KUWAIT 3RD FLOW MEASUREMENT TECHNOLOGY CONFERENCE

19 - 21 NOVEMBER 2017

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PAN DONGJIE

ENGINEER,

Shengli Oilfield Shengli Petroleum Instrument Factory

Catalogue

01 Profile

02 MPFM

03 Quality guarantee

04 Test reprot and approve

Company Profile

COMPANY PROFILE

Shengli Oilfield Shengli Petroleum Instrument Ffactory was founded in 1992,located in Dongying city Shandong Province China.We specialize in the production of flow meters, measuring equipment and technology integration service.

Certification

API Q1　ISO9001：2008　OHSAS 18001　HSE14001

Company honor

02

Nonradioactive multiphase flow meter

MPFM

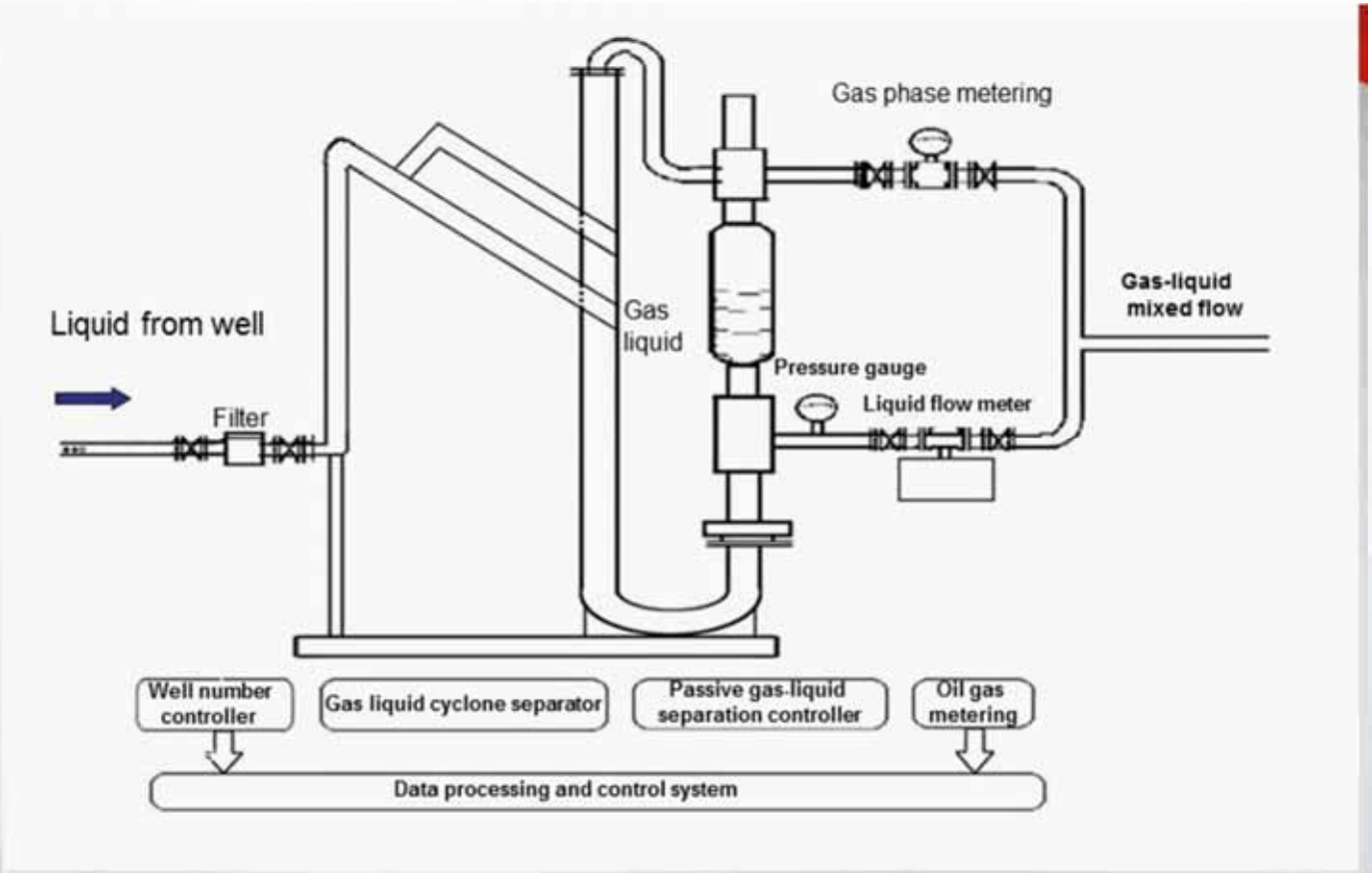
MPFM

patent


实用新型专利证书

This product is our self-developed patent technology products, mainly used to measure single wellhead output of liquid, gas phase and water rate measurements. The product integrates hydrocyclone separation technology, oil, gas density difference analysis, fluid measurement technology, gas measurement, pressure measurement, data acquisition and processing technical applications.

Dynamic principle diagram



MPFM

Structure

- Gas-liquid cyclone separator
- Gas-liquid separation controller
- Measuring instrument
- PLC data acquisition and processing system
- Automatic well selection valves (optional)
- GPRS remote transmission system (optional)
- Remote data access and publishing system (optional)

MPFM

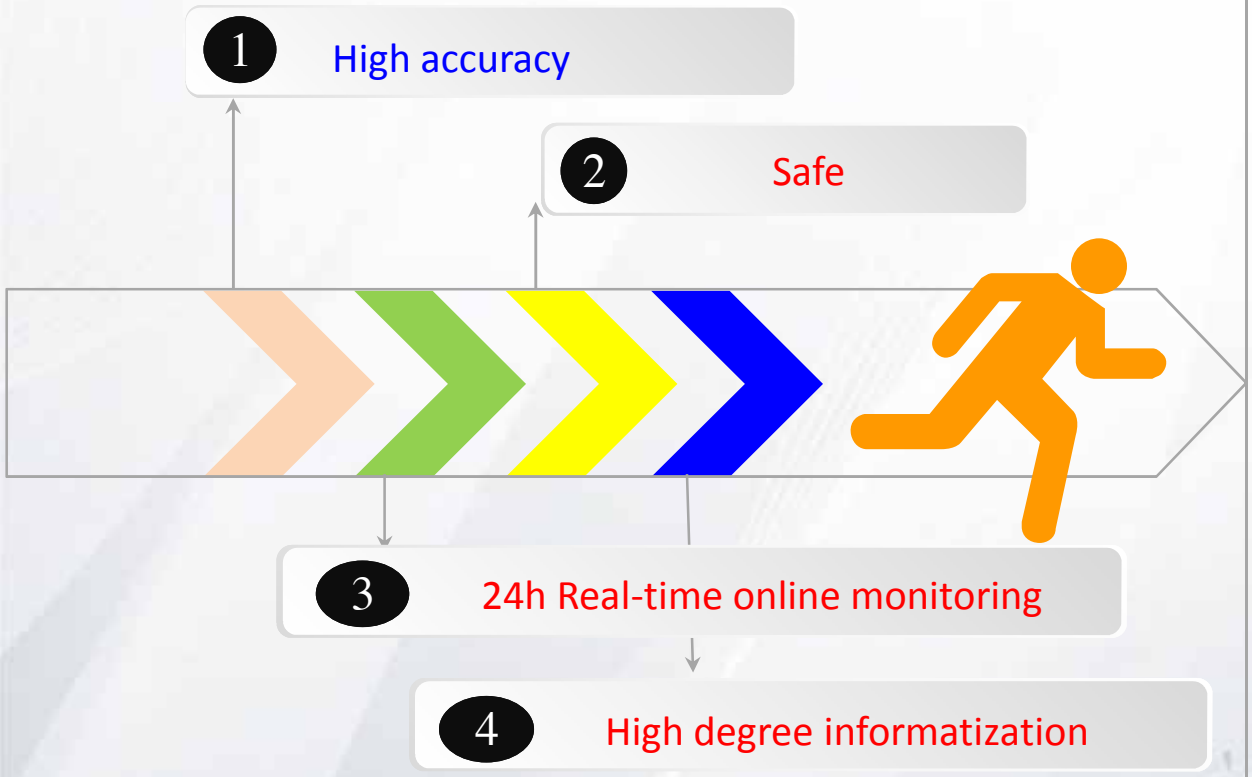
advantage

1. High accuracy
2. Safe
3. 24h Real-time online monitoring
4. High degree of informatization

High accuracy

Liquid flow	±2%-±5%
Water cut	±2%-±3%
Gas flow	±5%-±10%

MPFM



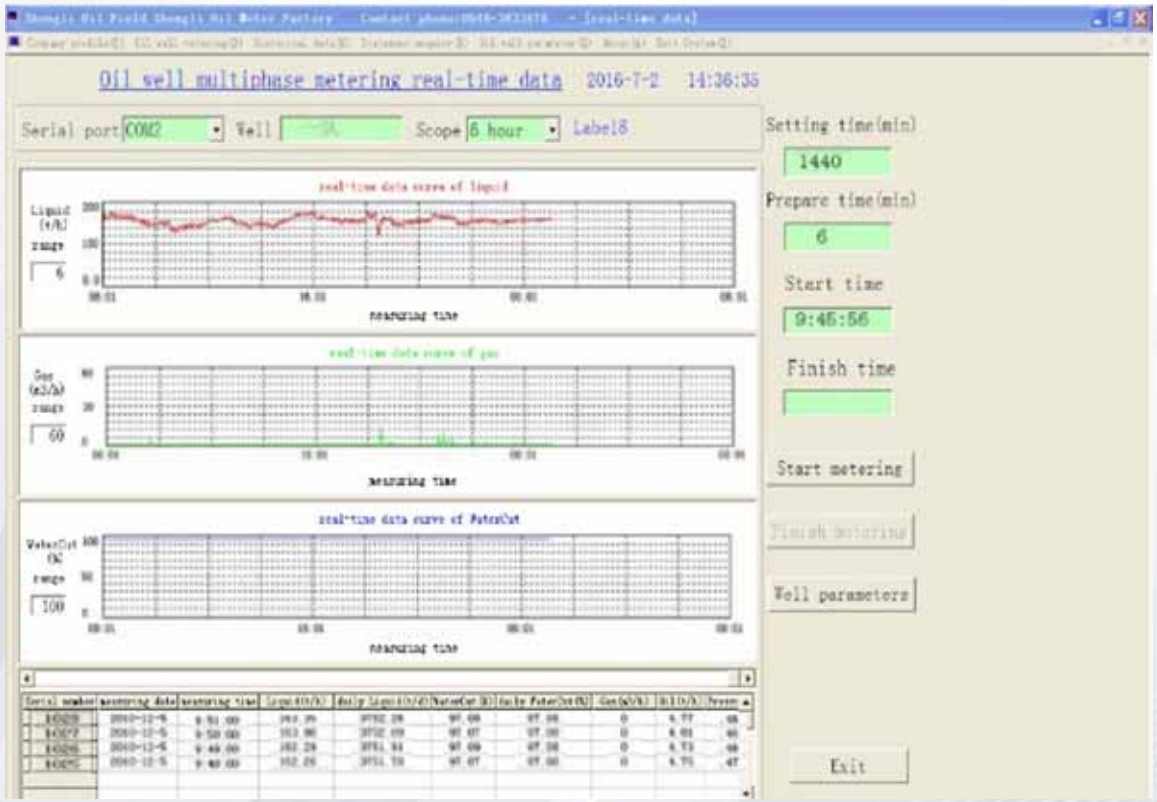
Safe

non-radioactive,
environment friendly
and safe

pipeline design,
Non-pressure content,
using more safely.

MPFM

advantage

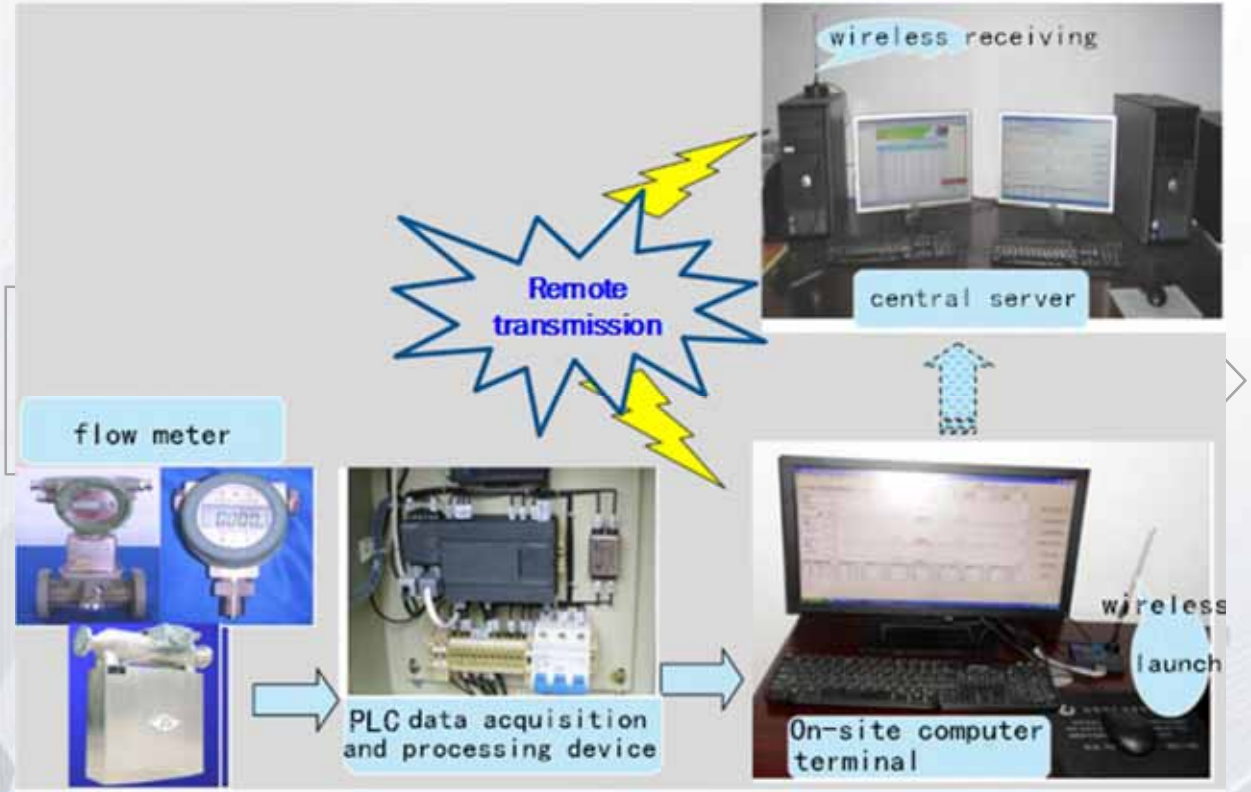


24h Real-time online monitoring

It is realization 24h real-time monitoring of metering instruments measuring parameters. And it could generate production data curve, and according to customer demanding form various production reports.

MPFM

advantage



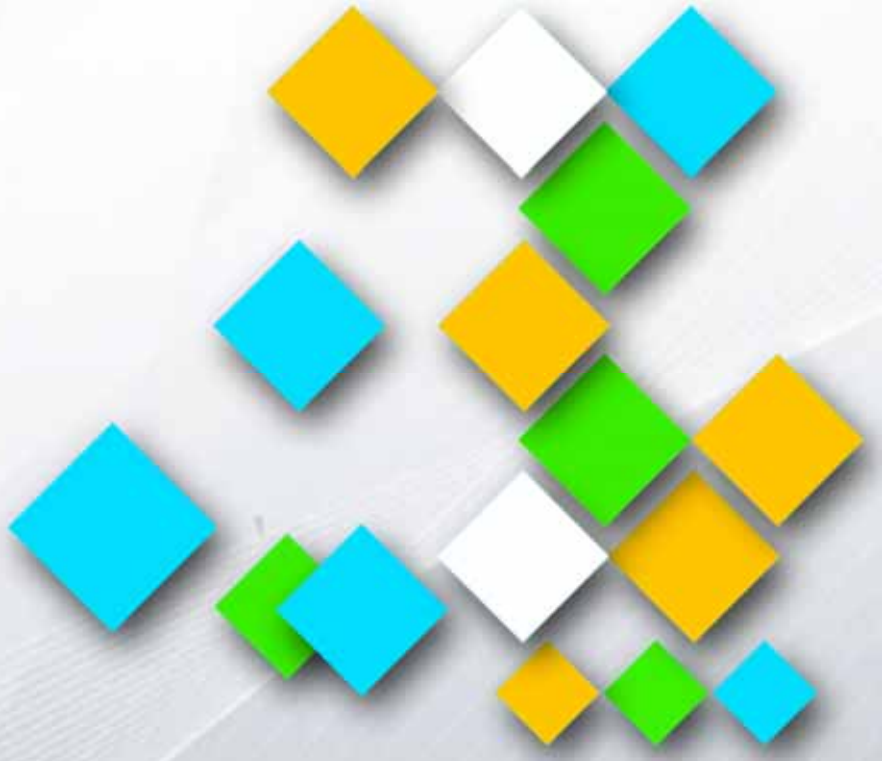
High degree informatization

Set up production information collection, storage, reporting and information network system, real-time monitoring of production data, effectively reduce the labor intensity and improve efficiency.

MPFM

Product categories

Type	Use
Fixed type	Single well measurement
	processing station measurement
Movable type	Movable measurement
Measurement parameter	Single phase measurement
	Two phase measurement
	Multi-phase measurement



MPFM

Fixed type single well measurment

MPFM

Fixed type processing station measurement



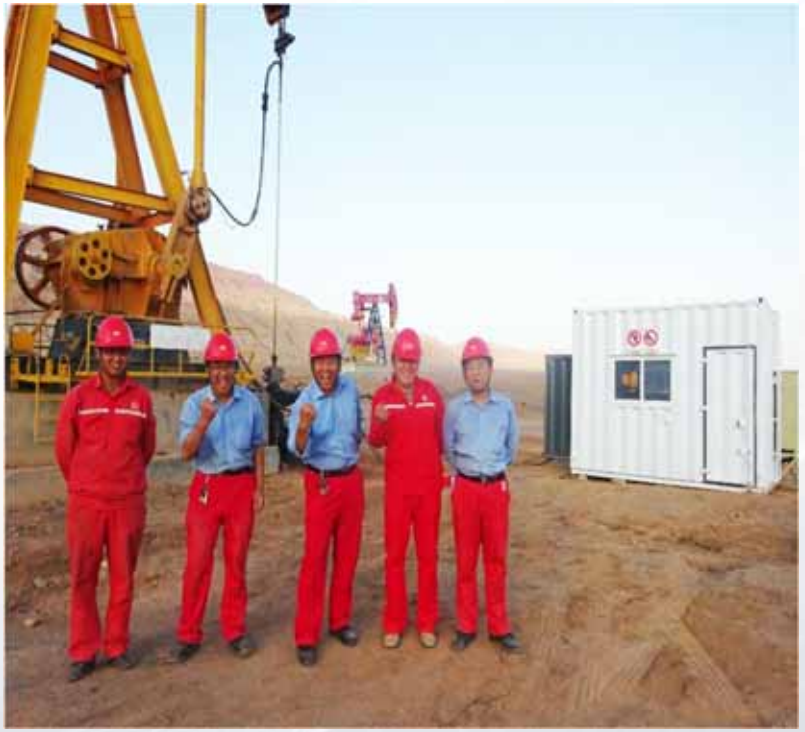

MPFM

Movable measurement

Oilfield site case

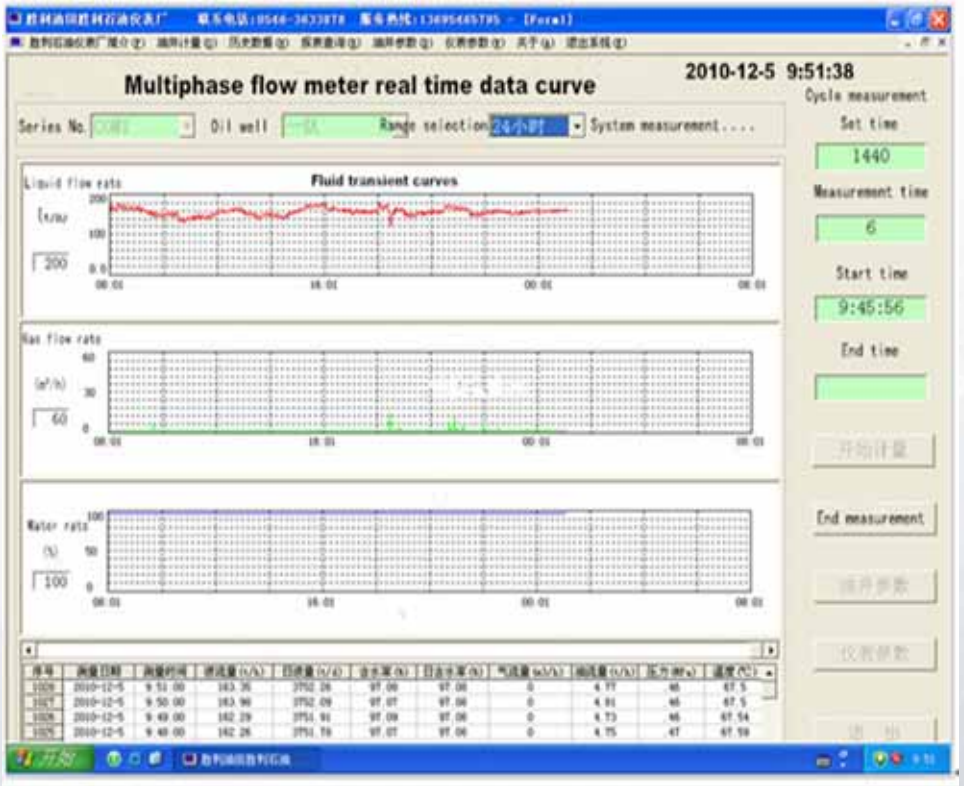
Oilfield site case

MPFM measurement service

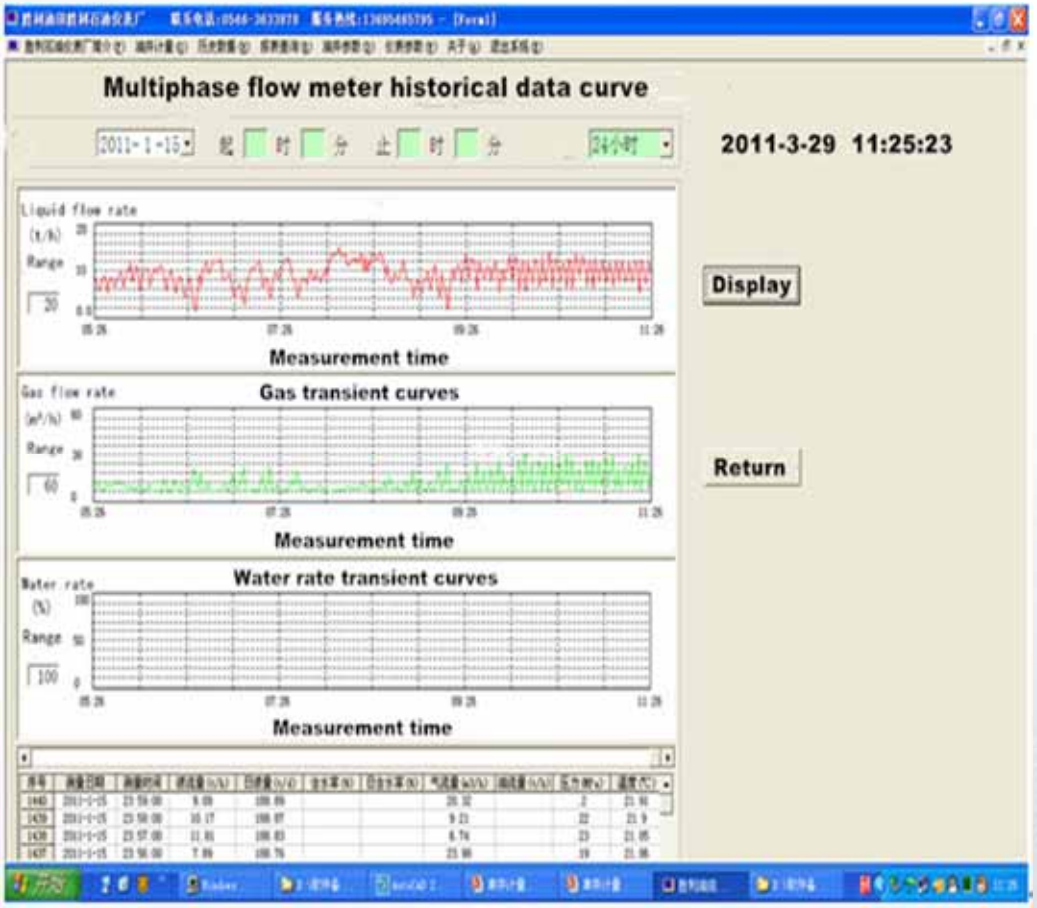


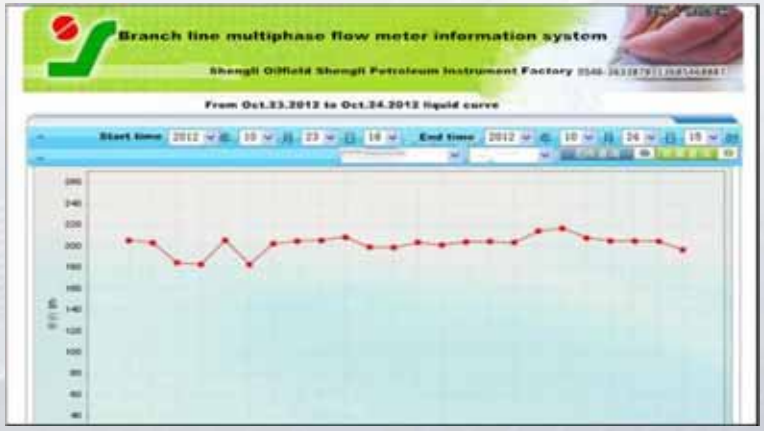
Intelligent measurement management system

Data query system



Intelligent measurement management system





03

Quality guarantee

Quality guarantee

Our company has established a perfect quality guarantee system, with testing equipment complete of physical and chemical laboratory, to ensure the excellent performance of products delivery.

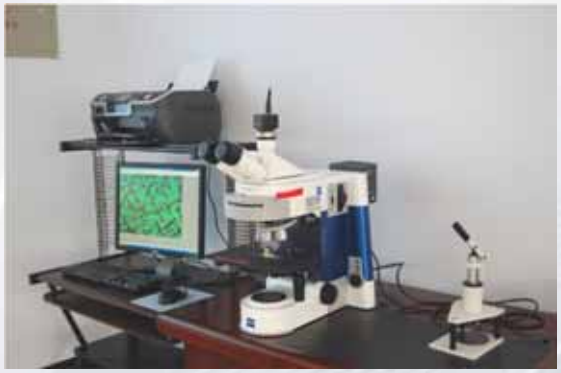
Quality guarantee

The corner of the lab

System test bench

System test bench

Computer screen display hydraulic universal testing machine



Metallographic microscope

Ultrasonic flaw detector

Quality guarantee

After-sales service and guarantee

Personal and efficient service team

Enterprises will establish an office at the location of the user, construct rapid responsive and treatment high efficient after-sales service team, to ensure that the customers get timely and effective treatment in the process of using products any problem.

Installation and commissioning services

We provide product installation and integration, the system function test, parameter configuration, system communication testing services, and we are the responsible for equipment on-site test run.

Visit customers regularly

The company will send staff to the on-site or contact through telephone to keep the system of regular visits to customers. We are initiative to understand the scence work situation of equipment, to ensure the equipment running normally, and customer satisfaction.

Enterprises formulate on-site personnel training service plan, will provide client on-site operating personnel with several classes of on-site training.To ensure that operators can quickly grasp the product installation, use and maintenance method.

Accessories supply

All the year round we stock with 300-2000 kinds of wearing parts

04

Test report and approve

Core customers

MPFM test report(Chinese original version)

shengli petroleum administration bureau measurement test institute

测 试 报 告

(NO：2012090112)

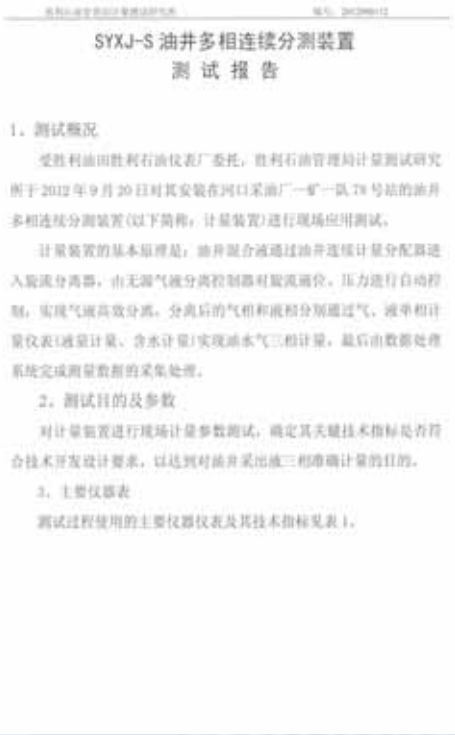
测试项目：SYXJ-S 油井多相连续分测装置

委托单位：胜利油田胜利石油仪表厂

测试日期：2012 年 09 月 20 日

胜利石油管理局计量测试研究所

2012 年 09 月 20 日



SYXJ-S 油井多相连续分测装置

测 试 报 告

1、测试概况

受胜利油田胜利石油仪表厂委托，胜利石油管理局计量测试研究所于 2012 年 9 月 20 日对其安装在河口采油厂一矿一队 78 号站的油井多相连续分测装置(以下简称：计量装置)进行现场应用测试。

计量装置的基本原理是：油井混合液通过油井连续计量分配器进入旋流分离器，由无源气液分离控制器对旋流液位、压力进行自动控制，实现气液高效分离，分离后的气相和液相分别通过气、液单相计量仪表(液量计量、含水计量)实现油水气三相计量，最后由数据处理系统完成测量数据的采集处理。

2、测试目的及参数

对计量装置进行现场计量参数测试，确定其关键技术指标是否符合技术开发设计要求，以达到对油井采出液三相准确计量的目的。

3、主要仪器表

测试过程使用的主要仪器仪表及其技术指标见表 1。

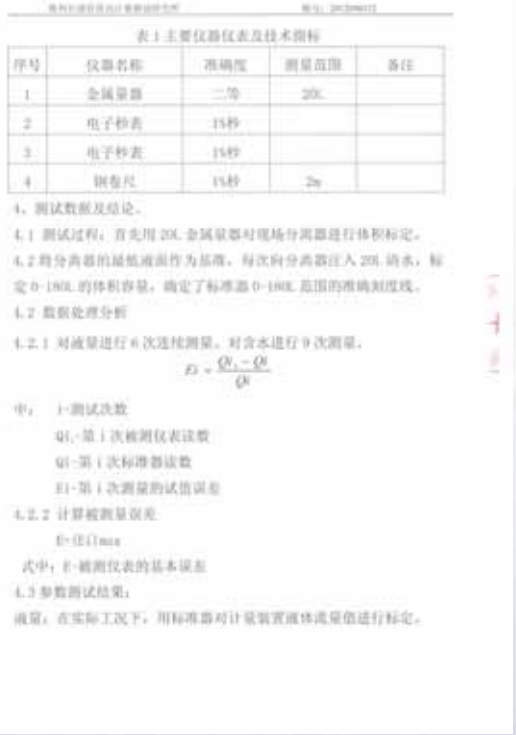


表 1 主要仪器仪表及技术指标

序号	仪器名称	准确度	测量范围	备注
1	金属量器	二等	20L	
2	电子秒表	1S秒		
3	电子秒表	1S秒		
4	钢卷尺	1S秒	2m	

4、测试数据及结论。

4.1 测试过程：首先用 20L 金属量器对现场分离器进行体积标定。

4.2 将分离器的最低液面作为基准，每次向分离器注入 20L 清水，标定 0-180L 的体积容量，确定了标准器 0-180L 范围的准确刻度线。

4.2 数据处理分析

4.2.1 对液量进行 6 次连续测量，对含水进行 9 次测量。

$$E1 = \frac{Q1_i - Q1}{Q1}$$

中，i-测试次数

Q1i-第 i 次被测仪表读数

Q1-第 i 次标准器读数

E1-第 i 次测量的试值误差

4.2.2 计算被测量误差

E=E1max

式中：E-被测仪表的基本误差

4.3 参数测试结果：

液量：在实际工况下，用标准器对计量装置液体流量值进行标定。

MPFM test report (translate version)

shengli petroleum administration bureau measurement test institute

标定结果，液体流量基本误差为 1.6%，优于设计指标<3%，符合设计要求。（测量结果见附表 1）

含水，采用 GB/T9929-88 原油含水量测定法（蒸馏法）取样化验与计量装置计量含水进行比对，比对结果：含水基本误差为 2.71%，优于设计指<5%，符合设计要求。（见附表 2）

气量：对 1.5 级涡街流量计进行计量检定，检定结果最大误差为 1.5%，检定合格（检定报告见附表 3）

4.4 由测试结果可知，计量装置符合设计要求。

4.5 该计量装置较好地解决了油井多相计量的难题，实现了油井自动化计量，保证了计量精度。

五、测试人：

六、审核人：

七、签发人：

胜利石管理局计量测试研究所

2012 年 9 月 20 日

附表 1：

油水混合流量测试数据表

标准容器型号：YQ04-2

测试日期：2012.9.20

测试地点：采油一矿一队 79 号计量站

油井号：668 648-5 648-12

序号	标准容器量值 m³	计量装置量值 m³	计值误差 %	基本误差 %	备 注
1	0.1500	0.1517	0.0017	1.13	
2	0.1500	0.1492	-0.0008	-0.53	
3	0.1500	0.1510	0.0010	0.67	
4	0.1500	0.1520	0.0020	1.33	
5	0.1500	0.1485	-0.0015	-1.00	
6	0.1500	0.1524	0.0024	1.60	
7	0.1500	0.1479	-0.0021	-1.42	
8	0.1500	0.1533	0.0033	2.42	
9	0.1500	0.1516	0.0016	1.10	

附表 2：

含水测试数据表

序号	计量装置含水%	化验含水%	基本误差%	井号
1	11.72	11.4	+0.61	668
2	11.36	11.5	+1.00	
3	13.35	12.9	2.71	
4	81.77	81.4	0.88	648-5
5	84.32	85.1	-1.29	
6	83.45	82.8	0.96	
7	79.78	80.7	1.16	648-12
8	92.07	82.9	0.22	
9	89.89	92.1	-1.96	

MPFM test report (translate version)

shengli petroleum administration bureau measurement test institute

Shengli petroleum administration bureau measurement test institute No.2012090112

Test report

(No: 2012090112)

Test item: Non-radioactive multiphase flow meter

Entrust unit: Shengli Oilfield Shengli Petroleum Instrument Factory

Test date: 20th Sep. 2012

Shengli petroleum administration bureau measurement test institute

20th Sep.2012

Shengli petroleum administration bureau measurement test institute No.2012090112

Non-radioactive multiphase flow meter

Test report

1.Test overview

Entrusted by Shengli Oilfield Shengli Petroleum Instrument Factory, On 20th Sep.2012 Shengli petroleum administration bureau measurement test institute proceed on-site application test to the non-radioactive multiphase flow meter (Abbreviation:MPFM) that installed Hekou oil production plant metering station No.78.

The measurement priciple of the MPFM: Liquid from oil well realizes the efficient separation of gas liquid two phase flow through gas-liquid cyclone separator. The gas liquid two-phase liquid level and pressure difference are controlled by the gas-liquid separation controller to ensure that the cyclone separator of gas and liquid separation's effect reaches the best. The gas and liquid after separation realizes accurate measurement of liquid volume, water cut and air volume through mass flow meter and vortex gas flow meter respectively. Field pressure data can be measured by pressure transmitter.

2.The test purpose and parameter

For MPFM,conduct on-site measurement parameter test,ensure that the key technical index whether conform to technical development design requirement,in order to achieve the purpose of oil well produced liquid three-phase accurate measurement.

3.The main instrument

In the testing process used main instrument and technical index as follow sheet 1

Shengli petroleum administration bureau measurement test institute No.2012090112

Sheet 1 main instrument and technical inses

Item	Name of instrument	Accurate	Scope of measurement	remarks
1	Metal tank	Second-class	20L	
2	Crossmetro	1% second		
3	Crossmetro	1% second		
4	Steel tape	1% second	20m	

4.Measurement data and conclusion

Test procedure: Firstly use 20L metal tank to calibrate volume of the on-site separator.

4.1 put the minimum level of the separator as benchmark,20L pure water inject to the separator every time ,calibrate 0-180L volume capacity,to determine the standard metal tank range of 0-180L accurate scale.

4.2 data processing and analysis

4.2.1 For liquid,proceed to 6 times continuous measurement.For water-cut,proceed to 9 times measurement.

$$Ei = \frac{Qi - Qs}{Qs}$$

In the formula

i : test times

Qi : the i time the meter is tested reading

Qs : the i time standard metal tank reading

Ei: the i time measurement indication error

4.2.2 Calculated by measuring error

E=(Ei)max

MPFM test report (translate version)

shengli petroleum administration bureau measurement test institute

In the formula

E : the basic error of the measured instrument

4.3 Parameter test results

Liquid: under the actual working condition,use standard metal tank to calibrate MPFM liquid flow value.

Calibration result: liquid flow basic error is 1.6%, superior to the design index ≤ 3%, comply with the design requirement.(measurement result see attached table 1)

Water cut : adopt GB/T8929-88 crude water cut measurement method(distillation method), sampling test and compare to MPFM measurement water cut.Compare result :water cut basic error is 2.71%, superior to the design index ≤ 5%,comply with the design requirement.(measurement result see attached table 2)

Gas:for the grade 1.5 vortex flow meter,proceed to calibrate,the result of the calibration maximum error is 1.35%, calibration qualified(measurement result see attached table 3)

4.4 By the test result : the MPFM comply with the design requirement.

4.5 This MPFM resolve the difficult problem of oilwell multiphase measurement.And realize oilwell automatic measurement,ensure the measuring accuracy.

5.Tester: Guoqing Tang Hanli Zhong Lijuan Chen

6.Auditor : Aiping Dong

7.Issuer : Yanhua Cheng

Shengli petroleum administration bureau measurement test institute

20th Sep. 2012

Attached table 1:

Oil water mixture liquid test data table

Standard metal tank model : F0204-7

Test date: 20th Sep.2012

Test site: oil production plant metering station No.78

Oil well No.: 648 648-5 648-13

Item	Standard metal tank metering value(t)	MPFM metering value(t)	Indication error(%)	Basic error(%)	Remarks
1	0.1500	0.1517	0.0017	1.13	Liquid scope (46-60)t/d
2	0.1500	0.1492	-0.0008	-0.53	
3	0.1500	0.1510	0.0010	0.67	
4	0.1500	0.1520	0.0020	1.30	Liquid scope (20-25)t/d
5	0.1500	0.1485	-0.0015	-1.00	
6	0.1500	0.1524	0.0024	1.60	
7	0.1500	0.1479	-0.0021	-1.42	Liquid scope (3-10)t/d
8	0.1500	0.1513	0.0013	0.87	
9	0.1500	0.1516	0.0016	1.10	

Attached table 2:

Water cut test data table

Item	MPFM water cut (%)	Test water cut (%)	Basic error	Well No.
1	11.33	11.4	-0.61	648
2	11.38	11.5	-1.00	
3	13.25	12.9	2.71	
4	61.77	61.4	0.60	648-5
5	64.32	65.1	-1.20	
6	63.40	62.8	0.96	
7	79.76	80.7	1.16	648-13
8	83.07	82.9	0.21	
9	80.49	82.1	-1.99	

Customer satisfaction letter(Chinese original version)

Sinopec shengli oilfield gudao oil extraction plant


单井——计量间组合计量方式（油井多相连续分测装置）

验收意见

Approve

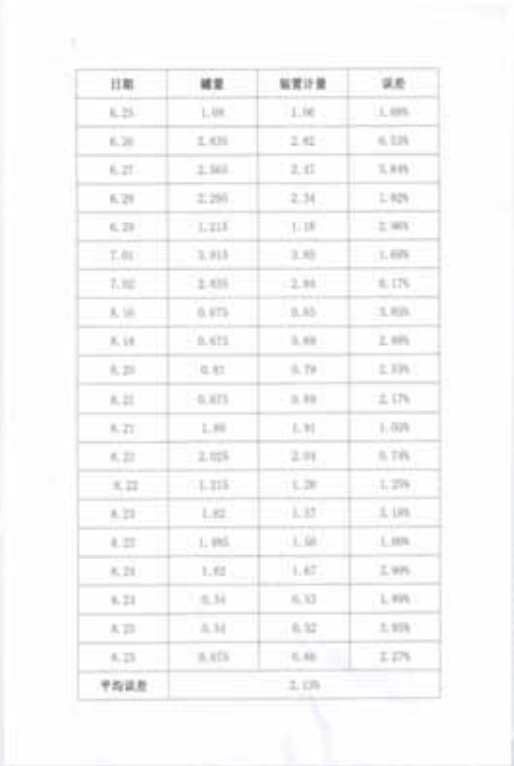
CNPC huabei oilfield

用户推荐意见

胜利油田胜利石油仪表厂生产的 SYJ-5-GDJ 油井油气水连续分测装置（井口式单井计量装置），自 2014 年 6 月在我采油四厂 #721 台子安装使用以来，取得了良好的效果，有效解决了油井常规计量方式中存在的诸多问题，能够及时、连续、准确记录单元区块油井的产量变化，实现单井的精细化管理。

该装置的应用，在以下几方面表现出较为优越的性能：使用安全。相比校玻璃管量油的容积法量油方式，该装置因不涉及压力容器，减少了安全隐患，使用更为安全，减少了安全事故的发生；装置操作简便易行，运行安全可靠，因装置工艺设计严密，可动部件及有源自动化仪表少，相对使用寿命长，故障率低，现场维护工作量小，运行可靠。人机对话，简单易学，适合于现场工人操作。装置采取了与采油流程相匹配的管道结构，从而实现了连续计量，可根据需要对重点观测油井的生产状况进行全天候全自动连续跟踪掌握；装置集成应用了节、阀、旋流、重力控制分离等先进技术，从而保证了气、液两相的高效分离及精确测量。同时，装置还可实现数据传输，及连续运行流量异动报警功能，当解间流量变化超出设置值时会及时报警，以提醒井查可能的故障或原因。

经过三个月的现场使用，效果良好，计量数据如下：



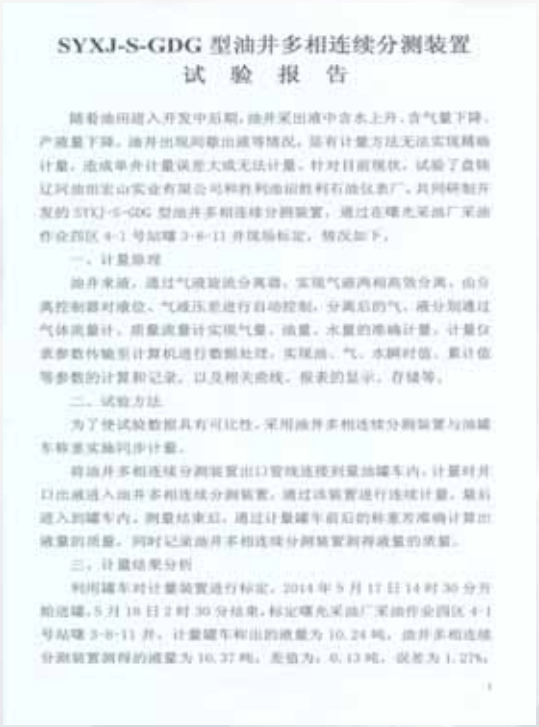
日期	罐量	装置计量	误差
6.25	1.08	1.06	1.89%
6.26	2.835	2.82	0.53%
6.27	2.365	2.43	2.74%
6.28	2.295	2.34	1.92%
6.29	1.215	1.18	2.96%
7.01	3.915	3.85	1.69%
7.02	2.835	2.84	0.17%
7.10	0.675	0.65	3.85%
7.18	0.675	0.69	2.38%
7.20	0.81	0.79	2.53%
7.22	0.675	0.69	2.17%
7.23	1.89	1.91	1.05%
7.25	2.025	2.04	0.74%
7.27	1.215	1.20	1.25%
7.28	1.62	1.57	3.18%
7.29	1.485	1.50	1.00%
7.31	1.62	1.67	2.99%
8.03	0.54	0.53	1.89%
8.05	0.54	0.52	3.85%
8.25	0.675	0.66	2.27%
平均误差		2.13%	

通过这段时间现场的试验和应用，我们认为该装置操作简单，运行稳定，可靠性高，非常适合我井区使用，操作人员稍加培训就可独立操作。该装置有效解决了低产井、间歇井，偏远井及难以计量井在常规油井采出液计量中存在的无法计量或难以计量的问题，完全达到目前对油井计量的标准要求，优点明显，效益显著，是替代当前分离器计量的优选产品，我们建议在我区块全面推广使用，以提升油田油井计量管理水平。

2014 年 8 月 25 日

Approve

CNPC Liaohe oilfield Shuguang oil extraction plant



SYXJ-S-GDG 型油井多相连续分测装置
试 验 报 告

随着油田进入开发中后期，油井采出液中含水上升，含气量下降，产液量下降，油井出现间歇出液等情况。现有计量方法无法实现精确计量，造成单井计量误差大或无法计量。针对目前现状，试验了盘锦辽河油田宏山实业有限公司和胜利油田胜利石油仪表厂，共同研制开发的 SYXJ-S-GDG 型油井多相连续分测装置，通过在曙光采油厂采油作业四区 4-1 号站曙 3-6-11 井现场标定，情况如下：

一、计量原理

油井来液，通过气液旋流分离器，实现气液两相高效分离，由分离控制器对液位、气液压差进行自动控制，分离后的气、液分别通过气体流量计、质量流量计实现气量、油量、水量的准确计量，计量仪表参数传输至计算机进行数据处理，实现油、气、水瞬时值、累计值等参数的计算和记录，以及相关曲线、报表的显示、存储等。

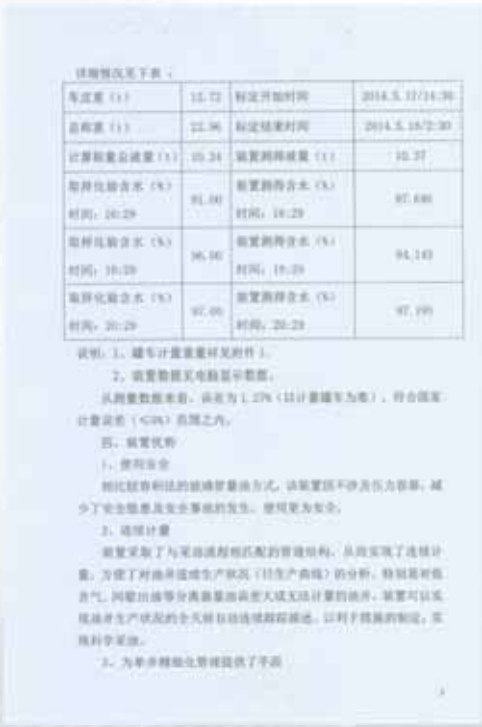
二、试验方法

为了使试验数据具有可比性，采用油井多相连续分测装置与油罐车称重实施同步计量。

将油井多相连续分测装置出口管线连接到装油罐车内，计量时井口出液进入油井多相连续分测装置，通过该装置进行连续计量，最后进入到罐车内，测量结束后，通过计量罐车前后的标重方准确计算出液量的质量，同时记录油井多相连续分测装置测得液量的质量。

三、计量结果分析

利用罐车对计量装置进行标定，2014 年 5 月 17 日 14 时 30 分开始进罐，5 月 18 日 2 时 30 分结束，标定曙光采油厂采油作业四区 4-1 号站曙 3-6-11 井，计量罐车标出的液量为 10.24 吨，油井多相连续分测装置测得的液量为 10.37 吨，差值为：0.13 吨，误差为 1.27%。



详细情况见下表：

车皮重（t）	12.72	标定开始时间	2014.5.17/14:30
总称重（t）	22.96	标定结束时间	2014.5.18/2:30
计算标重总液量（t）	10.24	装置测得液量（t）	10.37
取井化验含水（%） 时间：16:29	91.80	装置测得含水（%） 时间：16:29	87.686
取样化验含水（%） 时间：16:29	96.80	装置测得含水（%） 时间：16:29	94.143
取样化验含水（%） 时间：20:29	97.05	装置测得含水（%） 时间：20:29	97.195

说明：1、罐车计量重量详见附件 1。

2、该装置能直观电脑显示数据。

从测量数据来看，误差为 1.27%（以计量罐车为准），符合国家计量误差（<3%）范围之内。

四、装置优势

1、使用安全

相比较容积法的玻璃管量油方式，该装置因不涉及压力容器，减少了安全隐患及安全事故的发生，使用更为安全。

2、连续计量

装置采取了与采油流程相匹配的管道结构，从而实现了连续计量，方便了对油井连续生产状况（日生产曲线）的分析，特别是对低含气、间歇出油等分离质量油品差大或无法计量的油井，装置可以实现油井生产状况的全天候自动连续跟踪描述，以利于精确的制定，实施科学采油。

3、为单井精细化管理提供了平台

装置集成应用了管、阀、旋流、重力控制分离等先进技术，从而确保了气、液两相的高效分离及精确计量，装置采用计算机分析处理系统对现场计量仪表采集参数进行数据处理，对液、油、气、水、温度、压力等相关参数自动生成各种曲线和报表，另外还可根据需要实现单井定时间点，定时间段，全天候连续自动跟踪计量，为单井精细管理提供了准确及时的第一手资料。

4、动态监控报警功能

装置具有连续运行液量异动报警功能，当解间流量变化超出设置值时会及时报警，以便解井排查出现的故障或原因。

5、操作简单，运行可靠

装置操作系统采用人性化设计，人机对话，简单易学，适合于现场工人操作。另外，因装置工艺设计严密，可动部件及有源自动化仪表少，维护工作量小，装置使用寿命长，运行可靠。

经过试验，该装置操作简单，运行较稳定，该装置可解决低产井、间歇井、偏远井等难计量的问题。

采油作业四区　　生产科

二〇一四年五月二十八日

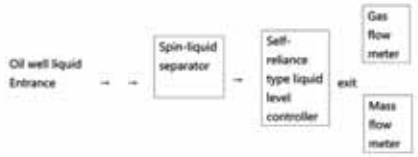
Approve

CNPC Liaohe oilfield Shuguang oil extraction plant

Single oil well---room combination of metering
(Oil Well Multiphase Continuous Measuring Device)

Acceptance opinion

Oil Well Multiphase Continuous Measuring Device (specification: SYXJ-5-GFB) design new measurement nodes,change well station measurement,to explore new methods to minimize measurement errors.It can realize continuous and accurate measurement of metering station.Using time from Jan.2012 to Dec.2.13. So far this device use in Gudao extraction plant 8 sets. They correspond to the metering station: 2-3-1 station,2-3-2station,2-2station,2-9station,2-6station,3-1station
This device adopts: swirl flow seperation+flow meter,contents chart as follow:



1. The device total liquid measurement experiment and conclusion, after a long time of comparison and analysis of experimental data. for total liquid measurement we have conclusion as follows:
1)The device' s total liquid metering stability well and high repeatability .Measuring maximum fluctuations is no more than 1%
2)The device total liquid metering accuracy highly, the maximum error is less than 1.5%,advantage obviously
2.The device comprehensive water cut measurement experiment and analysis result:
After a long time of comparison and analysis of experimental data, we have the following conclusion for the total liquid water cut measurement. the device on comprehensive water cut metering accuracy better than 0.1%

3.The conclusion of device for gas liquid separation effect experiment and data analysis:
Continuously observe and record the density of mass flowmeter instrument display data, analysis and calculation of the density values show that the equipment of the gas-liquid separation efficiency, to meet technical requirements of gas mixture containing less than 5%.

Shengli oilfield Gudao oil extraction plant
Mar.1.2014

Approve (translate version)

CNPC huabei oilfield

User recommendations

The SYXJ-5-GDJ oil gas water continuous measuring device(single oil well metering device) produced by Shengli Oilfield Instrument Co., Ltd. Since JUN.2014 using in Yijun oil extraction plant WT21,achieved good result.It sovles effectively to many problems that exist in the single oil well routine measurement method. It can record timely,continuously,accurately for single oil well's change of liquid,oil,gas production. It realized fine management of single oil well.

Application of the device, showed better performance in the following areas :

1. Use safely: Compared with glass tube volume of oil, which does not involve pressure vessels, it reduces security risks, device operate simply, operation safely and reliable.

2. Because the device process design closely, moving parts and original automation instrument less. Relatively it is long service life, low failure rate, site maintenance workload small, reliable operation.

3. The man-machine dialogue Man-machine dialogue, easy to learn, suitable for field workers operation, the device to match the production process of pipeline structure, so as to realize the continuous measurement, according to the needing to focus on observation oil wells all-weather automatic continuous production status of the following description.The device integrated application of the pipe, valve, swirl flow, gravity control separation and other advanced technology, so as to ensure the efficient separation of gas and liquid two phase precise measurement.

4. Meanwhile, the device can also realize data transmission, and alarm functions for continuous fluid volume changes.When the setting of the instantaneous flow change,it can alarm timely, to remind the possible breakdown or reason.

After three months of site application, good results, measurement datas are as follows :

Date	tank amount	device metering	error
6.25	1.55	1.56	1.00%
6.26	2.835	2.81	0.57%
6.27	2.565	2.47	3.64%
6.28	2.295	2.34	1.92%
6.29	1.215	1.18	2.96%
7.01	3.915	3.85	1.69%
7.02	2.835	2.81	0.17%
7.14	0.675	0.65	3.85%
7.18	0.675	0.69	2.08%
7.2	0.81	0.79	2.53%
7.21	0.675	0.69	2.17%
7.22	1.89	1.91	1.05%
7.23	2.025	2.01	0.74%
7.24	1.215	1.20	1.25%
7.27	1.62	1.67	3.18%
7.28	1.485	1.5	1%
7.29	1.62	1.67	3.09%
7.29	0.54	0.53	1.89%
7.30	0.54	0.52	3.85%
7.31	0.675	0.66	2.27%
average error			1.72%

Approve letter(translate version)

CNPC Liaohe oilfield Shuguang oil extraction plant

User opinion

As oilfield entered middle and later periods of the development, the oil well water cut rising in produced liquid and air content decreased, the production fluid decreased, and the well result in intermittent liquid.So the original measuring method cannot achieve precise measurement, single-well metering error caused by big or unable to measure. In view of the present situation, we test SYXJ - 5 - GDG Oil Well Multiphase Continuous Measuring Device of Shengli Oilfield Instrument Co., Ltd. Through in shuguang oil production plant operation four area 4-1 station department 3-8-11 oil well field calibration, situation as follows:

1. Measure principle:

Liquid from oil well realizes the efficient separation of gas liquid two phase flow through gas-liquid cyclone separator. The gas liquid two-phase liquid level and pressure difference are controlled by the gas-liquid separation controller to ensure that the cyclone separator of gas and liquid separation's effect reaches the best. The gas and liquid after separation realizes accurate measurement of liquid, water cut and gas through mass flow meter and vortex gas flow meter respectively. The site pressure and temperature data measured by corresponding transmitter.

2. Test ways:

In order to make the test data are comparable,we adopt the way of Oil Well three-phase continuous measuring device and oil tank truck weighing synchronous measurement.

We put the outlet line of Oil Well three-phase continuous measuring device to connect to oil tank truck.Wellhead liquid into the device, through device continuous measuring, finally into the oil tank truck

After the measurement, By measuring tank weighing before and after difference, to calculate accurately the amount of liquid quality .At the same time record the amount of liquid quality of Oil Well three-phase continuous measuring device.

3. Measurement results

Oil tank truck		Oil well device	
wagon weight (t)	12.72	Start time	May.17.2014/14:30
Total weight(t)	22.96	End time	May.18.2014/2:30
Calculations weighing total liquid(t)	10.24	Device metering liquid(t)	10.37
Sampling test water cut(%) 16:29	91.00	Device metering water(%)	87.646
Sampling test water cut(%) 18:29	96.00	Device metering water(%)	94.143
Sampling test water cut(%) 20:29	97.00	Device metering water(%)	97.196

Judging from the measurement data,based on the measurement of oil tank truck,erro is 1.27%, it comply with the national measurement error(≤5%)

4. Equipment advantages:

1) using safely

2) continuous measuring

3) provides a way of fine management for single we

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Thanks for Attention