



## The Study of Development Possibility of X Reservoir in Iranian Offshore

Taghian, M. ■ Shahid Bahonar University  
Sarraf, A. ■ Shahid Bahonar University  
Mohebbi, A. ■ Shahid Bahonar University  
Ghadamgahi, S. E. ■ Iranian Offshore Oil Company

### Abstract

X oil reservoir is a shared reservoir between Iran and one of its neighbors. Seismic data has revealed noticeable oil potential. For more hydrocarbon production from this undeveloped reservoir, overview simulation study of reservoir development is needed. The dynamic model presented here is based on the rescue file exported from X static model construction that is created by Eclipse. Four development scenarios have been modeled and revealed that by properly selecting well locations and designing production schemes, a recovery factor of greater than 50% is achievable. It seems that the best option to develop this reservoir, based on oil production and availability of the empty slots on the platform, is drilling of three horizontal wells with gas lift operation. Lack of production history from X reservoir and having limited number of conventional core analysis data, make the dynamic model presented here subject to some level of uncertainties.

**Keywords:** Dynamic Model, Development Scenario, Gas Lift, Shared Oil Field

## The Study of Gas Injection in Gas Condensate Reservoirs and Its Effect on Productivity of the Reservoirs

Taheri, Z.  
Alizadeh Tabrizi, N. ■ Amirkabir University of Technology  
Hashemi, A. ■ Petroleum University of Technology

### Abstract

Gas reservoirs can be classified into dry gas, wet gas and Gas condensate reservoirs. In gas condensate reservoirs, the reservoir temperature lies between the critical temperature and the cricondentherm. When the pressure falls below the dew point, the gas will drop out liquid by retrograde condensation in the reservoir. This heavy part of the gas has found many applications in industry and also in daily life. By remaining in the reservoir, not only this valuable liquid is lost, but also its accumulation will result in forming a condensate bank near the well bore region, which makes a considerable reduction in well productivity. In this paper, gas injection has been studied in a gas condensate reservoir to increase the recovery factor and the capability of different injection gases (CO<sub>2</sub>, N<sub>2</sub>, CH<sub>4</sub> and separator gas) has been compared through different injection schemes. The injection schemes considered were: different injection rates, pressures and durations. The results showed that the injection of above mentioned gasses can increase the condensate recovery from 5% (in the least efficient case, i.e. in a very low injection pressure and rate) to 30%. Knowing that many parameters can affect the decision of selecting the injection scheme, other than gas and condensate recovery factor, doing an economical evaluation is inevitable to take them all into account and determine the optimum one.

**Keywords:** Gas Condensate Reservoirs, Condensate, Dew Point, Injection Duration, Recovery Factor

## Investigation of Ultrasonic Well Stimulation in Production and Injection Wells

Hosseini Sisakht, A. M. ■ National Iranian South Oil Company (NISOC)  
Hadizadeh, S. ■ National Iranian South Oil Company (NISOC)  
Safian, G. ■ National Iranian South Oil Company (NISOC)

### Abstract

Local impairment of formation permeability often causes reduced production because of the interaction of the reservoir with drilling and completion fluids. The problem may be compounded by impairment caused by fines migration during production. It is not always possible to prevent formation damage completely, and well stimulation techniques to remove or mitigate the impact of formation damage have been used in the industry for more than half a century. Although conventional well stimulation techniques (both matrix and fracturing stimulation) have been applied very successfully, they do suffer from some severe limitations.

Both matrix stimulation and hydraulic-fracture treatments involve the pumping of specialized fluids. Therefore, these techniques are "invasive". High-frequency sonic and ultrasonic waves have been used in many industrial applications to remove contaminants, such as dirt, oil, and grease from parts that are immersed in fluids. An obvious extension of this application is the removal of wellbore impairment by exposing it to high-frequency acoustic waves. This paper concerns about acoustic well stimulation, involved mechanisms and its operational issues.

**Keywords:** Impairment, Stimulation, Piezoelectric, Ultrasonic Waves, Jet Mix Sampler



# Paper Abstracts

Prepared by: Behruz Shaker Shiran ■ Parvaneh Taherinia

## An Alternative Conductor Guide Design

Daghigh, M. ■ Pars Oil and Gas Company (POGC)

### Abstract

Conductor guides are one of the high cost items of a drilling platform because the guides fabrication of the guides is not amenable to automation and is a labor intensive. In order to reduce fabrication costs and increase efficiency, an alternative conductor guide design is proposed to replace the conventional conductor guide design. The proposed alternative design involves the replacement of circular hollow sections by square hollow sections for the fabrication of conductor framings. A detailed study has been carried out to investigate the effects of such replacement on the structural integrity of a typical shallow water jacket structure based on both in-place and fatigue analyses. It was found that the replacement was beneficial to the integrity of the jacket structure in the in-place analysis, but the reverse was true in the fatigue study. However, the results showed that the proposed alternative conductor guide design was economically viable for the jacket structure studied.

**Keywords:** Conductor, Drilling Platform, Offshore Platform, Fatigue, Square Hollow Sections, Circular Hollow Sections

## Geochemical Study of Silurian Source Rocks and Dehram Gas Reservoirs

Sepahvand, S. ■ Exploration Directorate of NIOC

### Abstract

Source rock is one of the essential parameters in every petroleum system. In Fars province in Iran and offshore of Persian Gulf, in Permo-Triassic carbonate, gas reserves in the excess of 600 Tcf have been discovered. In this petroleum system, reservoirs are well sealed by the anhydrite of the Dashtak formation and hydrocarbons are originated from early Liandoverian highly organic shales. The chromatographic and isotopic differences observed between the gas samples are due to different maturity levels and the gas samples are termogenic gas with a maturity range which increases from South Pars to interior Fars.

**Keywords:** Gas Exploration, Silurian Source Rock, Permo-Triassic Reservoirs, Petroleum System

## Using Electrical Submersible Pump to Optimize the Low Pressure Wells

Razavi, A. ■ National Iranian South Oil Company (NISOC)  
Hashemi, A. ■ Omidyeh Islamic Azad University

### Abstract

Oil wells in a reservoir which is located in the south of Iran have decline pressure of 30 to 50 psi/year and in the near future well head pressure of low pressure wells will decrease and result in reduction of oil flow to first stage or second stage separation. One of the methods of artificial lift that was recognized in National Iranian South Oil Company (NISOC) to prevent this problem is using electrical submersible pump. Sensitivity analysis of 10 selected wells in different conditions was performed using two methods. In the first method, ESP pumps were used at the beginning stage of oil production from the well. In the second method, natural flow of well continued until the wellhead pressure declined and then the ESP Pumps were used. Technical analysis showed that in the second method production is more reliable and without risk of missing well due to damage. Economic analysis also showed 30% reduction in the capital cost in the second method.

**Keywords:** Electrical Submersible Pump, Multiphase Pump