

CONTENTS

Host Chapter, Officers, and Conferences and Expositions Committee	ix
State of the Society Address, William P. Bahnfleth, 2013–2014 ASHRAE President	x
Inaugural Address, Thomas H. Phoenix, 2014–2015 ASHRAE President	xiii
Technical Program.....	xvi

TECHNICAL PAPERS

SE-14-001	Methods for Calculation of Evaporation from Swimming Pools and Other Water Surfaces Mirza Mohammed Shah, PE, PhD, Fellow/Life Member ASHRAE	3
SE-14-002	Phase-Splitting Algorithm for Ice Slurry Heterogeneous-Flow Pressure Drop in Straight Pipe Flow Shugang Wang, PhD; Yanjie Lv; Jihong Wang, PhD; Tengfei Zhang, PhD, Member ASHRAE	18
SE-14-003	Determination of the Effect of Humidity on the Probability of ESD Failure or Upset in Data Centers Mahdi Moradian; Abhishek Patnaik; Yunan Han; Fayu Wan; Xu Gao; David Pommerenke; David E. Swenson.....	25
SE-14-004	Staging Packaged Air-Conditioning Units to Improve Energy Efficiency and Humidity Control by Reducing Cycling Losses Dustin Pohlman, PE, Associate Member ASHRAE; Abdul Qayyum Mohammed, Associate Member ASHRAE; Seth Parker, Student Member ASHRAE; Kelly Kissock, PhD, PE, Member ASHRAE	42
SE-14-005	Engineering and Economic Analysis of Air Conditioners in the Kingdom of Saudi Arabia— Upgrading the Minimum Energy Performance Standards John Proctor, PE, Member ASHRAE; Abram Conant, Associate Member ASHRAE.....	50
SE-14-006	Generalized Performance Maps for Single- and Dual-Speed Residential Heat Pumps Simbarashe Nyika; Seth O. Holloway, Associate Member ASHRAE; W. Travis Horton, PhD, Member ASHRAE; James E. Braun, PhD, PE, Fellow ASHRAE	65
SE-14-007	Generalized Performance Maps for Variable-Speed, Ducted, Residential Heat Pumps Simbarashe Nyika; Seth O. Holloway, Associate Member ASHRAE; W. Travis Horton, PhD, Member ASHRAE; James E. Braun, PhD, PE, Fellow ASHRAE	80
SE-14-008	Thermal Design of Window-Wall Interface in Wall Energy Retrofits Using High-Performance Vacuum Insulation Jan Kosny, PhD, Member ASHRAE; Cezary Misiiopecki; Ali Fallahi, PhD, Associate Member ASHRAE; Nitin Shukla, PhD; William C. duPont, Member ASHRAE; Lawrence D. Carbary	90
SE-14-009	Experimental and Numerical Investigation of Surface Convection Enhancement by a V-Formation Delta-Winglet Array in a Developing Channel Flow Jing He, PhD, Associate Member ASHRAE; Liping Liu, PhD, Associate Member ASHRAE; Anthony M. Jacobi, PhD, Fellow ASHRAE	107
SE-14-010	Energy Codes and the Evolution of Fenestration: 20 Years of NFRC Ratings in Seattle John Hogan, PE, Member ASHRAE	118
SE-14-011	Temperature Trends for Locations Listed in the Tables of Climatic Design Conditions in the 2013 ASHRAE Handbook—Fundamentals Didier Thevenard, PhD, PE, Member ASHRAE; Mark W. Shephard	133

SE-14-012	Evaluation of the Thermal Performance of Two Nonstandard Borehole Configurations Parham Eslami-nejad, PhD; Michel Bernier, PhD, PE, Member ASHRAE; Odile Cauret, PhD	147
SE-14-013	Effects of Unequal Borehole Spacing on the Required Borehole Length Massimo Cimmino, Student Member ASHRAE; Michel Bernier, PhD, PEng, Member ASHRAE	158
SE-14-014	Quality Control Assessment of Vertical Ground Heat Exchangers Jasmin Raymond, PGeo, PhD, Associate Member ASHRAE; Louis Lamarche, PE, PhD; Marc-André Blais, PE	174
SE-14-015	Effects of Weather Parameters on Vertical Ground Heat Exchanger Design Farzin M. Rad, PEng, Member ASHRAE; Alan S. Fung, PhD, PEng, Member ASHRAE; Wey H. Leong, PhD, PEng, Member ASHRAE	184
SE-14-016	Installation and Results of Variable-Frequency Drives at a Mid-Sized Power Generation Facility Scott A. Achelpohl, PE; Jeffrey A. Green, Student Member ASHRAE; James A. Mathias, PhD, PE, Associate Member ASHRAE	195
SE-14-017	Virtual Flow Meter to Estimate the Water Flow Rates in Chillers Eric McDonald, Student Member ASHRAE; Radu Zmeureanu, PEng, PhD, Member ASHRAE	200
SE-14-018	Analytical Expression for Transient Heat Transfer in Concrete Core Activation Maarten Sourbron, PhD; Lieve Helsen, PhD; Martine Baelmans, PhD	209
SE-14-019	An Absorption Chiller System Using Lithium Bromide and Water as Working Fluids: Exergy Analysis S. Anand; A. Gupta; S.K. Tyagi; Y. Anand	226
SE-14-020	Deluge Evaporative Cooling Performance of Wavy Fin and Tube-Inclined Heat Exchangers Sahil Popli, Student Member ASHRAE; Yunho Hwang, PhD, Member ASHRAE; Reinhard Radermacher, PhD, Fellow ASHRAE	240
SE-14-021	Condensing Boiler and Vapor Vacuum-Heating System Combo Igor Zhadanovsky, PhD	254
SE-14-022	Cost Efficiency Comparison for Hot-Water Condensing Boiler (HWCB) and Vapor Vacuum Heating and Condensing Boiler (VVHCB) Combo Igor Zhadanovsky, PhD	264
SE-14-023	<i>(HVAC&R Research)</i> Numerical Study of a Ventilation System Based on Wall Confluent Jets Setareh Janbakhsh, Student Member ASHRAE; Bahram Moshfegh	272
SE-14-024	Preliminary Test and Analysis of a Stirling-Engine-Based Residential Trigeneration System at TRCA Archetype Sustainable House Navid Ekrami, Student Member ASHRAE; Zannatul Moiet Hasib; Seth B. Dworkin, PhD, PEng; Alan Fung, PhD, PEng, Member ASHRAE; David Naylor, PhD, PEng	273
SE-14-025	Characterizing Airflow and Power of VAV Series Fan-Powered Terminal Units from Component Data—Part I Peng Yin, Student Member ASHRAE; Dennis L. O’Neal, PhD, PE, Fellow ASHRAE	285

SE-14-026	Characterizing Airflow and Power of VAV Series Fan-Powered Terminal Units from Component Data—Part II Peng Yin, Student Member ASHRAE; Dennis L. O’Neal, PhD, PE, Fellow ASHRAE	296
SE-14-027	Improvement of Computational Relations for Fan Pressures in HVAC Systems Mikhail Nudelman, Member ASHRAE; Ed Kernerman, PhD, PE	308
SE-14-028	Analyzing the Effects of Airflow Disturbances on Measurement and Control Equipment Positioned Downstream and Close to an Air Duct Elbow—For the Purpose of Optimizing System Performance Using a CFD Technique Ali M. Hasan, CEng, Member ASHRAE	311
SE-14-029	One- and Two-Time-Constant Models to Predict the Capacity of Geothermal Heat Pumps in Cycling Conditions Demba Ndiaye, PhD, PE, Member ASHRAE; Michel Bernier, PhD, PE, Member ASHRAE	320
SE-14-030	Analysis of the Energy Performance and Control Optimization of a GSHP Installation J. Cervera-Vázquez; C. Montagud; J.M. Corberán	334
SE-14-031	Should the Optimization Horizon in Optimal Control of Ground-Coupled Heat-Pump Systems Cover the Interseasonal Time Scale? Stefan Antonov; Clara Verhelst, PhD; Lieve Helsen, PhD	346
SE-14-032	Experimental Validation of Ground Heat Exchanger Design Methodologies Using Real, Monitored Data J.R. Cullin, Student Member ASHRAE; C. Montagud, PhD; F. Ruiz-Calvo; J.D. Spittler, PhD, PE, Fellow ASHRAE	357
SE-14-033	Withdrawn	
SE-14-034	Sensor Data Management, Validation, Correction, and Provenance for Building Technologies Charles C. Castello, PhD, Affiliate Member ASHRAE; Jibonananda Sanyal, PhD, Associate Member ASHRAE; Jeffrey Rossiter; Zachary Hensley; Joshua R. New, PhD, Member ASHRAE	370
SE-14-035	Energy Analysis, Optimal High-Limit Control and Engineering Approach of Air-Side Economizers Gang Wang, PhD, PE, Member ASHRAE; Li Song, PhD, PE; Member ASHRAE.....	383
SE-14-036	Matching Building Energy Simulation Results against Measured Data with Weather File Compensation Factors L. Carl Fiocchi; Benjamin S. Weil, PhD, Member ASHRAE; Simi Hoque, PhD.....	397
SE-14-037	Business Value as the Driver for Management of Building Energy Assets Niloofer Salahi; Khashayar Mahani; Jianmin Zhu; Mohsen A. Jafari, PhD; Yan Lu, PhD, Member ASHRAE; Kaveh Gharieh; P.J. Winslow.....	405
SE-14-038	Optimizing Building Energy Footprint Using Integrated Reliability and EnergyPlus Simulation Approach Khashayar Mahani; Niloofer Salahi; Jianmin Zhu; Mohsen A. Jafari, PhD; Yan Lu, PhD, Member ASHRAE	416

SOCIETY BUSINESS

2013–2014 ASHRAE Officers, Directors, Staff, and Council and Committee Members	431
2013–2014 ASHRAE Chapter Officers.....	437
2013–2014 ASHRAE Technical Committees, Task Groups, Technical Resource Groups, and Multidisciplinary Task Groups.....	441
2013–2014 ASHRAE Standard and Guideline Project Committees.....	478
ASHRAE Past Conferences	494
Society Presidents.....	496
ASHRAE Honors and Awards	498
2013–2014 ASHRAE Intersociety Representatives.....	518
ASHRAE Associate Societies.....	519
In Memoriam, July 2013 to June 2014.....	523
Index of Technical Papers, Volume 120, Part 2	525