

# Shahin Negahban

## EDUCATION:

Ph.D. in Chemical & Petroleum Engineering - University of Kansas (1986)

M.S. in Chemical Engineering – University of Michigan (1979)

B.S. in Chemical Engineering – University of Michigan (1978)

## WORK EXPERIENCE:

### **ADCO - Abu Dhabi, UAE – January 2014 to present**

ADCO VP Applied Research and Development – Responsible for:

- Managing the newly formed ADCO Applied R&D organization
- Developing R&D projects focusing on Carbonate Subsurface Efficient Recovery R&D mainly on 5 areas of :
  - Carbonate EOR Experimental and Theoretical
  - Carbonate DRP and Rock Characterization
  - Carbonate Geo-Mechanics and Fracture Characterization and Unconventional
  - Advanced EOR Reservoir Simulation Framework
  - Engineering and Facilities
- Working closely with ADNOC R&D Task Force and R&D Manager to integrate ADCO R&D Business Model within the ADNOC R&D Strategy Framework
- Selection and preparation of the ADCO staff interested in pursuing their Ph.D. degrees

### **Accomplishments:**

- Developed a fully functional R&D organization with clear Strategy, Mission, Vision and Values
- Sent 27 PhD students in Europe and USA conducting business value added Applied R&D
- Developed a very comprehensive ADCO R&D Portal
- Raised 36 Million Dollar 5-year Budget

### **ADCO - Abu Dhabi, UAE – April 2013 – January 2014**

Chief Technology Officer (CTO) – Responsible for:

- Establishing and building ADCO's Research & Development vision and culture.
- Leading all aspects of ADCO's applied technology and fundamental R&D development to help maximize long-term strategy for oil recovery by sustaining "Green" production capacity beyond maturity of ADCO reservoirs as per ADCO's 2020+ strategy.
- Managing all the internal and external R&D activities for ADCO including: (a) the Joint Industry Projects (JIPs) with external universities (e.g., Heriot-Watt University and Massachusetts Institute of technology); (b) R&D projects with the Petroleum Institute (PI) and other UAE Universities; and (c) EOR R&D projects for ADNOC Oil Sub-Committee (OSC).
- Developing an ADCO Applied R&D organization closely inline with the ADNOC Research and Development Strategy.

### **Accomplishments:**

- Developed an innovative Applied R&D business model and received ADCO Executive Management Approval.
- Developed an AR&D organizational structure (5 AR&D Trust Areas and Job Description for Staff) and received management approval

### **Petroleum Institute - Abu Dhabi, UAE – January 2012 – April 2013**

VP Research and Development – Responsible for:

- Establishing and building a Research & Development culture at Petroleum Institute.
- Developing vision, mission, values and strategy for Petroleum Institute Research Center (PIRC).
- Building a Safe World-Class "Carbonate" Research and Development Centre that is recognized and admired for its People, Performance, Progressiveness and Partnership.

- Directing and leading the PIRC in conducting high-quality Research and Development (R&D) projects to address ADNOC's oil and gas production challenges
- Providing efficient, environmentally acceptable and cost-effective solutions for ADNOC operating companies' technical needs.

**Accomplishments:**

- Managed construction of a 25,000 square ft Research Center at Petroleum Institute)
- Developed a fully functional R&D organization at Petroleum Engineering
- Developed 16 R&D trust areas for all the departments (PE, ChE, ME, EE and Geoscience) and raised 40 Million dollars budget
- Reached agreements with TOTAL to build Advanced PVT and DRP laboratories and BP to build Advanced Special Core Analysis lab in the Petroleum Institute Research Center (sevel integrated oil and gas companies are involved with supporting Petroleum Institute)

**ADCO - Abu Dhabi, UAE – June 2010- January 2011**

ADCO EOR Senior Strategic Advisor – Responsible for:

- Managing the ADCO EOR Master Plan and ongoing CO2 EOR pilots and full field development activities
- Acting as the ADCO CO2 EOR/Carbon Capture, Utilization and Storage (CCUS) manager for External Research and Development Projects
- Managing ongoing CO2 EOR and CCUS JIPs with Academia (Petroleum Institute, Masdar Institute, Rice U, U of Texas Austin, Stanford U. and MIT)
- Coordinates with Technical Centre (Engineering & Projects) on facilities input to CO2 EOR strategic topics
- Supports ADNOC CO2/N2 team and ADCO assets on strategic EOR related initiatives and ongoing pilots and full field projects

**ADCO - Abu Dhabi, UAE – June 2007- June 2010**

ADCO EOR Manager – Developed a very comprehensive EOR road map including

- EOR screening study of all ADCO reservoirs
- Comprehensive EOR laboratory study on advanced PVT, advanced Asphaltene and advanced SCAL for CO2/ADCO oils for all major reservoirs (Bab, Bu Hasa, Asab, Shah, Sahil, Dabb'iyah and Rumaitha
- Designed and implemented the first CO2 EOR pilot in the GCC in Rumaitha Field
- Working on design and implementation of other CO2 pilots in ADCO.
- Developed the first CO2 EOR SPE workshop in Abu Dhabi
- Coordinated the formation of the tri-organizational Carbon Lead Steering Committee between ADCO, ADNOC and Masdar.

**ADCO - Abu Dhabi, UAE – June 2005 - June 2007**

Reservoir Engineering Coordinator for NEB (North East Bab) Team – Provided co-ordination of all RE activities in PDD/NEB, UAE. Responsible for developing Phase I (110 MBOD by mid 2006) NEB while implementing optimum reservoir management and sound field operating practices and honoring HSE guidelines. I have been instrumental in transferring latest technology to ADCO in areas of PVT, SCAL, simulation and reservoir engineering, and secondary and tertiary IOR processes. I am frequently requested to consult on various issues by other reservoir engineers in NEB and other teams in ADCO, notably laboratory work (PVT, EOR PVT, SCAL, etc.), simulation work and other areas of reservoir engineering.

**ADCO - Abu Dhabi, UAE – October 2004 - June 2005**

QPID (Quality Process Implementation Department) – Acting as a skill pool expert in PVT/EOR/Reservoir Engineering, responsible for developing working systems (standard operating procedures) for many aspects of reservoir engineering (PVT, EOR, SCAL, Management, Simulation, etc.), developing (coaching/mentoring and training) UAE nationals, reviewing/monitoring reservoir engineering activities (reports, modeling, management, etc.) and developing laboratory PVT and SCAL programs as per request from ADCO teams and monitoring the progress of laboratory works conducted by service companies.

**ADCO - Abu Dhabi, UAE – October 2002 - October 2004**

Reservoir Engineering Coordinator for Bu Hasa Team – Provided co-ordination of all RE activities in PDD/Bu Hasa, UAE. Was responsible for meeting sustainable capacities for Bu Hasa while implementing optimum reservoir management and

sound field operating practices and honoring HSE guidelines. Have been instrumental in transferring latest technology to ADCO in areas of PVT, SCAL, simulation and reservoir engineering, and secondary and tertiary IOR processes. Frequently requested to consult on various issues by other Reservoir Engineers and other teams in ADCO, notably laboratory work (PVT, EOR PVT, SCAL, etc.), simulation work and other areas of reservoir engineering.

**ADCO - Abu Dhabi, UAE – April 2001 - October 2002**

Senior Reservoir Engineering in North East Bab Team – Responsible for short and long term Reservoir Engineering plans for NEB team's field development in ADCO, UAE, including surface and subsurface activities. Charged with leading and providing solutions to complex inter-discipline specific problems with the ADCO/NEB team – e.g. development risk mitigation, monitoring strategy, monitoring multimillion dollar large scale ADCO projects, and coaching/mentoring/career development for UAE nationals.

**BP Upstream Technology Group – Aberdeen, UK - May 2000 - April 2001**

Senior Research Engineer in the Forties EOR Team (UK) – Managed and worked on developing a feasible EOR project for Forties field in North Sea. Designed PVT/EOR and SCAL programs and conducted compositional simulations.

**BP Upstream Technology Group, Houston September 1999 -May 2000**

Reservoir Engineering Group - Conducted a simulation study on maximizing liquid recovery from a condensate field in North Sea.

**Amoco Petrophysics School, Tulsa, USA August 1998 - July 1999**

As a petrophysics trainee, I worked on petrophysical characterization and performance modeling of the Chirag field of the Gunashli-Chirag-Azeri Mega-Structure located on the Caspian Sea Basin (Amoco had 34% interest as part of AIOC).

**Fracture Stimulation Technology Group, Amoco, 1997- August 1998**

Fracturing Group - Developed methodology for incorporating an effective gel viscosity correlation into the Amoco implicit compositional simulator, IGCAMP. Conducted 2-D and 3-D simulation case studies for fracture fluid cleanup and polymer recovery and their impact on increased fracture conductivity, effective length, and well productivity.

**Coalbed Methane Group, Amoco, 1994 - 1997**

Enhanced Coalbed Methane (ECBM) Reservoir Engineering - Worked with Denver SRBU, Durango JOMT, and USOG Acquisitions groups on micropilot analysis and history-match, small and full field reservoir modeling and history-match, and design and implementation of world's largest ECBM project in Tiffany, Colorado.

- As a member of the multi-discipline Fruitland Outcrop Investigation team, was responsible for development of a very complex reservoir description to investigate possible causes of gas seeps at the surface. Presented the results to Colorado Oil and Gas Conservation Commission last fall.
- As a member of a Nitrogen Enhanced Coalbed Recovery Project team, was responsible for history matching the primary production data and make nitrogen ECBM recovery future forecast for a coalbed methane reservoir. This project is currently ongoing.
- Performed numerous pilot and field scale simulations studies for the Denver BU coalbed methane growth team and acquisitions group.

**Reservoir Studies & Model Development Group, Amoco, 1990 - 1993**

Worked on the Amoco Generalized COMpositional Simulator (GCOMP) model development, user support, and reservoir modeling studies.

- Developed the GCOMP vectorized Black Oil/K (p) options, which speed up simulation, run time by a factor of 4 or better on Cray platforms. Developed flash package for CO<sub>2</sub> miscible and immiscible simulations. Also developed, incorporated and tested several model features in GCOMP. Conducted engineering studies to improve the simulation technology for various recovery processes, and to identify areas needing improvements by determining the model limitations.
- Conducted several joint reservoir simulation studies with Amoco BU personnel.
- Played lead role in providing technical support to Amoco personnel on GCOMP usage, and in maintaining and updating GCOMP on several computing platforms (e.g. Sun workstation, IBM RISC 6000 workstations, IBM mainframe, Cray supercomputers). Worked with other members of the team in maintaining and updating the CUI (Computer Users' Instructions).

**Enhanced Oil Recovery Group, Amoco, 1986 - 1989**

Conducted research in the area of process modeling and interpretation of enhanced gas drives:

- Worked on compositional simulation of slim tube tests and vertical and horizontal corefloods involving CO<sub>2</sub> and other enhanced gas displacements of reservoir crude oils; simulation study on the role of capillary and gravity forces during immiscible core displacements, development and validation of equation-of-state fluid properties for CO<sub>2</sub>-West Texas reservoir oils; and simulation/modeling of flow instabilities such as viscous fingering and gravity override.
- Modeled and interpreted enhanced gas drive tests in support of Egyptian and Valhall reservoirs.
- Modeled laboratory long corefloods using a mimic system, Bairoil, North Cowden Unit and other West Texas systems to improve understanding of physics of CO<sub>2</sub> flooding.
- Modeled water blocking physics to simulate Nipisi, Sacroc and other systems.
- Developed equation-of-state fluid descriptions for many CO<sub>2</sub>-west Texas oil systems.

#### **Department of Chemical & Petroleum Engineering - U. of Kansas – Lawrence, KS – 1982 - 1986**

Conducted research on phase behavior modeling of electrolyte and nonelectrolyte, two- and three-phase liquid-liquid systems; development of an Excess Gibbs Energy model for electrolyte systems; experimental phase behavior modeling of surfactant systems; and development of computational algorithms for parameter estimation and phase behavior prediction of liquid-liquid systems.

#### **Publications:**

1. **“Three-liquid-phase equilibria of ternary and quaternary mixtures, water/n-decane/2-butyloxyethanol and water/n-octane/1-propanol/sodium chloride—experimental measurements and their correlation with the UNIQUAC model”**, Shahin Negahban, G.P. Willhite, S.M. Walas and M.J. Michnick, Chemical and Petroleum Engineering, University of Kansas, Lawrence, KS 66045 U.S.A., Fluid Phase Equilibria, Volume 32, Issue 1, Pages 49-61, October 1986.
2. **Modeling of Three-Phase Liquid/Liquid Equilibria**”, Negahban, Shahin, U. of Kansas; Willhite, G. Paul, U. of Kansas; Wales, S.M., U. of Kansas, SPE Reservoir Engineering, Volume 3, Number 3, August 1988.
3. **“Correlation and Experimental Investigation of Multicomponent Multiphase Liquid-Liquid Equilibria of Electrolyte and Non-Electrolyte Systems.”** Negahban, Shahin, Ph.D. Thesis. University of Kansas: Lawrence, KS., 1986.
4. **“Simulation of the Effects of Mixing in Gasdrive Core Tests of Reservoir Fluids”**, Negahban, Shahin, Shiralkar, Gautam S., Gupta, Surendra P., Amoco Production Co., SPE Reservoir Engineering, Volume 5, Number 3, August 1990.
5. **Development and Validation of Equation-of-State Fluid Descriptions for CO<sub>2</sub>/Reservoir-Oil Systems**”, Negahban, Shahin, Kremesec Jr., V.J., Amoco Production Co., SPE Reservoir Engineering, Volume 7, Number 3, August 1992.
6. **“An Improved Empirical Approach for Prediction of Formation Water Saturation and Free Water Level for Uni-modal Pore Systems”**, Negahban, Shahin, BPAmoco; G.W. Gunter, NExT; C.R. Smart, BPAmoco, SPE Annual Technical Conference and Exhibition, 1-4 October 2000, Dallas, Texas.
7. **“Characterization of Enhanced Coalbed Methane Recovery Injection Wells”**, J.P. Seidle (Amoco EPTG), C.A. Sigdestad (Amoco EPTG), K.T. Raterman (Amoco EPTG), S. Negahban (Amoco EPTG), SPE Annual Technical Conference and Exhibition, 5-8 October, San Antonio, Texas, 1997.
8. **“An Experimental Study at an Abu Dhabi Reservoir of Asphaltene Precipitation Caused By Gas Injection”**, S. Negahban, SPE, and J.N.M. Bahamaish, Abu Dhabi Co. for Onshore Oil Operation; N. Joshi, SPE, J. Nighswander, SPE, and A.K.M. Jamaluddin, SPE, Schlumberger, SPE Production & Facilities, Volume 20, Number 2, May 2005.

9. **“Screening of Field Development Options by Simulation Study To Improve Recovery From Lower Southern Units of Complex Carbonate Reservoir”**, Zahid Bhatti, Shahin Negahban, and Mohamed Shuaib, ADCO, Abu Dhabi International Petroleum Exhibition and Conference, 5-8 November 2006, Abu Dhabi, UAE.
10. **The Role of Geomechanics at Early Stages of Field Development: A Case Study**”, Jorge S. Gomes, Maria Ribeiro, Shahin Neghaban, Yousef Dabbour, Jamal Bahmaish, and Georges Zaborowski, ADCO, Abu Dhabi International Petroleum Exhibition and Conference, 5-8 November 2006, Abu Dhabi, UAE.
11. **“Implication of Properly Tuned EOS and Properly Measured SCAL on Prediction of Rates, Reserves and Field Performance using a Full Field Fully Compositional Model for an Off-shore Complex Carbonate Field in Abu Dhabi, UAE”**, Salma Al Hejari, SPE, Ahmed El Mahdi, SPE, and Shahin Negahban, SPE, Adco, SPE Middle East Oil and Gas Show and Conference, 11-14 March 2007, Kingdom of Bahrain.
12. **“Tight Reservoirs - A Development Challenge Example from a Carbonate Reservoir Offshore Abu Dhabi, UAE”**, Salma Al Hajeri, Abeer Al Shehhi, Maria Teresa Ribeiro, Mohamed Ayoub, Shahin Negahban, and Jamal Bahamaish, ADCO, SPE Middle East Oil and Gas Show and Conference, 11-14 March 2007, Kingdom of Bahrain.
13. **“An Empirical Saturation Modeling of a Complex Carbonate Abu Dhabi Reservoir Using the Routine High Pressure Mercury and Oil/Water Capillary Pressure Data”**, R.E. Mahmoud Basoni, R.E.C. Shahin Negahban, S.R.E. Ahmed Dawood, S.R.E. Ahmed El Mahdi, and T.L. Jamal Bahmaish, Adco, SPE Middle East Oil and Gas Show and Conference, 11-14 March 2007, Kingdom of Bahrain.
14. **“An Integrated Approach for a Full-Field Optimized Development of a Carbonate Reservoir on a Shallow Marine Environment, Abu Dhabi”**, Ahmed El Mahdi, Mohammed Ayoub, Samy Daif-Allah, SPE, Shahin Negahban, Maria Ribeiro, and Jamal Bahamaish, Adco, SPE Middle East Oil and Gas Show and Conference, 11-14 March 2007, Kingdom of Bahrain.
15. **“RESERVOIR ROCK TYPING FROM CREST TO FLANK”**, R.E. Mahmoud Basoni, R.E.C. Shahin Negahban, S.R.E. Ahmed Dawood, S.R.E. Ahmed El Mahdi, and T.L. Jamal Bahamaish, Adco, Abu Dhabi International Petroleum Exhibition and Conference, 3-6 November 2008, Abu Dhabi, UAE.
16. **“Carbonate Reservoir Rock Typing - The Link between Geology and SCAL”**, Jorge S. Gomes, SPE, Maria Teresa Ribeiro, SPE, Christian J. Strohmenger, Shahin Negahban, SPE, and Mohammed Zubair Kalam, SPE, ADCO, Abu Dhabi International Petroleum Exhibition and Conference, 3-6 November 2008, Abu Dhabi, UAE.
17. **“Design and Implementation of the first CO<sub>2</sub>-EOR Pilot in Abu Dhabi, UAE.”**, by Salma Al Hajeri, Shahin Negahban, Ghaniya Al-Yafei, Ali Al Basry, SPE, Abu Dhabi Company for Onshore Oil Operations (ADCO), SPE EOR Conference at Oil & Gas West Asia, 11-13 April 2010, Muscat, Oman.
18. **“Integrated History Matching Simulation Study of the First Miscible CO<sub>2</sub>-EOR Pilot in Abu Dhabi Heterogeneous Carbonate Oil Reservoir”**, Salma Al Hajeri, ADCO, Shawket Ghedan, Petroleum Institute, Ali Al Basry, Shahin Negahban, ADCO, SPE Middle East Oil and Gas Show and Conference, 25-28 September 2011, Manama, Bahrain.
19. **“Lessons learned from the First Miscible CO<sub>2</sub>-EOR Pilot Project in Heterogeneous Carbonate Oil Reservoir in Abu Dhabi, UAE”**, A. Al Basry, S. Al Hajeri, H. Saadawi, F. Al Aryani, A. Obeidi, S. Negahban, G. Al Yafei, Abu Dhabi Company for Onshore Oil Operations (ADCO), SPE Middle East Oil and Gas Show and Conference, 25-28 September 2011, Manama, Bahrain.
20. **“Miscible Gas Injection Tests in Carbonates and its impact on Field Development”**, Zubair Kalam, Ali S Al-Rawahi, Ismail A Al-Hosani, Shahin Negahban and Abdul Samad A Rehman, Abu Dhabi Company for Onshore Oil Operations (ADCO), SPE Reservoir Characterization and Simulation Conference and Exhibition, 9–11 October 2011, Abu Dhabi, UAE.

21. **“An EoS Model for a Middle East Reservoir Fluid with an Extensive EOR PVT Data Material”**, Shahin Negahban, ADCO; Karen Schou Pedersen, Calsep A/S; Mahmoud Ali Baisoni, ADCO; Pashupati Sah, Calsep Malaysia; and Jawad Azeem, Calsep FZ-LLC Dubai, Abu Dhabi International Petroleum Exhibition and Conference, 1-4 November 2010, Abu Dhabi, UAE.
22. **“Carbonate Rock Types Matrix, the Ultimate Rock Properties Classification Catalogue”**, O. Al-Farisi, Abu Dhabi Marine Operating Co.; H.A. Belhaj, S.G. Ghedan, The Petroleum Inst.; S. Negahban, Abu Dhabi Co. Onshore Oil Operation; J.S. Gomes, The Petroleum Inst., 6th International Petroleum Technology Conference, Mar 26 - 28, 2013 2013, Beijing, China.