



天然气工业

TIANRANQI GONGYE

2011 年第 31 卷第 3 期

(月刊·1981 年创刊 总第 209 期)

主 管 中国石油天然气集团公司

主 办 四川石油管理局

中国石油西南油气田公司

川庆钻探工程有限公司

编辑出版 天然气工业编辑部

(610051)

成都市府青路一段 3 号

主 编 冉隆辉

社 长 蒋 骥(028)86011178

总 编 居维清(028)86012712

编辑部主任 韩晓渝(028)86012718

广告发行科科长 申红涛(028)86012716

投稿网址 www.trqgy.cn

发行范围 公开发行

国内发行 成都市邮政局

国外发行 中国国际图书贸易总公司

(100044)北京 399 信箱

国外代号:M 944

照排印刷 四川懿博印务有限责任公司

出版日期 2011 年 3 月 25 日

中国标准 ISSN 1000-0976

连续出版物号 CN 51-1179/TE

CODEN TIGOE3

邮发代号 62—14

广告许可证 5101034000085

国内定价 25.00 元/本

国外定价 10.00 美元/本

责任编辑 曹 丽

装帧设计 关 洁

如有印刷、装订错误请直接与印刷单位联系

联系电话:(028)86018458

目 次

■大气田巡礼

普光高含硫气田开发关键技术 孔凡群,王寿平,曾大乾(1)

普光气田开发指标优化技术 王寿平,孔凡群,彭鑫岭,等(5)

普光气田礁滩相储层表征方法 曾大乾,彭鑫岭,刘志远,等(9)

震控储层建模方法及其在普光气田的应用 姜贻伟,刘红磊,杨福涛,等(14)

普光气田高含硫气井安全快速优质钻完井配套技术
侯树刚,刘东峰,李铁成,等(18)

普光高含硫气田特大型天然气净化厂关键技术解析
于艳秋,毛红艳,裴爱霞(22)

■地质勘探

大庆油田及其外围盆地非常规天然气资源勘探潜力
廖群山,徐会建,杨建国,等(26)

塔里木盆地库车坳陷中部构造单元划分新方案
与天然气勘探方向 徐振平,李勇,马玉杰,等(31)

川西北部河湾场气田天然气地球化学特征及其气源探讨
黄东,戴鑫,戴贤,等(37)

基于 Alford 旋转的转换波各向异性校正技术 刘红爱,马昭军,甘其刚(41)

梯度结构张量分析法在三维地震资料河道砂体预测中的应用
李一,钟广法,宋继胜,等(44)

■开发工程

考虑吸附、变形的煤层气分阶段流动模型 欧成华,梁成钢,蒋建立,等(48)

确定煤层气井合理生产压差的新思路 毛慧,韩国庆,吴晓东,等(52)

扬古伊气田 J_3k-o 超高压湿天然气藏特征及开发策略
包强,冷有恒,张李,等(56)

■钻井工程

川东地区高峰场区块气体钻井后的钻井液转换工艺
王亮,吴正权,杨兰平,等(59)

裂缝性致密砂岩气层暂堵性堵漏钻井液技术 王业众,康毅力,李航,等(63)

苏里格气田桃 7 井区水平井斜井段和水平段适用钻井液体系
崔贵涛,金祥哲,董宏伟,等(66)

■集输工程

四参数缔合模型预测酸性气体中硫的溶解度 卞小强,杜志敏,汤勇(73)

普光气田地面集输系统硫沉积问题探讨 李时杰,杨发平,刘方俭(75)

■加工利用

天然气低温分离工艺中汞的分布模拟 蒋洪,刘支强,严启团,等(80)

天然气气质变化影响乙炔生产的应对措施 郑岩,米钰林,付武华(85)

■安全环保

某集气站天然气压缩机噪声治理 陈小飞,华忠志,梁宁涛,等(89)

SIL 在天然气净化厂控制系统安全分析中的应用
夏太武,袁树海,宋彬,等(92)

■经济管理

中国天然气气质规格及互换性标准问题 郭开华,王冠培,皇甫立霞,等(97)

中国多气源天然气区域市场特点与定价原则 梁永宽,李晓魁(102)

■要闻信息

中国2月份天然气进口同比增加130%(13) 剑门102井测试获百万立方米工业气流(58) 加快天然气发展要解决好五大问题(62) 华北煤层气日产量突破百万立方米(91) 首台国产高含硫天然气焚烧炉试验成功(101)

■英文摘要

(105-118)

■广告目次

汉胜工业设备(上海)有限公司(11-03-01) 天信仪表集团有限公司(11-03-02) 极睿解释平台(11-03-03) 四川蜀谷仪表科技有限公司(11-03-04) 川庆钻探工程有限公司地球物理勘探公司物探研究中心(11-03-05) 川庆钻探工程有限公司钻采工艺技术研究院油气井测试技术服务公司(11-03-06) 川庆钻探工程有限公司地质勘探开发研究院实验研究中心(11-03-07) 川庆钻探工程有限公司钻采工艺技术研究院空气钻井技术服务公司(11-03-08) 上海化工研究院化学工程及装备研究所(11-03-09) 上海化工研究院上海绿强新材料有限公司(11-03-10) 中国天然气工业网(11-03-11)

封面说明:普光天然气净化厂
摄 影:陈墨青

第六届编委会名单

顾问(以汉语拼音排序):

戴金星	傅诚德	贺振华	胡朝元
胡光灿	葛家理	贾承造	康玉柱
李士伦	李 允	刘宝珺	罗平亚
马在田	邱中建	史兴全	田在艺
王铁冠	夏鸿辉	翟光明	

名誉主任(排名不分先后):

廖永远 周守为 胡文瑞

主 任(排名不分先后):

李鹭光	胥永杰	孙龙德	王道富
冯志强	谢文彦	黄立功	徐向荣
刘振武	杜志敏	刘家铎	

执行主任:

李爱民

委 员(以汉语拼音排序):

蔡希源	董伟良	杜金虎	姜 伟
蒋 骥	焦大庆	焦方正	金之钧
雷 群	李 杰	李广月	李海平
李景明	李相方	李亚林	刘树根
马新华	马永生	潘和平	庞雄奇
秦 勇	冉隆辉	师春元	沈耕田
孙 宁	孙延祚	宋 岩	王一刚
万尚贤	卫平生	吴大奎	伍贤柱
夏 斌	谢玉洪	熊建嘉	徐春春
杨 龙	杨 华	叶 舟	张本全
张金川	张敬谦	张宁生	张元泽
赵文智	赵政璋	周志斌	



CONTENTS

March 2011, Vol. 31, Issue 3 (TOTAL No. 209)

NATURAL GAS INDUSTRY

(monthly, Started in 1981)

Editor-in-Chief: RAN Long-hui

General Director: JIANG Ji

Natural Gas Industry

Journal Agency

No. 3, Sec. 1, Fuqing Rd.,

Chengdu

Sichuan Province 610051, P. R. China

Tel: +86(28)8601 2712

Fax: +86(28)8601 2716

CODEN: TIGOE3

ISSN 1000-0976

CN 51-1179/TE

www.trqgy.cn

Executive Editor: JU Wei-qing

Editors Head: HAN Xiao-yu

Advertisement & Subscription

Manager: SHEN Hong-tao

English Editor: JIANG Jing-ping

E-mail: jjp@trqgy.cn

jjplynch@hotmail.com

Publishing Date: March 25, 2011

Annual Subscription Rates:

China RMB ¥300

Overseas US \$120

Overseas Distributor:

China International Book Trading

Corporation

P. O. Box 399, Beijing 100044

P. R. China

Tel: +86(10)6843 3197

Code No. : M 944

■ TECHNICAL PROGRESS IN LARGE GAS FIELDS

- 1 Key techniques for the development of the Puguang Gas Field with a high content of H_2S by Kong Fanqun, Wang Shouping, Zeng Daqian
- 5 Optimization of the development indexes of the Puguang Gas Field by Wang Shouping, Kong Fanqun, Peng Xinling, et al
- 9 Characterization methods of reef-beach facies reservoirs in the Puguang Gas Field by Zeng Daqian, Peng Xinling, Liu Zhiyuan, et al
- 14 Seismic-constrained reservoir modeling and its application in the Puguang Gas Field by Jiang Yiwei, Liu Honglei, Yang Futao, et al
- 18 Package of technologies for safe, fast and high-quality drilling and completion of high- H_2S gas wells in the Puguang Gas Field by Hou Shugang, Liu Dongfeng, Li Tiecheng, et al
- 22 An analysis of key technologies applied in a super-large natural gas conditioning plant in the Puguang Gas Field by Yu Yanqiu, Mao Hongyan, Pei Aixia

■ GEOLOGY AND EXPLORATION

- 26 Unconventional natural gas potentials of the Daqing Oil Field and its peripheral basins by Liao Qunshan, Xu Huijian, Yang Jianguo, et al
- 31 Future gas exploration orientation based on a new scheme for the division of structural units in the central Kuqa Depression, Tarim Basin by Xu Zhenping, Li Yong, Ma Yujie, et al
- 37 Geochemical behaviors and gas origins in the Hewanchang Gas Field, northern part of the Western Sichuan Basin by Huang Dong, Dai Xin, Dai Yun, et al
- 41 Alford Rotation-based anisotropic correction for the converted waves by Liu Hongai, Ma Zhaojun, Gan Qigang
- 44 Application of the gradient structure tensor analysis method to the prediction of channel sand from 3D seismic data by Li Yi, Zhong Guangfa, Song Jisheng, et al

■ DEVELOPMENT AND PRODUCTION

- 48 A stage-by-stage flow model of coalbed methane gas considering adsorption and deformation by Ou Chenghua, Liang Chenggang, Jiang Jianli, et al
- 52 A new discussion on the determination methods of reasonable drawdown pressure for a coalbed methane gas well by Mao Hui, Han Guoqing, Wu Xiaodong, et al

- 56 Reservoir characteristics of and development strategies for the J₃k-o gas reservoir in the Yangguyi Gas Field, right bank of the Amu Darya River by Bao Qiang, Leng Youheng, Zhang Li, et al

■ DRILLING ENGINEERING

- 59 Drilling fluids transformation after gas drilling at the Gaofengchang Block in the eastern Sichuan Basin by Wang Liang, Wu Zhengquan, Yang Lanping, et al
- 63 Drilling fluids for temporary sealing in fractured tight sandstone gas reservoirs by Wang Yezhong, Kang Yili, Li Hang, et al
- 66 Drilling fluid system applicable to deviated and horizontal intervals in the Tao7 wellblock of the Sulige Gas Field by Cui Guitao, Jin Xiangzhe, Dong Hongwei, et al
- 70 Design and application of well testing string with slip joints in deep gas wells by Ding Liangliang, Lian Zhanghua, Wei Chenxing, et al

■ STORAGE AND TRANSPORTATION

- 73 Prediction of the sulfur solubility in sour gas by means of the association model with four parameters by Bian Xiaoqiang, Du Zhimin, Tang Yong
- 75 A discussion on the sulphur deposition in the ground surface gathering and transmission system of the Puguang Gas Field by Li Shiji, Yang Faping, Liu Fangjian

■ PROCESSING AND UTILIZATION

- 80 A simulation study of the mercury distribution in the low-temperature gas separation process by Jiang Hong, Liu Zhiqiang, Yan Qituan, et al
- 85 Countermeasures for eliminating the effect of difference in natural gas quality on the acetylene production by Zheng Yan, Mi Yulin, Fu Wuhua

■ HSE MANAGEMENT

- 89 Noise control of a gas compressor in a gas gathering station by Chen Xiaofei, Hua Zhongzhi, Lian Ningtao, et al
- 92 Application of Safety Integrity Level (SIL) and the Hazard and Operability Analysis (HAZOP) in a natural gas purification plant by Xia Taiwu, Yuan Shuhai, Song Bin, et al

■ ECONOMIC MANAGEMENT

- 97 Gas quality specification and interchangeability standards in China by Guo Kaihua, Wang Guanpei, Huangpu Lixia, et al
- 102 Market characteristics and pricing principles of Chinese natural gas regional market with multiple gas sources by Liang Yongkuan, Li Xiaokui

Natural Gas Industry, approved by the State Scientific and Technological Commission, is a unique gas journal in China with an overall view on science and technology of gas industry. Starting her first issue in 1981, NGI has a history of 30 years' experience. NGI has turned from bimonthly to monthly journal since the first issue in 2004. NGI has grown up to be one of the exclusively essential journals in China reporting on new theories and techniques related to natural gas industry both at home and abroad, which covers industry spotlights, geologic research, geophysical exploration, drilling engineering, development and production, storage and transportation, gas processing and utilization, QHSE management, marketing and economy, etc. ■

To obtain the information on "the Authors and Abstracts", please see the back pages (p105-118) of this magazine or visit the English version on our website: www.trqgy.cn/e