

# **International Conference on Extraction, Transport, Storage and Processing of Hydrocarbons & Minerals (ETSaP 2020)**

IOP Conference Series: Materials Science and Engineering  
Volume 952

Tyumen, Russia  
24 – 25 August 2020

**Editor:**

**Rasul A. Mamadaliev**

ISBN: 978-1-7138-4780-9  
ISSN: 1757-8981

**Printed from e-media with permission by:**

Curran Associates, Inc.  
57 Morehouse Lane  
Red Hook, NY 12571



**Some format issues inherent in the e-media version may also appear in this print version.**

This work is licensed under a Creative Commons Attribution 3.0 International Licence.  
Licence details: <http://creativecommons.org/licenses/by/3.0/>.

No changes have been made to the content of these proceedings. There may be changes to pagination and minor adjustments for aesthetics.

Printed with permission by Curran Associates, Inc. (2022)

For permission requests, please contact the Institute of Physics  
at the address below.

Institute of Physics  
Dirac House, Temple Back  
Bristol BS1 6BE UK

Phone: 44 1 17 929 7481  
Fax: 44 1 17 920 0979

[techtracking@iop.org](mailto:techtracking@iop.org)

**Additional copies of this publication are available from:**

Curran Associates, Inc.  
57 Morehouse Lane  
Red Hook, NY 12571 USA  
Phone: 845-758-0400  
Fax: 845-758-2633  
Email: [curran@proceedings.com](mailto:curran@proceedings.com)  
Web: [www.proceedings.com](http://www.proceedings.com)

# TABLE OF CONTENTS

Preface	
Peer review declaration	
Reduction of well stimulation period after hydraulic fracturing.....	1
<i>A E Verisokin, T A Gun'kina, V A Vasil'yev, A I Shchekin, D Yu Serdyukov</i>	
Non-stationary mass transfer of oil-water mixture in reservoirs with a system of horizontal wells.....	8
<i>I N Zhizhimontov, Yu D Zemenkov, A B Shabarov</i>	
Calculation of the thermodynamic characteristics of an upward swirling gas flow under conditions of side wind .....	15
<i>A G Obukhov</i>	
Risk management of oil and gas transportation facilities based on reliability indicators monitoring .....	21
<i>M Yu Zemenkova, Yu D Zemenkov, A A Gladenko, E L Chizhevskaya</i>	
Technology for developing expert modules and DSS comprehensive platform for reliability and risks monitoring in the Oil and Gas Engineering.....	27
<i>M Yu Zemenkova, Yu D Zemenkov, V V Golik, S Belsky</i>	
Conditions choice for conducting experiments to determine the oil cooling time.....	35
<i>A U Yakupov, D A Cherentsov, K S Voronin</i>	
Method for improving the liquid hydrocarbon preparation efficiency .....	40
<i>A M Kulikov, A A Gladenko, M A Alexandrov</i>	
Thermal impact of buried reservoirs with industrial waste of the fuel and energy complex on frozen soils.....	46
<i>M Yu Zemenkova, P Yu Mikhailov, A B Shabarov, U Yu Shastunova</i>	
Justification of the choice of pump drive for pumping stations of main pipelines, taking into account the principles of energy and economic efficiency .....	54
<i>A G Zakirzakov, Yu D Zemenkov</i>	
Directions for improving the motivational mechanics of modern oil and gas production companies.....	59
<i>E L Chizhevskaya, J D Zemenkov, M J Zemenkova</i>	
Simulation of the stress-strain state of the working body of the system for the development of the pipeline trench.....	64
<i>S P Pirogov, D A Cherentsov, K S Voronin, A U Yakupov</i>	
The deployment of the collapsible piping through a large water obstacle.....	69
<i>D I Melnikov, L V Seoev, M Yu Zemenkova, S Yu Podorozhnikov</i>	
Calculation of the speed descriptions of the upward swirling gas flow in conditions of lateral wind action .....	79
<i>A G Obukhov</i>	
Complex thermophysical modeling of processes in the foundation soil of oil pipelines in the Arctic and offshore conditions .....	87
<i>V V Golik, Yu D Zemenkov, I F Shagbanov</i>	

Use of collapsible pipelines for joint work with main oil product pipelines .....	92
<i>D I Melnikov, M Yu Zemenkova, S Yu Podorozhnikov</i>	
Studying quality of diagnosing rolling stock at service enterprises of automobile transport .....	101
<i>V N Krasovsky, N I Krasovskaya, A V Sycheva</i>	
A comprehensive analysis of the properties of reservoir rocks to determine the productive oil horizons .....	106
<i>R V Klyuev, I I Bosikov, V Ch Revazov, K S Krysanov, B V Dzeranov</i>	
Development of an algorithm for determining the optimal start time of oil wells to reduce the peak load .....	112
<i>R V Klyuev, I I Bosikov, V Kh Tavasiev, O A Gavrina</i>	
Main aspects of the oil industry within the sustainable development concept .....	118
<i>N Fomenko, Al Mashkhadani Mohammed Jasim Hamad</i>	
Determining the location of the well's production collecting site at an oil field .....	124
<i>K S Voronin, D A Cherentsov, A U Yakupov</i>	
Issues of ensuring the design durability of reinforced concrete supports of the main pipelines of oil refineries .....	129
<i>P A Fedorov, M M Abdullin, A M Fatykhova, M M Fattakhov</i>	
Current state and perspectives of the gas industry of Russia .....	135
<i>L Sh Makhmudova, Kh Kh Akhmadova, A A Pimenov, Zh T Khadisova, Z A Abdulmezhidova</i>	
Temporary and operational transport roads in construction of transfer linear structures and their scientific and technical support .....	142
<i>L I Kortiev, R V Klyuev, F G Totchiev, S D Vaneev, N I Babunskaya</i>	
Modern technologies of project management and implementation in the construction industry .....	148
<i>A A Ermakov, A N Korkishko, S A Smirnov, A S Shapovalov</i>	
Analysis of the development of global energy production and consumption by fuel type in various regions of the world .....	153
<i>D S Shalaeva, O I Kukartseva, V S Tynchenko, V V Kukartsev, S V Aponasenko, E V Stepanova</i>	
Classification and features of projects in the oil and gas industry .....	160
<i>A S Bovkun, O V Arkhipkin, I S Koroduk, A A Krupchenko</i>	
Use of methods for water suppression in the Severo-Orekhovskoe field .....	167
<i>V F Dyagilev, T V Dyagileva</i>	
Preliminary zoning of negative impact of the projected oil waste polygon at the Samotlor field .....	173
<i>I S Aitov, A T Khudaiberdiev</i>	
Limiting state of plate with hole .....	180
<i>Yu I Kazarinov</i>	
Application of PCIU for protection of emergency pipelines against corrosion .....	187
<i>N N Saveleva, A R Salyakhova, K E Koretskiy, P E Koretskiy</i>	
Improvement of pin flexible coupling construction .....	194
<i>N N Saveleva, Y V Savelev</i>	

Methods for illegal tapping detection using non-destructive testing tools .....	199
<i>A R Salyakhova, K E Koretskiy, P E Koretskiy</i>	
Calculation of the torque on the crank shaft of the low-speed balancing drive sucker rod pumps.....	204
<i>A.S. Galeev, R.I. Arslanov, R.N. Suleymanov, O.V. Filimonov</i>	
Development of a hydraulic classifier used to obtain various sand fractions .....	210
<i>A E Verisokin, A P Yanukyan, P M Sorokin</i>	
Experience in developing oil and gas deposits with horizontal wells located near the gas processing plant.....	214
<i>E V Vaganov, V F Tomskaya, I I Krasnov, M J Z Alsheikhly</i>	
An analysis of the effectiveness of hydraulic fracturing at YS1 of the Northern field.....	221
<i>A V Karpikov, R I Aliev, N V Babyr</i>	
Results of the experimental study of the fatigue characteristics of the repaired welded joint of the marine stationary oil and gas producing platform .....	227
<i>C Teodoriu, I V Starokon, Ch S Guseynov</i>	
Development of the non-stationary waterflooding technology.....	233
<i>E M Almukhametova, E M Veliev, A M Puchkov</i>	
Approbation of the system technology for improving well drilling under difficult mining conditions of Bashkortostan fields .....	237
<i>A P Chizhov, V E Andreev, V V Mukhametshin, L S Kuleshova</i>	
Hydraulically perfect modes of injection of grouting mixtures when isolating absorbing formations.....	242
<i>A P Chizhov, V E Andreev, A V Chibisov, V V Mukhametshin, L S Kuleshova</i>	
Experience in using the Russian LWD complex for well drilling .....	248
<i>A Y Davydov, I A Yakhina</i>	
Intensification of the gas inflow when bringing wells into production .....	254
<i>G S Dubinskiy, V E Andreev, L S Kuleshova, V V Mukhametshin</i>	
Wave thermal flooding when designing high-viscosity oil reservoirs.....	261
<i>G S Dubinskiy, V E Andreev, V V Mukhametshin, L S Kuleshova, I Sh Mingulov</i>	
The use of a liquid destructor with flow into the stream during the injection of the fracturing mixture .....	265
<i>I G Fattakhov, L S Kuleshova, AV Kochetkov, I F Galiullina, I G Andaryanov, A R Safiullina, I R Gizatullin</i>	
Probabilistic statistical model for predicting the effectiveness of hydraulic fracturing.....	269
<i>K F Gabdrakhmanova, G R Izmaylova, L Z Samigullina</i>	
Stress corrosion cracking in pipelines .....	276
<i>A K Gumerov, A R Khasanova</i>	
Set of measures to prevent liner sticking during directional drilling .....	280
<i>E L Guseynova, E M Guseynov</i>	
Non-conventional methods for oil production in the conditions of the Abdrakhmanovskaya site of the Romashkino oil field .....	285
<i>A Yu Gutorov</i>	

Development of microcalcite-based drilling fluid.....	290
<i>R A Ismakov, T D Dikhtyar, F N Yangirov</i>	
Investigating the mechanisms of shape distortion of the heat-affected region during electric-arc welding of oilfield pipelines.....	295
<i>M Ya Khabibullin, R I Suleimanov</i>	
Improving the design of a downhole filter for fluid production with an increased concentration of suspended particles.....	301
<i>M Ya Khabibullin, R I Suleimanov, Sh G Mingulov, Yu A Kotenev, Sh Kh Sultanov</i>	
Thermal acid impulse method for enhanced oil recovery.....	305
<i>M Ya Khabibullin, N N Soloviev, A R Safiullina, A A Karimova</i>	
Improving the method and equipment of thermo-acidic pulsation treatment.....	310
<i>M Ya Khabibullin, G S Dubinskiy, P M Malyshev, A R Safiullina, A A Karimova</i>	
Improving equipment and technology for selective acid treatment of wells.....	315
<i>M Ya Khabibullin</i>	
Improvement of formation fluid separation efficiency.....	321
<i>M Ya Khabibullin</i>	
Improvement of the efficiency of horizontal wells.....	326
<i>R A Kozikhin, I G Fattakhov, L S Kuleshova, V E Andreev, A R Safiullina, A Kh Gabbasov, I G Andaryanov</i>	
The effect of axial loading on drill string deformation.....	334
<i>L S Kuleshova, D I Akhmetshina, A A Fatkullin, A A Abdulmanov</i>	
Technological features of pumping water into high-viscosity oil injection wells with the bottom hole pump.....	341
<i>Sh G Mingulov, I Sh Mingulov, V V Mukhametshin</i>	
On the influence of the amount and viscosity of oil on the content of solid particles in the water injected into the reservoir.....	347
<i>Sh G Mingulov, I Sh Mingulov</i>	
Restoring the intake capacity of injection wells by means of shock-wave exposure.....	352
<i>Sh G Mingulov, V Sh Mukhametshin</i>	
Bottomhole zone treatment by creating pressure pulses at the wellhead of low-viscosity oil pools.....	357
<i>Sh G Mingulov, I Sh Mingulov</i>	
Dynamics control of a drilling tool by installing a downhole hydromechanical compensator of pressure fluctuations of drilling fluid into the bottom hole assembly.....	362
<i>T N Minnivaliev, I G Arslanov, L S Kuleshova, A N Minnivaliev</i>	
The results of applying the method of mathematical statistics to predict technological effectiveness of hydraulic fracturing.....	368
<i>Al F Shakurova, Ay F Shakurova</i>	
Developing the efficiency of low-productivity oil deposits via internal flooding.....	372
<i>N N Soloviev, V Sh Mukhametshin, A R Safiullina</i>	
Research deformation caused by hydraulic fracturing.....	376
<i>A E Verisokin, A A Airapetova, L G Zhulina, A V Nazarenko, V A Tkachenko</i>	

Backfilling for mines .....	381
<i>L H Zagorodnyuk, A S Chernysh, V S Lesovik, A Yu Schekina, V D Ryzhikh, D A Sumskey, D A Sinebok</i>	
Well bottomhole cleaning device .....	386
<i>L M Zaripova, M S Gabdrakhimov</i>	
Analysis of the current issue of well bore and well bottom cleaning .....	390
<i>L Z Zainagalina</i>	
Differential impact on wellbore zone based on hydrochloric-acid simulation .....	394
<i>Yu V Zeigman, V V Mukhametshin, L S Kuleshova</i>	
Improved rotary union in top-drive hydraulic power packs used on drilling rigs.....	399
<i>R I Suleimanov, M Ya Khabibullin</i>	
Degree and nature of shaft misalignments in pumping units assessed against vibration criteria .....	405
<i>R N Suleymanov, O V Filimonov</i>	

**Author Index**