minor.
Corrective Action: Stop meter calibration and record "as found" readings; adjust differential pen arc, and record "as left" readings.
Abatement Period: Prior to completion of calibration.

15. Differential and static pen accuracy shall be tested for linearity at zero and 100 percent and at 1 point within the normal range of the differential and static recordings to assure accuracy.

Violation: Minor.
Corrective Action: Adjust pens to assure accuracy.
Abatement Period: Prior to completion of calibration.

16. During testing of the meter accuracy, the static pen time lag shall be adjusted to ensure independent movement of the static pen in relation to the differential pen.

Violation: Minor.
Corrective Action: Make appropriate adjustments.

Abatement Period: Prior to completion of calibration.

17. For all sales and allocation meters, the accuracy of the measuring equipment at the point of delivery or allocation shall be tested following initial meter installation or following repair and, if proven adequate, at least quarter thereafter unless a longer period is approved by the authorized officer. All extensions of intervals between tests of meters shall be approved in writing by the authorized officer.

Violation: Minor.
Corrective Action: Test meter for accuracy.
Abatement Period: a. 24 hours for initial installation or following repairs.
b. 30 days for failure to calibrate meter quarterly.

18. At least a 24-hour notice shall be given to the authorized officer prior to conducting the tests and calibrations required by this order.

Violation: Minor.
Corrective Action: Notify authorized officer of scheduled meter and calibrations at least 24 hours prior to next tests and calibrations.
Abatement Period: Prior to next calibration.

19. If the inaccuracy of the measuring equipment results in a volume calculation more than 2 percent in error, the volume measured since the last calibration be ***corected*** in addition to adjusting the meter to zero error. Also, the operator shall submit a corrected report adjusting the volumes of gas measured , and showing or discussing all the calculations made in correcting the volumes. The volume shall be corrected back to the time the inaccuracy occurred, if known. If this time is unknown, volumes shall be corrected for the last half of the period elapsed since the date of last calibration.

Violation: Minor.
Corrective Action: a. adjust meter to zero error.
b. Submit corrected report
Abatement Period: a. Prior to completion of calibration.
b. 60 days.

20. If, for any reason, the measuring equipment is out of service or malfunctioning so that the quantity of gas delivered is not known, the volume delivered during this period shall be estimated using one of the following methods, in the listed order of priority:

a. Record data on check metering equipment if used in lieu of main meter recordings. If check meters are not installed or are found to be recording inaccurately; then,
b. Base corrections on the percentage error found during the instrument test. If that is not feasible; then,
c. Estimate the quantity of gas run, based on deliveries made under similar conditions when the metering equipment was registering accurately.

Violation: Minor.

Corrective Action: Estimate volumes delivered during those periods cited using one or more of the approved methods identified in the order of priority and, when necessary, submit an amended report showing corrected volumes.
Abatement Period: 60 days.

21. Volumes of gas delivered shall be determined according to the flow equations specified in AGA Committee Report No.3
Violation: Minor.
Corrective Action: Recalculate all gas volumes not determined in accordance with flow equations specified in §6.3 of the AGA Committee Report No. 3.
Abatement Period: 60 days.

22. Unless otherwise established, the point of sales delivery and appropriate measurement shall be on the leasehold (or within the boundaries of the communitized area(CA) or unit participating area). Sales off the leasehold (or outside the CA or unit participating area) may be approved by the authorized officer.
Violation: Minor.
Corrective Action: Submit application to the authorized officer for approval of off lease (CA or unit participating area) measurement.
Abatement Period: 30 days.

23. The Btu content shall be determiend at least annually, unless otherwise required by the authorized officer, by means of (1) a recording calorimeter, (2) calculations based on a complete compositional analysis of the gas and the heating value of each constituent, in accordance with AGA Committee Report No. 3, or (3) any other method acceptable to the authorized officer. The authorized officer shall be apprised of the method used for each determination and be furnished with all needed analytical data or other documentation upon request. The Btu content most recently determined and used for royalty purposes shall be reported.
Violation: Minor.
Corrective Action: Determine Btu values and submit an amended report.
Abatement Period: 30 days.

24. All meter calibration report forms shall include the following information, if applicable, and shall be submitted to the authorized officer, upon request.

a. Name of producer or seller.
b. Name of purchaser.
c. Federal or Indian lease number, communitization agreement number, or unit name or number and participating area identification.
d. Station or meter number.
e. Meter data (make, differential, static and temperature range, recording period).
f. Type of connections (flange or pipe, upstream or downstream static connections).
g. Orifice data (plate size and ID of meter tube).

h. Base of data used on each chart or record (temperature, specific gravity, atmospheric pressure).
i. Time and date of test.
j. Instrument error(s) found and certification of corrections, and "found" and " left" data for all instruments;
k. Signature and affiliation of tester and witness.
l. Remarks.

Violation: Minor.
Corrective Action: Submit amended meter calibration report(s) to authorized officer, including all required information.
Abatement Period: 15 days

25. For purposes of measurement and meter calibration, atmospheric pressure is that value defined in the buy/sell contract (normally assumed to be a constant value). In the absence of such a definition in the buy/sell contract, the atmospheric pressure shall be established through an actual measurement or assumed to be a constant value based on the elevation at the metering station.

Violation: Minor.
Corrective Action: Recalibrate gas meter and submit amended report indicating corrected volumes using the adjusted absolute zero or properly calculated pressure extensions.
Abatement Period: 30 days.

26. The method and frequency of determining specific gravity are normally defined in the buy/sell contract. Except when a continuous recording gravitometer is used, specific gravity may be determined at the time of an instrument check using a spot or cumulative gas sample, and is usually effective the first of the following month. The continuous recorder may be of a gravity balance or kinematic type. Also, specific gravity may be determined from a laboratory analysis of a spot or cumulative gas sample.

Violation: Minor.
Corrective Action: Determine specific gravity of gas by approved method and submit an amended report with a corrected volume.
Abatement Period: 30 days.

D. Gas Measurement by Other Methods or at Other Locations Acceptable to the Authorized Officer.

Using any method of gas measurement other than by orifice meter at a location on the lease, unit, unit participating area, or communitized area requires the prior approval from the authorized officer pursuant to 43 CFR 3162.7-3. Other measurement methods include, but are not limited to:

Turbine metering systems
Positive displacement meter
Pitot tube
Orifice well tester
Critical flow prover
Gas-oil ratio

The requirements and minimum standards for gas measurement on the lease, unit, unit participating area, or communitized area by an alternate method of measurement, or at a location off the lease, unit, unit participating area, or communitized area by either an authorized or an alternate method of measurement, are as follows:

1. *Measurement of the Lease, Unit, Unit Participating Area, or Communitized Area*

   a. A written application for approval of an alternate gas measurement method shall be submitted to the authorized officer and written approval obtained before any such alternate gas measurement method is installed or operated. Any operator requesting approval of any alternate gas sales measurement system shall submit performance data, actual field test results, or any other supporting data or evidence acceptable to the authorized officer, that will demonstrate that the proposed alternate gas sales measurement system will meet or exceed the objectives of the applicable minimum standards or does not adversely affect royalty income or production accountability.

Violation: Major.
Corrective Action: Submit application and obtain approval.
Abatement Period: Prior to sales.
[54 FR 39528, Sept. 27, 1989]

2. *Measurement at a Location Off the Lease, Unit, Unit Participating Area, or Communitized Area.*

   a. A written application for off-lease measurement shall be submitted to the authorized officer and written approval obtained before any such off-lease gas measurement facilities are installed or operated. The application for approval of ***off-lease*** **measurement** facilities at the desired off-lease location before approval will be granted, but no additional approval as to the gas sales measurement method is required, provided measurement is to be accomplished by an orifice meter pursuant to the requirements and minimum standards of this Order.

Violation: Minor.
Corrective Action: Submit application and obtain approval.
Abatement Period: 20 days.

b. If gas measurement is to be accomplished at a location off the lease, unit, unit participating area, or communitized area by any alternate measurement method (any method other than measurement by an orifice meter), then the application, in addition to justifying the location of the measurement facilities, shall also demonstrate the acceptability of the alternate measurement method pursuant to Sec. III.D.1. of this Order.

Violation: Major.
Corrective Action: Submit application and obtain approval.
Abatement Period: Prior to sales.

V. Variances from Minimum Standards.

An operator may request that the authorized officer approve a variance from any of the minimum standards prescribed in Section III. hereof. All such requests shall be submitted in writing to the appropriate authorized officer and shall provide information as to the circumstances warranting approval of the variance(s) requested and the proposed alternative means by which the related minimum standard(s) will be satisfied. The authorized officer, after considering all relevant factors, shall approve the requested variance(s) if it is determined that the proposed alternative(s) meets or exceeds the objectives of the applicable minimum standard(s), or will not adversely affect royalty income or production accountability.

In addition, approval may be given orally by the authorized officer before the operator initiates actions which require a variance from minimum standards. The oral request, if granted, shall be followed by a written request not later than the fifth business day following oral approval, and written approval will then be appropriate.

The authorized officer may also issue NTL's that establish modified standards and requirements for specific geographic areas of operations.

After notice to the operator the authorized officer may also require compliance with standards that exceed those contained in this Order whenever such additional requirements are necessary to achieve protection of the royalty income or production accountability. The rationale for any such additional requirements shall be documented in writing to the operator.

[54 FR 39528, Sept. 27, 1996]