

◎ 中文核心期刊  
◎ 中国科技核心期刊  
◎ 中国期刊全文数据库收录期刊

◎ 中国石油文献数据库收录期刊  
◎ 美国《化学文摘》(CA) 收录期刊  
◎ 俄罗斯《文摘杂志》(AJ) 收录期刊

ISSN 1000-8241  
CN 13-1093/TE  
CODEN YOCHEP

2015.07  
第34卷  
07

# 油气储运



*Oil & Gas Storage and Transportation*



ISSN 1000-8241



07>

中国石油学会石油储运专业委员会会刊  
主办：中国石油天然气股份有限公司管道分公司

9 771000 824156



# 油气储运

## YOUQI CHUYUN

2015年7月第34卷第7期  
(月刊·1977年创刊 总第319期)

主编:艾慕阳 副主编:关中原

主管单位 中国石油天然气集团公司

主办单位 中国石油天然气股份有限公司  
管道分公司

编辑出版 《油气储运》杂志社

通信地址 (065000)河北省廊坊市金光道51号

编辑部 0316-2177193 2177197

2176753

广告部 0316-2177392

出版部 0316-2177392

发行部 0316-2177392

传真 0316-2177392

网址 yqcy.paperopen.com

发行范围 公开发行

国内发行 河北省廊坊市邮政局

国外发行 中国出版对外贸易总公司  
(100011)北京782信箱

印刷 廊坊市恒泰印务有限公司

出版日期 2015年7月25日

中国标准连续出版物号 ISSN 1000-8241  
CN 13-1093/TE  
国际期刊 CODEN 码 YOCHEP

邮发代号 18-89

广告经营许可证号 1310004000002

国内定价 25.00 元/册

国外定价 25.00 美元/册

责任编辑 李在蓉

装帧设计 曹立立

封面题字 启 功

封面摄影 刘 燃

# 目 次

## 前瞻与综述

0685 成品油管网调度优化研究进展 梁永图,张浩然,邵奇

0689 管道补口热收缩带粘接质量超声检测技术及其进展 王维斌

0694 油气管道环焊缝缺陷内检测技术现状与展望

王婷,杨辉,冯庆善,等

0699 油气管道废弃处置技术及其应用 徐华天,马宏伟,康叶伟,等

## 输送与储存

0704 埋地油罐高液位阀关阀运动学分析及数值模拟

张世富,宋仕强,张起欣,等

0709 天然气运输方式的适用范围与经济性比较

万方敏,解东来

## 投产与运行

0714 一种基于剩磁效应的管道缺陷检测方法 杨理践,崔婉婷,刘博,等

0719 管道弱磁检测技术的有限元仿真 刘博,刘斌,杨理践,等

0723 油气管道通径检测器三通检测技术 李晓龙,张仕民,赵春华,等

0727 管道弱磁应力内检测装置的设计与应用 伍奕,荣军

0732 非高斯噪声背景下的管道泄漏微弱信号自适应检测

费凡,赵敏,董绍华,等

0737 基于主成分分析和神经网络的管道泄漏识别方法

刘啸奔,张宏,夏梦莹,等

0741 罐底板缺陷漏磁场三维有限元分析 温兴柔,赵力伟

0746 天然气管道泄漏声波的混沌特性 王洪超,陈瑞东,王卫星

0751 管道壁厚及焊缝缺陷激光超声检测技术 杨依光,赵锋,王飞,等

0755 基于差压法的清管器远程在线跟踪定位 王海明,刘博,邱红辉,等

0759 多工况下基于RBF神经网络的管道泄漏检测

龚骏,税爱社,包建明,等

# Oil & Gas Storage and Transportation

0764 油气管道通信光缆的定位检测方法 沈光霖, 李青春, 庞笑, 等

0768 基于远场涡流检测技术的海管立管内检测方案 杨巍, 马洪新, 郭斌, 等

0771 包裹防腐层的油气管道中的剪切周向导波 王福宾, 周成文, 曹永利, 等

0775 基于磁致伸缩效应的管道裂纹检测器机械结构的设计 藏延旭, 金莹, 陈崇祺, 等

0779 机场油库油品泄漏监测的无线传感器节点设计 陈祥勇

0784 基于双 Duffing 振子的天然气管道泄漏检测系统 刘四运, 贾伯早

## 一线报道

0788 洞库贴壁油罐底板实时探漏技术 杨金林, 杜明忠, 张方林, 等

0791 塘燕复线泄漏检测系统检测精度改进方法 刘喆, 周建伟, 施志雄, 等

0795 铁大线与新大线水力联运的若干问题 王德云, 王芳

## 《油气储运》杂志

### 第九届编委会

主任: 姚伟

副主任: 李伟林 赵丑民 艾慕阳

顾问(以汉语拼音为序):

李鹤林 罗平亚 严大凡 杨祖佩

委员(以汉语拼音为序):

陈健峰 陈开彬 陈世一 陈向新  
崔涛 樊栓狮 冯耀荣 高发连  
高庭禹 宫敬 郭揆常 韩忠晨  
何利民 敬加强 李长俊 李利民  
梁成浩 刘扬 路民旭 孟繁春  
闵希华 钱建华 沈本贤 石永春  
孙春良 谭羽非 全兴华 王力戎  
王寿喜 王树立 王卫国 王小平  
吴长春 吴明 徐昌学 负军贤  
张成伟 张劲军 张来斌 张伟  
张伟明 张文伟 张秀杰 章泽华  
赵堂玉 赵宗昌 钟太贤 朱天升

秘书长: 姜宝良

副秘书长: 关中原(兼)

**简讯** 下期要目(0698) 撰稿指南(0703) 本刊链接(0767)



# **Oil & Gas Storage and Transportation**

**Monthly, Started in 1977**

**Editor-in-chief:** AI Muyang

**General Director:** GUAN Zhongyuan

**Oil & Gas Storage and Transportation**

Journal Agency

No.51, Jinguang Rd., Langfang City, Hebei Province, 065000, PRC

**Tel:** +86(316)2176173

**Fax:** +86(316)2177392

**CODEN:** YOCHEP

**ISSN 1000-8241**

**CN 13-1093/TE**

[yqcy.paperopen.com](http://yqcy.paperopen.com)

**Managing Editor:** LI Zairong

**English Editor:** LIU Chunyang  
LIU Bo

**Technical Editor:** CAO Lili

**Cover Inscription:** QI Gong

**Cover Photographer:** LIU Ran

**Publishing Date:** July 25, 2015

**Annual Subscription Rates:**

**China RMB** ¥300

**Overseas US \$** 300

**Overseas Distributor:**

China Publisher External Trading Corporation  
PC Box 782, Beijing, 100011, PRC

# **CONTENTS**

## **FORWARD-LOOKING & OVERVIEW**

0685 Progress in the study on scheduling optimization of products pipeline network LIANG Yongtu, ZHANG Haoran, SHAO Qi

0689 Ultrasonic testing techniques for the binding quality of heat shrinkable tapes used in the field coating for welded joints of pipeline WANG Weibin

0694 Current status and prospect of inline inspection technologies for defects in girth weld of oil and gas pipeline WANG Ting, YANG Hui, FENG Qingshan, et al

0699 Technologies and cases of oil and gas pipeline abandonment XU Huatian, MA Hongwei, KANG Yewei, et al

## **TRANSPORTATION & STORAGE**

0704 Kinematics analysis and numerical simulation of high level valve shutoff of buried oil tank ZHANG Shifu, SONG Shiqiang, ZHANG Qixin, et al

0709 Application scope and economical comparison of natural gas transportation WAN Fangmin, XIE Donghai

## **COMMISSIONING & OPERATION**

0714 A pipeline defect detection technique based on residual magnetism effect YANG Lijian, CUI Wanting, LIU Bo, et al

0719 Finite element simulation of weak magnetic detection technology for pipelines LIU Bo, LIU Bin, YANG Lijian, et al

0723 Tee detection with caliber detector for oil and gas pipeline LI Xiaolong, ZHANG Shimin, ZHAO Chunhua, et al

0727 Design and application of weak magnetic stress inline inspection device for pipeline WU Yi, RONG Jun

0732 Adaptive detection of weak signals of pipeline leakage under background of non-Gauss noises FEI Fan, ZHAO Min, DONG Shaohua, et al

0737 Pipeline leakage recognition based on principal component analysis and neural network LIU Xiaoben, ZHANG Hong, XIA Mengying, et al

0741 Three-dimensional finite element analysis of magnetic leakage field of defects of tank bottom plate WEN Xingrou, ZHAO Liwei

0746 Chaotic features of acoustic waves related to natural gas pipeline leakage WANG Hongchao, CHEN Ruidong, WANG Weixing

0751 Laser ultrasonic detection technology of pipe wall thickness and weld defects YANG Yiguang, ZHAO Feng, WANG Fei, et al

# Oil & Gas Storage and Transportation

- 0755 Remote on-line tracing and positioning of pigs based on differential-pressure method WANG Haiming, LIU Bo, QIU Honghui, et al
- 0759 Pipeline leak detection method based on RBF neural network under different working conditions GONG Jun, SHUI Aishe, BAO Jianming, et al
- 0764 Location test method of communication optical fiber cable of oil and gas pipeline SHEN Guangji, LI Qingchun, PANG Xiao, et al
- 0768 Inline inspection on riser of submarine pipeline based on remote field eddy current detection technique YANG Wei, MA Hongxin, GUO Bin, et al
- 0771 Shear circumferential guided wave in oil and gas pipeline with coating WANG Fubin, ZHOU Chengwen, CAO Yongli, et al
- 0775 Design of mechanical structure of crack detector for pipeline based on the magnetostrictive effect ZANG Yanxu, JIN Ying, CHEN Chongqi, et al
- 0779 Design of wireless sensor nodes for monitoring leakage in airport oil tankfarm CHEN Xiangyong
- 0784 Dual-Duffing-oscillator-based leakage detection system for natural gas pipeline LIU Siyun, JIA Bozao

## APPLICATION REPORT

- 0788 Real-time leak detection technology of bottom plate in cave on-wall oil tank YANG Jinlin, DU Mingzhong, ZHANG Fanglin, et al
- 0791 Precision improving method of leakage detection system for Tanggu-Yanshan Parallel Oil Pipeline LIU Zhe, ZHOU Jianwei, SHI Zhixiong, et al
- 0795 Challenges in hydrodynamic combination operation of Tieling-Dalian Crude Oil Pipeline and Xingang-Dalian Crude Oil Pipeline WANG Deyun, WANG Fang

## INTRODUCTION

Since its commencement in 1977, the exclusive Oil & Gas Storage and Transportation (OGST) Journal is dedicated to disseminating the latest scientific and technological accomplishments and advancements in oil and gas storage and transportation field. OGST is sponsored by PetroChina Pipeline Company. The main columns include forward-looking & overview, observation & focus, integrity & reliability, transportation & storage, commissioning & operation, design & construction, subsea pipeline & shipping, application report, etc.

In recent years, OGST has achieved many significant milestones, which include expanding its contents and improving its format, establishing a world-class domain website (<http://yqcy.paperopen.com>), realizing automatic treatment processes of contributions, accelerating the processing of contributions and shortening the publication time. It has been indexed by Scopus of Holand, CA and Ulrich PD of the USA, and AJ of Russia. In a joint effort with Chinese National Knowledge Infrastructure (CNKI), OGST has also implemented digital publication to expand the dissemination of excellent papers to a wider readership.

Maintaining a high standard of scientific journal publication has always been the unwavering goal of OGST. OGST will continue to strive towards excellence in reporting and transmission of scientific accomplishments and information, promoting the innovation in theory and practice, and contribute to the transfer of scientific accomplishments to productivity and development of oil and gas pipeline industry in its unique way.

# KCON® 四川精控阀门制造有限公司

国家能源局和中石油批准的旋塞阀国产化承担者

第一家通过国家级鉴定的旋塞阀制造商

唯一一家已通过中石油工业性试验的旋塞阀供应商

已在中石化和中石油油气管线上批量使用的旋塞阀制造商



## 专注于油气管线阀门的研发和制造

ISO9001, ISO14001, OHSAS18001, APIQ1, API6D, CE/PED, API607/6FA, ATEX, TS认证企业

网站: [www.kconvalve.com](http://www.kconvalve.com)

电话: 0838-6839920

邮箱: [sales@kconvalve.com](mailto:sales@kconvalve.com)

传真: 0838-6839880