

R E S U M E

PERSONAL INFORMATION

NAME Md Motiur RAHMAN

Associate Professor
Petroleum Engineering Department
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NATIONALITY Australian

DATE OF BIRTH 30th September 1960

PLACE OF BIRTH Nawabganj, Bangladesh

QUALIFICATIONS

- **Ph.D. in Petroleum Engineering (2002).** The University of New South Wales, Sydney, Australia.
Thesis title: Multivariate and Multiple Criteria Optimization of Hydraulic Fracturing; with Particular Application to Tight Gas Reservoirs
- **Diploma in Geothermal Energy Technology (1994).** The University of Auckland, New Zealand.
Project title: Acidizing Geothermal Wells in Broadland-Ohaki Fields
- **Master of Engineering in Petroleum Engineering (1993).** The University of New South Wales, Sydney, Australia.
Thesis title: Evaluation of Formation Damage due to Drilling and Completion Fluids in a Typical Australian Oil Well
- **Graduate Diploma in Petroleum Engineering (1990).** The University of New South Wales, Australia.
- **Bachelor of Technology in Mining Engineering (1985).** Banaras Hindu University, Varanasi, India.

PROFESSIONAL EXPERIENCE

JANUARY 2010 – PRESENT

Institution Petroleum Engineering Department
The Petroleum Institute

Position Associate Professor of Petroleum Engineering

Teaching Undergraduate and graduate courses
PEEG 341 Completion and Workover
PEEG 443 Production System Design and Analysis
PEEG 510 Advanced Well Testing
PEEG 540 Advanced Well Performance Analysis
PEEG 593 Special Topic in PE (Well Stimulation)
PEEG 598/599 M.Eng. Project and M.Sc. Thesis

Research Interests:

Reservoir stimulation by hydraulic fracturing sandstone, and acid fracturing carbonates

Production modeling for propped/acid fractured tight gas/oil sands

Formation damage and matrix acidizing

JANUARY 2008 – JANUARY 2010

Institution Australian School of Petroleum
The University of Adelaide, Australia

Position Senior Lecturer of Petroleum Engineering

Teaching Undergraduate and graduate courses
PETROENG 1006 Introduction to Petroleum Engineering, PETROENG 3007 Well Testing and Pressure Transient Analysis, PETROENG 3023 Well Completion and Stimulation, PETROENG 3020/7050 Production Engineering and Optimization

Research **Grants:**

- *Internal Grant:* Awarded a 2008-09 research grant (\$12,000) from the Engineering Faculty to conduct research on "An algorithm to predict production flow rate from propped/acid fractured well in tight formation", completed in December 2009.
- *External Grant:* Gas well simulator design and planning for a well (Adelaide University Well no. 1) of 152 m deep, concept design of

which is done originally by Prof. Podio of UT Austin. The well system is intended to be as flexible as possible in order to satisfy the maximum number of applications: research, postgraduate teaching, undergraduate teaching, training and service to the industry. The project is of worth \$1M, a grant from SANTOS and is to be completed by February 2010.

Services School coordinator for overseas promotion for international students (Middle East)
Postgraduate (Course Work) Coordinator
Reviewed three papers for Journal of Energy Resource Technology
Reviewed two extended abstracts for International Conference on Modelling, Simulation and Applied Optimization, Sharjah, UAE
Reviewed a paper for Petroleum Science and Technology

Examined an MS Thesis from the University of New South Wales, June 2009

FEBRUARY 2004 – JANUARY 2008

Institution Department of Chemical and Petroleum Engineering
United Arab Emirates University, Al-Ain, UAE

Position Associate Professor of Petroleum Engineering (promoted to the Associate Professor Rank from 01 September 2007)

Teaching **Courses** (undergraduate and graduate):
PETE 308 Drilling Engineering I, PETE 407 Drilling Engineering II, PETE 419 Well Performance, PETE 507 Well Testing, PETE 512 Petroleum Production Operations, PETE 570 Special Topic (Horizontal & Multilateral Wells), PETE 585 Graduation Project I, PETE 590 Graduation Project II, PTSE 722 Well Stimulation (Graduate course).

Course Development:

- Developed PETE 308 Drilling Engineering I, PETE 419 Well Performance, and PETE 512 Petroleum Production Operations courses on Laptop (as part of university's laptop course development project)

Research **Internal Grants:**

- Awarded a 2006-07 individual research grant (AED. 19,100) from the University to conduct research on "Integration of Acid Penetration and Acid Loss Flux with Fracture Geometry to Model Hydraulic

Fracturing", completed in December 2007 (project no. 04-02-7-11/07 UAEU). This work is on carbonates and UAE has mostly carbonate reservoirs.

- Awarded a 2005-06 individual research grant (AED. 16,900) from the University to conduct research on "Production from Hydraulically Fractured Gas Reservoir – A Method to Model Flow Rates Incorporating Non-Darcy Effects", completed in February 2007 (Project No. 03-02-7-11/06).
- Awarded a 2004-05 individual research grant (AED. 23, 460) from the university to conduct research on "Constrained Hydraulic Fracture Optimization – A Systematic Approach to Design Treatment Parameters", completed in February 2006 (Project No. 03-02-7-11/05).

Examination of Thesis:

- Examined a master's thesis from the Australian School of Petroleum, The University of Adelaide, Australia, March 2006. Thesis Title: "Application of Fractional Flow Theory to Foams in Porous Media" by Mr. Zulfiqar Firoze Dholkawala.

Services

University Service:

- Served in department committees: course improvement & outcome assessment, course scheduling & teaching load adjustments, and research. Served as Faculty sponsor to the SPE student chapter.
- Served in college committees: Graduation project examination, and development of new college course 'Introduction to Engineering Design and Ethics'.
- Served in university committee: a member & secretary for MS Petroleum program. Served as a panel member to interview the applicants for graduate courses.

Community Service:

- Chaired a technical session on 21st November (11:30-13:55) in the Kuwait 2nd Oil and Gas Conference & Exhibition, Kuwait City, 20-22 November 2006.
- Co-chaired a technical session in the SPE Asia Pacific Oil & Gas Conference and Exhibition, Adelaide, Australia, 11-14 September 2006.
- Reviewed manuscripts, submitted for publication in Emirates Journal for Engineering Research, UAE University.
- Served as technical expert in well stimulation (to resolve a complex situation between two UAE oil companies and a local service company) to the Ministry of Justice, during March-May 2006.
- Reviewed manuscripts submitted for publication in Petroleum Journals Online (e-journal of Drilling Engineering).

- Reviewed manuscripts submitted for publication in The Journal of Engineering Research, Sultan Qaboos University, Oman.
- Reviewed manuscripts submitted for publication in Petroleum Journals Online (e-journal of Production Engineering).

APRIL 2002 – FEBRUARY 2004

Institution	Australian School of Petroleum The University of Adelaide Adelaide SA 5005, AUSTRALIA
Position	Lecturer (Level B)
Teaching	Setup drilling fluids and cement laboratory and prepared the materials for experiments for the first time in the school. Developed lecture materials and taught the following undergraduate and graduate courses: <ul style="list-style-type: none"> • Introduction to Petroleum Industry (co-teaching) • Drilling Engineering (year-2 course) • Well Completion (year-3 course) • Drilling Engineering (graduate course, co-teaching with Prof. A. Podio of University of Texas Austin), and • Well Completion & Stimulation (graduate course, co-teaching with Prof. A. Podio of University of Texas at Austin).
Research	<p>Grants:</p> <ul style="list-style-type: none"> • Awarded Engineering Faculty Small Research Grant (A\$ 5000) for research on "Methodology Development in Hydraulic Fracturing", completed the project in January 2004 <p>Supervised (as principal supervisor) an M.Eng.Sc student's research work on the above project based on fracturing data from Santos Ltd, during 2002-04. Research title was 'Optimizing hydraulic fracturing treatment parameters to stimulate low permeable gas reservoir'.</p> <p>Adelaide University Test Well No.1:</p> <p>Worked with Prof. Tony Podio of UT Austin, during its concept design (downhole and surface facility), visited Santos's Moomba field in order to design gas well simulator in line with Santos fields/requirements.</p>
Services	<p>University Service:</p> <ul style="list-style-type: none"> • Coordinated liaison activities between Santos Ltd and legal advisor of the university to formulate an agreement for transfer of field data for graduate students' research and contract research in the school. • School activities: (1) member of school's curriculum committee (2) initiated the opening of a SPE Student Chapter in the university for

the first time and worked as a faculty advisor to the Chapter, (3) worked as a second year students' course coordinator, (4) represented the school in the university open day and career night program.

JULY 1997 – MARCH 2002

- Institution** School of Petroleum Engineering
The University of New South Wales
Sydney NSW 2052, AUSTRALIA
- Position** Teaching and Research Assistant (while doing Ph.D.)
- Teaching** Taught and supervised Year-2 and Year-3 students in the following subjects:
1. Rock and Fluid Properties Laboratory (teaching & marking)
 2. Well Drilling Equipment & Operations (tutoring & marking)
 3. Drilling Fluids and Cementing (tutoring & marking)
 4. Drilling and Production Laboratory (teaching & marking)
- Assisted undergraduate/graduate students with specific problem in their projects from time to time
- Research** Research/Industry works conducted including PhD work:
- Designed a process of optimum hydraulic fracture treatment. An optimization algorithm linking hydraulic fracture geometry, in-situ parameters, pumping parameters, reservoir producibility, and finally economic analysis is developed.
 - In-situ stress characterization based on well logs and hydraulic fracture pressure data. Analyzing the mechanism behind the treatment pressure anomalies experienced onshore Australia (using hydraulic fracture simulation by *FRACPRO*). Reservoir simulation and fracture optimization by *FRACPRO*.
 - Performed numerical studies of hydraulic fracture development under the stress conditions to explain complexity in fracture development (using *HYFRANC-3D*).

NOVEMBER 1994 - JUNE 1997

- Institution** Geothermal Institute
The University of Auckland
Auckland, NEW ZEALAND
- Position** Engineering Tutor and Research Assistant
- Teaching** Taught and supervised postgraduate diploma students in subjects:

1. Geothermal system and technology (tutoring & marking)
2. Geothermal production engineering (tutoring & marking)
 - The above subjects include geology, drilling, slotted liner completion, well testing, and reservoir/production engineering.
 - Assisted students in their project works and field works from time to time

Research/Industry works conducted:

- Background information gathering on geothermal well testing and acidizing technique for Ohaaki-Broadlands geothermal wells. Analysis and presentation of the assessment results of Rotokawa geothermal field
- Analysis and interpretation of production data after acidizing the wells and evaluation of acidizing technique adopted first time in New Zealand, with recommendation to the NZ Geothermal Industry
- Analysis and interpretation of production data and identifying formation damage in geothermal wells and their acid treatment to remove formation damage in Ohaaki-Broadlands geothermal field (for Contact Energy Ltd., Taupo, NZ)
- Analysis of pressure-temperature profile for injection, heating, transient, shut-in and discharge tests, using GD-Manager. Preparation of completion reports for Ohaaki-Broadlands geothermal wells (for Contact Energy Ltd., Taupo, NZ)
- Analysis and interpretation of Ngawha Geothermal Field data with a view to reduce non-condensable gases in the steam (for Kingston Morrison Ltd., Auckland, NZ)

JANUARY 1991 - JUNE 1993

Institution School of Petroleum Engineering
 The University of New South Wales
 Sydney 2052 AUSTRALIA

Position Research Assistant (while doing ME)

Research/industry works conducted:

- Background information gathering and interpretation of formation damage and its removal techniques applied in Mareenie field of Central Australia
- Setting up rigs/equipment to conduct different laboratory experiments for formation damage analysis and acid treatment, with recommendation to achieve removal of formation damage
- Analysis of water sensitivity and formation damage due to different drilling, completion/workover fluids, using dynamic filtration apparatus and permeameter. Matrix acidizing to remove formation damage and

study of reaction kinetics of acid with sandstone.

JULY 1985 - FEBRUARY 1990

- Organization** Sylhet Gas Fields Ltd (SGFL)
(presently a national oil & gas company of Bangladesh)
P.O. Chiknagoal, Sylhet
BANGLADESH
- Position** Engineer (Drilling and Production)
- Tasks** Tasks Conducted:
- Well planning and design for oil & gas wells. Preparation of drilling & completion program. Preparation of material list, casing design, cementing and mud program. Worked with the consultant from Oil & Mining Services Ltd. of UK in drilling projects.
 - Technical supervision and well-site operations during drilling, completion and well testing. Well test analyses and reservoir engineering calculations of oil and gas reservoir. Conducted long term production testing of gas wells.
 - Material co-ordination and well-site supervision during workover and recompletion of gas-condensate wells. Preparation of authorized field expenditures for drilling and completion projects, and monitoring day to day expenditure against plan
 - Production-operation and maintenance of Sylhet oil and gas-condensate wells. Maintenance and operation of gas gathering, dehydration and condensate fractionation plant. Worked with the consultants from Seamore B.V. of The Netherlands.
 - Conceptual design and installation of surface facilities (with LPG plant) in Kailashtila Gas Field. Worked with consultants from Applied Engineering Company at their home office in Orangeburg, South Carolina, USA in October 1987.

RESEARCH AND PUBLICATIONS

JOURNAL PAPERS:

1. **Rahman, M.M.** and Rahman, M.K. "Optimizing Hydraulic Fracture to Manage sand Productuion by Predicting Critical Drawdown Pressure in Gas Well", *J. of Energy Resources Technology*, accepted in April 2011 (in press).
2. Omar, M.A.Z. and **Rahman, M.M.** "Modeling Pinpoint Multistage Fracturing with 2D Fracture Geometry for Tight Oil Sands", *Petroleum Science and Technology*, 2011, **29**, pp. 1203-1213.
3. **Rahman, M.M.** "An Algorithm to Model Acid Fracturing in Carbonates: Insightful Sensitivity Analysis" *Petroleum Science and Technology*, 2010, **28**, pp. 1046-1058.

4. **Rahman, M.M.** and Rahman, M.K. "Review of Hydraulic Fracture Models and Development of an Improved Pseudo-3D Model for Stimulating Tight Oil/Gas Sand", *Energy Sources, Part A*, 2010, **32**, 1416-1436.
5. **Rahman, M.M.** "Constrained Hydraulic Fracture Optimization Improves Low Permeable Oil Reservoirs", *Energy Sources, Part A*, 2008, **30**, pp. 536-551.
6. Rahman, M.K., **Rahman, M.M.**, and Joarder, A.H. "Analytical Production Modelling for Hydraulically Fractured Gas Reservoirs", *Petroleum Science and Technology*, 2007, **25**, pp. 683-704.
7. **Rahman, M.M.**, Chen, Z., and Rahman, S.S. "Experimental Investigation of Shale Membrane Behavior under Tri-Axial Conditions", *Petroleum Science and Technology*, 2005, **23**, pp. 1265-1282.
8. **Rahman, M.M.**, Rahman, M.K. and Rahman, S.S. "Optimizing Treatment Parameters for Enhanced Hydrocarbon Production by Hydraulic Fracturing", *J. of Canadian Petroleum Technology*, 2003, **42** (6), pp. 38-46.
9. **Rahman, M.M.**, Rahman, M.K. and Rahman, S.S. "Multicriteria Hydraulic Fracturing Optimization for Reservoir Stimulation", *Petroleum Science and Technology*, 2003, **21** (11-12), pp. 1721-1758.
10. **Rahman, M.M.**, Hossain, M.M., Crosby, D.G., Rahman, M.K. and Rahman, S.S.: "Analytical, Numerical and Experimental Investigations of Transverse Fracture Propagation from Horizontal Wells", *J. of Petroleum Science and Engineering*, 2002, **35**, pp. 127-150.
11. Crosby, D.G., **Rahman, M.M.**, Rahman, M.K. and Rahman, S.S.: "Single and Multiple Transverse Fracture Initiation from Horizontal Well", *J. of Petroleum Science and Engineering*, 2002, **35**, pp. 191-204.
12. **Rahman, M.M.**, Rahman, M.K. and Rahman, S.S., "An Integrated Model for Multi-objective Design Optimization of Hydraulic Fracturing", *J. of Petroleum Science and Engineering*, 2001, **31**, pp. 41-62.
13. Rahman, M.K., **Rahman, M.M.** and Rahman, S.S., "A Decision Support System for Improving Hydraulic Fracture Treatment for Hydrocarbon Reservoirs", *Australian Pet. Prod. Expl. Association Journal*, 2001, pp. 633-648.
14. **Rahman, M.M.**, Rahman, M.K., and Rahman, S.S. "The Recognition and Alleviation of Complexity with Hydraulic Fracturing Onshore Australia", *Australian Pet. Prod. Expl. Association Journal*, 2000, pp. 469-480.
15. Azizi, T., **Rahman, M.M.** and Rahman, S.S. "Design and Planning of Low Permeability Reservoir Stimulation by Acid Treatment: An Integrated Laboratory Analysis and Computer Modeling" *Australian Pet. Prod. Expl. Association Journal*, 1999, pp. 548-561.
16. Rahman, S.S., **Rahman, M.M.** and Khan, F.A. "Response of Low-permeability Illitic Sandstone to Drilling and Completion Fluids" *J. of Petroleum Science and Engineering*, 1995, **12**, pp. 309-322.
17. **Rahman, M.M.**, Khan, F.A. and Rahman, S.S. "Development of Wellbore Treatment Technology for Improving Production Efficiency from Australian Oil and Gas Wells." *Australian Pet. Prod. Expl. Association Journal*, 1994, pp. 79-91.

CONFERENCE PAPERS:

1. **Rahman**, M.M. and Sarma, H.K. "Maximizing Tight Gas Recovery through a New Hydraulic Fracture Optimization Model", SPE 148205, presented at the SPE Reservoir Characterization and Simulation Conf. and Exh., Abu Dhabi, October 9-11, 2011
2. Newman, M.S., **Rahman**, M.M. "A New Efficiency Criterion for Acid Fracturing in Carbonate Reservoirs", SPE 122630, presented at the SPE Asia-Pacific Oil & Gas Conf. and Exh., Jakarta, August 4-6, 2009.
3. Newman, M.S., Pavludis, M., **Rahman**, M.M. "Importance of Fracture Geometry and Conductivity in Improving Efficiency of Acid Fracturing in Carbonates", Paper No. 2009-146, presented at the Canadian International Petroleum Conference, Calgary, June 16-18, 2009.
4. **Rahman**, M.M.: "Productivity Prediction for Fractured Wells in Tight Sand Gas Reservoirs Accounting the Effect of Non-Darcy Effects", presented at the SPE Russian Oil & Gas Technical Conference and Exhibition, Moscow, Russia, 28-30 October 2008.
5. **Rahman**, M.M.: "Integration of Acid Fracture Penetration and its Flux Loss with Fracture Geometry to Model Acid Fracturing", presented at the 9th Annual Research Conference, Al-Ain, UAE, April 21-23, 2008.
6. **Rahman**, M.M.: "Production from Hydraulically Fractured Gas Reservoir – A Method to Model Flow Rates Incorporating Non-Darcy Effects", presented at the 8th Annual Research Conference, Al-Ain, UAE, April 22-24, 2007.
7. **Rahman**, M.M. "A New Tool to Optimize Hydraulic Fracture Treatment Parameters to Stimulate Tight Oil and Gas Reservoirs", presented at the Kuwait Second International Oil and Gas Conference, Kuwait, November 20-22, 2006.
8. **Rahman**, M.M. and Rahman, M.K. "An Intelligent Hydraulic Fracture Optimization Model: A New Tool to Stimulate Low Permeable Oil Reservoir", SPE 101137 presented at the *SPE Asia Pacific Oil & Gas Conf.*, Adelaide, Australia, September 11-13, 2006.
9. **Rahman**, M.M.: "Constrained Hydraulic Fracture Optimization – A Systematic Approach to Design Treatment Parameters", presented at the 7th Annual Research Conference, Al-Ain, UAE, April 22-24, 2006.
10. **Rahman**, M.M., Rahman, M.K. and Rahman, S.S.: "An Analytical Model for Production Estimation from Hydraulically Fractured Tight-gas Reservoirs", SPE 77901 presented at the *SPE Asia Pacific Oil & Gas Conf.*, Melbourne, Australia, October 8-10, 2002.
11. **Rahman**, M.M., Rahman, M.K. and Rahman, S.S. "Multivariate Fracture Treatment Optimization for Enhanced Gas Production from Tight Reservoirs", SPE 75702 presented at the *SPE Gas Technology Symposium*, Calgary, Alberta, Canada, April 30–May 2, 2002.
12. **Rahman**, M.M., Rahman, M.K. and Rahman, S.S. "Control of Hydraulic-Fracturing-Induced Formation Damage by Optimizing Treatments With Constraints", SPE 73754 presented at the SPE International Symposium and

Exhibition on Formation Damage Control, Lafayette, Louisiana, February 20-21, 2002.

13. **Rahman, M.M.**, Farag, S., and Rahman, S.S. "Evaluation of Formation Damage of Mereenie Sandstone Reservoir due to Drilling and Completion Practices", presented at the SPE Asia Pacific Formation Damage Forum Series, 10-14 May 1992, Bali, Indonesia.

INDUSTRY REPORTS:

1. "Formation Damage and Acidizing of Tirrawarra and Pacoota Sandstones", a report No. 3 submitted to Santos Limited, Adelaide, December 1999.
2. "Characterization of In-situ Stresses and Natural Fractures within the Cooper Basin, Australia" a report No. 2 submitted to Santos Limited, Adelaide, October 1998.
3. "Increase in Production Rate by Removing Formation Damage from Australian Oil and Gas Wells", a project report for ERDC, Australia, June 1993.
4. "Potential Hydrocarbon Production from Tight Oilshale in McArthur Basin", a project report for APCRC, Australia, March 1993.
5. "Laboratory Evaluation of Formation Damage of Pacoota Sandstone in Mereenie Field", a project report for AGL Petroleum, Brisbane, Australia, June 1992.

HONORS/AWARDS

- Excellent in teaching as evaluated by the chairman of the Department of Chemical and Petroleum Engineering, UAE University, for the academic years 2004-05, 2005-06, and 2006-07.
- Australian Postgraduate Award by the Australian Government to study PhD in Petroleum Engineering.
- Honor for being selected by the Geothermal Institute to present at the 16th NZ Geothermal Workshop, November 1994, Auckland, New Zealand.
- Equity and Merit Award by the Australian Government to study ME in Petroleum Engineering.

PROFESSIONAL MEMBERSHIPS

- Member of the Society of Petroleum Engineers, USA
- Graduate Member of the Institution of Engineers, Australia