

# ***CURRICULUM VITAE***

## **NEAL B. NAGEL**

### **OilField Geomechanics LLC**

**Name** Neal B. Nagel  
Mobile: 832.327.9566  
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#### **Years of Experience – 35+ yrs**

Adjunct Professor, Univ North Dakota, 2021-present  
OilField Geomechanics, Founder, Owner and Chief Engineer, 2014-present  
Itasca Houston, VP of Engineering/Chief Engineer, 2013 (1 year)  
Itasca Houston, Chief Engineer, 2009-2013 (4 years)  
ConocoPhillips, Principal Engineer, 2002-2009 (7 years)  
Phillips Petroleum Company, 1989-2002 (13 years)  
Southern Illinois University, Asst. Prof. 1988-1999 (1 year)  
New Mexico Institute of Mining and Technology, Asst. Prof. 1987-1988 (1.5 years)  
Various consulting and summer jobs during grad school, 1982-1987 (1.5 years)

**Degrees** BS, MSc & Ph.D. – Mining Engineering, University of Missouri-Rolla

#### **Industry Recognition, Committees and Activities**

##### **SPE**

- Member, SPE Reservoir Advisory Committee (2021-present)
- Member, SPE Casing Deformation Work Group (2021-present)
- Chairman, SPE Geomechanics Technical Section (2017-2021)
- Co-Chair, SPE Summit “Casing Deformation in Unconventionals” (2021)
- SPE Distinguished Lecturer (2016-2017)
- ARMA Short Course on Geomechanics of Unconventionals (2021)
- SPE HFTC Short Course on Geomechanics of Unconventionals (2016-19, 2021-22)
- SPE ATCE Short Course on Geomechanics of Unconventionals (2017)
- SPE Reservoir Description & Dynamics Advisory Committee, Geomechanics Subcommittee (2016-2019)
- Chief Editor, SPE Solids Injection Monograph
- Member, SPE Monograph Committee (2005-2009)
- Member, SPE Drilling & Completions Subcommittee (2005-2012)
- SPE Distinguished Lecturer (2003-2004)
- Member, Program Committee, SPE ATW: Pore Pressure and Stress (2007)
- Member, SPE Drilling & Completion Director Selection Committee (2006)
- Member, Program Committee, SPE Forum: Well Failure (2006)
- Local SPE section officer (2000-2002)
- SPE Annual Technical Conference Well Completion Committee (1990-1994)

##### **Other**

- Expert Panel, Certifying Authority for Nova Scotia Utility Review Board: Alton Gas Salt Cavern(s) Development Project (2012-present)
- Testifying Expert Witness: Geomechanics and Salt Cavern Stability (Florida Gas Transmission Company v. Texas Brine Company, LLC, Docket No. 34316 and Crosstex Energy Services, LP, et al. v. Texas Brine, et al., Docket No: 34202 and Pontchartrain Natural Gas System, k/d/s/ Promix, LLC and Acadian Gas Pipeline System v. Texas Brine Company LLC, et al., Docket No: 34265, Division “B”, 23rd Judicial District Court, Assumption Parish, Louisiana) (2017)
- Doctoral Committee: K. Rodriguez, UCV, Petroleum Engineering School (2015-present)
- NSERC Grant Reviewer: 2016

- Paper Reviewer: ARMA, SPE, AJGS, AAPG, RMRE (2012-present)
- Contributing Author: *Unconventional Oil and Gas Resources: Exploitation and Development*, U. Ahmed & D.N. Meehan, Eds, CRC Press, 2016
- Contributing Author: *Hydraulic Fracturing*, M. Smith and C.T. Montgomery, CRC Press, 2015
- PTTC - Short Courses on Geomechanics of Unconventionals (2015)
- AAPG, URTEC Short Course on Geomechanics of Unconventionals (2015)
- ARMA Hydraulic Fracturing Technical Group (2013-present)
- ARMA Short Course on Geomechanics of Unconventional / Workshop on Geomechanics for Unconventionals (2013, 2015, 2016)
- SEG, AAPG, SPWLA, HGS, DGS, PTTC, SPE (Forums and ATWs) invited presentations (2011-2017)
- Sandia Salt Project, Phillips Petroleum Representative (1999-2002)
- Expert Witness: Ekofisk Subsidence Case, Norway (1996)
- Joint Chalk Research (JCR) Program Administrator (1996-1999)
- Joint Chalk Research project leader: Deformation-Related Well Performance in Fractured Chalk (1997-1999); Compaction and Surface Subsidence (1993-1996)
- Joint Chalk Research Geomechanics Expert Panel (1993-2002)
- API Subcommittee for Long-Term Conductivity of Proppants (1991-1993)

### **Current Position (2014 – Present)**

**Title:** Chief Engineer & Principal – OilField Geomechanics LLC  
Adjunct Professor of Petroleum Engineering, Univ North Dakota  
504 FM 359, Suite 130 - #166  
Richmond, TX 77406  
Office: 832.327.9566

**Job Responsibilities:** *Engineering Advisor:* Geomechanics of Unconventionals; Hydraulic Fracturing; Wellbore Stability; Salt Modeling, Compaction & Subsidence; Solids/Cuttings Injection Engineering oversight, review, and sign-off on all projects.  
*Project proposals and marketing.*  
*Principal Instructor:* Geomechanics training – open courses and in-house courses for major and independent companies (Devon, Diamondback Energy, Pioneer, Noble, Whiting, YPF, Weatherford).  
*Expert Witness support.*  
*Graduate Student Advisor and Mentor*

### **Professional Experience**

**2013-2014: VP of Engineering/Chief Engineer – Itasca Houston, Houston, Texas**

**Responsibilities:**

Engineering oversight, review, and sign-off on all projects.  
Technology Marketing and Client Relations.  
Corporate strategies (engineering) and service strategies.  
Budgeting (engineering) and project administration.  
Engineer supervision, hiring, review.

**2009-2013: Chief Engineer, Itasca Houston, Inc. – Houston, Texas**

**Responsibilities:**

Engineering oversight, review, and sign-off on all Itasca Houston projects.  
Support in company management and definition of product and service strategies.  
Integrated project leader.  
Project proposals and marketing.  
Principal Instructor: Geomechanics training – 2 open courses a year and in-house

courses for major and independent companies.  
 Supervision, mentoring, and review of young engineers.  
 Major Projects Development: Shell Marcellus, Haynesville, generic Unconventional geomechanics studies; Marathon Bakken study; Encana Horn River study; Talisman Montney study; PEMEX Chicontepec study; YPF Vaca Muerta study; Pluspetrol Vaca Muerta study; TOTAL Elgin study; Anadarko Nansen study; PEMEX KMZ study.

**2002-2009: Principal Engineer, ConocoPhillips – Houston, Texas**

**Responsibilities:**

Principal Instructor: COP Stimulation School  
 Principal Instructor: COP Global Wellbore Stability Course  
 Co-Instructor: COP Completion Skills Development Program  
 Co-Instructor: Completions/Geomechanics at COP Engineering Academy

Geomechanics Lead for performing world-wide geomechanics evaluations and provide geomechanics support for world-wide completions/stimulation and drilling operations. Major projects in: China, Qatar, Indonesia, UK, Norway, Alaska, Canada and Venezuela. Provide training on borehole stability, salt stability, hydraulic fracturing and completion technology for new-hire and experienced engineers.

Perform world-wide cuttings reinjection (solids injection) evaluations and provide on-going support for solids/waste disposal operations.

Lead and support reservoir characterization efforts (particularly geomechanics-related) for world-wide COP operations including geological characterization (fault/fracture geomechanics) and flow model development (implementation and analysis of model compressibility issues). Lead and coordinate subsidence technical service and research for COP Norway; develop and update subsidence forecasts and risk analyses for the Ekofisk and Eldfisk Fields; evaluate field data for determination of causes and trends in Ekofisk and Eldfisk subsidence; perform field compressibility and subsidence evaluations for world-wide operations. Borehole stability analysis for assets around the world.

Mentoring: Young/New hire engineers in geomechanics and stimulations

**2000 - 2002: Senior Principal Reservoir Engineer – Phillips Petroleum, Bartlesville, OK**

**Responsibilities:**

Coordinate subsidence research for PPCoN; develop and update subsidence forecasts and risk analyses, borehole stability for Ekofisk and Eldfisk; evaluate field data for determination of causes and trends in Ekofisk and Eldfisk subsidence; cuttings reinjection evaluations; general geomechanics investigations such as casing deformation issues.

Geomechanics Team Leader; coordinate joint geomechanics projects; communicate geomechanics issues and capabilities to management and SBU's; assist in the development and evaluation of team members.

Joint Chalk Research Geomechanics Project Leader; coordinate project group for the geomechanics project under JCR 6; draft project descriptions, contractor notifications, and contracts; technical liaison for PPCo to JCR group.

Phillips Representative to the Sandia Salt Project.

**1999 - 2000: Senior Reservoir Engineering Specialist – Phillips Petroleum, Bartlesville, OK**

**Responsibilities:**

Coordinate subsidence research for PPCoN under E230 program; develop and update subsidence forecasts and risk analyses for Ekofisk and Eldfisk; evaluate field data for determination of causes and trends in Ekofisk and Eldfisk subsidence; cuttings reinjection evaluations; general geomechanics investigations such as casing deformation issues.

Phillips Representative to the Sandia Salt Project.

**1997 - 1999: Senior Reservoir Engineering Specialist – Phillips Norway**

**Responsibilities:**

Coordinate subsidence research and analyses internally within Phillips, with co-venturers, and with external research firms; develop and update subsidence forecasts and risk analyses for Ekofisk and Eldfisk; communicate subsidence developments with co-venturers and Norwegian authorities; evaluate field data for determination of causes and trends in Ekofisk and Eldfisk subsidence; and general geomechanics investigations (cuttings re-injection and casing deformation issues).

Team leader for the Produced Water Team, a multi-disciplinary team assembled to review produced water handling for Phillips' PL018 fields and determine solutions to new regulatory restrictions enacted by the Norwegian government.

Program administrator for the Joint Chalk Research Program, Phase 5 (JCR 5), a 17 mmNOK joint industry program of investigation into improving recovery and operations of chalk reservoirs; Project leader for the Well Performance project within JCR 5.

**1995 - 1997: Senior Reservoir Engineer – Phillips Norway**

**Responsibilities:**

Coordinate subsidence research and analyses internally within Phillips, with co-venturers, and with external research firms; Develop and update subsidence forecasts and risk analyses for Ekofisk and Eldfisk; Communicate subsidence developments with co-venturers and Norwegian authorities; Evaluate field data for determination of causes and trends in Ekofisk and Eldfisk subsidence; General geomechanics investigations (cuttings re-injection and casing deformation issues).

**1993 - 1995: Associate Reservoir Engineer – Phillips Norway**

**Responsibilities:**

Investigations of the causes and effects of reservoir compaction and subsidence; Development of finite element models for the modeling of reservoir compaction and seabed subsidence; and Forecasting of subsidence and horizontal motions.

**1990 - 1993: Staff Reservoir Engineer - Research & Services Division, Phillips Petroleum Company, Bartlesville, Oklahoma**

**Responsibilities:**

General geomechanics investigations; Coordination of hydraulic fracturing research; Team Leader for the Formation Completion Task Force; and Development of finite element geomechanics models for investigations of Eldfisk subsidence.

**1989 - 1990: Visiting Assistant Professor of Mining Engineering - Southern Illinois University, Carbondale, Illinois**

**Responsibilities:**

Teach Graduate and Undergraduate level courses in mining engineering including undergraduate level courses in surface mining and mine development and graduate level courses in strata control/subsidence; Principal Investigator for Illinois Mining and Mineral Resources Research Institute Project BM-USDI-G119: 'The Study of the Geostatistical Properties of Coal Quality Parameters of the Herrin #6 Coal Seam'; Co-Principal Investigator for National Mine Land Reclamation Center Project SIUC-01: 'A Study of the Change in Soil Matrix Potential of Prime Farmland Soils Due to Differing Deep Tillage Techniques'; and Faculty Advisor for student chapter of the Society of Geologists and Mining Engineers.

**1987 - 1989: Assistant Professor of Mining Engineering - New Mexico Institute of Mining and Technology, Socorro, New Mexico**

**Responsibilities:**

Teach Undergraduate level courses in mine ventilation, surface mining, introduction to mining, and mechanics of materials; Developed a Coal Royalty Verification Program for the New Mexico State Land Office; and Faculty Advisor for the Cooney Mining Club. Support for WIPP research project.

**1982 - 1987: Part-time laboratory assistant for Haas & Associates Consulting - Rolla, Missouri**

**Responsibilities:**

Select, prepare, and test rock samples for determination of rock mechanical properties for mine design and dam construction.

Projects conducted for (partial list): Exxon Coal Resources, USA; Amax Coal Company; Shell Oil Company, Mining; and Cominco American, Ltd.

**1982 - 1987: Teaching Assistant - University of Missouri-Rolla, Rolla, Missouri**

**Responsibilities:**

Teach the laboratory portion of the courses Rock Mechanics I and Mine Ventilation.

**Summer, 1984 & 1985: Summer engineer - Rochester & Pittsburgh Coal Company, Indiana, Pennsylvania**

**Responsibilities:**

Entry-level engineering work in the environmental permitting department.

**Selected Publications and Papers**

1. Nagel, N.B., D. Gokaraju, A. Mitra, and M. Sanchez-Nagel, 2017, "Consideration of Stress Shadows in Stacked Plays", Paper ARMA 17-884 presented at 51st US Rock Mechanics/Geomechanics Symposium, San Francisco, CA, USA, 25-28 June.
2. Sanchez-Nagel, M., N.B. Nagel, A.A. Rodriguez, and N. Nieto, 2017, "Evaluating Stresses Along Horizontal Wells in Unconventional Plays", SPE Paper 184875 presented at the SPE Hydraulic Fracturing Technology Conference, The Woodlands, Texas, USA, 24-28 January.
3. Nagel, N.B. and M. Sanchez-Nagel, 2015, "On the Importance and Impact of Key Geomechanical Parameters in Unconventional Play Developments", Paper ARMA 15-514 presented at 49th US Rock Mechanics/Geomechanics Symposium, San Francisco, CA, USA, 28 June – 1 July.

4. Nagel, N.B., Sheibani, F., Lee, B.T., Agharazi, A., Zhang, F., 2014, "Fully-Coupled Numerical Evaluations of Multistage Completion Schemes: The Critical Role of In-Situ Pressure Changes and Well Configuration", SPE Paper 168581 presented at the SPE Hydraulic Fracturing Technology Conference, The Woodlands, Texas, USA, 4-6 February.
5. Agharazi, A., Lee, B.T., Nagel, N.B., Zhang, F., and Sanchez-Nagel, M., 2013 "Tip-Effect Microseismicity – Numerically Evaluating the Geomechanical Causes for Focal Mechanisms and Microseismicity Magnitude at the Tip of a Propagating Hydraulic Fracture", SPE Paper 167129 presented at the SPE Unconventional Resources Conference-Canada, Calgary, Alberta, 5-7 November.
6. Zhang, F., Nagel, N.B., Sanchez-Nagel, M., Lee, B.T., Agharazi, A., 2013, "The Critical Role of In-Situ Pressure on Natural Fracture Shear and Hydraulic Fracturing-Induced Microseismicity Generation", SPE Paper 167130 presented at the SPE Unconventional Resources Conference-Canada, Calgary, Alberta, 5-7 November.
7. Nagel, N.B., Zhang, F., Sanchez-Nagel, M., Lee, B.T., Agharazi, A., 2013, "Stress Shadow Evaluations for Completion Design in Unconventional Plays", SPE Paper 167128 presented at the SPE Unconventional Resources Conference-Canada, Calgary, Alberta, 5-7 November.
8. Nagel, N.B., F. Zhang, M. Sanchez-Nagel and B. Lee, 2013, "Evaluation of Stress Changes Due to Multi-Stage Hydraulic Fracturing - Consideration of Field Results", presented at Rock Mechanics for Resources, Energy and Environment, Eurock13, the ISRM International Symposium, Wroclaw, Poland, 21-26 September.
9. Garcia, X., N.B. Nagel, F. Zhang, M. Sanchez-Nagel and B. Lee, 2013, "Revisiting Vertical Hydraulic Fracture Propagation Through Layered Formations - A Numerical Evaluation", Paper ARMA 13-203 presented at 47th US Rock Mechanics/Geomechanics Symposium, San Francisco, CA, USA, 23-26 June.
10. Rios, A.M., G. Gutierrez, N.B. Nagel, F. Zhang, M. Sanchez-Nagel and B. Lee, 2013, "Stress Shadow Evaluations for Chicontepec - Evaluating New Completion Options", Paper ARMA 13-200 presented at 47th US Rock Mechanics/Geomechanics Symposium, San Francisco, CA, USA, 23-26 June.
11. Zhang, F., N.B. Nagel, B. Lee and M. Sanchez-Nagel, 2013, "The Influence of Fracture Network Connectivity on Hydraulic Fracture Effectiveness and Microseismicity Generation", Paper ARMA 13-199 presented at 47th US Rock Mechanics/Geomechanics Symposium, San Francisco, CA, USA, 23-26 June.
12. Zhang, F., N.B. Nagel, X. Garcia, B. Lee and M. Sanchez-Nagel, 2013, "Fracture Network Connectivity - A Key To Hydraulic Fracturing Effectiveness and Microseismicity Generation", presented at ISRM International Conference for Effective and Sustainable Hydraulic Fracturing, Brisbane, Australia, 20-22 May.
13. Nagel, N.B., F. Zhang, M. Sanchez-Nagel, X. Garcia, and B. Lee, 2013, "Quantitative Evaluation of Completion Techniques on Influencing Shale Fracture Complexity", presented at ISRM International Conference for Effective and Sustainable Hydraulic Fracturing, Brisbane, Australia, 20-22 May.
14. Savitski, A. A., M. Lin, A. Riahi, B. Damjanac and N.B. Nagel, 2013, "Explicit Modeling of Hydraulic Fracture Propagation in Fractured Shales," in International Petroleum Technology Conference, Beijing, China.
15. Nagel, N.B., M. Sanchez-Nagel, F. Zhang, X. Garcia, and B. Lee, 2013, "Coupled Numerical Evaluations of the Geomechanical Interactions Between a Hydraulic Fracture Stimulation and a Natural Fracture System in Shale Formations", Rock Mechanics and Rock Engineering, DOI 10.1007/s00603-013-0391-x
16. Pettitt, W.S., M. Pierce, B. Damjanac, J. Hazzard, L. Lorig, C. Fairhurst, M. Sanchez-Nagel, N.B. Nagel, J. Reyes-Montes, J. Andrews and R.P. Young, 2012, "Combining Microseismic Imaging and Hydrofracturing in Numerical Simulations", Paper ARMA 12-554 presented at the 46th U.S. Rock Mechanics Symposium, Chicago, Illinois, USA.
17. Pettitt, W.S., B. Damjanac, J. Hazzard, Y. Han, M. Sanchez-Nagel, N.B. Nagel, J. Reyes-Montes and R.P. Young, 2012, "Engineering Hydraulic Treatment of Existing Fracture Networks", Paper SPE 160019 presented at the SPE Annual Technical Conference and Exhibition, San Antonio, Texas, USA.
18. Nagel, N.B., M. Sanchez-Nagel, X. Garcia, and B. Lee, 2012, "Understanding "SRV": A Numerical Investigation of "Wet" vs. "Dry" Microseismicity During Hydraulic Fracturing", Paper SPE 159791 presented at the SPE Annual Technical Conference and Exhibition held in San Antonio, Texas, USA,

8-10 October.

19. Nagel, N.B., M. Sanchez-Nagel, X. Garcia, and B. Lee, 2012, "A Numerical Evaluation of the Geomechanical Interactions Between a Hydraulic Fracture Stimulation and a Natural Fracture System", ARMA 12-287 presented at the 46th Rock Mechanics / Geomechanics Symposium, Chicago, Illinois, 24-27 June.
20. Nagel, N.B., X. Garcia, B. Lee, and M. Sanchez-Nagel, 2012, "Hydraulic Fracturing Optimization for Unconventional Reservoirs - The Critical Role of the Mechanical Properties of the Natural Fracture Network", Paper SPE 161934 presented at the SPE Canadian Unconventional Resources Conference, Calgary, Alberta, Canada, 30 October - 1 November.
21. Nagel, N., M. Sanchez-Nagel, and BT Lee, 2012, "Gas Shale Hydraulic Fracturing: A Numerical Evaluation of the Effect of Geomechanical Parameters", Paper SPE 152192 presented at the SPE Hydraulic Fracturing Technology Conference and Exhibition, The Woodlands, Texas, USA, 6-8 February.
22. Pettitt, W.S., M. Pierce, B. Damjanac, J. Hazzard, L. Lorig, C. Fairhurst, I. Gil, M. Sanchez-Nagel, N.B. Nagel, J. Reyes-Montes R.P. Young, 2011, "Fracture Network Engineering for Hydraulic Fracturing", *The Leading Edge*, 30(8), pp844-853.
23. Nagel, N., I. Gil, M. Sanchez-Nagel, and B. Damjanac, 2011, "Simulating Hydraulic Fracturing in Real Fractured Rock – Overcoming the Limits of Pseudo3D Models", Paper SPE 140480 presented at the SPE Hydraulic Fracturing Technology Conference and Exhibition, The Woodlands, Texas, USA, 24-26 January.
24. Nagel, N., B. Damjanac, X. Garcia, and M. Sanchez-Nagel, 2011, "Discrete Element Hydraulic Fracture Modeling - Evaluating Changes in Natural Fracture Aperture and Transmissivity", Paper SPE 148957 presented at the Canadian Unconventional Resources Conference, Calgary, Alberta, Canada, 15-17 November.
25. Nagel, N. and M. Sanchez-Nagel, 2011, "Stress Shadowing and Microseismic Events: A Numerical Evaluation", Paper SPE 147363 presented at the SPE Annual Technical Conference and Exhibition, Denver, Colorado, USA, 30 October-2 November.
26. Gil, I., N.B. Nagel, M. Sanchez-Nagel, and B. Damjanac, 2011, "The Effect of Operational Parameters on Hydraulic Fracture Propagation in Naturally Fractured Reservoirs - Getting Control of the Fracture Optimization Process", Paper ARMA 11-391 presented at ARMA 45th U.S. Rock Mechanics/Geomechanics Symposium, San Francisco, California, USA.
27. Omdal, E., M. V., T. G. Kristiansen N. B. Nagel, R. I. Korsnes and A. Hiorth, 2010, "Deformation Behavior of Chalk Studied Close to In Situ Reservoir Conditions," *Rock Mech. Rock Eng.*, 43, pp557-580.
28. Gil, I., B. Damjanac, N.B. Nagel and Q. Guo, 2010, "Geomechanical Evaluation of Solids Injection", Paper ARMA 10-399 presented at 44th U.S. Rock Mechanics Symposium/5th U.S.-Canada Rock Mechanics Symposium, Salt Lake City, Utah, USA.
29. Nagel, N. B., and F. Meng, 2009, "Wellbore Strengthening: The Effect of the Permeable Case", Paper AADE-09-NTCE presented at Unlocking the Potential: Sustaining Drilling Performance, American Association of Drilling Engineers (AADE) National Technical Conference & Exhibition, New Orleans, Louisiana, USA.
30. Guo, G., and N. B. Nagel, 2009, "Cuttings Reinjection Case Histories", paper presented at Unlocking the Potential: Sustaining Drilling Performance, American Association of Drilling Engineers (AADE) 2009 National Technical Conference & Exhibition, New Orleans, Louisiana, USA.
31. Nagel, N. B., and F. Meng, 2007, "What Does the Rock Mechanics Say: A Numerical Investigation of Wellbore Strengthening", Paper AADE-07-NTCE-65 presented at the American Association of Drilling Engineers (AADE) National Technical Conference & Exhibition, Houston, USA.
32. Nagel, N. B., 2006, "On the Importance of Cuttings Reinjection", *Schlumberger Oilfield Rev.*, 18(4), 1 (Winter 2006).
33. Doomhof, D., T. G. Kristiansen, N. B. Nagel, P. D. Patillo and C. Sayers, 2006, "Compaction and Subsidence", *Schlumberger Oilfield Rev.*, 18(3), pp50-68 (Autumn 2006).
34. Nagel, N. B., 2005, "4,000,000 Barrels and Counting: Experience with Cuttings Reinjection in North Sea Shales Ekofisk", Paper ARMA/USRMS 05-782 presented at Alaska Rocks 2005 - Rock Mechanics for Energy, Mineral and Infrastructure Development in the Northern Regions, University of Alaska-Anchorage, Anchorage, USA.
35. Nagel, N. B., 2004, "Oilfield Subsidence: The Five W's (What? Why? 2xWhere? & What!)", SPE

Distinguished Lecture Series, 2003-2004.

36. Chin, L. Y., and N. B. Nagel, 2004, "Modeling of Subsidence and Reservoir Compaction under Waterflood Operations", *Int. J. Geomech.*, 4(1), 28-34.
37. Gauer, P. R., J. E. Sylte and N. B. Nagel, 2002, "Ekofisk Field Well Log Decompaction", Paper SPE 78177-MS presented at Oil Rock 2002, SPE/ISRM Rock Mechanics Conference, Irving, Texas, USA.
38. Nagel, N. B., 2001, "Ekofisk Geomechanics Monitoring," presented at the Workshop on Geomechanics in Reservoir Simulation, IFP, Rueil-Malmaison, France.
39. Nagel, N. B., 2001, "Compaction and Subsidence Issues within the Petroleum Industry: From Wilmington to Ekofisk and Beyond", *Phys. Chem. Earth A*, 26(1-2), pp3-14.
40. Chin, L. Y., and N. B. Nagel, 2001, "Modeling of the Effect of Well Treatment on Horizontal Well Casing Deformation", paper presented at Rock Mechanics in the National Interest, 38th U.S. Rock Mechanics Symposium, Washington, D.C., USA, Vol. 1, pp. 133-139.
41. Chin, L. Y., and N. B. Nagel, 2001, "Computer Modeling of Subsidence and Reservoir Compaction under Fieldwide Water Injection Operations", paper presented at Computer Methods and Advances in Geomechanics, 10th IACMAG, Tucson, Arizona, USA.
42. Sylte, J. E., L. K. Thomas, D. W. Rhett, D. D. Brunning and N. B. Nagel, 1999, "Water-Induced Compaction in the Ekofisk Field", Paper SPE 56426-MS presented at SPE Annual Technical Conference and Exhibition, Houston, Texas, USA.
- 43.emper, R., N. B. Nagel and R. Gold, 1998, "Monitoring Formation Compaction," Baker Hughes in-Depth, 4(2).
44. Nagel, N. B., and K. J. Strachan, 1998, "Implementation of Cuttings Reinjection at the Ekofisk Field", paper presented at EUROCK 98, SPE/ISRM Conference on Rock Mechanics in Petroleum Engineering, Trondheim, Norway.
45. Nagel, N. B., 1998, "Ekofisk Field Overburden Modelling", paper presented at EUROCK 98, SPE/ISRM Conference on Rock Mechanics in Petroleum Engineering, Trondheim, Norway.
46. Broughton, P., T. R. Aldridge and N. B. Nagel, 1997, "Geotechnical Aspects of Subsidence Related to the Foundation Design of Ekofisk Platforms", *Proc. ICE - Geotech. Eng.*, 125(3), p129-140.
47. Hansteen, H., K. Høeg, M. Gutierrez and N. B. Nagel, 1996, "Numerical Modelling of Overburden Deformation and Subsidence", 5th North Sea Chalk Symposium, Reims, France.
48. Gutierrez, M., T. Berre, K. Høeg, N. B. Nagel and F. Engstrøm, 1996, "Laboratory Testing and Modelling of Scale Effects on Chalk", 5th North Sea Chalk Symposium, Reims, France.
49. Gutierrez, M., K. Høeg and N. B. Nagel, 1996, "Modeling of the Compaction Behavior of Intact and Fractured Chalk", 5th North Sea Chalk Symposium, Reims, France.
50. Eiksund, G., G. Savnø and N. B. Nagel, 1996, "Creep Related Subsidence Caused by Oil and Gas Extraction", *Int. J. Rock Mech. Min. Sci.*, 33(8), 378A-379A(2).
51. Berre, T., M. Gutierrez, K. Høeg, N. B. Nagel and T. Kristiansen, 1996, "Laboratory Testing of an Overburden Shale", 5th North Sea Chalk Symposium, Reims, France.
52. Eiksund, G., G. Savnø and N. B. Nagel, 1995, "Creep Related Subsidence Caused by Oil and Gas Extraction", in *Land Subsidence, Proceedings of the Fifth International Symposium on Land Subsidence*, The Hague, pp. 277-285.
53. Nagel, N. B., W. T. Arnold III, S. L. Scott, T. S. Thrasher and M. W. McCoy, 1994, "Completion Task Force Improves Well Stimulation Performance", *World Oil*, 215(11).
54. Chin, L. Y., R. R. Boade, N.B. Nagel and G. H. Landa, 1994, "Numerical Simulation of Ekofisk Reservoir Compaction and Subsidence: Treating the Mechanical Behavior of the Overburden and Reservoir", paper presented at Rock Mechanics in Petroleum Engineering, EUROCK '94, Delft, Netherlands.
55. Nagel, N. B., W. T. Arnold III, M. W. McCoy, S. L. Scott and T. S. Thrasher, 1993, "An Integrated Team Approach for Improving Company-Wide Stimulation Design and Quality Control", Paper SPE 26142-MS presented at the SPE Gas Technology Symposium, Calgary, Alberta, Canada.