DAVID E. SASK

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CURRICULUM VITAE

Goals

- Primary Research & Interest: Improved Oil Recovery (IOR) processes and Artificial Lift technology.
- Use of Machine Learning and AI to improve resource recovery by tracking pressure and other well bore & reservoir data over time to predict and control intelligent completions.
- Development of intelligent completions systems for IOR and AL.

Education

1978 B. Sc. (Chemical Engineering – Environmental Option), Queen's University, Kingston, Ontario, Canada
1971 Senior Matriculation, Composite High School, Grande Prairie, Alberta, Canada
Numerous business and technical courses throughout my career.

Key Engineering and Business Strengths

Key Strengths:

- Horizontal well production: Industry wide peer recognition for contributions to the advancement in understanding of production problems and optimization. SPE Regional Award for Production and Operations 2014.
- IOR/EOR technology development for improving recovery from both conventional and unconventional reservoirs.
- Artificial lift: Evaluated and/or implemented a wide variety of systems including plunger lift, gas lift, jet pumps, rod pumps and chemical foamers in both gas and liquids rich resource plays.
- Innovation: Worked throughout career to create and deploy new technology to improve efficiency and production.
- Communication: Recognized as a strong communicator with the ability to present to management, customers, peers and operations personnel. Able to develop and deliver courses within organizations, industry and academia.
- Software: Used a wide range of production software including PVR, Wellview, SCADA and Spotfire for data analytics. Coordinated projects using Schlumberger OLGA transient well bore modelling software to understand horizontal well performance and to evaluate artificial lift systems and minimize operating costs.

Technical Skills:

- Engaged in production, completions and well testing engineering and design throughout my career.
- Strength in production optimization techniques for both vertical and horizontal oil and gas wells.
- Worked with data analytics to identify and understand complex production patterns as well as to find best solutions.
- Well versed in field operations and working with operations personnel.
- Ability to identify challenges and limiting conditions as well as the opportunities to increase production.
- Understand the need to design systems for operational efficiency as well as for technical merit.

Team and Leadership Skills:

- Most recently worked as a production engineering advisor. Worked closely with facility, completions, drilling and reservoir engineers as well as operations personnel to meet business unit targets and budget.
- Enjoy team projects and the ability to enhance business and technical solutions through the creativity that can be generated from combining team skills.
- Experience leading teams in large companies and small enterprises.
- Have been able to inspire, motivate and lead others, both as a peer and as a supervisor.
- My self-motivation skills, energy level, and high level of commitment assist in motivating by example.
- Believe that all stakeholders in every project or activity must be actively engaged to ensure project success.
- Mentoring young professionals is a key component of my leadership skills.

Professional Experience

1) **April 2015 to Present: David Sask Technology Inc.**
Currently Evaluating technical opportunities for IOR in mature oil reservoirs.
2018-2025 Queen's University: Adjunct Lecturer for "Energy Transition and the Oil and Gas Industry" course.
2022-2025 Precise Downhole Solutions: Principal Advisor Oura™ Intelligent Downhole Valve Technology for Improved Oil Recovery (IOR) and Gas Lift applications.
2017-2022 Algar Geothermal: Consultant for private geothermal energy company. Coordinated the detailed thermal modeling of existing oil & gas wells for conversion to use as geothermal energy sources. Co-authored SPE paper.
2019-2020 Sonatrach Algeria: Production Optimization Advisor - Identify opportunities to increase production in a legacy conventional oil field of 2000+ wells including vertical and hz wells. Develop test procedures and remediation plans to optimize production in one section of the field initially focusing on salt and asphaltene issues.
2018 Source Rock Energy: Design input to horizontal well testing system for multi-stage fracture evaluation.
2017 KPMG: Consultant on client SRED (Scientific Research & Experimental Development) tax claims to CRA.
2016 Saguaro Resources: Production Engineering Advisor – Evaluate well bore efficiencies, identify causes of production impairment and recommend optimization solutions for their Montney liquids rich play in NE BC.
2015-2016 ARC Resources: Production Engineering Advisor - Provided technical support to the evaluation and implementation of optimal artificial lift solutions for the Montney liquids rich play in NE BC. Utilized OLGA transient well bore simulator to predict artificial lift performance. Evaluated results from pilot artificial lift installations and worked with the completions, facilities and operations teams to evaluate capital and operating costs for each alternative.

2) **June 2008 to March 2015: Encana Corporation – Calgary, Alberta**
Production Engineering Advisor
From May 2012 – Mar 2015: Advisor for Duvernay field, a deep, highly over-pressured liquids rich reservoir where I was responsible for all production issues in the Kaybob portion of the field and worked closely with geology, reservoir, drilling, completions, operations and facilities personnel.
- Evaluated artificial lift options for deep, over-pressured reservoirs to establish an approved artificial lift plan. Utilized well bore modelling software (OLGA) to simulate the impact of artificial lift technologies and their economic impact on field development. Initiated installation of first AL systems in the field.
- Led team to implement wet metering technology in liquids rich gas wells with LGR ratios from 50-250 bbls/mmscf and reduced CAPEX by $45 million. Field trials resulted in approval from AER (Alberta Energy Regulator) for the Duvernay and the liquids rich portion of Encana's Montney development.
- Steering committee member for two industry consortiums to test artificial lift technology, PTAC Gas Well Pump Consortium and Tulsa University Horizontal Well Artificial Lift Project.
- Played a key leadership role in the Encana Technology Exchange Program, to efficiently transfer knowledge between the Canadian and US Divisions. Mentored you engineers, supported business units.

From June 2008 to May 2012: Lead the production optimization activities in the Ft. Nelson Business Unit and provided technical leadership across the company on artificial lift strategies for horizontal gas wells.
- Lead the well review process for all wells in the BU and oversaw annual optimization plan and budget.
- Plunger lift optimization of over 350 gas wells including development of new software techniques and testing programs to understand efficiency of plungers in horizontal wells.
- Used transient well bore modelling software (OLGA) to understand the impact of tubing landing depths and well bore trajectories on well performance. Co-authored SPE paper.
- Identified the precipitation of halite (salt) in horizontal wells, understand the different mechanisms for deposition, and develop methods for clean outs.
- Statistical review of coiled tubing corrosion and designed tool to improve safety during CT recovery.
- Comparative data analytic studies of velocity strings, plunger lift and chemical foamers on efficiencies.
- Provided technical support to Horn River team for deeper HT gas wells with high CO2 concentrations.

3) **1999 to 2008: David Sask Technology Inc. – Calgary, Alberta**
Provided consulting engineering for the design of oil and gas down hole equipment and production technology.
Jun 2005 – May 2008. Full time consulting services provided to Encana's Ft. Nelson BU in Calgary.
- Developed and implemented programs to evaluate production in a field with 1100 horizontal gas wells.
- Planned, installed and evaluated production logging programs in horizontal wells to identify key production problems and understand liquid hold up issues in horizontal wells.
- Responsible for all production engineering activities including facilities in Helmet field.
- Worked with service companies to design innovative solutions for artificial lift, including pilot studies.

Aug 2000 – May 2005. Full time consulting services provided to Schlumberger Technology Corporation in Houston Texas, providing expertise in the design and development of proprietary technology relating to:

- completion valve design for offshore production strings using AutoCad.
- well testing and stimulation systems including open hole straddle packer isolations systems for horizontal wells, with the main focus on Middle East legacy oil fields.
- subsea control systems for offshore fields in Gulf of Mexico and West Africa.

3) 1986 – 1998: Downhole Systems Technology Canada Inc. - Calgary, Alberta

President. Founded the company, provided the initial product concepts and patents for the company's proprietary technology, and arranged the $1.8 million in private and public financing to complete the product development. The company developed two patented, advanced technology systems, for evaluating and stimulating oil and gas wells. These real time systems were based upon computerized data acquisition and control systems that allowed data to be gathered, analysed, and used to provide feedback to enhance the data collection process. This technology was applicable to open hole testing, and horizontal well evaluation and stimulation utilizing inflatable straddle packers. Responsible for all aspects of the business including, planning, reporting, administration, operations, engineering, marketing and sales. Played a key role in the detailed mechanical design as well as setting all system function specifications. A strong customer focus was maintained by playing an active role in meeting customers regularly.

Accomplishments:

- Successfully completed the development of a real time well testing system encompassing complex mechanical design, electrical power engineering, micro-electronics engineering, communications telemetry, and software.
- System contained a 1.5HP PCP pump, 3 linear valves and 5 pressure/temperature transducers.
- System was the first high voltage, high current power system for use with single conductor oilfield wire line.
- Initiated a joint venture in 1995 for the development of new technology to evaluate and stimulate horizontal wells using concentric coiled tubing in conjunction with the company's data acquisition and control technology.
- The company had an average annual revenue growth of 67% between 1992 and 1997.

4) 1984 – 1985: Petro Safety Corp., Toronto, Ontario

Project Manager - Research and Development. This position involved the development of a well drilling safety system and included responsibility for the prototype design, testing, and development to bring the product to the marketplace. My responsibilities also included the direct supervision of a small team of engineers and technicians.

5) 1982 – 1984: Canterra Energy Ltd., Calgary, Alberta

Petroleum Engineer - Completions and Workovers for EOR. Responsible for the preparation of detailed engineering programs to complete and work over wells in Western Canada. This included analysis of logs, DST's, cores and other formation evaluation techniques, preparation of AFE's, control of costs, continuous interaction with field operations, on-site support for critical operations, and the preparation of technical reports and project summaries.

Accomplishments:

- Completed extensive study to design a dual producer/injector completion for a tertiary recovery project. This reduced the number of wells that were required to inject solvent and produce the secondary production target.
- Introduced the use of multiple packer completions which provided a substantial decrease in the number of work overs required on a tertiary recovery project.
- Developed several new techniques for testing oil and gas wells to evaluate their potential for production, and to evaluate and enhance stimulation techniques, including deep HPHT sour gas wells in Ram River area.
- Introduced the development of light-weight remedial cementing techniques for low pressure wells in the Rainbow Lake field to improve cementing efficiency and reduce work over costs.
- Performed over 30% of the workload in an engineering group of 6 engineers. This workload was consistent in terms of rig operating days, number of projects (wells) and AFE amounts.

6) 1977 – 1982: Johnston Testers Ltd. (A division of Schlumberger Canada), Calgary, Alberta.

Positions Held: Field Engineer, Sales Engineer, District Manager and Division Manager. A broad range of field experience was gained in the areas of well testing, production equipment operations. Management duties included budgets, purchasing, scheduling, P&L decision making, operations coordination, marketing, sales, equipment availability, staff training, service quality improvements and development of customer relations.

Accomplishments:

- Managed a division with three different product lines and sales in excess of $8 million.
- Introduced the first real time drill stem testing system to Canada testing the Hibernia offshore discovery well.
- Developed and implemented multi-well real time interference testing programs.
- Optimized utilization of personnel and equipment for during difficult economic conditions within the industry.

Professional Publications

Patents:

1) Canada No. 1,249,772 - Drill Stem Testing System 1989-2-07
2) USA No. 4898236 - Drill Stem Testing System 1990-2-06
3) USA No. 4995462 - Dewaxing Control Valve 1991-2-26
4) Canada No. 1,318,848 - Dewaxing Control Valve 1993-6-08
5) USA No. 5,638,904 - Safeguarded Method and Apparatus for Fluid Communication Using Coiled Tubing, With Application To Drill Stem Testing 1997-6-17
6) Canada No. 2,167,491 - Safeguarded Method and Apparatus for Fluid Communication Using Coiled Tubing, With Application To Drill Stem Testing 1997-1-26
7) USA No. 6,527,050 & 6,722,438(CIP) - Method and Apparatus for Formation Damage Removal 2003-03-04
8) Canada No. 2416116 - Method and Apparatus for Formation Damage Removal 2009-10-13
9) United Kingdom No. GB2383600 - Method and Apparatus for Formation Damage Removal 2004-09-29
10) USA No. 7,063,156, & 7,267,177 Tubing Fill and Testing Valve, 2006-6-20, 2007-09-11
11) USA No 7,849,920 – System and Method for Optimizing Production In a Well 2010-12-14

Technical Papers:

1) CADE/CAODC Drilling Conference April 1991, "Improvements In Operational Efficiency Of Drill Stem Testing."
2) CADE/CAODC Drilling Conference April 1993, "Practical Application - Real Time Drill Stem Testing System."
3) 47th Annual Technical Meeting of The Petroleum Society, June 1996, ***Best Paper Award***
   "Test, Treat, Test System Using A Concentric Tubing/DST Package."
4) SPE International Conference on Horizontal Well Technology, November 1996
   "The Selective Evaluation And Stimulation Of Horizontal Wells Using Concentric Coiled Tubing."
5) Petroleum Technology Association of Canada, Technical Forum, October 2002, Maximizing the Productivity of Horizontal Wells using CTEST ™ (Coiled Tubing Evaluation and Stimulation Technology)
6) SPE 108084, Rocky Mountain Oil & Gas Technology Symposium, April 2007, "Production and Video Logging in Horizontal Low Permeability Gas Wells"
7) CIPC/SPE Gas Technology Symposium 2008 Joint Conference Calgary, Alberta, Canada, 17-19 June 2008, "Plunger Lift in Horizontal Gas Wells - An Old Technique in a New Application"
8) CSUG/SPE 137860, Canadian Unconventional Resource Conference, Calgary, Alberta, Canada, 19-21 Oct 2010, "Plunger Lift Optimization in Horizontal Gas Wells: Case Studies and Challenges"
9) CSUG/SPE 149477, Canadian Unconventional Resource Conference, Calgary, Alberta, Canada, 15-17 Nov 2011, "Investigation of Liquid Loading in Tight Gas Horizontal Wells With a Transient Multiphase Flow Simulator"
10) SPE-208928-MS, SPE Canadian Energy Technology Conference, Calgary, Alberta, Canada, 16-17 Mar 2022. "Optimizing Geothermal Heat Extraction From End Of Life Oil & Gas Wells Using A Transient Multiphase Flow Simulator"

Industry Collaboration:

Steering Committee: PTAC Gas Pump Consortium to develop and test early-stage artificial lift technology (2011 – 2014)

Advisory Board: Tulsa University Horizontal Well Artificial Lift Project for experimental flow characterization by testing and modelling flow dynamics and evaluate artificial lift performance in horizontal wells (2012–2016)

Course Instruction:

1) ALRDC 2013, 2014 and 2015 Gas Well Deliquification Workshop, Denver, CO, Continuing Education Course on Horizontal Wells (largest class attendance of the 9 courses offered at workshop in 2013 and 2014). Most workshop courses cancelled in 2016 due to low enrollment.
2) Queen's University, Kingston ON, Adjunct Instructor and Course Coordinator for CHEE 414, a 4th year Oil and Gas course for chemical and geological engineering students in the 2017/2018 thru 2024/2025 academic years.

Award:

1) 2014 SPE Canada Regional Award for Production and Operations

Hobbies And Personal Interests

Running, canoeing, paddle boarding, squash, snow shoeing and reading a wide range of non-fiction.

Volunteering

Royal Canadian Air Cadets, Squadron Sponsoring Committee – 2022 - present
Race Director and volunteer coordinator for Banff Jasper Relay 2009 - 2015.
Queen's University Department of Chemical Engineering – Industry Advisor TEAM Course 2002 – 2019.