

Curriculum vitae

ROLE IN THE PROJECT

Project manager Work package leader
 Project partner Other (specify)

PERSONAL INFORMATION

Family name, First name:	Vefring, Erlend		
Date of birth:	01.10.1961	Sex:	Male
Nationality:	Norwegian		

HIGHER EDUCATION/OTHER TRAINING

	Subjects/degree/	Name of institution, country
1989	PhD in Applied Mathematics, Acoustics	University of Bergen, Norway / University of Texas at Austin, Dept. of mech. Engineering, USA
1986	MSc in Applied Mathematics, Acoustics	University of Bergen, Norway

POSITIONS (academic, business, industry, public sector, national or international organisations)

Current Position

	Job title/name of employer/country
2020-	Center Director DigiWells and Vice President NORCE Energy, Norway

Previous positions held (list)

	Job title/name of employer/country
2018-2020	Vice President, NORCE Energy, Norway
2006-2018	Vice President, IRIS, Norway
2003-2006	Professor II, University of Bergen, Dept. of applied mathematics, Norway
2002-2006	Research Director with responsibility for 15 - 25 persons, Rogaland Research, Norway
1997-2002	Chief Scientist, Rogaland Research, Norway
1996-1999	Research Director with responsibility for 12 – 15 persons, Rogaland Research, Norway
1996	Visiting scientist at Petrobras Research Center, Rio de Janeiro, Brazil
1990-1996	Research Scientist and from 1992 Research Director, Rogaland Research, Norway
1989-1990	Associate Professor, University of Bergen, Dept. of applied mathematics, Norway
1987-1988	Ph.D. scholarship, University of Texas at Austin, Dept. of mech. Engineering, USA

CENTER AND PROJECT MANAGEMENT EXPERIENCE FROM RELEVANT RESEARCH & INNOVATION ACTIVITIES (from 2000)

	Center/Project/topic/role in project/funding from
2020-	Center Director, Center for Researchbased Innovation (CRI) DigiWells, Budget 232 MNOK, Funded by RCN, AkerBP, ConocoPhillips, Equinor, Lundin, Total and Wintershall DEA.
2018-	Chairman steering committee, JIP "Geosteering for Improved Oil Recovery". Budget 22,4 MNOK. Funded by RCN, Equinor, Vår Energi, AkerBP and Baker Hughes.

2017-	Chairman steering committee, DEMO2000 Joint Industry Project (JIP) "Demonstration of Automated Drilling Process Control". Budget 85 MNOK. Funded by the Research Council of Norway (RCN), Equinor, Vår Energi, AkerBP, Repsol, Total, Odfjell Drilling, Sekal, CanRig and National OilWell Varco.
2017-2020	Chairman steering committee, DEMO2000 JIP "Demonstrations of Drilling Data Hub". Budget 12 MNOK. Funded by RCN, AkerBP, Vår Energi, Equinor, Halliburton, Odfjell and Sekal.
2017-2018	Project Manager, JIP "Geosteering for Improved Oil Recovery". Budget 22,4 MNOK.
2011-2015	Program Manager Deputy, Drillwell, Program 2: "Geosteering, deep imaging and flexible earth model". Budget 25 MNOK. Funded by RCN, Statoil, ConocoPhillips, Wintershall, Repsol, Lundin and Total.
2008-2013	Project manager for the project "MaxWells – Wells for Maximum Value Creation". Budget 16 MNOK. Funded by RCN and Statoil.
2008-2011	Project manager for project "Flexible Earth Model". Budget 8 MNOK. Funded by RCN.
2005-2008	Program manager for the JIPs "E_Well-Construction-Management", "DRILLTRONICS Rig" and "DrillScene". Funded by RCN, ENI and Statoil.
2005-2007	Project manager for the JIP "Continuous updating of reservoir simulation models and improved reservoir management". Budget 9 MNOK. Funded by RCN, ENI, Chevron, Norsk Hydro, Statoil and Total.
2004-2005	Project manager for the JIP "DRILLTRONICS". Budget 31 MNOK. Funded by ENI, Chevron and Statoil.
2003-2005	Project manager for the project "Monitoring and Steering of a network of Advanced Wells". Budget 6.25 MNOK. Funded by ENI.
2003 -2005	Project Manager for the JIP "Reservoir Operations with Advanced Wells". Budget 9 MNOK. Funded by RCN, ENI, Chevron, Norsk Hydro and Statoil.
2000-2002	Project Manager for the JIP "Design of Advanced Wells and Reservoir Steering". Budget 3.6 MNOK. Funded by ENI, Statoil and the Norwegian Research Council.
2000-2002	Project Manager for the JIP "Data Interpretation and Necessary Instrumentation for a Network of Advanced Wells". Budget 3.5 MNOK. Funded by RCN, ENI, Norsk Hydro and Conoco.

PROFESSIONAL MEMBERSHIPS

Society of Petroleum Engineers
Norwegian Petroleum Association

EXPERIENCE FROM RELEVANT RESEARCH & INNOVATION ACTIVITIES (if applicable)

	Project/type of R&I activity and R&I content /role and tasks/funding from
2017-	Project initiation and project management as chairman of steering committee for DEMO2000 project / JIP "Demonstration of Automated Drilling Process Control". Development and demonstration of next generation drilling automation and autonomous drilling.
2017-	Project initiation and project management as chairman of steering committee for DEMO2000 project /JIP "Demonstration of Drilling Data Hub". Development and demonstration of Drilling Data Hub for integration between data providers and data consumers enabling interoperability.

2011-	Project initiation, research, innovation and initial demonstration of new ensemble based decision support tool for geosteering which balances well productivity and drilling risk. Being demonstrated at field cases. Developed in JIPs.
2004-2011	Research, innovation and commercialization of drilling process monitoring and drilling automation solutions. Developed in several JIPs. Involvement in the process from initial research to commercialization as board member in companies DRILLTRONICS Rig, DrillScene and Sekal (from 2011) commercializing the solutions. Sekal was acquired by Sumitomo in 2019. The commercial products DrillScene and DrillTronics are now a commercial success and widely used globally.
2000-2007	Research, innovation and demonstration of new workprocess for updating reservoir simulation models using ensemble based methods. Involved in project initiation and project management. Continued research and development at IRIS and NORCE from 2008. Ensemblebased workprocesses for reservoir management are now widely used globally, becoming the industry standard and also commercialized by the Norwegian company Resoptima.
1991-2005	Research, innovation and commercialization of digital twins for the well delivery process. Development of prototypes and later products used for planning drilling and well operations. Involvement in the whole process from initial research to board member in commercialization company PETEC. PETEC was acquired by SCANDPOWER in 2005 which again was acquired by Schlumberger in 2012. Products now available in Schlumberger suite of software and used widely in the industry.

BOARD MEMBER

	Board member
2017-	National Center for Improved Oil Recovery at University of Stavanger
2014-2015	COREC–Centre for Oil recovery
2013-2015	DrillWell – Centre for drilling and well for improved recovery.
2006-2013	Forskningsinvest AS. A subsidiary of IRIS for commercialization of research results
2011	Board member of Sekal
2004-2011	DRILLTRONICS RIG SYSTEMS AS, from 2011 part of Sekal. Drilling automation technology
2004-2011	DRILLSCENE AS, from 2011 part of Sekal. Drilling process monitoring technology
2004-2007	Core2Field AS, Reservoir analysis technology
2003-2005	PETEC AS. Acquired by SCANDPOWER in 2005 which again was acquired by Schlumberger in 2012.

PhD STUDENTS SUPERVISED

	PhD student
2018	Erich Suter, Petroleum Engineering, University of Stavanger
2011	Jan Einar Gravdal, Petroleum Engineering, University of Stavanger
2011	Øvind Breyholtz, Petroleum Engineering, University of Stavanger
2006	Gerhard Nygaard, Petroleum Engineering, NTNU
2002	Rolf Johan Lorentzen, Applied Mathematics, University of Bergen
2000	Kjell Kåre Fjelde, Applied Mathematics, University of Bergen
2000	Antonio C. V. M. Lage, University of Stavanger

ORGANISATION OF CONFERENCES

	Name	Role in committee
2012-2021	SPE Norway One Day Seminar and now the SPE Norway Subsurface Conference, 250 – 500 participants, Bergen	Member
2019	Collaboration to Increase Competiveness, 110 participants, Stavanger	Chairman
2018	Collaboration in a Digital Environment, 110 participants, Stavanger	Chairman
2017	Digital Drilling, 100 participants, Stavanger	Chairman
2016	Technology Step Change, 90 participants, Stavanger	Chairman
2015	Technology Step Change Drilling and Well, 70 participants, Stavanger	Chairman
2010	Automated Drilling Seminar, 50 participants, Houston	Chairman
2008	Automated Drilling Seminar, 40 participants, Stavanger	Chairman

Track record

Publications (from Google scholar): 63 publications, 2061 citations, h-index: 21

10 selected publications illustrating span of research activities in time and interests:

S. Alyaev, R. Bratvold, X. Luo, E. Suter and E. Vefring: "An Interactive Decision Support System for Geosteering Operations", Paper 191337 at SPE Norway One Day Seminar held in Bergen, 18 April 2018
E. Suter, E. Cayeux, H.A. Friis, T. Kårstad, A. Escalona, and E. H. Vefring, "A Novel Method for Locally Updating an Earth Model While Drilling Geosteering", International Journal of Geosciences, 8, 237-264, 2017
Y. Chen, R. J. Lorentzen and E. H. Vefring, "Optimization of well trajectory under uncertainty for proactive geosteering", SPE Journal, 20, pp. 368 – 383, 2015
J. Zhou, G. Nygaard, and E. H. Vefring, "Adaptive decentralized control of DC-DC converter systems", paper presented at 7th IEEE Conference on Industrial Electronics and Applications (ICIEA), Singapore, 18-20 July 2012
Jan Einar Gravdal, Rolf J. Lorentzen, Kjell K. Fjelde and Erlend H. Vefring, "Tuning of Computer Model Parameters in Managed Pressure Drilling Applications Using an Unscented Kalman Filter Technique", SPE Journal, Volume 15, Number 3, 2010
F. I. Iversen, E. Cayeux, E. W. Dvergsnes, J. E. Gravdal, E. H. Vefring, B. Mykletun, A. Torsvoll, S. Omdal, and A. Merlo: "Monitoring and Control of Drilling Utilizing Continuously Updated Process Models." Paper SPE 99207 at IADC/SPE Drilling Conference, Miami, Florida, U.S.A., 21 – 23 February 2006
E. H. Vefring, G. Nygaard, R. J. Lorentzen, G. Nævdal and K. K. Fjelde: "Reservoir Characterization during UBD: Methodology and Active Tests." SPE Journal, Vol. 11, No. 2, pp. 181-192, June 2006
G. Nævdal, L. M. Johnsen, S. I. Aanonsen and E. H. Vefring: "Reservoir Monitoring and Continuous Updating Using Ensemble Kalman Filter." SPE Journal, pp. 66-74, March 2005
D. R. Brouwer, G. Nævdal, J. D. Jansen, E. H. Vefring and C. P. J. W. van Kruijsdijk: "Improved Reservoir Management Through Optimal Control and Continuous Model Updating." Paper SPE 90149 at SPE Annual Technical Conference and Exhibition, Houston, Texas, 26 –29 September 2004
R. Rommetveit and E. H. Vefring: "Comparison of Results From an Advanced Gas Kick Simulator With Surface and Downhole Data From Full Scale Gas Kick Experiments in an Inclined Well", paper SPE 22558 in proceedings of SPE Fall Conference, Dallas, Texas, Oct. 6-9 1991