

CURRICULUM VITA

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RESEARCH AREA AND PROGRAMS

My research interests include petroleum and energy production and transportation, multiphase flow in energy systems, flow assurance, artificial lift in oil wells, under-balanced drilling, thermal hydraulics and multiphase flow in nuclear applications, and mathematics and science education. I am the Founder and Director of the Kuwait University International Collaborative Research Program and the Co-director and Co-founder of the New Mexico Institute of Mining and Technology Drilling and Production Research Consortium.

CONTRIBUTION TO THE UNITED NATIONS SUSTAINABLE DEVELOPMENT GOALS (SDGs)

In 2015, UN member states agreed to 17 global Sustainable Development Goals (SDGs) to end poverty, protect the planet, and ensure prosperity for all. According to Scopus, I contributed to 7 out of the 17 SDGs.



EDUCATION

Ph.D. in Petroleum Engineering	The University of Tulsa, Tulsa, OK, USA (2003)
M.Sc. in Math & Sci. Education	The University of Tulsa, Tulsa, OK, USA (2003)
M.Sc. in Petroleum Engineering	The University of Tulsa, Tulsa, OK, USA (1999)
B.Sc. in Petroleum Engineering	The University of Tulsa, Tulsa, OK, USA (1995)

PERSONAL DETAILS

Nationality: Kuwaiti

Languages: Arabic (Spoken and written)

English (Spoken and written)

PROFESSIONAL EXPERIENCE

KUWAIT UNIVERSITY

Professor

2018-present

- Coordinating a collaborative international research program.
- Conducting research in flow assurance, multiphase flow, and the application of fluid flow in human respiratory events to mitigate COVID-19.
- Advising graduate students pursuing their M.Sc. and Ph.D. degrees at KU, MIT, TU, and NMT.
- Teaching undergraduate and graduate production engineering courses.
- Chaired the committee to establish the PE PhD program, formed by the Dean of the College of Graduate Studies.

Acting Dean

2015-2016

Vice Dean for Research and Academic Affairs

2012-2016

- Coordinated the 2013 ABET Accreditation of the Seven College Engineering Programs. Resulted in full accreditation of all programs being visited.
- Coordinated the Establishment of two Ph.D. programs in Engineering and an M.Sc. Program.
- Coordinated the Reduction of all B.Sc. Engineering Programs Curricula from 144 to 132 credit hours.
- Coordinated the collaboration between the College and Kuwait Oil Co.

Associate Professor

2010-2018

- Conducted research in heavy oil multiphase flow in pipes.
- Conducted research in steady state and transient multiphase flow in pipelines and wellbores.
- Advised graduate students pursuing their M.Sc. and Ph.D. degrees.

- Taught undergraduate and graduate production engineering courses.

Assistant Professor **2003-2010**

- Conducted research on steady state and transient multiphase flow in pipelines and wellbores, flow assurance, and under-balanced drilling.
- Taught undergraduate and graduate production engineering courses.

**NEW MEXICO INSTITUTE OF MINING AND TECHNOLOGY
(SOCORRO, NM, USA)**

Adjunct Professor in the Petroleum and Natural Gas Eng. Dept. **2022-present**

Co-founder of Production and Drilling Research Projects (PDRP) **2011-present**

Associate Director of PDRP **2011-present**

Visiting Research Professor in PE Dept. **Summer 2019**

RICE UNIVERSITY (Houston, TX, USA)

Visiting Professor in the Chemical and Biomolecular Eng. Dept. **2025-Present**

- Co-supervising PhD students.
- Researching asphaltene deposition in oil wells.

MASSACHUSETTS INSTITUTE OF TECHNOLOGY (Cambridge, MA, USA)

Visiting Professor in Nuclear Sci. and Eng. Dept. **2016-2017**

- Taught a graduate course.
- Co-supervised PhD students.
- Conducted research on boiling multiphase flow and heat transfer.

THE UNIVERSITY OF TULSA (Tulsa, OK, USA)

Research Collaborator **2005-Present**

Visiting Research Professor in PE Dept. **Summer 2009**

Visiting Research Professor in PE Dept. **Summer 2018**

Research Assistant **1997-2003**

- Conducting large-scale experiments on multiphase flow in a hilly-terrain pipeline.
- Modeling slug flow characteristics along a hilly-terrain pipeline.
- Assisting in teaching graduate and undergraduate production design courses.

KUWAIT OIL COMPANY

Petroleum Reservoir Engineer

1995-1997

- Development of Minagish Field (West Kuwait):
 - Conducting a material balance study of the Minagish Oolite reservoir.
 - Conducting Reservoir Uncertainty Study for the Minagish Oolite reservoir.
 - Conducting PVT study on Minagish Oolite reservoir fluids.
 - Developing sector reservoir simulation model using ECLIPSE reservoir simulator.
- Evaluation of prospect fields.
- Exploration of Kra'a Almaro field (West Kuwait).

Production and Flow Assurance Engineering Consultant

2007-present

- Evaluating new technologies in production engineering.
- Supervising ongoing projects and technologies.
- Establishing external research and technology networks.
- Initiating and leading technology and research projects.
- Investigating asphaltene deposition in oil wells.
- Modeling ESP failures.

ADMINISTRATIVE SERVICES

- College of Engineering and Petroleum, *Acting Dean*, 2015-2016.
- College of Engineering and Petroleum, *Vice-Dean for Research and Academic Affairs*, 2012-2016.
- College of Engineering and Petroleum, *Chair of Engineering graduate programs* (Engineering Area Committee) 2012-2016.
- College of Engineering and Petroleum, Founder and Director of Kuwait University Petroleum Production Research Projects (KUPRP), 2007- present.
- Advisory Board Member (Representing Kuwait Oil Company) in The University of Tulsa Fluid Flow Research Consortium (TUFFP), 2006-2013 and 2015- 2020.
- Advisory Board Member (Representing Kuwait Oil Company) in The University of Tulsa Artificial Lift Research Consortium (TUALP), 2006-2012 and 2015-2020.
- National Union of Kuwait Students, USA Branch, director of media committee (1989-1991) and director of students affairs committee (1992).

PROFISSIONAL SERVICES

- *Member*, National Committee to represent Kuwait in the World Petroleum Council, Ministry of Oil, Kuwait (2019-2022).
- *Board member*, SPE Kuwait Section, Kuwait (2016-2023).
- *Faculty Advisor*, SPE Kuwait University Student Chapter, Kuwait (2018-present).
- *SPE Energy4Me Ambassador* (2021-present).
- *Associate Editor*, Journal of Petroleum Science and Engineering (2018-2024).
- *Associate Editor*, Journal of Geoenergy Science and Engineering (2024-present).
- *Associate Editor*, The International Journal of Learning, Volume 11.
- *External evaluator* of PE faculty promotions in US universities (TU and NMT), the Australian University of Kuwait, and A'Sharqiyah University of Oman.
- *External evaluator* of PhD dissertations from international universities.
- *Technical Editor*, SPE J., SPE Prod. and Op. J., Int. J. Multiphase Flow, Canadian J. of Chem. Eng., J. of Canadian Pet. Tech., Energy and Fuels, ASME J. of Energy Res. Tech., J. of Petroleum Sci. and Eng., J. of Applied Statistics, J. of Oil and Gas Sci. and Tech., Int. J. of Oil, Gas and Coal Tech., J. of Applied Thermal Eng., Int. J. of Learning, J. of Pet. Exploration & Prod. Tech., MethodsX J., Indoor Air Journal, J. of Engineering Research, Energies, Energy and Fuel J., J. of Petroleum, Int. J. of Hydrogen Energy, Measurement J., J. of Geofluids, J. of Measurement and Instrumentation, J. of Mechanical Engineering Science, J. of Petroleum Science and Technology, J. of Pipeline Science and Engineering, Int. Communications in Heat and Mass Transfer J., Scientia Iranica J., and the Multiphase Production Technology conference proceedings.
- *Technical Program Committee Member*, Second Kuwait International Petroleum Conference and Exhibition (KIPCE), December 2005 (Kuwait).
- *Invited Speaker*, SPE Kuwait-Section Technical Seminar Series, 2008 (Kuwait).
- *International Technical Advisory Committee Member*, British Hydrodynamics Research Group (BHRG) International Multiphase Technology North America and Europe Conference Series, (2009-Present).
- *Panel Speaker*, SPE Kuwait International Petroleum Conference and Exhibition, "Developing People and Competencies within the Industry," December 2012 (Kuwait).
- *Executive and Technical Committee Member*, 2013 Middle East Artificial Forum, Abu Dhabi, UAE.

- *External evaluator*, Kuwait Oil Company Technical Professional Ladder (TPL) promotion committees: 2009, 2013 and 2015.
- *Keynote Speaker*, SPE Production Optimization Workshop, “Optimization of Heavy Oil Multiphase Flow in Wells and Pipeline,” February 2013 (Kuwait).
- *Keynote Speaker*, SPE Kuwait Oil and Gas Show (KOGS), “Developing People Competencies within the Industry,” October 2013 (Kuwait).
- *Keynote Speaker*, SPE Flow Assurance Workshop, “Challenges and Integrated Solutions for Mature and Green Fields and by Green People,” October 2013 (Abu Dhabi, UAE).
- *Invited Speaker*, Graduate Seminar in New Mexico Institute of Mining and Technology, “Heavy Oil Multiphase Flow Production: Recent Research Development and Future Challenges,” September 2013 (Socorro, New Mexico, USA).
- *Keynote Speaker*, Global Oil and Gas Conference and Exhibition, “Flow Assurance Challenges in Heavy Oil Field Development,” March 2014 (Kuwait).
- *Panel Speaker*, College of Engineering and Petroleum 1st Engineering Forum, “Imagineering of Engineering Future,” March 2014 (Kuwait).
- *Invited Speaker*, Graduate Seminar in Massachusetts Institute of Technology (MIT), “Heavy Oil Flow Assurance and Multiphase Flow Modeling Gap: Opportunity for Multidisciplinary Research,” April 2014 (Cambridge, USA).
- *Executive Committee Member*, SPE International Heavy Oil Conference and Exhibition, December 2014 (Kuwait).
- *Keynote Speaker*, SPE International Heavy Oil Conference and Exhibition, “The Power of Collaboration between the Oil and Medical Industries – Maximizing Health and Wealth,” December 2014 (Kuwait).
- *Panel Speaker*, SPE International Heavy Oil Conference and Exhibition, “Heavy Oil, Challenges, Learning and Opportunities,” December 2014 (Kuwait).
- *Speaker*, “SPE Energy for Me: Science Teacher Workshop,” December 2014 (Kuwait).
- *Invited Speaker*, Industry Technology Facilitator (ITF) GCC Countries Workshop, “University-Industry Impactful Research Collaboration, Why and How?,” January 2015 (Kuwait).
- *Invited Speaker*, University of Tulsa SPE Student Chapter, “Flow Assurance and its Three Sides of the Coin,” April 2015 (Tulsa, OK, USA).

- *Executive and Technical Committee Member*, 2015 Middle East Artificial Forum, Doha, Qatar.
- *Panel Moderator*, SPE Annual Technical Conference & Exhibition, “New Technologies and People Competencies for Integrated Flow Assurance Solutions,” September 2016 (Dubai, UAE).
- *Invited Speaker*, Colorado School of Mines Distinguished Seminar Series, “Flow Assurance and its Three Sides of the Coin,” February 2017 (Golden, CO, USA).
- *Invited Speaker*, Louisiana State University, Graduate Seminar Series, “Flow Assurance and its Three Sides of the Coin,” October 2017 (Baton Rouge, LA, USA).
- *Invited Speaker*, Oklahoma University, Graduate Seminar Series, “Flow Assurance and its Three Sides of the Coin,” April 2018 (Norman, OK, USA).
- *Panel Speaker*, GOTECH 2nd Conference and Exhibition, “Academia-Industry Collaboration, Why and How,” October 2018 (Dubai, UAE).
- *Panel Speaker*, SPE International Heavy Oil Conference and Exhibition, “Powering the World. Fueling the Future with Heavy Oil,” December 2018 (Kuwait).
- *Invited Speaker*, Colorado School of Mines, “The State and Future of Multiphase Production Technology,” April 2019 (Golden, CO, USA).
- *Invited Speaker*, University of Southern California SPE Student Chapter, “Flow Assurance and its Three Sides of the Coin,” August 2019 (Los Angeles, CA, USA).
- *Executive Committee Member*, SPE Kuwait Oil and Gas Show (KOGS) Conference and Exhibition, October 2019 (Kuwait).
- *Panel Moderator*, SPE Kuwait Oil and Gas Show (KOGS) Conference and Exhibition: “How R&D Can Transform the Oil and Gas Industry,” October 2019 (Kuwait).
- *Panel Speaker*, SPE Emerging Professional Forum, “Reaching Out to Young Talent of Kuwait,” October 16th, 2019 (Ahmadi, Kuwait).
- *Member*, Petroleum Engineering Department Heads Association (PEDHA), 2019-present.
- *Executive and Technical Committee Member*, 2019 Middle East Artificial Forum, Muscat, Oman.
- *Steering Committee Member*, SPE Workshop: Change as a Constant, Digital Transformation in Oil and Gas, April 14-15, 2020 (Kuwait) [Workshop was canceled due to COVID-19].

- *Executive Committee Member*, SPE International Heavy Oil Conference and Exhibition (HOCE), December 2020 (Kuwait) [Conference was canceled due to COVID-19].
- *Award Judge*, SPE Middle East and North Africa Regional Technical Awards, May 2020.
- *Committee member*, Kuwait Foundation for Advancement of Sciences, Kuwait Prize (\$130,000) nomination and selection committee, 2020.
- *Member*, SPE Middle East Advisory Council, 2021-present.
- *Member*, The Ministry of Higher Education Private Universities Council Permanent Committee for establishing new programs and private universities in Kuwait, 2021-present.
- *Invited Speaker*, University of Texas at Austin, Graduate Seminar, “Integrated Modeling of Asphaltene Deposition in Oil Wells,” September 2022 (Austin, TX, USA).
- *Committee Chair*, Ministry of Higher Education Search Committee for Kuwait Institute of Scientific Research (KISR) General Director, 2022.
- *Speaker*, Texas Tech. University, Classroom Seminar “Multiphase Production Technology and the Significance of Slug Flow,” Oct. 2023 (Virtual).
- *Committee member*, Kuwait Foundation for Advancement of Sciences Jaber Al-Ahmad Prize (\$30,000) selection committee, 2023.
- *Invited Speaker*, The Australian University of Kuwait, Seminar “Carbon Capture, Transportation and Storage (CCTS) – Research and Education Challenges and Opportunities,” Kuwait City, Kuwait, Nov. 2023.
- *Invited Speaker*, King Fahad University for Petroleum and Mineral (KFUPM) Flow Assurance Technology Symposium, “Is It the End of an Era or a New Start? New Insights into Multiphase Flow and Flow Assurance Challenges,” Dhahran, The Kingdom of Saudi Arabia, Feb. 2024.
- *Committee member*, Kuwait Foundation for Advancement of Sciences, Kuwait Prize nomination and selection committee, 2024 (prize award: \$130,000).
- *Committee member*, Kuwait Foundation for Advancement of Sciences Jaber Al-Ahmad Prize selection committee, 2024 (prize award: \$30,000).
- *Invited Speaker*, Rice University, Chemical and Biomolecular Engineering Department Seminar “The State-of-the-art and Future Challenges of Multiphase Flow Technology and Flow Assurance,” August 2024 (Houston, TX, USA)

- *Invited Speaker*, ENNOVA Company “Asphaltene Deposition in Oil Production System Using Integrated Modeling Approach,” August 2024 (Stafford, TX, USA).
- *Invited Panel Speaker*, SPE Kuwait International Symposium “Data Analytics in Artificial Lift and Production Optimization,” November 2024, Kuwait City, Kuwait.
- *Committee member*, Kuwait University, Highest Consultation Academic Promotion Committee, Academic year 2024-2025.
- *Committee member*, Kuwait University Academic Promotion Bylaws Modification Committee, Academic year, 2024-2025.
- *Executive and Technical Committee Member*, 2025 Middle East Artificial Forum, Muscat, Oman.
- *Committee member*, Kuwait Foundation for Advancement of Sciences Jaber Al-Ahmad Prize selection committee, 2025 (prize award: \$30,000).

HONORS and AWARDS

- Recipient of the 2025 College of Engineering and Petroleum Award for the highest productivity and impact in research in Petroleum Engineering.
- Recipient of the 2025 Kuwait University Scientific Research Conference Energy Award (Awarded by KFAS).
- Recipient of the *SPE 2023 International Distinguished Services Award*.
- Recipient of the *SPE 2022 International Production and Operations Award*.
- Recipient of the *SPE 2021 Regional (Middle East and North Africa) Distinguished Service Award*.
- Recipient of the *SPE 2020 International Distinguished Membership Award*.
- Recipient of the *SPE 2019 Regional (Middle East and North Africa) Production and Operations Award*.
- Recipient of the 2019 *distinguished Kuwait University third-place Posters Awards*.
- Member of the *SPE League of Volunteers* for outstanding volunteerism contribution, 2018.
- Recipient of the *SPE 2017 Regional (Middle East and North Africa) Distinguished Achievement for Petroleum Engineering Faculty Award*.
- Recipient of *Kuwait Foundation for Advancement of Science (KFAS) 2016 Jaber Al-Ahmad Al-Sabah prize (\$30,000) for engineering sciences*.
- Recipient of the 2013 *distinguished Kuwait University second-place Posters Awards*.

- Recipient of *the Best Young Researcher Award in the College of Engineering and Petroleum*, Kuwait University (2007).
- Recipient of the *British Petroleum (BP) most outstanding contribution paper* award at the 12th International Conference on Multiphase Production Technology, Barcelona, Spain (2005).
- Recipient of Kuwait University Scholarship for higher studies, M.Sc. and Ph.D. (1997-2003).
- Recipient of The University of Tulsa *Thomas C. Frick Award for Outstanding Academic Achievement in Petroleum Engineering* (1995).
- Recipient of the *USA National Dean's List* award for high standards of academic excellence and positive performance (1993-1994).
- Bachelor of Science with *Magna Cum Laude* from The University of Tulsa. (1995).
- Recipient of Kuwait Ministry of Higher Education Scholarship (1991 to 1995).
- The University of Tulsa Alumni member (1995-present).
- US Bureau of Educational and Cultural Affairs International Exchange Alumni member (2016-present).

PUBLICATIONS

BOOKS

1. **Al-Safran, E.**, and Brill, J. April 2017. *Applied Multiphase Flow in Pipes and Flow Assurance-Oil and Gas Production*. Society of Petroleum Engineers (SPE), Richardson, TX., USA, (ISBN: 978-1-61399-492-4).

REFEREED JOURNALS

1. Zhang, H-Q., **Al-Safran, E.**, Jayawardena, S., Redus, C., Sarica, C. and Brill, J.: "Modeling of Slug Dissipation and Generation in a Hilly Terrain Pipeline," ASME J. Energy Resource Technology, 125, 161-168, 2003.
2. **Al-Safran, E.**, Taitel, Y. and Brill, J.: "Prediction of Slug Length Distribution along a Hilly-Terrain Pipeline Using Slug Tracking Model," ASME J. Energy Resources Technology, 126, 54-62, 2004.
3. **Al-Safran, E.** and Brown, D.: "The Internet and Cyber Crimes: A Lack of Awareness of Security Issues by Teachers Who Use Innovative Technology in the Classroom," Int. J. of Learning, 11, Article LC04-0168-2004.

4. **Al-Safran, E.**, Sarica, C., Zhang, H-Q., and Brill, J.: "Investigation of Slug Flow Characteristics in the Valley of Hilly-Terrain Pipeline," *Int. J. of Multiphase Flow*, 31, 337-357, 2005.
5. **Al-Safran, E.**, Sarica, C., Zhang H-Q., and Brill, J.: "Probabilistic/Mechanistic Modeling of Slug Length Distribution in a Horizontal Pipeline," SPE 84230-PA, *SPE Production and Facilities J.*, **20** (02), 160-172, May 2005.
6. **Al-Safran, E.**, Sarica, C., Zhang H-Q., and Brill, J.: "Mechanistic/Probabilistic Modeling of Slug Initiation in a Lower Elbow of a Hilly-Terrain Pipeline," SPE 102254-PA, *SPE Production and Operations J.*, **23** (01), 88-99, February 2008.
7. **Al-Safran, E.**, Owayed, J., Albazali T., and Santhakar, A.: "Optimization of Required Volumetric Flow Rates for Aerated Mud Underbalanced Drilling," *J. of Petroleum Science and Technology*, 26 (12), 1403-1423, 2008.
8. **Al-Safran, E.**, Kappos, L. and Sarica, C.: "Experimental and Numerical Investigation of Separator Pressure Fluctuation Effect on Terrain Slugging in a Hilly-Terrain Two-Phase Flow Pipeline," *ASME J. Energy Resources Technology*, vol. 130 (3), 1-13, August 2008.
9. **Al-Safran, E.** and Kelkar, M.: "Prediction of Two-Phase Critical Flow Boundary and Mass Flow Rate Across Chokes," SPE 109243-PA, *SPE Production and Operations J.*, **24** (02), 249-256, May 2009.
10. **Al-Safran, E.**: "Prediction of Slug Liquid Holdup in Two-Phase Horizontal Pipes," *ASME J. Energy Resources Technology*, 131, 1-8, June 2009.
11. **Al-Safran, E.**: "Investigation and Prediction of Slug Frequency in Horizontal Gas/Liquid Two-Phase Flow Pipeline," *J. of Petroleum Science and Engineering*, 69, 143-155, 2009.
12. Garrouch, A., **Al-Safran, E.**, and Garrouch, K.: "A Classification Model for Rock Typing Using Dielectric and Permittivity and Petrophysical Data," *J. Geophysics and Eng.*, 6 (3), p. 311-323, September, 2009.
13. Gokcal, B., Al-Sarkhi A., Sarica, C., and **Al-Safran E.**: "Prediction of Slug Frequency for High-Viscosity Oils in Horizontal Pipes," SPE 124057-PA, *SPE Projects, Facilities and Construction J.*, **5** (3), 136-144, September 2010.
14. **Al-Safran, E.** and Brown, D.: "The Relationship between Classroom Computer Technology and Student's Academic Achievement," Paper 111021, *J. of Research in Higher Education*, **15** (1), December 2011.

15. **Al-Safran, E.**, Gokcal, B., and Sarica, C.: “Investigation and Prediction of High-Viscosity Liquid Effect on Two-Phase Slug Length in Horizontal Pipeline,” SPE 150572-PA, *SPE Production and Operation J.*, **28** (3), 296-305, June 2013.
16. **Al-Safran, E.**, Kouba, G., and Brill, J.: “Statistical Analysis and Hydrodynamic Modeling of Unsteady Gas-Liquid Slug Velocity Behavior,” *J. of Petroleum Science and Engineering*, 109, 155-163, September 2013.
17. **Al-Safran, E.**, Brown, D., and Wiseman, A.: “The Effect of Principal’s Leadership Style on School Environment and Outcome,” Paper 131666, *J. of Research in Higher Education*, 22, November, 2013.
18. Nguyen, T., **Al-Safran, E.**, and Saasen, A.: “Modeling the Design and Performance of Progressing Cavity Pump Using 3-D Vector Approach,” *J. of Petroleum Science and Engineering*, 122, 180-186, October 2014.
19. **Al-Safran, E.**, Kora, C. and Sarica, C.: “Prediction of Slug Liquid Holdup in High Viscosity Liquid and Gas Two-Phase Flow in Horizontal Pipes,” *J. of Petroleum Science and Engineering*, 133, 566-575, September 2015.
20. Pivnicka, S., Nguyen, T., **Al-Safran, E.**, and Saasen A.: “Pressure Gradient Prediction of Time-Dependent Drilling Fluids and the Effect of Acceleration,” *J. of Petroleum Science and Engineering*, 135, 246-252, November 2015.
21. **Al-Safran, E.**: “Probabilistic Modeling of Slug Frequency in Gas/Liquid Pipe Flow using Poisson Probability Theory,” *J. of Petroleum Science and Engineering*, 138, 88-96, February 2016.
22. Nguyen, T., Tu, H., **Al-Safran, E.**, and Saasen, A.: “Simulation of Single-Phase Liquid Flow in Progressing Cavity Pump,” *J. of Petroleum Science and Engineering*, 147, 617-623, November 2016.
23. Al-Ruhaimani, F., Pereyra, E., Sarica, C., **Al-Safran, E.**, and Torres C., “Experimental Analysis and Model Evaluation of High-Liquid-Viscosity Two-Phase Upward Vertical Pipe Flow,” SPE 184401-PA, *SPE Journal*, **22** (03), 712-735, June 2017.
24. Lizarraga-Garcia, E., Buongiorno, J., **Al-Safran, E.**, and Lakehal, D.: “A Broadly-Applicable Unified Closure Relation for Taylor Bubble Rise Velocity in Pipes with Stagnant Liquid,” *Int. J. of Multiphase Flow*, 87, 345-358, March 2017.
25. Phan, H., Nguyen, T., **Al-Safran, E.**, Saasen, A., and Nes, O.: “An Experimental Investigation into the Effects of High Viscosity and Foamy Oil Rheology on a

- Centrifugal Pump Performance,” *J. of Petroleum Science and Technology*, 7(1), 67-78, February 2017.
26. Ersoy, G., Sarica, C., **Al-Safran, E.**, and Zhang Q-H.: “Three-Phase Gas-Oil-Water Flow in Undulating Pipeline,” *J. of Petroleum Science and Engineering*, 156, 468-483, June 2017.
 27. Nguyen, T., Oliveira, R., **Al-Safran E.**, Saasen, A.: “Casing-Design Optimization Using CAML Technique and Drilling Fluid Performance,” SPE 185951-PA, *SPE Drilling and Completion J.*, **32** (03), 208-212, September 2017.
 28. **Al-Safran, E.**, Aql, A., Nguyen, T.: “Analysis and Prediction of Fluid Flow Behaviour in Progressing Cavity Pumps,” *ASME J. of Fluids Engineering*, 139, 1-11, December 2017.
 29. **Al-Safran, E.**, and Al-Qenae, K.: “A Study of Flow-Pattern Transitions in High-Viscosity Oil-and-Gas Two-Phase Flow in Horizontal Pipes,” SPE 187939-PA, *SPE Production and Operations J.*, **33** (2), 269-280, May 2018.
 30. Al-Ruhaimani, F., Pereyra, E., Sarica, C., **Al-Safran, E.**, and Torres C., “Prediction of Slug-Liquid Holdup for High-Viscosity Oils in Upward Gas/Liquid Vertical-Pipe Flow,” SPE 187957-PA, *SPE Production and Operation J.*, **33** (02), 281-299, May 2018.
 31. Al-Ruhaimani, F., Pereyra, E., Sarica, C., **Al-Safran, E.**, Chung, S., and Torres C., “A Study on the Effect of High Liquid Viscosity on Slug Flow Characteristics in Upward Vertical Flow,” *J. of Petroleum Science and Engineering*, 161, 128-146, January 2018.
 32. Nguyen, T., **Al-Safran E.**, and Nguyen, V.: “Theoretical Modeling of Positive Displacement Motors Performance,” *J. of Petroleum Science and Engineering*, 166, 188-197, Feb. 2018.
 33. **Al-Safran, E.**: “Prediction of Asphaltene Precipitation Risk in Oil Wells Using A Coupled Thermo-hydraulics Model,” *J. of Petroleum Science and Engineering*, 167, 329-342, August 2018.
 34. Worth, D., **Al-Safran, E.**, Choudhuri, A., and Al-Jasmi, A.: “Assessment of Artificial Lift Methods for a Heavy Oil Field in Kuwait,” *J. of Petroleum Science and Engineering*, 180, 835-843, June 2019.
 35. Su, G-Y., D’Aleo, F., Phillips, B., Streich, R., **Al-Safran, E.**, Buongiorno, J., and Prasser, H.: “On the Oscillatory Nature of Heat Transfer in Steady Annular Flow,” *Int. Comm. in Heat and Mass Transfer J.*, 108, 104328, 2019.

36. Tea-Woo, K., **Al-Safran, E.**, Eduardo, P., and Sarica, C.: “Experimental Study using Advanced Diagnostics to Investigate Slug Aeration and Bubble Behavior in High Liquid Viscosity Horizontal Slug Flow,” *J. of Petroleum Science and Engineering*, 191, 107202, March 2020.
37. Ghasemi, M., and **Al-Safran, E.**: “Integrated Reservoir/Wellbore Production Model for Oil Field Asphaltene Deposition Management,” *J. of Petroleum Science and Engineering*, 192, 107213, April 2020.
38. Nguyen, T., Pande, S., Bui, D., **Al-Safran, E.**, and Nguyen, V.: “Pressure Dependent Permeability: Unconventional Approach on Well Performance,” *J. of Petroleum Science and Engineering*, 193, 107358, May 2020.
39. **Al-Safran, E.**, Ghasemi, M., and Al-Ruhaimani, F.: “High-Viscosity Liquid/Gas Flow Pattern Transitions in Upward Vertical Pipe Flow,” SPE 199901-PA, *SPE Journal*, **25** (03), 1155-1173, June 2020.
40. Su, G., D’Aleo, F., Phillips, B., **Al-Safran, E.**, Buongiorno, J., and Prasser, H.: “Suppression of Nucleate Boiling in Upward Two-phase Annular Flow: A Direct Measurement Using Modern Diagnostics,” *Int. J. of Heat and Mass Transfer*, 159, 120143, June 2020.
41. Fan, Y., **Al-Safran, E.**, Pereyra, and Sarica, C.: “Modeling Pseudo-slugs Liquid Holdup in Slightly Upward Inclined Pipes,” *J. of Petroleum Science and Engineering*, 194, 107564, June 2020.
42. Nguyen K., Nguyen, T. C., and **Al-Safran, E.**: “Modeling the Performance of Progressive Cavity Pump under Downhole Conditions Mining and Technology,” *J. of Petroleum Science and Engineering*, 198, 108121, January 2021.
43. Nguyen, T., and **Al-Safran, E.**: “Marine Riser Failure Analysis for Offshore Conventional Drilling and Managed Pressure Drilling Operations,” *J. of Petroleum Science and Engineering*, 199, 108307, January 2021.
44. Lizarraga-Garcia, E., Buongiorno, J., and **Al-Safran, E.**: “Computational Fluid Dynamics (CFD) of Taylor Bubbles in Vertical and Inclined Pipes with Upward and Downward Liquid Flow,” SPE 205373-PA, *SPE Journal*, **26** (06), 3832-3847, December 2021.
45. **Al-Safran, E.**: “Application of Multiphase Flow and Droplet Separation Theory in Modeling Cough Droplets Contamination Range to Mitigate COVID-19 Transmission – Do not Stand too Close to Me!,” *J. of Engineering Research*, **9** (4A), 293-310, December 2021.

46. **Al-Safran, E.**, and Al-Ali, B.: “Modeling Asphaltene Deposition in Vertical Oil Wells,” *J. of Petroleum Science and Engineering*, 221, 111277, 2023.
47. Shaaban, O., and **Al-Safran, E.**: “Prediction of Slug Length for High-Viscosity Oil in Gas/Liquid Horizontal and Slightly Inclined Pipe Flows,” *J. of Geoenergy Science and Engineering*, 221, 211348, 2023.
48. **Al-Safran, E.** and Shaaban, O.: “Prediction of Slug Length Distribution in Horizontal Large Diameter Gas/Liquid Pipeline System,” *J. of Geoenergy Science and Engineering*, 240, 212985, 2024.
49. Aql, A., and **Al-Safran, E.**: “Investigation of Taylor Bubble Behavior in Upward and Downward Vertical and Inclined Pipe Flows,” *J. of Geoenergy Science and Engineering*, 242, 213194, 2024.
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2. **Al-Safran, E.**: “Transient Multiphase Flow Simulation,” Fluid Flow Project, University of Tulsa, 2001.
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5. **Al-Safran, E.:** “Improvements and Enhancements of TUFFP Slug Tracking Model.” The University of Tulsa Funded Project Final Report, 2006.
6. **Al-Safran, E.,** Buongiorno, J., Lakehal, D., and Lizarraga-Garcia, E.: “Using Multiphase CFD to Improve the Closure Relations of Mechanistic Model Codes from Oil and Gas Application, KFAS Funded Project OIP04/14 Final Report, 2016.
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8. **Al-Safran, E.,** and Al-Ruhaimani, F.: “Modeling High-Viscosity Two-Phase Flow Pattern Transitions in Upward Vertical Pipe Flow.” Kuwait University Funded Project RE01/16 Final Report, 2019.
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Ph.D. and M.Sc. SUPERVISION/CO-SUPERVISION

<u>Research Title</u>	<u>Student</u>	<u>Degree/Inst.</u>
A New Correlation for Slug Frequency of Two-Phase Flow in Horizontal Pipeline (Completed).	Dana Alkandari	M.Sc. (KU)
Investigation of Two-Phase Flow Behavior in a Top Elbow of a Hilly-Terrain Pipeline (Completed).	Aamaal Alsan'e	M.Sc. (KU)
Slip Modeling of Two-Phase Annular Flow (Completed).	Hissa Alreshidi	M.Sc. (KU)
Unified Black Oil and Condensate Two-Phase Flow Choke model (Completed).	Sunds Alomair	M.Sc. (KU)
Effects of High Oil Viscosity on Slug Liquid Holdup In Horizontal Pipes (Completed).	Ceyda Kora	MSc. (U. Tulsa)
An Experimental Study of Non-Newtonian Fluid Flow Behavior across Orifice Gas-Lift Valves (Completed).	Victor Fairuzov	M.Sc. (NMT)
Experimental Analysis and Theoretical Modeling of High Liquid Viscosity Two-Phase Vertical Upward Flow (Completed).	Feras Alruhaimani	Ph.D. (U. Tulsa)
Experimental Investigation of the Effect of	Hiep Phan	M.Sc.

High Viscosity and Foamy Oil on a Centrifugal Pump Performance (Completed).		(NMT)
Investigation of High-Viscosity Liquid Two-Phase Flow Pattern in Horizontal and Slightly Inclined Pipes (Completed).	Khaled Al-Qenae	M.Sc. (KU)
Slugging Effect in Heavy Oil Horizontal Wells (Completed).	Mariam Zera'i	M.Sc. (KU)
Dimensional and Empirical Modeling of Fluid Flow in Progressing Cavity Pumps (Completed).	Ahmad Aql	M.Sc. (KU)
Experimental and Simulation of PCP Performance in Single-Phase Flow Condition (Completed).	Hai Tu	M.Sc. (NMT)
A Study Of the Onset of Liquid Accumulation and Pseudo-Slug Flow Characterization (Completed).	Yilin Fan	Ph.D. (U. Tulsa)
Thermohydraulics and Suppression of Nucleate Boiling in Upward Vertical Two-Phase Annular Flow: Probing Multiscale Physics by Innovative Imaging Techniques (Completed).	Guan-Yu Su	Ph.D. (MIT)
Single Point Unloading Gas Lift – New Approach Using Phase Change Media (Completed).	Hiep Phan	Ph.D. (NMT)
Detailed Flow Field Analysis of Air and Highly Viscous Liquid Slug Flow in Horizontal Pipes (Completed).	Tea-Woo Kim	Ph.D. (U. Tulsa)
Modeling and Experimental Study of Flow Pattern Transitions in Co-current Two-Phase Gas/Shear-Thinning Liquid Flow in Upward Vertical Concentric Annulus (Completed).	Victor Lema	Ph.D. (NMT)
Advancement of Closure Relations for Annular Flow Modeling in CFD (Completed).	Giulia Agostinelli	Ph.D. (MIT)
The Impact of Flow Assurance Risks on Kuwait Offshore Field Development Plans (Completed).	Sara Al-Ansari	M.Sc. (KU)
Modeling Asphaltene Deposition in Oil Wells (Completed).	Batoul Al-Ali	M.Sc. (KU)
Modeling Asphaltene Deposition using Physics-Informed Machine Learning (Ongoing)	Hajar Almutairi	M.Sc. (KU)

FUNDED RESEARCH PROJECTS

<u>Source/Year</u>	<u>Research Title. (Role and Budget)</u>
KU ZE11/2004	Imposed Transient Effect on Two-Phase Slug Flow Characteristics. (PI, KD 2,000)
KU EP02/2006	Estimating Rock Petrographic Properties from Non-Destructive Dielectric Permittivity Measurements. (Co-PI, Completed, KD 8,800)
KU GE01/2007	Nanotechnology Applications in Engineering and Petroleum Fluid Characterization (PI, 2012-2016, KD 1,677,480)
KU GE01/2008	Semiconductor Fabrication for Engineering Applications (PI, 2012-2016, KD 117,600)
KU GE02/2008	Semiconductor Characterization for Engineering Applications (PI, 2012-2016, KD 242,600)
KU GE03/2008	Petroleum Refining and Petrochemical Research. (PI, 2012-2016, KD 636,300)
KU RE01/2016	Modeling High-Viscosity Two-Phase Flow Pattern Transitions in Upward Vertical Flow. (PI, Completed, KD20,000)
KFAS OIP04/2014	Use of Multiphase CFD to Improve the Closure Relationships of Mechanistic Model Codes for Oil and Gas Applications (PI, Completed, KD 60,000)
University of Tulsa/2004	Improvement and Enhancement of Two-Phase Slug Tracking Model. (PI, Completed)
University of Tulsa/2008	Experimental and Theoretical Investigation of Heavy Oil Two-Phase Slug Length in Horizontal Pipes. (PI, Completed)
University of Tulsa/2010	Slug Flow Characterization in Heavy Oil in Horizontal and Inclined Pipes (PI, Completed)
KOC01/2022	Integrated Modeling of Asphaltene Deposition in Oil Wells (PI, Completed, KD73,410)
KFAS N23-64SE-2097	Investigation of Carbon Dioxide (CO ₂)/Brine Interfacial Tension for CCUS Applications (PI, Ongoing, KD 5,000)
KOC02/2024	Mitigation Strategies for Asphaltene Deposition in Oil Wells (PI, Ongoing, KD75,000)

COURSES TAUGHT

UNDERGRADUATE

- Production Engineering (KU-PE411).
- Production Equipment Design (KU-PE435).
- Natural Gas Engineering (KU-PE425).
- Fluid Mechanics (KU-PE241)
- Engineering Probability and Statistics (KU-ENGR304).
- Introduction to Petroleum Engineering (KU-PE301).
- Fundamentals of Petroleum Engineering (KU-PE101).
- Industrial Training in Petroleum Engineering (KU-PE450).

GRADUATE

- Thermal Hydraulics in Power Technology – Two-Phase Flow Module (MIT-22.313J).
- Transport Phenomena in Petroleum Engineering (KU-PE505).
- Advanced Production Engineering (KU-PE556).
- Two-Phase Flow Modeling in Pipes (KU-PE555).
- Advanced Fluid Mechanics (KU-ENG510).
- Special Topics in Petroleum Engineering (KU-PE591).

INDUSTRIAL SHORT COURSES

- Basic Oil Study (KOC).
- Fundamentals of Production Engineering (KOC).
- Production and Process Engineering (KOC).

PROFESSIONAL MEMBERSHIP

- | | |
|---|--------------|
| ▪ Society of Petroleum Engineers (SPE). | 1997-present |
| ▪ American Society of Mechanical Engineers (ASME). | 2000-present |
| ▪ American Statistical Association (ASA). | 2002-present |
| ▪ American Society of Engineering Education (ASEE). | 2008-present |

HOBBIES

- Tennis.
- Swimming.

- White Water Rafting.
- Hiking.
- Reading.