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**NATIONAL STANDARD OF THE
PEOPLE'S REPUBLIC OF CHINA**

GB/T 17286.3-2010

Replacing GB/T 17286.3-1998

**Liquid hydrocarbons -- Dynamic measurement -- Proving
system for volumetric meters -- Part 3: Pulse interpolation
techniques**

液态烃动态测量 体积计量流量计检定系统 第3部分：脉冲插入技术

(English Translation)

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Foreword

GB/T 17286 "Liquid Hydrocarbon Dynamic Measurement Volumetric Flowmeter Verification System" includes the following four parts.

--- Part 1. General principles;

--- Part 2. Volume tube;

--- Part 3. Pulse insertion technology;

--- Part 4. Volume tube operator guide.

This part is the third part of GB/T 17286.

This part is equivalent to the ISO 7278-3:1998 "liquid hydrocarbon dynamic measurement volumetric flowmeter verification system Part 3. Pulse Insert Technology.

This part replaces GB/T 17286.3-1998 "Determination of liquid hydrocarbon dynamic measurement volumetric flowmeter verification system Part 3. Pulse Insert Technology.

This part is revised according to GB/T 1.1-2000 "Standardization Work Guide Part 1. Standard Structure and Writing Rules" and GB/T 20000.2-2009 "Standardization Work Guide Part 2. Adopting International Standards" made some editorial changes.

The main differences between this part and the technical content of GB/T 17286.3-1998 are as follows.

--- In GB/T 17286.3-1998, the definition of repetitiveness is. "Under the prescribed conditions of use, repeat the same application Incentives, the ability of the measuring instrument to give a very similar response." In this section, this definition is changed to read. "Under the same measurement conditions, Repeated measurement of the same measured capability, the ability of the measuring instrument to provide close indications." This redefinition makes the concept clearer and more accurate Indeed, normative.

--- In GB/T 17286.3-1998, the definition of the detection switch signal is. "A switch letter to

start or stop the display device Number or voltage change signal. In this section this definition is changed to read. "A switch signal that activates or stops the pointing device or Signal of voltage change".

--- Suggestions in this section, in order to reduce the internal rotation nonlinearity of the flowmeter, you can use only one pulse per revolution.

Flow meter. It may not be common in practical applications, but this recommendation only considers reducing the internal rotational nonlinearity of the flowmeter.

--- In GB/T 17286.3-1998, the definition of phase-locked loop pulse insertion method n" is. "According to multi-phase output collection frequency increase the high number of pulses" is defined in this section as "the number of high frequency pulses generated by the collected voltage controlled oscillator (VCO)".

--- In 5.1.5 of GB/T 17286.3-1998. "In each case the same volume tube detection switch should be used the leading edge of the signal. In this section it is modified to read. "The same signal leading or trailing edge should be used in each case."

--- In Chapter 2, change ISO 6551:1982 to GB/T 17746-1999 (idt ISO 6551:1982).

Appendix A of this section is a normative appendix.

This part was proposed by China National Petroleum Corporation.

This part is under the jurisdiction of the Oil and Gas Measurement Subcommittee of the Oil Industry Measurement and Analysis Method Professional Standardization Technical Committee.

This section is responsible for drafting the unit. China National Petroleum Corporation Measurement and Testing Institute.

Introduction

When using a volumetric tube to calibrate a flow meter with a pulse output, there is a limit to the minimum number of pulses to be collected during the calibration.

The number of pulses that can be generated during a test run is sometimes limited to well below 10,000 pulses. Therefore, in many applications, no method of increasing the resolution of the flowmeter is sought.

One way to solve this problem is to process the pulse signal from the flow meter to increase the resolution of the flow meter. This kind of improved flow meter the technique of resolution is called pulse insertion technology.

This section applies primarily to volumetric tubes, but does not in any way limit the different pulse insertion techniques in this or other fields.

Further development.

National standard GB/T 17286.3-1998 "Hydraulic hydrocarbon dynamic measurement volumetric flowmeter verification system - Part 3 Since its implementation on October 1, 1998, Technology has played a positive role in promoting the development of China's crude oil dynamic measurement technology.

In the past 10 years, the dynamic measurement technology of liquid hydrocarbons at home and abroad has undergone new changes. In order to adapt to the specific national conditions of China, in order to promote liquidity the development of hydrocarbon metering technology and its integration with international practices, it is necessary to amend GB/T 17286.3-1998.

Dynamic measurement of liquid hydrocarbons Volumetric flowmeter verification system Part 3. Pulse insertion technique

1 Scope

This part of GB/T 17286 gives a system for the verification of turbine or volumetric flowmeters in conventional volumetric tubes or small volumetric tubes.

In order to improve the resolution of the flowmeter, the application methods and conditions to be followed when applying the pulse insertion technique. When characterizing other forms of flowmeters, Also refer to the methods provided in this section.

This section describes the three most commonly used pulse insertion techniques and their conditions of use. It also describes the operation of the test pulse insertion system.

The equipment used in the state and the calibration method; some methods for measuring the irregularity of the pulse interval of the flowmeter are also described (see Appendix A).

2 Normative references

The provisions in the following documents become the provisions of this part by reference in this part of GB/T 17286. Quotations with dated and all subsequent amendments (not including errata content) or revisions do not apply to this section, however, encouragement is achieved in accordance with this section.

The parties to the agreement study whether the latest versions of these documents can be used. For undated references, the latest edition applies to this section.

GB/T 17746-1999 Dynamic measurement of petroleum liquids and gases - Fibre and/or electronic pulse data cable transmission fidelity and Reliance (idtISO 6551.1982)

3 Terms and definitions

The following terms and definitions apply to this part of GB/T 17286.

Clock clock

A device that produces a stable frequency whose period is used as a reference standard for measuring time.

Detection switch signal detector signal A signal that initiates or stops a switching signal or voltage change indicative of a device.

Internal rotation linearity intra-rotation linearity A rotary flow meter produces a pulse at a constant flow rate with a quantitative measure of the uniformity of the interval between pulses. Linearity general table Shows the standard deviation of the pulse interval from the average pulse interval. Such measurements include periodic and aperiodic measurements caused by flow meter mechanisms result.

The internal rotational linearity is a measure of the degree of uniformity that is caused by the rotor of the flow meter and is repeated in an intermittent or periodic manner.

Leading edge and trailing edge leading/lagging edge Used to trigger or control the rise and fall voltage of the counter pulse.