

OIL AND GAS TRANSPORTATION AND STORAGE

Sensitivity Analysis on Risk Factors of the Third Party Damage in Gas Pipeline

Jiang Hongye, Yao Anlin (Southwest Petroleum University Petroleum Engineering Institute, Chengdu, Sichuan, 610500, China)

Yao Huiquan, Zhang Zhaoxu (PetroChina West-to-East Gas Pipeline Company, Shanghai, 200122, China) **NGO, 2011, 29(1):1-4**

ABSTRACT: Remote causes of the third party damage are very complicated and have very high randomness and the third party damage fault tree is established in order to identify these causes. Based on the concept of sensitivity factor and the basic principle, calculated is the structure importance of bottom events of the third party damage fault tree, analyzed is the sensitivity of risk factors of the third party damage in gas pipeline and identified are main factors affecting these risks in order to provide the basis of controlling and managing the third party damage risks.

KEYWORDS: Third party damage; Risk factor; Sensitivity analysis; Gas pipeline

Integration and Optimization of Shaanxi-Beijing Gas Transmission System

Zhou Ying, Chen Feng, Sun Zairong (China Petroleum Engineering Co., Ltd. Southwest Company, Chengdu, Sichuan, 610017, China) **NGO, 2011, 29(1):5-8**

ABSTRACT: Shaanxi-Beijing gas transmission system consists of such three main pipelines as Shaanxi-Beijing Gas Pipeline I, II and III. Shaanxi-Beijing Gas Pipeline III, completed in October 2010, is another important gas pipeline supplying product gas to the area along the Bohai Sea after Shaanxi-Beijing Gas Pipeline I and II. Introduced are the structure of Shaanxi-Beijing gas transmission system network and design optimization of Shaanxi-Beijing Gas Pipeline III.

KEYWORDS: Shaanxi-Beijing gas transmission system; Process design optimization; Joint operation optimization

Process Renovation Design of Waste Water System in Product Oil Storage Depot

Ma Guoguang, Yang Ying (Southwest Petroleum University Petroleum Engineering Institute, Chengdu, Sichuan, 610500, China)

Jiang Ziyi (School of Environmental Science and Engineering, Tongji University, Shanghai, 200092, China)

Zeng Xiaofei (PetrolChina Sichuan Selling Branch, Chengdu, Sichuan, 610017, China) **NGO, 2011, 29(1):9-11**

ABSTRACT: Analyzed are characteristics of all kinds of oil depot waste water treatment methods, introduced is the current situation of waste water treatment process and it is pointed out that such problems as unstable quality and too much petroliferous, SS and other pollutants exist in waste water treatment and a large number of BOD₅ and pathogenic bacteria exist in waste water, which will result in oily waste water discharge and blockage of active carbon filter. To solve these problems, air float purifier and SBR reaction pool are added to renovate the old process. The operational results show that this new process can operate properly and has good effect. All pollutant indexes in waste water treated by adopting this process can meet the Grade I discharge standard in the Integrated Waste Water Discharge Standards(GB8978-1996).

KEYWORDS: Oil depot; Waste water treatment; Process; Renovation

Failure Analysis on Sebei-Ningxia-Lanzhou Gas Pipeline System

Su Xin, Guo Yanlin (China Petroleum Engineering Co., Ltd. Southwest Company, Chengdu, Sichuan, 610017, China)

Wen Yumei (Sichuan Chuan Gang Gas Co., Ltd. Sichuan, Chengdu, 610017, China)

Ye Weihua (State Intellectual Property Office of P. R. C., Beijing, 100088, China) **NGO, 2011, 29(1):12-14**

ABSTRACT: Introduced is the structure of the Sebei–Ningxia–Lanzhou gas pipeline system, simulated and analyzed are two kinds of main failure working conditions of the system by using the SPS software and simulation results show that failure of the gas compressor stations closer to the terminal station has larger and faster effect on the system and reliability of the system will be improved if gas supply pressure of the terminal station is increased properly in normal working condition. Also, failure of the single pipelines closer to the terminal station has larger and faster effect on the system. Therefore, special patrol and maintenance shall be conducted to those important sections in order to ensure that the whole gas pipeline system operates safely and smoothly.

KEYWORDS: Sebei–Ningxia–Lanzhou; Natural gas; Gas pipeline; Failure; Analysis

OIL AND GAS TREATING AND PROCESSING

Review on Development Process of Gas Desulfurization and Decarburization Technique

— Methyldiethanolamine (MDEA for Short) Outshines Others

Wang Kaiyue (PetroChina Southwest O&G Field Company Natural Gas Research Institute, Chengdu, Sichuan, 610213, China) **NGO, 2011, 29(1): 15–21**

ABSTRACT: Reviewed is the development process of gas desulfurization and decarburization technique briefly and evaluated are four kinds of techniques, especially amine process. In the 1980s of last century, MDEA has been applied in industry. Particularly in China, significant energy conservation and economical benefits have been obtained in its application and it has outshined others. Described is the technical structure of desulfurization and decarburization technique applied to natural gas purification in China and progress of MDEA application in the world for recent years and subjects are put forward for further research.

KEYWORDS: Natural gas; Desulfurization and decarburization; Amine process; MDEA; Development process

Performance Assessment on Gas Purification Unit and Sulfur Recovery Rate Calculation

Cen Zhaohai (PetroChina Southwest O&G Field Company Development Department, Chengdu, Sichuan, 610051, China) **NGO, 2011, 29(1): 22–24**

ABSTRACT: Sulfur recovery rate is one of important indexes in natural gas purification unit performance assessment. Rational selection of R value calculation method is critical to obtain accurate sulfur recovery rate data. Comparative analysis is conducted on different R value calculation methods according to relevant data obtained in natural gas purification unit performance assessment of certain gas treatment plant and analysis results show that sour gas and air flow or carbon balance shall be firstly applied to calculate R value in order to get accurate sulfur recovery rate.

KEYWORDS: Natural gas purification plant; Purification unit; Performance assessment; Sulfur recovery rate; R value calculation

Discuss on Helium Extraction Technology in Certain Large Gas Treatment Unit

Zhong Zhiliang, He Jun, Wang Hongwei, Long Zengbing, Song Guanghong (China Petroleum Engineering Co., Ltd. Southwest Company, Chengdu, Sichuan, 610017, China) **NGO, 2011, 29(1): 25–28**

ABSTRACT: Briefly introduced is the purpose of helium and main techniques applied at present in helium extraction from natural gas at home and abroad. Taking raw natural gas from gas field A and B in certain region as the research object, discussed is the natural gas treatment scheme and analyzed is the key technique applied in natural gas treatment. Process calculation results show that C_3^+ recovery rate of this scheme can reach 94% and helium recovery rate can reach more than 98% and better good economic benefits can be obtained.

KEYWORDS: Helium extraction; Helium concentration; Light hydrocarbon recovery; Natural gas liquefaction

CH₄-CO₂ Reforming Reaction Dynamics Mechanism and Catalyst Reformation

Long Wei, Xu Wenyuan (Traffic University of East China Dept. of Chemistry and Chemical Engineering, Nanchang, Jiangxi, 330013, China) **NGO, 2011, 29(1): 29-33**

ABSTRACT: Methane and carbon dioxide reforming reaction is a contemporary research hotspot, microscopic reforming reaction dynamics mechanism has compensated for existing controversial differences. Selection of catalysts, carrier effect, adjuvant effect and anti-carbon de-position property are the key factors affecting the reaction. Through microcosmic characterization of catalyst in experiment, comparatively analyzed and resolved is the catalyst deactivation due to carbon deposit and largely improved and expanded are the activity center, carrier and adjuvant.

KEYWORDS: Methane and carbon dioxide reforming; Catalyst; Reaction mechanism; Deactivation; Adjuvant; Carbon deposit

OIL AND GAS FIELD DEVELOPMENT

Development Technology and Strategy of Shale Gas

Li Wuguang, Yang Shenglai, Yin Dandan, Lou Yi, Guo Jin, Meng Hu (Petroleum Engineering Institute, China University of Petroleum, Beijing 102249, China) **NGO, 2011, 29(1): 34-37**

ABSTRACT: Shale gas is a kind of unconventional natural gas with enormous reserves and complex reservoir structure and its development needs high technology, massive fund and a lot of personnel. Mainly introduced are its exploration and development technologies at home and abroad, such as reservoir evaluation technology (logging and coring technology), stimulation technology for horizontal wells (multi-branch and connected horizontal wells), perforating optimization technology and fracturing stimulation technology. Analyzed are main problems which exist in shale gas research and development in China and forecast are development trends of shale gas development technology at present.

KEYWORDS: Shale gas development; Reservoir evaluation; Horizontal well stimulation; Perforating optimization; Fracturing stimulation

Shale Gas Reservoir Fracturing Technology and Analysis on Adaptability in China

Wang Wenxia, Li Zhiping (China University of Geosciences(Beijing)Energy Institute, Beijing, 100083, China)

Huang Zhiwen (Petroleum Exploration&Production Research Institute, SINOPEC, Beijing, 100083) **NGO, 2011, 29(1): 38-41**

ABSTRACT: At present, shale gas research, exploration and development in China is still at the exploratory stage and shale gas research, exploration and development in America has entered into mass rapid development stage. By using such foreign shale gas reservoir fracturing technologies for reference as hydraulic fracturing, horizontal well subsection fracturing and comprehensive fracture detection technology, in combination of shale gas reservoir characteristics of Sichuan Basin in China and existing fracturing foundation, analyzed is the adaptability of shale gas reservoir fracturing in China and described are constraint conditions of fracturing. It is believed that theoretical research shall be strengthened at the same time of introduction of foreign technologies so that shale gas reservoir development in China can enter into a new stage of development and effective development results can be achieved.

KEYWORDS: Shale gas reservoir; Fracturing technology; Adaptability; Theoretical research

Numerical Well Test Analysis on Testing Information of Double Permeability Medium Reservoir Swabbing Well

Wang Jinru, Wang Xinhai, Jiang Yong (Key Laboratory of Exploration Technologies for Oil and Gas Resources under the Ministry of Education, Yangtze University, Jingzhou, Hubei, 434023, China) **NGO, 2011, 29(1): 42-44**

ABSTRACT: Bottom hole pressure change resulting from exploration process characteristics of swabbing wells is very complicated. For this kind of wells, it is difficult to describe the whole formation pressure change process if the mathematical model established for flowing wells is applied. Established is the determined production well test model for one swabbing well located in the circular confining bed center. Considering well bore storage effect and skin factor, block-centered grid implicit difference scheme is applied to disperse the mathematical model for evaluating numerical solution. This model is applied to explain Well m13 and its results show that the model can better reflect complex change process of bottom hole pressure and can accurately explain test data produced in flow or restoration stage of un-flowing well in double permeability medium reservoir swabbing well.

KEYWORDS: Double permeability medium reservoir; Swabbing well; Bottom hole pressure; Mathematical model; Numerical model; Numerical simulation

Application of New Gemini Hyamine in VES Clean Fracturing Fluid

Lou Pingjun, Niu Hua, Ye Sujuan (Henan Daochun Chemical Technology Co., Ltd, Zhengzhou, Henan, 450002, China)
Zhu Hongjun, Ding Hui (Zhengzhou Surfactant Engineering Technology Research Center, Zhengzhou, Henan, 450002, China) **NGO, 2011, 29(1): 45–47**

ABSTRACT: Gemini hyamine cationic surfactant NGA and sodium chloride are applied to prepare a VES clean fracturing fluid and control stress rheometry is used to test properties of the VES clean fracturing fluid. Test results show that the VES clean fracturing fluid system prepared with NGA 2.0% (wt) and NaCl 4.0% (wt) has good viscoelasticity and temperature resistance stability and its highest temperature resistance can reach up to 95°C, which will make up for the deficiency of much addition volume of traditional hyamine clean fracturing fluid system and poor temperature resistance and has a good application prospect.

KEYWORDS: Viscoelasticity; VES clean fracturing fluid; Temperature resistance property; Application

CORROSION AND CORROSION PROTECTION

Test and Analysis on Soil Resistivity in Deep Well Anode Ground Bed Design

Mao Binhui, Peng Shini (Faculty of Urban Construction and Environmental Engineering, Chongqing University, Chongqing, 400045, China) **NGO, 2011, 29(1): 48–50**

ABSTRACT: Pointed out are some problems currently existing in soil resistivity test along the deep well anode ground bed, such as lack of further analysis on test results and lack of guiding significance of the test results in actual engineering practices. Introduced is application of Barnes analysis method in soil resistivity test along the deep well anode ground bed. This method is analyzed and verified in combination of actual engineering practices and such conclusions are obtained as that this method has simple principle, uncomplicated calculation and meets the engineering accuracy requirements. At the same time, it is pointed out that more attention shall be paid to some issues during application process and especially data fitting methods are not applicable in data processing.

KEYWORDS: Deep well anode; Depth direction; Soil resistivity; Barnes analysis method

Differences in External Corrosion Protection, Heat Preservation and Cathodic Protection Practices of Domestic and Foreign Oil Companies

Chen Binyuan, Zhang Shengli, Tang Qiang (China Petroleum Engineering Co., Ltd. Southwest Company, Chengdu, Sichuan, 610017, China) **NGO, 2011, 29(1): 51–53**

ABSTRACT: External corrosion protection of in-station pipelines is an important measure for ensuring that process pipelines and equipment within the station operate properly and cathodic protection system of long-distance pipelines is an important component for ensuring that the pipelines operate properly. Researched are conventional practices of foreign oil companies in in-station pipeline corrosion protection design, cathodic protection system

design and heat preservation structure design and put forward are new ideas and concepts of domestic oil companies in in-station pipeline corrosion protection design, cathodic protection system design and heat preservation structure design.

KEYWORDS: External corrosion protection; Cathodic protection; Heat preservation; Rock wool; Composite silicate; Glass cotton

TECHNOLOGY AND ECONOMY

Bidding and Tendering Under the Mode of BOQ Valuation

Sun Yumei (PetroChina Sichuan Petrochemical Co., LTD, Pengzhou, Sichuan, 611900, China)

Han Li (China Petroleum Engineering Co., Ltd. Southwest Company, Chengdu, Sichuan, 610017, China) **NGO, 2011, 29 (1): 54–58**

ABSTRACT: “Valuation Norm of the Construction Project Amount Inventory” has a profound effect on perfection of laws and regulations in construction market, project construction cost control objectives and concrete works. Application of BOQ valuation pattern can enhance the operability of the “Bidding Law”, lead construction enterprises to carry out fair and reasonable price competition and promote healthy, orderly and coordinate development of project construction bidding. The norm has such characteristics as unified quantities, rationally low quoted price and independent quotation. In order to do well engineering cost control work in the bidding stage according to the new valuation model, bill of quantities shall be prepared well, basic number of a tender shall be reviewed and risks shall be shared reasonably in contract terms. Analyzed is the bidding management in detail according to the latest “Norm” issued by Ministry of Construction of P.R.C.

KEYWORDS: Bill of quantities; Bidding control price; Tendering price; Method of bid evaluation

MACHINERY AND EQUIPMENT

Analysis on the Reasons Causing Cracks in Hot Bends

Cao Xiaoyan, Li Tianlei (China Petroleum Engineering Co., Ltd. Southwest Company, Chengdu, Sichuan, 610017, China)

Cao Xiaoyan, Li Tianlei (Research Office of Sichuan, CNPC Oil Pipeline Mechanic and Environmental Behavior Key Laboratory Chengdu, Sichuan, 610017, China)

Luo Guangwen (PetroChina Southwest O&G Field Company CDB High Sour Gas Field Development Project Department, Chengdu, Sichuan, 610051, China) **NGO, 2011, 29(1): 59–62**

ABSTRACT: Analyzed are causes of crack formation in hot bend fabrication of certain vessel plant. Through analysis on chemical composition and microstructure in bends and micro-area energy spectrum analysis on their cracks, it is found that cracks in hot bends result from local rich Cu phase and copper brittleness in the hot bends. Therefore, their local rich Cu phase and copper brittleness shall be reduced as far as possible in order to reduce or avoid cracking.

KEYWORDS: Hot bend; Crack; Energy spectrum analysis; Copper brittleness

ENGINEERING GEOLOGY AND SURVEY

Method of Treating Slope along Sichuan to the East Gas Pipeline

Ye Guigen, Xue Shifeng (China University of Petroleum (East China) Department of Engineering Mechanics, Dongying, Shandong, 257061, China) **NGO, 2011, 29(1): 63–66**

ABSTRACT: Sichuan–East Gas Pipeline goes through an area in which landslide occurs frequently, where many landslide disasters occur often in pipeline construction projects, which will bring about great threat on gas pipeline, personnel and construction equipment. In order to reduce landslide disasters, based on fluid structure interaction

theory, considering seepage effects, finite difference software FLAC^{2D} and FLAC^{3D} are applied to establish 2D and 3D mechanical models and geometry model for Luozhentian slope along the Sichuan–East Gas Pipeline, analyzed is its stability under different conditions before and after pipeline ditch excavation, obtained are slope stability coefficient, strain cloud pictures and displacement curves and corresponding anti-sliding measures are given according to engineering geological conditions. Analyzed is the level 6 intensity seismic resistance of the treated slope and assessed is its comprehensive stability.

KEYWORDS: Landslide; Fluid Structure Interaction; Slope stability; Numerical simulation

Analysis on Main Points of Construction Quality Supervision of CFG Pile Composite Foundation of Oil Tank

Yuan Guangbi (Petrochemical Project Quality Supervision Terminal Pipeline Branch, Xuzhou, Jiangsu, 22100, China)

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ABSTRACT: Taking the construction of 4 new oil tanks in Yizheng oil transfer station for example, analyzed is the mechanism of CFG pile and introduced are important points in engineering quality supervision on CFG pile composite foundation.

KEYWORDS: Oil tank; CFG pile; Mechanism; Quality supervision

INDUSTRY AND CIVIL CONSTRUCTION

Specific Considerations in Building Fire Fighting System Design

Zhao Huatian, Deng Ye (China Petroleum Engineering Co., Ltd. Southwest Company, Chengdu, Sichuan, 610017, China)

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ABSTRACT: Building fire prevention in gas treatment plants always is very important in architectural design and complete fire fighting system in building is critical to assure production safety. Summarized is practice experience from architectural design of gas treatment plants in many years. In combination with relative building fire prevention standards and specifications, analyzed are some problems existing in building fire prevention design in gas treatment plants, listed are some considerations in fire fighting system design and some rational solutions are put forward.

KEYWORDS: Gas treatment plant; Building; Fire and explosion proof design; Suggestion

COMPUTER AND COMMUNICATION

Research and Suggestion on Relative Issues of Communication System Construction in Oil Production Project in Sichuan and Chongqing

Zhou Yonghong, Song Qingan, Xu Bin, Yao Chun, Zhou Lin (China Petroleum Engineering Co., Ltd. Southwest Company, Chengdu, Sichuan, 610017, China) **NGO, 2011, 29(1): 75–79**

ABSTRACT: With large-scale rebuilding and construction of gas pipelines in Sichuan and Chongqing, communication system construction in oil production project in the area has developed greatly. It is necessary to pay more attention to some generality problems existing in the construction. In combination with experience and lessons from communication system construction in oil and gas pipeline projects in recent years, discussed briefly are some generality problems existing in communication system construction in Sichuan and Chongqing and relative suggestions are put forward, which are beneficial to improve and promote future similar communication system construction in this area.

KEYWORDS: Oil communication construction; Experience and lesson; Generality problem; Discuss; Suggestion; Improvement; Promotion