

Timothy P. McDowell

Thermal Energy System Specialists, LLC

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Education

University of Wisconsin-Madison, Madison, Wisconsin

MSME December, 1993

Thesis title: “Investigation of Ammonia and Equipment Configurations for Supermarket Applications.”

Rice University, Houston, Texas

BSME May, 1992

Employment

Thermal Energy System Specialists, LLC, Madison, Wisconsin and Lafayette, Colorado

Vice President, January 2004 - present

- Software Development
- Thermal system simulation and analysis.
- Monitoring data analysis.
- Project management.
- Founded Colorado office in 2016

Thermal Energy System Specialists, Madison, Wisconsin

Partner, October 1995 – December 2005

- Thermal system simulation and analysis
- Monitoring data analysis
- Software development
- Project management

STAN and Associates, Inc., Dayton, Ohio

Mechanical Designer, January 1995 - October 1995

- Assisted in energy studies and analyses of schools and hospitals.
- System design including HVAC systems and boiler installations.
- Cost estimating and specification review.
- Control system commissioning.
- Wrote spreadsheet based hospital energy utilization analysis program.
- Performed field work in schools, hospitals, and boiler houses.

Thermal Storage Applications Research Center, University of Wisconsin-Madison

Research Intern, September 1994 - December 1994

- Wrote simulation program of supermarket HVAC&R system to evaluate different system types, alternatives, and components.

Solar Energy Lab, University of Wisconsin-Madison

Research Assistant, June 1992-August 1994

- Assisted in computer simulation of supermarket refrigeration systems.
- Attended seminars in research areas including alternative refrigerants, demand side management, absorption cooling, thermal storage and solar energy.
- Wrote hypertext based World Wide Web (Internet) site introducing mechanical engineering department and faculty.

State of Texas, Energy Intern Program

Internship at Texas Southern University, Houston, Texas, May - August 1991

- Internship dealt with energy management on the campus with a larger goal of reducing the consumption of energy throughout Texas institutions.
- Work responsibilities included research into possible projects and development of the projects, including life cycle savings calculations.

Computer Experience EES, TRNSYS and DesignBuilder simulation programs.
FORTRAN, C++, Visual Basic and Python programming.

Honors Elected Tau Beta Pi, 1992
ASHRAE Distinguished Service Award, 2016
IBPSA-USA Outstanding Service Award, 2020

Professional Societies Member of ASHRAE, TC 6.9 Thermal Storage 2000-2003, TC 4.7 Energy Calculation 2003-2006, 2010-2012, Secretary 2009-2010, Vice Chair 2010-2011, Chair 2011-2012; SSPC 140 Method of Test for Evaluating Building Performance Simulation Software 2005-present, Chair 2023-present, SSPC 205 Representation of Performance Data for HVAC&R and Other Facility Equipment 2014-present, SPC 232P Common Content and Specifications for Building Data Schemas 2022-present, Chair 2022-present. Member of IBPSA, Board of Directors IBPSA-USA chapter 2005-2013, 2019-present, Secretary 2010-2013, 2021-2022, Vice President 2023-present, co-chair Technical Committee SimBuild 2006, chair SimBuild 2012

Publications Publication list available on request

Publications

- McDowell, T., J. Mitchell, and S. Klein, *Investigation of Ammonia and Equipment Configurations for Supermarket Refrigeration Applications*, EPA publication # 600/R-95-028, February 1995
- McDowell, T., J. Mitchell, and S. Klein, *Investigation of Ammonia-Secondary Fluid Systems in Supermarket Refrigeration Systems*, ASHRAE Transactions 1994, Vol. 101, part 2.
- Thornton, J., McDowell, T., and Hughes, P., *Comparison of Practical Vertical Ground Heat Exchanger Sizing Methods to a Fort Polk Data/Model Benchmark*, ASHRAE Transaction, Vol. 103, Part 2, Boston 1997.
- Thornton, J., McDowell, T., Hughes, P., Shonder, J., and Pahud, D., Hellstrom, G., *Residential Vertical Geothermal Heat Pump System Models: Calibration to Data*, ASHRAE Transactions summer 1997.
- McDowell, T., S. Emmerich, J. Thornton, and G. Walton, *Integration of Airflow and Energy Simulation using CONTAM and TRNSYS*, 2003.ASHRAE Transactions, Vol. 109, No. 1
- McDowell, T., D. Bradley, J. Thornton, and M. Kummert, *Converging on a Recommended Set of Interpretations and Assumptions in Applying Standard Tests to Energy Analysis Tools*, IBPSA-USA SimBuild 2004.
- McDowell, T., D. Bradley, J. Thornton, and M. Kummert, *Simulation Synergy: Expanding TRNSYS Capabilities*, IBPSA-USA SimBuild 2004.
- Emmerich, S., T. McDowell, and W. Anis, *Investigation of the Impact of Commercial Building Envelope Airtightness on HVAC Energy Use*, NISTIR 7238, June 2005
- McDowell, T., and S. Emmerich, *Initial Evaluation of Displacement Ventilation and Dedicated Outdoor Air Systems for U.S. Commercial Buildings*, NISTIR 7244, July 2005.
- McDowell, T., and S. Emmerich, *Analysis of Dedicated Outdoor Air Systems for Different Climates*, IBPSA Building Simulation 2005.
- Emmerich, S.J., McDowell, T.P., and W. Anis, *Simulation of the Impact of Commercial Building Envelope Airtightness on Building Energy Utilization*, ASHRAE Transactions Vol 113, pt. 2, 2007.
- McDowell, T.P. and J. W. Thornton, *Simulation and Model Calibration of a Large-Scale Solar Seasonal Storage System*, IBPSA-USA SimBuild 2008.
- Hendron, R., G. Barker, E. Hancock, and T. McDowell. "Evaluation of a High Performance Multi-Family Residential Building in Aspen, Colorado." Proceedings of the ASME 3rd International Conference on Energy Sustainability--2009.
- Hendron, R., E. Hancock, G. Barker, and T. McDowell. "Evaluation of a High-Performance Multifamily Residential Building in Aspen, Colorado. Paper No. 2009-90304", Proceedings of the ASME 3rd International Conference on Energy Sustainability—2009.
- McDowell, T.P., J.W. Thornton, and M. Duffy, *Comparison of a Ground-coupling Reference Standard Model to Simplified Approaches*, IBPSA Building Simulation 2009.
- Beausoleil-Morrison, I., T. McDowell, M. Kummert, F. McDonald, R. Jost, and A. Ferguson, *The Design of an ESP-r and TRNSYS Co-Simulator*, IBPSA Building Simulation 2011.
- Macdonald, F., R. Jost, I. Beausoleil-Morrison, M. Kummert, T. McDowell, and A. Ferguson, *A Demonstration of the Run Time Coupling between ESP-r and TRNSYS*, IBPSA-USA SimBuild 2012.

- Beausoleil-Morrison, I., F. Macdonald, M. Kummert, R. Jost, and T. McDowell, *Co-Simulation between ESP-r and TRNSYS: More Highly Resolved Modelling of Integrated Building and Energy Systems*, IBPSA Building Simulation 2013.
- Rice, K., V. Baxter, S. Hern, T. McDowell, J. Munk, and B. Shen, *Development of a Residential Ground-Source Integrated Heat Pump*, ASHRAE Conference Papers, Dallas, TX. 2013
- Shen, B., C.K. Rice, T.P. McDowell, and V.D. Baxter, *Energy Simulation of Integrated Multiple-Zone Variable Refrigerant Flow System*, ASHRAE Conference Papers, Denver, CO 2013
- McDowell, T.P. and M. Kummert, *Estimating Sub-Hourly Solar Radiation and Effective Sky Temperature from Hourly Weather Data*, IBPSA-USA SimBuild 2016
- Neymark, J., M. Kennedy, R. Judkoff, J. Gall, D. Knebel, R. Henninger, M. Witte, T. Hong, T. McDowell, D. Yan, and X. Zhou. *Airside HVAC BESTEST: Adaptation of ASHRAE RP 865 Airside HVAC Equipment Modeling Test Cases for ASHRAE Standard 140. Volume 1, Cases AE101-AE445*. NREL/TP-5500-66000, 2016.
- Neymark, J., M.D. Kennedy, R. Judkoff, J. Gall, R. Henninger, T. Hong, D. Knebel, T. McDowell, M. Witte, D. Yan, and X. Zhou. *Airside HVAC BESTEST: HVAC Air-Distribution System Model Test Cases for ASHRAE Standard 140*, IBPSA Building Simulation 2017.
- McDowell, T.P., D. Bradley, M. Hiller, J.Lam, J. Merk, and W. Keilholz, *TRNSYS 18: The Continued Evolution of the Software*, IBPSA Building Simulation 2017.
- Zhang, K., T. McDowell, and M. Kummert, *Sky Temperature Estimation and Measurement for Longwave Radiation Calculation*, IBPSA Building Simulation 2017.
- McDowell, T.P., M. Kummert, and S. Latellier-Duchesne, *Methods for Determining Sub-hourly Solar Radiation from Hourly Data*, IBPSA-USA SimBuild 2018
- McDowell, T.P., K. Yousef, J. Siegenthaler, T. Butcher, *A New Detailed Model of Wood Pellet Boilers*, IBPSA-USA SimBuild 2020
- McDowell, T. P., and R. Muehleisen, *New Standard 140 test suite: weather drivers*, IBPSA Building Simulation 2021
- Kruis, N., T. McDowell, C.S. Barnaby, and T. Mankad, *ASHRAE Standard 205P: Progress towards representation of performance data for HVAC&R equipment*, IBPSA Building Simulation 2021
- Neymark, J., R. Judkoff, M. Kummert, R. Muehleisen, J. Allison, J. An, J. Glazer, R. Henninger, M. Hiller, Y. Jiang, A. Johannsen, N. Kruis, T. McDowell, E. Ono, P. Strachan, M. Witte, D. Yan, H. Yoshida, and X. Zhou, *Update of ASHRAE Standard 140/BESTEST thermal fabric test cases*, IBPSA Building Simulation 2021