

UNITED STATES  
DEPARTMENT OF THE INTERIOR  
BUREAU OF LAND MANAGEMENT

Notice To Lessees/Operators of Onshore Federal and Indian  
Oil and Gas Leases Within the Jurisdiction of the  
Montana State Office  
NTL 2007-1

Standards for the Use of Electronic Flow Computers Used On  
Differential Type Flow Meters For Gas Measurement

This notice is to inform Federal and Indian lessees/operators of the minimum standards and requirements for sales and allocation Electronic Flow Computers (EFCs) used on differential-type flow meters for gas measurement. EFCs that meet these standards and requirements are approved for use on all Federal and Indian oil and gas leases located within Montana, North Dakota, and South Dakota.

For the purpose of this NTL, a “*differential-type flow meter*” is a meter that determines flow rate as a function of a change in gas pressure caused by the meter geometry. Examples include orifice plate meters, venturi meters, and pitot tubes. An “*electronic flow computer*” includes the secondary device that electronically measures the differential pressure and other variables, and the tertiary device which makes flow rate calculations, and stores the data.

The requirements of this NTL supersede and replace all existing variances specifically addressing EFC installation and approval. This NTL does not alter the standards and requirements of Onshore Order No. 5, applicable variances, or NTLs which only address the primary device. All EFCs already installed and operating prior to this notice shall be subject to all of the new provisions in this NTL, within the timeframes specified below:

1 year for EFCs measuring more than 500 Mcf/day on a monthly basis;  
2 years for EFCs measuring more than 100 Mcf/day but no more than 500 Mcf/day on a monthly basis; and  
3 years for EFCs measuring 100 Mcf/day or less on a monthly basis.

Other Standards Incorporated by Reference

1. Onshore Oil and Gas Order No. 5 (published at 54 FR 8100), *Measurement of Gas on Federal and Indian Oil and Gas Leases*, remains in full force and effect. Note that:
  - Requirement III.C.21 is specific to AGA Committee Report No. 3, 1985. This requirement has been superseded by Paragraph 3 of this NTL, which allows the use of AGA Committee Report No. 3, 1992;
  - Requirements III.C.4, III.C.5, III.C.13, III.C.14, III.C.15, III.C.16, and III.C.19 are unique to chart recorders and are not applicable to EFCs;
  - Paragraph 8 of this NTL provides requirements for EFCs similar to those provided for chart recorders in requirements III.C.13 and III.C.15; and
  - Paragraphs 9, 11, 13, and 14 of this NTL provide requirements for EFCs similar to those provided for chart recorders in requirement III.C.19.
  - Paragraph 15 of this NTL provides requirements for EFCs similar to those provided for chart recorders in requirements III.C.4 and III.C.5.
2. EFCs shall be installed, operated, and maintained in accordance with the portions of API Chapter 21, Section 1, September, 1993, that apply to differential types of flow meters.

In addition, Paragraphs 4, 5, 6, 8, 9, 10, 12, 13, and 16 of this NTL specify additional requirements or exceptions to API 21.1. Paragraphs 8, 10, 12, and 13 of this NTL, also state that only some of the provisions of API 21.1 will be enforced by the BLM. Specific portions of API 21.1 are referenced at the end of each paragraph listed above.

3. All flow rate calculations shall be made in accordance with either API 14.3, 1985 (AGA Committee Report No. 3, 1985), or API Chapter 14.3.3, 1992 (AGA Committee Report No. 3, Part 3, 1992). Supercompressibility shall be determined in accordance with API 14.3, 1985 (AGA Committee Report No. 3, 1985), AGA-8, or NX-19.

#### Informational Requirements

4. For each meter, the EFC shall display, at a minimum, the previous day's gas volume and the current instantaneous values of flowing (static) pressure, differential pressure, flowing temperature, and flow rate. The display shall be readable without the need for data collection units, laptop computers, or any special equipment, shall be onsite, and shall be in a location that is accessible to the BLM. This is an additional requirement to API 21.1.5.1.1.
5. The following information must be onsite and be accessible to the BLM personnel without the need for data collection units, laptop computers, or any special equipment. Operators must make every effort to keep this information accurate and up to date. If the BLM finds this information to be inaccurate, operators shall correct the information. This is an additional requirement to API 21.1.5.1.1.
  - The units of measure for each variable required in paragraph 4;
  - Make, range, and model number of each transducer/transmitter;
  - Calibrated span of each transducer/transmitter;
  - The physical location of the flowing (static) pressure (upstream or downstream).
  - Meter run inside diameter (mean);
  - Orifice bore or other primary device dimensions necessary for device verification, beta ratio determination, and gas volume calculation;
  - Atmospheric pressure or elevation above sea level;
  - A unique meter identification number; and
  - Specific gravity of the gas.
6. All records required by API 21.1.6 shall be retained for at least 6 years, and shall be made available to the BLM upon request. This is an exception to API 21.1.6.8.
7. Upon the BLM's request, the operator shall submit all technical documentation pertaining to the EFCs that are installed. This includes installation instructions, calibration procedures, technical and performance specifications, and information to verify that the calculation procedures in API 21.1.4.2 and 21.1.4.5 are being properly followed.

#### Verification and Calibration

8. "As found" readings for the differential pressure and static pressure transducers/transmitters shall be recorded at 0 percent and 100 percent of calibrated span, and at one point that represents the normal operating pressure of each transducer/transmitter. The inclusion of a verification point at the normal operating pressure is an additional requirement to API 21.1.8.3.1.2 and .3. The BLM will not enforce the provisions of API 21.1.8.3.1.2 and .3 that require more verification points than those specified in this requirement.

9. If any of the “as found” readings required in Paragraph 8 are off by more than the transducer/transmitter specification for reference accuracy (linearity, repeatability, and hysteresis), expressed in units of measure (inches of water column or psi), that transducer/transmitter shall be calibrated in accordance with the manufacturer’s specifications. Refer to the example in Attachment 1 for details. This is an additional requirement to API 21.1.8.3.
10. If either transducer/transmitter required calibration, then prior to returning a meter to service, “as left” readings for those transducers/transmitters shall be recorded at 0 percent and 100 percent of calibrated span, and at one point that represents the normal operating pressure of each transducer/transmitter. The inclusion of an “as left” verification point at the normal operating pressure is an additional requirement to API 21.1.8.3.1.5. The BLM will not enforce the provisions of API 21.1.8.3.1.5 that require more “as left” verification points than those specified in this requirement.
11. If any of the “as left” readings required in Paragraph 10 are off by more than the transducer/transmitter specification for reference accuracy, expressed in units of measure (inches of water column or psi), the transducer/transmitter shall be repaired or replaced within 48 hours. Refer to the example in Attachment 1.
12. An “as found” reading for the temperature transducer/transmitter shall be obtained near the normal flowing temperature of the gas. The requirement for an “as found” measurement at the normal flowing temperature of the gas is an additional requirement to API 21.1.8.3.1.4. Provisions of API 21.1.8.3.1.4 exceeding this requirement will not be enforced by the BLM.
13. If the “as left” readings for the temperature transducer/transmitter are not within 2.0°F of the test device, the temperature transducer/transmitter shall be replaced within 48 hours. Provisions of API 21.1.8.3.1.4 exceeding the requirements of this paragraph will not be enforced by the BLM.
14. If, during a verification or calibration, transmitter/transducer errors result in a flow rate error greater than 2 percent at the normal flowing conditions tested, the volume shall be corrected in addition to adjusting the transducers/transmitters to the standards specified in Paragraphs 9 and 13. In addition, 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 volumes 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 verification or calibration.

#### Other Requirements

15. For meters measuring more than 100 Mcf/day on a monthly basis, the EFC shall be installed, operated, and maintained to comply with either paragraph (a) or (b) below, whichever is less restrictive, for the majority of the flowing period:
  - (a) The differential and static pressures shall record in the upper 2/3 of the calibrated transducer/transmitter spans; or
  - (b) Overall meter station uncertainty shall be  $\pm 3$  percent, or better. The calculation of uncertainty shall be done in accordance with API 14.3.1, 1991 (AGA Committee Report No. 3, Part 1, 1991) or other method that has been approved by the BLM. The BLM may prescribe operating limits to implement this requirement.

16. Unless otherwise approved or required by the BLM, the low flow cutoff shall not be set higher than 0.5 inches of water. This is an additional requirement to API 21.1.4.2.3.

Variances from Requirements or Minimum Standards

An operator may request that the BLM approve a variance from any of the requirements or minimum standards prescribed in this NTL. All such requests shall be submitted in writing to the appropriate BLM office and provide information as to the circumstances that warrant approval of the variance(s) requested and the proposed alternative means by which the requirements or related minimum standard(s) will be satisfied. The BLM, after considering all relevant factors, will approve the requested variance(s) if it is determined that the proposed alternative(s) meet or exceed the objectives of the applicable minimum standard(s); or does not adversely affect royalty income or production accountability. Variances granted by the BLM under this NTL shall be limited to proposals and requirements under the BLM statutory and/or regulatory authority only, and shall not be construed as granting variance to regulations under other Federal Agency, State, or Tribal authority.

APPROVED:

\_\_\_\_\_

Date

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State Director

## Calibration Tolerances

### Example for Paragraphs 9 and 11

Paragraphs 9 and 11 address the transducer/transmitter reference accuracy specifications, expressed in actual units of measure: inches of water column or psia/psig.

The purpose of Paragraphs 9 and 11 is to recognize that even the best transducers/transmitters will drift slightly, and to allow some level of tolerance when performing verification. Using the stated transducer/transmitter reference accuracy, provided by the manufacturer, is an objective way to specify the tolerance.

Example: You are performing a verification of the differential pressure transducer on an EFC. The manufacturer's specifications for this transducer state a reference accuracy of  $\pm 0.2\%$  of span. The calibrated span of the transducer is 0-50". Assume the normal operating differential pressure is 27.0". You obtain the following "as found" readings as required by paragraph 8:

Required Test Point	Applied Pressure (inches water)	"as found" Pressure (inches water)	Error (inches water)
Zero	0.0	0.1	0.1
100 percent of span	50.0	50.0	0.0
Normal operating pressure	27.0	27.2	0.2

Does this transmitter need to be calibrated according to Paragraph 9?

**Answer:** Since the calibrated span is 50", the reference accuracy of the transducer, expressed in units of measure, is  $\pm 0.1$ " (0.2% of 50"). If any of the required "as found" readings are off by more than  $\pm 0.1$ ", the transducer must be calibrated. The "as found" reading at the "normal operating pressure" is 0.2" greater than the applied pressure, which is more than the  $\pm 0.1$ " allowed. Therefore, according to Paragraph 9, this transducer must be calibrated in accordance with the manufacturer's specifications. Per paragraph 11, if after calibration the transducer still could not achieve a tolerance of  $\pm 0.1$ " for all three required test points, it would have to be repaired or replaced within 48 hours.