

SPE International Conference and Exhibition on Health, Safety, Security, Environment and Social Responsibility 2018

Abu Dhabi, United Arab Emirates
16 - 18 April 2018

Volume 1 of 2

ISBN: 978-1-5108-6193-0

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© (2018) by Society of Petroleum Engineers
All rights reserved.

Printed by Curran Associates, Inc. (2018)

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

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
Web: www.proceedings.com

TABLE OF CONTENTS

VOLUME 1

SESSION 1: AIR QUALITY AND EMISSIONS MANAGEMENT

Upstream Energy Benchmarking: Identifying Energy Improvement and GHG Reduction Opportunities For Current and Future Operations, Including Technology Gaps	1
<i>Dugald Wright</i>	
Greenhouse Gas Emissions Along the Norwegian Gas Value Chain	15
<i>Juliette Leyris, Bjørn Ove Jansen, Odd-Arne Follum, Unni Musdalslien</i>	
Mission to End Emission: Flare Minimisation and Energy Conservation by Process Optimisation in NGL Fractionation Facility	27
<i>Sevideen Abdul Shathar, Venugopal Bakhavachsalam, Bala Murugan Ramakrishnan, Anand Singh</i>	
Elements and Enablers of Low-Emissions Pathways	34
<i>M. S. Fawcett, L. Perez Bajo, J. A. Herbertson</i>	

SESSION 2: PROCESS SAFETY: HUMAN FACTOR AND PERFORMANCE I

A Method for Assessing the Quality of Proactive Operator Monitoring POM as a Safety Barrier in Service Company Operations	41
<i>Ronald W. McLeod, Mathew Novia, Lamberto Nonno, Sarah Acton, Neil Easton</i>	
The Great Risk Delusion	53
<i>Gareth Huw Roberts</i>	
An Applied Behavior Science Project; Rig Floor Safety	64
<i>Wilmer Capote, A. Boz, J. C. Lopez, V. Noya, P. Bordage, N. Febles, C. Hebein, R. Houmanfar, M. Alavostius</i>	
The Psychological Safety of Oil and Gas Workers in the Arctic	81
<i>Yana Korneeva, Natalia Simonova, Tamara Tyulubaeva, Galina Degteva</i>	

SESSION 3: OCCUPATIONAL SAFETY: TRANSPORT SAFETY

Safe Driving - Lessons Learned in Organising a Large Transportation Project	90
<i>P. A. R. Hudson</i>	
Road Risk Analysis and VTS Geo-Fencing: A New Concept Implemented During the Urban Seismic Acquisition Operations to Eliminate/Minimize the Motor Vehicle Accidents	100
<i>Rifad Ali Minhaj, Mashari Al-Awadi, Bader Al-Ajmi, Mohammad Al-Enezi</i>	
Barrier Analysis & Strengthening to Eliminate Road Traffic Accidents in Oil Fields	108
<i>Muhammad R Tayab, Suhail Villapil, Ghanim Kashwani</i>	
A Holistic Approach in Managing Road Transport Safety in Garraf, Iraq	118
<i>Azrul Abd Hamid, Shairizal Badzri, Vanessa Clare</i>	

SESSION 4: OCCUPATIONAL MEDICINE FOR A HEALTHY WORKFORCE AND A SAFE WORKPLACE

Establishing Guidance for Contractor Fitness for Duty	129
<i>Ugochi Irikannu</i>	
Effective Prevention of Tuberculosis Transmission in Oil and Gas Workplaces: A Programmatic Approach	137
<i>Malick Diara, Susan Ngunjiri, Jerry Strohkorb</i>	
Firefighter Fitness Programme	148
<i>Gary Stewart</i>	
Obstructive Sleep Apnea OSA as a Cause Of Resistant Fatigue in the Safety Sensitive Workforce	153
<i>Scott Levy, Neelum Sanderson, Leslie Emma</i>	

SESSION 34: KNOWLEDGE SHARING EPOSTER STATION I

Transforming Your Culture of Safety: Time To Lead	159
<i>Taher Z. Patwa, Moustafa Moussa</i>	
The Application of Unmanned Aerial Systems UAS's to Improve Emergency Oil Spill Response	168
<i>Sarah Hall</i>	

SESSION 35: KNOWLEDGE SHARING EPOSTER STATION II

Oil Spill Cleaning and Recovery by Polyurethane Sponge Coated with Silane Molecules	181
<i>Sagar Dadhich, Lijo P Lalu</i>	

SESSION 36: KNOWLEDGE SHARING EPOSTER STATION III

Monitoring Health and Safety of Oilfield Workers through Wearable Technology	189
<i>Ankit Sinha, Harsh Vyas</i>	
Just Culture & Root Cause Analysis – A Necessary Marriage	193
<i>Larry Perkinson</i>	

SESSION 37: KNOWLEDGE SHARING EPOSTER STATION IV

Working in Partnership to Deliver Oman's Solar into Schools Project	200
<i>J. T. Robinson, M. M. Abu Rumman</i>	

SESSION 5: OCCUPATIONAL SAFETY: PHYSICAL HAZARDS

Relaunch of the IOGP Recommended Practice for Safety in Lifting and Hoisting Operations 2018	207
<i>Graeme Lawrie</i>	
Implementation of Industry Best Practice Using a Risk-Based Approach: DROPS - A Case Study	213
<i>K. Walker, B. McBeath</i>	
Dropped Objects - The Journey to Elimination	225
<i>Andrew Clarke</i>	
Choice Not Chance: A Dropped Objects Prevention Campaign Based On Emotional Engagement and Personal Choice	231
<i>Davide Scotti, Darren Matkin, Alessandro Negri</i>	

SESSION 6: PROCESS SAFETY: ASSET INTEGRITY

Asset Integrity in the Offshore Construction Industry - Adopting the Operators' Best Practices	240
<i>S. Passarella</i>	
Safety Design Integrity Review for Aged Oil and Gas Facilities	251
<i>Kotaro Nitta, Keiji Tanigawa</i>	
Remote Sensing Technologies for Detecting, Visualizing and Quantifying Gas Leaks	257
<i>Xavier Watremez, André Marblé, Thierry Baron, Xavier Marcarian, Dominique Dubucq, Ludovic Donnat, Laurent Cazes, Pierre-Yves Foucher, Ronan Danno, Damien Elie, Martin Chamberland, Jean-Philippe Gagnon, Le Brun Gay, Jeremy Dobler, Ruben Østrem, Andres Russu, Matthew Schmidt, Olivier Zaouak</i>	
Integrity of Non-Piggable Oil and Gas Flowlines Contributing Factors and Proposed Mitigation Methods	276
<i>M. I. Al Janahi, A. H. Elkhatib, T. Al Mazrouei, S. Al Menhali, G. Al Katheiri</i>	

SESSION 7: WASTE MANAGEMENT

Treatment of Oil-Impacted Soil and Oily Waste: Overview of Two Field Demonstration Projects	283
<i>Gabriel Sabadell, David Thomas, Paul Bireta, Grant Scholes, Cody Murray, Benoit Boulay, Gavin Grant, Dave Major</i>	
An Integrated Approach to Manage Drilling Waste to Minimise Environmental Impacts	297
<i>Muhammad R Tayab, Ghanim Kashwani, Dewi Novita Sandra, Etehad Abou Ali, Tariq Hasan Mohammed, Mohamed Awadh Alhammami</i>	
Experimental Investigation of Bio-Degradable Environmental Friendly Drilling Fluid Additives Generated from Waste	306
<i>M. T. Al-saba, K. W. Amadi, K. O. Al-Hadramy, M. F. Al Dushaishi, A. Al-Hameedi, H. Alkinani</i>	
Iraq Operations' Five 5 Years Waste Management Blue Print to Manage Waste in Remote Environment of Garraf, Iraq Operations	316
<i>Afzariah Binti Che Arshad, M. Akmal B. Yaacob, Shairizal B. Badzri</i>	

SESSION 8: CREATING SHARED VALUE: COLLABORATION, PARTNERHIP, INVESTMENT

Managing Social Impacts of Labour Influx: Lessons Learned from a World Bank Global Portfolio Review	329
<i>Jay Wagner, Susan Dowse, Murray Jones, Marla Orenstein, Dan Owen</i>	
Monitoring and Evaluation of Social Investment	339
<i>Tural Valiyev, Azrina Abdullah, Helen Murphy, Elizabeth Edwards</i>	
The Business Case for Ethical Recruitment of Migrant Labor	350
<i>Gorge Wilson</i>	
Evaluating the Global Social Performance Generated Locally by Saipem's Sustainable Business Strategy	358
<i>Emmanuelle Charlot-Clarisse, Pierluigi Nunzi</i>	

SESSION 9: PROTECTING WORKERS HEALTH-INNOVATIONS IN INDUSTRIAL HYGIENE

Wireless Area Telemetry Network for Gas Detection: Indigenous Product Development in the Kingdom of Saudi Arabia	365
<i>M. T. Hussein, U. A. Shaikh, F. M. Mudawwar, I. M. Khayyat</i>	
Identification, Investigation, Reporting and Management of Occupational Illnesses in ADNOC Onshore	373
<i>Saud Al Hammadi, Zuleykha Rasulova, Amina Marshoodi, Noura Al Kaabi, Abdul Nazar Khalid</i>	

SESSION 10: ENVIRONMENTAL IMPACT ASSESSMENT

The Environmental Management Index EMI - A Proposed Methodology for Environmental Risks and Impacts Management for the Oil & Gas Industry	381
<i>Isaac Njéra, Juan Ramón Miguélez, Tomás Ostolaza, Simon Firth, Mary Lou Lauria, Carlos Salvador, Carmen Santamaría</i>	
ERA Acute-Implementation of a New Method for Environmental Risk Assessment of Acute Offshore Oil Spills	405
<i>Jean-Marie Libre, Christian Collin-Hansen, Grethe Kjeilen-Eilertsen, Tonje Waterloo Rogstad, Cathrine Stephansen, Odd Willy Brude, Anders Bjorgesæter, Ute Brønner</i>	
Innovative Drilling Platform Preserves Sensitive Habitat	427
<i>Christopher Thomas, Juan Carlos Lopez</i>	
Seismic Acquisition: Going the Extra Environmental Mile	438
<i>G. A. Casson, G. S. MacGlennon, P Neilson</i>	

SESSION 11: OPERATIONAL EXCELLENCE: DRIVING A CONSISTENT METHOD

Development, Adoption and Implementation of Fabrication Site Construction Safety Recommended Practices	454
<i>N. Popat, B. Perkins, N. Vassiliev, O. Reyes Valdes, C. Hawkes, M. Carvalho</i>	
Implementing IOGP 423 - HSE Management Guidelines for Working together in a Contract Environment	462
<i>L. Iversen, O. Faugstad</i>	
An Innovative Communication Strategy to Spread Life Saving Rules Companywide	476
<i>Davide Scotti, Darren Matkin, Manikanta Agraharam</i>	
Major Accident Prevention - Lessons Learned and Reinforcement Initiatives Ongoing in Statoil	493
<i>Bjoern Holst</i>	

SESSION 12: THE CONSTANT CHALLENGE: ADDRESSING THE HUMAN ELEMENT

Wellsite Risk Management Improvement Including Human Factors	501
<i>Tom Knode, Doug Schonacher, Norman Ritchie</i>	
Human Error - Fresh Thinking for Managing Non-Compliant Behaviors	518
<i>Peter V. Bridle</i>	
Behavioral Safety: Setting Strategic Objective to Reduce Workplace Accidents	525
<i>Amal Al Halyan</i>	
Integrating Human Factors in the Constructability Process	532
<i>Matteo Palazzolo, Angelo Spingardi</i>	

SESSION 13: PLANNING FOR THE UNEXPECTED: ARE WE READY?

Integrated Cybersecurity for Modern Information Control Models in Oil and Gas Operations	539
<i>Mohammad Aljbran, Mohammed Al-Ghazal, Viranchi Vedpathak</i>	
Solving Community Protection for Inhabited Areas on an Peninsula Close to an Offshore Drilling Site	551
<i>Karim Sabet, Henning Groeschke, Michael Zeidler</i>	
Search and Rescue Operations for Logistic, Drilling and Seismic Operations in Dense Jungle in Papua New Guinea	558
<i>David Albert</i>	
That Wasn't Supposed to Happen! Emergency Response Planning With Unforeseen High Consequence Low Probability Events	566
<i>P. A. R. Hudson</i>	

SESSION 14: SUSTAINABILITY AND OPERATIONS: FOUR ELEMENTS OF A SUSTAINABILITY MANAGEMENT SYSTEM

Paper Title: Sustainable Development Goals Atlas	575
<i>Rick Mire, Sophie Depraz, Becci Collacott, Amy Collins</i>	
Development of a Set of Sustainability Instructions for the Upstream Business - A Case Study	587
<i>Chiara Sacco, Marcos Gallego</i>	
Integration of United Nations Sustainable Development Goals into Service Company Sustainability Reporting: Material Issues for the Triple Bottom Line	592
<i>Alexander James</i>	

Southern Area Oil Operations Continuing Journey of Sustainability	599
<i>Ensan El-Ayoubi</i>	

SESSION 15: REMOTE HEALTH CARE PROVISION IN COMPLEX AND DEMANDING LOCATIONS

Challenges and Effective Strategy for Managing Occupational Health and Industrial Hygiene at Onshore Remote Environments of Garraf, Iraq Operation	610
<i>Shairizal B Badzri, Ahmal Kamal B Abu Bakar, Vanessa Clare</i>	
Coping with the Extremes of the Sahara Desert	624
<i>Steven Daniel Todd</i>	
New Offshore Medical Evacuation Strategy Using Intervention Vessels.....	640
<i>G. Stenman, J. Castello, S. X. Racine, F. Farge, M. Ecoffet, C. Brisquet, S. Degraeve, J. M. Courandier</i>	
Offshore Medical Evacuation - The Malaysian Experience	651
<i>Shanty Sivapirathoshan</i>	

SESSION 16: JOURNEY THROUGH SAFETY CULTURE TRANSFORMATION I

The Long and Winding Road to a Just Culture	660
<i>J. Groeneweg, E. Ter Mors, E. van Leeuwen, S. Komen</i>	
Enhancing Oil & Gas Safety Culture by Affecting Human Experience	671
<i>S. J. Jose, A. Phadke, S. C. Hilliard, S. Galloway, G. Fletcher</i>	
Moving Up The Culture Ladder: Creation and Application of Management Methods to Guide Organisations towards Generative, A Case Study	684
<i>T. G. L. Hudson, P. T. W. Hudson</i>	
Improving HSE Culture and Leadership - How KNPC is Pursuing HSE Excellence.....	694
<i>Steve Arendt, N. Alsaleh, O. Suarez</i>	

SESSION 17: BIODIVERSITY AND SENSITIVE ENVIRONMENTS

Monitoring Biodiversity in Critical Habitats: Case Study from the PNG LNG Project, Papua New Guinea.....	709
<i>Stephen Richards, Iain Woxvold, Jane Mogina, Laura Ann Dresser</i>	
Methodology For Minimizing Environmental Impacts During A Seismic Survey By Applying An Ecological Avoidance Program	722
<i>D. Ochanda, C. Jenet</i>	
Minimizing Acoustic Environmental Impact of Marine Seismic Exploration	734
<i>John R. Tulett, Robert M. Laws, Mehul Supawala, Jon-Fredrik Hopperstad, David Gerez</i>	
Biodiversity Management in an Oil and Gas Company: From Theory to Practice.....	743
<i>Raquel Fernández-Casatejada, Carmen Santamaría</i>	

SESSION 18: RESPECTING HUMAN RIGHTS: ENGAGEMENT, CONFLICT RESOLUTION AND SECURITY BEST PRACTICES

Moving from Conflict to Engagement with a Marginalised Community in Iraq Generates Mutual Trust, Improved Security and Business Continuity	754
<i>B. Skerritt, C. Boyd, H. Al-Mudhaffar, J. McDonald, A. Roscoe</i>	
Land Access and Resettlement: Working with Government and Oil & Gas Partners to Develop a Common Framework for Land Access	761
<i>Magali Pollard, Marion Muyobo</i>	
Security Related Human Rights - Correct Risk Management for All Scenarios	769
<i>Kevin Hunt</i>	
Practical Application of Free Prior Informed Consent.....	779
<i>Jan Harm Fouche Grobler</i>	

SESSION 19: PROCESS SAFETY: BARRIER MANAGEMENT

Famous Barriers, A Novel Approach to Improving Management Understanding of Critical Functions.....	785
<i>T. G. L. Hudson</i>	
Proactive Operator Monitoring as a Safety Barrier for a Global Service Company	792
<i>Ronald W. McLeod, Mathew Novia, Lamberto Nonno</i>	
Barrier-Based Approach in Monitoring Risk Reduction Measures Associated with Major Accident Scenarios	803
<i>P. T. Aberenika, A. L. Wokomah, I. A. Anozie</i>	

VOLUME 2

Bowtie Barriers - Adding Offense to Defensive Risk Reduction Models	816
<i>Paul Haydock</i>	

SESSION 34: KNOWLEDGE SHARING EPOSTER STATION I

Shetland Gas Plant Waste Water Treatment Systems - Achieving Compliance in a Fragile Ecosystem.....	834
<i>Andy Bain, Rachael Ferguson</i>	
Sichuan Finishing Strong: Safety and Social Performance Excellence in Decommissioning and Restoration.....	852
<i>J. F. Mota, P. Rattananon, X. Zhou, H. K. Zhao, F. Guo, R. Serpa, B. Yuan, L. Lin</i>	

SESSION 35: KNOWLEDGE SHARING EPOSTER STATION II

Indigenous Social and Environmental Monitoring Program in a Gas Field Development Project Bolivia.....	861
<i>Leslie Lovo</i>	
Modeling Offshore Drill Cuttings Discharge.....	868
<i>Changyong Zhang</i>	

SESSION 36: KNOWLEDGE SHARING EPOSTER STATION III

Addressing Misunderstandings and Supporting Consistency in the Methane Discourse.....	875
<i>M. Sathiamoorthy, J. A. Herbertson, L. Perez Bajo</i>	
Pilot Program on Energy Reduction in Engineering and Manufacturing Facilities on Global Scale Highlights Challenges and Performance Improvements	883
<i>Hannah Scott, Ian Sealy</i>	

SESSION 37: KNOWLEDGE SHARING EPOSTER STATION IV

Where Does Information on Incidents Come From?	890
<i>V. L. Murphy, A. Littlejohn, B. Rienties, S. King, R. Bryden</i>	
Learning from Incidents - Oily Water Drainage System	900
<i>Kuriakose Mathew Molelputhenpura, Khalid Adel, Ibrahim Al Awadhi</i>	

SESSION 38: KNOWLEDGE SHARING EPOSTER STATION I

Journey Towards Energy Excellence	910
<i>Debashis Pradhan, Sobhakar C. Chanda, Ahmed Al-Amoudi</i>	
A Case Study of Greenhouse Gas Emission Measurements and Reduction Potential Evaluation during Oil & Gas Production in China	917
<i>Yibin Weng, Ming Xue, Xiangyu Cui</i>	

SESSION 39: KNOWLEDGE SHARING EPOSTER STATION II

The Legacy of Piper Alpha 30 Years on: Is the Oil Industry Doing Enough about Process Safety?.....	925
<i>Hisham Saadawi</i>	
Implementing Continuous Improvement in Hazard Studies.....	935
<i>M J Godfrey</i>	

SESSION 40: KNOWLEDGE SHARING EPOSTER STATION III

Upstream Hearts and Minds Program – at Malaysia's Asset Sabah Assets Experiences	946
<i>Sarah Azmee, Ahmad Suhaime M Ariffin</i>	
What to Do if HSE Performance Flattens Out? Resuming Your Drive to Zero	956
<i>Steve Arendt, O. Suarez</i>	

SESSION 41: KNOWLEDGE SHARING EPOSTER STATION IV

Establishment of First Drilling Contractor Energy Management System Stimulates Dynamic Optimization	966
<i>Hind Al Mulla, Mohamed Hendawy, Hatim Khalifa, Dileep Chandran</i>	

SESSION 20: JOURNEY THROUGH SAFETY CULTURE TRANSFORMATION II

Industry Safety Data, What is it Telling Us?	976
<i>K. Walker, C. Hawkes, W. Poore, M. Carvalho</i>	
Getting to Zero and Beyond	999
<i>J. Jack Hinton, M. Glencross Colette, Tony Zamora, Tom Knode, Andrew Dingee</i>	
We Want Zero! - Using Lateral Thinking Strategies to Address a Fundamental Question: What is Preventing Us to Achieve Zero?	1008
<i>Davide Scotti, Darren Matkin, Simona Ruffolo</i>	
Incident Investigation: A Culture Change Tool?	1021
<i>Larry Perkinson</i>	

SESSION 21: SPILLS PREVENTION AND EMERGENCY RESPONSE

Oil Spill Response Viability Analysis for the Norwegian Continental Shelf Integrated in a Web Based Planning Tool	1036
<i>H. P. Dahlslett, Ø. Aarnes, A. Rudberg, G. Gravir, O. W. Brude, S. Lunde, R. Bergstrøm</i>	
Real World Spill Response Optimisation	1043
<i>Simon Gibbons</i>	
Early Detection as a Tool to Bridge Prevention and Response Barriers for Oil Spills	1059
<i>E. Jara, A. Pueyo, J. P. Gómez, A. Perez-Lepe, M. Borao</i>	
From Net Environmental Benefit Analysis to Spill Impact Mitigation Assessment SIMA	1067
<i>Peter M. Taylor, Martin A. Cramer, Robert T.E. Cox, Richard Santner</i>	

SESSION 22: SUSTAINABLE RESOURCE MANAGEMENT: BENEFITS TO INDUSTRY OPERATIONS AND FOOTPRINT

Developing a Carbon Management Strategy for Kuwait Oil Company	1077
<i>M Osund-Ireland, J Richer, T Stenhouse</i>	
Chemical Stewardship Principles for the Oil and Gas Services Sector	1094
<i>Brian McHenry</i>	
The Development and Piloting of an Energy Management Culture Assessment Tool for Use in Organisations	1102
<i>Stuart King, Matthew Lawrie</i>	
ENOC Retail Smart Station UAE First Solar-Powered Service Station	1114
<i>Hamdan Aldoukhi</i>	

SESSION 23: PROCESS SAFETY: WELL ENGINEERING AND DRILLING

Full-Scale Testing of Gravity Displacement with Heavy Fluid in Well Annulus to Stop Gas Migration and Reinstate Operations Safety	1130
<i>Efecan Demirci, Andrew K. Wojtanowicz</i>	
Development and Testing a New Surface Drilling Blow Out Preventer Bop Activation Technology	1149
<i>Michael Affleck, Monty Gilleland</i>	
Well Integrity Life Cycle	1161
<i>Mohamed Hassan Gouda, Ismail Aslam</i>	
Methods of Early Gas Kick Detection and Well Control Risk Assessment in Deepwater Drilling	1174
<i>Yuqiang Xu, Zhichuan Guan, Weiqing Chen</i>	

SESSION 24: INNOVATION IN SAFETY: WHAT WILL THEY THINK OF NEXT?

Adding the Predictive P into Personal Protective Equipment	1183
<i>Samantha J. Horseman, Colin M. Sloman, Steven A. Seay, Mohammed A. Al Abdabbuh, Yasser Alem</i>	
Use of Unmanned Aerial Systems Reduces HES Risks	1200
<i>Rob Hoffmann, Ian McAllister</i>	
Smart Automated Designs for Better HSE Performance	1210
<i>Muhammad Adnan Akhtar</i>	

SESSION 25: OCCUPATIONAL MEDICINE IMPACTING HEALTH IN COMMUNITIES

Linking Longitudinal Morbidity and Mortality Trends in Host Communities to Workplace Disease Control Efforts in the PNG LNG Project	1218
<i>Nirven Kumar, G. Krieger</i>	
Preventing Workplace Transmission of Tuberculosis in a High Tuberculosis Endemic Country	1225
<i>C. Kapiri, Nirven Kumar</i>	

Addressing Human Performance in the Workplace through a Multidisciplinary Approach	1235
<i>Ugochi Irikannu</i>	

SESSION 26: PROCESS SAFETY: HUMAN FACTOR AND PERFORMANCE II

Process Safety Behaviour Change: Improving Operational Integrity Through Process Safety Fundamentals	1245
<i>Robin Bryden, Eamon Chandler, Grzegorz Kulawski, Chris LeBlanc</i>	
Human Performance and Safety Culture Initiatives Transform Safety Performance	1255
<i>Rob Hoffmann, Nicole Lerner, Steven Critchley, Geoffrey Cislo</i>	
Integrating Human Factors into Standard Risk Assessment - Proposal Approach	1262
<i>Abdelsalam Yasseen, Sergey Peresykin</i>	
Applications of Mixed Reality in Process Safety and Operational Integrity	1274
<i>Ashish Kulkarni, Amey Kulkarni</i>	

SESSION 27: GAUGING PERFORMANCE TO MEASURE SUCCESS

Building Better Performance Measures for Better Conversations to Provoke Change	1280
<i>A. D. Gower-Jones, W. T. Peuscher, J Groeneweg, S. King, M Taylor</i>	
Refining Heinrich: Power Laws in Incident Severity Distributions	1293
<i>T. G. L. Hudson</i>	
Contract Safety Pre-Qualification; Experience in a Reactive Safety Culture Environment	1302
<i>Emeka Ezeaku</i>	
Setting Up an Operational Global Risk Dashboard for Upstream Operating Entities?	1317
<i>O. Cassassoles, M. Dembele, A. Glowacz, J. Supiot, J. M. Courandier</i>	

SESSION 28: PRODUCED WATER AND WASTEWATER MANAGEMENT

Improving Produced Water Quality Discharge into the Sea by Using Hungry Bacteria	1327
<i>Pierre Pedenaud, Patrick Baldoni-Andrey, Audrey Breton, Bertrand Segues, Anne Demangel, Matthieu Jacob</i>	
Desalination of Produced Water of Asab Oil Field Abu-Dhabi to Enhance its Oil Recovery and Water Injectivity	1338
<i>Ilyas Khurshid, Md Monwar Hossain, Abdulrahman Alraeesi, Ameera Fares, Fatima Albalushi, Amina Alhammadi</i>	
Utilization of Gas Process Plant Effluents as an Emerging Source of Fresh Water for Crude Washing and Drilling Mud Preparation	1344
<i>Hesham Mohamed Al Johi, Mohamed Ali Shamashergy, Mohamed Awadh, Mohamed Alsuwaidi, Vijaya Bhaskar Reddy, Santhanam Thyagarajan, Najat Albreiki, Dalia Salim Abdullah, Tariq Hasan Mohammed</i>	
Waste Water Treatment by Chemical Coagulation Method-Increasing Output and Reducing Environmental Impact	1352
<i>P. Agarwal, A. Gupta, S. Dasgupta, D. Thummar, R. S. Satyarthi, M. Joshi, S. S. Chauhan, J. Mishra, A. Parasher, S. Tiwari, E. Rao, P. Khot</i>	

SESSION 29: COMMUNITY ENGAGEMENT: SHAPING THE INTERNAL CONVERSATION FOR BETTER OUTCOMES

A Solid Response to External Stakeholders Requires a Solid Internal Organisation	1366
<i>C. W. F. Luca, S. A. M. de Koning</i>	
Community Liaison Officers: On the Frontline of Social Risk Management	1378
<i>Clare Bebbington, Emma Wilson</i>	
Community Engagement, Commitments, and Partnership for Successful E&P Operations in Bolivia	1389
<i>Eva Calvimontes, Sergio Eduardo Ayala Sánchez, Krish Ravi Ravishankar</i>	
Digital Transformation: Social Impact Assessment and Management	1395
<i>Emery Brusset, Kristina Grunenber</i>	

SESSION 30: WELLNESS AS AN ENABLER OF PRODUCTIVITY

ExxonMobil Culture of Health	1399
<i>Jill Lundin</i>	
Wellness as an Enabler of Safety and Productivity – Implications for Safe Operations	1406
<i>Janis Davis-Street, Michael Steinberg, Michael Grimsley, Micaela Broll, Susanne McDonald</i>	
Health Risk Communication - Using Data to Inform a Preventive Health Communication Strategy	1419
<i>A. Shannon, S. Boyer, J. Davis-Street</i>	
Prevention is Key: Achieving Optimal Health in the Workplace	1428
<i>R. Tauzin, A. K. Pachiyannakis</i>	

SESSION 31: ENVIRONMENTAL RISK MANAGEMENT

Paper Title: Raising the Bar for Biodiversity and Ecosystem Services Management in the Oil and Gas Industry	1438
<i>Anna Gray</i>	
Business Improvements through Implementation of International Investors' Standards	1449
<i>E. A. Amirkhanova</i>	
Continuous Improvement in Environmental Performance: A Case Study in an Oilfield Services Company	1455
<i>Ian Sealy, Hannah Scott</i>	
Tracking Corporate Stewardship of Environmental Services-Opportunities of Big Data Applications and Long Term Value	1460
<i>Nigel H Wright</i>	

SESSION 32: LEARN & LIVE: GAIN FROM THE PAIN

How to Take Learning from Incidents to the Next Level	1467
<i>A. Parker, F. Ummels, J. Wellman, D. Whitley, J. Groeneweg, Linda Drupsteen-Sint</i>	
How Do You Know If You're Learning from Incidents?	1478
<i>V. L. Murphy, A. Littlejohn, B. Rienties, S. King, R. Bryden</i>	
Embedding Learnings from Serious Incidents into Drilling Operations	1486
<i>Muhammad R. Tayab</i>	
Sustainable Corrective Actions - Is SMART Good Enough?	1499
<i>Larry Perkinson</i>	

SESSION 33: WORKPLACE MENTAL HEALTH, WORKERS WELFARE AND RESILIENCE PROGRAMMES- MANAGING THE EMERGING EPIDEMIC

Evaluating Behaviour, Fatigue and Depression and Their Relation to Road Traffic Accidents	1511
<i>Amal Salim Al Halyan</i>	
Addressing Adaptive and Inherent Resilience - Lessons Learned from Hurricane Harvey	1517
<i>Janis Davis-Street, Stephen Frangos, Brian Walker, Gregory Sims</i>	
High Profile Tour; A Powerful Tool in Enhancing Well-Being Conditions of the Workforce	1528
<i>Mustapha Nasr-Eddine Boucif, Majid Ali Bin Kuwair, Mohamad El-Chaib, Dinesh Pagar, John Bradley Thomas</i>	

SESSION 34: KNOWLEDGE SHARING EPOSTER STATION I

A Greater Protection of Operators 'Occupational Health through the Elimination of Sledge Hammer Use	1538
<i>Saber Mohamed Mohamed</i>	
Eliminate Risk of Dropped Object During Pipe Drifting Operations Drift Catcher Sub	1545
<i>Islam Khaled Abdel Karim, Majid Al Hammadi, Yousef Al Hammadi, Mario Vargas, Tarek Khalil, Ahmed Ibrahim Dakroury, Saeed Al Hajeri, Rami Essam El Behiry, Khaled Abdelhalim</i>	

SESSION 35: KNOWLEDGE SHARING EPOSTER STATION II

Risk Assessment for Increase in Plant Capacity	1557
<i>Ziauddin Shahabuddin</i>	
A Risk-Based Approach to the Assessment of Aviation Emergency Response	1564
<i>K. Walker, O. Oeen</i>	

SESSION 36: KNOWLEDGE SHARING EPOSTER STATION III

Potential Application of Crude Oil Degrading Bacteria in Oil Spill and Waste Management	1572
<i>M. Al Mujaini, S. J. Joshi, N. Sivakumar, S. N. Al-Bahry</i>	

SESSION 37: KNOWLEDGE SHARING EPOSTER STATION IV

Strategic Partnerships for Reducing Health Risks in the Workplace	1588
<i>Fouad Rizk</i>	
Environment & Social Impact Assessment: Embedding No Net Loss/Net Gain Calculation into the Process to Optimize Impact Mitigation	1594
<i>David Ochanda, Olga Konovalova, Christelle Jennet</i>	

SESSION 38: KNOWLEDGE SHARING EPOSTER STATION I

Costa Norte Project: Enhancing Environmental Protection Against Oil Spills in the Northern Brazilian Coast Through the Combination of Data Collection, Numerical Forecasts and Impact Assessment..... 1603
M. C. Pessoa, A. Guedes, D. S. Queiroz, J. D. Pellegrini, M. Fragoso, M. M. Cabral, M. L. Soares, C. M. Sabino, F. O. Chaves, L. D. Assad, A. Vasconcelos, C. S. Bock, R. Toste, D. G. Faller, M. Rollnic

SESSION 40: KNOWLEDGE SHARING EPOSTER STATION III

Addressing Cultural Heritage and Human Rights: Integration of Archaeological Impact Management in Sensitive O&G Operations Bolivia 1613
Irene B. Roca Ortiz

SESSION 41: KNOWLEDGE SHARING EPOSTER STATION IV

Cohabitation and Co-Operation Between Oil Activities and Environmental Sensitive Areas in Mender Field 1623
Khalid AlBeshr, Saud Al Hammadi, Vijaya Bhaskar Reddy, Saleh Abdulla Alkarbi, Kishan Dass, Shaikha Al Ameri

Author Index