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RESUME

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Bobby Shackouls Professor

William L. Giles Distinguished Professor

Department of Mechanical Engineering, Mississippi State University

EDUCATION

Ph.D. - Mechanical Engineering, North Carolina State University, 1974
M.M.E. - Mechanical Engineering, North Carolina State University, 1970
B.S. - Mechanical Engineering, Mississippi State University, 1968

PROFESSIONAL REGISTRATION

Registered Professional Engineer in Mississippi

PROFESSIONAL EXPERIENCE

June 1979 to Present: Bobby Shackouls Professor (2005-Present), William L. Giles Distinguished Professor (1997-Present), Professor (1985-Present), Associate Professor (1980-85), Assistant Professor (1979-80), Department of Mechanical Engineering, Mississippi State University. Areas of teaching and research specialization--thermal sciences and experimental procedures. Research interests--heat transfer, fluid mechanics, experimental techniques, and uncertainty analysis. Sabbatical leave (2002) --verification and validation of CFD codes, Haslar Marine, Ltd., Portsmouth, UK. Administrative duties--Head (1990-08), Department of Mechanical Engineering, Interim Dean of Engineering (1995-96, 2004, 2007-08), Director (2006-Present), Sustainable Energy Research Center, Interim Director (2008-Present), Institute for Clean Energy Technology, Director (2008-Present), Energy Institute, Bagley College of Engineering; Interim Vice President for Research and Economic Development (2009), Mississippi State University.

January 1974 to June 1979: Supervisor (1978-1979), Senior Engineer (1974-1978), Westinghouse Electric Corporation, Bettis Atomic Power Laboratory, West Mifflin, Pennsylvania. Specialized in heat transfer, fluid mechanics, noise, and vibration in nuclear reactor cores and power plant components. Work included analysis, design, and testing of advanced reactor plant concepts; basic research testing in turbulence, noise generation, and flow-induced vibration; and management of the R&D testing facility where above programs were performed. In 1976 served as Staff Engineer to the General Manager (six-month rotating position)--responsible for work assignments and budgets. From 1976 to 1978 served as technical coordinator of the Noise and Vibration Technology Program at Bettis. From 1978 to 1979 managed the Bettis Thermal and Hydraulics Laboratory.

September 1968 to January 1974: National Defense Education Act Fellow (1971-1972), Oak Ridge Associated Universities Fellow in Nuclear Science and Engineering (1968-1971), Graduate Teaching Assistant (1968-1974), North Carolina State University, Raleigh, North Carolina. Completed Ph.D. with research in area of atmospheric heat transfer in polluted environments including radiative heat transfer effects. Courses taught included thermodynamics and labs on experimental methods for mechanical engineers.

PROFESSIONAL AFFILIATIONS

American Society of Mechanical Engineers (Fellow), American Institute of Aeronautics and Astronautics (Associate Fellow), American Society for Engineering Education, American Society of Heating, Refrigerating, and Air-Conditioning Engineers, Society of Automotive Engineers - Aerospace, Tau Beta Pi, Pi Tau Sigma, Phi Kappa Phi, Sigma Xi

SPONSORED RESEARCH

Principal or Co-Principal Investigator

- "Mississippi State University Sustainable Energy Center," \$27,142,500, co-director with W. D. Batchelor, U.S. Department of Energy, Award No. DE-FG36-06GO86025, June 1, 2006 – June 30, 2010.
- "Micro-CHP and Bio-Fuel Center," \$5,840,000, with L. M. Chamra, B. K. Hodge, P. J. Mago, R. Luck, W. D. Batchelor, S. D. Filip To, T. French, H. L. Ginn, and N.N. Schulz, U. S. Department of Energy, Contract No. DEFG0204ER63842-04090945, June 15, 2004-Jan.30, 2010.
- "Propane-Fueled Combined Heat and Power (CHP) Systems," \$75,000, with P. J. Mago, L. M. Chamra, and G. Zdaniuk, Propane Education and Research Council, Mar. 1, 2007 – Feb. 28, 2008.
- "Global Center for Desiccant Technology," American Gas Cooling Center, \$1,100,876, with B. K. Hodge and L. M. Chamra, Aug. 31, 1995-Oct. 2006.
- "Uncertainty Analysis for Rocket Engine Prototype Testing and Modeling," \$239,998, NASA/Marshall Space Flight Center, Contract No. NAS13-03032-NNS04AA52D, with S. T. Hudson, Jan. 6, 2004-Dec. 31, 2005.
- "Prognosis for Structural Health," \$979,096, with M. F. Horstemeyer, S. R. Daniewicz, J. A. Schneider, and J. C. Newman, Jr., DARPA BAA03-02, Northrop-Grumman, Oct. 29, 2003-Sept. 30, 2005.
- "Desiccant/CHP Technology," Mississippi Valley Gas and Oak Ridge National Laboratory, \$419,912, with B. K. Hodge, C. A. James, J. A. Parsons, and L. M. Chamra, Oct. 1, 2001- Feb. 13, 2004.
- "Uncertainty Analysis for Rocket-Based Combined Cycle (RBCC) Systems Testing," \$199,998, NASA/Stennis Space Center, Grant No. NAS13-98033 DO 160, with S. T. Hudson, Sept. 28, 2001-Oct. 31, 2003.
- "Advanced Desiccant Technology Research," Oak Ridge National Laboratory and Gas Research Institute, \$560,442, with B. K. Hodge, J. W. Stevens, A. A. Jalalzadeh-Azar, and L. M. Chamra, Aug. 16, 1998 - Sept. 30, 2001.
- "Uncertainty Analysis for Texaco's Steam Flow Facility," Texaco Exploration and Production Technology Dept., \$24,772, with R. Luck, Jan. 1, 1998 - May 15, 1998.
- "Bridge Project, Mississippi DOE EPSCoR Program," U.S. Department of Energy, Grant No. DE-FG02-93ER75928, \$85,192, Sept. 30, 1993 - Feb. 29, 1996.
- "Mississippi Statewide DOE/EPSCoR Energy-Related Graduate Traineeship Program," U.S. Department of Energy, Grant No. DE-FG02-91ER75660, \$61,110, with B. K. Hodge and G. A. Adebisi, Sept. 30, 1991 - Sept. 30, 1994.
- "Characterization of a Thermal Energy Storage System Utilizing an Encapsulated Phase Change Storage Material--Phase III: Data Analysis and Reporting," Battelle, Pacific Northwest Laboratory, Contract No. DE-AC06-76RLO 1830, \$40,000, with G. A. Adebisi and A. A. Jalalzadeh-Azar, Oct. 1, 1993 - June 30, 1994.
- "Mississippi DOE EPSCoR Planning Grant," U.S. Department of Energy, Grant No. DE-FG02-91ER75676, \$37,250, Sept. 30, 1991 - Dec. 31, 1993.
- "Characterization of a Thermal Energy Storage System Utilizing an Encapsulated Phase Change Storage Material--Phase II: Test Facility Operation," Martin Marietta Energy Systems, Inc., Oak Ridge National Laboratory, Subcontract No. 19X-SA025C, Mod. No. 8, \$266,447, with G. A. Adebisi, R. E. Forbes, and B. K. Hodge, May 16, 1991 - Sept. 30, 1993.
- "Thrust Measurement System Uncertainty Technical Support," NASA, NAS13-330, Delivery Order 58, \$3,147, Nov. 19-30, 1992.
- "Characterization of a Thermal Energy Storage System Utilizing an Encapsulated Phase Change Storage Material--Phase I: Test Facility Design and Construction," Martin Marietta Energy Systems, Inc., Oak Ridge National Laboratory, Subcontract No. 19X-SA025C, Mods. No. 6 and 7, \$230,686, with G. A. Adebisi, R. E. Forbes, and B. K. Hodge, Oct. 25, 1989 - Sept. 30, 1991.
- "Investigation of the Commercial Feasibility of Ash Removal from Lignite by Density Separation," Mississippi Mineral Resources Institute, MMRI No. 91-6F, \$5,000, with C. W. Bouchillon, July 1, 1990 - June 30, 1991.

- "Support to Stennis Space Center's Rocket Engine Plume Diagnostics Experiment Program," NASA, NAS13-330, Delivery Order 7, modification 1, \$74,921, with H. W. Coleman, Oct. 1, 1989 - Dec. 31, 1990.
- "Ash Removal from Lignite by Density Separation," Mississippi Mineral Resources Institute, MMRI No. 90-4F, \$5,000, with C. W. Bouchillon, July 1, 1989 - June 30, 1990.
- "Uncertainty Analysis of an Experimental Approach for Detecting Wear during Tests of the Space Shuttle Main Engine," NASA, NAS13-330, Delivery Order 7, \$21,000, with H. W. Coleman, June 1, 1989 - September 30, 1989.
- "Ash Removal from Lignite by Ion Exchange," Mississippi Mineral Resources Institute, MMRI No. 89-3F, \$5,000, with C. W. Bouchillon, July 1, 1988 - June 30, 1989.
- "Improvement of an Electrostatic Separator for Ash Removal from Lignite," Mississippi Mineral Resources Institute, MMRI No. 88-5F, \$5,000, with C. W. Bouchillon, July 1, 1987 - June 30, 1988.
- "Evaluation of an Electrostatic Separator on Lignite," Mississippi Mineral Resources Institute, MMRI No. 87-4F, \$5,000, with C. W. Bouchillon, July 1, 1986 - June 30, 1987.
- "Processes for Improving Lignite as a Fuel," Mississippi Mineral Resources Institute, MMRI No. 86-4F, \$15,300, with C. W. Bouchillon, July 1, 1985 - June 30, 1986.
- "Ultrafine Grinding of Low-Rank Coals," U.S. Department of Energy, Morgantown Energy Technology Center, Contract No. DE-AC21-84FC10622, \$260,743, with C. W. Bouchillon, Aug. 1984 - Aug. 1987.
- "Processes for Improving Lignite as a Fuel," Mississippi Mineral Resources Institute, MMRI No. 85-2S, \$16,000, with C. W. Bouchillon, July 1, 1984 - June 30, 1985.
- "Beneficiation and Drying of Mississippi Lignite," Mississippi Department of Energy and Transportation, METB No. 83-250-255, \$94,766, with C. W. Bouchillon, Aug. 16, 1983 - Aug. 15, 1984.
- "Lignite Beneficiation and Drying," Mississippi Mineral Resources Institute, MMRI No. 84-3S, \$18,000, with C. W. Bouchillon, July 1, 1983 - June 30, 1984.
- "Beneficiation and Drying of Mississippi Lignite," Mississippi Department of Energy and Transportation, Mississippi Power and Light Co., and Ergon, Inc., MERC No. 83-2-056, Modification 3, \$47,272, with C. W. Bouchillon, Jan. 1, 1983 - Aug. 15, 1983.
- "Extension of a Research Program on the Utilization of Mississippi Lignite," Mississippi Department of Energy and Transportation, MERC No. 83-2-056, Modification 1, \$2,500, with C. W. Bouchillon, Oct. 15, 1982 - May 15, 1983.
- "Evaluation of Fluid-Energy Pulverization of Mississippi Lignite," Mississippi Mineral Resources Institute, MMRI No. 83-10S, \$11,450, with C. W. Bouchillon, July 1, 1982 - June 30, 1983.
- "A Research Program on the Utilization of Mississippi Lignite," Mississippi Department of Energy and Transportation, METB No. 82-91-117, \$20,000, with C. W. Bouchillon, May 16, 1982 - Aug. 15, 1982.

Associate Investigator

- "Testing and Evaluation of Heat Recovery/Seed Recovery," U.S. Department of Energy, Contract No. DE-AC02-80ET-15601, Mar. 1980 - Aug. 1981. (Responsible for analytical modeling and test section design.)
- "Heat Recovery and Seed Recovery Development Project," Subcontractor to Babcock and Wilcox Co., Prime U.S. Department of Energy Contract No. DE-AC-2-79CH10018, Sept. 1979 - Mar. 1981.
- "Testing and Evaluation of MHD Materials and Substructures," U.S. Department of Energy, Contract No. EX-76-C-01-2246, June 1979 - Feb. 1980. (Responsible for analytical modeling and test section design.)

PUBLICATIONS

Books and Book Chapters

- Steele, W. G. and Coleman, H. W., "Experimental Uncertainty Analysis," in Chapter 19, "Mathematics," *CRC Handbook of Mechanical Engineering*, Second Edition, CRC Press, Boca Raton, FL, 2005, pp. 19-113 - 19-128.
- Ames, W. F., Cain, G., Tong, Y. L., Steele, W. G., Coleman, H. W., Kautz, R. L., Frangopol, D. M., and Norton, P., *Mathematics for Mechanical Engineers*, CRC Press, Boca Raton, FL, 2000.
- Coleman, H. W. and Steele, W. G., *Experimentation and Uncertainty Analysis for Engineers*, Second Edition, John Wiley & Sons, Inc., New York, NY, 1999. (661 citations, scholar.google.com, "uncertainty analysis") (Third Edition in press for publication in 2009)
- Coleman, H. W. and Steele, W. G., "Uncertainty Analysis," Chapter 39, *CRC Handbook of Fluid Dynamics*, CRC Press, Boca Raton, FL, 1998.

Journal Articles

- Solanki, K. N., Acar, E., Rais-Rohani, M., Horstemeyer, M. F., and Steele, W. G., "Product Design Optimization with Microstructure-Property Modeling and Associated Uncertainties," *International Journal of Design Engineering*, Vol. 2, No. 1, pp.
- Steele, W. G. and Schneider, J. A., "Undergraduate Laboratory Experiences Using Uncertainty Analysis to Validate Engineering Models with Experimental Data," *International Journal of Engineering Education*, Vol. 23, No. 2, 2007, pp. 387-393.
- Mago, P. J., Chamra, L. M., and Steele, W. G., "A Simulation Model for the Performance of a Hybrid Liquid Desiccant System During Cooling and Dehumidification," *International Journal of Energy Research*, Vol. 30, 2006, pp. 51-66.
- Chamra, L. M., Steele, W. G., and Huynh, K., "The Uncertainty Associated with Thermal Comfort," *ASHRAE Transactions*, Vol. 109, Pt. 2, 2003, pp. 356-365.
- Hodge, B. K. and Steele, W. G., "A Survey of Computational Paradigms in Undergraduate Mechanical Engineering Education," *Journal of Engineering Education*, Vol. 91, No. 4, Oct. 2002, pp. 415-417.
- Jalalzadeh-Azar, A. A., Steele, W. G., and Hodge, B. K., "Performance Characteristics of a Commercially Available Gas-Fired Desiccant System," *ASHRAE Transactions*, Vol. 106, Pt.1, 2000, pp. 95-104.
- Brown, K. K., Coleman, H. W., and Steele, W. G., "A Methodology for Determining Experimental Uncertainties in Regressions," *Journal of Fluids Engineering*, Vol. 120, No. 3, Sept. 1998, pp. 445-456.
- Jalalzadeh-Azar, A. A., Hodge, B. K., and Steele, W. G., "Thermodynamic Assessment of Desiccant Systems with Targeted and Relaxed Humidity Control Schemes," *ASHRAE Transactions*, Vol. 104, Pt. 2, 1998, pp. 313-319.
- Adebisi, G. A., Nsofor, E. C., Steele, W. G., and Jalalzadeh-Azar, A. A., "Parametric Study on the Operating Efficiencies of a Packed Bed for High-Temperature Sensible Heat Storage," *Journal of Solar Energy Engineering*, Vol. 120, No. 1, Feb. 1998, pp. 2-13.
- Hosni, M. H., Coleman, H. W., and Steele, W. G., "Application of Mathcad® Software in Performing Uncertainty Analysis Calculations to Facilitate Laboratory Instruction," *Computers in Education Journal*, Vol. 7, No. 4, Oct. - Dec. 1997, pp. 1-9.
- Jalalzadeh-Azar, A. A., Steele, W. G., and Adebisi, G. A., "Performance Comparison of High-Temperature Packed Bed Operation with PCM and Sensible-Heat Pellets," *International Journal of Energy Research*, Vol. 21, 1997, pp. 1039-1052.
- Steele, W. G., Ferguson, R. A., Taylor, R. P., and Coleman, H. W., "Computer-Assisted Uncertainty Analysis," *Computer Applications in Engineering Education*, Vol. 5, No. 3, 1997, pp. 169-179.

- Steele, W. G., Maciejewski, P. K., James, C. A., Taylor, R. P., and Coleman, H. W., "Asymmetric Systematic Uncertainties in the Determination of Experimental Uncertainty," *AIAA Journal*, Vol. 34, No. 7, July 1996, pp. 1458-1463.
- Adebisi, G. A., Hodge, B. K., Steele, W. G., Jalalzadeh-Azar, A. A., and Nsofor, E. C., "Computer Simulation of a High Temperature Thermal Energy Storage System Employing Multiple Families of Phase-Change Storage Materials," *Journal of Energy Resources Technology*, Vol. 118, No. 2, June 1996, pp. 102-111.
- Brown, K. K., Coleman, H. W., Steele, W. G., and Taylor, R. P., "Evaluation of Correlated Bias Approximations in Experimental Uncertainty Analysis," *AIAA Journal*, Vol. 34, No. 5, May 1996, pp. 1013-1018.
- Jalalzadeh-Azar, A. A., Steele, W. G., and Adebisi, G. A., "Heat Transfer in a High Temperature Packed Bed Thermal Energy Storage System-Roles of Radiation and Intraparticle Conduction," *Journal of Energy Resources Technology*, Vol. 118, No. 1, Mar. 1996, pp. 50-57.
- Coleman, H. W., Steele, W. G., and Taylor, R. P., "Implications of Correlated Bias Uncertainties in Single and Comparative Tests," *Journal of Fluids Engineering*, Vol. 117, No. 4, Dec. 1995, pp. 552-556.
- Taylor, R. P., Steele, W. G., and Douglas, F., "Uncertainty Analysis of Rocket Motor Thrust Measurements with Correlated Biases," *ISA Transactions*, Vol. 34, 1995, pp. 253-259.
- Coleman, H. W. and Steele, W. G., "Engineering Application of Experimental Uncertainty Analysis," *AIAA Journal*, Vol. 33, No. 10, Oct. 1995, pp. 1888-1896.
- Taylor, R. P., Luck, R., Hodge, B. K., and Steele, W. G., "Uncertainty Analysis of Diffuse-Gray Radiation Enclosure Problems," *Journal of Thermophysics and Heat Transfer*, Vol. 9, No. 1, Jan.-Mar. 1995, pp. 63-69.
- Steele, W. G., Ferguson, R. A., Taylor, R. P., and Coleman, H. W., "Comparison of ANSI/ASME and ISO Models for Calculation of Uncertainty," *ISA Transactions*, Vol. 33, 1994, pp. 339-352.
- Chakraborty, W., Taylor, R. P., Steele, W. G., and Coleman, H. W., "Bias Error Reduction Using Ratios to Baseline Experiments - Heat Transfer Case Study," *Journal of Thermophysics and Heat Transfer*, Vol. 7, No. 4, Oct.-Dec. 1993, pp. 754-757.
- Steele, W. G., Taylor, R. P., Burrell, R. E., and Coleman, H. W., "Use of Previous Experience to Estimate Precision Uncertainty of Small Sample Experiments," *AIAA Journal*, Vol. 31, No. 10, Oct. 1993, pp. 1891-1896.
- Hodge, B. K. and Steele, W. G., "A Century of Evolution in a Mechanical Engineering Curriculum," *Mechanical Engineering News*, Vol. 30, No. 2, 1993, pp. 22-26.
- Taylor, R. P., Hodge, B. K., and Steele, W. G., "Series Piping System Design Program with Uncertainty Analysis," *Heating/Piping/Air Conditioning*, Vol. 65, No. 5, May 1993, pp. 87-93.
- Steele, W. G. and Bouchillon, C. W., "Experimental Determination of the Power Requirements for Ultrafine Grinding and Drying of Low-Rank Coals in a Fluid-Energy Mill," *Particulate Science and Technology*, Vol. 10, No. 3-4, 1992, pp. 171-182.
- Bouchillon, C. W. and Steele, W. G., "Electrostatic Separation of Ultrafinely Ground Low-Rank Coals," *Particulate Science and Technology*, Vol. 10, No. 1-2, 1992, pp. 73-89.
- Steele, W. G. and Coleman, H. W., "Integrating Uncertainty Analysis Concepts into Undergraduate Laboratory Courses," *International Journal of Engineering Education*, Vol. 8, No. 2, 1992, pp. 147-153.
- Hodge, B. K. and Steele, W. G., "A School District's Energy Management Program," *Heating/Piping/Air Conditioning*, Vol. 61, No. 9, Sept. 1988, pp. 109-113.
- Steele, W. G. and Hodge, B. K., "Using an Energy Index to Assess the Effectiveness and Potential of Energy Management Programs," *ASHRAE Transactions*, Vol. 93, Pt. 2, 1987, pp. 643-652.
- Hodge, B. K., Steele, W. G., and King, R., "A Simplified Energy Audit Technique for Generic Buildings," *ASHRAE Transactions*, Vol. 92, Pt. 2, 1986, pp. 121-132.
- Hodge, B. K. and Steele, W. G., "The Ten Commandments for Energy Conservation Programs," *ASHRAE Journal*, Vol. 26, No. 6, June 1984, pp. 49-50.

- Hodge, B. K. and Steele, W. G., "Energy Conservation Opportunities for Schools in Mild Climates," *Energy Engineering*, Vol. 79, No. 3, Apr./May 1982, pp. 16-36.

Technical Papers (* Peer Reviewed Paper)

- Steele, W. G. and Coleman, H. W., "Quantification of Uncertainties in Computational Mechanics Simulations Using Experimental Uncertainty Analysis Concepts," Paper 2836, 8th World Congress on Computational Mechanics and the 5th European Congress on Computational Mechanics in Applied Sciences and Engineering, Venice, Italy, June 30 - July 4, 2008.
- Coleman, H. W. and Steele, W.G., "An Overview of ASME V&V 20: Standard for Verification and Validation in Computational Fluid Dynamics and Heat Transfer," Paper 2822, 8th World Congress on Computational Mechanics and the 5th European Congress on Computational Mechanics in Applied Sciences and Engineering, Venice, Italy, June 30 - July 4, 2008.
- Steele, W. G., "Current Test Uncertainty Standards," Invited ASME Paper IMECE2007-44146, International Mechanical Engineering Congress and Exposition, Seattle, WA, Nov. 11-15, 2007.
- *Weathers, J. B., Marvel, B. T., Srinivasan, K. K., Mago, P. J., Chamra, L. M., and Steele, W. G., "Error Propagation in Heat Release Analysis of Pilot Ignited Natural Gas Combustion," ASME Paper IMECE2007-42144, International Mechanical Engineering Congress and Exposition, Seattle, WA, Nov. 11-15, 2007.
- Xue, Y. A., Solanki, K. S., Steele, W. G., Horstemeyer, M. F., and Newman, Jr., J. C., "Reliability of Mechanistic Multistage Fatigue Model for damage and Life Estimates," 9th AIAA Non-deterministic Approaches Conf., Honolulu, HI, Apr. 23-26, 2007.
- Steele, W. G., Molder, K. J., Hudson, S. T., Vadasy, K. V., Rieder, P. T., and Giel, T., "Uncertainty Evaluation of the Computational Model Used to Support the Integrated Powerhead Demonstrator Project," 53rd JANNAF Propulsion Meeting, Monterey, CA, Dec. 5-8, 2005.
- Steele, W. G. and Dieck, R. D., "Overview of the 2005 Update of PTC19.1 – Test Uncertainty," Invited ASME Paper IMECE2005-82929, International Mechanical Engineering Congress and Exposition, Orlando, FL, Nov. 5-11, 2005.
- *Steele, W. G. and Schneider, J. A., "Experiences in an Undergraduate Laboratory Using Uncertainty Analysis to Validate Engineering Models with Experimental Data," ASEE SE Section Annual Conference, Chattanooga, TN, April 3-5, 2005, and ASEE Annual Conference and Exposition, Portland, OR, June 12-15, 2005.
- Horstemeyer, M. F., Solanki, K., and Steele, W. G., "Uncertainty Methodologies to Characterize a Damage Evolution Model," Plasticity 2005, Kauai, HI, Jan. 3-8, 2005.
- *Steele, W. G. and Schneider, J. A., "Integrating Model Validation and Uncertainty Analysis into an Undergraduate Engineering Laboratory," ASME Paper IMECE 2004-61614, International Mechanical Engineering Congress and Exposition, Anaheim, CA, Nov. 14-19, 2004.
- Ragsdale, J. G., Jackson, J. R., Schneider, J. A., and Steele, W. G., "Resolving Experimental Damage by Use of Uncertainty Analysis," Materials Science and Technology Conference, New Orleans, LA, Sept. 26-29, 2004.
- Law, B. C., Hudson, S. T., Steele, W. G., Buzzell, J., and Hughes, M. S., "Parametric Uncertainty Analysis Study to Provide RBCC Testing Guidelines," AIAA Paper 2003-5234, 39th AIAA Joint Propulsion Conference, Huntsville, AL, July 20-23, 2003.
- *Chamra, L. M., Steele, W. G., and Huynh, K., "The Uncertainty Associated with Thermal Comfort," ASHRAE Paper 4665, ASHRAE Annual Meeting, Kansas City, MO, June 28 - July 2, 2003.
- Hudson, S. T., Schneider, J. A., and Steele, W. G., "Uncertainty Analysis for Undergraduate and Graduate Mississippi State University Mechanical Engineering Students," invited AIAA Paper 2003-0797, 41st AIAA Aerospace Sciences Meeting and Exhibit, Reno, NV, Jan. 6-9, 2003.
- Hudson, S. T., Steele, W. G., Ryan, H. M., Hughes, M. S., and Hammond, J. M., "Test Facility Uncertainty Analyses for RBCC Systems Testing," AIAA Paper 2002-3607, 38th AIAA Joint Propulsion Conference, Indianapolis, IN, July 7-10, 2002.

- *Blandford, R. S., Daniewicz, S. R., and Steele, W. G., "Application of Uncertainty Methodologies to Measured Fatigue Crack Growth Rates and Stress Intensity Factor Ranges," ASTM 33rd National Symposium on Fatigue and Fracture Mechanics, Moran, WY, June 25-29, 2001, and in *ASTM STP 1417*, 2002, pp. 445-457.
- *Hodge, B. K. and Steele, W. G., "Computational Paradigms in Undergraduate Mechanical Engineering Education," ASEE Annual Conference, Albuquerque, NM, June 24-27, 2001, and ASEE Southeastern Regional Conference, Charleston, SC, April 1-3, 2001.
- Steele, W. G. and Coleman, H. W., "Modern Applications of Experimental Uncertainty Analysis," invited tutorial for ASME Fluids Engineering Division Summer Meeting, New Orleans, LA, May 29-June 1, 2001.
- Steele, W. G., Wort, G. N., Meecham, P. C., Bridwell, G., McQuay, G., and Swann, B., "Measurement Uncertainty Applied to Cost Effective Testing," SAE Paper 2000-01-5607, World Aviation Congress and Exposition, San Diego, CA, Oct. 10-12, 2000.
- *Jalalzadeh-Azar, A. A., Steele, W. G., and Hodge, B. K., "Performance Characteristics of a Commercially Available Gas-Fired Desiccant System," ASHRAE Paper 4326, ASHRAE Winter Meeting, Dallas, TX, Feb. 5-9, 2000.
- Steele, W. G. and Coleman, H. W., "Recent Developments and Current Status in Experimental Uncertainty Analysis," invited Fluids Engineering Division Lecture, International Mechanical Engineering Congress and Exposition, Nashville, TN, Nov. 14-19, 1999.
- *Luck, R., Steele, W. G., and Wheeler, M. C., "Uncertainty Weighted Corrections of Flows Subject to Continuity Constraints," 45th International Instrumentation Symposium, Albuquerque, NM, May 2-6, 1999.
- *Hodge, B. K., Steele, W. G., and Emplainscourt, M. C., "Learning Styles Distributions in Mechanical Engineering at Mississippi State University," ASEE Southeastern Regional Conference, Clemson, SC, April 11-13, 1999.
- Jalalzadeh-Azar, A. A., Cook, K., Steele, W. G., and Hodge, B. K., "Experimental Facility for Gas-Fired Desiccant Systems: Capabilities and Performance Analyses," Paper RCP-53, 1998 International Gas Research Conference, San Diego, CA, Nov. 8-11, 1998.
- *Stevens, J. W., Hodge, B. K., Steele, W. G., and Jalalzadeh-Azar, A., "Experience Incorporating Desiccant Dehumidification into an Existing HVAC Course," ASEE Annual Conference, Seattle, WA, June 28 - July 1, 1998.
- *Jalalzadeh-Azar, A. A., Hodge, B. K., and Steele, W. G., "Thermodynamic Assessment of Desiccant Systems with Targeted and Relaxed Humidity Control Schemes - Alternatives and Case Studies," ASHRAE Paper 4210, ASHRAE Annual Meeting, Toronto, Canada, June 20-24, 1998.
- Steele, W.G. and Coleman, H. W., "Engineering Applications of Uncertainty Analysis," invited tutorial for ASME Fluids Engineering Division Summer Meeting, Vancouver, BC, June 22-27, 1997.
- *Brown, K. K., Coleman, H. W., and Steele, W. G., "A Methodology for Determining Experimental Uncertainties in Regressions," International Mechanical Engineering Congress and Exposition, Atlanta, GA, Nov. 17-22, 1996, and in *Proceedings of the ASME Fluids Engineering Division*, Vol. 242, 1996, pp. 263-273.
- *Jalalzadeh-Azar, A. A., Steele, W. G., and Hodge, B. K., "Design of a Test Facility for Gas-Fired Desiccant Dehumidifiers," International Joint Power Generation Conference and Exposition, Houston, TX, Oct. 14-16, 1996.
- *Hosni, M. H., Coleman, H. W., and Steele, W. G., "Application of Mathcad Software in Performing Uncertainty Analysis Calculations to Facilitate Laboratory Instruction," ASEE Annual Conference, Washington, DC, June 23-26, 1996.
- *Coleman, H. W. and Steele, W. G., "Implementing New Uncertainty Guidelines and Standards in Turbine Testing and Modeling," ASME Paper 96-GT-82, International Gas Turbine and Aeroengine Congress and Exhibition, Birmingham, U.K., June 10-13, 1996.
- *Hodge, B. K. and Steele, W. G., "Career Patterns of Mississippi State ME Graduates," ASEE Southeastern Regional Conference, Gatlinburg, TN, Apr. 14-16, 1996.

- *Jalalzadeh-Azar, A. A., Steele, W. G., and Adebisi, G. A., "Performance Comparison of High-Temperature Packed Bed Operation with PCM and Sensible-Heat Pellets," ASME Paper 95-WA/HT-10, International Mechanical Engineering Congress and Exposition, San Francisco, CA, Nov. 12-17, 1995.
- Steele, W. G., "Overview of Revised ANSI/ASME Standard on Measurement Uncertainty--PTC 19.1," invited speaker and panel member for Uncertainty Measurements in Testing, International Joint Power Generation Conference and Exposition, Minneapolis, MN, Oct. 9-11, 1995.
- *Hodge, B. K. and Steele, W. G., "Experiences with a Curriculum with Balanced Design Content in all Stems," ASEE Annual Conference, Anaheim, CA, June 23-25, 1995, and ASEE Southeastern Regional Conference, Biloxi, MS, April 9-11, 1995.
- *Taylor, R. P., Steele, W. G., and Douglas, F., "Uncertainty Analysis of Rocket Motor Thrust Measurements with Correlated Biases," 41st ISA International Instrumentation Symposium, Denver, CO, Apr. 30-May 4, 1995.
- *Jalalzadeh-Azar, A. A., Steele, W. G., and Adebisi, G. A., "Heat Transfer in a High Temperature Packed Bed Thermal Energy Storage System--Roles of Radiation and Intraparticle Conduction," 4th ASME/JSME Thermal Engineering Joint Conference, Maui, HI, Mar. 19-24, 1995.
- Brown, K. K., Coleman, H. W., and Steele, W. G., "Estimating Uncertainty Intervals for Linear Regression," AIAA Paper 95-0796, AIAA 33rd Aerospace Sciences Meeting, Reno, NV, Jan. 9-12, 1995.
- *Steele, W. G., Ferguson, R. A., Taylor, R. P., and Coleman, H. W., "Example of Computer-Assisted Uncertainty Analysis," International Mechanical Engineering Congress and Exposition, Chicago, IL, Nov. 6-11, 1994, and in *Developments in Electrorheological Flows and Uncertainty Analysis*, ASME, Fluids Engineering Division, Vol. 205, 1994, pp. 173-179.
- Steele, W. G., "Implications of Correlated Bias Uncertainties in Single and Comparative Tests," invited speaker and panel member for Current Developments in Uncertainty Analysis, International Mechanical Engineering Congress and Exposition, Chicago, IL, Nov. 6-11, 1994, and Recent Developments in Measurement Uncertainty, 18th AIAA Ground Testing Conference, Colorado Springs, CO, June 20-23, 1994.
- Steele, W. G., Maciejewski, P. K., James, C. A., Taylor, R. P., and Coleman, H. W., "Considering Asymmetric Systematic Uncertainties in the Determination of Experimental Uncertainty," invited AIAA Paper 94-2585, 18th AIAA Aerospace Ground Testing Conference, Colorado Springs, CO, June 20-23, 1994.
- *Steele, W. G., Ferguson, R. A., Taylor, R. P., and Coleman, H. W., "Comparison of ANSI/ASME and ISO Models for Calculation of Uncertainty," ISA Paper 94-1014, 40th ISA International Instrumentation Symposium, Baltimore, MD, May 1-5, 1994 (chosen for Dr. Robert B. Abernathy Measurement Uncertainty Paper Award).
- Taylor, R. P., Luck, R., Hodge, B. K., and Steele, W. G., "Uncertainty Analysis of Diffuse-Gray Radiation Enclosure Problems," AIAA Paper 94-0132, AIAA 32nd Aerospace Sciences Meeting, Reno, NV, Jan. 10-13, 1994.
- Brown, K. K., Coleman, H. W., Steele, W. G., and Taylor, R. P., "Evaluation of Correlated Bias Approximations in Experimental Uncertainty Analysis," AIAA Paper 94-0772, AIAA 32nd Aerospace Sciences Meeting, Reno, NV, Jan. 10-13, 1994.
- *Adebisi, G. A., Nsofor, E. C., Steele, W. G., and Jalalzadeh-Azar, A. A., "Parametric Study of the Operating Efficiencies of a Packed Bed for High-Temperature Sensible Heat Storage," ASME Winter Annual Meeting, New Orleans, LA, Nov. 28-Dec. 3, 1993, in *Thermodynamics and the Design, Analysis and Improvement of Energy Systems*, ASME, Heat Transfer Division, Vol. 266, 1993, pp. 59-71.
- Taylor, R. P., Hodge, B. K., and Steele, W. G., "Uncertainty Analysis in Piping Network Analysis and Design--Pump Selection Case Studies," AIChE Annual Meeting, St. Louis, MO, Nov. 7-12, 1993.
- Taylor, R. P., Luck, R., Hodge, B. K., and Steele, W. G., "Uncertainty Analysis of Diffuse-Gray Radiation Enclosure Problems--A Hypersensitive Case Study," Fifth Annual Thermal and Fluids Analysis Workshop, Cleveland, OH, Aug. 16-20, 1993.
- *Hodge, B. K. and Steele, W. G., "A Century of Evolution in a Mechanical Engineering Curriculum," ASEE Annual Conference, Urbana/Champaign, IL, June 20-24, 1993 (chosen best paper in session), and ASEE Southeastern Regional Conference, Nashville, TN, Apr. 4-6, 1993.

- *Steele, W. G., Taylor, R. P., and Coleman, H. W., "The Determination of Precision Uncertainty for Small Sample Experiments," ISA Paper 93-118, 39th ISA International Instrumentation Symposium, Albuquerque, NM, May 2-6, 1993.
- Hodge, B. K., Taylor, R. P., Jones, E. W., and Steele, W. G., "Experiences with a Video-Taped Off-Campus Mechanical Engineering Graduate Program," ASEE Southeastern Regional Conference, Nashville, TN, Apr. 4-6, 1993.
- Steele, W. G. and Hodge, B. K., "A Curriculum with Balanced Design Content in All Stems," in *Innovations in Engineering Design Education*, a resource guide for the ASME Engineering Design Education Conference, Orlando, FL, Mar. 24-26, 1993, pp. 161-164.
- Chakrour, W., Taylor, R. P., Steele, W. G., and Coleman, H. W., "Bias Error Reduction in Experimental Results by Presentation as a Ratio to a Baseline Experiment--A Heat Transfer Case Study," AIAA Paper 93-0922, AIAA 31st Aerospace Sciences Meeting, Reno, NV, Jan. 11-14, 1993.
- *Adebiyi, G. A., Hodge, B. K., Steele, W. G., Jalalzadeh, A. A., and Nsofor, E. C., "Computer Simulation of a High Temperature Thermal Energy Storage System Employing Multiple Families of Phase-Change Storage Materials," ASME Winter Annual Meeting, Anaheim, CA, Nov. 8-13, 1992, and in *Thermodynamics and the Design, Analysis, and Improvement of Energy Systems*, ASME, Advanced Energy Systems Division, Vol. 27, 1992, pp. 1-11.
- Steele, W. G., Taylor, R. P., Burrell, R. E., and Coleman, H. W., "The Use of Data from Previous Experience to Estimate the Precision Uncertainty of Small Sample Experiments," AIAA Paper 92-3954, 17th AIAA Aerospace Ground Testing Conference, Nashville, TN, July 6-8, 1992.
- *Steele, W. G. and Coleman, H. W., "Accounting for Correlated Bias Error Effects in Thermal Sciences Experimentation," 3rd ASME-JSME Thermal Engineering Joint Conference, Reno, NV, Mar. 17-22, 1991.
- Bouchillon, C. W. and Steele, W. G., "Electrostatic Separation of Ash-Rich Particles in Ultrafinely Ground Low-Rank Coal," 21st Annual Meeting of the Fine Particle Society, San Diego, CA, Aug. 21-25, 1990.
- Steele, W. G. and Coleman, H. W., "Using Uncertainty Analysis in Experimentation," invited speakers and panel members for Symposium on Experimental Uncertainty in Fluid Measurements, ASME Winter Annual Meeting, San Francisco, CA, Dec. 10-15, 1989.
- Coleman, H. W., Steele, W. G., and Chenevert, D. J., "Uncertainty Analysis of Dopant Concentration in a Plume Diagnostics Test Facility," First Annual Conference on Health Monitoring for Space Propulsion Systems, Cincinnati, OH, Nov. 14-15, 1989.
- *Bouchillon, C. W., Steele, W. G., and Burnett, J. D., "Power Requirements for Ultrafine Grinding and Drying of Low-Rank Coals in a Fluid-Energy Mill," International Symposium on Advances in Fine Particle Processing, Boston, MA, Aug. 22-25, 1989, and in *Advances in Fine Particle Processing*, Elsevier Scientific Publishing Co., New York, NY, 1990, pp. 19-30.
- Bouchillon, C. W. and Steele, W. G., "Evaluation of Ultrafine Grinding and Drying of Low-Rank Coals in a Fluid-Energy Mill," Fifteenth Biennial Low-Rank Fuels Symposium, St. Paul, MN, May 22-25, 1989.
- Steele, W. G. and Coleman, H. W., "Integrating Uncertainty Analysis Concepts into Undergraduate Laboratory Courses," ASEE Southeastern Section Annual Meeting, Tuscaloosa, AL, Apr. 2-4, 1989.
- *Steele, W. G. and Coleman, H. W., "Use of Uncertainty Analysis in the Planning and Design of an Experiment," ASME Winter Annual Meeting, Boston, MA, Dec. 13-18, 1987, and in *Experimental Uncertainty in Fluid Mechanics*, ASME, Fluids Engineering Division, Vol. 58, 1987, pp. 63-67.
- *Coleman, H. W. and Steele, W. G., "Some Considerations in the Propagation of Bias and Precision Errors into an Experimental Result," ASME Winter Annual Meeting, Boston, MA, Dec. 13-18, 1987, and in *Experimental Uncertainty in Fluid Mechanics*, ASME, Fluids Engineering Division, Vol. 58, 1987, pp. 57-62.
- *Steele, W. G. and Hodge, B. K., "Using an Energy Index to Assess the Effectiveness and Potential of Energy Management Programs," ASHRAE Paper 3092, ASHRAE Annual Meeting, Nashville, TN, June 28 - July 1, 1987.
- Steele, W. G. and Bouchillon, C. W., "Combined Ultrafine Grinding and Drying of a Low Rank Coal," Fourteenth Biennial Lignite Symposium on Technology and Utilization of Low-Rank Coals, Dallas, TX, May 18-21, 1987.

- *Hodge, B. K., Steele, W. G., and King, R., "A Simplified Energy Audit Technique for Generic Buildings," ASHRAE Paper 2983, ASHRAE Annual Meeting, Portland, OR, June 22-25, 1986, and in *Energy Use in Commercial Buildings: Measurements and Models*, ASHRAE Technical Data Bulletin, Vol. 2, 1986, pp. 86-97.
- Hodge, B. K. and Steele, W. G., "Energy Engineering in the 21st Century," ASEE 83rd Annual Conference, Atlanta, GA, June 16-20, 1985.
- Steele, W. G., Bouchillon, C. W., and Ross, R. B., "Beneficiation Processes for Ultrafinely Ground Low Rank Coals," Thirteenth Biennial Lignite Symposium on Technology and Use of Low-Rank Coals, Bismarck, ND, May 21-23, 1985.
- Hodge, B. K., Steele, W. G., and Walker, R. D., "How to Use Generic Building Concepts to Streamline Energy Audits," Sixth World Energy Engineering Congress, Atlanta, GA, Nov. 29 - Dec. 2, 1983.
- Bouchillon, C. W., Steele, W. G., Clippard, J. A., and Burnett, J. D., "Evaluation of the Micropulverization, Drying and Beneficiation of Lignite," 6th International Coal and Lignite Utilization Exhibition and Conference, Houston, TX, Nov. 15-17, 1983.
- Steele, W. G., Bouchillon, C. W., Clippard, J. A., and Hartness, J. L., "Evaluation of the Micropulverization of Mississippi Lignite," Twelfth Biennial International Meeting on Technology and Utilization of Low-Rank Coals, Grand Forks, ND, May 18-19, 1983.
- Hodge, B. K. and Steele, W. G., "The Use of the Energy Utilization Index in Energy Surveys for Generic Buildings," Fifth World Energy Engineering Congress, Atlanta, GA, Sept. 14-17, 1982.
- Sriram, V. and Steele, W. G., "Temperature Distribution and Nitrous Oxide Formation in the Non-Adiabatic Combustion of Fuel Oil," AIAA Paper 82-0882, AIAA/ASME Joint Fluids, Plasma, Thermophysics and Heat Transfer Conferences, St. Louis, MO, June 7-11, 1982.
- *Arun Kumar, R., Powe, R. E., and Steele, W. G., "Thermal Performance Analysis of an MHD Simulation Test Facility," ASME Paper 80-WA/HT-13, ASME Winter Annual Meeting, Chicago, IL, Nov. 16-21, 1980.

PROFESSIONAL ACTIVITIES

Accreditation Board for Engineering and Technology

- Mechanical Engineering Program Evaluator (1988-1995)

American National Standards Institute

- USA Technical Advisory Group (TAG) for International Organization for Standardization (ISO) TAG 4-Metrology (1991-1993)

American Society for Engineering Education

- *Mechanical Engineering News* (Departmental News Editor 1983-1987)

American Society of Mechanical Engineers

- Performance Test Codes Standards Committee (1994-Present, Chair Technical Sessions Committee 1996-1997)
- Performance Test Code Committee PTC 19.1 on Test Uncertainty (1991-Present, Vice-Chair 1995-Present)
- Performance Test Code Committee PTC 61 on Verification and Validation in Computational Fluid Dynamics and Heat Transfer (2003-Present, Committee Founder with H. W. Coleman)
- Mechanical Engineering Department Heads Committee (1990-Present, Vice Chair Region XI 1994-1995)
- Mississippi Liaison Coordinator for Region XI (1992-1994)
- Northeast Mississippi Group (1986-Present, Board Member 1986-1989, 1999-Present)
- Mississippi Section (1979-Present, Chair Technical Activities Committee 1979-1980, Treasurer 1983-1984, Secretary 1984-1985)

- MS State Univ. Student Section (Faculty Advisor 1983-1984)

International Organization for Standardization (ISO)

- Working Group for Committee ISO/TC 30/SC 9 - General Topics (Measurement Uncertainty) (1996-Present)

Society of Automotive Engineers-Aerospace

- In-Flight Propulsion Measurement Committee E-33C on Measurement Uncertainty (1996-Present, Chair 1998-2005, Vice-Chair 2005-Present)

University Committees

- Phi Kappa Phi (Vice President 2002-2003, President 2003-2004)
- Institutional Self-Study for SACS Reaffirmation of Accreditation (Chair Committee on Principles and Philosophy of Accreditation, 2001-2003)
- Institutional Information Management Special Committee (2001)
- Search Committee for Vice President for Research (Chair 1997-1998)
- Academic Department Heads Executive Committee (1992-1995)
- Search Committee for Aerospace Engineering Dept. Head (Chair 1991-1992)
- Dow/Weyerhaeuser Minority Scholars Committee (Chair 1990-1994)
- University Research Council (1990)
- University Council for Undergraduate Studies (1988-1990)
- University Task Force to Enhance Undergraduate Education (1987-1988)
- University Faculty Council (1986-1991, Chair Univ. Resources Comm. 1991)
- Eng. College Faculty Council (1982-1983, 1987-1989, Vice-Chair 1988, Chair 1989)
- Mech. & Nuc. Eng. Dept. Graduate Coordinator (1981-1990)
- Mech. & Nuc. Eng. Dept. Undergraduate Coordinator (1985-1990)
- Mech. & Nuc. Eng. Dept. Graduate Comm. (1981-1990, Chair 1981-1984)
- Mech. & Nuc. Eng. Dept. Undergraduate Committee (Chair 1984-1990)
- Mech. & Nuc. Eng. Dept. Nuclear Engineering Committee (1987-1990)

COURSES TAUGHT

Undergraduate

- Heat Transfer
- Measurement Systems
- Experimental Techniques I
- Experimental Techniques II
- Computer Aided Design
- Air Conditioning

Graduate

- Experimental Procedures
- Radiative Heat Transfer

Short Course on Experimentation and Uncertainty Analysis presented (with H. W. Coleman) for

- American Institute of Aeronautics and Astronautics, Colorado Springs, CO, June 18-19, 1994, San Diego, CA, July 8-9, 1995, Los Angeles, CA, Feb. 7-8, 2008, Orlando, FL, Jan. 3-4, 2009
- Boeing Space Systems, Huntsville, AL, July 30-31, 1990, Houston, TX, Aug. 18-19, 2003; Boeing Commercial Airplane Group, Seattle, WA, Aug. 16-17, 1993, Jan. 24-27, 1994, Aug. 6-9, 1996, Dec. 4-5, 2000; Boeing Rocketdyne, Canoga Park, CA, May 4-5, 2000, May 7-8, 2001, Sept. 9-10, 2002
- Embraer, Sao Jose dos Campos, Brazil, Aug. 15-16, 2000
- General Electric Aircraft Engines, Cincinnati, OH, Nov. 8-9, 1999
- Maritime Research Institute Netherlands, MARIN, Wageningen, The Netherlands, June 23-25, 2008
- NASA Ames Research Center, San Jose, CA, Sept. 22-23, 1994, Feb. 2-5, 1998
- NASA Dryden Flight Research Center, Edwards AFB, CA, June 8-11, 1998, May 10-11, 2001
- NASA Glenn Research Center, Cleveland, OH, July 24-25, 1995, Sept. 25-26, 1995, Mar. 10-11, 1997
- NASA Johnson Space Center, Aug. 18-19, 2003
- NASA Kennedy Space Center, Aug. 4-5, 2003; Nov. 1-2, 2004
- NASA Langley Research Center, Hampton, VA, Sept. 13-14, 1993, June 7-10, 1994, Aug. 16-19, 1994, Oct. 17-20, 1994, Dec. 12-15, 1994, Oct. 30-31, 1995, Oct. 2-3, 2003, Oct. 22-23, 2007, Mar. 19-20, 2008
- NASA Marshall Space Flight Center, Huntsville, AL, Mar. 16-17, 1992, Oct. 15-16, 1992, Feb. 7-8, 1994, Jan. 27-28, 2003, June 19-20, 2007
- NASA Stennis Space Center, Mar. 17-18, 2003
- National Aerospace Laboratory, NLR, Marknesse, The Netherlands, June 19-19, 2008
- National Research Council - Canada, Ottawa, Ontario, May 29-June 1, 1995, St. John's Newfoundland, March 26-27, 2001
- Pennsylvania State University Applied Research Lab, State College, PA, Nov. 4-5, 1991
- Public Offerings, Seattle, WA, Sept. 19-22, 2000; Newport News, VA, June 19-20, 2001
- Sandia National Laboratory, Albuquerque, NM, Nov. 28-29, 2001
- University of Alabama at Huntsville, Huntsville, AL, Mar. 12-13, 1990
- U.S. Army Engineer Waterways Experiment Station, Vicksburg, MS, Dec. 18-21, 1989, July 9-10, 1990, Dec. 10-11, 1990, Aug. 26-27, 1991, Apr. 19-20, 1993
- U.S. Army Missile Command, Huntsville, AL, June 13-16, 1989
- U.S. Naval Surface Warfare Center, Annapolis, MD and Carderock, MD, Oct. 16-19, 1989, Feb. 12-15, 1990, May 21-24, 1990; Memphis, TN, Sept. 29-30, 1994; Carderock, MD, Oct. 1-4, 1990, Nov. 5-6, 1990, June 17-18, 1991, Oct. 23-25, 1991, Nov. 18-19, 1991, Dec. 9-10, 1991, Dec. 14-15, 1992, Dec. 8-9, 1993, Oct. 21-22, 1996, July 14-15, 1997, June 28-29, 1999, Aug. 9-10, 1999, Apr. 11-12, 2000, Sept. 27-28, 2000, Jan. 29-30, 2002, Sept. 15-16, 2003, Dec. 13-14, 2005, Feb. 25-26, 2008
- U.S. Navy Coastal Systems Station, Panama City, FL, May 17-18, 1994

HONORS AND AWARDS

- Southern Growth Policies Board 2009 Innovator Award, 2009
- Bobby Shackouls Professorship, 2005
- Ground Testing Award, AIAA Ground Testing Conference, 2004, Portland, OR
- Career Achievement Award, Bagley College of Engineering, 2004
- Fellow, ASME, 1998
- Outstanding Faculty Honoree for Mississippi State University for the Higher Education Appreciation Day, Working for Academic Excellence (HEADWAE) sponsored by the Mississippi Legislature, 1998

- Outstanding Research Paper Award, MSU College of Engineering, 1997
- William L. Giles Distinguished Professor, Mississippi State University, 1997
- Associate Fellow, AIAA, 1996
- Outstanding Faculty Member Award, MSU Chapter Pi Tau Sigma, 1996
- Dr. Robert B. Abernathy Measurement Uncertainty Paper Award, 41st International Instrumentation Symposium, 1995, Denver, CO
- Best Paper in Session Award, Trends in Mechanical Engineering Session, ASEE Annual Conference, 1993, Urbana/Champaign, IL

MILITARY SERVICE

U.S. Army ROTC, Mississippi State University (1964-1968)

- Distinguished Military Student (1968)
- Distinguished Military Graduate (1968)

U.S. Army Reserve Control Group (1968-1976)

- Captain, Ordnance
- Ordnance Officer Training Program (1973)

PERSONAL DATA

Born March 19, 1946, Biloxi, MS

Married, three children

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