

## Shari Dunn-Norman

Shari Dunn-Norman is an Associate Professor of Petroleum Engineering. She has decades of experience in the education environment. Shari holds a BS from the University of Tulsa and a PhD from Heriot Watt University.

### PROFESSIONAL EXPERIENCE

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- 2004–Present**      **Missouri University of Science and Technology (Missouri S&T) Department of Geological Sciences and Engineering**  
*Associate Professor, Petroleum Engineering – August 2013–Present*  
*Program Head, Petroleum Engineering – August 2004–2005/2009, June 2010–2013*  
Responsible for the teaching of production engineering, hydraulic fracturing, artificial lift, petroleum engineering design, environmental applications, offshore oil technology, petroleum economics and a graduate level course in advanced production engineering.
- 1997–1998**      **Maguire Oil and Gas Institute, Edwin L. Cox School of Business, Southern Methodist University, Dallas, TX**  
*Visiting Instructor*
- 1983–1985**      **ARCO International Oil and Gas Company (AIOGC), Los Angeles, California**  
*Senior Operations Engineer – May, 1983–September, 1985*  
Responsible for production operations staff review of subsidiary operations in the UK, Netherlands and Norway. Duties included evaluating the economics of various field developments in the North Sea, assisting with preparation of the long range plan, reviewing various exploratory and development drilling proposal, and preparing major project operations. Taught multiphase flow and pipeline design in AIOGC's Field Development School, which was presented to visiting Chinese engineers via a simultaneous translator. Completed a gas compression study for a pipeline in the South China Sea, and reviewed a potential farm in North Yemen.  
*Exploration Engineer – November 1981–May 1983, Denver, Colorado*  
Provided support for exploration efforts in the Western U.S. Responsible for reviewing authorizations for expenditure (AFE's) for exploratory prospects, and presenting these to management. Other functions included estimating exploratory reserves, preparing project economics, evaluating logs and drill stem tests, preparing testing programs (fracturing design, execution and flow testing - Bakken Formation, North Dakota), and projecting development facility requirements for exploratory prospects. Assisted in preparing engineering development scenarios used for bidding the Federal Offshore California lease sale (68). Organized the initial study of the high CO<sub>2</sub> gas area (Riley Ridge) in western Wyoming. This included reservoir analysis, development scenarios, market projections, and economics.

*Operations/ Analytical Engineer – June 1978–March 1981*

Responsible for the Oklahoma Panhandle, Kansas and North Texas Areas. Experience included reservoir engineering for a new waterflood, infield drilling for an existing waterflood, P/Z analysis of many gas well and primary reservoir reviews for farmouts, farmins or land purchases. Production and operations experience was varied and included some logging, coring (conventional, fresh and pressure coring), preparing project economics, preparing workover AFE's, designing completion, workover and stimulation treatments (MHF fracturing treatments - Mississippian Formation), selecting submersible pumps for large volume wells, selecting pumping units, designing rod strings, reviewing field fluid levels and testing injection wells. Worked as a pumper in Drumright, Oklahoma from January 1980 to April 1980, during the Oil, Chemical and Atomic Workers Union (OCAW) strike. Responsible for reporting production maintaining well treatments, dressing stuffing boxes, production testing wells, changing pump charts, and supervising the LACT, production facilities, and injection facilities for a large portion of the waterflood unit. Worked on an injection balancing study for the Rozet Muddy Sand Unit. Prepared AFE's for infield drilling in the Riverton Dome (gas) Field and reviewed and prepared AFE's for a co-owner operated waterflood. Evaluated several farmout and farmin proposals.

1977

Chevron U.S.A., Lafayette Louisiana

*Assistant Drilling Engineer*

Summer employment as an Offshore Assistant Drilling Engineer. Specific experiences included coring operations, logging, measuring bit wear, running and cementing casing, changing rams, weighing and sampling mud, preparing BOP calculations, and rig material accounting.

1976

Union Oil of California, Van, Texas

*Roustabout*

Summer employment as a Roustabout. General duties included steaming and cleaning tanks, changing baffles in separators, repairing leaks in field lines, changing pump charts, shooting fluid levels, and other general field maintenance.

*EDUCATION*

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1990

Heriot-Watt University, Edinburgh, Scotland

*Doctor of Philosophy, Petroleum Engineering*

Dissertation Title: "A Computational Model of Well Completion Design," V.I & II, 850 page

*PUBLICATIONS*

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**Books**

Content advisor for Gasoline, by Kevin Cunningham, Cherry Lake Publishing, Ann Arbor, Michigan, 2008.

Erickson, K.T., E. K. Stanek, E. Centinkaya, S. Dunn-Norman and A. Miller, Stability and Control of Dynamical Systems with Applications, Chapter 20, "Reliability of SCADA Systems in Offshore Oil and Gas Platforms," Birkhauser Publishing, 2003.

Dunn-Norman, S. and CS Lee, Geology of the Oceans – Mining and Oil Exploration, *Encyclopedia of Life Support Systems* (EOLSS), UNESCO, EOLSS Publishers Co. Ltd., 2006.

Co-editor with Economides, M. J. and L. T. Watters, *Petroleum Well Construction*, John Wiley & Sons, April, 1998.

Economides, M. J., Dunn-Norman, S. and L. T. Watters, "Introduction", *Petroleum Well Construction*, Chapter 1, John Wiley & Sons, April, 1998.

Dunn-Norman, S., C. Williams, M. Baldrige and W. Meaders, "Completion Hardware," *Petroleum Well Construction*, Chapter 14, John Wiley & Sons, April, 1998.

Dunn-Norman, S. and C. Robison, "Designing Completions for the Life of the Field," *Petroleum Well Construction*, Chapter 21, John Wiley & Sons, April, 1998.

## Technical Papers

Yang, F, Britt, L.K., Dunn-Norman, S, and M.Al-Alwani, "Don't Let Your Landman Plan Your Wellpath!," SPE 173331, to be presented at the SPE Hydraulic Fracturing Technology Conference, Woodlands, Texas, 3-5 February, 2015.

Chokshi, R., Lane W., Dunn-Norman, S and C. Chumkratoke, "Service Industry & University Collaboration in Teaching Production Optimization with Artificial Lift," SPE 170646, presented at the SPE Annual Technical Conference and Exhibition, Amsterdam, The Netherlands, 27-29 October, 2014.

Theppornprapakorn, V. and S. Dunn-Norman, "A CFD Validation of Historical Production Studies Comparing Plug-and-Perf to Openhole Sleeve Completion Methods in Horizontal Multi-stage Fractured Wells," SPE/URTeC 1886725, presented at the 2014 Unconventional Resources Technology Conference, Denver, Colorado, August, 2014.

Smith, P. E., Dunn-Norman, S. and M. B. Smith, "A Methodology for Statistical Propped Fracture Treatment Design in Fluvial Environments," SPE 168595, presented at the SPE Hydraulic Fracturing Technology Conference, Woodlands, Texas, 4-6 February, 2014.

Yang F, Bai B, Dunn-Norman S, Nygaard R, and Eckert A, "Factors affecting CO<sub>2</sub> storage capacity and efficiency with water withdrawal in shallow saline aquifers", submitted to *Environmental Earth Sciences* on August 31, 2012.

Yang F , Bai B, and Dunn-Norman S , "Modeling the effects of completion techniques and formation heterogeneity on CO<sub>2</sub> sequestration potential in saline aquifers", *Environmental Earth Sciences*, 2011, 64: 841~849.

Yang F , Bai B, Nygaard R, and Dunn-Norman S, "Impact of Water Withdrawal on CO<sub>2</sub> sequestration in Missouri shallow saline aquifers", presented at the 10th Annual Conference on Carbon Capture and Sequestration", Pittsburgh, Pennsylvania, USA, May 2-5, 2011.

Yang F, Bai B, Dunn-Norman S, Nygaard R, and Eckert A , "Factors affecting CO<sub>2</sub> storage capacity and efficiency with water withdrawal in shallow saline aquifers", submitted to *Environmental Earth Sciences* on August 31, 2012.

Yang, F, Bai, B., Tang, Dazhen, Dunn-Norman, S., Wronkiewicz, D. "Characteristics of CO<sub>2</sub> sequestration in saline aquifers," *Petroleum Sciences*, 7(1), 2010, 83-93.

Yang, F, Bai, B., Tang, Dazhen, Dunn-Norman, S., Wronkiewicz, D. "Comparison of Completion and Heterogeneity Effect on CO<sub>2</sub> Sequestration in Shallow and Deep Saline Aquifers," paper SPE 131381 to be presented at the CPS/SPE International Oil & Gas Conference and Exhibition in China held in Beijing, China, 8–10 June 2010.

Hunky, R., Wu, Y, Bai, B., Dunn-Norman, S., "An Experimental Study of Alkaline Surfactant Flooding in Ultra Shallow Heavy Oil Reservoirs," paper SPE 132537 to be presented at Western Regional 2010 SPE, for presentation at Anaheim, California, USA, 27-29 May 2010.

### *HONORS AND AWARDS*

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Alumni Association Outstanding Undergraduate Advisor Award, 2009

School of Materials, Energy & Earth Resources Sustained Teaching Excellence 2007 School of Materials, Energy & Earth Resources Sustained Teaching Excellence 2006

School of Materials, Energy & Earth Resources Sustained Teaching Excellence in Laboratory Instruction, 2003-2005

School of Materials Energy & Earth Resources Sustained Teaching Excellence Award, 2004-2005

School of Mines and Metallurgy UMR Sustained Excellence in Teaching Award, 2002-2003

Faculty Performance Shares Recipient, 2001

### **Conference Honorable Mention**

"SCADA System Trends in Deepwater Developments" Paper presented at Rio Oil and Gas 2000 Conference, Rio Brazil, October 19th, 2000

*1998-99 Highest Ranked Advisor in Freshmen Engineering*

*Phillips Petroleum Faculty Excellence Award at UMR, 1994-5*

Outstanding Petroleum Engineering Student, Univ. of Tulsa-1978 Outstanding Senior Award, Tulsa Alumni Association, 1978

Tau Beta Pi, University of Tulsa Chapter, since 1977

Pi Epsilon Tau, University of Tulsa Chapter, since 1977

### *PROFESSIONAL REGISTRATION AND AFFILIATION*

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*40 Year Member; Student Professional Society Advisor for 17 years*

Society of Petroleum Engineers' of AIME, since 1974 Completion Engineering Association, since 1991

*Volunteer and Member*

St. Louis Academy of Science, since 1993 Missouri Academy of Science

*Member*

Pi Epsilon Tau, since 1976 Tau Beta Pi, since 1977

*PROFESSIONAL SERVICES*

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Panel Member, EPA 2013 Science Advisory Board (SAB) Hydraulic Fracturing Research Advisory Panel, Washington DC, May- 2013 - 2015

*Co-Chairman, Missouri Oil and Gas Council, 2009-present*

*SPE Drilling Engineering Committee, 2012-present SPE Star Scholarship Selection Committee, 2012 SPE Teaching Award Committee, member 2012*

Member, EPA Scientific Advisory Board Review Panel for EPA's proposed Study Plan for the Risks of Hydraulic Fracturing to Underground Sources of Drinking Water, 1/2011-6/2011

*SPE Professionalism Committee, 2009-2011, Committee Chair 2011-12 SPE Production Operations Symposium Planning Committee, 2010-2011*

*Member, 2009 Planning Committee for Petroleum Engineering Colloquium, August 2009, Los Angeles, CA Member, SPE Professionalism Committee 2009-2012*

*Vice Chair, Association of Petroleum Heads, 2008-2009*

*Secretary, Society of Petroleum Engineers R&D Committee, 2006-2009 Chairman, Missouri Oil and Gas Council, 2004-2009*

*Steering Committee Member, Gas Storage Technology Consortium, DOE project section and oversight committee for research projects handled through Penn State, 2005-2006*

*Steering Committee Member, Offshore Pipelines, 2003 2--- International Offshore Mechanics and Arctic Engineering Conference, OMAE, June 8-14, 2003, Cancun, Mexico.*

*Steering Committee Member, Offshore Pipelines – 2004 International Offshore Mechanics and Arctic Engineering Conference, OMAE, June 8-14, 2003, Cancun, Mexico.*

*Session Chair and Co-chair – 2003 International Offshore Mechanics and Arctic Engineering Conference, OMAE, June 8-14, 2003, Cancun, Mexico.*

*Conference Steering Committee Chairman – 2003 International Offshore Pipeline Work Workshop, Hosted by the US Minerals Management Service, February 26-28, 2003, New Orleans, LA.*

*Program Reviewer – Texas State Research Awards, Texas State Board of Higher Education Austin, Texas, 22-23 September, 2001.*

*Reviewer for Los Alamos National Laboratory proposal “Intensification of Petroleum and Gas Production by Use of High-Power Plasma Generators of Elastic Impulses.” May 2000.*

*Steering Committee Member, 2001 SPE Forum Series on The Big Crew Change, Park City, Utah, 5-10 August, 2001.*

*Session Judge*, PhD International Student Contest, 1999 Annual Technical Conference, Society of EPA Panel Member, EPA 2011 Panel for the Review of Hydraulic Fracturing Study Plan, EPA Science Advisory Board, Washington DC March- June 2011

Ad Hoc Panel Petroleum Engineers, Houston, Texas, October, 1999.

*Steering Committee Member*, 1999 SPE Forum Series on Deepwater Well Challenges, South America and Caribbean Forum, Tobago, West Indies, October 31- November 5, 1999.

*Program Reviewer* – Texas State Research Awards, Texas State Board of Higher Education Austin, Texas, 20-22 August, 1999

*Session Judge*, PhD International Student Contest, 1998 Annual Technical Conference, Society of Petroleum Engineers, New Orleans, Louisiana, September, 1998.

*Session Chairman*, International Programs, Planning Committee Member, 1995 SPE Colloquium on Petroleum Engineering Education, Snowmass Colorado, July, 1995.

*Session Chairman*, Compliance and Risk Assessment, 1995 Rocky Mountain Symposium on Environmental Issues in Oil and Gas Operations, Denver, Colorado, October, 1995

*Session Chairman*, Horizontal Well Performance, SPE International Meeting on Petroleum Engineering, Beijing, China, November, 1995

*Steering Committee Member*, 1993 SPE Colloquium on Petroleum Engineering Education, Snowmass Colorado, July, 1993.

*UMR Representative*, Completion Engineering Association