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**EDUCATION**

- 1999      **Ph.D. in Electrical Engineering**  
*University of Wyoming*, Laramie, WY
- 1995      **Master of Science in Electrical Engineering**  
*University of Wyoming*, Laramie, WY
- 1992      **Bachelor of Science in Electrical Engineering**  
*University of Wyoming*, Laramie, WY

**PROFESSIONAL QUALIFICATIONS**

- Jun 2007-  
present      **Registered Professional Engineer, State of Alaska**, *Electrical Engineering*, License #: 11793

**TEACHING/INSTRUCTION**

- Jun 2018-  
present      **Professor, University of Alaska-Fairbanks**, *Electrical and Computer Engineering*  
*Power and Controls Option*  
Advising and instruction at the undergraduate and graduate level in Power and Controls.
- Jul 2006-  
Jun 2018      **Associate Professor, University of Alaska-Fairbanks**, *Electrical and Computer Engineering*  
*Power and Controls Option*  
Advising and instruction at the undergraduate and graduate level in Power and Controls.
- Aug 1999-  
Jun 2006      **Assistant Professor, University of Alaska-Fairbanks**, *Electrical and Computer Engineering*  
*Power and Controls Option*  
Advising and instruction at the undergraduate and graduate level in Power and Controls.  
Courses instructed: Electric Machinery (EE 303), Electrical Power Systems (EE 404), Electrical Power Engineering (EE 406), Power Electronics Design (EE 408/608), Digital Control Systems (EE 671), and special topic courses (EE 693) in Adaptive Filtering, Nonlinear Systems, and Renewable and Sustainable Energy Systems.
- Summer 2002-  
2007      **Alaska Summer Research Academy, University of Alaska-Fairbanks**  
Lead instructor for junior high and high school students for Electrical Engineering unit dealing with power and energy.
- Spring 1999      **Assistant Lecturer, University of Wyoming**, *Electrical Engineering*  
Instructor for senior Electrical Engineering course in Power Systems.
- Summer 1993,  
Summer 1995      **Engineering Summer Program, University of Wyoming**, *Electrical Engineering*  
Assistant instructor for program to expose high school juniors to the various engineering disciplines.
- Spring 1993-  
Fall 1998      **Teaching Assistant, University of Wyoming**, *Electrical Engineering*  
Instructor for laboratories in lower and upper level engineering courses including: Introduction to Engineering Problem Solving, Circuits, Electromechanics, and Automatic Control Systems.

## RICHARD W. WIES, Ph. D., P. E.

### RESEARCH EXPERIENCE

Aug 1999-  
present

**Principal Investigator, *University of Alaska-Fairbanks, Institute of Northern Engineering***

- 1) US Department of Energy Office of Electricity Grid Modernization Laboratory Consortium through Pacific Northwest National Laboratory (PNNL) (\$156.94k: Oct 2017-Mar 2019)  
*Development of an Open-Source Platform for Advanced Distribution Management Systems*  
-Development of an energy storage monitoring and optimization application for the PNNL GridAPPS-D platform to assist operators in electric utilities with microgrids comprised of intermittent renewables and energy storage.
- 2) Iowa Department of Transportation Aurora Pooled Fund Consortium (\$30k: Jun 2016-Dec 2016)  
*Review Synthesis of Alternative Power Supply*  
-Review and analysis of alternative power supplies used on remote (off-grid) road weather information systems (RWIS).
- 3) Alaska Energy Authority Emerging Energy Technology Fund (\$20k: Sep 2012-Dec 2013)  
*Self-Regulated Wind Diesel Grid Using Electric Thermal Storage Units*  
-Development of grid regulation controls for electric thermal heaters in wind-diesel power plants in Alaska remote communities.
- 4) Alaska Department of Transportation and Public Facilities (\$30k: Oct 2012-Sep 2013)  
*Review of Power Sources for Alaska DOT Road Weather Information Systems (RWIS): Phase I*  
-Explore possibilities for replacing currently used power sources at remote off-grid RWIS sites with technology that is state-of-the-art.
- 5) US Environmental Protection Agency EPA P3 Competition (\$10k: Aug 2010-Aug 2011)  
*Electric Vehicle Conversions Using Alternative Energy to Drive Alaskan Rural Communities*  
-Lead and mentored a UAF engineering student team to develop environmentally friendly vehicles for Alaska rural communities as a EPA P3 competition entry.
- 6) Alaska Energy Authority (\$319.28k with \$158.05k to INE: May 2010-May 2013)  
*Improving the Energy Efficiency of Alaska Seafood Processing Plants*  
-Development of energy efficiency testing procedures and kits to study the energy efficiency of seafood processing plants in Alaska.
- 7) Alaska University Transportation Center (\$20k: Jan 2010-Sep 2010)  
*LED Street Lights in Alaska*  
-Testing and analysis of LED street lights for roadway applications in Alaska.
- 8) US Department of Energy Arctic Energy Technology and Development Laboratory (\$371.40k: Jul 2003-Sep 2008)  
*Effects of Village Power Quality on Fuel Consumption and Operating Expenses*  
-Development of an electric power quality monitoring and evaluation system for villages in remote rural Alaska in conjunction with Alaska Energy Authority and rural utilities.
- 9) US Department of Energy EPSCoR (\$450k with \$142k to INE: Jun 2003-May 2007)  
*Advanced Techniques for Power System Identification from Measured Data*  
-Continuation of Ph.D. research in power system interarea mode identification with DOE EPSCoR funding under a subcontract with the University of Wyoming.

**RICHARD W. WIES, Ph. D., P. E.**

- 10) US Department of Energy Arctic Energy Technology and Development Laboratory (\$107k: Jul 2003-May 2005)

*Polar Regions Hybrid Remote Power Stations*

-Development of hybrid power systems for remote power applications in polar regions.

- 11) NSF Collaborative Classroom and Laboratory Improvement Program (\$43.45k plus \$28.47k match from UAF Vice Provost for Research: Jul 2003-Jun 2004)

*A Novel Approach in Improving Power Electronics and Electric Drives Courses, Curriculum, and Laboratories: Multi-University Adaptation and Implementation*

-Development and implementation of a novel Power Electronics and Electric Drives classroom and laboratory curriculum at UAF in collaboration with four other universities.

- 12) Alaska EPSCoR Seed Grant (\$20.42k: Jun 2001-Jun 2002)

*Development and Implementation of Self-Sustainable Hybrid Power System Technologies in Cold Regions*

-Development of a research base leading to the submission of a full proposal to the US DOE National Energy Technology Lab for external funding.

Aug 1999-  
present

**Co-Principal Investigator, University of Alaska-Fairbanks, Institute of Northern Engineering**

- 1) NSF Innovations at the Nexus of Food, Energy and Water Systems (\$2.4M: Jan 2018-Jun 2021)

*Coupling infrastructure improvements to food-energy-water system dynamics in small cold region communities: MicroFEWs*

-Develop a process by which researchers and community members together characterize how renewable energy infrastructure might impact the Food-Energy-Water (FEW) nexus in isolated Arctic and Subarctic communities.

- 2) Denali Commission (\$87.68k: Oct 2009-2012)

*Technical and Economic Evaluation of HVDC Transmission Systems for Rural Alaskan Applications*

-Evaluation of HVDC transmission system for rural Alaska applications.

- 3) Denali Commission (\$60k: Oct 2009-2011)

*Smart Grid using Wind Power for Vehicle Electrification on St. Paul Island*

-Evaluation of options for vehicle electrification on St. Paul Island, Alaska.

- 4) Alaska University Transportation Center (\$140.82k: Aug 2008-Jun 2010)

*Economical Analysis of Alaskan Street Lights by using Light-Emitting Diode (LED) Technology*

-Testing and analysis of LED street lights for roadway applications in Alaska.

- 5) Alaska University Transportation Center (\$191.03k: Aug 2007-2009)

*Dust Measurement to Determine Effectiveness of Rural Dust Control Strategies*

-Development a method for dust measurement on roads in Alaska rural areas.

- 6) NSF Computer & Information Science & Engineering (\$109.85k: Aug 2004-2006)

*Hardware-in-the-Loop Simulator*

-Development of hardware-in-the-loop simulators (HILS) systems to allow for remote computer control and simulation of systems with the actual full-scale hardware in place.

**RICHARD W. WIES, Ph. D., P. E.**

- 7) US Department of Energy Arctic Energy Technology and Development Laboratory (\$50k: Jan-Dec 2004)

*Galena Electric Power - A Situational Analysis*

-Development of a system model for a situational analysis to determine the economics of operating the Galena, Alaska power system from a nuclear power plant.

- 8) US Department of Energy (DOE) Arctic Energy Technology and Development Laboratory (\$500k: Jun 2002-Nov 2004)

*Enhanced Village Power Performance Monitoring*

-Development of standardized monitoring and control systems for villages in conjunction with Alaska rural utilities.

- 9) US Army Tank Command (\$537.54k: Aug 1999-Aug 2000)

*Lightweight Robotic and Semiautonomous Ground Vehicle Mobility and Survivability Enhancements Program*

-Design and testing of a prototype electric drive for use in unmanned ground vehicles.

Jun 2010-present

**Task Lead, University of Alaska-Fairbanks, Alaska Center for Energy and Power (ACEP)**

- 1) Office of Naval Research (\$4.0M: Sep 2017-Aug 2020, Pre-award: Jun 2017)

*Alaska Regional Collaboration for Technology Innovation and Commercialization*

-Task Lead: Laboratory Testing Track - Subtask Grid-forming capability for asynchronous prime power generators

- 2) Office of Naval Research (\$4.0M: Sep 2017-Aug 2020, Pre-award: Jun 2017)

*Alaska Hub for Energy Innovation and Deployment*

-Task Lead: Control Systems Optimization and Enabling Grid-forming Capability for Asynchronous Prime Power Generators

- 3) US Department of Energy EPSCOR (\$850k: Jul 2013-Jul 2015)

*Sustainable Village Energy: Integration of Renewable and Diesel Systems to Improve Energy Self-Reliance for Remote Rural Alaska Communities*

-Subtask Lead: Engineering Challenges: Distributed Controls & Smart Grid Applications

- 4) US Department of Energy EPSCOR (\$2.86M: Jul 2010-Jul 2013)

*Making Wind Work for Alaska: Supporting the Development of Sustainable, Resilient, Cost-Effective Wind-Diesel Systems for Isolated Communities*

-Subtask Lead: Wind-Diesel Technology Development: Smart Grid Applications

Jun 2004-Aug 2010

**Research Participant, University of Alaska-Fairbanks, Institute of Northern Engineering**

- 1) US Department of Energy National Energy Technology Lab (\$140.33k: Aug 2008-2010)

*St. Paul Fuel Assessment-Phase I*

-Analysis of potential for producing and making use of hydrogen for energy storage and vehicle fuel applications on St. Paul Island, Alaska.

- 2) Usibelli Coal Mine (\$25k: Jul 2006-Jun 2007)

*Double Role Crusher Design for Aurora Power Plant*

-Testing and analysis of electrical energy requirements and potential benefits of double role crusher for processing coal for direct use in the Aurora power plant.

## RICHARD W. WIES, Ph. D., P. E.

3) US Department of Defense (\$2M: Jan 2005-Dec 2007)

*RAMGEN/Fuel Cell Hybrid*

-Development and testing of a RAM (compression) jet electric generator as a hybrid with fuel cells for military applications in collaboration with RAMGEN Power Systems™.

4) US Department of Energy (\$60k: Jun 2004-Dec 2005)

*Amchitka Independent Assessment: Diffusion Measurements*

-Development and implementation of an electrical test bed to measure resistivity of bedrock core samples from the island before nuclear testing in the 1960s and 1970s.

Summer 1995- **Ph.D. Dissertation, University of Wyoming, Electrical Engineering**

May 99 *"Use of Ambient Data for Estimating Low-Frequency Electromechanical Modes in Power Systems."*

- DOE EPSCOR Research Fellow in conjunction with Battelle PNNL and Bonneville Power Administration (1995-1996).

-AWU Graduate Fellow at Battelle PNNL in Summer 96.

Spring 1995 **Masters Thesis, University of Wyoming, Electrical Engineering**

*"The Effects of Transient Switching Harmonics from Adjustable-Speed Drives on the Communication Frequency Spectrum with Filtering Solutions as Applied to Electric Vehicles."*

Fall 1992- **Laboratory Research, University of Wyoming, Electrical Engineering**

Spring 1995 Worked as DOE/AWU Graduate Fellow in the University of Wyoming Motor Testing and Training Center.

-Aided in the design and construction of a 300 HP dynamometer.

-Performed extensive testing of motors with IEEE and NEMA standards.

-Designed and constructed a 500 W mobile solar energy demonstration.

Summer 1992 **Research Assistant, University of Wyoming, Electrical Engineering**

Worked in conjunction with DOE Electric Motor Testing project

-Tested induction motors in the petroleum and mining industry.

-Analyzed and reported findings on energy use, efficiency and over-sizing of motors.

**PUBLICATIONS (Aug 1999-Present): Citations IEEE Explore (IE), Google Scholar (GS), and Research Gate (RG)**

### BOOKS

- 1) A.N. Agrawal, **R.W. Wies**, and R.A. Johnson, *Hybrid Electric Power Systems: Modeling, Optimization, and Control*, VDM Verlag, Jul 2007.

### BOOK CHAPTERS

- 1) **R. W. Wies**, R. A. Johnson, and A. Agrawal, *Energy-Efficient Standalone Fossil-Fuel Based Hybrid Power Systems Employing Renewable Energy Sources*, Fossil Fuel and the Environment, Dr. Shahriar Khan (Ed.), Ch. 6, ISBN: 978-953-51-0277-9, InTech, Mar. 2012. (1 citation GS)
- 2) **R. W. Wies**, *The Power Electronics Handbook: DC-DC Converters*, CRC Press, Boca Raton, FL, Chap. 2: Sections 1, 3-5, Nov. 2001.

### JOURNAL PUBLICATIONS

- 1) M. Farrokhbadi, C. A. Cañizares, J. W. Simpson-Porco, E. Nasr, L. Fan, P. A. Mendoza Araya, R. Tonkoski, U. Tamrakar, N. Hatziaargyriou, D. Lagos, **R. W. Wies**, M. Paolone, M. Liserre, L. Meegahapola, M. Kabalan, A. H. Hajimiragha, D. Peralta, M. Elizondo, K. P. Schneider, F. Tuffner, J. Reilly, and R. Palma Behnke, "Microgrid Stability Definitions, Analysis, and Examples," *IEEE Transactions on Power Systems*, vol. ?, no. ?, pp. ???-???, ????. 2019.

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- 2) Erin Whitney, William E. Schnabel, Srijan Aggarwal, Daisy Huang, **Richard W. Wies, Jr.**, Justus Karenzi, Henry P. Huntington, Jennifer I. Schmidt, and Aaron D. Dotson, "MicroFEWs: A Food–Energy–Water Systems Approach to Renewable Energy Decisions in Islanded Microgrid Communities in Rural Alaska," *Environmental Engineering Science*, Mary Ann Liebert, Inc., Jun. 2019. DOI: <https://doi.org/10.1089/ees.2019.0055> (1 citation GS)
- 3) R. Melton, K. P. Schneider, E. Lightner, T. McDermott, P. Sharma, Y.C. Zhang, F. Ding, S. Vadari, R. Podmore, A. Dubey, **R. Wies**, and E. Stephan, "Leveraging Standards to Create an Open Platform for the Development of Advanced Distribution Applications," *IEEE Access*, vol. 6, pp. 37361-37370, Jun. 2018. DOI: 10.1109/ACCESS.2018.2851186 (1 citation IE; 1 citations GS)
- 4) N. T. Janssen, R. A. Peterson, **R. W. Wies**, Generalized Heat Flow Model of a Forced Air Electric Thermal Storage Heater Core, *ASME Journal of Thermal Science and Engineering Applications*, vol. 9, iss. 4, Apr. 2017. DOI: 10.1115/1.4036366
- 5) N. T. Janssen, **R. W. Wies**, and R. A. Peterson, Frequency Regulation by Distributed Secondary Loads on Islanded Wind-Powered Microgrids, *IEEE Transactions on Sustainable Energy*, vol. 7, no. 3, pp. 1028-1035, Jul. 2016. DOI: 10.1109/TSTE.2015.2502487 (5 citation IE; 8 citations GS)
- 6) B. E. Muhando and **R. W. Wies**, Nonlinear  $H_{\infty}$  Constrained Feedback Control for Grid-Interactive WECS Under High Stochasticity, *IEEE Transactions on Energy Conversion*, vol. 26, no. 4, pp 1000-1009, Dec. 2011. DOI: 10.1109/TEC.2011.2164797 (8 citations IE; 14 citations GS)
- 7) **R. W. Wies**, R. A. Johnson, and A. N. Agrawal, Life Cycle Cost Analysis and Environmental Impacts of Integrating Wind-Turbine Generators (WTGs) into Standalone Hybrid Power Systems, *WSEAS Transactions on Systems*, vol. 4, iss. 9, pp. 1383-1393, Aug. 2005. ISSN 1109-2777 (12 citations GS)
- 8) **R. W. Wies**, A. N. Agrawal, and T. J. Chubb, "Optimization of a PV with Diesel-Battery System for Remote Villages," *International Energy Journal*, vol. 6, no.1, part 3, pp. 107-118, Jul. 2005. (7 citations RG)
- 9) M. G. Anderson, N. Zhou, J. W. Pierre, and **R. W. Wies**, Bootstrap-based Confidence Interval Estimates for Electromechanical Modes from Multiple Output Analysis of Measured Ambient Data, *IEEE Transactions on Power Systems*, vol. 20, no. 2, pp. 943-950, May 2005. DOI: 10.1109/TPWRS.2005.846125 (57 citations IE; 85 citations GS)
- 10) **R. W. Wies**, R. A. Johnson, A. N. Agrawal, and T. J. Chubb, Simulink Model for Economic Analysis and Environmental Impacts of a PV with Diesel-Battery System for Remote Villages, *IEEE Transactions on Power Systems*, vol. 20, no. 2, pp. 692-700, May 2005. DOI: 10.1109/TPWRS.2005.846084 (126 paper & 1 patent citation IE; 207 citations GS)
- 11) **R. W. Wies**, J. W. Pierre, and D. J. Trudnowski, Use of ARMA Block Processing for Estimating Stationary Low-Frequency Electromechanical Modes of Power Systems, *IEEE Transactions on Power Systems*, vol. 18, no. 1, pp. 167-173, Feb. 2003. DOI: 10.1109/TPWRS.2002.807116 (157 paper & 1 patent citation IE; 243 citations GS)

### TECHNICAL REPORTS

- 1) M. Farrokhbadi, C. A. Cañizares, J. W. Simpson-Porco, E. Nasr, L. Fan, P. A. Mendoza Araya, R. Tonkoski, U. Tamrakar, N. Hatziargyriou, D. Lagos, **R. W. Wies**, M. Paolone, M. Liserre, L. Meegahapola, M. Kabalan, A. H. Hajimiragha, D. Peralta, M. Elizondo, K. P. Schneider, F. Tuffner, J. Reilly, and R. Palma Behnke, "Microgrid stability, definitions, analysis, and modeling," IEEE Power and Energy Society, Tech. Rep. PES-TR66, Apr. 2018.
- 2) J. J. Sanchez-Gasca (chair), D. Trudnowski (sec.), E. Barocio, C. Cañizares, J. H. Chow, M. L. Crow, L. Dosiek, H. Ghasemi, M. Gibbard, L. Haarla, J. Hauer, H. Huang, I. Kamwa, G. Ledwich, R. Martin, E. Martinez, A. R. Messina, B. Pal, J. W. Pierre, T. Tauhala, J. Turunen, L. Vanfretti, V. Vittal, D. Vowles, **R. Wies**, and N. Zhou, "Identification of Electromechanical Modes in Power Systems," IEEE Power and Energy Society, Tech. Rep. PES-TR15, Jun. 2012.

**CONFERENCE PROCEEDINGS**

- 1) **R. W. Wies**, MicroFEWS: Understanding the FEW Nexus in Remote Alaska Communities, *Proceedings of the 2018 IEEE Power and Energy Society General Meeting*, Panel on Research and Education for Food, Energy, and Water Nexus, 18PESGM2195, Portland, OR, Aug. 2018. PESGM.2018-PESSLI
- 2) **R. W. Wies**, N. T. Janssen, and R. A. Peterson, Autonomous Distributed Secondary Loads for Sole Frequency Regulation in High Penetration Wind-Diesel Microgrids, *Proceedings of the 2017 IEEE Power and Energy Society General Meeting*, Chicago, IL, Jul. 2017. DOI: 10.1109/PESGM.2017.8274105
- 3) **R. W. Wies**, N. T. Janssen, R. A. Peterson, and M. Mueller-Stoffels, Remote Islanded Microgrids in Alaska and the Arctic, *Proceedings of the 2017 IEEE Power and Energy Society General Meeting*, Panel on Lessons Learned from Implementing Portable and Reconfigurable Microgrids for Resilient Operation, 17PESGM2766, Chicago, IL, Jul 2017. PESGM.2017-PESSLI
- 4) **R. W. Wies**, N. T. Janssen, and R. A. Peterson, Voltage and Frequency Stability in Remote Islanded Microgrids with High Penetration of Renewables and Unbalanced Loading, *Proceedings of the 2016 IEEE Power and Energy Society General Meeting*, Panel on Microgrid Stability and Modelling, Boston, MA, Jul 2016. PESGM.2016-PESSLI1249
- 5) **R. W. Wies**, Achieving Maximum Value from Variable Resources (In Islanded Grids), *Proceedings of the 2016 Guam Conference for Island Sustainability*, Guam, Apr 2016.
- 6) **R. W. Wies**, N. T. Janssen, and R. A. Peterson, Distributed Self-Sensing Secondary Loads for Frequency Regulation in Wind-Powered Islanded Microgrids, *Proceedings of the 2015 IEEE Power and Energy Society General Meeting*, Denver, CO, Jul 2015. DOI: 10.1109/PESGM.2015.7286033 (47 full text views IE)
- 7) Paul S. Gill, Michael C. Hatfield, Daniel Randle, **Richard Wies**, Rajive Ganguli, Siena Rosetti, and Samuel Vanderwaal. "Team of Unmanned Aircraft Systems (UAS) and Unmanned Ground Vehicles (UGV) for Emergency Response in Mining Applications", 51st AIAA/SAE/ASEE Joint Propulsion Conference, AIAA Propulsion and Energy Forum, AIAA 2015-4111, Jul 2015. DOI: <http://dx.doi.org/10.2514/6.2015-4111> (6 citations GS)
- 8) N. T. Janssen, **R. W. Wies**, and R. A. Peterson, Improved Frequency Regulation on Hybrid Wind-Diesel Microgrids using Self-Sensing Electric Thermal Storage Devices, *Proceedings of 2014 Australasian Universities Power Engineering Conference (AUPEC)*, Perth, WA, Australia, Sep 2014. DOI: 10.1109/AUPEC.2014.6966561 (83 full text views IE)
- 9) **R. W. Wies**, E. Chukkapalli, and M. Mueller-Stoffels, Improved Frequency Regulation in Mini-Grids with High Wind Contribution using Online Genetic Algorithm for PID Tuning, *Proceedings of the 2014 IEEE Power and Energy Society General Meeting*, Washington, DC, Jul 2014. DOI: 10.1109/PESGM.2014.6939257 (4 citations IE)
- 10) N. T. Janssen, **R. W. Wies**, and R. A. Peterson, Development of a Full-Scale-Lab-Validated Dynamic Simulink® Model for a Stand-Alone Wind-Powered Microgrid, *Proceedings of 2014 ASME Power Conference*, Baltimore, MD, Jul 2014. DOI:10.1115/POWER2014-32035 (4 citations GS)
- 11) **R. W. Wies**, N. T. Janssen, and R. A. Peterson, Evaluation of Grid-Interactive Electric Thermal Storage (GETS) Heaters for Islanded Renewable Energy-Diesel Microgrids in Cold Regions, Improved Frequency Regulation in Mini-Grids with High Wind Contribution using Online Genetic Algorithm for PID Tuning, *Proceedings International Conference on Cold Climate Technology*, Narvik, Norway, May 2014.
- 12) B. E. Muhando, **R. W. Wies**, T. H. Johnson, and G. Holdmann, "Grid-Scale Rampable Dispatchable Storage: Cascaded Use of Advanced Battery Technology to Increase Energy Security in Alaska," *Proceedings of the 2012 IEEE Power and Energy Society General Meeting*, San Diego, CA, Jul 2012. DOI: 10.1109/PESGM.2012.6345223 (2 citations IE)

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- 13) **R. W. Wies**, B. E. Muhando, and E. Chukkapalli, "Reduced Fuel Consumption in Standalone Wind-Diesel Systems in Remote Arctic Communities using Smart Grids," *2012 Arctic Frontiers Conference: Energies in the High North*, Tromsø, Norway, Jan 2012.
- 14) **R. W. Wies**, R. Peterson, and M. Sateriale, "Optimization of Electrothermal Loads in Standalone Wind-Diesel Microgrids in Remote Arctic Communities," *2012 Arctic Frontiers Conference: Energies in the High North*, Tromsø, Norway, Jan 2012.
- 15) **R. W. Wies** and D. S. Pozo, "Energy-Efficient Wind-Diesel Generation Systems Employing Smart Grid Technology in Alaska Rural Villages," *2011 International Wind-Diesel Workshop*, Girdwood, AK, Mar 2011.
- 16) **R. W. Wies**, R. A. Johnson, and J. D. Aspnes, "Design of an Energy-Efficient Standalone Distributed Generation System Employing Renewable Energy Sources and Smart Grid Technology as a Student Design Project," *Proceedings of the 2010 IEEE Power and Energy Society General Meeting*, Minneapolis, MN, Jul 2010. DOI: 10.1109/PES.2010.5590089 (17 citations IE)
- 17) D. L. Barnes, R. A. Johnson, **R. W. Wies**, T. Marsik, C. Milne, S. Underbakke, and D. Filler, "Dust Measurements to Determine Effectiveness of Rural Dust Strategies," *Proceedings of the 14<sup>th</sup> Conference on Cold Regions Engineering, Cold Regions Engineering, Cold Regions Impacts on Research, Design, and Construction*, American Society of Civil Engineers, Duluth, Minnesota, Aug 2009. DOI: [http://dx.doi.org/10.1061/41072\(359\)49](http://dx.doi.org/10.1061/41072(359)49) (32 downloads from ASCE)
- 18) **R. W. Wies**, R. A. Johnson, and A. N. Agrawal, "Life Cycle Cost, Efficiency, and Environmental Impact Analysis for Integrating Renewable Energy Sources into Standalone Village Power Systems," *2009 CIGRÉ-PES Symposium: Integration of Wide-Scale Renewable Resources into the Delivery System*, Calgary, AB, Canada, Jul 2009.
- 19) **R. W. Wies**, L. G. Brouhard, R. A. Johnson, and C. S. Lin, "Thermal-Electric Simulink<sup>®</sup> Model of Diesel Electric Generators with Economic Dispatch in Remote Standalone Systems," *Proceedings of the 2009 IEEE Power Engineering Society General Meeting*, Calgary, AB, Canada, Jul 2009. DOI: 10.1109/PES.2009.5275376 (863 full text views IE)
- 20) **R. W. Wies**, "Wind-Diesel Efficiency and Life Cycle Cost Analysis using Simulink<sup>®</sup>," *2009 International Wind-Diesel Workshop*, Ottawa, ON, Canada, Jun 2009.
- 21) **R. W. Wies**, "Economic Dispatch and SCADA for Diesel Efficiency Improvements," *2009 International Wind-Diesel Workshop*, Ottawa, ON, Canada, Jun 2009.
- 22) **R. W. Wies**, L. G. Brouhard, and R. A. Johnson, "Efficiency Improvements for Diesel Electric Generation Systems in Alaska Rural Villages through Economic Dispatch," *2008 Alaska Rural Energy Conference*, Girdwood, AK, Sep 2008.
- 23) **R. W. Wies**, L. G. Brouhard, R. A. Johnson, and C. S. Lin, "Effects of Rising Electric Load and Ambient Air Temperature on Diesel Electric Generators in Alaska Rural Villages," *Proceedings of the 2007 Arctic Energy Summit*, Anchorage, AK, Oct 2007.
- 24) **R. W. Wies**, R. A. Johnson, and A. N. Agrawal, "Life Cycle Cost, Efficiency and Environmental Impact Analysis for Integrating Renewable Energy Sources into Standalone Village Power Systems in Remote Arctic Climates," *Proceedings of the 2007 Arctic Energy Summit*, Anchorage, AK, Oct 2007.
- 25) A. N. Agrawal, V. S. Sonwalkar, and **R. W. Wies**, "A Feasibility Analysis of Deploying Photovoltaic Array in a Remote Arctic Community," *Proceedings of the 2007 Arctic Energy Summit*, Anchorage, AK, Oct 2007.
- 26) **R. W. Wies**, A. Balasubramanian, and J. W. Pierre, "Adaptive Filtering Techniques for Estimating the Low-Frequency Electromechanical Modes in Power Systems," *Proceedings of the 2007 IEEE Power Engineering Society General Meeting*, Tampa, FL, Jun 2007. DOI: 10.1109/PES.2004.1373202 (25 citations IE)



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- 27) S. Bogosyan, M. Gokasan, A. Turan and **R. W. Wies**, "Development of Remotely Accessible Matlab/Simulink Based Electrical Drive Experiments," 2007 IEEE International Symposium on Industrial Electronics, Vigo, Jun 2007, pp. 2984-2989. DOI: 10.1109/ISIE.2007.4375090 (8 citations IE)
- 28) **R. W. Wies** and R. A. Johnson, "Village Metering and Power Study," 2007 Alaska Rural Energy Conference, Session T5-C, Fairbanks, AK, Apr 2007.
- 29) **R. W. Wies**, A. Balasubramanian, and J. W. Pierre, "Combining Least Mean Squares Adaptive Filter and Auto-Regressive Block Processing Techniques for Estimating the Low-Frequency Electromechanical Modes in Power Systems," *Proceedings of the 2006 IEEE Power Engineering Society General Meeting*, Montreal, Canada, Jun 2006. DOI: 10.1109/PES.2006.1709578 (15 citations IE)
- 30) **R. W. Wies**, A. Balasubramanian, and J. W. Pierre, "Using Adaptive Step-Size Least Mean Squares (ASLMS) for Estimating Low-Frequency Electromechanical Modes in Power Systems," *Proceedings of the 2006 Probabilistic Methods Applied to Power Systems (PMAPS) Conference*, Stockholm, Sweden, Jun 2006. DOI: 10.1109/PMAPS.2006.360409 (19 citations GS)
- 31) **R. W. Wies**, A. N. Agrawal, R. A. Johnson, and T. J. Chubb, "Implementation of a Remote Terminal Unit on a Diesel Electric Generator for Performance Analysis of Remote Power Systems in Rural Alaska," 2005 Alaska Rural Energy Conference, Valdez, AK, Sep 2005.
- 32) **R. W. Wies**, R. A. Johnson, and A. N. Agrawal, "Integration of Wind-Turbine Generators (WTGs) into Hybrid Distributed Generation Systems in Extreme Northern Climates," 2005 Alaska Rural Energy Conference, Valdez, AK, Sep 2005.
- 33) J. L. Benning, D. L. Barnes, **R. W. Wies**, and M. Razavi, "Spatial and Scalar Effects on Diffusion of Radionuclides for Amchitka Island," *Environmental and Subsurface Science Symposium*, Big Sky, MT, 2005.
- 34) **R. W. Wies**, R. A. Johnson, and A. N. Agrawal, "Integration of Wind-Turbine Generators (WTGs) into Standalone Hybrid Power Systems in Extreme Northern Climates," *5th WSEAS International Conference on Power Systems and Electromagnetic Compatibility*, Corfu Island, Greece, Aug 2005. (5 citations GS)
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- 36) **R. W. Wies**, R. A. Johnson, A. N. Agrawal and T. J. Chubb, "Using HOMER and Simulink for Long-Term Performance Analysis of a Hybrid Electric Power System in a Remote Alaskan Village," *NREL World Renewable Energy Congress VIII*, Denver, CO, Aug 2004.
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- 38) **R. W. Wies**, R. A. Johnson, A. N. Agrawal, and T. J. Chubb, "Economic Analysis and Environmental Impacts of a PV with Diesel-Battery System for Remote Villages," *Proceedings of the 2004 IEEE Power Engineering Society General Meeting*, Denver, CO, Jun 2004. DOI: 10.1109/PES.2004.1373209 (9 citations IE)
- 39) **R. W. Wies**, A. N. Agrawal, T. J. Chubb and R. A. Johnson, "Simulink Model for Economic Analysis & Environmental Impacts of a Photovoltaic with Diesel-Battery System for Remote Villages," 2004 Alaska Rural Energy Conference, Talkeetna, AK, Apr 2004.
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- 42) N. Zhou, J. W. Pierre, and **R. W. Wies**, "Estimation of Low-Frequency Electromechanical Modes of Power Systems from Ambient Measurements Using a Subspace Method," *Proceedings of the 2003 North American Power Symposium (NAPS)*, Oct 2003.
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- 45) **R. W. Wies** and A. N. Agrawal, "Modeling and Optimization of Hybrid Electric Power Systems for Remote Locations in Extreme Climates," *Proceedings of the 2003 IASTED International Conference on Power and Energy Systems*, paper 379-190, pp. 241-246, Feb 2003.
- 46) M. G. Anderson, J. W. Pierre, and **R. W. Wies**, "Confidence Interval Estimates for the Frequency and Damping Ratio of Electromechanical Modes using Ambient Data," *Proceedings of 2002 North American Power Symposium (NAPS)*, Tempe, Arizona, Oct 2002.
- 47) **R. W. Wies** and J. D. Aspnes, "Design of an Energy-Efficient Hybrid Power Source for Remote Locations as a Student Project," *Proceedings of the 2002 ASEE Annual Conference Proceedings*, Session 2133, paper 2002-1289, Jun 2002. (58 downloads from ASEE)
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- 49) **R. W. Wies**, J. Mitchell, S. Daniels, J. G. Hawkins, "Analysis of Electric Machines and Drive Systems for Unmanned Ground Vehicle Applications," in *Unmanned Ground Vehicle Technology II*, Grant R. Gerhart, Robert W. Gunderson, Chuck M. Shoemaker, Editors, *Proceedings of SPIE Vol. 4024*, pp. 263-272, Jul 2000. DOI: 10.1117/12.391637 (1 citation GS)

### SCIENTIFIC AND PROFESSIONAL SOCIETY MEMBERSHIPS

- IEEE (1992-pres)
  - IEEE Power and Energy Society (1995-pres)
  - IEEE Power System Dynamic Stability Committee (2003-pres)
    - IEEE PES Microgrid Stability and Modelling Task Force (2016-present)
    - IEEE PES Modal Identification Task Force (2010-2012)
  - Power Engineering Education Committee (2007-pres)
- Tau Beta Pi (1991-pres)

### INSTITUTIONAL AND PROFESSIONAL SERVICE

- Member: UAF Electrical & Computer Engineering Faculty Search (2002-2003; 2009-2010; Chair: 2009-2010; 2012-2014; 2017-2018)
- Member: UAF CEM Dean's Search Committee (Mar 2007-Jun 2008)
- Member: UAF Faculty Senate/Graduate Academic and Advisory Committee (2004-2006)
- Member (Chair): UAF CSEM and CEM Scholarship Committee (2000-present)

## **RICHARD W. WIES, Ph. D., P. E.**

- Journal Manuscript Reviewer: IEEE Transactions on Power Systems (1997-pres), Education (2000-pres), Energy Conversion (2001-pres), Industrial Electronics (2005-pres), Sustainable Energy (2015-pres); International Journal of Adaptive Control and Signal Processing (2005-pres), IET Transactions on Generation, Transmission, and Distribution (2005-pres), IET Transactions on Renewable Generation (2007-pres), Progress in Photovoltaics: Research and Applications (2006-2009).
- Proposal Reviewer: NSF Energy, Power, Controls, and Networks (2016); NSF Science and Technology Centers: Integrative Partnerships Program (2008-2009); US Department of State Civilian Research & Development Foundation STCU (2004-2005)
- Lead Instructor (Energy Unit): Alaska Summer Research Academy (2002-2007)

### **PROFESSIONAL DEVELOPMENT ACTIVITIES**

- Attended over 30 conferences and presented over 40 papers (1999-pres)
- Attended 12 cold regions and renewable energy related workshops
- Teaching Workshops: *Teaching Power Electronics, Electric Drives, and Power Systems* (Jan 2002, Feb 2004, Jun 2007, Feb 2008, Feb 2009, Feb 2010, Feb 2012, Aug 2012, & Feb 2013)

### **RESEARCH ACTIVITIES**

- modeling, design, and performance analysis of renewable and sustainable energy systems
- dynamic modeling of distributed controls for standalone smart micro-grids
- application of signal processing techniques for analyzing power system stability
- development of classroom and laboratory curriculum for power systems courses

### **HONORS AND AWARDS**

- Invited Panel Presentation: 2017 IEEE Power and Energy Society Conference (see Conference 3)
- Invited Book: *Hybrid Electric Power Systems: Modeling, Optimization, and Control* (see Book 1)
- Invited Conference and Journal Paper: 2005 WSEAS International Conference on Power Systems and Electromagnetic Compatibility (see Journal 7 and Conference 34)
- Invited Paper: 2003 IEEE Power Engineering Society Conference (see Journal 11 and Conference 43)
- Best Paper in Electric Power Systems Session: 2002 American Controls Conference (see Conference 48)