

CURRICULUM VITAE

BIOGRAPHICAL DATA

Geir Hareland
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PROFESSIONAL RECORD

Academic Record

- i) Undergraduate, B.Sc., June 1981, Mechanical Engineering
University of Minnesota, Minneapolis, MN, USA
- ii) Graduate, M.Sc., August 1985, Petroleum Engineering
University of Tulsa, Tulsa, OK, USA
- ii) Graduate, Ph.D., December 1991, Mechanical Engineering
Oklahoma State University, Stillwater, OK, USA

Academic and Other Appointments

14 - Present - Continental Resources Chair of Petroleum Engineering and Professor, School of Chemical Engineering, Oklahoma State University, Stillwater, OK, USA. Perform drilling and completion research, teach classes and advise graduate students. Performing field applicable research with the oil and gas drilling and completion industry.

04 - 14 - NSERC/CAODC (2005-2010) and NSERC/Talisman (2010-2014) Drilling Chair and Professor, Chemical and Petroleum Engineering Department, University of Calgary, Calgary, Canada. Chaired the industry/academic/government funded drilling and completion research program at University of Calgary, taught drilling classes and advised graduate students.

00 - 04 - Founder and Board Member, Drops Technology AS, Oslo, Norway (Period as CEO and general manager). While working as administrator and head of technology developed the rate of penetration (ROP) model based Drops Drilling Simulator (DDS) and performed drilling optimization plans and quality control on all active wells simulated by the DDS in the North Sea. Represented OER (independent operator) as license owner on the Njord and Brage fields in the North Sea.

92 - 00 - Assistant to Associate Tenured Professor, Chemical and Petroleum Engineering Department, New Mexico Institute of Mining and Technology, Socorro, New Mexico. Classes taught: Fluid Mechanics, Drilling Engineering, Drilling Fluids Laboratory, Well Design, Well Completion Laboratory, Reservoir Stimulation, Advanced Drilling Mechanics, Advanced Directional Drilling, Drilling Optimization Techniques and Advanced Well Stimulation. Performed research in different areas of drilling, completion, stimulation and production.

89 - 91 - Drilling Research Engineer, Mechanical and Aerospace Engineering Department, Oklahoma State University, Stillwater, Oklahoma. Used rate of penetration models to investigate drilling parameters to predict in-situ rock stresses.

85 - 89 - Drilling Engineer, Amoco Production Company, Tulsa, Oklahoma. Developed and tested drilling engineering models in the Engineering Simulator for Drilling (ESD) which was part of the Critical Drilling Facility (CDF) at Amoco Research Center (ARC) for use in drilling operations planning and daily follow-up including; rate of penetration and cost/foot, hydraulics, torque and drag, solids control, drilling fluid rheology and solids control models.

81 - 82 - Facilities Engineer, Esso Exploration and Production, Stavanger, Norway. Performed top-site weight study on the Statoil platforms in the North Sea.

Administrative and Technology Transfer Responsibilities

Founder, Board Member, Drops Technology AS, Norway (2000-2004)
Founder, CEO and General Manager, Harcon Inc., Socorro, New Mexico (2004-2014)
Founder, R&D Advisor, Northbasin Energy Services Inc., Leduc, Canada (2010-2013)
Founder, Board Member, nFluids Inc., Calgary, Canada (2011-2015)
Founder, Board Member, Rocsol Technologies Inc., Calgary, Canada (2013-present)

Professional Certification and Memberships in Learned Societies

- 1) P. Eng in Alberta, Canada (2006-2013)
- 2) SPE member since 1985
- 3) APEGGA member since (2006-2013)
- 4) ARMA member since 2007

EDUCATIONAL ACTIVITIES

Instruction Undergraduate Level

ES 216	Fluid Mechanics
PET 311	Drilling Engineering
PET 311L	Drilling Fluids Lab
PET 413	Well Design
PET 413L	Well Design Lab

PET 468 Well Stimulation
EPETE 4313 Drilling and Well Completion
ENPE 521 Introduction to Drilling Engineering

Instruction Graduate Level

PET 535 Drilling Optimization Techniques
PET 555 Advanced Directional Drilling
PET 532 Advanced Well Stimulation
PET 581 Special Topics in Petroleum Engineering
ENME 619 Drilling Optimization and Simulation
ENCH 619 Advanced Drilling Simulation
PETE 5313 Advanced Drilling Modeling and Simulation
PETE 5413 Advanced Well Design

Invited Seminars/Lectures

The Society of Petroleum Engineers (SPE) Distinguished Lecturer 2010/2011 presenting invited talk “Drilling Simulation Reduces Drilling Cost”. Travel around the world giving lectures to SPE chapters/members.

Multiple lectures and seminars have been given over the years to large and small oil and gas companies in all parts of the world. Most lectures/seminars have been on drilling optimization and applications of drilling optimization engineering tools.

Graduate Supervision - Current Graduate Students

- 1) S. Akhtarmanesh, PhD., “Nanoparticle Based Weighted Drilling Fluids”
- 2) A. Atashnezhad, PhD., “Real-Time Drilling Optimization of PDC bits”
- 3) H.A. Ameer, PhD., “Automation Detection System of Gas Kicks”
- 4) T. Coryell, M.Sc., “Design and Testing of Nano Particle Based Oil Field Cements”
- 5) A. Cedola, M.Sc., “Determination of Permeability from Drilling Data”
- 6) S. Loggins, M.Sc., “Evaluation of Sealing Capability of Different Muds and LCMs”
- 7) C. Cunningham, M.Sc., “Multistage Horizontal Stimulation Optimization in the San Andres, New Mexico”
- 8) J. Love, M.Sc., “Complete Stimulation Geomechanical Log from Drilling Data”

Past-Supervised Graduate Student Topics

Graduated PhDs (10)

- 1) “A New Approach to Wellbore Stability Analysis”
- 2) “Foam Diversion in Multi-Layered Matrix Acidizing”
- 3) “Single PDC Cutter Force Modeling”
- 4) “Fractured Horizontal Well Inflow Modeling”
- 5) “Development of an Underbalanced Drilling Optimization Simulator”
- 6) “Real Time Torque and Drag Analysis during Directional Drilling”
- 7) “Experimental Analysis and Mechanistic Modeling of Wellbore Strengthening”

- 8) "Performance, Simulation and Field Application Modeling of Rollercone and PDC Drill Bits"
- 9) "Utilization of Dispersed Nanoparticles in Drilling Fluids to Prevent Fluid Loss"
- 10) "Wellbore Strengthening by Means of Nanoparticle-Based Drilling Fluids"

Graduated M.Sc. (36)

1. "In-Situ Stress Determination from E-Logs"
2. "Real-Time Matrix Acidizing Optimization"
3. "Wellbore Stability Analysis Using Drilling Data"
4. "Horizontal Well Inflow Modelling"
5. "Drilling Optimization on Gjallar – a HTHP Deep Water Well"
6. "Drilling Optimization on the Varg Field, North Sea"
7. "A Non-Linear Approach to Modeling PDC Cutter Wear"
8. "Drilling Simulation on the Alwyn Field, North Sea"
9. "Development of Correlations between Sonic Logs and Drillability"
10. "Improved Drilling Efficiency Technique using Integrated PDM and PDC Bit Parameters"
11. "Temperature Modeling of Drilling Fluids while Drilling SAGD Wells"
12. "Geomechanical Modeling of the Karr Field"
13. "Drilling Simulation and Optimization of the Field in Kazakhstan"
14. "Drilling Optimization of Two Wells Located in Siberian Part of Russia Using Drilling Simulator Software"
15. "Real Time Monitoring of Hole Cleaning"
16. "Measurement of Minimum Horizontal Stress from Logging and Drilling Data in Unconventional Oil and Gas"
17. "Evaluation and Comparison of 3-D Rotary Steerable Systems"
18. "Optimum Volumetric Flowrate for Stable Foam Drilling in Deep Wells"
19. "Drilling Hydraulics Optimization"
20. "Drilling Optimization with the Use of a Drilling Simulator"
21. "Borehole Stability in Highly Inclined Wells Using Von Mises Failure Criteria"
22. "Wellbore Stability in Underbalanced Drilling"
24. "Skin Damage from Drilling Fluid"
25. "Method to Determine Real Time Bit Wear using ROP equations and MSE"
26. "Real Time Pore Pressure Determination using LWD and MWD"
27. "Methods of Determining Wellbore Stability for Directional Drilling Planning and Applications"
28. "Directional Cutting Transport Modeling"
29. "Downhole Weight on Bit Prediction with Analytical Model and Finite Element Method"
30. "PDC Drill Bit Redesign and Simulation for Optimized Performance"
31. "Design of Low-toxic Non-Solid Anti-Freeze Polymer Drilling Fluid"
32. "Effect of Change in Hydrophilic-Lipophilic Balance (HLB) on State of Stable Invert Emulsion Drilling Fluid"
33. "Design of Novel Technologies to Remove Fine Particles from Invert Emulsion Drilling Fluids"

34. “Field Testing of Nanoparticle Drilling Fluids”.
35. “The Blaster – an Oscillating Nozzle Drill Bit”.
36. “Use of Particle Swarm Optimization (PSO) to Optimize Weight on Bit in Drilling Operations””

Examiner/Supervision Graduate Student Committees

Served on multiple graduate student committees and as examiner during the tenure at New Mexico Institute of Mining and Technology, the University of Calgary and Oklahoma State University.

Supervised Postdoctoral Fellows

Dr. Runar Nygaard, Rock Mechanics and Drilling Engineering Modeling, 2006-2007
 Dr. Andang Kustamsi, Wellbore Stability and Geomechanical Modeling, 2007-2009
 Dr. Bashir Busamin, Hole Cleaning Modeling, 2010
 Dr. Mazeda Tahmeen, Development of Real Time Drilling Advisory System, 2006-2014
 Dr. Andrew Wu, Drilling Mechanics, 2008-2014
 Dr. Victoria Kosensko, Bioremediation of Drilling Fluids, 2010-2014

SCHOLARLY ACTIVITIES

Funded Research Activities

Research administrated as Principal Investigator totaling more than 10.0 M\$.

- 2017-2020 - National Academy of Sciences through the Gulf Research Program. Advanced cement characterization and modeling to evaluate novel additives to improve wellbore integrity.
- 2016-2018 - International Research Institute of Stavanger AS for the Research Council of Norway. Leakage Risk Assessment for plugged and abandoned oil and gas wells.
- 2014-2018 - Continental Resources Chair Program. Development of a drilling engineering artificial intelligence advisory system and nano-based drilling fluids. Research program applies new methods of PDC bit optimization and artificial intelligence in drilling engineering operations.
- 2010-2014 - Talisman/NSERC/Unconventional Drilling and Completion Optimization. Research had 18 distinct tasks involving unconventional reservoir drilling and completion rock mechanics, real-time drilling modeling and drilling fluid research.
- 2004-2010 - CAODC/NSERC /Real-Time Drilling Optimization Modeling. Research includes the development of a new drilling system for improving real-time drilling efficiency and safety.
- 2003-2004 - Norwegian Research Council /Linking of 3-D Earth Model and a Drilling Simulator to Reduce Drilling Costs.

- 1995-2000 - Sandia National Laboratory/PDC bit force modeling and testing.
- 1992-1997 - Norsk Hydro/Investigation of production models for multifractured/multilateral horizontal wells.

Consulting and Active Industry Involvement

- 2004-2011 -Advisor on project developments for Pason Systems including active involvement in operations drilling optimization for Canadian Natural Resources, Anadarko, Husky Energy, Shell, Seven Generations, BG International drilling operations in Western Canada.
- 1998-2004 -Performed quality control on drilling optimization on North Sea wells for Statoil, Norsk Hydro and Totalfinaelf for Drops Technology AS, Oslo, Norway.
- 1997 -Saga Petroleum - ROP and cost reduction on Haltenbanken and the Varg Field.
- 1995 -Norsk Hydro - Sand control prediction and analysis in the Flensfjord formation on the Brage Field.
- 1995 -Norsk Hydro - Economics of hydraulic fracturing of the gas injectors in the Oseberg Field.
- 1994 -New Mexico Bureau of Mining - Using new technology to safely retrieve oils and gas around and under the potash mines in the south New Mexico.
- 1989 -Amoco Norway - Design of drilling programs for Valhall/Tor and specified selection criteria for base oil to be used in oil base drilling fluids in North Sea.
- 1985 -Norsk Hydro - Performed full field reservoir simulations of the Oseberg field including different production and injection schemes.

Professional Service

1. Adjunct Professor, University of Calgary 2014-2017
2. SPE Distinguished Lecturer 2010-2011
3. Member of the CAODC Education Committee, 2009-2011
4. Co-chaired CAODC/CADE drilling conference in Calgary, 2007
5. Co-chaired session at the CIPC GTS/SPE conference in Calgary, June 2008
6. Reviewer for Canadian Journal of Petroleum Technology, Journal of Petroleum Science and SPE Journal of Drilling and Completion

Patents and Publications

Patents and Patent Applications

1. Hareland, G and Husein, M., “DRILLING FLUIDS WITH NANO AND GRANULAR PARTICLES AND THEIR USE FOR WELLBORE STRENGTHENING”, US patent 9,920,233, issued March 20, 2018.
2. Husein, M., M. Zakaria and G. Hareland “USE OF NANOPARTICLES AS A LUBRICITY ADDITIVE IN WELL FLUIDS”, US patent 9,701,885, issued July 11, 2017; U.S. patent application 2017/0298264.

3. Comeau, L. Hareland G., Janzen J. and J. Kaminski, "DRILL BIT WITH A FLOW INTERRUPTER", US patents 8,544,567, issued October 1, 2013; 8,899,354, issued December 2, 2014, and 9,234,392, issued January 12, 2016.
4. Husein, M., M. Zakaria and G. Hareland, "NOVEL NANOPARTICLE-CONTAINING DRILLING FLUIDS TO MITIGATE FLUID LOSS", US patent application 2016/0009979.
5. Hareland, G., "DRILLING SYSTEM", US patent application 2015/00904985.
6. Hareland, G. and Janzen, J., "PDC DRILL BIT WITH FLUTE DESIGN FOR BETTER BIT CLEANING", US patents 8,517,124, issued August 27, 2013 and 8,899,355, issued December 2, 2014.
7. Hareland G, Fazaeli, M. and Z. Wu, "AUTODRILLER SYSTEM", US patent application 2014/0196949.
8. Comeau, L., Hareland G. et al, "DRILL BIT WITH A FLOW INTERRUPTER," US patent application 2011/0000716.
9. Hareland G, Veenkant, R., L. and A. W., Iyoho, "METHOD OF PREDICTING DRILL BIT PERFORMANCE", Canadian patent application 2009654.

Journal Publications

1. Yan, T, Z. Chang, G. Hareland and J.R. Ratjar, "A Model to Predict Formation Force", SPE paper 25519, SPE Drilling and Completion, December 1996.
2. Guo, B., G. Hareland, and J. Rajtar, "Computer Simulation Predicts Unfavorable Mud Rate and Optimum Air Injection Rate for Aerated Mud Drilling", SPE 26892, presented and published at the 1993 SPE Eastern Regional Conference, Pittsburgh, PA, 2-4 November, 1993. SPE Drilling and Completion, March 1996.
3. Hareland, G. and R. Harikrishnan, "Comparison and Verification of Electric Log Derived Rock Stresses and Rock Stresses Derived from Mohr's Failure Envelope", SPE 26948 presented and published at the 1993 SPE Eastern Regional Conference, Pittsburgh, PA, 2-4 November, 1993. SPE Formation Evaluation, December 1996.
4. Hareland, G., C.E. Polston, and W.E. White, "Normalized Rock Failure Envelope as a Function of Rock Grain Size", Technical Note Manuscript presented at the 34th US Symposium on Rock Mechanics, Madison, Wisconsin, 27-30 June, 1993. International Journal of Rock Mechanics and Mining Sciences, November 1993.
5. Talabani, S. and G. Hareland, "New Cement Additives That Eliminate Cement Body Permeability", SPE 29269, presented and published at the 1995 Asia Pacific Oil & Gas Conference in Kuala Lumpur, Malaysia, 20-22 March, 1995. Energy Sources, 1999 Vol. 2, pp. 163-176.
6. Hareland G, R.K. Bratli, F. Stene, S. Fagereng, S. Giljarhus and S. Bautz, "Improved Primary Well Control by Calibrating Crucial Well Parameters While Drilling", presented and published at the IADC Well Conference 1995, Jakarta, Indonesia, 30 November - 1 December, 1995. Published in World Oil, August, 1997.
7. Hareland G. and P. R. Rampersad, "Design and Performance of Fractured Horizontal Wells", published in the Norwegian Petroleum Directorate - Near Well Flow - Summary Reports, pp. 329-341, Stavanger, Norway, 1995.

8. Hareland, G., "The Past Decade's Development and Future Trends in Oil Well Drilling, Completion and Stimulation with Special Applications to Developments at the WIPP Site", New Mexico Bureau of Mines Bulletin 155, Socorro, New Mexico, 1996.
9. Hareland, G., W.C. Lyons, D.D. Baldwin, G. Briggs G. and R.K. Bratli, "Extended Reach Composite Materials Drill Pipe", SPE paper 37646 presented at the SPE/IADC Conference in Amsterdam, 4-6 March, 1997. Published in the Journal of Petroleum Technology, February 1997, and in the SPE Drilling and Completion Journal, 1998.
10. Hareland G., Paul R. Rampersad, Olav M. Skår, "Simulation can help optimize drilling and reduce costs", IADC Drilling Contractor Magazine, July/August 2000.
11. Salehi S., G. Hareland, R. Nygaard, "Numerical Simulations of Wellbore Stability Under-Balanced-Drilling Wells", SPE 105155, presented at SPE Middle East Oil & Gas Show, Bahrain, 11-14 March, 2007. Journal of Petroleum Science and Engineering, Volume 69, Issues 1-2, August 2007, pages 156-162.
12. Hareland G., W. Yan, R. Nygaard and J. L. Wise, "Cutting Efficiency of a Single PDC Cutter on Hard Rock", CIPC2007- 82 paper prepared for 2007 Canadian International Petroleum Conference, Calgary, Canada, 12-14 June, 2007. Canadian Journal of Petroleum Technology, June, 2009.
13. Motahhari H., G. Hareland, R. Nygaard and B. Bond, "Method of Optimizing Motor and Bit Performance for Maximum ROP", CIPC2007- 88 paper prepared for 2007 Canadian International Petroleum Conference, Calgary, Canada, 12-14 June, 2007. Canadian Journal of Petroleum Technology, June 2009.
14. Shirkavand F., G. Hareland, and W. Olsen, "The Design and Development of a Drilling Simulator for Planning and Optimizing Under-Balanced Drilling Operations", CIPC2007- 141 paper prepared for 2009 Canadian International Petroleum Conference, Calgary, Canada, 12-14 June, 2007. Canadian Journal of Petroleum Technology, June 2010.
15. Salehi S., G. Hareland, K. K. Dehkordi, M. Ganji and M. Abdollahi, "Casing Collapse Risk Assessment and Depth Prediction with a Neural Network System Approach", published in the Journal of Petroleum Science and Engineering, Volume 69, Issues 1-2, November 2009, pages 156-162.
16. Salehi S., G. Hareland, R. Nygaard, "Numerical Simulations of Wellbore Stability Under-Balanced-Drilling Wells", Journal of Petroleum Science and Engineering, Volume 72, Issues 3-4, June 2010, pages 229-235.
17. Shirkavand F., G. Hareland, and W. Olsen, "The Design and Development of a Drilling Simulator for Planning and Optimizing Under-Balanced Drilling Operations", CIPC2007- 141 paper prepared for 2009 Canadian International Petroleum Conference, Calgary, Canada, 12-14 June, 2007. Canadian Journal of Petroleum Technology, June 2010.
18. Motahhari H., G. Hareland, and J. James, "Improved Drilling Efficiency Technique Using Integrated PDM and PDC Bit Parameters", CIPC2008-132 paper prepared for 2008 Canadian International Petroleum Conference, Calgary, Canada, 12-14 June, 2008. Canadian Journal of Petroleum Technology, October, 2010.
19. Fazelizadeh, M., G. Hareland, B. Aadnoy, "Application of a New 3-D Analytical Model for Wellbore Friction", Modern Applied Science, Vol. 4, No. 2, February, 2010.
20. Aadnoy, B., Fazelizadeh, M. and G. Hareland, "A 3-D Analytical Model for Wellbore Friction", Canadian Journal of Petroleum Technology, October, 2010.

21. Thameen, M., G. Hareland, B. Rashidi, "Development of an Intelligent System for Analysis of both Static and Real-Time Oil and Gas Well Drilling Data", Modern Applied Science, Vol. 4, No. 12, December, 2010.
22. Nazeri, T., G. Hareland and J. J. Azar," Review of Cutting Transport in Directional Well Drilling", SPE paper 132372, SPE Western Regional Meeting, Anaheim, California, USA, May 27-29, 2010. Shortened paper version published in Journal of Petroleum Technology, Volume 63, No 2, February, 2011.
23. Wu, A., G. Hareland and M. Fazelizadeh, "Torque and Drag Analysis Using Finite Element Method", Modern Applied Science, Vol. 5, No. 6, December, 2011.
24. Wu, A., G. Hareland, and M. Fazelizadeh. 2012. Comparison of Analytical and Numerical Models on Torque and Hookload Calculation. IOSR Journal of Engineering, Vol. 2 Issue 1, Jan.2012, pp. 077-083
25. Contreras, O., G. Hareland and R. Aguilar, "An Innovative Approach for Pore Pressure Prediction and Drilling Optimization in and Abnormally Subpressured Basin", SPE paper 148947 presented at 2012 SPE Canadian Unconventional Resources Conference, Calgary, Canada, November 15-17, 2011. Accepted for publication in the SPE Drilling and Completion Journal.
26. Zakaria, M., M. Husein and G. Hareland, "Novel Nanoparticle-Based Drilling Fluid Improved Characteristics", SPE paper 156992, 2011 SPE International Nanotechnology Conference and Exhibition, Noordwijk, Netherlands, June 12-14, 2012. Shortened paper version published in Journal of Petroleum Technology, Volume 63, No 2, November, 2012.
27. Kostenko V., R. J. Martinuzzi and G. Hareland, "Impact of Oil-Based Drilling Fluids Emulsification on Tolerance and Hydrocarbon-Degrading Potential of *Ralstonia pickettii* and *Alcaligenes piechandii*", ISSN: 2157-7463, Journal of Petroleum and Environmental Biotechnology, May, 2013.
28. Kostenko V., R. J. Martinuzzi and G. Hareland, "Pseudomonas putida Biofilm Facilitates Fine Solids, Water and Oil Separation from Oil Sands Tailings", 3(1):110-129, Journal of Scientific Research, April, 2014
29. Rashidi B., Hareland, G. and A. Wu, "Performance, Simulation and Field Application Modeling of Rollercone Bits", Journal of Petroleum Science and Engineering, 133, 507-517, June, 2015.
30. Borisov, A., Husein, M., and Hareland, " A field Application of Nanoparticle-Based Invert Emulsion Drilling Fluids", Journal of Nanoparticle Research, Volume 17, Issue 8, August, 2015.
31. Contreras, O., Alsaba, M., Hareland, G., Husein, M. and R., Nygaard, "Effect on Fracture Pressure by adding Nanoparticles to a Non-Aqueous drilling fluid for permeable formations", Journal of Energy Resources Technology, accepted for publication 2015.
32. Contreras, O., G., Hareland, M., Husein, R., Nygaard, and M., Alsaba, "Experimental Investigation on Wellbore Strengthening In Shales by Means of Nanoparticle-Based Drilling Fluids", SPE Drilling and Completion Journal, accepted for publication 2015.
33. Contreras, O., Alsaba, M., Hareland, G., Husein, M. and R. Nygaard, "Effect on Fracture Pressure by Adding Iron-Based and Calcium-Based Nanoparticles to a Nonaqueous Drilling Fluid for Permeable Formations", J. Energy Recourses Technology 138(3), Paper No: JERT-15-1189, January 06, 2016.

Peer Reviewed Articles

1. Hareland, G., J.J. Azar, and P.R. Rampersad, "Comparison of Cutting Transport in Directional Drilling Using LVT Invert Emulsion Mineral Oil-Based Muds and Water-Based Muds", SPE peer reviewed paper 25871, presented at the Joint Rocky Mountain Regional Meeting, Denver, Colorado, 12-16 April, 1993.
2. Hareland, G. and R. Nygaard, "Linking of 3-D Earth Model and a Drilling Simulator to Reduce Drilling Costs", Norwegian Research Council Project Summary Reports, 2003.
3. Nygaard R. and G. Hareland, "Calculating Unconfined Rock Strength from Drilling Data". Published at the 1st Canada-U.S. Rock Mechanics Symposium, Vancouver, British Colombia, Canada, 27-31 May, 2007.
4. Nygaard R., K. Bjorlykke, K. Hoeg and G. Hareland, "The Effect of Diagenesis on Stress Strain Behavior and Acoustic Velocities in Sandstones". Published at the 1st Canada-U.S. Rock Mechanics Symposium, Vancouver, British Colombia, Canada, 27-31 May, 2007.
5. Hareland G., I.V. Olea, F. Shirkavand, J. Hayes, R. Nygaard and R. Teichrob, "Correlation of Sonic Log Values to Strength in Salts", 42nd U.S. Rock Mechanics Symposium and 2nd U.S.-Canada Rock Mechanics Symposium, San Francisco, CA, 29 June - 2 July, 2008.
6. Nygaard R. and G. Hareland, "Prediction of Directional Change in Wells Based on Formation Rock Strength", 42nd U.S. Rock Mechanics Symposium and 2nd U.S.-Canada Rock Mechanics Symposium, San Francisco, CA, 29 June-2 July, 2008.
7. Hareland, G., A. Wu,, B. Rashidi, "A New Drilling Rate Model for Tricone Bits and Its Application to Predict Rock Compressive Strength", ARMA 10-206, 44th US Rock Mechanics Symposium and 5th US-Canada Rock Mechanics Symposium, Salt Lake City, UT, 27-30 June, 2010.
8. Wu, A., G. Hareland, and B. Rashidi, "The Effect of Different Rock Types and Roller Cone Insert Types and Wear on ROP (Rate of Penetration)", ARMA 10-207, 44th US Rock Mechanics Symposium and 5th US-Canada Rock Mechanics Symposium, Salt Lake City, UT, 27-30 June, 2010.
9. Teichrob R., A. Kustamsi, G. Hareland and U. Odiegwu, "Estimating In-Situ Stress Magnitudes and Orientations in an Albertan Field in Western Canada", ARMA 10-224, 44th US Rock Mechanics Symposium and 5th US-Canada Rock Mechanics Symposium, Salt Lake City, UT, 27-30 June, 2010.
10. Rashidi, B., G. Hareland, M. Fazaelizadeh, and M. Svirg, "Comparative Study Using Rock Energy and Drilling Strength Models", ARMA 10-254, 44th US Rock Mechanics Symposium and 5th US-Canada Rock Mechanics Symposium, Salt Lake City, UT, 27-30 June, 2010.
11. S. Abdrazakov, G. Hareland, L. Lines, L. and B. Busahmin," From Seismic to ROP and \$/m for Exploration Wells", ARMA 11-447, 45th US Rock Mechanics Symposium, San Francisco, CA, 27-30 June, 2011.
12. V. Mostafavi, G. Hareland and B. S. Aadnoy, "Assessment and Mitigation of Drilling Risks Using ROP Model Coupled with Monte-Carlo Simulation, ARMA 11-128, 45th US Rock Mechanics Symposium, San Francisco, CA, 27-30 June, 2011.

13. V. Mostafavi, G. Hareland, M. Belayneh and B. S. Aadnoy, “Experimental and Mechanistic Modeling of Fracture Sealing Resistance with Respect to Fluid and Fracture Properties” ARMA 11-198, 45th US Rock Mechanics Symposium, San Francisco, CA, 27-30 June, 2011.
14. V. Mostafavi, B. S. Aadnoy and G. Hareland, “Model-Based Uncertainty Assessment of Wellbore Stability Analyses and Downhole Pressure Estimations, ARMA 11-127, 45th US Rock Mechanics Symposium, San Francisco, CA, 27-30 June, 2011.
15. Z. Wu, G. Hareland, B. Rashidi, X. Gao and Y. Yang, “Geometrical Modeling of Rock Breakage Craters to Improve the Performance of a ROP Simulator”, ARMA 11-161, 45th US Rock Mechanics Symposium, San Francisco, CA, 27-30 June, 2011.
16. G. Hareland, Z. Wu and B. Rashidi, “Geometrical Modeling of Rock Breakage Craters to Improve the Performance of a ROP Simulator”, ARMA 11-208, 45th US Rock Mechanics Symposium, San Francisco, CA, 27-30 June, 2011.
17. O. M. Contreras, R. Aguilera and G. Hareland, “A Case Study for Pore Pressure Prediction in an Abnormally Sub-Pressured Western Canada Sedimentary Basin”, ARMA 11-456, 45th US Rock Mechanics Symposium, San Francisco, CA, 27-30 June, 2011.
18. Z. Wu and G. Hareland, “Calculation of Friction Coefficient and Down Hole Weight on Bit with Finite Element Analysis of Drillstring”, ARMA 12-195, 46th US Rock Mechanics Symposium, Chicago, IL, 24-27 June, 2012.
19. B., Rashidi, G. Hareland, A. Wu, Y. Lin and Y. Yang, “New Approach to Mechanical Modeling of Inserts of Rollercone Bits”, ARMA 12-241, 46th US Rock Mechanics Symposium, Chicago, IL, 24-27 June, 2012.
20. I. Kowakwi, H. Chen, G. Hareland and B. Rashidi, “The Two-Term Rollercone Rate of Penetration (ROP) Model with Integrated Hydraulics Function”, ARMA 12-246, 46th US Rock Mechanics Symposium, Chicago, IL, 24-27 June, 2012.
21. Cedola, A.E., Akhtarmanesh, S., Qader, R., Caldarola, V.T., Hareland, G., Nygaard, R. and M., Alsaba, “Nanoparticles in Weighted Water Based Drilling Fluids Increase Loss Gradient”, ARMA paper 2016-310, 2016 ARMA 50th US Rock Mechanics/Geomechanics Symposium held in Houston, Texas, USA, 26-29 June 2016.
22. Akhtarmanesh, S., Alsaba, M., Cedola, A.E., Qader, R., Caldarola, V.T., Hareland, G. and R. Nygaard, “Barite Nano-Micro Particles with LCM Seal Fractured Formations Better in Weighted Water Based Drilling Fluids”, ARMA paper 2016-306, 2016 ARMA 50th US Rock Mechanics/Geomechanics Symposium, Houston, Texas, USA, 26-29 June 2016.
23. Calderola, V.T., Akhtarmanesh, S., Cedola, A.E, Qader, R. and G. Hareland, G., “Potential Directional Drilling Benefits of Nanoparticles in Weighted Water Based Drilling Fluids”, ARMA paper 2016-309, 2016 ARMA 50th US Rock Mechanics/Geomechanics Symposium, Houston, Texas, USA, 26-29 June 2016.
24. Thorp, N., Hareland, G., Elbing, B.R. and R. Nygaard, “Modelling of a Drill Bit Blaster” ARMA paper 2016-451, 2016 ARMA 50th US Rock Mechanics/Geomechanics Symposium, Houston, Texas, USA, 26-29 June 2016.
25. Self, R., Atashnezhad, A. and G. Hareland, “Use of a Swarm Algorithm to Reduce the Drilling Time through Measurable Improvement in Rate of Penetration”, ARMA paper 2016-456 2016 ARMA 50th US Rock Mechanics/Geomechanics Symposium, Houston, Texas, USA, 26-29 June 2016.

Other Technical Publications

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