

# **SPE Middle East Artificial Lift Conference and Exhibition 2022**

Manama, Bahrain  
25 – 26 October 2022

ISBN: 978-1-7138-6301-4

**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.**

Copyright© (2022) by Society of Petroleum Engineers  
All rights reserved.

Printed with permission by Curran Associates, Inc. (2023)

For permission requests, please contact Society of Petroleum Engineers  
at the address below.

Society of Petroleum Engineers  
P. O. Box 833836  
Richardson, Texas 75083-3836

Phone: (800) 456-6863  
Fax: (972) 952-9435

[books@spe.org](mailto:books@spe.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

## **OFFSHORE APPLICATIONS AND ALTERNATIVE DEPLOYMENT**

Application of Dual ESP Completion with Remote Monitoring in Offshore Wells Having Variable Flow Conditions .....	1
<i>Karthick Prabhu, Digambar Tirawadekar, Nilesh Gorde, Sergei Vasilev</i>	
A Lesson Learned from Slickline Deployed ESP System Field Trials in H <sub>2</sub> S Well Environment.....	12
<i>Fahad Al-Shunaiber, Ibrahim Al-Dossary, Yhossie Windiarto, Abdolrahman Al-Saif</i>	
Improving Run Life of Coiled-Tubing-Deployed ESP in Harsh Environment for Qatar's Al Karkara Field.....	21
<i>Rashid C. Palliparambil, Jose Caridad, Eduardo G. Dector, Sudhakar Khade, Neymar Atiencia, Ahmed Amr Gewily, Salem Al-Owairi, Daniel Marcu, Ahmed A Al-Yafei</i>	

## **R&D AND NEW TECHNOLOGY**

The World's First Successful Digital Intelligent Artificial Lift (DIAL) for Dual String Application - A Paradigm Shift for Gas Lift System in Offshore Malaysia .....	32
<i>Nurfarah Izwana Salleh, M Haziq M Ghazali, M Rizwan Rozlan, Syarifah Suliza Wan Mat, Mohamad Sazwan Ismail, Amirul Adha Amsidom, Cheol Hwan Roh, M Farris Bakar, M Faizatulizuddin ishak</i>	
Implementation of a New Proprietary Vortex Fluid Sucker Rod Pump System to Improve Production by Enhancing Flow Dynamics .....	47
<i>Corbin Coyes, Benny Williams, Camille Jensen, Mike Conner, Bradley Link, Jeff Saponja, Jordy Quinn</i>	
Compact, Pressure-Actuated Downhole Safety Valve Improves Safety and Efficiency for Cable Deployed ESPs .....	60
<i>Rob Crawford, Matt Manning, Fraser Hamilton, Charles Harcourt</i>	

## **DESIGN, MODELLING, AND OPTIMIZATION**

Analysis of Different Natural Production Flow Paths in ESP Completions .....	69
<i>Hattan Banjar, Jawad Alzayer, Eiman Munif</i>	

## **KNOWLEDGE SHARING EPOSTER SESSIONS - TUESDAY**

Success Story of Retrieval and Reinstallation of the First New Technology Rigless Cable Deployed ESP System .....	78
<i>Mulad B Winarno, Mohammad A Eissa, Khaled M Mutairi</i>	
Cable Deployed ESP -TransCoil- Retrieval.....	87
<i>Akram Mohamed Mahmoud</i>	
High Rate Slim ESP Viability Assessment in the Field.....	97
<i>Fahad Alshinaiber, Yhossie Windiarto, Mayadah Alhashem, Rui Pessoa Rodrigues</i>	

Bottom Intake ESP for Slim Wells Applications .....	104
<i>Jose Caridad, Marwan Mohammad Alamoudi, Lester Zhi Guang Lim, Salem Feras Alyami</i>	
Physical Testing of a High-Speed Helico-Axial Pump for High-GVF Operation .....	116
<i>Chidirim Enoch Ejim, Jinjiang Xiao, Woon Yung Lee, Wilson Andres Zabala</i>	
Surface PM Motor Drive for Sucker Rod Pumps – Design and Field Results .....	125
<i>Yaroslav Alexeev, Anton Shakirov</i>	
An E-Line Deployed Electric Submersible Progressive Cavity Pump (ESPCP) to Unload Observation Wells for Logging .....	136
<i>Jamie Cochran, JJ Xiao, Khaled Mutairi, Mulad Winarno, Christopher Wrighton</i>	
Electric Submersible Pump Setting Depth Optimization- A Field Case Study.....	146
<i>Bader Abdullah Alqahtani, Mubarak Abdullah Alqahtani, Abdullah Mubarak Alqahtani</i>	

### **KNOWLEDGE SHARING EPOSTER SESSIONS - WEDNESDAY**

Planning the Production Lifecycle of a Newly Developed Gas Field in a Remote Desert.....	153
<i>Steven Hochanadel, Bagus Wahyu Setiadi, Jose Valbuena, Mahannad Mahfouz, Fatimah Hashim AlNasser</i>	
Backpressure Reduction on Beam Pumping Wells by Flowline Gas Purging .....	166
<i>Andreja Ante Gluscevic</i>	
An Effective Solution to Extend the ESP Run Life in Sour Fields.....	173
<i>Jawad Mansour Al Khalifah, Mohammad Ahmed Aleissa, Khaled Mouawad AlMutairi, Saud Abdulaziz Alquwizani</i>	
Improving Run Life in PCP Wells with CO <sub>2</sub> and H <sub>2</sub> S Concentrations Using Tungsten-Alloy- Coated Rods and Couplings .....	185
<i>Azzan Al Asmi, Christian Landgraf, Hilal Al Abri, Benigno Montilla, Jose Caridad, Pedro Perez, William Wyninegar</i>	
Production Life Cycle Management Service Eliminates 1,195 Wellsite Visits in South American Field, Saving a Total of 26,141 Miles.....	194
<i>Ernan Franco, Jorge Luis Villalobos Leon, Maria Elena Quinzo Bravo, Andres Orozco, Adriana Davila</i>	
Successful Optimization Design for a Gas Lift System in Offshore Oil Field .....	213
<i>Abdullah M. Al-Dhafeeri, Sultan Al-Aklubi Al-Aklubi, Saad Al-Sdeiri, Shebl Fouad Abo Zkry</i>	
Lifting Heavy Oil from Inactive Well by Hydraulic Lift Systems.....	223
<i>Abid Ur Rehman, Marwan Abdelbary</i>	
Pad Wells and Packer Penetrator Depth with and Without Tdv.....	235
<i>Towfeq Salem Kasem</i>	
Long Encapsulated MLE Tube for Dual ESP.....	242
<i>Omar Mohammed Bashmal, Akram Mohammed Mahmoud</i>	

### **ARTIFICIAL LIFT RELIABILITY ENHANCEMENT**

Advances in the Understanding of H <sub>2</sub> S Paths into the ESP Electrical System .....	251
<i>Rui Francisco Pessoa Rodrigues, Abdolrahman Abdullah Alsaif</i>	

Proposal - Harmonic Mitigation Challenges in Unconventional ESP Applications ..... 264  
*Abdelrahman Farouk Hussein*

Successful Progressing Cavity Pump Reliability Improvement Project in an Oman Steamflood ..... 275  
*Shauna Noonan, Jasim Al Jabri, Bassam Al Janadi, Edward Rubiano*

### **NOVEL APPLICATIONS FOR OPTIMIZATION AND EFFICIENCY**

Enhancing the Performance of the PMM for ESP and PCP Applications with the VSD Technology  
of Submersible Motor Control and Direct Torque Control Respectively ..... 285  
*Motaz Mohamed, Athishkirthik Ramasamy Thangavel, Ari Huttunen, Matti Eskola, Matias  
Niemela, Vitaly Chernikov*

A New Model for Optimized Gas Allocation in Gas Lift Operation Using Metaheuristic Algorithms ..... 294  
*Ahmed Merzoug, Abderraouf Chemmakh, Habib Ouadi, Aimen Laalam, Sofiane Djezzar,  
Aldjia Boualam, Nadia Mouedden, Vamegh Rasouli, Ezdeen Ibrahim*

Managing Gas Lift Optimization Opportunities Through Enhanced Production Advisory with  
AI/ML..... 306  
*Roberto Fuenmayor, Mohamad Mustaqim Mokhlis, Satyaraj Muniandy*

### **PUSHING THE BOUNDARIES IN CHALLENGING AND UNCONVENTIONAL ENVIRONMENTS**

Testing Gas-Liquid Homogenization for High GVF Flow Applications in ESPs..... 314  
*Chidirim Enoch Ejim, Jinjiang Xiao, Hassan Mohamed Badr, Abdelsalam Mohammad  
Alsarkhi, Rached Ben-Mansour*

Novel Use of PMM Technology in Complicated Well Environment ..... 325  
*Bhushan Chaudhari, Chetan Mishra, Oleg Atamanov, Yuriy Nikitin*

Intermediate Diameter, High Horsepower ESP Motors for Unconventional Wells..... 333  
*Charles Leroy Wheeler, Michael Robert Rumbaugh*

### **PRODUCTION LIFE CYCLE MANAGEMENT AND ARTIFICIAL INTELLIGENCE**

Machine Learning Engine for Real-Time ESP Failure Detection and Diagnostics ..... 341  
*Rafael Adolfo Lastra, Jinjiang Xiao*

Successful Application of Jet Pump Technology for Production Optimization in a Brown Oil Field -  
A Case Study in Pakistan..... 348  
*Shuaib Ahmed Kalwar, Abdul Quddos Awan, Muhammad Saeed Akhtar, Ramiz ul Hassan,  
Khizer Mehmood Khakwani*

**Author Index**