ASME 2016

POWER & ENERGY

Conference & Exhibition

CONFERENCE
June 26-30, 2016

EXHIBITION
June 28-29, 2016

Charlotte Convention Center, Charlotte, NC, USA

Program

www.asme.org/events/power-energy

Media Sponsor MECHANICAL ENGINEERING

ASME SETTING THE STANDARD

The American Society of Mechanical Engineers (ASME)

CHARLOTTE

June 26, 2016

Greetings!

On behalf of the citizens of Charlotte, I would like to welcome the attendees of the 2016 ASME (American Society of Mechanical Engineers) Power and Energy Conference to Charlotte on June 26 – 30, 2016. We are happy that you have chosen Charlotte for this event and we trust that you will feel comfortable and at home in the Queen City.

It gives me great pleasure to share our fast-growing, dynamic, and innovative city with such a diverse and impressive group. Charlotte continues to be recognized and selected as a meeting destination by an increasing number of organizations. It is a community of pleasant tree-lined neighborhoods, parks and museums, restaurants, and sports facilities. We are especially proud to be the home of the NASCAR Hall of Fame, the Levine Center for the Arts which includes The Bechtler Museum of Modern Art, and the Harvey B. Gantt Center for African-American Arts +Culture. In addition, the activities available in our vibrant Center City mixes dining, entertainment, and cultural amenities that are distinctly Charlotte.

Again, we are pleased to have you join us in Charlotte and we welcome the opportunity to share our southern hospitality with you.

Sincerely,

Jennifer W. Roberts

Jennifer Watson Roberts
Mayor

Mayor Jennifer Watson Roberts
Office of the Mayor 600 East Fourth Street Charlotte, NC 28202-2853 704/336-2241

Welcome from the Conference Chairs & the Executive Advisory Committee

Dear Colleagues,

Welcome to the ASME 2016 Power & Energy Conference and to Charlotte, North Carolina, a U.S. energy hub!

In 2016, we bring together FIVE of ASME's energy events including – the Energy Storage Forum, the Energy Sustainability Conference, the Fuel Cell Conference, the Gas Turbine Forum and the Power Conference – to bring you "Engineering the Energy Portfolio." Additionally, Power & Energy is co-located with ICONE 24 – the International Conference on Nuclear Engineering.

We are excited and proud to announce that we have a five-day action packed schedule and much for you to engage in and learn about. From pre-conference workshops and seminars, multiple technical tours, keynote, plenary, panel, and poster sessions, and technical tracks, you will have many options to choose from. Additionally, there are numerous ASME Standards & Certification meetings (including Performance Test Code Week), as well as ASME Division Technical Committee Meetings. Be sure to visit our vibrant exhibit floor and learn about the newest technological advancements in the power and energy fields.

A special thank you to our volunteer leadership and Executive Advisory Committee - who spent countless hours putting together a top-notch technical program. We would also like to thank all of our sponsors and exhibitors for their support of the program. We would like to thank you, our attendees, for joining us. We look forward to meeting many of you.

Lastly, we hope everyone will take some time and enjoy Charlotte. Have a great conference, and thank you again for attending.

ASME 2016 Energy Storage Forum

Conference Chair: Christopher Rahn, Penn State University

Conference Co-Chair: Bobby Bailie, Dresser-Rand, a Siemens business

ASME 2016 10th International Conference on Energy Sustainability

Conference Chair: Mansour Zenouzi, Wentworth Institute of Technology

Conference Co-Chair: Jonathan Scheffe, University of Florida

Technical Program Chair: Robert Braun, Colorado School of Mines

Technical Program Chair: Mark Lausten, US Department of Energy

Technical Program Co-Chair: Sophia Haussener, EPFL

Technical Program Co-Chair: Chris Schmitt, GE Power & Water

ASME 2016 14th Fuel Cell Science, Engineering, and Technology Conference

Conference Chair: Wilson K. S. Chiu, University of Connecticut

Technical Program Co-Chair: George Nelson, University of Alabama in Huntsville

ASME Gas Turbine Forum

Conference Chair: Richard Dennis, US Department of Energy, National Energy Technology Laboratory

Conference Co-Chair: John Gulen, Bechtel Infrastructure and Power Inc.

ASME 2016 Power Conference

Conference Chair: Justin Voss, AES - Global Insurance

Technical Program Chair: Jason Lee, Babcock Power Services Inc.

Technical Program Co-Chair: Steven Greco, We Energies

Executive Advisory Committee

Chair: Frank L. Michell, American Electric Power (AEP)

Chris Atkinson, ARPA-e

Bobby Bailie, Dresser-Rand, a Siemens business

Robert Braun, Colorado School of Mines

Wilson Chiu, University of Connecticut

Richard Dennis, US Department of Energy, National Energy Technology Laboratory

John Gülen, Bechtel Infrastructure and Power Inc.

Sophia Haussner, EPFL

Mark Lausten, US Department of Energy

George Nelson, University of Alabama Huntsville

Christopher Rahn, Penn State University

Michael Reid, Duke Energy

Bruce Rising, Siemens

Christian Sattler, Institute of Solar Research

Jonathan Scheffe, University of Florida

Justin Voss, AES

Mansour Zenouzi, Wentworth Institute of Technology

ICONE Conference Chair: Yassin Hassan, TX A&M University

ICONE Liaison: Jovica Riznic, CNSC

John Bendo, ASME

Stephen Crane, ASME

Paul Cleri, ASME

John Grimes, ASME

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ASME FUEL CELL CONFERENCE

ASME GAS TURBINE FORUM

ASME ENERGY STORAGE FORUM

Technical Program

General Information

Registration Hours & Location

Registration is located on the **street level Concourse C area** of the convention center. The registration hours are as follows:

Sunday, June 26
7:00 am – 7:00 pm

Monday, June 27
7:00 am – 6:30 pm

Tuesday, June 28
7:00 am – 5:30 pm

Wednesday, June 29
7:00 am – 5:30 pm

Thursday, June 30
7:00 am – 5:00 pm

CHARLOTTE CONVENTION CENTER

All technical sessions, exhibits, keynote and plenary sessions take place at the Charlotte Convention Center, 501 South College Street. The center is divided into four floors: Meeting Room Level, Ballroom Level, Exhibit Level and Street Level. The majority of the conference functions including the exhibitor reception on Tuesday, June 28, the conference luncheons Tuesday and Wednesday, June 28-29, and daily coffee breaks will take place in Exhibit Hall C. On Monday night, June 27, there will be a reception located in the NASCAR Hall of Fame connected to the center across from the Crown Ballroom from 6:30 pm - 8:30 pm. Please note room names and locations when reviewing your schedule.

CONFERENCE HOTELS

The conference headquarters hotel is the Westin Charlotte located just steps away from the convention center on 901 South College Street. The Hilton Charlotte Center City on 222 East Third Street across from the convention center is the location of many Standards and Certification Committee Meetings held in conjunction with the conference. The hotel is also the location of several pre-conference workshops and seminars taking place on Sunday and Monday. The Holiday Inn Charlotte located at 230 North College Street serves as the student headquarters hotel.

CONFERENCE PAPER ELECTRONIC ACCESS & DVD

All Full Conference Registrants will receive a DVD that includes all scheduled presentations and electronic access to these presentations. The official proceedings of the 2016 Power & Energy Conference will be produced at the conclusion of the conference. Papers that were not presented on site in Charlotte will not be published in the conference proceedings and cannot be cited or indexed.

NAME BADGES

Please wear your name badge at all times. Admission to some conference functions, technical sessions, and the exhibition will be granted by the colored coding on your badge. Your badge also provides a helpful introduction to other attendees and guests. If you misplaced your badge, please go to the ASME registration desk and ask for a replacement.

TICKETED FUNCTIONS / ITEMS

Your registration packet will include guest tickets to certain functions such as the NASCAR Reception and the Power Conference Gala and Awards or Energy Sustainability Conference/Fuel Cell Conference Gala and Awards (if you purchased them in advance). Additionally, participation at the daily lunches and technical tours will be ticket only. Entrance to the Workshops, Seminars, and NASCAR Reception as well as the conference galas will be determined by a special color coding on your badge. If you wish to bring a guest, you must purchase a ticket in advance.

REGISTRATION POLICIES

1. Full registration fees include admission to all technical sessions, exhibits, keynote and plenary sessions, NASCAR reception, exhibitor reception, lunches, ICONE 24 and Power & Energy 2016 Conference DVD, electronic access to the conference papers and refreshment breaks.

2. Conference registration to either ICONE 24 or the Power & Energy Conference allows access to both conferences.

3. One-day registration only allows access to the conference activities on that particular day.

4. Guest registration allows access to the conference receptions, keynote, and exhibit hall.

5. All attendees, including members, non-members, authors, panelists, chairs, and co-chairs must pay the appropriate registration fee.

6. No one will be allowed to attend the technical sessions without first registering and obtaining the official ICONE 24/Power & Energy 2016 conference badge.

ON-SITE REGISTRATION FEES

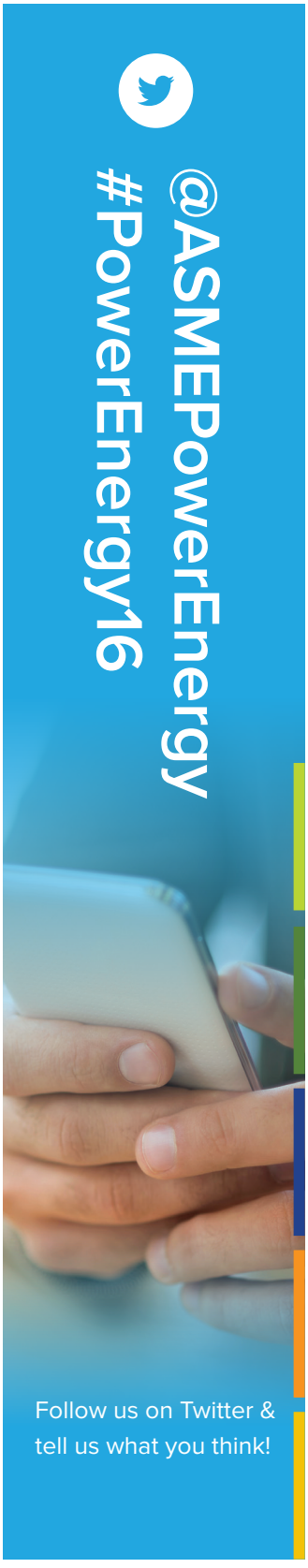
	Full Registration	One-Day Registration
ASME Member/Author/Presenter	$970.00	$500
Cooperating Society Member	$970.00	$500
Non-Member	$1170.00	$500
ASME Student Member	$450.00	N/A
Student Non-Member	$550.00	N/A
ASME Life Member	$450.00	N/A

Workshops- Sunday, June 26 & Monday, June 27
Cost: $200.00 each

Seminars – Sunday, June 26 & Monday, June 27
Cost: $50 each (unless noted otherwise in the program)

SPECIAL NEEDS OR HANDICAPPED ATTENDEES

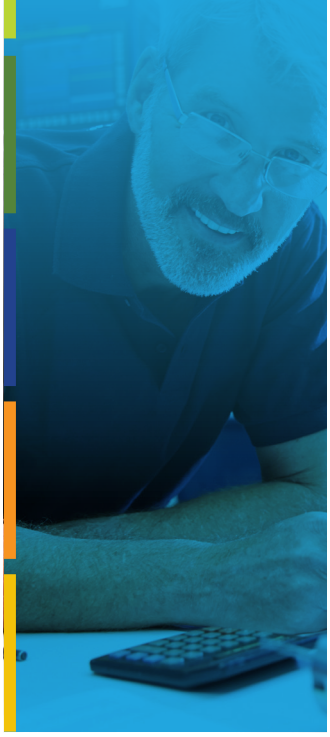
Whenever possible, we are pleased to make arrangements for special needs or handicapped registrants. Advance notice may be required for certain requests. For on-site assistance, please visit the registration area at the convention center concourse C and ask to speak with a representative.



General Information

ASME Complimentary Membership

Any attendee that pays a non-member conference registration fee will receive a one year ASME membership free of charge. ASME will activate this complimentary membership for qualified attendees approximately four weeks after the conclusion of the conference.



AUTHOR'S PRACTICE ROOM

Room 216B, Meeting Room Level, convention center will be available to all conference participants as a presentation "practice" room. The room will be equipped with (2) LCD projectors, (2) computers, and (2) screens, Monday through Thursday during the registration hours. Authors are encouraged to use this facility to meet with their co-authors and review presentations.

Monday, June 27	7:00 am – 6:30 pm
Tuesday, June 28	7:00 am – 5:30 pm
Wednesday, June 29	7:00 am – 5:30 pm
Thursday, June 30	7:00 am – 5:00 pm

AUTHOR'S BRIEFING

On the morning of their session, authors, panelists, session chairs and co-chairs are invited to attend the author's briefing to discuss session protocol and get acquainted. The briefing will take place in Room 207ABCD, meeting room level convention center from 8:00 am - 8:45 am on Monday and 7:00 am - 7:45 am from Tuesday through Thursday. Continental Breakfast will be available.

SESSION ROOM EQUIPMENT

Each session room is equipped with a screen and an LCD projector. There will also be a laptop computer in each room. Speakers should have a copy of their presentation to load onto this computer via CD or memory stick. It is recommended that authors/speakers bring all visual aids with them.

PUBLICATIONS SALES

All Power and Energy & ICONE 24 Conference technical papers are available on DVD and electronically to registered attendees only. Attendees will receive a conference DVD at the registration desk and electronic access via their e-mail on record. Additional copies of the 2016 Power and Energy /ICONE 24

Proceedings can be ordered from:
ASME Order Department 150 Clove Road, 6th Floor
Little Falls, NJ 07424-2139

PROFESSIONAL DEVELOPMENT HOUR CREDITS (PDH)

PDH (Professional Development Hour) Credits will be issued upon request in the registration area. Depending on the volume of requests, you may be asked to return at a later time after the request has been processed. All requests must be made prior to 12:00 pm on Thursday, June 30, 2016. PDH credits will be given for the workshops & seminars based on length.

EXHIBITS

Exhibit Hall C, Convention Center, Exhibit Level

The exhibit hall opens on Tuesday, June 28 at 9:30 am during the morning refreshment break. Attendees will also have the opportunity to visit the exhibits during the lunch breaks and all refreshment breaks on Tuesday & Wednesday and as well as during the exhibitor reception on Tuesday night from 5:45 pm- 7:30 pm. No one will be allowed to enter the exhibit hall without a conference badge.

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Building a low-carbon future, today.

At Duke Energy, sustainability means doing business in a way that's good for people, the planet and profits. Whether it's improving energy efficiency or investing in green technologies, we're committed to creating a low-carbon future.

www.duke-energy.com

Exhibitor Hours

Installation
Monday, June 27
12:00 pm - 5:00 pm

Exhibit Hall Open
Tuesday, June 28
9:30 am – 7:30 pm
Exhibitor Reception
5:45 pm- 7:30 pm

Exhibit Hall Open
Wednesday, June 29
9:30 am – 4:00 pm

Dismantle
Wednesday, June 29
4:00 pm - 9:00 pm

DAILY LUNCHES

Daily lunches will be available Monday, June 27 in the Crown Ballroom, Tuesday, June 28 & Wednesday, June 29 in Exhibit Hall C located on the Exhibit level of the convention center, and Thursday, June 30 in the Richardson Ballroom AB. Lunches are only provided for full conference attendees or those who have registered for one-day.

Monday, June 27	1:00 pm – 2:00 pm
Tuesday, June 28	12:00 pm – 1:30 pm
Wednesday, June 29	12:00 pm – 1:30 pm
Thursday, June 30	12:00 pm – 1:00 pm

DAILY REFRESHMENT BREAKS

Daily morning and afternoon refreshment breaks will be available Monday – Thursday, June 27 – June 30 in the Charlotte Convention Center.

Monday, June 27	10:45 am – 11:15 am (Near Food Court)
	3:45 pm – 4:15 pm (Near Food Court)
Tuesday, June 28	9:30 am – 10:15 am (Exhibit Hall C)
	3:15 pm – 4:00 pm (Exhibit Hall C)
Wednesday, June 29	9:30 am – 10:15 am (Exhibit Hall C)
	3:15 pm – 4:00 pm (Exhibit Hall C)
Thursday, June 30	9:30 am – 10:15 am (Near Food Court)
	2:45 pm – 3:15 pm (Near Food Court)

SEGMENT MEETINGS

Engineering Sciences Segment Meeting

Saturday, June 25, 2016

8:00 am – 5:00 pm

Hilton Center City Charlotte, 222 E 3rd St, Johnson Room

Energy Conversion & Storage Segment Meeting

Saturday, June 25, 2016

8:30 am – 6:00 pm

Hilton Center City Charlotte, 222 East 3rd Street, Gwynn Room

ASME ATTENDEES:

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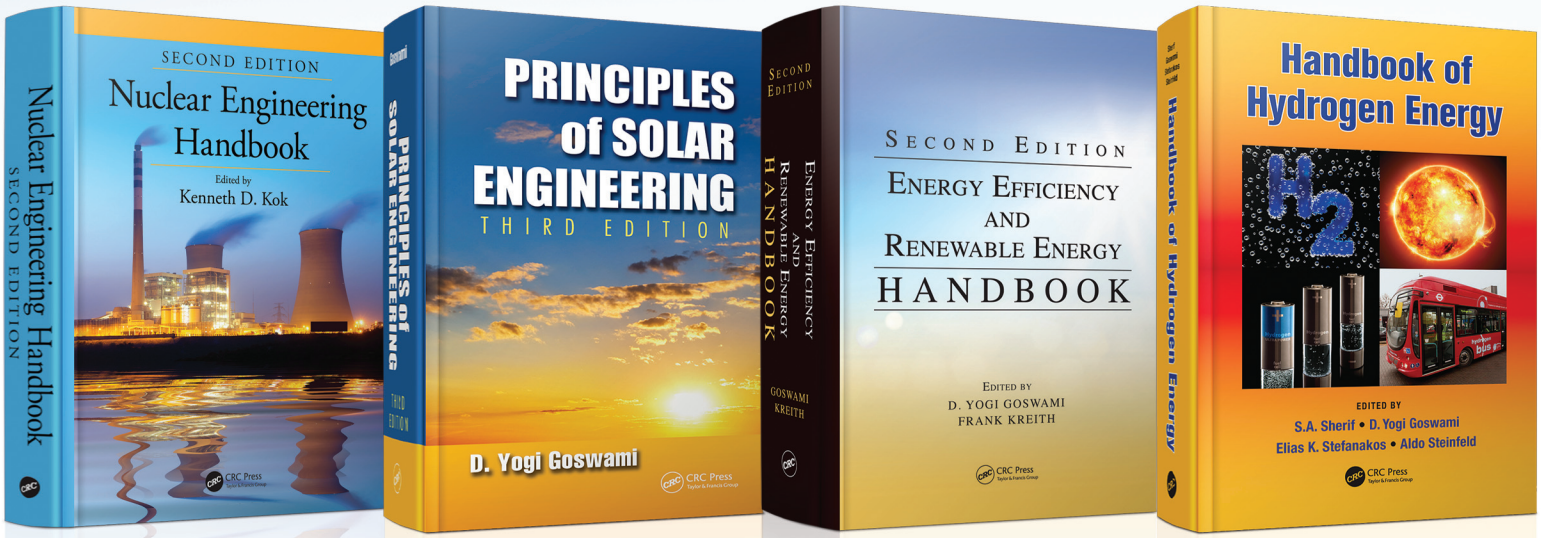

ISBN: 9781482215922

- Provides a comprehensive, up-to-date overview of nuclear engineering
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- Describes the newest nuclear reactor designs

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- Provides a detailed analysis of concentrating collectors
- Introduces new topics not covered in the last edition

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- Examines wind, solar-thermal, photovoltaic solar, ocean, geothermal, and biomass energy

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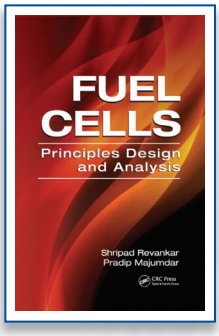
- Includes extensive references to enhance additional study and reflection

More Top Selections for ASME Members



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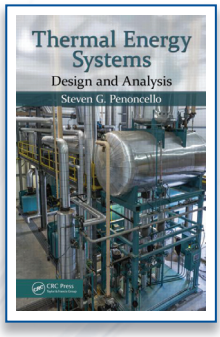

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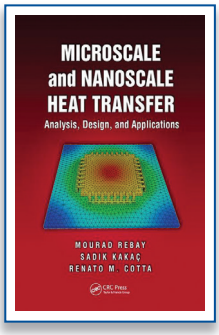

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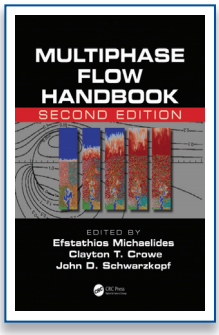

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Pre-Conference Workshops

SUNDAY, JUNE 26, 2016

From Engineer to Manager: A Roadmap for a Successful Transition
1:00 pm – 5:00 pm; Cost: $200 person
Room: Gwynn; Hilton Center City Charlotte, 222 E 3rd St.

This workshop is for ALL engineers and students who may at some point in their careers assume a management role or consider a career move from technical professional into management.

Most engineers will at some point in their careers assume a management role (e.g., as a project manager or team leader) or consider a move into a full-time management position. The change in role is usually quick to occur but in few cases has there been any preparation to assist in a smooth transition. As a result most engineers are not aware of what being a new manager is all about before its thrust upon them. Would you be ready for the change? What should you really expect? What are the critical things you need to know as a new manager?

The workshop will be a practical look at some of the key elements in preparing for a successful transition from technical professional to manager. As opposed to being a "How to Manage" session, the speaker will relate lessons he has learned as he crossed over into management and assumed increasingly responsible management positions. He will share lessons from his personal experiences that have enhanced his effectiveness and the "little things" that can assist the attendee in becoming an effective manager – be it as a project manager, team leader or as a full-time manager in a supervisory position. If you are an engineer about to assume a managerial role, an engineer who may be contemplating a move into management or even if you are a new manager who is now experiencing some managerial growing pains, this session is for you. And for the student engineer or early career professional, it's never too early to consider the requirements and steps to be taken in preparing for future management roles and positions.

Presenter: John T. Bozewicz, Division Head, Naval Surface Warfare Center

MONDAY, JUNE 27, 2016

The Total Condenser Performance™ Workshop
9:00 am - 1:00 pm; Cost: $200 person
Room 201A, Charlotte Convention Center

Achieving the perfect balance of condenser efficiency and reliability is attainable through effective cleaning, testing and inspection. With this in mind, we've created the Total Condenser Performance™ Workshop designed to help you maximize MW output and minimize risk of condenser related forced outages during your operating cycle. The Total Condenser Performance™ Workshop includes valuable information on tube cleaning, eddy current testing and leak detection procedures when executed together or independently can help you achieve the best results from your condensers and heat exchangers. Incorporating the principles addressed in the seminar typically results in increased MW output, improved condenser performance and reduced CO2 emissions.

Canceled

Presenter: Gary Fischer, Conco Services Corp.

Solar Energy: Technologies and Project Delivery for Buildings
9:00 am - 1:00 pm; Cost: $200 person
Room 201B, Charlotte Convention Center

This workshop is to prepare practitioners and instructors to include solar energy in electrical and mechanical design of buildings. Contents include: solar resource and components of solar irradiance; principles of photovoltaic devices and photovoltaic systems; integration of distributed generation into utility systems; solar water heating; solar ventilation air preheating; and passive solar heating. Information on the technologies is supplemented with information regarding the process by which successful solar projects are delivered. Several case studies are considered. Each workshop participant will receive a hardcopy or e-book by the instructor. For instructors, 22 one-hour MS PowerPoint presentations; MS Excel spreadsheet calculations; 120 solved homework problems and 40 solved exam problems are available to accompany the textbook.

Canceled

Presenter: Andy Walker, PhD PE, National Renewable Energy Laboratory

Heat Rate Assessment
9:00 am – 1:00 pm; Cost: $200 person
Room 202A, Charlotte Convention Center

The Heat Rate Workshop will present a quantitative methodology for optimizing thermal performance in conventional and combined cycle power plants. The focus will be on identifying opportunities to reduce fuel consumption, reduce emissions and recover lost capacity in a cost-effective manner.

Canceled

The workshop will outline a proven method for assessing the heat rate health at your facilities, and will help you identify and prioritize heat rate best practices that will benefit your plants. This workshop will help corporate and plant engineering personnel to optimize equipment and system efficiencies. Application of advanced tools (data validation, advanced pattern recognition, thermal performance monitoring, etc.) to thermal performance monitoring will be discussed.

Presenter: Marcus Caudill, Principal Performance Engineer

COMSOL Multiphysics for Power and Energy Applications
9:00 am – 1:00 pm; Cost: $200 person
Room 202B, Charlotte Convention Center

This workshop will provide an opportunity to advance your skills in multiphysics simulation. It begins with a walk-through of the fundamental modeling steps in COMSOL Multiphysics®.

Canceled

Attendees will then have the chance to learn about power and energy simulations with a COMSOL expert. Finally, attendees will leave with new skills to work on applications using a free, two-week COMSOL trial.

What You Will Learn:
• Power and energy simulations in COMSOL Multiphysics
• Discover the capabilities and features of COMSOL Multiphysics® and get a quick overview of the add-on products
• Learn the natural workflow of the COMSOL Desktop user interface through which all physical phenomena are set up
• See how to efficiently create and modify your models, and optimize your designs, step-by-step
• Experience the speed and ease of modeling in the COMSOL environment, shown through a hands-on multiphysics simulation example
• Learn to convert an existing COMSOL model into an App using the COMSOL Application Builder.
• Learn about improving and optimizing your designs using parametric solvers and the Optimization Module.

Presenter: Aditya Kalavagunta, Senior Engineer, COMSOL Inc.

Critical Power Plant Pumps – Performance Reliability & Optimization
9:00 am – 1:00 pm; Cost: $200 person
Room 210A, Charlotte Convention Center

Canceled

The workshop will provide broad knowledge in the critical pumps of combined power plants. This includes the understanding of pump hydraulics, standard materials, manufacturing and assembly and pump operation; provide guidelines for monitoring the pump's performance and methods of improving and optimizing the pump's operational reliability; and provide reference handouts for ensuring the operational reliability of the pumps. The workshop will focus on: pumps in combined cycle power plants and fossil power plants, pumps for critical services in broad categories such as: boiler feed pumps, condensate and heater drain pumps, and circulating and cooling water pumps. Additionally, it will be limited to only the basic and fundamental theory and practices and finally, it will cover methods of improving an optimizing the pump's operational reliability.

Who should attend: power plant personnel who are already working with pumps - planning, design, procurement, installation, operation, systems, etc. Parties interested in the pumps used in power plants.

Handouts include: Quick Reference Guide for Pump Troubleshooting; Power Plant Pumps: Guidelines For Application and Operation, Hydraulic Institute; and case studies reprints.

Presenters: Bob Jennings, Manager of Energy Upgrades, Hydro, Inc. and Dr. T. Ravisundar, Chief Engineer, HydroAire Inc.

Pre-Conference Seminars

SUNDAY, JUNE 26, 2016

CFD (Computational Fluid Dynamics)
9:00 am – 5:00 pm; Cost: $50 person
Room: Mecklenburg Hall; Hilton Center City Charlotte, 222 E 3rd St.

The seminar will target early career researchers and engineers to provide the basis and results for selection of several CFD applications for certain flow problems. The seminar will introduce the fundamental equations and solution methods and then continue to recent developments and some practice guidelines of CFD for nuclear engineering applications. Informal discussions and questions will be conducted.

Organizers: Yassin Hassan, Texas A&M University & Kazuyuki Takase, Nagaoka University of Technology

Presenters: Yassin Hassan, Texas A&M University, Richard Schultz, ISU, TAMU, Elia Merzari, Argonne National Laboratory, Sofiane Benhamadouche, EDF, Dominique Bestion, CEA, Shiro Takahashi, Hitachi Heavy Industry Co. Ltd., Chiaki Kino, Institute of Advanced Energy

Thermal-Hydraulic Methods, Experimentation and Benchmarking
8:00 am – 5:00 pm; Cost: $50 person
Room: Johnson; Hilton Center City Charlotte, 222 E 3rd St

This seminar will present an overview of some of the key Thermal-Hydraulic methodologies, experimentation procedure and its application to nuclear power plants. The relevant computer code model and theory will be described and real experimental work will be presented and discussed. Computer code simulations of experiments and benchmarking will also be presented. This seminar is applicable to both students/professors and engineers in the relevant industry fields.

Presenters: Jovica Riznic, Canadian Nuclear Safety Commission, Shripad Revankar, Purdue University, Guanghui Su, Xi'an Jiaotong University, Yasuteru Shibamoto, Japan Atomic Energy Agency, Nikolay Ivanov Kolev, Siemens AG, Guoqiang Wang, Westinghouse Electric Company.

Application of Nuclear Codes & Standards
8:00 am – 4:30 pm; NO CHARGE (Registration is required)
Room: South Carolina; Hilton Center City Charlotte, 222 E 3rd St.

This seminar will demonstrate the application of ASME's nuclear codes and standards. There will be a brief overview and discussion on current and future revisions to ASME's nuclear codes and standards product catalog (i.e. NQA-1, OM, RA-1, etc.). Followed by case studies demonstrating applicability and how future industry endeavors, like small modular reactors (SMRs), will affect codes and standards.

Presenters: Masaki Morishita, Japan Atomic Energy Agency; Ron Lippy, True North Consulting; Rick Grantom, C. R. Grantom P.E. & Assoc. LLC; Doug Brown, Sargent & Lundy, LLC; Tim Adams, Stevenson and Associates, a Jensen Hughes Company; Ralph Hill, Hill Engineering Solutions LLC; Clay Smith, Fluor; John Bendo, ASME; Chris Sanna, ASME; Ronald Bellamy, Camfil; Paul Lang, ASME; Charles Withers, The National Board of Boiler and Pressure Vessel Inspectors; Steve McCracken, EPRI.

MONDAY, JUNE 27, 2016

Waterhammer Analysis
9:00 am – 12:00 pm; Cost: $50 person
Room: 204, Charlotte Convention Center

This seminar will present an overview of the fluid mechanics of classical waterhammer theory and its application to nuclear power plant systems. All known waterhammer mechanisms will be discussed together with the methods of simulating these. Real plant examples will be presented and discussed. Results of computer simulation of waterhammer solutions will be presented in the form of animations showing the movement of pressure and velocity waves. These greatly help in understanding the phenomena and the associated mechanisms. Fluid Structure Interaction (FSI) aspects will also be addressed.

Presenter: Asif Arastu, Technical Consultant, Unisont Engineering, Inc.

Development and Maintenance of a Formal Plant Performance Monitoring and Improvement Program
9:00 am - 1:00 pm; Cost: $50 person
Room 205, Charlotte Convention Center

A formal thermal performance program is essential for maximizing electric power generation of a nuclear steam turbine cycle. There are many factors that can impact cycle efficiency including seasonal temperature changes of the primary cooling water, main condenser fouling, balance of plant equipment modifications or failures, and cycle isolation losses. The purpose of the formal plant monitoring program is to consistently track, trend and monitor the steam cycle, identify losses, and effectively communicate any issues to the proper plant personnel for resolution.

This seminar will cover the fundamental principles of the power plant cycle efficiency, with emphasis on both the theory and practical considerations regarding how to maximize generation output through the use of the formal plant performance monitoring program.

Topics include:
- Discussion of balance of plant equipment and the potential cycle impacts
- Using ASME PTC 6 Methods to understand performance
- Guidance for development of the formal Thermal Performance Program
- Methods for effective tracking, trending and reporting
- Case Studies of successful program implementation
- Using the methods for long term goal planning and increased generation output

The information presented will be applicable to:
- Plant and Corporate Design Engineers
- Plant System (field) Engineers
- Plant and Corporate Performance Monitoring Engineers

Presenters: Jack Little, President of ILD, Inc. and Mike Morgan, Principal Engineer, ILD.

Piping Stress Analysis for Dynamic Events and Fluid-Structure Interaction
1:00 pm - 4:00 pm; Cost: $50 person
Room 204, Charlotte Convention Center

Fluid transient events such as waterhammer have caused severe damage to piping systems. If the loading is known, it is possible to analyze the piping system accurately to find an appropriate design that can sustain the loading. This workshop will present an overview of the structural analyses of piping systems under dynamic loadings in general, and on fluid transient loadings in particular. Basic theory and numerical methods will be presented, followed by discussions on modeling considerations in order to obtain good results. Normally the fluid transient analysis and the piping structure analysis are performed independently, but the potential impact of fluid-structure interactions will be discussed. Actual problems, including some from Workshop 2 will be used as examples. An interactive 3D graphic program will be used to demonstrate how such a tool may be used effectively for design or troubleshooting by visualizing the dynamic system response in realistic views.

Presenter: Hong Ming Lee, Unisont Engineering, Inc.

MONDAY, JUNE 27, 2016

Siemens – SOLD OUT
8:00 am – 12:00 pm; Cost: $25 per person
Bus departs at: 8:00 am (arrive for loading at 7:45 am)
From: Martin Luther King, Jr. Blvd. Exit, Charlotte Convention Center

Siemens in Charlotte is one of the lead facilities in the company's global manufacturing network and serves as the worldwide hub for Siemens 60 Hz large power generating equipment. Opened in 1969, the facility has manufactured and serviced generators and steam turbines for the power generation market for decades.

In November 2011, the facility celebrated the opening of a new expansion, adding gas turbine production and service capabilities. The new Gas Turbine facility was designed based on LEAN manufacturing principles and is certified to U.S. LEED Gold green building standards. With its current workforce of 1,600 and more than one million square feet of space under roof, Siemens Energy in Charlotte has become one of the largest manufacturers in the city and also one of the largest among the 250+ Energy companies based in Charlotte. Tour participants will see the manufacturing and servicing of large gas turbines, large steam turbines, and generators. The tour will also cover various aspects of the Siemens Charlotte operation, including its focus on lean manufacturing concepts, workforce development, and more

Tour participants must wear flat, hard soled, closed shoes. Business flats, running shoes, or hiking shoes with a hard sole are fine. Steel or composite-toed safety shoes are also fine. Siemens will provide safety glasses. All tour participants must be fully mobile in the event of an emergency.

MONDAY, JUNE 27, 2016

Westinghouse WEC Carolina Energy Solutions, LLC (CES)
8:00 am – 12:00 pm; Cost: $25 per person
Bus departs at: 8:00 am (arrive for loading at 7:45 am)
From: Martin Luther King, Jr. Blvd. Exit, Charlotte Convention Center

Westinghouse Electric Company's WEC Carolina Energy Solutions, LLC (CES) provides welding and machining services for the installation, repair, modification and maintenance of components, piping and supporting equipment for the nuclear, fossil, petrochemical, geothermal and process industries. Based in Rock Hill, South Carolina (USA), CES has approximately 50,000 square feet of office and shop space to support projects in the United States and worldwide. During the tour of the facility, our talented personnel will demonstrate our unique remote orbital welding and field machining capabilities. In addition, visitors will have the opportunity to view our in-house weld training and testing facility, which is used to qualify our welders to ASME Section IX and assist in maintaining their exemplary skill levels.

Westinghouse will provide safety glasses. Participants should wear durable footwear and long pants. No high heels or open toe shoes and no skirts or dresses for women. Tour participants will not be permitted to bring bags into the facility. Registration will be required in advance and a valid form of ID will be required on-site. Tour participation is subject to review by Westinghouse. The minimum tour requirement is 20 people, with a cap of 45.

Technical Tours

MONDAY, JUNE 27, 2016

Westinghouse Columbia Fuel Fabrication Facility
8:00 am – 2:00 pm (box lunch will be provided); Cost: $25 per person
Bus departs at: 8:00 am (arrive for loading at 7:45 am)
From: Martin Luther King, Jr. Blvd. Exit, Charlotte Convention Center

The Columbia Fuel Fabrication Facility is part of Westinghouse Electric Company's Nuclear Fuel business and is one of the largest facilities of its kind in the world. The site houses the fuel manufacturing facilities, product engineering and testing laboratories, and fuel marketing and contract administration. Covering 1,155 acres that includes 550,000 square feet of manufacturing and office space, the Columbia Fuel Fabrication Facility employs about 1,124 personnel.

Nuclear fuel fabricated here is used in commercial reactors worldwide to generate electricity. Fuel and fuel-related products are provided to reactors across the U.S., as well as being exported to other countries and regions, including: Belgium, Brazil, China, Czech Republic, France, Japan, Slovenia, South Korea, Spain, Sweden, Taiwan and the United Kingdom. Nuclear power plants produce about 20 percent of the electricity generated in the United States. About 10 percent of U.S. electricity comes from nuclear fuel manufactured by Westinghouse at the Columbia Fuel Fabrication Facility.

Westinghouse will provide safety glasses and steel toe shoe covers. Tour participants will not be permitted to bring bags into the facility. Registration will be required in advance and a valid form of ID will be required on-site. Tour participation is subject to review by Westinghouse. The minimum tour requirement is 20 people with a cap of 50.

THURSDAY, JUNE 30, 2016

Pioneer Motor Bearing
8:00 am – noon; Cost: $25 per person
Bus departs at: 8:00 am (arrive for loading at 7:45 am)
From: Martin Luther King, Jr. Blvd. Exit, Charlotte Convention Center

Tour participants will get to see an operating precision machine shop that manufactures fluid film bearings for all of the major OEMs. The bearings are seen in gas turbines, steam turbines, hydro turbines, and other rotating machinery. Highlights include a demonstration of centrifugally casting Babbitt metal to a steel bearing shell, QA demonstrations of ultrasonic testing, and technical content presented by Dr. Lyle Branagan (subject matter expert for EPRI).

All tour participants must wear closed-toe shoes. Steel- toed shoes are not required. Eye protection must be worn at all times, and Pioneer will provide everyone with safety glasses. Tour participation is limited to US nationals. No photography or videos will be allowed. Tour participation is subject to review by Pioneer Motor Bearing. Advance registration will be required. This tour caps at 50 attendees with a minimum of 10 attendees.

THURSDAY, JUNE 30, 2016

Duke Energy Renewable Energy Command Center - FULL
9:00 am – 10 am OR 11:00 am - noon
Cost: Complimentary, however advance registration is required
Tours depart at: 9:00 am (meet at 8:45 am) OR 11:00 am (meet at 10:45 am)
From: Martin Luther King, Jr. Blvd. Exit, Charlotte Convention Center

Duke Energy's Renewable Energy Command Center in Charlotte, N.C., uses powerful and secure technology to monitor wind and solar power plants across the country. Duke Energy entered the wind power business in 2007 and launched its commercial solar power business in 2009. The Center provides critical monitoring and control services for all of Duke Energy Renewables' operating assets, which total more than 2,500 megawatts(MW) of wind and solar energy. As well as optimizing its own assets, the business offers these services to third-party renewables operators through Duke Energy Renewable Services.

Each tour caps at 20 attendees. Note that these tours will depart from the Charlotte Convention Center and attendees will WALK to/from the Command Center. It will take approximately 5 minutes from the Convention Center to the Command Center. No photography or videos will be allowed.

THURSDAY, JUNE 30, 2016
GUEST TOUR

The Carolina Aviation Museum Tour and the Lake Norman Sightseeing Cruise
Thursday, June 30, 2016
10:15 am – 3:45 pm ; Cost: $77.50 per person
Bus departs at: 10:15 am (arrive for loading at 10:00 am)
From: Martin Luther King, Jr. Blvd. Exit, Charlotte Convention Center

Our first stop will be a visit to the Carolina Aviation Museum (a one hour guided tour and narrative about U.S. Airways Flight 1549 "Miracle on the Hudson" is included). Next, step back in time when the paddle wheel boat was the queen of the lake. You'll tour Lake Norman on the paddle wheel boat as you cruise the lake and take in the beautiful area sites & homes.

Tour includes: Escort, luxury transportation, admission fees and boarding pass
Tour Time: 5 hours
Minimum: 23 attendees

PERFORMANCE TEST CODE WEEK

All Meetings will be held at the:
Hilton Charlotte Center City, 222 E 3rd Street

WEDNESDAY, JUNE 22, 2016

PTC 52 Concentrated Solar Power Plants Committee
8:00 am - 5:00 pm; Room: Walker A/B

THURSDAY, JUNE 23, 2016

PTC 52 Concentrated Solar Power Plants Committee
8:00 am - 5:00 pm; Room: Gwynn

FRIDAY, JUNE 24, 2016

PTC 52 Concentrated Solar Power Plants Committee
8:00 am - 12:00 pm; Room: Gwynn

SUNDAY, JUNE 26, 2016

TWDP Turbine Water Damage Prevention Committee
12:00 pm - 5:00 pm; Room: Graham

MONDAY, JUNE 27, 2016

Reliability, Availability, and Maintainability (RAM) of Power Plants Committee
8:00 am - 5:00 pm; Room: Walker A/B

PTC 19.1 Test Uncertainty Committee
9:00 am - 5:00 pm; Room: Waring

PTC 19.3 Temperature Measurement Committee
9:00 am - 5:00 pm; Room: Johnson

TUESDAY, JUNE 28, 2016

PTC 19.1 Test Uncertainty Committee
9:00 am - 5:00 pm; Room: Waring

PTC 19.6 Electrical Power Measurement Committee
9:00 am - 5:00 pm; Room: Johnson

PTC 53 Mechanical and Thermal Energy Storage Systems Committee
8:00 am - 12:00 pm; Room: Ardwell

TES Thermal Energy Storage Safety Committee
1:00 pm - 6:00 pm; Room: Ardwell

RAP Standard Committee on Power Plant Reliability, Availability and Performance Committee
5:00 pm - 7:00 pm; Room: Walker

WEDNESDAY, JUNE 29, 2016

PTC 6.2 Steam Turbines in Combined Cycles Committee
9:00 am - 5:00 pm; Room: Walker A/B

PTC 19.5 Flow Measurement Committee
9:00 am - 5:00 pm; Room: Gwynn

PTC 19.6 Electrical Power Measurement Committee
8:00 am - 3:00 pm; Room: Waring

PTC 22 Gas Turbines Committee
8:00 am - 4:00 pm; Room: Johnson

THURSDAY, JUNE 30, 2016

Performance Test Code (PTC) Standards Committee
8:00 am - 4:00 pm; Room: Gwynn

ASME Standards & Certification

BOARD ON NUCLEAR CODES & STANDARDS MEETINGS & ACTIVITIES

All Meetings will be held at the: Hilton Charlotte Center City, 222 E 3rd Street

MONDAY, JUNE 27, 2016

Committee on Board Operations/Committee on Board Strategic Initiatives (Nuclear Codes & Standards):
8:00 am-11:45 am
Piedmont Ballroom - North Carolina Hall, Third Floor, Closed Meeting

Joint Board on Pressure Technology Codes and Standards/ Board on Nuclear Codes & Standards Luncheon:
Noon – 1:30 pm
Piedmont Ballroom – South Carolina Hall, Third Floor, Closed Event

Joint Board on Pressure Technology Codes and Standards/ Board on Nuclear Codes & Standards:
2:00 pm – 4:30 pm
Piedmont Ballroom- Mecklenburg Hall, Third Floor, Open Meeting

Reception-Board on Pressure Technology Codes and Standards/ Board on Nuclear Codes & Standards:
5:30 pm-7:00 pm
Piedmont Ballroom – South Carolina Hall, Third Floor, Closed Event

TUESDAY, JUNE 28, 2016

Board on Nuclear Codes and Standards:
8:00 am- noon
Piedmont Ballroom- North Carolina Hall, Third Floor, Open Meeting

Board on Pressure Technology Codes and Standards:
8:00 am-3:00 pm
Piedmont Ballroom- South Carolina Hall, Third Floor, Open Meeting

MONDAY, JUNE 27, 2016

Cybersecurity Sessions
Location: Charlotte Convention Center, Room 208A

Session 1: 11:15 am – 1:00 pm
Session 2: 2:00 pm – 3:45 pm

Presenters:

Massoud Amin, Director of the Technological Leadership Institute (TLI) and Professor of Electrical & Computer Engineering (ECE), University of Minnesota

Michael Assante, SANS lead for Industrial Control System (ICS) and Supervisory Control and Data Acquisition (SCADA) security and co-founder of NexDefense

Cynthia Larose, Chair of Mintz Levin's Privacy & Security Practice and a Certified Information Privacy Professional (CIPP)

Protecting the Grid, Power Generating Facilities & More.
Session 1 will consist of an "overview" panel with brief 3-5 minute presentations from each presenter followed by a Q&A session.

Session 2 will include more in-depth 10-15 minute presentations by our presenters and it will also include additional Q&A. Learn about the legal analysis of liability if the "owners" of the utility transmission and public-facing power delivery systems fail to step up their internal cybersecurity game, plus what enables effective cyber defenses, system resilience and engineering, and necessary operational practices to deal with our future (including deconstructing the recent cyber attacks on the Ukraine power system) and much more!

MONDAY, JUNE 27, 2016

FutureME Mini-Talks & Social Meetup
2:30 pm- 4:00 pm
Location: Charlotte Convention Center, Room 208B

Presented by the ASME ECE Programming Committee

Join the ECE Programming Committee for a 90 minute social experience! You will have the opportunity to hear four short, relevant, and inspirational Mini-Talks given in an informal setting by experienced early career engineers sharing their perspective on career development. Advanced registration required.

In addition to the mini-talks, you can meet up with other mechanical engineers that have similar interests, to network professionally, and make new connections with ASME leadership and/or renew past friendships.

Bring plenty of business cards for networking! Ice cream will be served!

Event Highlights
• Opportunity to get connected with fellow early career engineers
• Mini-Talks covering diverse topics relevant for early career engineer career development
• Ice Cream will be served to create an informal setting for networking

Program Moderator:
Eduardo Jose Barrientos, Ph.D., Senior Technology Systems Engineer, GM Global Propulsion Systems - Torino

FutureME Mini-Talks and Presenters:

"Defining Disrupting and Changing Technologies through Codes and Standards"
Dan Comperchio, P.E., Senior Engineer, Willdan Energy Solutions

Early in the career of engineers, a particularly daunting challenge many face is understanding the large body of codes and standards within their industry. This can be compounded by industries and technologies that are rapidly evolving at rates that codes and standards struggle to keep up with. Regardless of experience, code committees value input from a wide range of backgrounds, providing a rich environment for exchanging ideas, exposure to a broader cross-section of the industry and the opportunity to connect with peers impacting the direction of the industry. In this talk, Dan will draw on his experience working in an industry undergoing explosive growth and constant innovation and the challenges in the development of codes and standards. He will discuss the importance of early career engineers engaging in the process and the opportunities the experience presents, as a core group of experts and leaders help shape technologies and industries.

"Making a Gigaton of Difference"
Marta C. Hatzell, Ph.D., Assistant Professor, Georgia Institute of Technology

As new employees in any organization, early career engineers are challenged to be able to quickly make a contribution and become leaders in their area of expertise. In Marta's field of sustainable

energy, her new role gave her the opportunity to potentially reduce CO2 emissions by at least a gigaton. In order to quickly make a direct impact, she realized she would need to pivot from the original career path she initially envisioned for herself. Deviating from that known path is always uncomfortable, however, doing so allows you to make significant contributions. This talk will highlight the key steps you must take to insure you have the potential to make a gigaton of difference in their field.

"Taking Ownership as a New Engineer"
Jeffrey Gibson, Ph.D., Combustion Heat Transfer Designer, Siemens Energy

Taking ownership of your project is essential for success as an engineer. However, many things may complicate this task. For new engineers, these complications could be adjusting to new roles as well as to one's place in a larger organization. In this talk, Jeffrey Gibson will discuss three areas in which any engineer can demonstrate ownership, regardless of experience level. Drawing on the experience of his first large-scale design project, Jeffrey illustrates how taking ownership will place an engineer in a position to make a significant contribution to their organization.

"Incentives to Pursuing a Career in the Public Sector"
Jovica R. Riznic, Ph.D., FASME, Technical Specialist, CNSC

We live and work in a world of constant change, characterized by corporate globalization; multinational products, and geographical and cultural differences and needs, just to name a few of the different challenges. Productivity and efficiency demands us to do more with less, to navigate through mergers and acquisitions and get a flatter and leaner organizational structure, which only contributes to the uncertainty and complexity of balancing personal and professional life. These challenges are not only typical for private sector but for public sector as well. The public sector brings its own complexities of valuing and integrating engineering principles into making policy and regulations, balancing between the interests of business and the public, and not to mention a common perception of the public sector as a burden on taxpayer's shoulders. In his talk, Jovica will provide a personal perspective on career transition as an engineer from academia and research to public service. He will provide insights and discuss the general perception of public service and how we can all improve our professional life management as engineers.

MONDAY, JUNE 27, 2016

Power & Energy/ICONE 24 Welcome & Event-Wide Keynote Session
4:15 pm – 6:00 pm
Richardson Ballroom

Master of Ceremonies
Timothy Graves, Director of Conferences and Events, ASME

Moderator
David Walsh, Editor in Chief, ASME.org

Welcome Remarks

Keith Roe, President of the American Society of Mechanical Engineers, 2016-2017

Roe, a fellow of ASME, has been an active member of the Society for more than 40 years. Throughout his distinguished association with ASME, Roe has held a number of leadership positions including a three-year term as a member of the Board of Governors (2008-2011), founding chair (1987-96) and a current member of the ASME Industry Advisory Board, a member and chair of the ASME Foundation's Board of Directors (1994-2007), where he currently serves as chair emeritus, and served as chair of the Board of Trustees (1998-2008). His committee work included tenures on the Committee on Governance, Committee on Investments, and the Committee on Planning and Organization among others.

Roe recently retired as chairman, president and chief executive officer of Burns and Roe Enterprises, Inc., a company that his grandfather Ralph Coats Roe founded in 1932. Keith Roe joined the Oradell, NJ-based company in 1974 as a design engineer. At his retirement, Burns and Roe Enterprises was one of the leading power engineering, procurement, construction services firms in the world.

Among his many professional associations, Roe is a member of the National Academy of Construction, the Nuclear Energy Institute, the National Society of Professional Engineers, and is the founding co-chair of the board of directors of FIATECH, a non-profit construction industry consortium. He is a member of the United States Energy Association, the American Nuclear Society, and the American Society of Civil Engineers.

Roe is the recipient of many honors and recognitions including the ASME Dedicated Service Award and the prestigious ASME President's Award. He is a recipient of the Society's Outstanding Leadership Award and the ASME Foundation Legacy Award.

Roe received his Bachelor's degree in mechanical engineering from Princeton University and earned his Master's degree and Engineer's degree in nuclear engineering from the Massachusetts Institute of Technology, Cambridge, Mass. He also attended the Harvard Business School, Program for Management Development.

In 1969, Roe received his commission from the U.S. Navy Officer Candidate School, Newport, RI, and served in active duty in the U.S. Navy (1968-1974) before being honorably discharged with the rank of lieutenant.

Roe also holds the distinction of being the first ASME president whose father was also president of the Society. Kenneth Andrew Roe served as the Society's 90th president during the 1971-72 term.

Roe currently serves as a consultant in the energy field.

Dr. Kikuo Kishimoto
Dr. Kikuo Kishimoto is currently a Professor of the Department of Transdisciplinary Science and Engineering, Dean of School of Environment and Society and also Dean of Graduate School of Engineering, Tokyo Institute of Technology. He received his B.S. degree in 1975, M.S. degree in 1977, and Doctor of Engineering degree in 1982 from Tokyo Institute of Technology. He worked as a Research Associate and Associate Professor at Tokyo Institute of Technology from 1977 to 1995. During this period, he was a Visiting Scholar at Cambridge University from 1987 to 1988. He served as Vice President for education in 2012.

He has published over 250 journal papers in the areas of applied mechanics, fracture mechanics, reliability of microelectronic devices, and others. He has also published authoritative and widely used reference books in these fields. In 1980 and2000, he was awarded the JSME Medal for Best Paper for his contributions to dynamic fracture mechanics and interfacial mechanics, respectively. He also received the Best Paper Award from Japan Society of Corrosion Engineering in 1993, Society of Materials Science Award for Academic Contribution in 2006, and JSME Materials and Mechanics Division Achievement Medal in 2007 and Contribution Medal in 2014.

He is the 94th President of Japan Society of Mechanical Engineers, a fellow of Society of Automotive Engineers of Japan and a fellow of American Society of Mechanical Engineers. He was a member of Science Council of Japan and served as a chairman of mechanical engineering committee during 2011-2014. He has also served and chaired on various scientific and technological committees promoting research and education. He is a vice-president of Japan Accreditation Board for Engineering Education (JABEE).

Wang Delin, Secretary General CNS
Mr. Wang was born in 1964. In 1985, he graduated from Changchun College of Geology, with a Bachelor's degree of Engineering. After that, he entered Beijing Research Institute of Chemical Engineering and Metallurgy (BRICEM) and got his Master's degree in Nuclear Chemistry in 1988. He started his career in BRICEM, holding positions including Assistant Engineer, Engineer and Senior Engineer. From 2006 to 2010, Mr. Wang took the position as the General Manager of CNNC JinYuan Uranium Industry Company. In 2011, he began to work as the Secretary General of Chinese Nuclear Society.

Frank Michell, Manager, Applications Engineering & Balance of Plant, American Electric Power (AEP) Power & Energy/ICONE 24 Executive Advisory Committee Chair

Frank Michell is Manager of the Applications Engineering and Balance of Plant Mechanical Equipment Group of the Engineering Services Organization of American Electric Power responsible for providing engineering services to AEP's Fossil Hydro Generating Fleet in the areas of Mechanical Engineering Analysis (fluid mechanics, thermodynamics, heat transfer, stress analysis & CFD modeling), fire protection engineering and balance of plant mechanical equipment & system expertise/design basis for pumps, heat exchangers, cooling towers, HVAC & dust collection and other misc. equipment. Frank is active in several industry organizations including the Cooling Technology Institute, EPRI and ASME. Frank has previously been Chair of the ASME Heat Exchanger Committee and Chair of the ASME Power Division. Frank is currently serving on the ASME Energy Conversion & Storage Segment Committee and is Chair of the Executive Advisory Committee for the ASME 2016 Power & Energy Conference. Frank is Treasurer and Immediate Past President of the Cooling Technology Institute. Frank holds a BS Degree in Mechanical Engineering from Polytechnic Institute of New York and is an ASME Fellow.

Event-Wide Keynote Session

John Elnitsky, Senior Vice President of Nuclear Engineering, Duke Energy
Duke Energy Planning for the Road Ahead

John Elnitsky serves as senior vice president of nuclear engineering for Duke Energy. He is responsible for corporate and site engineering for Duke Energy's fleet of nuclear reactors, including reactor core design, nuclear safety analysis, nuclear fuel management and procurement, systems engineering, design engineering, and engineering technical programs. Duke Energy operates 11 nuclear reactors at six nuclear sites in the Carolinas. He assumed his current position in January 2016.

Elnitsky earned a Bachelor of Science degree, with distinction, in mechanical engineering from the United States Naval Academy in Annapolis, Md. He holds both a Master of Science degree and an advanced degree in mechanical engineering from the Naval Postgraduate School in Monterey, Calif. He is also a graduate of Naval Power School and completed executive business education programs at the University of California at Berkley's Haas School of Business and the University of North Carolina's Kenan-Flagler School of Business. Elnitsky is a certified project management professional by the Project Management Institute and a member of the American Nuclear Society and the American Society of Mechanical Engineers.

Andrew J. Lammas, Vice President of Gas Power Technology, GE Power
Powering Everyone: GE's Relentless Effort to Bring Power to Those in Need

John was born in Bromsgrove, England and undertook an undergraduate apprenticeship with Rolls-Royce PLC studying Mechanical Engineering at Salford University in Manchester, England. After graduating with a first class honors degree, he held several assignments in the area of gas turbine design with Rolls-Royce.

In 1985 John joined GE Aircraft Engines in Cincinnati, Ohio and held a number of technical and managerial roles in design, systems and product support engineering. These experiences afforded John significant knowledge of the design and operation of GE's fleet of engines, which in turn allowed him to make major contributions to the success of many of the engine families, including the GE90, CF6 and CFM56.

In early 2007 John was promoted to General Manager and Chief Engineer for GE Energy in Greenville, South Carolina. The following year he was promoted to General Manager of Thermal Systems and Gas Turbine Engineering. In 2010 John was named Engineering Vice President, GE Oil & Gas located in Florence, Italy. He then moved back to Greenville, SC, in 2012, as Vice President of Gas Power Technology for GE Power and is currently in this role.

B. Chris Tye, President, Power, Fluor Corporation
Building the Next Generation of Power - Insights from Fluor on the Global Power Market

Chris is the President of Fluor's Power Business, responsible for Fluor's fossil, renewables, nuclear, environmental and maintenance power markets. He has more than 40 years of experience with Fluor in all aspects of engineering, procurement, construction, maintenance, operations, and sales.

Previously, Chris served as the Senior Vice President of Operations and Global Leader of nuclear power business for Fluor.
His sales experience includes the start-up and staffing of two new sales organizations that were focused on providing services to operating nuclear power plants and management of global marketing and sales for the Duke/Fluor Daniel power partnership and the Mining and Metal division. His operations experience includes engineering, procurement, contracts, construction, and maintenance of hydro, fossil, and nuclear power plants.
He has also trained and consulted more than 300 company managers in "Kepner Tregoe" problem analysis and decision-making concepts, working with all levels of Fluor and client management.

Chris has served in numerous people development roles including the Fluor Leadership Development Forum (chairman), the Fluor Sales People Development Forum, the Fluor Corporate Sales Board, and the Fluor Power Group People Development Forum.
He is a member of numerous industry organizations including the American Nuclear Society (ANS), the Nuclear Energy Institute (NEI), and the Institute of Nuclear Power Operations (INPO). Chris also serves on the Civil Industry Nuclear Trade Advisory Committee (CINTAC) of the U.S. Department of Commerce, the Citadel School of Engineering Industry Advisory Board, and the Western Carolina University Construction Industry Advisory Board.
Chris has a bachelor's degree in Civil Engineering from The Citadel and a master's degree in Engineering and Construction Management from the University of Missouri. He is a Registered Professional Engineer.

Opening Reception
NASCAR Hall of Fame Opening Reception
400 East Martin Luther King, Jr. Blvd. Entrance
Monday, June 27, 6:30 pm- 8:30 pm

Full registration fees include admission to the NASCAR Hall of Fame reception. Guests over 16 years of age accompanying registrants must purchase a guest registration to attend the reception. Tickets are sold at the registration counter and cost $100. One guest registration allows access to both receptions, the keynote and the exhibit floor.

Women in Engineering Lunch
Tuesday, June 28, 2016; 12:00 pm – 1:30 pm, Room 207A

Join us for a special lunch for our female engineers! Network with your colleagues and hear from two speakers who will share their perspectives as engineers at this informal lunch.

Speakers:

Lea Boche, Heat Rate Improvement Program, Electric Power Research Institute

Lisa Davies, PE, Mechanical Discipline Supervisor – Fluor Nuclear Power Division, Fluor Enterprises, Inc.

Exhibitors & Sponsors Reception & Event-wide Poster Competition
Tuesday, June 28; 5:45 pm – 7:30 pm

Exhibit Hall C, Convention Center, Exhibit Level
Guests over 16 years of age accompanying registrants must purchase a guest registration to attend the reception. Tickets are sold at the registration counter and cost $100. One guest registration allows access to both receptions, the keynote and the exhibit floor.

Posters
Posters will be presented at the Tuesday evening reception and remain up until Wednesday, June 29 in Exhibit Hall C. Authors should have their posters set up by NOON, Tuesday, June 28 and removed by 5:00 pm, Wednesday, June 29.

Exhibitor Presentations
Expo Hall C, Exhibit Stage
Tuesday, June 28

1:15 pm - 1:45 pm
Lectrodryer: *Hydrogen Cooled Generator Auxiliary Upgrades*

2:00 pm - 2:30 pm
Bentley Systems: *Importance of Structural & Pipe Stress Integration for Earthquake Design on Power Plants Plus our Hot Clash Detection for Safe Operation*

2:45 pm - 3:15 pm
Allied Technical Resources: *Working Smarter and Safer- Generator Alignments Under Two Hours*

3:30 pm - 4:00 pm
Applied Flow Technology: *Fluid System Modeling Select Topics: 1) Sonic Choking and Gas/Steam Relief Systems, 2) Waterhammer and Resulting Pipe Forces, 3) Pump Sizing and Selection*

5:00 pm - 5:30 pm
Thielsch Engineering: *Asset Management Solutions for High Energy Piping Integrity and Boiler Reliability Programs*

Conference Award Galas

Energy Sustainability & Fuel Cell Conference Awards Gala
Tuesday, June 28, 7:30 pm – 10:00 pm
Westin Hotel, 601 South College Street, Room: Providence Ballroom
Ticket required

Yellott Award & Lecture

Yellott Award Winner: **Prof. Dr. Christian Sattler**
Perspective of Solar Fuels to Achieve the COP21 Goals

Prof. Dr. Christian Sattler is head of the Department of Solar Chemical Engineering at the German Aerospace Center's Institute of Solar Research (http://www.dlr.de/sf/en/desktopdefault.aspx/tabid-7159/11923_read-28158/). He is also professor for solar fuel production at the Technical University of Dresden; As the key area of his work is the production of fuels especially hydrogen by solar thermo- and photochemical processes.

He has published over 300 papers - including 119 refereed journal papers, and has 14 patents. Between 2006 - 2008 he served as the technical committee chair for solar chemistry and bioconversion for the ASME Solar Energy Division. From 2009-2014 he was a member of the executive committee and from 2012-2013 its chair. Since 2015 he serves on the ASME Leadership Team for Energy Conversion and Storage.

He also serves as vice president of the research association at N.ERGHY (www.nerghy.eu), member of the European Joint Technology Initiative for Fuel Cells and Hydrogen, and the national representative to Task VI of the IEA's SolarPACES and Task 35 of the Hydrogen Implementing Agreements.

Special Events

Power Division Awards Gala

Wednesday, June 29, 7:30 pm – 10:30 pm
Old Mecklenburg Brewery, 4150 Yancey Rd.
Ticket required.
Bus departs at: 7:30 pm (arrive for loading at 7:15 pm)
from: Martin Luther King, Jr. Blvd. Exit, Charlotte Convention Center

2016 Prime Movers Award Winner

The ASME Power Conference is pleased to recognize the achievements of the Prime Movers Award. The Prime Movers Committee Award recognizes outstanding contributions to the literature of thermal electric station practice or equipment which are available through public presentation and publication.

The Prime Movers Committee of the Edison Electric Institute established the award in 1954.

The 2016 Prime Movers Award Winner is:

Weizhong Feng is the General Manager of Shanghai Waigaoqiao No. 3 (WGQ3) Power Generation Co., LTD., and at the same time is also the General Manager of Shanghai Shenergy Energy Technology Co., LTD. He is a professor of engineering, and an adjunct professor in Tsinghua University, Shanghai University of Electric Power, North China Electric Power University, and Southeast University. He is also a vice chairman of the China Energy Society, a boiler committee member of the Chinese Society of Power Engineering and a turbine committee member of the Chinese Society for Electrical Engineering and a vice president of the automation committee of Shanghai Society for Electrical Engineering. He owns more than 40 patents and has published 42 academic studies. At present his research interests are Ultra-supercritical power generation technology and energy saving and emission reduction technology.

PowerEnergy 2015-49551
Developing Green, Highly Efficent Coal-Fired Power Technologies

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ASME

ASME helps the global engineering community develop solutions to real world challenges. Founded in 1880 as the American Society of Mechanical Engineers, ASME is a not-for-profit professional organization that enables collaboration, knowledge sharing, and skill development across all engineering disciplines, while promoting the vital role of the engineer in society. ASME codes and standards, publications, conferences, continuing education, and professional development programs provide a foundation for advancing technical knowledge and a safer world.

Visit: www.asme.org
Booth: 218

Platinum

Duke Energy

Duke Energy is one of the largest electric power holding companies in the United States. Its regulated utility operations serve approximately 7.4 million electric customers located in six states in the Southeast and Midwest, representing a population of approximately 24 million people. Its Commercial Portfolio and International business segments own and operate diverse power generation assets in North America and Latin America, including a growing portfolio of renewable energy assets in the United States.

Headquartered in Charlotte, N.C., Duke Energy is a Fortune 125 company traded on the New York Stock Exchange under the symbol DUK. More information about the company is available at duke-energy.com.

Visit: www.duke-energy.com

Gold

Westinghouse

Westinghouse provides the most reliable, dependable nuclear power plants, nuclear fuel, nuclear plant automation and operating plant products and services. Our vision is simple -- to be the first to innovate the next technology, practice or solution that helps us help customers generate safer, cleaner, more reliable energy for more people and a better planet.

Visit: www.westinghousenuclear.com
Booth: 716

Silver

E4Carolinas

E4 Carolinas is the trade association for organizations engaged in the Carolinas energy economy. Member companies create more value for themselves and become more successful through collaboration with other Carolinas energy organizations in the areas of workforce development, economic development, innovation & capital, communications and policy.

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Booth: 610

Siemens

Siemens AG is a global technology powerhouse that has stood for engineering excellence, innovation, quality, reliability and internationality for more than 165 years. The company is active in more than 200 countries, focusing on the areas of electrification, automation and digitalization. One of the world's largest producers of energy-efficient, resource-saving technologies, Siemens is No. 1 in offshore wind turbine construction, a leading supplier of combined cycle turbines for power generation, a major provider of power transmission solutions and a pioneer in infrastructure solutions as well as automation, drive and software solutions for industry. The company is also a leading provider of medical imaging equipment and a leader in laboratory diagnostics as well as clinical IT.

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Curtiss-Wright
Curtiss-Wright Nuclear Division provides engineered solutions for Fleet Asset Management and Optimization Solutions (FAMOS). The FAMOS integrated suite of solutions has set the benchmark for technology used to optimize asset performance and reliability for improved stakeholder value. For over three decades of power generation industry experience, FAMOS has delivered advanced technology for monitoring, detecting and diagnosing problems by analyzing vast plant data, thereby anchoring your operation with a business case.

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Fluor
Fluor is a FORTUNE 500 company that delivers engineering, procurement, construction, maintenance (EPCM), and project management to governments and clients in diverse industries around the world. For over a century, clients have selected Fluor as their company of choice to complete challenging projects in remote parts of the world.

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Delegate Bag Insert

Krell Institute
The Department of Energy National Nuclear Security Administration Stewardship Science Graduate Fellowship offers similar opportunities to students pursuing a Ph.D. in areas of interest to stewardship science, such as high-energy density physics, low-energy nuclear science, or properties of materials under extreme conditions.

Visit: www.krellinst.org/ssgf

EXHIBITORS

A.D. Tubi Inossidabili
A.D. Tubi is a world manufacturer of welded tubes for the power generation, making stainless steel, duplex, superduplex, lean duplex, nickel alloys, ferritic and superferritic steels and titanium. We proudly provide the highest quality tubing for condensers and low stress u-tubes for feedwater heaters from .281'' to 2.500'' OD.

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Air Monitor Power Division
Air Monitor Power designs and manufactures coal mass flow and airflow measurement solutions for combustion optimization and boiler diagnostics. Air Monitor Power systems accurately measure individual burner air and coal flows, as well as Primary Air, Secondary Air, Over-Fired Air, FGR, SCR, and others. Air Monitor Power also provides engineering flow studies and three dimensional traverse testing services.

Air Monitor Power's proven solutions help improve overall coal-fired plant performance and reduce emissions.

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Allied Technical Resources, Inc.
Allied Technical Resources, Inc. (ATR) has supported the Power Sector with quality professional and technical staffing resources for over 25 years. The four executives have a combined 120+ years of experience in the industry, each having worked for A/E firms, power utilities, and Nuclear Steam Supply System providers. We understand the market and our customer's goals. Today, ATR is widely recognized as a preferred provider to deliver cost competitive solutions.

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Applied Flow Technology
Applied Flow Technology has grown to be a leader in the pipe flow modeling software market. With a primary focus on developing high quality fluid flow analysis software, AFT has a comprehensive line of products for the analysis and design of piping and ducting systems.
With channel partners around the world and customers in more than 70 countries, AFT software has helped companies in many industries design safer, more efficient systems and solve operational problems.

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Atlas Copco Tools & Assembly
Atlas Copco provides bolting tools to the Fabrication and Maintenance industry, including hydraulic bolt tensioners, hydraulic and pneumatic torque wrenches and electric transducerized wrenches. Atlas Copco is a world-leading provider of innovative compressors, construction and mining equipment, power tools and assembly systems. Atlas Copco offers Hydraulic Nuts and CAM Nuts (TR) for use with existing Bolts to change Torque Applications to a Tensioned applications. Products rated for 1100 degrees F.

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Bentley Systems
Bentley Systems is a software development company that supports the professional needs of those responsible for creating and managing the world's infrastructure, including roadways, bridges, airports, skyscrapers, industrial/power plants, and utility networks. Bentley delivers solutions for the entire lifecycle of the infrastructure asset, tailored to the needs of the various professions – the engineers, architects, planners, contractors, fabricators, IT managers, operators and maintenance engineers – who will work on and work with that asset over its lifetime.

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Cambridge University Press is a not-for-profit organization that dates from 1534 and is part of the University of Cambridge. Our mission is to unlock people's potential with the best learning and research solutions by combining state-of-the-art content with the highest standards of scholarship, writing and production. Visit our stand to browse new titles, available at 20% discount, and pick up free journal sample copies.

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Capture 3D, Inc.
Capture 3D is a leader in innovative non-contact 3D measurement solutions that optimize 3D scanning, inspection, and reverse engineering applications for product development, manufacturing, and production. Our cutting-edge technology and intelligent software quickly obtains accurate full part geometry to rapidly solve engineering issues, prevent future problems, and eliminate costs/rework while improving quality.

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Clean Air Engineering
CleanAir's Performance Group offers performance testing and consulting services for a variety of power plant components and systems. Services include:

- New Plant or Component Acceptance Testing;
- Heat Rate and Capacity Assessments;
- Efficiency Testing for Boiler, Air Heaters, Steam and Gas Turbines;
- Acoustic Baseline and Acceptance Testing; and
- Cooling Tower Thermal Performance and Drift Emissions Testing.

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Combustion Technologies, Inc.
Combustion Technologies Corporation provides the North American Power Industry with the equipment and services (integration, start-up & maintenance) necessary for combustion optimization. We specialize in combustion air and pulverized coal flow measurement and control as well as flue gas analyzers: CO, O2 and NO. Through partnerships with industry leaders, CTC offers premier products for boiler optimization and efficiency.

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Conco Services Corporation
Conco Services Corporation is the world leader in off-line mechanical tube cleaning. From power generation to polymers, alumina to refineries, Conco technicians have restored efficiency and reliability to over 150 million condenser and heat exchanger tubes worldwide. In addition to cleaning services, Conco is a leading provider of nondestructive testing services, including IRIS, RFT, eddy current and tracer gas leak detection.

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Curran International
Curran International is a company comprised of creative problem solvers, and is known worldwide as a turnkey heat exchanger solutions provider. We offer a wide range of both field and shop services to the power, petro-chemical, pulp and paper and various other industries. Our experienced personnel work directly with our clients by offering comprehensive solutions designed to enhance equipment performance and reliability through cleaning, NDE, hydraulic liners, explosive tube plugging, coating, retubing and other services.

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Day & Zimmerman
Day & Zimmermann is the world's leading full-scope, turnkey condenser retubing contractor with more than 35 years of experience providing innovative products and services for condensers and heat exchangers. Our extensive portfolio includes vibration analysis and resolution, expansion joint replacement, helium leak detection, tube cleaning and consulting services.

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DevonWay
Founded in San Francisco in 2005, DevonWay has become a leading provider of Continuous Improvement and Asset Management Apps to Fortune 500 customers across industries as diverse as Energy, Government, and Construction. Its platform-based applications are designed to give users real-time operational insight by being highly configurable, easy to use, quick to deploy, available on mobile devices, and easy to integrate with legacy systems provided by vendors like SAP, IBM Maximo, ABBlVentyx, and Oracle.

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Elsevier
Elsevier is a leading provider of energy books, journals, and databases. We provide trusted content, along with the tools and technology to help drive innovation. Come visit our booth to view our latest titles.

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Energy-Tech
Energy-Tech magazine is dedicated to the engineering, operations and maintenance of electric power plants. In Association with the ASME Power Division, it delivers quality technical information to more than 14,000 engineers, plant maintenance and operations personnel, and senior level management in the power generation industry. Energy-Tech is published in print and online at Energy-Tech.com. It also delivers a free weekly email newsletter and hosts a wide assortment of training webinars and online courses.

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F&B Mfg. LLC
F&B is a contract manufacturer specializing in complex sheetmetal forming, hydroforming, welding, heat treating, vacuum brazing, laser cutting & machining, CNC machining, FPI, Water jet cutting in-house tool design & fabrication and assembly. Materials handled include stainless steel, aluminum, steel, titanium, brass, copper, Inconel, and brass alloys sheet metal assemblies, engine components, auxiliary power unit parts and environmental control systems parts. Markets served include Aerospace, Defense/Military, Industrial Gas Turbines, Semiconductor, and Commercial industries

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Fronius has the perfect solution for every application area. From compact Stick Welders, MIG and TIG applications to complex automated welding systems. The secret of our lead in innovation: all products are developed in collaboration with those who use them. This means that all Fronius products are tested in real-life situations; ensuring they are reliable and user-friendly. With our dedicated sales and support staff, Fronius USA will support your company's needs.

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Gateway Consulting
Gateway designs and deploys electronic document management solutions built on the leading information technology platforms. We excel at business process improvement scenarios that demand industry-focused expertise and exceptional information technology skills. Gateway delivers business collaboration solutions for industries' most demanding, document-centric applications. Highly qualified consultants and analysts are assigned to every engagement. We leverage an organization's existing IT investments and rapidly deploy world-class information management solutions.

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Hitachi Zosen
Based on the technologies accumulated since 1881, Hitachi Zosen is forging ahead as an innovator providing products and services. Our main business domains are Environment and Plants, Machinery and Process and Nuclear Fuel Cycling-related Equipment, Marine Disaster Prevention Systems. One of the product line of Marine Disaster Prevention Systems called "Flap-Gate", which uses the natural forces, can prevent nuclear power plants from natural disasters such as flooding and tsunamis with high standards of reliability.

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Holloway Houston
Holloway Houston, Inc. is the United States' largest single-location sling shop and testing complex. Our company, Holloway Houston, offers everything that's needed for your industrial lifting needs, combining quality products with state-of-the-art testing services made available at our world-class testing facility.

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Idaho National Lab
INL is one of the U.S. Department of Energy's multi-program national laboratories, and is the lead lab for nuclear energy development. INL researchers performs work in each of DOE's strategic goal areas: energy, national security, science and environment. Day-to-day management and operation of the laboratory is the responsibility of Battelle Energy Alliance.

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Since 1981 ILD has provided engineering services to the nuclear and fossil power industries, petrochemical plants, paper mills, and other process industries. We have experienced personnel available for Technical Support/Systems Engineering and Design Engineering duties. We hold international patents on turbine testing equipment that has become the de facto standard for US nuclear power Terry Turbine testing without steam. Our core Principal Engineering Staff has a combined commercial nuclear power experience in excess of 175 man-years.

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Institute of Nuclear Energy Safety Technology
Institute of Nuclear Energy Safety Technology (INEST), Chinese Academy of Sciences (CAS) was founded in September 2011 based on the advanced nuclear energy research team, i.e. FDS Team. INEST is the professional institute focusing on basic research of nuclear energy safety and the supporting institution of Key Laboratory of Neutronics and Radiation Safety, CAS. It is also the independent nuclear safety assessment and evaluation center with the aim of promoting the sustainable development of nuclear science and technology.

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Intertek AIM
Intertek Asset Integrity Management (AIM) engineering services offer solutions to industry by using advanced technology and world-class expertise to solve problems and gain a competitive edge. Our unique AIM program combines the understanding of process properties with a detailed knowledge of materials and equipment. These services help our clients minimize costs, improve efficiency, meet safety standards, and ensure that installations conform to operational and design parameters.

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Joseph Oat Corporation
Founded in 1788, Joseph Oat has been a family owned and operated small business for over 225 years. We are a world renowned designer and manufacturer of fabricated nuclear ASME Section III & VIII, Safety-Related heat exchangers, coolers, tanks, accumulators, spent fuel/rad-waste canisters/casks, and other specialty products for the nuclear power and radioactive waste industries. Our QA system has been audited by NUPIC and complies with NQA-1 & 10CFR50 Appendix B. We have continuously held an 'N' Stamp certification since 1966 and maintain a very strong nuclear safety culture. We Make Metal Work ©.

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Kinectrics
Kinectrics' internationally-recognized engineers and scientists offer expert capabilities and advanced lab facilities for radioactive materials and analytical chemistry testing, materials characterization, nuclear and mixed waste management, fuel channels and, many other services. Kinectrics capabilities include complete services for Equipment Qualification and Commercial Grade Dedication, inspection and maintenance systems, and leading-edge inspection tooling. Kinectrics' services are complemented by Candesco, Division of Kinectrics, with specialized expertise in nuclear regulatory affairs and licensing, safety assessment, and decommissioning.

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Komax Systems
Komax Systems, Inc. has led the industry in static mixing technology offering a diverse range of Static Mixers, Steam Heaters, Desuperheaters, and Heat Exchangers. With more than three hundred combined years of fluids-mixing experience, the Komax design team has applied Komax technology to over one hundred thousand installations worldwide. We are continuously developing new solutions to mixing challenges. To date, we have developed technologies that have resulted in over 40 mixing and heat transfer patents.

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LPI, Inc. is a diversified engineering consulting firm providing technical expertise to power utilities, transportation, marine, petrochemical, pharmaceutical, aerospace, municipalities and construction industries. LPI personnel have extensive experience with power plants (nuclear and fossil fuel), and such structures as bridges and tunnels, vehicles, ships, railroad cars, and pipe lines. Our expertise in the fields of structural, metallurgical, mechanical, electrical and chemical engineering, finite element analysis, fatigue and fracture mechanics, dynamic strain gage measurements and chemical analysis has allowed us to develop a breadth of quality engineering capabilities.

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Mistras Group Co
MISTRAS Group is a leading "one source" global provider of technology-enabled asset protection solutions used to evaluate the structural integrity of critical energy, industrial, and public infrastructure. MISTRAS uniquely combines industry-leading products and technologies; on-line monitoring of critical assets; mechanical integrity (MI); non-destructive testing (NDT) services; destructive testing (DT) services; and proprietary world class data warehousing and analysis software - to provide comprehensive and competitive products, systems and services solutions from a single source provider.

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NEC provides the "Total Generator Solution" for high-voltage turbo- and hydro-generators, all makes and sizes, manufacturing a wide range of types of windings for stators, rotors, fields and exciters. NEC also has a full-service engineering staff available for failure analyses, testing, uprates and replacement component design. With a fully-equipped facility with balance pit and on-site field services, NEC ready to address the needs of any generator maintenance, repair and overhaul (MRO) project. ISO9001-certified QA systems.

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Oak Ridge National Laboratory
Oak Ridge National Laboratory (ORNL) is a multi-program science and technology laboratory managed for the U.S. Department of Energy by UT-Battelle, LLC. Scientists and engineers at ORNL conduct basic and applied research and development to create scientific knowledge and technological solutions that strengthen the nation's leadership in key areas of science; increase the availability of clean, abundant energy; restore and protect the environment; and contribute to national security.

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PCB Piezotronics, Inc.
PCB Piezotronics designs and manufactures hazardous area approved industrial accelerometers for machinery condition monitoring and predictive maintenance requirements. General purpose, precision, low frequency, high frequency, seismic and multi-axis applications are supported with an extensive product offering: piezoelectric accelerometers, 4-20 mA transmitters, cables and accessories. Our sensors spot imbalance, bearing faults and misalignment by measuring machine vibration providing early fault diagnosis. Product line interfaces directly with data acquisition equipment including online systems and handheld data collectors.

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We are a global power generation service provider capable of meeting your diverse needs. The scalability of our offerings range from providing a single resource for a week to providing turnkey contractual O&M services for a multi-year term. We combine extensive capabilities and global resources with the responsive, independent approach of an agile organization. We're renowned for our expertise, committed to safety and trusted by the largest power OEMs, constructors, and producers in the world.

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Pilgrim established over sixty years in the U.K. is a world leader in the design, manufacture and supply of hydraulically tensioned fastener products. The performance of its radial fit bolt ensures that both turbine manufacturers and power plants worldwide incorporate the specification into either new or retrofit programmes. Accredited to ISO 9001, OHSAS 18001 and ISO 14001 standards Pilgrim remain at the forefront of innovative coupling solutions.

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Pioneer Motor Bearings
Founded in 1920, Pioneer provides OEMs and end users bearing engineering, manufacturing and repair expertise to help design, build, maintain and upgrade large rotating equipment to operate more efficiently and reliably over an extended life. Pioneer has served nuclear power plants on site in Europe, South America, Asia and coast-to-coast in North America. From Emergency repairs to the most challenging retrofit design/build requirements, we can satisfy most fluid film bearing requirements of nuclear, fossil fuel and hydroelectric plants.

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Rentech Boiler Systems
Rentech Boiler Systems designs and manufactures high quality custom boilers in a variety of categories including fired packaged boilers, waste heat boilers, heat recovery steam generators (HRSG's) and specialty boilers. Rentech is located in Abilene, Texas and is in its third decade of manufacturing steam generation systems for customers around the world.

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ReTube Co.
RetubeCo provides the global power generation industry with superior tooling and technical services for high quality, cost-effective retubing and repairs to steam condensers and balance-of-plant heat exchangers. Our extensive experience in both fossil and nuclear power, coupled with our high production tooling ensures your project will come in on time, on budget and with minimal risk.

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Strong Hold Products
Strong Hold Products manufactures a complete line of heavy-duty storage equipment. Our industrial strength products include storage cabinets, tool carts, shop tables and desks, paint cabinets, computer cabinets, and many others. Founded in Louisville, KY U.S.A., and long before 5S and lean manufacturing were popular trends in manufacturing, Strong Hold has been making top grade industrial storage products. With a wide variety of accessories and options, Strong Hold will customize a solution that is right for you.

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Structural Integrity
Structural Integrity Associates, Inc. is an internationally recognized leader of engineering and inspection services for the prevention and control of structural and mechanical failures with more than 30 years of experience. We offer services from R&D to engineering, metallurgy, and nondestructive testing; from nuclear and fossil-fueled power plant support to oil and gas transmission pipeline applications; and renewable energy sources including hydro, geothermal and wind generation. Contact us today: 1-877-4SI-POWER, info@structint.com, www.structint.com.

Visit: www.structint.com
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TAW Miami Service Center, Inc.
TAW's expertise in high-tech, quality-controlled and customized solutions services customers around the world in industries such as fossil, renewable and nuclear power generation, the military, homeland security, mining, chemical processing, steel and water utilities, just to name a few. Our services include all aspects of engineering and design specifications to fabrication and manufacturing, delivery and installation, and maintenance and repair. With over 90 years of experience, we have proven our success.

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Booth: 599

Thermal Wave Imaging, Inc.
Thermal Wave Imaging is the leading innovator and provider of state-of-the-art thermographic NDT (non-destructive testing) solutions ranging from low-cost portable systems for field applications to highly sophisticated automated inspection equipment for manufacturing / QA. Our commercial systems, custom turnkey solutions, and testing and evaluation services are designed to meet critical needs of aerospace, power generation and automotive OEMs and suppliers.

Visit: www.thermalwave.com
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Thielsch Engineering Co.
Thielsch Engineering's mission is to deliver engineering experience and failure analysis expertise to the electric utility industry. We increase profitability by making the critical run/repair/replace decisions on boiler, piping, and turbine components with no intention other than improving reliability and safety. We have a multi-disciplined engineering staff to support clients with everything from engineering design, to equipment inspections and repairs, and process evaluation and optimization. We offer a full range of metallurgical environmental and testing laboratories along with the field service personnel to provide rapid response on projects.

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Turbo Filtration LLC
Turbo Filtration, LLC, a RelaDyne company, provides 24/7 high quality turbine generator lube oil system cleaning services for all types of turbines, compressors, and diesel engines. TFC services include high velocity oil flushing, hydroblasting, EHC flushing, chemical flushing, oil analysis, and consulting services. We offer rental equipment, filtration skids, oil dehydration equipment, and customized equipment solutions to fit your needs. Contact us today to discuss how we can help with your flushing requirements: 251-457-8807.

Visit: www.tfcglobal.com
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UNC– Charlotte
Located on the Charlotte Research Institute campus of UNC Charlotte, the Energy Production and Infrastructure Center (EPIC) serves as a state-of- the-art research and education center. With over 75 faculty members working in energy-related disciplines, EPIC is quickly becoming a national leader in energy research and development. EPIC offers seven Applied Research Clusters and multiple high-tech laboratories, where interdisciplinary researchers collaborate with industry to provide solutions and a resilient workforce to solve today's energy challenges.

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Vallourec Heat Exchanger Tubes
Vallourec Heat Exchanger Tubes manufactures welded titanium and stainless steel tubes used mainly in heat exchangers for power generation, desalination and the chem/petrochem industries. We also manufacture FineFin tubing used mainly in refrigeration and air conditioning applications. Finned tubing is available in a variety of specialty metals. Plant locations include 7 factories on 3 continents. Our U.S. mill is located in Morristown, TN.

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Versa Integrity Group
The Versa Integrity Group provides a wide range of Inspection and Mechanical Integrity services. Included in our work is Conventional and Advanced NDT services, Reliability services as well as Rope Access. The Rope Access division carries out both Inspection and Maintenance work. We work in multiple industries and help many customers meet their code requirements.

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WEG Electric Corp.
Founded in 1961, WEG has grown into a global solutions provider of industrial electrical technologies. Committed to growth on a global scale, WEG continually invests in state-of-the-art manufacturing facilities and processes, and the development of new and improved industrial
electrical solutions. WEG offers a diverse and integrated product line that includes motors, drives, controls, transformers, and generators.

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Zuuk International Inc.
Zuuk Inspection, a division of Zuuk International, has an ASME NQA-1 and 10CFR50 Appendix B compliant Nondestructive Testing and Inspection program. We provide support to spent fuel storage programs, new construction, maintenance, refurbishment and life management. In addition to the traditional nondestructive testing methods such as: Ultrasonic Testing (UT), Magnetic Particle Testing (MT), Liquid Dye Penetrant Testing (PT) and Visual Testing (VT), Zuuk Inspection specializes in Phased Array Ultrasonic Testing (PAUT).

Visit: www.zuukinternational.com
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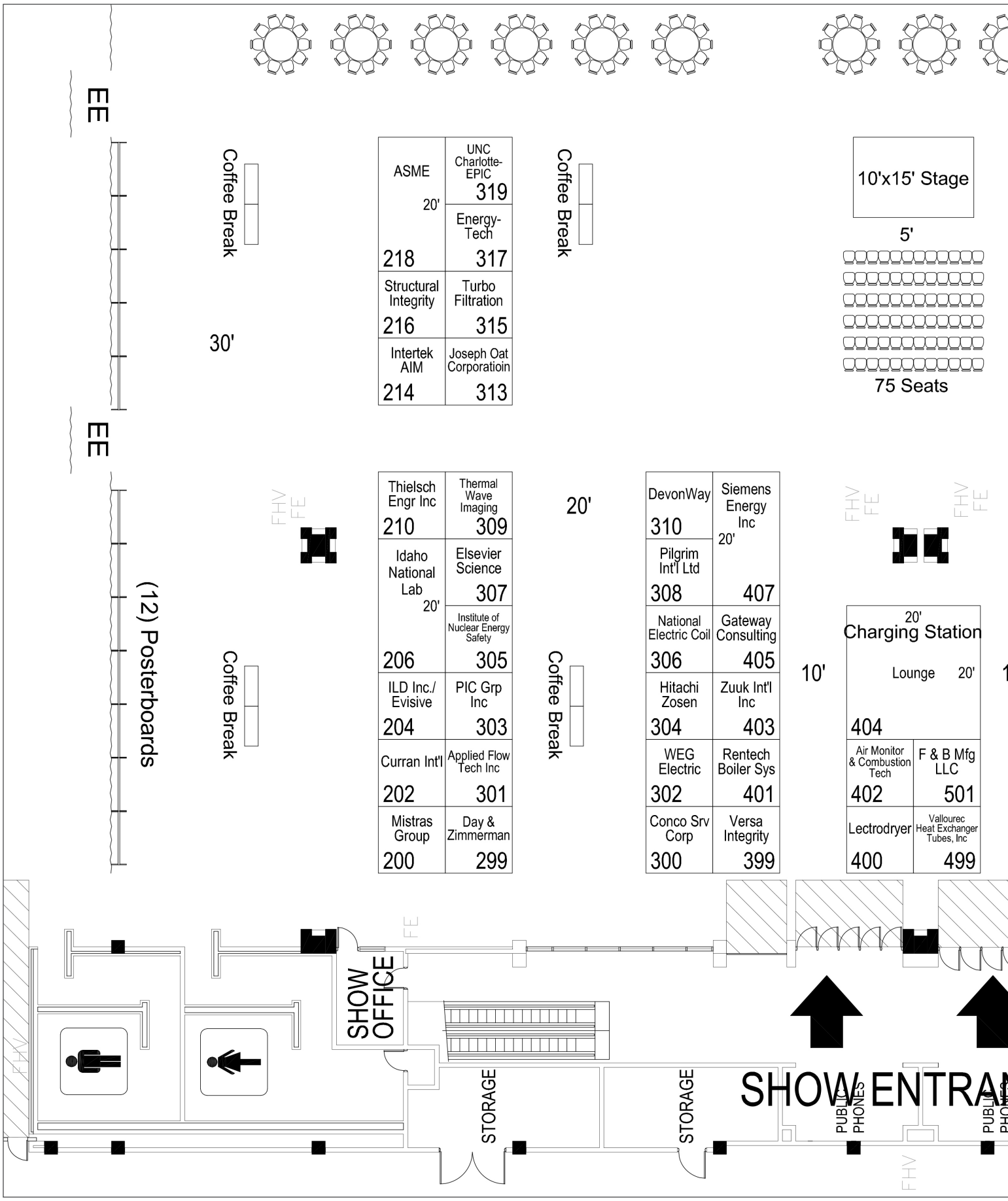

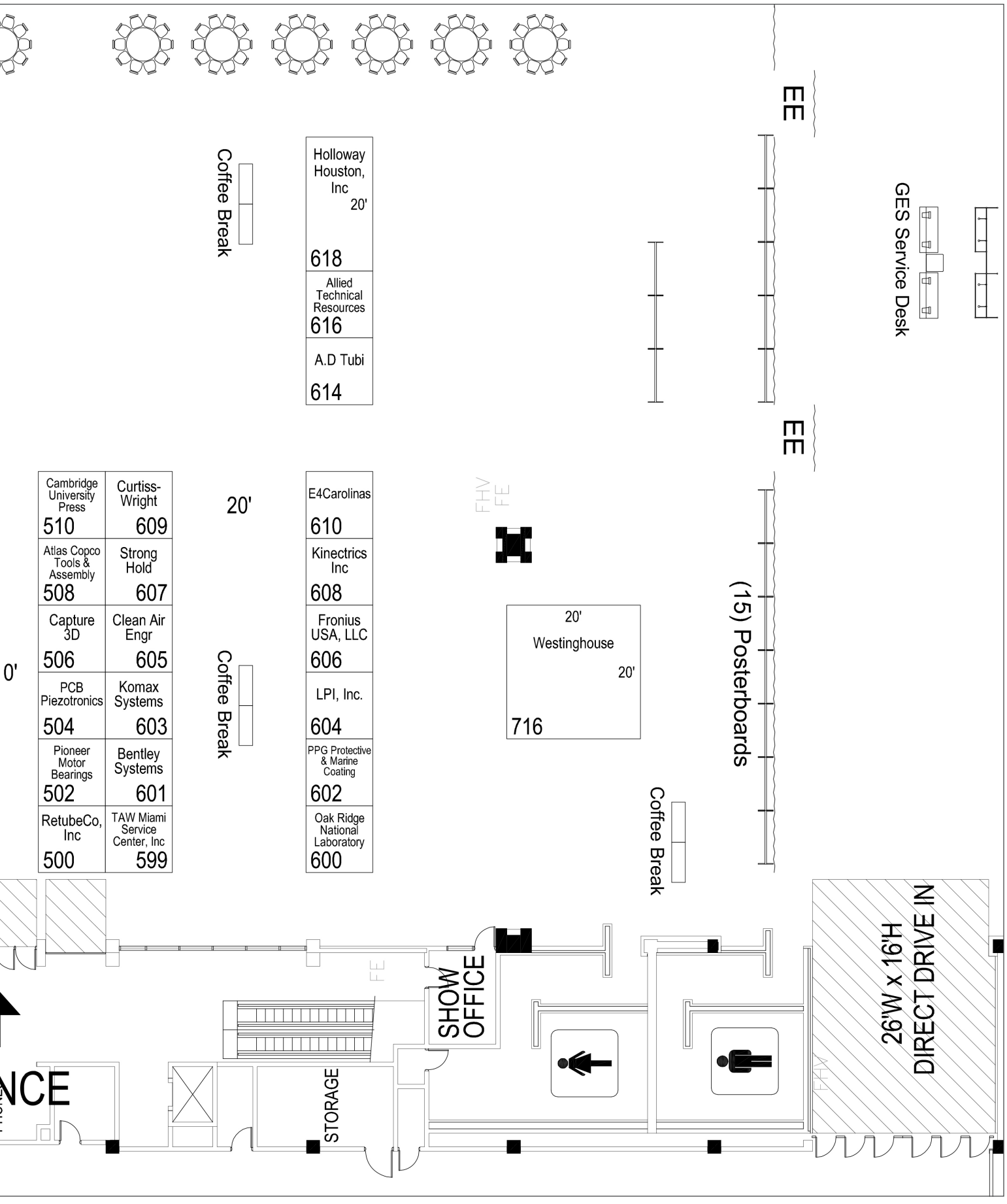
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FHV

ASME Division Technical Committee Meetings

POWER DIVISION TECHNICAL COMMITTEE MEETINGS

SUNDAY, JUNE 26; 1:00 PM- 5:00 PM
Power Division Executive Committee (Hilton Center City Charlotte, Morehead)
(By Invitation Only)

MONDAY, JUNE 27; 12:00 PM-2:00 PM
Power Division Executive Committee and Committee Chairs Meeting
(Closed) – Room 203B, Charlotte Convention Center

TUESDAY, JUNE 28; 1:30 PM- 3:15 PM
Power Division Technical Committee Meetings
(Open to all attendees)

- Combined Cycle Power Plant, Room 206A
- Fuels & Combustion Technology, Room 204
- Power Systems, Room 203B
- Heat Exchangers, Room 201A
- Plant Operations, Room 211A
- Reliability, Availability & Maintainability, Room 203A
- Renewables and Advanced Energy Systems, Room 201B
- Turbines, Generators, & Auxiliaries, Room 208B
- Steam Generators, Room 202A

WEDNESDAY, JUNE 29; 7:00 AM - 8:00 AM
ICOPE & Power Division Meeting
(By Invitation Only) - Room 105

WEDNESDAY, JUNE 29; 12:00 PM – 1:30 PM
Power Division Administrative Committee Meetings
(Open to all attendees) – All meetings in Room 207B & C

- Honors & Awards – Reserved Table, Lunch
- International Relations – Reserved Table, Lunch
- Public Affairs & Education – Reserved Table, Lunch
- Program Coordination- Reserved Table, Lunch
- Student Competition – Reserved Table, Lunch

THURSDAY, JUNE 30; 12:00 PM – 1:30 PM
Power Division Meetings, Room 207A
2017 Conference Program Coordination Meeting

ADVANCED ENERGY SYSTEMS DIVISION TECHNICAL COMMITTEE MEETINGS

WEDNESDAY, JUNE 29
Advanced Energy Systems Division Systems Analysis
5:50 pm- 6:50 pm; Room 206A

Advanced Energy Systems Division Renewable Energy and Energy Efficiency
5:50 pm- 6:50 pm; Room 209A

Advanced Energy Systems Division Electrochemical Energy Conversion and Storage
5:50 pm- 6:50 pm; Room 209B

Advanced Energy Systems Division Executive Committee
6:50 pm- 7:50 pm; Room 210B

SOLAR ENERGY DIVISION TECHNICAL COMMITTEE MEETINGS

WEDNESDAY, JUNE 29
Solar Energy Division Conservation and Solar Buildings Committee
6:00 pm- 7:00 pm; Room 201A

Solar Energy Division Heating and Cooling Applications and Analysis Committee
6:00 pm- 7:00 pm; Room 201B

Solar Energy Division Solar Chemistry & Bio Conversion Committee
6:00 pm- 7:00 pm; Room 202A

Solar Energy Division Solar Thermal Power Committee
6:00 pm- 7:00 pm; Room 202B

Solar Energy Division Photovoltaics Committee
6:00 pm- 7:00 pm; Room 204

Solar Energy Division Wind Energy Committee
6:00 pm- 7:00 pm; Room 205

Solar Energy Division Executive Committee Meeting
7:00 pm- 8:00 pm; Room 210A

Conference Technical Program

- POWER CONFERENCE
- ENERGY SUSTAINABILITY CONFERENCE
- FUEL CELL CONFERENCE
- GAS TURBINE FORUM
- ENERGY STORAGE FORUM

6/27

6/28

6/29

6/30

POWER CONFERENCE

ENERGY SUSTAINABILITY CONFERENCE

FUEL CELL CONFERENCE

GAS TURBINE FORUM

ENERGY STORAGE FORUM

MON. 6/27

9:00 AM – 10:45 AM
ASME 2016 10TH INTERNATIONAL CONFERENCE ON ENERGY SUSTAINABILITY

TRACK 2-1
SUSTAINABLE BUILDING ENERGY SYSTEMS

Session 2-1-2: Community and City Scales Energy Systems

West Meeting Rooms, Charlotte Convention Center, 210B

Session Organizer: **Moncef Krarti**, *University of Colorado-Boulder, Boulder, CO, United States*

On-Line Early Fault Detection of a Centrifugal Chiller Based on Data Driven Approach
Technical Paper Publication. PowerEnergy2016-59291
Cinthia Audivet Duran, Marco E. Sanjuán, *Universidad Del Norte, Barranquilla, OO, Colombia*

Quantitative Assessment of Advanced Energy Efficiency Retrofitting for Hospitals in India
Technical Paper Publication. PowerEnergy2016-59307
Lakshman Ravi Teja Pedamallu, Vivek Kumar Singh, Alvaro Peixoto Filipe Gomes, *University of Coimbra, Coimbra, Portugal*

Design of Carbon-neutral Residential Communities in Kuwait
Technical Paper Publication. PowerEnergy2016-59609
Baqer Ameer, *University of Colorado, Boulder, CO, United States*, ***Moncef Krarti***, *University of Colorado, Boulder, CO, United States*

Forecasting Building HVAC Energy Demand in New York City with a coupled Weather-Building Energy Model
Technical Paper Publication. PowerEnergy2016-59153
Luis Ortiz, Jorge Gonzalez, Estatio Gutierrez, Mark Arend, Stephen Neufeld, Thomas Legbandt, *City College of New York, New York, NY, United States*

Impacts of Climate Change in Energy Infrastructure in the Intra-Americas Region
Technical Paper Publication. PowerEnergy2016-59154
Moises Angeles, Jorge Gonzalez, Equisha Glenn, *City College of New York, New York, NY, United States*, ***Nazario Ramirez***, *University of Puerto Rico-Mayaguez, Mayaguez, PR, United States*

Session 2-1-3
Advances in Energy Storage Systems for Buildings

West Meeting Rooms, Charlotte Convention Center, 209B

Session Organizer: **M. Keith Sharp**, *University of Louisville, Louisville, KY, United States*
Session Co-Organizer: **Ming Qu**, *Purdue Engineering Prof, West Lafayette, IN, United States*

Experimental Investigation of Baffle Should Configurations on Heat Transfer to an Immersed Heat Exchanger
Technical Presentation. PowerEnergy2016-59116
Julia Haltiwanger Nicodemus, Jackson Jeffrey, David C Bedding, *Lafayette College, Easton, PA, United States*

A Numerical Simulation Study for the Performance of a Multi-Purpose Large Solar Hot Water System Operated in Taiwan
Technical Paper Publication. PowerEnergy2016-59313
Ru Yang, *National Sun Yat-sen University, Kaohsiung, Taiwan*, ***Yu-Ting Yen***, *National Sun Yat-Sen University, Kaohsiung, Taiwan*

The Utilization of Ground Surroundings for Seasonal Solar Energy Storage
Technical Paper Publication. PowerEnergy2016-59663
Bernd Weber, Eduardo Solis Figueroa, *UAEM - U. Autonoma Del Estado De Mexico, Toluca, Mexico, Mexico*, ***Ma Dolores Duran Garcia***, *Universidad Autonoma del Estado de Mexico, Estado de Mexico, Edo de Mex, Mexico*, ***Iván G. Martínez Cienfuegos***, *UAEM - U. Autonoma Del Estado De Mexico, Toluca, Mexico*, ***Eduardo Rincon Mejia***, *UAEM - U. Autonoma Del Estado De Mexico, Toluca, Edo. de Mexico, Mexico*

TRACK 2-8
CONCENTRATING SOLAR POWER

Session 2-8-1: Concentrators and Optics I

West Meeting Rooms, Charlotte Convention Center, 210A

Session Organizer: **Nathan Siegel**, *Bucknell University, Lewisburg, PA, United States*
Session Co-Organizer: **Miriam Ebert**, *Institute of Solar Research, German Aerospace Center (DLR), Stuttgart, Germany*

Improvement in Spiral Heliostat Field Layout Thermo-Economic Performance by Field Zoning Implementation
Technical Paper Publication. PowerEnergy2016-59298
Mohamed Gadalla, *American University of Sharjah, Sharjah, Sharjah, United Arab Emir.*, ***Mohammad Saghafifar***, *American University of Sharjah, Sharjah, Sharjah, United Arab Emir.*

On-Sun Evaluation of the PHLUX Method for Heliostat Beam Characterization
Technical Paper Publication. PowerEnergy2016-59409
Julius Yellowhair, *Sandia National Lab, Albuquerque, NM, United States*, ***Clifford Ho***, *Sandia National Laboratories, Albuquerque, NM, United States*

Efficiency and Environmental Durability of Self-Cleaning Electrodynamic Screens for Maintaining High Optical Performance of CSP Mirrors
Technical Presentation. PowerEnergy2016-59862
Malay Mazumder, *Boston University, Boston, MA, United States*, ***Mark Horenstein***, *Boston University, Boston, MA, United States*, ***Annie Bernard, Ryan Eriksen***, *Boston University, Boston, MA, United States*, ***Julius Yellowhair***, *Sandia National Lab, Albuquerque, NM, United States*, ***Sean Garner***, *Corning Inc., New York, NY, United States*, ***Nitin Joglekar***, *Boston University, Boston, MA, United States*

Characterization of a 6 kW High-Flux Solar Simulator with an Array of Xenon Arc Lamps
Technical Presentation. PowerEnergy2016-59888
Robert Gill, *Georgia Institute of Technology, Atlanta, GA, United States*, ***Evan Bush***, *George W. Woodruff School of Mechanical Engineering, Atlanta, GA, United States*, ***Philipp Haueter***, *ETH Zurich, Zurich, Switzerland*, ***Peter Loutzenhiser***, *Georgia Institute of Technology, Atlanta, GA, United States*

TRACK 2-12
GEOTHERMAL, OCEAN, AND EMERGING ENERGY TECHNOLOGIES

Session 2-12-1: Marine Energy

West Meeting Rooms, Charlotte Convention Center, 209A

Session Organizer: **Chris Schmitt**, *GE Power & Water*
Session Co-Organizer: **Mansour Zenouzi**, *Wentworth Inst of Tech*

Tidal Current Energy Resource Assessment using API Method in Korea
Technical Presentation. PowerEnergy2016-59881
***Chulhee Jo, Doyoub Kim, Su Jin Hwang**, Inha University, Incheon, Korea (Republic)*

Application of Single Point Mooring Concept to Enhance the Station Keeping of Floating Body of Tidal Current Device
Technical Presentation. PowerEnergy2016-59829
***Chulhee Jo, Doyoub Kim, Sujin Hwang, Myeong Joo Kim**, Inha University, Incheon, Korea (Republic)*

11:15 AM – 1:00 PM
ASME 2016 10TH INTERNATIONAL CONFERENCE ON ENERGY SUSTAINABILITY

TRACK 2-1
SUSTAINABLE BUILDING ENERGY SYSTEMS

Session 2-1-1: Advances in Thermally Driven Building Cooling and Heating Technologies and Systems

West Meeting Rooms, Charlotte Convention Center, 210B

Session Organizer: **Alvaro Lentz**, *CCNY, Fort Lee, NJ, United States*
Session Co-Organizer: **Jorge Gonzalez**, *City College of New York, New York, NY, United States*

Performance of A Solar Thermal Adsorption Cooling System based On Metal Organic Frameworks in Texas
Technical Paper Publication. PowerEnergy2016-59130
***Dervis Emre Demirocak, Mehdi Kabir**, Texas A&M University - Kingsville, Kingsville, TX, United States*

Optimization of Solar Powered Membrane Based Multi-Effect Regenerator for Building Air-Conditioning
Technical Paper Publication. PowerEnergy2016-59133
***M Kum Ja, Swapnil Dubey, Choo Fook Hoong, ET Mohan Dass**, Nanyang Technological University, Singapore, Singapore*

The Potential of Sky Radiation with Change in Design Parameters
Technical Paper Publication. PowerEnergy2016-59255
***Adrienne M Parsons, M. Keith Sharp**, University of Louisville, Louisville, KY, United States*

Performance Study on Household Combined Heating, Power and Biogas System in Winter
Technical Presentation. PowerEnergy2016-59699
***Jinping Li, Xiaofei Zhen, Airong Yang, Jieyuan Yang, Juanjuan Huang**, Lanzhou University of Technology, Lanzhou City, Gansu Province, China*

TRACK 2-5
ENERGY STORAGE

Session 2-5-1: Energy Storage Systems and Components for Power Grid

West Meeting Rooms, Charlotte Convention Center, 209B

Session Organizer: **Amey Barde**, *UCLA, Los Angeles, CA, United States*
Session Co-Organizer: **Reza Baghaei Lakeh**, *California State Polytechnic University, Pomona, Pomona, CA, United States*

Active Fluidized Bed Technology used for Thermal Energy Storage
Technical Paper Publication. PowerEnergy2016-59053
***Peter Steiner**, TU Wien, Vienna, Austria, **Karl Schwaiger**, Technische Universität Wien, Vienna, Austria, **Heimo Walter, Markus Haider**, Vienna University of Technology, Vienna, Austria*

Industrial Grid Interactive Fluid Heating Utilized for Micro-Grid Efficiency and Management
Technical Presentation. PowerEnergy2016-59087
***Christopher Molnar**, Chromalox, Coraopolis, PA, United States*

Simulation of Reversible Solid Oxide Electrochemical Cell Systems for Energy Storage
Technical Presentation. PowerEnergy2016-59140
***Evan Reznicek, Robert Braun**, Colorado School of Mines, Golden, CO, United States*

Optimal Capacity Sizing for a Completely Green Village with Programmable Appliances
Technical Paper Publication. PowerEnergy2016-59341
***Juliette Ugirumurera, Zygmunt J. Haas**, University of Texas at Dallas, Richardson, TX, United States*

Lubricant Free Foil Bearings Pave Way to Highly Efficient and Reliable Flywheel Energy Storage System
Technical Paper Publication. PowerEnergy2016-59350
***Hooshang Heshmat**, Mohawk Innovative Tech Inc, Albany, NY, United States, **James F. Walton II**, Mohawk Innovative Technology, Inc., Albany, NY, United States*

TRACK 2-8
CONCENTRATING SOLAR POWER

Session 2-8-2: Concentrators and Optics II

West Meeting Rooms, Charlotte Convention Center, 210A

Session Organizer: **Julius Yellowhair**, *Sandia National Lab, Albuquerque, NM, United States*

Track and Tilt Collection for Central Receiver CSP
Technical Paper Publication. PowerEnergy2016-59618
***Roger Angel, Justin Hyatt**, University of Arizona, Tucson, AZ, United States*

Development and Prototype Testing of Low-cost Lightweight Thin Film Solar Concentrator
Technical Paper Publication. PowerEnergy2016-59692
Gani Ganapathi, *JPL, Pasadena, CA, United States*, ***Arthur Palisoc***, *L'Garde, Inc., Tustin, CA, United States*, ***Armin Buchroithner***, *Graz University of Technology, Graz, Austria*, ***Sai Nataraj***, *California State University Los Angeles, Los Angeles, CA, United States*, ***Bill Nesmith, Andrew Kindler***, *Jet Propulsion Laboratory, Pasadena, CA, United States*, ***Gyula Greschik***, *TentGuild Engineering Co., Boulder, CO, United States*, ***Koorosh Gidanian***, *KNF Corp, Laguna Beach, CA, United States*

An Improved Arc Source Model for the Design of High Flux Solar Simulators
Technical Presentation. PowerEnergy2016-59563
Nathan Siegel, *Bucknell University, Lewisburg, PA, United States*, ***Jeff Roba***, *Bucknell University, Scott Township, PA, United States*, ***M. Laura Beninati***, *Bucknell University, Lewisburg, PA, United States*

High-Flux Solar Simulator with Automated Sample Handling and Exposure System (ASHES)
Technical Presentation. PowerEnergy2016-59854
Clifford Ho, *Sandia National Laboratories, Albuquerque, NM, United States*, ***Scott Wilson, Maxwell Sandford III***, *Team Technologies, Albuquerque, NM, United States*, ***Ryan Anderson, William Kolb, Daniel Ray***, *Sandia National Laboratories, Albuquerque, NM, United States*, ***Daniel Fajardo***, *Team Technologies, Albuquerque, NM, United States*, ***Joshua Christian***, *Sandia National Laboratories, Albuquerque, NM, United States*, ***Julius Yellowhair***, *Sandia National Lab, Albuquerque, NM, United States*

TRACK 2-12
GEOTHERMAL, OCEAN, AND EMERGING ENERGY TECHNOLOGIES

Session 2-12-2: Emerging Energy Technologies

West Meeting Rooms, Charlotte Convention Center, 209A

Session Organizer: **Mansour Zenouzi,** *Wentworth Inst of Tech*

Modeling and Simulation of Tethered Underwater Kites for Power Generation
Technical Paper Publication. PowerEnergy2016-59123
Yao Wang, *Worcester Polytechnic Institute, Worcester, MA, United States*, ***David Olinger***, *Worcester Polytechnic Institute, Upton, MA, United States*

Determining the Potential of Salinity Gradient Energy Source using an Exergy Analysis
Technical Paper Publication. PowerEnergy2016-59532
Arash Emdadi, *EPFL, Lausanne, Canton of Vand, Switzerland*, ***Mansour Zenouzi***, *Wentworth Institute of Technology, Boston, MA, United States*, ***Gregory Kowalski***, *Northeastern University, Beverly, MA, United States*

The Role of Temperature on Salt Removal Using Capacitive Deionization
Technical Presentation. PowerEnergy2016-59886
Jiankai Zhang, Mohammadreza Nazemi, Marta Hatzell, *Georgia Institute of Technology, Atlanta, GA, United States*

Selective Emitters Design and Optimization for Energy Harvesting Using Rectennas
Technical Paper Publication. PowerEnergy2016-59363
Mehdi Zeyghami, Philip D. Myers, Jr., *University of South Florida, Tampa, FL, United States*, ***D. Yogi Goswami***, *University of South Florida, Tampa, FL, United States*, ***Elias Stefanakos***, *University of South Florida, Tampa, FL, United States*

2:00 PM – 3:45 PM
ASME 2016 10TH INTERNATIONAL CONFERENCE ON ENERGY SUSTAINABILITY

TRACK 2-2
SUSTAINABLE INFRASTRUCTURE AND TRANSPORTATION

Session 2-2-1: Sustainable Infrastructure and Transportation - 1

West Meeting Rooms, Charlotte Convention Center, 206B

Session Organizer: **Dervis Demirocak**, *Texas A&M - Kingsville, Kingsville, TX, United States*

District Heating Cost Optimization
Technical Paper Publication. PowerEnergy2016-59086
Aaron Eicoff, *van Zelm Engineers, Hartford, CT, United States*

Thermal Management and Enhancement of Adsorption Based Onboard Hydrogen Storage System
Technical Paper Publication. PowerEnergy2016-59629
Hailei Wang, *Oregon State University, Corvallis, OR, United States*, ***Daniel Miller***, *Colorado School of Mines, Golden, CO, United States*

Transforming the Way Electricity is Consumed During the Aluminium Smelting Process.
Technical Presentation. PowerEnergy2016-59790
Mark Dorreen, *The University of Auckland, Auckland, New Zealand*, ***Linda Wright, Geoffrey Matthews***, *Energia Potior, Queenstown, Otago, New Zealand*

TRACK 2-5
ENERGY STORAGE

Session 2-5-2: Thermal and Thermochemical Energy Storage - I

West Meeting Rooms, Charlotte Convention Center, 209B

Session Organizer: **Karthik Nithyanandam**, *University of California, Los Angeles, Los Angeles, CA, United States*
Session Co-Organizer: **Sarada Kuravi**, *New Mexico State University, Las Cruces, NM, United States*

Effect of Viscosity Variations on Charge and Discharge Time of a Sulfur-Based Thermal Energy Storage System
Technical Paper Publication. PowerEnergy2016-59161
Reza Baghaei Lakeh, *California State Polytechnic University, Pomona, Pomona, CA, United States*, ***Karthik Nithyanandam***, *University of California, Los Angeles, Los Angeles, CA, United States*, ***Amey Barde***, *University of California, Los Angeles, Los Angeles, CA, United States*, ***Louis Tse***, *University of California, Los Angeles, Los Angeles, CA, United States*, ***Richard Wirz***, *University of California, Los Angeles, Los Angeles, CA, United States*

A New Phase Change Material for High Temperature Thermal Energy Storage
Technical Paper Publication. PowerEnergy2016-59219
Yanping Sun, *CSIRO, Newcastle, NSW, Australia*, ***Yifeng Jiang***, *University of New South Wales, Sydney, Australia*, ***Frank Bruno***, *University of South Australia, Adelaide, Australia*, ***Sean Li***, *University of New South Wales, Sydney, Australia*

Solar Water Distillation Using Paraffin Wax as Phase Change Material
Technical Paper Publication. PowerEnergy2016-59249
Bellam Sudheer, *Jawaharlal Nehru Technological University, Hyd, Telangana, India*, ***K Vijaya Kumar Reddy***, *JNTUH, Hyderabad, India*, ***Ravi Gugulothu***, *Jawaharlal Nehru Technological University, Hyd, Hyderabad, India*, ***V S S P Sashank Tallapragada***, *Jawaharlal Nehru Technological University, Hyd, Hyderabad, Telangana State, India*, ***Manikanta Bhavirisetti***, *Jawaharlal Nehru Technological University, Hyd, Hyderabad, Telangana, India*

Experimental Characterization of Flow and Temperature Fields in Water Storage Tank with Porous-Tube Thermal Stratification Manifolds
Technical Presentation. PowerEnergy2016-59751
Shuping Wang, *University of Minnesota, Minneapolis, MN, United States*, ***Jane Davidson***, *University of Minnesota, Wayzata, MN, United States*

CaMnO3-based Materials for CSP Thermochemical Energy Storage
Technical Presentation. PowerEnergy2016-59905
Andrea Ambrosini, Sean Babiniec, Eric Coker, *Sandia National Laboratories, Albuquerque, NM, United States*, ***Peter Loutzenhiser***, *Georgia Institute of Technology, Atlanta, GA, United States*, ***James Miller***, *Sandia National Laboratories, Albuquerque, NM, United States*

TRACK 2-8
CONCENTRATING SOLAR POWER

Session 2-8-3: Concentrators and Optics III

West Meeting Rooms, Charlotte Convention Center, 210A

Session Co-Organizer: **Sophia Haussener**, *EPFL, Lausanne, Switzerland*

Application of Sol-Gel Method as a Protective Layer on a Specular Reflective Surface for Secondary Reflector in a Solar Receiver
Technical Paper Publication. PowerEnergy2016-59046
Samia Afrin, *University of Texas at El Paso, El Paso, TX, United States*, ***John Dagdelen***, *University of California, Berkeley, Berkeley, CA, United States*, ***Zhiwen Ma***, *NREL, Golden, CO, United States*, ***Vinod Kumar***, *University of Texas at El Paso, El Paso, TX, United States*

Design of a High-Efficiency Solar Concentrator Using Prism-Compound Parabolic Concentrator Combination
Technical Presentation. PowerEnergy2016-59861
Ngoc Hai Vu, Seoyong Shin, *Myongji University, Yongin, Korea (Republic)*

A New Linear Fresnel Receiver Assembly Design for Low-Cost Water-Borne Reflectors
Technical Presentation. PowerEnergy2016-59858
Guangdong Zhu, *National Renewable Energy Laboratory, Golden, CO, United States*, ***Nick Kramer, Greg Mungas, John King***, *Hyperlight Energy, La Jolla, CA, United States*

- POWER CONFERENCE
- ENERGY SUSTAINABILITY CONFERENCE
- FUEL CELL CONFERENCE
- GAS TURBINE FORUM
- ENERGY STORAGE FORUM

TUES. 6/28

PLENARY SESSIONS & SPEAKERS

Tuesday, June 28, 2016
8:00 am – 9:30 am

ENERGY SUSTAINABILITY CONFERENCE PLENARY SESSION

Room 203B

Speakers:

Catherine McKalip-Thompson, Manager of Sustainability, Bechtel Global Infrastructure

Sustainable Solutions

Catherine McKalip-Thompson is the Manager of Sustainability for the Bechtel's Global Infrastructure business unit, providing implementation strategies for the incorporation of sustainability concepts on infrastructure projects and instituting a sustainability management system. From 2012-2014, she was seconded to the Gabonese National Infrastructure Agency to develop a sustainability program in the implementation of the national infrastructure master plan fulfilling Gabon's National Sustainable Development Strategy. Previously, Catherine led the implementation of Bechtel's sustainability policy in all aspects of proposals and project execution on Bechtel's projects for the federal government. She is the Bechtel liaison to the Institute for Sustainable Infrastructure and sustainability representative for Construction Industry Institute, having co-chaired the Sustainability Community of Practice and the member liaison to the US Green Building Council. She was appointed to the Frederick County Sustainability Commission and served on the San Francisco Planning and Urban Research Advisory Board.

Prior to joining Bechtel, Catherine staffed the President's Council on Sustainable Development under the White House Council on Environmental Quality, focusing on climate change and community development then on international financial flows for sustainability.

Catherine holds a M.A. in International Economics, Energy and Environment from the Johns Hopkins School of Advanced International Studies and a BA in International Relations from the University of California at Davis.

Patrick Phelan, Program Manager for Emerging Technologies - Building Technologies Office, Energy Efficiency and Renewable Energy, US Department of Energy

The Future of Buildings

Patrick Phelan received his BS degree from Tulane University in New Orleans, his MS degree from MIT, and his PhD from UC Berkeley, all in mechanical engineering. Following a two-year post-doctoral fellowship at the Tokyo Institute of Technology, he started his academic career as an Assistant Professor at the University of Hawaii in 1992. In 1996 he moved to Arizona State University (ASU), where he is a Professor of Mechanical & Aerospace Engineering, and a Senior Sustainability Scientist. While on leave from ASU he served as the Director of the NSF Thermal Transport Processes Program from 2006 to 2008. He is again on leave from ASU, and through July 2016 is the Program Manager for Emerging Technologies in the Building Technologies Office, Energy Efficiency and Renewable Energy, US Department of Energy.

Tuesday, June 28, 2016
8:00 am – 9:30 am

FUEL CELL CONFERENCE PLENARY SESSION

Room 208B

Speaker:

Kyle Grew, Ph.D., Research Scientist, U.S. Army Research Laboratory

The Research & Development of Fuel Cells Technologies for Army Energy and Power Applications

Dr. Kyle Grew is a research scientists at the U.S. Army Research Laboratory (ARL), where he is a member of the electrochemistry branch's fuel cell team. ARL's electrochemistry branch takes a materials based approach to the research and development of electrochemical technologies which can help address power and energy storage/conversion needs of tomorrow's Army. Dr. Grew's own research and development efforts are specifically geared toward fuel cell technologies. He has additional research interest in the development, validation, and use of computational methods for the study of electrochemical energy systems; transport and interfacial phenomena; fuel cell materials and systems; heterogeneous materials; and three-dimensional materials characterization methodologies. Dr. Grew was previously as an Oak Ridge Associated Universities post-doctoral research fellow at ARL. Prior to joining ARL, Dr. Grew received a Ph.D. degree in Mechanical Engineering from the University of Connecticut (2010) and a B.S. in Mechanical Engineering from the University of Dayton (2004). He has published more than 25 peer reviewed journal articles and given more than 50 conference and other invited/notable talks. Dr. Grew is an active member of the Electrochemical Society (ECS) and the American Society for Mechanical Engineers (ASME).

Tuesday, June 28, 2016
8:00 am – 9:30 am

GAS TURBINE FORUM PLENARY PANEL SESSION: MANUFACTURING FOR ADVANCED TURBINE PERFORMANCE

Room 208A

Speakers:

Mike Aller, Executive Director & CEO, Energy Florida / Consortium for Advanced Production and Engineering of Gas Turbines and Rotating Machinery (CAPE)

As Executive Director and CEO, Mike Aller is responsi-

ble for managing Energy Florida's operations, community and public sector outreach and helps to coordinate several of Energy Florida's industry working groups. Since taking on his current role in 2010, Mike has worked to develop a robust ecosystem of support services for the Florida and the Southeastern U.S. energy technology industry, and built public-private partnerships to help Florida's aerospace, defense and agribusiness industries identify and capture new opportunities in the power generation and clean technology industries.

One of Energy Florida's major areas of focus is advanced turbine technologies and related manufacturing processes. In the turbine sector, Energy Florida is coordinating the NIST Advanced Manufacturing Technology Consortium (AMTech) for Advanced Turbine Manufacturing Technologies - the Consortium for Advanced Production and Engineering of Gas Turbines and Rotating Machinery (CAPE). The CAPE consortium is working with a broad coalition of industry partners from across the country to outline the necessary steps for developing new industrial materials, testing standards and certification parameters enabling the introduction of new materials into the manufacture of gas turbines and rotating machinery.

Mike has over fifteen years' experience in economic and policy analysis, including five years as a researcher at the Brookings Institution and the Peterson Institute for International Economics in Washington DC, and served on the staff of the White House Office of Management and Budget (OMB). He has also served as an adjunct faculty member at Rollins College in Winter Park, Florida, teaching courses on international economics, emerging economies (China and India), and global energy and resource issues. Mr. Aller holds a Masters in international economics and environmental policy from the University of California at San Diego, and a Bachelor's degree in science, technology and international affairs from Georgetown University's Walsh School of Foreign Service. He speaks Mandarin Chinese and French, and is a former member of the US National Rowing Team.

Joseph Fadok, Director of Component and Design Tool Technologies, Siemens Power and Gas)

Joseph Fadok is the Director of Component and Design Tool Technologies within the Siemens Power and Gas division. His primary responsibility is to develop strategies and drive implementation of new technologies across the product lines of Siemens Power and Gas; targeting both new developments and enhancing the installed fleet. Mr. Fadok's career spans 25 years in the Energy industry in the areas of mechanical design, testing, project management, product strategy, and business development. He was formerly the director of Product Manufacturing Engineering for Gas Turbine products, leading a global organization focused on design for manufacture, Integrated Product Development, CAD-CAM, and product data management. As the project director for the Hydrogen Turbine Development Program sponsored by the Department of Energy, Mr. Fadok also successfully managed the development of advanced technologies in cooperation with universities and small business partners resulting in product solutions which have demonstrated significant combined cycle efficiency improvement and reduced emissions. He studied Mechanical Engineering at the University of Central Florida and is a member of the American Society of Mechanical Engineers. Joseph represents Siemens as an active corporate business partner with the City of Charlotte Mayors Youth Employment Program and serves in other education outreach programs in the Charlotte area.

John Intile, General Manager, Power Generation Technology, GE Power

Since 2014 Mr. John Intile has been General Manager of the Power Generation Technology team within GE Power's Gas Power System business as well as Power Generation Technology Platform Leader within GE Global Research. His focus is on technology and technology advancements that will benefit GE Power's future gas turbine products. Prior to his current role Mr. Intile led the conceptual design team that brought the latest technologies into GE's HA gas turbine engine portfolio. During his 15 years with GE Mr. Intile has also held engineering leadership roles working on Dry Low NOx (DLN) combustion technology for E and F-class engine platforms. Mr. Intile holds 10 patents. He has a Bachelor of Science Degree and a Master of Science Degree in Mechanical Engineering from the State University of New York at Stony Brook.

Tuesday, June 28, 2016
8:00 am – 9:30 am

POWER CONFERENCE PLENARY PANEL SESSION: POWER PRODUCTION FROM WASTE-TO-ENERGY: IMPACT AND INSIGHTS

Room: 203A

Speakers:

Dr. Marco Castaldi, Associate Professor, Chemical Engineering Department, The City College CCNY) of City University of New York (CUNY)

Impact of RDF Combustion on Cement Industry Emissions - Modeling and Experimental Analysis

Marco Castaldi was born in New York City and received his B.S. ChE (Magna cum Laude) from Manhattan College. His Ph.D. is in Chemical Engineering from UCLA and he has minors in Advanced Theoretical Physics and Astrophysics. Professor Castaldi has approximately 60 peer-reviewed research articles, 40 peer-reviewed conference papers, 3 book chapters and 11 patents in the fields of catalysis, combustion and gasification. Some of his research findings have been covered by The New York Times, The Observer, CNN, and other trade publications. Prior to his academic career Professor Castaldi worked as Manager of Fuel Processor Component Development for Precision Combustion Inc. in New Haven, CT overseeing projects totaling $5 MM.

John Clark, Senior Mechanical Engineer, HDR

Mr. Clark is a Senior Mechanical Engineer at HDR with over 30 years of industrial experience in waste-to-en-

ergy and power generation. He possesses professional experience in construction monitoring, start-up, operations, maintenance, inspection, and testing of steam and power production facilities. With more than three decades of experience in the resource recovery industry, he has worked on numerous waste-to-energy facilities covering most combustion technologies and has reviewed numerous emerging gasification technologies for waste processing. Prior to joining HDR, Mr. Clark worked in the Operations Department of Covanta Energy and was part of Covanta's Research and Development team. Other previous positions included the Director of Operations and the Director of Development at Connecticut Resources Recovery Authority, Associate at Grillo Engineering, and Plant Manager for Vicon Recovery, all within the waste to energy industry.

Tony Licata, Partner, Licata Energy & Environmental Consultants, Inc.

Tony Licata has over 40 years of experience in the environmental and power generation fields. He began his career as a startup and performance engineer involved in the startup of fossil-fuel fired boilers and air pollution control systems. His air pollution control system experience includes wet and dry FGD systems, low-NOx burners, SCRs, ESPs, and baghouses. He has an in depth knowledge of combustion and the control of dioxins through combustion controls.

He has experience in project management with responsibility for design, construction, startup, and operation of both waste-to-energy and fossil-fired power plants. Tony also has been involved in the development of IPP projects, a mercury control product line, and the development of new air pollution control technologies. He was responsible for the transfer of wet and dry FGD and SCR technologies from European licensors and the conversion to US-based technologies.

Tony received ASME's QRO certification for operating waste-to-energy plants and is a member of the QRO certification board. In 2002, Tony received ASME's Dedicated Service Award, in 2003 he was elected a Life Fellow of ASME, and in 2012 he received the ASME Pioneer Award. He received the AWMA's Waste Management Award in 2003. Tony's awards were based on his work to control both dioxins and mercury. He has published approximately 100 technical papers on environmental issues.

Tony's current work is based on integrated multi-pollutant control strategies including NOx, SO2, SO3, mercury and fine particulates.

Tim Sharobem, Research Associate, Earth Engineering Center, City College of New York

The Effect of SO2:HCl in Mixed Gas and Deposit Corrosion of Waste-to-Energy Boilers

Tim Sharobem is currently a research associate with the Earth Engineering Center at the City College of New York. He recently completed his PhD at Columbia University in the City of New York in May 2016 on high temperature corrosion of alloys in thermal treatment facilities. Tim is also an active member of the ASME Research Committee on Energy, Environment, and Waste, in which he serves on the Executive Committee and co-leads the Corrosion and Erosion subcommittee.

Robert E. Sommerlad, Principal at Robert E. Sommerlad, P.E

Continuous Monitoring Performance Monitoring in Waste-to Energy Plants Using PTC-34

Robert is a Principal at Robert E. Sommerlad, P.E., providing consulting services to industrial and private sector clients; he is a Mechanical Engineer with 50 years experience in combustion and air pollution control technology since receiving his B.S. and M.S. degrees from the New Jersey Institute of Technology, Newark College of Engineering. He is Principal of Robert E. Sommerlad, P.E.. He is a Registered Professional Engineer in New Jersey and a Board Certified Environmental Engineer with the American Academy of Environmental Engineers as well as a former member of its Board of Trustees. Robert started his career as an R&D Engineer at Foster Wheeler where he progressed over 27 years to a Development Engineer and then to senior management positions such as Vice President of Contract Operations Division of Foster Wheeler Development Corp. and President of FW Envireresponse. His work involved combustion, energy recovery, air pollution control, and environmental services. Robert formed an emission testing group and achieved many technological advances. He was FW's Program Manager on an USEPA's "Systems Analysis of Refuse as a Low Sulfur Fuel", which focused on using municipal solid waste with coal for power generation based on a detailed analysis of various waste-to-energy plants in Germany and applying such methods to US applications. It was a career highlight assignment, enabling many trips to Germany where Robert came to know industry icons such as M. Andrtizy, F.Nowak, K.H.Thoemen, the principals of VKW (later Deutsche Babcock), and Martin, the leading equipment supplier in the world at that time; his work was well-acknowledged and led to several innovative programs. Robert formed and managed the contract team for RD&D for industrial and governmental clients focusing on combustion, energy, and environmental technologies, formed and managed FW Envireresponse, an environmental engineering firm, and operated USEPA's Environmental Emergency Response Unit including its Mobile Incineration System.

Demetra Tsiamis, Associate Director of the Earth Engineering Center at the City College of New York

Demetra Tsiamis is the Associate Director of the Earth Engineering Center at the City College of New York. Ms. Tsiamis manages all applied research programs at EECICCNY sponsored by operating companies and industry consortia in the field of sustainable waste management and conversion. Her expertise is in thermal conversion of waste with a focus on gasification and pyrolysis of non-recyclable plastics. Ms. Tsiamis is the lead engineer on the Enerkem technical due diligence and has led several technical research programs on waste conversion for companies such as Covanta, Solar Turbines, and the American Chemistry Council. Ms. Tsiamis also leads the public outreach efforts of EECICCNY to form research partnerships with local government agencies and municipalities.

Ms. Tsiamis received her M.S. in chemical engineering in 2013 from Columbia University and her B.E. in chemical engineering in 2011 from The Cooper Union with a minor in environmental engineering. Her Master's thesis at Columbia University investigated the technical feasibility of

commercial pyrolysis technologies in the treatment of New York City's non-recyclable plastics. Prior to joining EEC|CCNY, Ms. Tsiamis worked as an environmental consultant for Langan Engineering and Environmental Services in New York.

Michael Van Brunt, PE, Director of Sustainability, Covanta

The Role of Waste-to-Energy in CO2 Mitigation and the Clean Power Plan

Michael Van Brunt is a licensed professional engineer with over fifteen years of experience in industry and consulting. Michael is currently Director of Sustainability at Covanta where his primary focus is on sustainability reporting, climate change, carbon offset project development, and life cycle assessment. He currently serves on the board of the National Recycling Coalition. He earned a B.S. and Masters in Environmental Engineering from Cornell University.

Tuesday, June 28, 2016
10:15 am – noon

ENERGY STORAGE FORUM & FUEL CELL CONFERENCE INVITED KEYNOTE JOINT SESSION: GRID ENERGY STORAGE

Room 208B

Moderator: **Bobby Bailie,** Business Development Director - CAES, Dresser-Rand, a Siemens business

Speakers:

Peiwen Li, Professor University of Arizona

Solar and Wind Energy Electricity for Hydrogen Production and Large Quantity Energy Storage

Dr. Li is a full professor in Aerospace and Mechanical Engineering Department at the University of Arizona. He received his Ph.D. in thermo-science for energy and power engineering from Xi'an Jiaotong University, China in 1995. Since then, he worked as a Research Scientist in National Mechanical Engineering Laboratory, Japan, and Kyoto University, and a Research Associate in University of Pittsburg, before joining the faculty of the University of Arizona in 2006. He has involved in energy and power related research and teaching including subjects of heat transfer and enhancement for convective flow, boiling and condensation heat transfer, turbulent flow drag reduction and drag-reduced fluid heat transfer and enhancement, electrochemical and heat/mass transfer processes in fuel cells and electrolyzers, hydrocarbon fuel processing and reforming for hydrogen production, flow field analysis for algal biofuel production, studies on thermal energy storage technologies for solar thermal energy. Currently he is leading a MURI project to develop a high temperature heat transfer fluid for concentrated solar thermal power systems. Dr. Li has authored and co-authored 78 articles on peer reviewed journals, 4 book chapters, over 90 articles on peer reviewed conferences, and one US patent. Dr. Li is an ASME member, he serves as an Associate Editor of Journal Solar Energy on thermal storage and heat transfer fluids for CSP.

Professor **Christopher Rahn**, Penn State University

Smart Batteries for Grid Energy Storage

Christopher D. Rahn graduated from the University of Michigan with a B.S. in mechanical engineering in 1985 and an M.S. from the University of California, Berkeley in 1986. After three years as a Research and Development Engineer at Ford Aerospace, he returned to Berkeley to pursue a Ph.D. After graduating from Berkeley in 1992, Dr. Rahn joined the Department of Mechanical Engineering at Clemson University. In 2000, he moved to the Pennsylvania State University where he is now a Professor of Mechanical Engineering, Director of the Mechatronics Research Laboratory, Co-Director of the Battery and Energy Storage Technology Center, and Associated Head for Administration in the Department of Mechanical and Nuclear Engineering. Dr. Rahn's research work on the modeling, analysis, design, and control of mechatronic systems has resulted in three books (including Battery Systems Engineering published in 2013), over two hundred peer reviewed publications, and several patents. An ASME Fellow, Dr. Rahn served as an Associate Editor of two ASME journals and chaired an ASME technical committee and the ASME Design Engineering Division.

Robert H. Schulte, Principal, Schulte Associates LLC

Enabling Higher Levels of Renewables with Grid-Scale Compressed Air Energy Storage (CAES)

Bob Schulte is a Principal in Schulte Associates LLC (SA, www.schulteassociates.com), an executive management consulting firm with offices in Raleigh, North Carolina, providing project management and interim CEO/COO services to energy industries. He is an expert in generation and transmission resource planning and project development, and utility business and regulatory affairs for both public and private utilities.

He was Project Manager of the proposed 270 MW Iowa Stored Energy Park compressed air energy storage (CAES) project, and is the primary author of "Lessons from Iowa," the U.S. Department of Energy/Sandia Labs report on lessons-learned there. He also performed the Gregory County Pumped Hydro Storage study, combining large-scale (1200 MW) pumped hydro storage with renewables to create a 100% renewable, fully dispatchable, baseload generation resource. He is currently a consultant to Burbank (California) Water & Power in modeling of a proposed 1200 MW CAES facility, 3000 MW Pathfinder wind field, and solar photovoltaics (the "Duck Curve") in Southern California as they would operate in the Western U.S. electric grid. Output of the project would serve utilities in Southern California and elsewhere, and replace an existing 1900 MW coal-fired generation station.

Prior to SA, Bob served 16 years at Northern States Power Company (NSP), now a unit of Xcel Energy. At NSP, he held a variety of positions in

resource planning for large-scale generation and transmission projects, marketing, distribution engineering and operations, and legislative/ regulatory affairs. He served as NSP VP of Rates and Corporate Strategy, and VP of Marketing and Customer Service.

Professor Richard Wirz, Director of the UCLA Energy Innovation Laboratory in the UCLA Mechanical & Aerospace Engineering Department

Thermal Energy Storage: A Key Piece of Large-Scale, Dispatchable Energy Storage

Professor Richard Wirz is the Director of the UCLA Energy Innovation Laboratory in the UCLA Mechanical & Aerospace Engineering Department. He is an expert in thermal energy storage and solar, wind, ocean generation. He is the Principal Investigator (PI) for the longest funded program in DOE/ARPA-E history, since its inception, related to advanced approaches to thermal energy storage. He currently serves as the Energy Lead of the Steering Committee UCLA's Grand Challenge for a Sustainable Los Angeles by 2050 and also holds a joint appointment at NASA Jet Propulsion Laboratory (JPL), serving on the JPL Climate Change and Energy Committee. He received two B.S. degrees, Aerospace and Ocean Engineering, at Virginia Tech, and then became the Technical Lead for Ocean Energy Technologies at SeaSun Power Systems in Alexandria, VA. Later, he assumed the role of Technical Lead, then Manager, for Renewable Energy at Gibbs & Cox, Inc. in Crystal City, VA. He then returned to graduate school to receive his Ph.D. degree from the California Institute of Technology (Caltech) Aerospace department, followed by a Senior Engineer position at JPL, and then his current role at UCLA. In addition to his UCLA and JPL positions, he is also the Chief Scientist for WindStream Technologies, Inc., a micro wind/solar startup; and, most recently, and is now Chief Advisor to Element 16 Technologies, Inc., a startup based on his thermal storage technologies. He has several patents and pending patents, and has authored over 100 journal and conference publications, and two NASA Tech Briefs. In addition to his passion for alternative energy, he is a semi-professional musician/songwriter and performs research in plasma propulsion.

10:15 AM – 12:00 PM
ASME 2016 POWER CONFERENCE

TRACK 1-3
HEAT EXCHANGERS, CONDENSERS, COOLING SYSTEMS, AND BALANCE-OF-PLANT

Session 1-3-3: Heat Exchanger Design, Testing and Construction

West Meeting Rooms, Charlotte Convention Center, 201A

Session Organizer: **Bill Bieber**, *Webco Industries, Sand Springs, OK, United States*
Session Co-Organizer: **Mark Tagliamonte**, *Retubeco Inc, Ooltewah, TN, United States*

Development of a Ceramic Heat Exchanger for Application as Solid Oxide Fuel Cell Cathode Air Preheater
Technical Paper Publication. PowerEnergy2016-59333
Jose Luis Cordova, *Mohawk Innovative Technology Inc., Albany, NY, United States*, ***Hooshang Heshmat***, *Mohawk Innovative Tech Inc, Albany, NY, United States*

The Science Behind Eddy Current and Remote Field Testing: For Condensers and Heat Exchanger Tubing
Technical Paper Publication. PowerEnergy2016-59273
Christopher Van Name, Gary Fischer, James Kocher, *Conco Services Corporation, Verona, PA, United States*

Planning the Field Construction Phase of Feedwater Heater Replacement Projects: Lessons from the Gibson 3G1/3G2 Feedwater Heaters Replacement
Technical Paper Publication. PowerEnergy2016-59509
Andrew Rister, *Duke Energy, Owensville, IN, United States*

TRACK 1-4
STEAM TURBINE-GENERATORS, ELECTRIC GENERATORS, TRANSFORMERS, SWITCHGEARS, ELECTRIC BOP & AUXILIARIES

Session 1-4-1: Steam Turbine Repairs, Refurbishments and Retrofits

West Meeting Rooms, Charlotte Convention Center, 202A

Session Organizer: **Michael Smiarowski**, *Siemens Energy Inc, Orlando, FL, United States*
Session Co-Organizer: **Steven Greco**, *We Energies, Milwaukee, WI, United States*

Weld Repair Optimization of HP Rotor Curtis Stage
Technical Presentation. PowerEnergy2016-59496
Lew Shuster, *Alstom Power Services, Midlothian, VA, United States*, ***Bruce Carney***, *Alstom Power, Midlothian, VA, United States*, ***Connor Kaufmann***, *Alstom Power Inc., Midlothian, VA, United States*

Lifetime Assessment of Steam Turbine Components
Technical Presentation. PowerEnergy2016-59499
Franco Alvarez, *Alstom Power, Midlothian, VA, United States*, ***Lew Shuster***, *Alstom Power Services, Midlothian, VA, United States*, ***Bruce Carney***, *Alstom Power, Midlothian, VA, United States*

Fundamentals of a Babbitted Bearing Repair Assistant
Technical Paper Publication. PowerEnergy2016-59389
Lyle Branagan, *Pioneer Motor Bearing Company, Kings Mountain, NC, United States*, ***Stephen H Hesler***, *Electric Power Research Institute, Charlotte, NC, United States*

TRACK 1-5
PLANT OPERATIONS, RELIABILITY, AND PERFORMANCE

Session 1-5-9: RAM 3 Panel Session

East Meeting Rooms, Charlotte Convention Center, 211A

Session Organizer: **Ryan Crane**, *ASME, New York, NY, United States*
Session Co-Organizer: **Brian Wodka**, *RMF Engineering, York, PA, United States*

This panel session is primarily for the discussion of the new ASME RAM-2-2016 standard. An overview of the standard will be presented highlighting the differences and benefits. The panel consists of members of the RAM Standards Committee.

Panel Session: ASME RAM Standards Activities
Technical Presentation. PowerEnergy2016-59892
Brian Wodka, *RMF Engineering, York, PA, United States*, ***James August***, *Southern Nuclear Vogtle 1/2, Waynesboro, GA, United States*, ***Ryan Crane***, *ASME, New York, NY, United States*

TRACK 1-7
RENEWABLES: SOLAR, WIND, HYDRO, & GEOTHERMAL

Session 1-7-4: Smart Grid Technologies

West Meeting Rooms, Charlotte Convention Center, 205

Session Organizer: **Reza Arghandeh**, *Florida State University, Center for Advanced Power, Tallahassee, FL, United States*
Session Co-Organizer: **David MacPhee**, *The University of Alabama, Tuscaloosa, AL, United States*

Generator Outages and Using Incentive Based Demand Response to Diminish Economic Impact
Technical Paper Publication. PowerEnergy2016-59415
Ailin Asadinejad, Kevin Tomsovic, *University of Tennessee, Knoxville, TN, United States*

Online Method for Measurement Data Analysis in Power Distribution Networks
Technical Paper Publication. PowerEnergy2016-59361
Yuxun Zhou, *UC Berkeley, Berkeley, CA, United States*, ***Reza Arghandeh***, *Florida State University, Center for Advanced Power, Tallahassee, FL, United States*, ***Ioannis Konstantakopoulos, Shayaan Abdullah, Costas Spanos, Alexandra von Meier***, *UC Berkeley, Berkeley, CA, United States*

Session 1-7-5: Advanced Technologies for CHP Systems

West Meeting Rooms, Charlotte Convention Center, 202B

Session Organizer: **John Fall**, *American Electric Power, Columbus, OH, United States*
Session Co-Organizer: **Victor Osorio**, *San Francisco State University, San Francisco, CA, United States*

Analysis of a Renewable Energy Based System using Nanofluids for Power Generation
Technical Paper Publication. PowerEnergy2016-59235
Mohamed Gadalla, *American University of Sharjah, Sharjah, United Arab Emir.*, ***Adnan Alashkar***, *Department of Mechanical Engineering, Sharjah, Sharjah, United Arab Emir.*

Experimental Study on Thermal Storage Performance of Cylindrically Encapsulated PCM in a Cylindrical Storage Tank with Axial Flow
Technical Paper Publication. PowerEnergy2016-59427
Chatura Wickramaratne, Francesca Moloney, *University of South Florida Clean Energy Research Center, Tampa, FL, United States*, ***Tolga Pirasaci***, *Gazi University, Ankara, Turkey*, ***Rajeev Kamal***, *University of South Florida Clean Energy Research Center, Tampa, FL, United States*, ***D. Yogi Goswami***, *University Of South Florida, Tampa, FL, United States*, ***Elias Stefanakos***, *University of South Florida, Tampa, FL, United States*, ***Jaspreet Dhau***, *Florida Polytechnic University, Lakeland, FL, United States*

Performance Analysis of Photovoltaic Thermal (PVT) Panels Considering Thermal Parameters
Technical Paper Publication. PowerEnergy2016-59671
W.J.A. Jayasuriya, A.U.C.D. Athukorala, *University of Moratuwa, Moratuwa, Sri Lanka*, ***A. T. D. Perera***, *EPFL, Lausanne, Switzerland*, ***M.P.G. Sirimanna, R.A. Attalage***, *University of Moratuwa, Moratuwa, Sri Lanka*

TRACK 1-9
REGULATORY, CODES, AND STANDARDS COMPLIANCE

Session 1-9-3: Regulatory, Codes, and Standards Compliance

West Meeting Rooms, Charlotte Convention Center, 204

Session Organizer: **Jane Connelly**, *Zachry Nuclear Engineering, Stonington, CT, United States*

Code Compliance in a Rapidly Changing Industry: Data Centers and the Development of BSR/ASHRAE Standard 90.4P
Technical Paper Publication. PowerEnergy2016-59665
Dan Comperchio, *Willdan Energy Solutions, Chicago, IL, United States*, ***Sameer Behere***, *Syserco, Fremont, CA, United States*

High-impact, Low-frequency Event Risk Assessment for Electro-mechanical Power Grid Equipment
Technical Presentation. PowerEnergy2016-59784
Arun Veeramany, Stephen Unwin, Garill Coles, Tony Nguyen, Jeff Dagle, *Pacific Northwest National Laboratory, Richland, WA, United States*

TRACK 1-10
STUDENT COMPETITION

Session 1-10-1: Student Competition

West Meeting Rooms, Charlotte Convention Center, 206A

Session Organizer: **André Teixeira**, *Soja De Portugal, Amarante, Portugal*

Harvesting Natural Salinity Gradient Energy for Hydrogen Production Through Reverse Electrodialysis (RED) Power Generation
Technical Paper Publication. PowerEnergy2016-59565
Mohammadreza Nazemi, Jiankai Zhang, Marta Hatzell, *Georgia Institute of Technology, Atlanta, GA, United States*

Feasibility Study of Smart Monofloat Hydrokinetic Power for the Rural Households in Naga Hammadi, Egypt
Technical Paper Publication. PowerEnergy2016-59540
Fahd Diab, *Assiut University, Assiut, Egypt*, ***Hai Lan***, *Harbin Engineering University, Harbin, China*

10:15 AM – 12:00 PM
ASME 2016 10TH INTERNATIONAL CONFERENCE ON ENERGY SUSTAINABILITY

TRACK 2-1
SUSTAINABLE BUILDING ENERGY SYSTEMS

Session 2-1-5: Advances in Building Integrated Systems

East Meeting Rooms, Charlotte Convention Center, 211B

Session Organizer: **Patrick Phelan**, *Department of Energy, Washington, DC, United States*

A Novel Energy System Integrated with Solar Power, Advanced Electric Vehicle and Home Heat Pumps
Technical Paper Publication. PowerEnergy2016-59267
Hideyuki Chisaka, Tsuguhiko Nakagawa, *Okayama Prefectural University, Soja, Okayama, Japan*

Effects of Irradiance and Ambient Temperature on a Decision-Making Tool for Rooftop PV Array Sizing for Commercial Buildings
Technical Paper Publication. PowerEnergy2016-59391
Carlo Bianchi, Amanda Smith, *University of Utah, Salt Lake City, UT, United States*

Design and Development of Hybrid Luminaire for Fiber-Optic Daylighting
Technical Presentation. PowerEnergy2016-59804
Ravi Gorthala, *University of New Haven, West Haven, CT, United States*

The Role IoT Will Play in the Facility of the Future
Technical Presentation. PowerEnergy2016-59358
Brad Witter, *Blue Pillar, Indianapolis, IN, United States*

TRACK 2-5
ENERGY STORAGE

Session 2-5-4: Thermal and Thermochemical Energy Storage - II

West Meeting Rooms, Charlotte Convention Center, 209B

Session Organizer: **Hailei Wang**, *Oregon State University, Corvallis, OR, United States*

Design and Analysis of Low-Cost Thermal Storage System for High Efficiency Concentrating Solar Power Plants
Technical Paper Publication. PowerEnergy2016-59469
Karthik Nithyanandam, *University of California, Los Angeles, Los Angeles, CA, United States*, ***Amey Barde***, *University of California, Los Angeles, Los Angeles, CA, United States*, ***Reza Baghaei Lakeh***, *California State Polytechnic University, Pomona, Pomona, CA, United States*, ***Richard Wirz***, *University of California, Los Angeles, Los Angeles, CA, United States*

Heat Transfer Behavior of Sulfur for Thermal Storage Applications
Technical Paper Publication. PowerEnergy2016-59470
Karthik Nithyanandam, *University of California, Los Angeles, Los Angeles, CA, United States*, ***Amey Barde***, *University of California, Los Angeles, Los Angeles, CA, United States*, ***Louis Tse***, *University of California, Los Angeles, Los Angeles, CA, United States*, ***Reza Baghaei Lakeh***, *California State Polytechnic University, Pomona, Pomona, CA, United States*, ***Richard Wirz***, *University of California, Los Angeles, Los Angeles, CA, United States*

High-Temperature Thermochemical Energy Storage via Manganese Oxide-Based Redox Cycle - Reduction Reactor Design
Technical Presentation. PowerEnergy2016-59432
Roman Bader, Lifeng Li, Peter Kreider, Joe Coventry, John Pye, Greg Burgess, *The Australian National University, Canberra, ACT, Australia*, ***Keith Lovegrove***, *IT Power, Canberra, ACT, Australia*, ***Alan W. Weimer***, *University of Colorado, Boulder, CO, United States*, ***Wojciech Lipinski***, *The Australian National University, Canberra, ACT, Australia*

Sulfur-based Thermal Storage System: Thermal Characteristics and Performance Analysis
Technical Presentation. PowerEnergy2016-59925
Amey Barde, *University of California, Los Angeles, Los Angeles, CA, United States*, ***Mitchell Shinn, Karthik Nithyanandam***, *University of California, Los Angeles, Los Angeles, CA, United States*, ***Reza Baghaei Lakeh***, *California State Polytechnic University, Pomona, Pomona, CA, United States*, ***Richard Wirz***, *University of California, Los Angeles, Los Angeles, CA, United States*

TRACK 2-8
CONCENTRATING SOLAR POWER

Session 2-8-4: Receivers I

West Meeting Rooms, Charlotte Convention Center, 210A

Session Organizer: **Antoni Gil Pujol**, *Massachusetts Institute of Technology, Cambridge, MA, United States*

Fundamental Study for the Power Tower's HCPV/T Combined Thermal Receiver
Technical Paper Publication. PowerEnergy2016-59051
Ayman Hagfarah, *Dynamic Engineering Consultant, Dubai, United Arab Emir.*, ***Mehdi Nazarinia***, *Heriot-Watt University, Dubai, United Arab Emir.*

Design and Modeling of Light-Trapping Tubular Receiver Panels
Technical Paper Publication. PowerEnergy2016-59158
Joshua Christian, Jesus D. Ortega, Clifford Ho, *Sandia National Laboratories, Albuquerque, NM, United States*, ***Julius Yellowhair***, *Sandia National Lab, Albuquerque, NM, United States*

Performance Evaluation of a High-Temperature Falling Particle Receiver
Technical Paper Publication. PowerEnergy2016-59238
Clifford Ho, Joshua Christian, *Sandia National Laboratories, Albuquerque, NM, United States*, ***Julius Yellowhair***, *Sandia National Lab, Albuquerque, NM, United States*, ***Kenneth Armijo***, *Sandia National Labs, Albuquerque, NM, United States*, ***William Kolb***, *Sandia National Laboratories, Albuquerque, NM, United States*, ***Sheldon Jeter***, *Georgia Tech, Atlanta, GA, United States*, ***Matthew Golob, Clayton Nguyen***, *Georgia Institute of Technology, Atlanta, GA, United States*

Upscaling, Manufacturing and Test of a Centrifugal Particle Receiver
Technical Paper Publication. PowerEnergy2016-59252
Miriam Ebert, Lars Amsbeck, Johannes Hertel, Andrea Jensch, Jens Rheinländer, David Trebing, Ralf Uhlig, *Institute of Solar Research, German Aerospace Center (DLR), Stuttgart, Germany*, ***Reiner Buck***, *German Aerospace Center, Stuttgart, Germany*

Effect of Flow Rate and Particle Size on Heat Transfer to Dense Granular Flows
Technical Paper Publication. PowerEnergy2016-59258
Megan Watkins, *NC State University, Raleigh, NC, United States*, ***Richard Gould***, *North Carolina State University, Raleigh, NC, United States*

TRACK 2-9
WIND ENERGY SYSTEMS AND TECHNOLOGIES

Session 2-9-1: Wind Farm Planning and Optimization

West Meeting Rooms, Charlotte Convention Center, 201B

Session Organizer: **Ali Mehmani**, *Columbia University, New York, NY, United States*
Session Co-Organizer: **Weifei Hu**, *Cornell University, Ithaca, NY, United States*, **Souma Chowdhury**, *University at Buffalo, Buffalo, NY, United States*

Numerical Analysis of a Large-Scale Hydraulic Wind Farm with Integrated Hydraulic Energy Storage
Technical Paper Publication. PowerEnergy2016-59539
Daniel Buhagiar, *University of Malta, Msdia, Malta*, ***Tonio Sant***, *Dept of Mechanical Engineering, University of Malta, Msida, Malta*

Efficient Wind Turbine Micrositing in Large-Scale Wind Farms
Technical Paper Publication. PowerEnergy2016-59594
David Guirguis, David A. Romero, Cristina H. Amon, *University of Toronto, Toronto, ON, Canada*

Reliability-Based Design Optimization of Wind Turbine Blades for Fatigue Life under Dynamic Wind Load Uncertainty
Technical Presentation. PowerEnergy2016-59817
Weifei Hu, *Cornell University, Ithaca, NY, United States*, ***Kyung Choi***, *University of Iowa, Iowa City, IA, United States*, ***Olesya Zhupanska***, *University of Arizona, Tucson, AZ, United States*, ***Hyunkyoo Cho***, *University of Iowa, Iowa City, IA, United States*, ***Nicholas Gaul***, *RAMDO Solutions, LLC., Iowa City, IA, United States*

10:15 AM – 12:00 PM
ASME 2016 IGTI GAS TURBINE FORUM

TRACK 5-1
GAS TURBINES FOR ADVANCED COMBINED CYCLE POWER SYSTEMS

Session 5-1-1: Pressure Gain Combustion and Sustainable GT Power Systems

West Meeting Rooms, Charlotte Convention Center, 208A

Session Organizer: **Donald Ferguson**, *US Department of Energy, National Energy Technology Laboratory, Morgantown, WV*
Session Co-Organizer: **John Gulen**, *Bechtel Infrastructure and Power Inc, Reston, VA*

Gas Turbine Combustion Systems for Air Brayton Concentrating Solar Power Plants
Technical Presentation. PowerEnergy2016-59040
Klaus Brun, *Southwest Research Institute, San Antonio, TX, United States*, ***Shane Coogan***, *Southwest Research Institute, San Marcos, TX, United States*

Integrating Geothermal Energy into a NG-fired Recuperated Brayton Cycle
Technical Presentation. PowerEnergy2016-59504
Nicholas Siefert, *National Energy Technology Laboratory, Pittsburgh, PA, United States*

Beyond 65% With Pressure Gain Combustion and Reheat
Technical Presentation. PowerEnergy2016-59867
John Gulen, *Bechtel Infrastructure and Power Inc, Reston, VA*

US DOE Office of Fossil Energy Overview of Pressure Gain Combustion for Gas Turbines
Technical Presentation. PowerEnergy2016-59941
Donald Ferguson, *US Department of Energy, National Energy Technology Laboratory, Morgantown, WV*

TRACK 5-2
ADVANCED MANUFACTURING FOR GAS TURBINES

Session 5-2-1: Advanced Materials for Gas Turbines

West Meeting Rooms, Charlotte Convention Center, 209A

Session Organizer: **Karen Thole**, *Pennsylvania State University, University Park, PA, United States*

Session Co-Organizer: **Seth Lawson**, *US Department of Energy, National Energy Technology Laboratory, Morgantown, WV*

Non-Contact Structured Blue Light 3D Scanner Airfoil Gage R&R Measurement Study
Technical Presentation. PowerEnergy2016-59003
Miles Molnar, *Capture 3D, Inc., Huntersville, NC, United States*, ***Catherine Kim***, *Capture 3D, Inc., Costa Mesa, CA, United States*

Development of Hybrid Turbine Components by Field Assisted Sintering Technology (FAST) - A Ground Breaking Manufacturing Technology
Technical Presentation. PowerEnergy2016-59761
Jogender Singh, *Pennsylvania State University, University Park, PA, United States*, ***Anil Kulkarni***, *Pennsylvania State University, University Park, PA, United States*

Coupling Experiment, Computation and Data Sciences in Materials Design and Development of Gas Turbine Materials
Technical Presentation. PowerEnergy2016-59768
David McDowell, *Georgia Institute of Technology, Atlanta, GA, United States*, ***Richard Neu***, *Georgia Institute of Technology, Atlanta, GA, United States*, ***Surya Kalidindi***, *Georgia Institute of Technology, Atlanta, GA, United States*

Effect of Build Direction and Channel Shape of Additively Manufactured Microchannels on Surface Roughness and Geometric Tolerances
Technical Presentation. PowerEnergy2016-59927
Jacob Snyder, Curtis Stimpson, *Pennsylvania State University, State College, PA, United States*, ***Karen Thole***, *Pennsylvania State University, University Park, PA, United States*, ***Dominic Mongillo***, *Pratt and Whitney, East Hartford, CT, United States*

1:30 PM – 3:15 PM
ASME 2016 10TH INTERNATIONAL CONFERENCE ON ENERGY SUSTAINABILITY

TRACK 2-1
SUSTAINABLE BUILDING ENERGY SYSTEMS

Session 2-1-6: Advances in Whole Building Analysis, Technologies and Design

East Meeting Rooms, Charlotte Convention Center, 211B

Session Organizer: **Antonio Bula**, *Universidad del Norte, Barranquilla, Colombia*

Infer Envelope Thermal Characteristics from Single Point in Time Thermal Images
Technical Paper Publication. PowerEnergy2016-59091
Salahaldin Alshatshati, Kevin Hallinan, Robert Brecha, *University of Dayton, Dayton, OH, United States*

Informing Low Carbon HVAC Systems Modelling And Design, Using A Global Sensitivity Analysis Framework
Technical Paper Publication. PowerEnergy2016-59593
Maria-Anna Chatzopoulou, *Clean Energy Processes (CEP) Laboratory, Department of Chemical Engineering, Imperial College London, London, United Kingdom*, ***James Keirstead, David Fisk***, *Department of Civil and Environmental Engineering, Imperial College London, London, United Kingdom*, ***Christos Markides***, *Clean Energy Processes (CEP) Laboratory, Department of Chemical Engineering, Imperial College London, London, United Kingdom*

Achieving Ultra-Low Energy Consumption in Data Center Mechanical Systems through Indirect Airside Economization
Technical Paper Publication. PowerEnergy2016-59667
Dan Comperchio, *Willdan Energy Solutions, Chicago, IL, United States*, ***Sameer Behere***, *Syserco, Fremont, CA, United States*

Dynamic Modeling And Verification Of An Energy Efficient Greenhouse With Aquaponics
Technical Paper Publication. PowerEnergy2016-59180
***Majdi Amin, John Kissock**, University of Dayton, Dayton, OH, United States*

Rechargeable Personal Air Conditioning Device
Technical Paper Publication. PowerEnergy2016-59253
***Yilin Du, Jan Muehlbauer, Jiazhen Ling, Vikrant Aute, Yunho Hwang**, University of Maryland, College Park, MD, United States*, ***Reinhard Radermacher**, University Of Maryland, College Park, MD, United States*

TRACK 2-3
CHP AND HYBRID POWER & ENERGY SYSTEMS

Session 2-3-1: Combined Heat and Power Systems

West Meeting Rooms, Charlotte Convention Center, 202B

Session Organizer: **Sarada Kuravi**, *New Mexico State University, Las Cruces, NM, United States*
Session Co-Organizer: **Ehsan Languri**, *Tennessee Technological University, Cookeville, TN, United States*

Development of Rotary Engine Based Micro-DG/CHP System
Technical Paper Publication. PowerEnergy2016-59117
***Richard Hack, Max R Venaas, Vince G McDonell**, University of California Irvine APEP, Irvine, CA, United States*, ***Tod Kaneko**, Mazda North American Operations, Irvine, CA, United States*

Development of an Exhaust Enthalpy Control Unit to Augment Combined Heat and Power Applications
Technical Paper Publication. PowerEnergy2016-59118
***Richard Hack, Elliot Sullivan-Lewis, Vince G McDonell**, University of California Irvine APEP, Irvine, CA, United States*

Self-sufficiency in an MCHP System Based on Local Demand and Supply Analysis
Technical Paper Publication. PowerEnergy2016-59172
***Christoph Ummenhofer, John Olsen, John Page**, University of New South Wales, Sydney, NSW, Australia*, ***Tim Roediger**, University of Applied Sciences Landshut, Landshut, Germany*

Analysis of Metal Organic Frameworks for use in Fluorocarbon Cooling Applications
Technical Presentation. PowerEnergy2016-59845
***JJ Jenks**, PNNL, Richland, WA, United States*, ***Radha Motkuri**, PNNL, Richland, WA, United States*, ***Pete McGrail**, PNNL, Richland, WA, United States*

TRACK 2-7
PHOTOVOLTAICS

Session 2-7-1: Photovoltaics I

West Meeting Rooms, Charlotte Convention Center, 210B

Session Organizer: **Thad Druffel**, *University of Louisville, Louisville, KY, United States*

Performance Analysis of Innovative Top Cooling Thermal Photovoltaic (TPV) Modules under Tropics
Technical Paper Publication. PowerEnergy2016-59075
***Swapnil Dubey**, Nanyang Technological University, Singapore, Singapore, Singapore*, ***C S Soon, Sin Lih Chin, Leon Lee**, OMEGA SOLAR PTE LTD, Singapore, Singapore*

Design and Performance Improvement of Mirror augmented Photovoltaic Systems
Technical Paper Publication. PowerEnergy2016-59366
***Prathusha Bodhanker**, University of Dayton, Dayton, OH, United States*, ***Ann Bradish**, University of Dayton, Powell, OH, United States*, ***John Kissock**, University of Dayton, Dayton, OH, United States*

Effect of Power Characteristics on Solar Panels: Hands-on Projects for Clean Energy System Class
Technical Paper Publication. PowerEnergy2016-59384
***Birce Dikici, Javier Jalandoni**, Embry-Riddle Aeronautical University, Daytona Beach, FL, United States*

Models for Prediction of Soiling-Caused Photovoltaic Power Output Degradation Based on Environmental Variables in Doha, Qatar
Technical Paper Publication. PowerEnergy2016-59390
***Bing Guo, Wasim Javed, Saadat Khan**, Texas A&M University at Qatar, Doha, Qatar*, ***Benjamin Figgis**, Qatar Environment and Energy Research Institute, Doha, Qatar*, ***Talha Mirza**, GreenGulf Inc. QSTP-B at Innovation Centre, QSTP, Doha, Qatar*

TRACK 2-8
CONCENTRATING SOLAR POWER

Session 2-8-5: Receivers II

West Meeting Rooms, Charlotte Convention Center, 210A

Session Organizer: **John Pye**, *The Australian National University, Canberra, ACT, Australia*

Calorimetric Evaluation of Novel Concentrating Solar Receiver Geometries with Enhanced Effective Solar Absorptance
Technical Paper Publication. PowerEnergy2016-59463
***Jesus D. Ortega**, Sandia National Laboratories, Albuquerque, NM, United States*, ***Julius Yellowhair**, Sandia National Lab, Albuquerque, NM, United States*, ***Clifford Ho, Joshua Christian, Charles Andraka**, Sandia National Laboratories, Albuquerque, NM, United States*

Comparing the Monte Carlo Method to the Discrete Ordinates Methods in Fluent for Calculating Radiation Heat Transfer in a Small Particle Receiver
Technical Paper Publication. PowerEnergy2016-59465
***Eugene Cho, Fletcher J. Miller**, San Diego State University, San Diego, CA, United States*

Volumetric Particles Receivers for Increased Light Trapping and Heating
Technical Paper Publication. PowerEnergy2016-59544
***Clifford Ho, Joshua Christian, Brantley Mills**, Sandia National Laboratories, Albuquerque, NM, United States*

Heat Transfer and Flow Control for a Falling Particle Reactor/Receiver in Concentrating Solar Applications
Technical Presentation. PowerEnergy2016-59910
***Daniel Miller, Luca Imponenti, Kevin Albrecht, Michael Sanders, Gregory Jackson**, Colorado School of Mines, Golden, CO, United States*

A Multi-Scale Approach for the Analysis of Open Volumetric Air Receivers
Technical Presentation. PowerEnergy2016-59894
Mattia Cagnoli, Antonio Froio, Laura Savoldi, Roberto Zanino, *Dipartimento Energia, Politecnico di Torino, Torino, Italy*, ***Fritz Zaversky***, *National Renewable Energy Center (CENER), Solar Thermal Energy Department, Sarriguren (Navarre), Spain*

TRACK 2-9
WIND ENERGY SYSTEMS AND TECHNOLOGIES

Session 2-9-2: Wind Turbine Design

West Meeting Rooms, Charlotte Convention Center, 201B

Session Organizer: **Suhas Pol**, *Texas Tech University, Lubbock, TX, United States*
Session Co-Organizer: **Raul Quispe-Abad**, *Michigan State University, East Lansing, MI, United States*

The Effect of Yaw Error on the Reliability of Wind Turbine Blades
Technical Paper Publication. PowerEnergy2016-59151
Roozbeh Bakhshi, *University of Maryland, College Park, MD, United States*, ***Peter Sandborn***, *University of Maryland-College Park, College Park, MD, United States*

Development of a Chassis Mounted Multi Stage Axial Flow Turbine for Wind Energy Harvesting on a Cruising Transport Vehicle - A CFD Based Approach
Technical Paper Publication. PowerEnergy2016-59548
Shreyas Hegde, Anand Thamban, Arham Ahmed, Meet Upadhyay, Arun Mahalingam, *National Institute of Technology Karnataka Surathkal, Mangalore, India*

Meta-Modeling Based Optimization of a Directional Augmentation Technique to Improve the Performance of Six-Blade Savonius Rotor using CFD Analysis
Technical Paper Publication. PowerEnergy2016-59639
Mst Sunzida Ferdoues, Krishna Vijayaraghavan, *Simon Fraser University, Surrey, BC, Canada*

1:30 PM – 3:15 PM
ASME 2016 14TH FUEL CELL SCIENCE, ENGINEERING, AND TECHNOLOGY CONFERENCE

TRACK 3-8
COMMERCIAL APPLICATIONS OF FUEL CELLS

Session 3-8-1: Commercial Applications of Fuel Cells - I

West Meeting Rooms, Charlotte Convention Center, 206B

Session Organizer: **Jack Brouwer**, *University of California Irvine, Irvine, CA, United States*

Design, Energy Modeling and Performance of an Integrated Industrial Size Biogas SOFC System in a Wastewater Treatment Plant
Technical Paper Publication. PowerEnergy2016-59484
Marta Gandiglio, *Politecnico Di Torino, Turin, Italy*, ***Ali Saberi Mehr***, *Tabriz University, Tabriz, Iran*, ***Andrea Lanzini***, *Politecnico di Torino, Turin, Italy*, ***Massimo Santarelli***, *Politecnico di Torino, Torino, Italy*

4 MW Locomotive Hybrid Solid Oxide Fuel Cell-Gas Turbine System Dynamic Modeling using Computational Fluid Dynamics Results
Technical Presentation. PowerEnergy2016-59777
Mohammad Ali Azizi, *University of California, Irvine, Irvine, CA, United States*, ***Jack Brouwer***, *University of California Irvine, Irvine, CA, United States*

Geothermic Fuel Cells: A Novel Application of Solid-Oxide Fuel Cells for Unconventional Oil and Gas Recovery
Technical Presentation. PowerEnergy2016-59855
Gladys Anyenya, Robert Braun, Buddy Haun, Mark Daubenspeck, Alexandra Newman, Neal Sullivan, *Colorado School of Mines, Golden, CO, United States*

Design and Sizing of a 4 MW Hybrid Solid Oxide Fuel Cell- Gas Turbine Engine for Long Haul Locomotive Operation
Technical Presentation. PowerEnergy2016-59916
Mohammad Ali Azizi, *University of California, Irvine, Irvine, CA, United States*, ***Jack Brouwer***, *University of California Irvine, Irvine, CA, United States*

1:30 PM – 3:15 PM
ASME 2016 IGTI GAS TURBINE FORUM

TRACK 5-1
GAS TURBINES FOR ADVANCED COMBINED CYCLE POWER SYSTEMS

Session 5-1-2: Fuels and Efficiency in Gas Turbines

West Meeting Rooms, Charlotte Convention Center, 208A

Session Organizer: **Seth Lawson**, *US Department of Energy, National Energy Technology Laboratory, Morgantown, WV*
Session Co-Organizer: **Mike Aller**, *Energy Florida, Cape Canaveral, FL, United States*

Impact of Fuel on Gas Turbine Performance and Emissions
Technical Presentation. PowerEnergy2016-59282
Rainer Kurz, *Solar Turbines Incorporated, San Diego, CA, United States*, ***Daniel Burnes***, *Solar Turbines, San Diego, CA, United States*

Low NOx Combustor Design for 65% Efficient Engine
Technical Presentation. PowerEnergy2016-59392
J. Enrique Portillo, *Siemens Power Generation, Inc., Orlando, FL, United States*

Turbomachinery Technology for Increased Combined Cycle Efficiency
Technical Presentation. PowerEnergy2016-59866
James Downs, *Florida Turbine Technologies Inc, Jupiter, FL, United States*

Gas Turbine Combined Cycle Optimized for Post-Combustion Capture
Technical Presentation. PowerEnergy2016-59868
John Gulen, *Bechtel Infrastructure and Power Inc, Reston, VA*

TRACK 5-2
ADVANCED MANUFACTURING FOR GAS TURBINES

Session 5-2-2: Advanced Manufacturing for Gas Turbines

West Meeting Rooms, Charlotte Convention Center, 209A

Session Organizer: **John Gulen**, *Bechtel Infrastructure and Power Inc, Reston, VA*
Session Co-Organizer: **Robin Ames**, *US Department of Energy, National Energy Technology Laboratory, Morgantown, WV*

Optimized Aero-Structural Design of Gas Turbine Internal Components Using Advanced Manufacturing
Technical Presentation. PowerEnergy2016-59042
Klaus Brun, *Southwest Research Institute, San Antonio, TX, United States*, ***Karl Wygant***, *Samsung Techwin, Pearland, TX, United States*

Ceramic Matrix Composite Advanced Transition for 65% Combined Cycle Efficiency
Technical Presentation. PowerEnergy2016-59374
Jay Morrison, *Siemens Power Generation Inc., Orlando, FL, United States*, ***Richard Charron***, *Siemens Energy Inc., Jupiter, FL, United States*, ***Jonathan Shipper***, *Siemens Energy Inc., Orlando, FL, United States*

Cooling of Turbine Airfoil with Near-Surface Embedded Channels (NSEC) and Oxide Dispersion Strengthened (ODS) Coating Protection
Technical Presentation. PowerEnergy2016-59812
Minking Chyu, Li Yang, Zheng Min, Sarwesh Parbat, *University of Pittsburgh, Pittsburgh, PA, United States*, ***Sin Chien Siw***, *University of Pittsburgh, Pittsburgh, PA, United States*

Emerging Advanced Additive Manufacturing Technologies for Gas Turbines
Technical Presentation. PowerEnergy2016-59871
Suman Das, *Georgia Institute of Technology, Atlanta, GA, United States*

1:30 PM – 3:15 PM
ASME 2016 ENERGY STORAGE FORUM

TRACK 6-1
BATTERY SYSTEMS

Session 6-1-1:Battery Technology

West Meeting Rooms, Charlotte Convention Center, 205

Session Organizer: **Christopher Rahn**, *Pennsylvania State University, University Park, PA, United States*

Optimal Battery-Structure Composites for Electric Vehicles
Technical Paper Publication. PowerEnergy2016-59177
Jun Ma, *Pennsylvania State University, University Park, PA, United States*, ***Christopher Rahn***, *Pennsylvania State University, University Park, PA, United States*, ***Mary Frecker***, *Pennsylvania State University, University Park, PA, United States*

How do Different Battery Chemistries Perform in a Hybrid Microgrid?
Technical Presentation. PowerEnergy2016-59312
Rebecca Ciez, *Carnegie Mellon University, Murrysville, PA, United States*, ***J. F. Whitacre, Inês M. L. Azevedo***, *Carnegie Mellon University, Pittsburgh, PA, United States*

Multifunctional Energy Storage Composites - Design, Fabrication, and Experimental Characterization
Technical Paper Publication. PowerEnergy2016-59416
Purim Ladpli, Raphael Nardari, Raunaq Rewari, *Stanford University, Stanford, CA, United States*, ***Hongjian Liu, Michael Slater, Keith Kepler***, *Farasis Energy Inc., Hayward, CA, United States*, ***Yinan Wang, Fotis Kopsaftopoulos, Fu-kuo Chang***, *Stanford University, Stanford, CA, United States*

Study of Heat and Mass Transfer in MgCl2/NH3 Thermo-Chemical Batteries
Technical Paper Publication. PowerEnergy2016-59099
Seyyed Ali Hedayat Mofidi, Kent Udell, *University of Utah, Salt Lake City, UT, United States*

TRACK 6-6
THERMAL ENERGY STORAGE SYSTEMS

Session 6-6-1: Thermal Energy Storage Systems I

West Meeting Rooms, Charlotte Convention Center, 209B

Session Organizer: **Peiwen Li**, *University of Arizona, Tucson, AZ, United States*

A Modular Solid-based Thermal Energy Storage for a Hybrid Compressed Air Energy Storage System
Technical Paper Publication. PowerEnergy2016-59160
Ian Villazana, Reza Baghaei Lakeh, *California State Polytechnic University, Pomona, Pomona, CA, United States*, ***Sammy Houssainy***, *University of California, Los Angeles, Los Angeles, CA, United States*, ***Kevin Anderson***, *California State Polytech University, Pomona, CA, United States*, ***Hossein Kavehpour***, *UCLA, Los Angeles, CA, United States*

A Hybrid Energy Storage System Based on Metal Hydrides for Solar Thermal Power and Energy Systems
Technical Paper Publication. PowerEnergy2016-59183
Shahin Shafiee, Mary McCay, *Florida Institute of Technology, Melbourne, FL, United States*

Development of Integration Methods for Thermal Energy Storages into Power Plant Processes
Technical Paper Publication. PowerEnergy2016-59266
Clemens Schneider, *University of Applied Sciences Zittau/Görlitz, Zittau, Saxony, Saxony, Germany*, ***Torsten Klette, Sebastian Braun***, *University of Applied Sciences Zittau/Görlitz, Zittau, Saxony, Germany*, ***Steffen Härtelt***, *University of Applied Sciences Zitta/Görlitz, Zittau, Saxony, Germany*, ***Alexander Kratzsch***, *Hochschule Zittau/Gorlitz, Zittau, Germany*

Measurement of the Basic Properties of Ternary Eutectic Chloride Salts Used As High Temperature Heat Transfer Fluids and Thermal Storage Media
Technical Paper Publication. PowerEnergy2016-59190
Ghazal Dehghani, Xiankun Xu, Peiwen Li, *University of Arizona, Tucson, AZ, United States*

4:00 PM – 5:45 PM
ASME 2016 POWER CONFERENCE

TRACK 1-3
HEAT EXCHANGERS, CONDENSERS, COOLING SYSTEMS, AND BALANCE-OF-PLANT

Session 1-3-1: Condensers & Condenser Exhaust Systems

West Meeting Rooms, Charlotte Convention Center, 201A

Session Organizer: **Wendy McGowan**, *Vallourec Heat Exchanger Tubes, Morristown, TN, United States*
Session Co-Organizer: **Todd May**, *Vallourec, Morristown, TN, United States*

Guidelines and Techniques for the Effective Control of Dissolved Oxygen in Steam Surface Condensers
Technical Paper Publication. PowerEnergy2016-59004
***Darren Nightingale**, Thermal Engineering International, Santa Fe Springs, CA, United States*

Evacuation Systems for Steam Surface Condensers: Vacuum Pumps or Steam Jet Air Ejectors?
Technical Paper Publication. PowerEnergy2016-59067
***Ranga Nadig**, Maarky Thermal Systems, Cherry Hill, NJ, United States*

EPA 316b Condenser and Circulating Water Pump Study
Technical Presentation. PowerEnergy2016-59912
***Kurt Schumann**, Propump Services LLC, Bethlehem, PA, United States*

TRACK 1-4
STEAM TURBINE-GENERATORS, ELECTRIC GENERATORS, TRANSFORMERS, SWITCHGEARS, ELECTRIC BOP & AUXILIARIES

Session 1-4-2: Generator Operations, Maintenance and Trends

West Meeting Rooms, Charlotte Convention Center, 202A

Session Organizer: **John McPhearson**, *Lectrodryer, Richmond, KY, United States*
Session Co-Organizer: **Russell Chetwynd**, *National Electric Coil, San Clemente, CA, United States*

Damage Mechanisms Found in Generator Rotor 18Mn18Cr Retaining Rings
Technical Paper Publication. PowerEnergy2016-59101
***William Moore**, National Electric Coil, Westerville, OH, United States*

Rapid H2 Purge with CO2 for Safer Plant Operation - Test Runs Results
Technical Paper Publication. PowerEnergy2016-59257
***Ted Warren, John McPhearson**, Lectrodryer, Richmond, KY, United States, **Larry Morris**, East Kentucky Power Cooperative, Maysville, KY, United States*

Generator Collector Brush Holder Testing and Design Improvements
Technical Paper Publication. PowerEnergy2016-59147
***Albert (Al) Steinbach, Frank Scalzo, Matthew Preston**, General Electric Co., Schenectady, NY, United States*

TRACK 1-5
PLANT OPERATIONS, RELIABILITY, AND PERFORMANCE

Session 1-5-6: RAM1

East Meeting Rooms, Charlotte Convention Center, 211A

Session Organizer: **Brian Wodka**, *RMF Engineering, York, PA, United States*
Session Co-Organizer: **Edward Dundon**, *Dominion Power, Clinton, CT, United States*

Check Valve Evaluation and Risk Mitigation Using Computational Fluid Dynamics and Flow Testing
Technical Presentation. PowerEnergy2016-59143
***David Schowalter**, Alden Research Lab Inc, Holden, MA, United States, **Christopher Bain**, BNL Industries Inc, Vernon, CT, United States, **David King**, Duke Energy, Seneca, NC, United States, **Ludwig Haber**, Alden Research Laboratory, Inc., Rutland, MA, United States, **Simon Schaad**, Alden Research Laboratory, Inc., Fort Collins, CO, United States*

F-Class Rotor Repair Capability & Life Time Extension Solutions for Improved Life Cycle Costs
Technical Presentation. PowerEnergy2016-59340
***Chad Garner**, ALSTOM, Jupiter, FL, United States, **Scott Keller, Jeffrey Benoit**, Power Systems Mfg, LLC, Jupiter, FL, United States*

Optimization of NDE Reexamination Locations for High Energy Piping Systems
Technical Presentation. PowerEnergy2016-59688
***Fatma G. Faham, P.E., Marvin J. Cohn, P.E., P.Eng., FASME**, Intertek AIM, Sunnyvale, CA, United States, **Michael T. Cronin, P.E.**, Intertek AIM, Fremont, CA, United States*

Residual Life Evolution Of power plants Pressurized, High Temperature Components Using Small Specimens Creep Testing Techniques
Technical Presentation. PowerEnergy2016-59767
***Balhassn Ali**, Bursa Orhangazi University, Bursa, Turkey*

TRACK 1-7
RENEWABLES: SOLAR, WIND, HYDRO, & GEOTHERMAL

Session 1-7-2: Advanced Technologies for Wind Energy

West Meeting Rooms, Charlotte Convention Center, 201B

Session Organizer: **Navid Goudarzi**, *University of Maryland, Columbia, MD, United States*
Session Co-Organizer: **David MacPhee**, *University of Alabama, Tuscaloosa, AL, United States*

The Straight-Bladed Morphing Vertical Axis Wind Turbine
Technical Paper Publication. PowerEnergy2016-59192
***David MacPhee**, University of Alabama, Tuscaloosa, AL, United States, **Asfaw Beyene**, San Diego State University, San Diego, CA, United States*

Simulation of Tethered Underwater Kites: Three Dimensional Trajectories for Power Generation
Technical Paper Publication. PowerEnergy2016-59141
Amirmahdi Ghasemi, *Worcester Polytechnic Institute, Worcester, MA, United States*, ***David Olinger***, *Worcester Polytechnic Institute, Upton, MA, United States*, ***Gretar Tryggvason***, *University of Notre Dame, Notre Dame, IN, United States*

Enhanced Energy Capture by a Vertical Axis Wind Turbine During Gusty Winds in an Urban/Suburban Environment
Technical Presentation. PowerEnergy2016-59834
Lam Nguyen, Meredith Metzger, *University of Utah, Salt Lake City, UT, United States*

A Comparison of Forecasting Methods for Vertical Axis Wind Turbine Applications in an Urban/Suburban Area
Technical Presentation. PowerEnergy2016-59835
Lam Nguyen, Meredith Metzger, *University of Utah, Salt Lake City, UT, United States*

SESSION 1-7-8: ADVANCED TECHNOLOGIES FOR CHP SYSTEMS 2

West Meeting Rooms, Charlotte Convention Center, 202B

Session Organizer: **John Fall**, *American Electric Power, Columbus, OH, United States*
Session Co-Organizer: **Victor Osorio**, *San Francisco State University, San Francisco, CA, United States*

Feasibility Study of the Use of Ground-Coupled Condensers in Industrial Thermal Management
Technical Paper Publication. PowerEnergy2016-59074
Ehsan Languri, *Tennessee Technological University, Cookeville, TN, United States*, ***Glenn Cunningham, Jie Cui***, *Tennessee Tech University, Cookeville, TN, United States*, ***Stephen Idem***, *Tennessee Tech University, Cookeville, TN, United States*

Design of a Partial Admission Turbine for an Organic Rankine Cycle with Environmental Fluctuation Consideration
Technical Paper Publication. PowerEnergy2016-59386
Hooshang Heshmat, *Mohawk Innovative Tech Inc, Albany, NY, United States*, ***Andrew Z. Hunsberger***, *Mohawk Innovative Technology Inc., Albany, NY, United States*, ***James F. Walton II***, *Mohawk Innovative Technology, Inc., Albany, NY, United States*

One-Dimensional and Three-Dimensional Numerical Optimization and Comparison of Single-Stage Supersonic and Dual-Stage Transonic Radial Inflow Turbines for the ORC
Technical Paper Publication. PowerEnergy2016-59508
Kiyarash Rahbar, Saad Mahmoud, Raya Al-Dadah, Nima Moazami, *University of Birmingham, Birmingham, West Midlands, United Kingdom*

Economic Study of a Novel Geothermal ThermoElectric Generation-plus-Membrance (G-TEG-M) System
Technical Presentation. PowerEnergy2016-59897
Kevin McCabe, *Southern Research, Durham, NC, United States*, ***Jay Renew***, *Southern Research, Cartersville, GA, United States*, ***Andy Muto, Tim Hansen***, *Southern Research, Durham, NC, United States*

High-Temperature Calcium-Based Thermochemical Energy Storage System for use with CSP Facilities
Technical Presentation. PowerEnergy2016-59883
Andy Muto, Santosh Gangwal, Tim Hansen, Kelly Mastro, *Southern Research, Durham, NC, United States*

TRACK 1-9
REGULATORY, CODES, AND STANDARDS COMPLIANCE

Session 1-9-2: Panel Discussion: Environmental Issues in the Power Industry

West Meeting Rooms, Charlotte Convention Center, 204

Session Organizer: **Jane Connelly**, *Zachry Nuclear Engineering, Stonington, CT, United States*

Sponsored and organized by the ASME Environmental Engineering Division (EED), this panel will discuss timely environmental engineering topics of greatest relevance to the power industry. Topics include: • Emissions/ Waste Reduction in Carbon Capture and Storage (CCS) Units • Permitting (multi media) in CCS Units at Power Plants • Water Conservation in Power Plants • Role of ASME Codes & Standards in Environmental Regulations • Environmental Impacts and Mitigation of Renewable Energy Sources (i.e., solar, wind, hydro, etc.) • Coal Ash Pond Containment Systems • Transient Emissions, Specifically Startup, Shutdown & Malfunction (SSM), on Combined Cycle Power Plants • Impact of SSM on Plant Operations and Emissions/ Emissions Control. Panelists: • Steve Unikewicz, Moderator, Nuscale Power • Anthony Licata, Licata Energy & Environmental Consultants • Mary Ellen Ternes, Crowe & Dunlevy • Arnold Feldman, JJDS Environmental

TRACK 1-10
STUDENT COMPETITION

Session 1-10-2: Student Competition

West Meeting Rooms, Charlotte Convention Center, 206A

Session Organizer: **Andrey Gunawan**, *Georgia Institute of Technology, Atlanta, GA, United States*
Session Co-Organizer: **Steven Greco**, *We Energies, Milwaukee, WI, United States*

Design and Performance of a Small Hybrid Solar Collector
Technical Paper Publication. PowerEnergy2016-59098
Alex Zielinski, Heather Dillon, Becca Baldwin, *University of Portland, Portland, OR, United States*, ***Caitlin Forinash, Kyle Zada***, *Oregon State University, Corvallis, OR, United States*, ***Chad Stillinger, Keaton Dieter***, *George Fox University, Newberg, OR, United States*

Achieving Deep Reduction in California CO2 Emissions via Renewable Resource Integration, Electrification, and Smart Grid Deployment
Technical Paper Publication. PowerEnergy2016-59457
Siavash Ebrahimi, *National Fuel Cell Research Center, Irvine, CA, United States*, ***Jack Brouwer***, *University of California Irvine, Irvine, CA, United States*

Restructured Performance-Based Levelized Cost of Energy (LCOE) in Power Purchase Agreements (PPAs)
Technical Paper Publication. PowerEnergy2016-59608
Maira Bruck, *University of Maryland, College Park, MD, United States*, ***Navid Goudarzi***, *University of Maryland, Columbia, MD, United States*, ***Peter Sandborn***, *University of Maryland, College Park, MD, United States*

The Future of Florida's Energy
Technical Presentation. PowerEnergy2016-59870
Lauren Smiarowski, *Florida Atlantic University- Harriet L. Wilkes Honors College, Jupiter, FL, United States*

4:00 PM – 5:45 PM
ASME 2016 10TH INTERNATIONAL CONFERENCE ON ENERGY SUSTAINABILITY

TRACK 2-4
ENVIRONMENTAL, ECONOMIC, AND POLICY CONSIDERATIONS OF ADVANCED ENERGY SYSTEMS

Session 2-4-1: Policy and Finance Considerations of Technology Deployment

West Meeting Rooms, Charlotte Convention Center, 208B

Session Organizer: **Jordan Macknick**, *National Renewable Energy Laboratory*
Session Co-Organizer: **Robert Braun**, *Colorado School of Mines*

Solar Net Metering Increases Utility-Generator Profit Margins
Technical Paper Publication. PowerEnergy2016-59425
***Richard Flarend**, Pennsylvania State Altoona, Altoona, PA, United States*

Assessing the Policy Interaction Effect of Renewable Portfolio Standards (RPS) and Clean Power Plan (CPP) Emissions Goals for States in the U.S Northeast
Technical Paper Publication. PowerEnergy2016-59501
***Shankar Chandramowli**, ICF International, Fairfax, VA, United States, **Frank Felder**, CEEEP - Rutgers University, New Brunswick, NJ, United States, **Xiaojun G. Shan**, State University of New York -Binghamton, Binghamton, New York, NY, United States*

The Impacts of Demand Response Measures on Power Plant Vulnerabilities Associated With Water Temperatures
Technical Presentation. PowerEnergy2016-59617
***Jordan Macknick**, National Renewable Energy Laboratory, Golden, CO, United States, **Ella Zhou, Gregory Brinkman, Matthew O'Connell**, National Renewable Energy Laboratory (NREL), Golden, CO, United States*

Energy Efficiency Policy Roadmap for the State of Kuwait
Technical Paper Publication. PowerEnergy2016-59673
***Fotouh Al-Ragom**, Kuwait Institute For Scientific Research, Safat, Kuwait, **Osamah Alsayegh, K. J. Sreekanth, Fareed AlGhimlas**, Kuwait Institute for Scientific Research, Kuwait*

TRACK 2-7
PHOTOVOLTAICS

Session 2-7-2: Photovoltaics II

West Meeting Rooms, Charlotte Convention Center, 210B

Session Organizer: **Thad Druffel**, *Univ of Louisville*
Session Co-Organizer: **Bing Guo**, *Texas A&M University at Qatar*

Performance of Concentrated Photovoltaic Cells Using Various Microchannel Heat Sink Designs
Technical Paper Publication. PowerEnergy2016-59411
***Mahmoud Ahmed**, Assiut University, Assiut, Egypt, **Ali Radwan**, Egypt-Japan University of Science and Technology, New Borg El-Arab, Egypt, **Shinichi Ookawara**, Tokyo Institute of Technology, Tokyo, Japan*

Performance Enhancement of Concentrated Photovoltaic System Using Phase-Change Material
Technical Paper Publication. PowerEnergy2016-59641
***Mahmoud Ahmed**, Assiut University, Assiut, Egypt, **Mohamed Emam**, Egypt-Japanese University of Science and Technology, Alexendria, Egypt, **Shinichi Ookawara**, Tokyo Institute of Technology, Tokyo, Japan*

Value Added Roll-to-Roll Manufacturing Perovskite Solar Cells for Photovoltaics
Technical Presentation. PowerEnergy2016-59853
***Thad Druffel**, University of Louisville, Louisville, KY, United States, **Brandon Lavery**, University of Louisville, Louisville, KY, United States*

Optimal Design and Uncertain Analysis of Compound Parabolic Concentrator (CPC) Solar Collector System
Technical Presentation. PowerEnergy2016-59874
***Hoe-Gil Lee**, Shiv Nadar University, District Gautam Buddha Nagar, U.P., India*

TRACK 2-8
CONCENTRATING SOLAR POWER

Session 2-8-6: Receivers III

West Meeting Rooms, Charlotte Convention Center, 210A

Session Organizer: **Joshua Christian**, *Sandia National Laboratories, Albuquerque, NM, United States*

Design and Analysis of a High Temperature Particulate Hoist for Proposed Particle Heating Concentrator Solar Power Systems.
Technical Paper Publication. PowerEnergy2016-59619
***Kenzo K. D. Repole**, Georgia Institute of Technology, Atlanta, GA, United States, **Sheldon Jeter**, Georgia Institute of Technology, Atlanta, GA, United States*

Solar Simulator Efficiency Testing of Lab-Scale Particle Heating Receiver at Elevated Operating Temperatures
Technical Paper Publication. PowerEnergy2016-59655
***Matthew Golob, Clayton Nguyen**, Georgia Institute of Technology, Atlanta, GA, United States, **Sheldon Jeter**, Georgia Institute of Technology, Atlanta, GA, United States, **Said Abdel-Khalik**, Georgia Institute of Technology, Atlanta, GA, United States*

Testing of a 25 kW Concentrated Solar Power on Demand Volumetric Receiver with Integrated Thermal Energy Storage Prototype
Technical Presentation. PowerEnergy2016-59557
***Antoni Gil Pujol**, Massachusetts Institute of Technology, Cambridge, MA, United States, **Alexander Slocum**, Massachusetts Institute of Technology, Cambridge, MA, United States, **Nicolas Calvet**, Masdar Institute of Science and Technology, Masdar City, Abu Dhabi, United Arab Emir., **Daniel Codd**, University of San Diego, San Diego, CA, United States*

High Temperature Particle Receiver for Concentrated Solar Power Generation
Technical Presentation. PowerEnergy2016-59857
***Christopher A. Bonino**, RTI International, Research Triangle Park, NC, United States, **Joshua Hlebak, PE**, RTI International, Raleigh, NC, United States, **Bruce A. Cook**, Material Dynamics & Devices, Inc., Research Triangle Park, NC, United States, **Nicholas Baldasaro**, RTI International, Research Triangle Park, NC, United States, **Richard Gould**, North Carolina State University, Raleigh, NC, United States*

Analytical Stress Calculation of Non-Axisymmetrically Heated Solar Receiver and Comparison with FEA Result
Technical Presentation. PowerEnergy2016-59929
***Jin-Soo Kim**, CSIRO Energy Centre, Newcastle, NSW, Australia, **Daniel Potter**, CSIRO, NSW, Australia, **Wilson Gardner**, CSIRO, Mayfield West, NSW, Australia*

4:00 PM – 5:45 PM
ASME 2016 14TH FUEL CELL SCIENCE, ENGINEERING, AND TECHNOLOGY CONFERENCE

TRACK 3-8
COMMERCIAL APPLICATIONS OF FUEL CELLS

Session 3-8-2: Commercial Applications of Fuel Cells - II

West Meeting Rooms, Charlotte Convention Center, 206B

Session Organizer: **George Nelson**, *University of Alabama in Huntsville, Huntsville, AL, United States*

Non Flow-Through (NFT), Advanced Product Water Removal (APWR), Low Temperature PEM Fuel Cell with Reduced Balance of Plant for Air-Independent Applications
Technical Paper Publication. PowerEnergy2016-59322
***Jay LaGrange, William F. Smith**, Infinity Fuel Cell and Hydrogen, Inc., Windsor, CT, United States*

Design Space Assessment of Hydrogen Storage Onboard Medium and Heavy Duty Fuel Cell Electric Trucks
Technical Paper Publication. PowerEnergy2016-59337
***John Gangloff, James Kast, Geoffrey Morrison, Jason Marcinkoski**, U.S. Department of Energy, Washington, DC, United States*

SOFC Technology: Commercial Path to Power Distribution
Technical Presentation. PowerEnergy2016-59844
***Scott Corey**, FuelCell Energy, Inc., Danbury, CT, United States, **Keith Davis**, FuelCell Energy, Inc, Danbury, CT, United States, **Hossein Ghezel-Ayagh**, FuelCell Energy, Inc., Danbury, CT, United States*

The Development and Testing of A Remote Controlled Solar Hydrogen Electric Water Sampling Boat
Technical Presentation. PowerEnergy2016-59875
***Horace Walcott, Minci Liang**, Brooklyn Tech, Brooklyn, NY, United States*

The Development and Testing of an In Pipe Hydrokinetic Energy Harvester
Technical Presentation. PowerEnergy2016-59666
***Horace Walcott, Maya Muhieddine, Mona Liu, Matthew Choy**, Brooklyn Tech, Brooklyn, NY, United States*

4:00 PM – 5:45 PM
ASME 2016 IGTI GAS TURBINE FORUM

TRACK 5-1
GAS TURBINES FOR ADVANCED COMBINED CYCLE POWER SYSTEMS

Session 5-1-3: Advances in Combined-Cycle Efficiency

West Meeting Rooms, Charlotte Convention Center, 208A

Session Organizer: **Robin Ames**, *US Department of Energy, National Energy Technology Laboratory, Morgantown, WV*

Session Co-Organizer: **Richard Dennis**, *US Department of Energy, National Energy Technology Laboratory, Morgantown, WV*

Gas Turbine Technical Advancement Path for 65% Efficiency
Technical Presentation. PowerEnergy2016-59254
***John Intile**, GE Power, Greenville, SC, United States, **Roger Schonewald**, GE Power & Water, Greenville, SC, United States*

Advanced and Transformational Hydrogen Turbines For Integrated Gasification Combined Cycles
Technical Presentation. PowerEnergy2016-59297
***Robin Ames**, US Department of Energy, National Energy Technology Laboratory, Morgantown, WV, **Richard Dennis**, US Department of Energy, National Energy Technology Laboratory, Morgantown, WV, **Walter Shelton**, U.S. Department of Energy/NETL, Morgantown, WV, United States, **Charles White, John Plunkett**, Noblis, Inc, Falls Church, VA, United States*

Advanced Technology for Combined Cycle Power Applications
Technical Presentation. PowerEnergy2016-59840
***David McDeed**, Mitsubishi Power Systems America, Inc, Lake Mary, FL, United States*

TRACK 5-2
ADVANCED MANUFACTURING FOR GAS TURBINES

Session 5-2-3: Manufacturing and Advances in Combined-Cycle Efficiency

West Meeting Rooms, Charlotte Convention Center, 209A

Session Organizer: **Karen Thole**, *Pennsylvania State Univ, University Park, PA, United States*
Session Co-Organizer: **Richard Dennis**, *US Department of Energy, National Energy Technology Laboratory, Morgantown, WV*

Advanced Manufacturing for the Next Generation Gas Turbine: Turbine Parts Life Implications
Technical Presentation. PowerEnergy2016-59394
***Arthur Harris, Manish Kumar, Maneesh Khanna**, Siemens Energy Inc., Charlotte, NC, United States*

Roadmapping Advanced Manufacturing Techniques and Processes for Next-Generation Gas Turbines: NIST AMTech Consortium for Advanced Production and Engineering of Gas Turbines and Rotating Machinery CAPE
Technical Presentation. PowerEnergy2016-59807
***Mike Aller, Tim Franta**, Energy Florida, Cape Canaveral, FL, United States, **William Day**, Longview Energy Associates, Kensington, CA, United States*

Advanced Manufacturing: a Critical Element of Gas Turbine Technical Advancement
Technical Presentation. PowerEnergy2016-59889
***Eric Bell**, GE Power, Greenville, SC, United States, **Roger Schonewald**, GE Power & Water, Greenville, SC, United States*

4:00 PM – 5:45 PM
ASME 2016 ENERGY STORAGE FORUM

TRACK 6-1
BATTERY SYSTEMS

Session 6-1-2: Lithium Ion Battery Technology

West Meeting Rooms, Charlotte Convention Center, 205

Session Organizer: **Christopher Rahn**, *Pennsylvania State University, University Park, PA, United States*

An Intelligent Nail Design for Lithium Ion Battery Penetration Test
Technical Paper Publication. PowerEnergy2016-59073
Tanvir Tanim, Mayank Garg, *Pennsylvania State University, State College, PA, United States*, ***Christopher Rahn***, *Pennsylvania State University, University Park, PA, United States*

Characterizing thermal properties of a Lithium ion battery
Technical Presentation. PowerEnergy2016-59302
Stephen Bazinski, *Oakland University, Rochester, MI, United States*, ***Xia Wang***, *Oakland University, Rochester, MI, United States*

Process-Based Cost Modeling of Cylindrical Lithium-Ion Batteries
Technical Presentation. PowerEnergy2016-59306
Rebecca Ciez, *Carnegie Mellon University, Murrysville, PA, United States*, ***J. F. Whitacre***, *Carnegie Mellon University, Pittsburgh, PA, United States*

TRACK 6-6
THERMAL ENERGY STORAGE SYSTEMS

Session 6-6-3: Thermal Energy Storage System Performance Testing and Safety Standards Panel Session

West Meeting Rooms, Charlotte Convention Center, 209B

Session Organizer: **Fredric Constantino**, *ASME, New York, NY, United States*

The PTC 53 performance testing committee for Mechanical and Thermal Energy Storage Systems provides uniform test methods, procedures and quantifiable methods for assessing, determining and reporting the performance of mechanical or thermal energy storage systems across varying technology platforms. This applies to systems including but not limited to compressed air, fly wheels, molten salts, or pumped hydro for storing energy mechanically or thermally from any source. The TES Safety Standards Committee for Thermal Energy Storage Systems is to develop and maintain safety codes and standards covering the design, construction, testing, maintenance, operation of thermal energy storage systems for the life cycle of the equipment. This technical panel will discuss the status of each committee, and provide audience members a chance to engage in committee activities. These ASME Standards and Certification (S&C) committee were officially established in June 2015.

Thermal Energy Storage System Performance Testing and Safety Standards
Technical Presentation. PowerEnergy2016-59800
Fredric Constantino, Kathryn Hyam, *ASME, New York, NY, United States*, ***William Conlon***, *Pintail Power LLC, Palo Alto, CA, United States*, ***Frederick Buckingham***, *MPR Assoc Inc, Houston, TX, United States*, ***Alan Thelen***, *Consumers Energy, Jackson, MI, United States*

5:45 PM – 7:30 PM
ASME 2016 POWER CONFERENCE

TRACK 1-12
POSTERS

Session 1-12-1: Power Conference Poster Session

Exhibit Level, Exhibit Hall C

Session Organizer: **Tina Toburen**, *T2E3, Inc., Kirkland, WA, United States*

(1) Exergetic and Economic Analysis of Subcooling & Superheating Effect on Vapor Compression Refrigeration System
Poster Paper Publication. PowerEnergy2016-59492
A. Sinan Karakurt, Umit Gunes, Yasin Ust, *Yildiz Technical University, Istanbul, Turkey*

(2) Experimental Exploration of a Small Scale Pneumatically Pumped Thermal Storage System
Poster Paper Publication. PowerEnergy2016-59566
Inri Rodriguez, *University of California, San Diego, La Jolla, CA, United States*, ***Jesus Cerda, Daniel Codd***, *University of San Diego, San Diego, CA, United States*

(3) Analytic Study of the Effects of the Grid Resistance on Grid-Connected PV Systems: Modeling and Simulation
Poster Paper Publication. PowerEnergy2016-59614
Saad Al-Gahtani, R. M. Nelms, *Auburn University, Auburn, AL, United States*

(4) Demonstration and Verification of Organic Rankine Cycle Technology to Increase Diesel Generator Efficiency
Poster Presentation. PowerEnergy2016-59830
Eric Ringler, *Southern Research, Durham, NC, United States*

(5) Estimation of Resource Availability for Miscanthus as a Dedicated Bioenergy Crop in the State of Iowa
Poster Presentation. PowerEnergy2016-59856
Kayley Lain, Scott Spak, H.S. Udaykumar, Menno Schukking, *The University of Iowa, Iowa City, IA, United States*

5:45 PM – 7:30 PM
ASME 2016 10TH INTERNATIONAL CONFERENCE ON ENERGY SUSTAINABILITY

TRACK 2-13
POSTER

Session 2-13-1: Poster

Exhibit Level, Exhibit Hall C

Session Organizer: **Mark Lausten**, *US Department of Energy, Bethesda, MD, United States*
Session Co-Organizer: **Robert Braun**, *Colorado School of Mines, Golden, CO, United States*

(6) PV Self-consumption Increase Using a Speed-variable Heat Pump by Means of Different Controller Strategies
Poster Presentation. PowerEnergy2016-59781
Johannes Üpping, *Hochschule Ostwestfalen-Lippe, Lemgo, Germany*

(7) Adsorption Cooling Thermal Performance Predictions Using Advanced Computational Intelligence Algorithms
Poster Presentation. PowerEnergy2016-59842
Wahiba Yaici, Evgueniy Entchev, *CanmetENERGY Research Centre, Natural Resources Canada, Ottawa, ON, Canada*

(8) Pilot-scale System with Particle-based Heat Transfer Fluids for Concentrated Solar Power Applications
Poster Presentation. PowerEnergy2016-59880
Joshua Hlebak, PE, *RTI International, Raleigh, NC, United States*, ***Christopher A. Bonino***, *RTI International, Research Triangle Park, NC, United States*

(9) Smart Thermal Grid with Integrated Distributed and Seasonal Thermal Storages
Poster Presentation. PowerEnergy2016-59801
Libing Yang, *Natural Resources Canada, CanmetENERGY, Ottawa, ON, Canada*, ***Evgueniy Entchev***, *CanmetENERGY Research Centre, Natural Resources Canada, Ottawa, ON, Canada*

(10) Bipolar, Needlepoint Active Ionization Technology Controls IAQ on VOC and Saves Energy!
Poster Presentation. PowerEnergy2016-59822
Steven Alexander, *Lime Energy, Huntersville, NC, United States*

(11) Particle Conveyer for Solar Thermo-Chemical Processes and Related Solid Heat Recovery Systems
Poster Paper Publication. PowerEnergy2016-59577
Stefan Brendelberger, Jan Felinks, Dominik Florian Kolb, *German Aerospace Center (DLR), Koeln, Germany*, ***Christian Sattler***, *German Aerospace Center DLR, Koeln, Germany*

(12) Performance and Applicability of New Material Heat Exchanger to Substitute Titanium
Poster Paper Publication. PowerEnergy2016-59542
Hyeon Ju Kim, *Korea Research Institute of Ships and Ocean Engineering, Goseong-gun, Gangwon-do, Korea (Republic)*, ***Young-Kwon Jung, Ho-Saeng Lee, Wee-Yeong Oh***, *KRISO, Goseong-gun, Gangwon-do, Korea (Republic)*

(13) Performance Characterization of Bi-Directional Turbines for use in Thermoacoustic Generator Applications
Poster Paper Publication. PowerEnergy2016-59372
Eric Boessneck, Thomas E. Salem, *Clemson University, North Charleston, SC, United States*

(14) Optical Performance Modeling of Linear Fresnel Reflector Systems
Poster Presentation. PowerEnergy2016-59887
Nick Kramer, *Hyperlight Energy, La Jolla, CA, United States*, ***Guangdong Zhu***, *National Renewable Energy Laboratory, Golden, CO, United States*, ***Greg Mungas, John King***, *Hyperlight Energy, La Jolla, CA, United States*

(15) Visual Characterization of Linear Fresnel Optical Accuracy
Poster Presentation. PowerEnergy2016-59893
Nick Kramer, *Hyperlight Energy, La Jolla, CA, United States*, ***Guangdong Zhu***, *National Renewable Energy Laboratory, Golden, CO, United States*, ***Greg Mungas, John King***, *Hyperlight Energy, La Jolla, CA, United States*

(16) An Integrated Computational Model for the Optimisation of Central Receiver Systems
Poster Presentation. PowerEnergy2016-59917
Daniel Potter, *CSIRO, NSW, Australia*, ***Jin-Soo Kim***, *CSIRO Energy Centre, Newcastle, NSW, Australia*, ***Yen Soo Too***, *CSIRO, Newcastle, NSW, Australia*

5:45 PM – 7:30 PM
ASME 2016 14TH FUEL CELL SCIENCE, ENGINEERING, AND TECHNOLOGY CONFERENCE

TRACK 3-6
POSTER SESSION

Session 3-6-1: Poster Session

Exhibit Level, Charlotte Convention Center, Exhibit Hall C

Session Organizer: **Soumik Banerjee**, *Washington State University, Pullman, WA, United States*

(17) 1kW-class Stack With SUS316L Metallic Bipolar Sheets For PEMFCs Application
Poster Presentation. PowerEnergy2016-59521
Chih-Chia Lin, *Industrial Technology Research Institute, Tainan, Taiwan*, ***Ching-Ying Huang***, *ITRI, Tainan, Taiwan*, ***Wen-Lin Wang***, *Industrial Technology Research Institute, Tainan, Taiwan*

(18) The Performance of Highly Carbon-filled Composites for Bipolar Plates in Proton Exchange Membrane Fuel Cells
Poster Presentation. PowerEnergy2016-59522
Ching-Ying Huang, Cheng-Hong Liu, *ITRI, Tainan, Taiwan*, ***Chih-Chia Lin***, *Industrial Technology Research Institute, Tainan, Taiwan*

(19) Study on Fabricated Bipolar Plates used in High Temperature Proton Exchange Membrane Fuel Cell (HT-PEMFC)
Poster Presentation. PowerEnergy2016-59526
Cheng-Hong Liu, Pei-Jung Wu, Chih-Chia Lin, Wen-Lin Wang, *Industrial Technology Research Institute, Tainan, Taiwan*

(20) Effect of the Cell Resistance and Operating Conditions on performances of HT-PEMFC
Poster Presentation. PowerEnergy2016-59537
Pei-Jung Wu, *Industrial Technology Research Institute, Tainan, Taiwan*, ***Ya-Yi Xu***, *Industrial Technology Research Institute (ITRI), Taiwan, Tainan, Taiwan*, ***Chih-Chia Lin, Wen-Lin Wang, Chao-Ho Lan***, *Industrial Technology Research Institute, Tainan, Taiwan*

(21) Diagnosis on Performance of a kW-scale Water-cooled PEMFC Stack
Poster Presentation. PowerEnergy2016-59791
Chen-Yu Chen, *Chinese Culture University, Taipei, Taiwan*, ***Chia-Hsien Kang, Siou-Sheng Su***, *National Cheng-Kung University, Tainan, Taiwan*

(22) Defects in Polymer Electrolyte Membrane Post Manufacturing
Poster Presentation. PowerEnergy2016-59808
Naveen Shrivastava, *Georgia Institute of Technology, Atlanta, Atlanta, GA, United States*, ***Tequila Harris***, *George W. Woodruff School of Mechanical Engineering, Atlanta, GA, United States*

(23) Influence of Electrode Design Parameters on the Performance of a Lithium Ion battery
Poster Presentation. PowerEnergy2016-59606
Meng Xu, *Oakland University, Rochester, MI, United States*, ***Xia Wang***, *Oakland University, Rochester, MI, United States*

POWER CONFERENCE

ENERGY SUSTAINABILITY CONFERENCE

FUEL CELL CONFERENCE

GAS TURBINE FORUM

ENERGY STORAGE FORUM

WED. 6/29

PLENARY SESSIONS & SPEAKERS

Wednesday, June 29, 2016
8:00 am – 9:30 am

ENERGY SUSTAINABILITY CONFERENCE PLENARY SESSION

Room: 203B

Speakers:

Raghubir Gupta, Vice President of the Energy Technology Division, RTI

Sustainable Power Production – Path Forward

Dr. Raghubir Gupta is currently Vice President of the Energy Technology Division. Dr. Gupta obtained his B. Tech. degree in Chemical Engineering from the Indian Institute of Technology, New Delhi, India. He worked as a process engineer for Engineers India Limited in Delhi before earning his Ph.D. degree (also in Chemical Engineering) from the Illinois Institute of Technology, Chicago.

Dr. Gupta joined RTI in June 1990 as a Research Chemical Engineer. During his tenure, he has played a key role in establishing a strong R&D program in the clean energy area at RTI. Dr. Gupta currently leads a group of about 50 researchers comprising of engineers and chemists with core annual R&D revenue of about $25 million. He is responsible for technical, business, financial, and administrative management of the Energy Technology Division.

Dr. Gupta's technical expertise ranges from coal/biomass gasification, biomass conversion, synthesis gas (syngas) cleanup and utilization, methane storage and conversion, carbon capture and utilization, and industrial water reuse. Dr. Gupta has presented his research work in a number of national and international conferences, published in a number of reputed journals (including a paper in "Science") and holds more than 20 U.S. and foreign patents. Dr. Gupta is a visiting scholar at the Lenfest Center for Sustainable Energy at the Columbia University in New York.

Klaus Lackner, Director, Center for Negative Carbon Emissions, School of Sustainable Engineering and the Built Environment, Arizona State University

Balancing the World's Carbon Budget by Capturing Carbon Dioxide from the Atmosphere

Dr. Klaus Lackner is the Director of Center for Negative Carbon Emissions and Professor at the School of Sustainable Engineering and the Built Environment of the Ira A. Fulton Schools of Engineering, Arizona State University. Lackner's research interests include closing the carbon cycle by capturing carbon dioxide from the air, carbon sequestration, carbon foot-printing, innovative energy and infrastructure systems and their scaling properties, the role of automation, robotics and mass-manufacturing in downscaling infrastructure systems, and energy and environmental policy. Trained as a theoretical physicist, he has made a number of contributions to the field of carbon capture and storage since 1995, including early work on the sequestration of carbon dioxide in silicate minerals and zero emission power plant design. In 1999, he was the first person to suggest the artificial capture of carbon dioxide from air in the context of carbon management. His recent work at Columbia University as Director of the Lenfest Center for Sustainable Energy advanced innovative approaches to energy issues of the future and the pursuit of environmentally acceptable technologies for the use of fossil fuels.

Wednesday, June 29, 2016
8:00 am – 9:30 am

FUEL CELL CONFERENCE PLENARY SESSION

Room: 208B

Thomas Fuller, Professor, Georgia Institute of Technology

Challenges in the Development of Fuel Cells for Automotive Applications

Tom Fuller is a Professor in the School Chemical & Biomolecular Engineering at the Georgia Institute of Technology. He also directs the GT Center for Innovative Fuel Cell and Battery Technologies. Dr. Fuller received a bachelor of science from the University of Utah in Chemical Engineering in 1982. After completing his undergraduate studies, Dr. Fuller served for five years in the U.S. Navy in the submarine force working as a Nuclear Engineer. He continued to serve in the Naval Reserve and retired at the rank of Commander in 2001. In 1992 he obtained a Ph.D. from the University of California, Berkeley also in Chemical Engineering. Subsequently, Dr. Fuller developed advanced lithium batteries while working as a postdoctoral fellow at Lawrence Berkeley National Laboratory. He then moved to United Technologies Corporation in 1993. In subsequent assignments Dr. Fuller was manager and then Director of Engineering. He was responsible for technology development, design, assembly, and test of cell stacks for UTC Fuel Cells.

His research group at Georgia Tech is focused on durability challenges for electrochemical systems, such as fuel cells and batteries. Fundamental understanding of the physical phenomena serves as a guide to the development of new materials and systems solutions to mitigate degradation in batteries and fuel cells. This research is a blend of experiments and mathematical modeling. Dr. Fuller is active in the Electrochemical Society—he is a past chair of the Energy Technology Division. In 2008 he received the Research Award from the Energy Technology Division. Beginning in July 2009, Dr. Fuller has been serving as a Technical Editor for the Journal of the Electrochemical Society. In 2009 Dr. Fuller was named a Fellow of the Electrochemical Society.

Wednesday, June 29, 2016
8:00 am – 9:30 am

POWER CONFERENCE PLENARY SESSION

Room: 203A

Brian Maragno, Operations Manager, Siemens Energy

Manufacturing Power Generation – An Overview of the Siemens Charlotte Energy Hub

Brian Maragno is the Operations Manager for Siemens Energy based in Charlotte, North Carolina. He is responsible for production of the company's Gas Turbine product line in the Americas. Brian has more than 25 years of experience in the power generation industry and has held various management roles within Westinghouse and Siemens. Brian's experience spans from rotor and component manufacturing, to process management, to supply management, to new product introduction.

This expertise has allowed Brian to help transfer valuable knowledge and best practices from his leadership role at Siemens' former Gas Turbine manufacturing facility in Hamilton, Ontario, Canada, to the Siemens Charlotte Energy Hub. This hub is capable of producing all three main power producing products used by central station power producers (Generators, Steam Turbines and Gas Turbines). The products range in size from 150 MW up to the largest nuclear sizes over 1600 MW.

Brian is an Industrial Management graduate from Mohawk College in Hamilton, Ontario.

8:00 AM – 9:30 AM
ASME 2016 ENERGY STORAGE FORUM

TRACK 6-4
COMPRESSED AIR AND MECHANICAL ENERGY STORAGE SYSTEMS

Session 6-4-1: Compressed Air and Mechanical Energy Storage Systems

West Meeting Rooms, Charlotte Convention Center, 205

Session Organizer: **Bobby Bailie,** *Dresser-Rand, a Siemens business*

Flywheel Energy Storage Plan Using Air Bearings
Technical Presentation. PowerEnergy2016-59126
***Drew Devitt**, American Offshore Energy, Aston, PA, United States*

Thermodynamic Analysis of an Advanced Solar-Assisted Compressed Air Energy Storage System
Technical Paper Publication. PowerEnergy2016-59314
***Kent Udell, Michael Beeman**, University of Utah, Salt Lake City, UT, United States*

Thermodynamic Model of a High Temperature Compressed Air Energy System for Grid Storage
Technical Paper Publication. PowerEnergy2016-59431
***Sammy Houssainy**, University of California, Los Angeles, Los Angeles, CA, United States*, ***Reza Baghaei Lakeh**, California State Polytechnic University, Pomona, Pomona, CA, United States*, ***Hossein Kavehpour**, University of California, Los Angeles, Los Angeles, CA, United States*

10:15 AM – 12:00 PM
ASME 2016 POWER CONFERENCE

TRACK 1-1
FUELS, COMBUSTION & MATERIAL HANDLING

Session 1-1-1: Advanced Combustion Systems and Issues - I

West Meeting Rooms, Charlotte Convention Center, 204

Session Organizer: **Ezra Bar-Ziv**, *Michigan Technological University, Houghton, MI, United States*

On Dual Location Fuel Injection in a Cylindrical High Intensity Combustor
Technical Paper Publication. PowerEnergy2016-59043
***Ahmed Said, Ashwani Gupta**, University of Maryland, College Park, MD, United States*

Fuel Property Effects on the Fate of Volume Distributed Combustion
Technical Paper Publication. PowerEnergy2016-59050
***Ahmed Khalil**, University of Maryland, Hyattsville, MD, United States*, ***Ashwani Gupta**, University Of Maryland, College Park, MD, United States*

Experimental and Numerical Investigation of a Prototype Low NOx Gas turbine Burner
Technical Paper Publication. PowerEnergy2016-59592
***Atanu Kundu**, Lund University, SKANE, Skane, Sweden*, ***Arman Ahamed Subash, Robert Collin**, Lund University, Lund, Skane, Sweden*, ***Jens Klingmann**, Lund University, Lund, Sweden*

Computational Fluid Dynamics Modeling for the Prediction of NOx in a Waste Gas Boiler
Technical Paper Publication. PowerEnergy2016-59115
***Adam Blackmore**, Hatch Ltd, Mississauga, ON, Canada*, ***Jennifer Woloshyn**, Hatch Ltd., Mississauga, ON, Canada*, ***Duane Baker**, Hatch Ltd, Mississauga, ON, Canada*

TRACK 1-3
HEAT EXCHANGERS, CONDENSERS, COOLING SYSTEMS, AND BALANCE-OF-PLANT

Session 1-3-2: Cooling System Studies

West Meeting Rooms, Charlotte Convention Center, 201A

Session Organizer: **Darren Nightingale**, *Thermal Engineering International, Santa Fe Springs, CA, United States*
Session Co-Organizer: **Daniel Janikowski**, *Plymouth Tube, Lake Geneva, WI, United States*

Dry Air Turbo-Compression Cooling
Technical Paper Publication. PowerEnergy2016-59152
***Todd Bandhauer, Shane Garland**, Colorado State University, Fort Collins, CO, United States*

Dynamic Modeling and Experimental Analysis of Induced Draft Cooling Tower
Technical Paper Publication. PowerEnergy2016-59155
***Ehsan Languri**, Tennessee Technological University, Cookeville, TN, United States*, ***Pallavi Patil, Glenn Cunningham, Albert Welch, Anthony Loftis**, Tennessee Technological University, Cookeville, TN, United States*

Comparing Combined Cycle Condensing Technologies by Measuring Plant Output, Cost and Water Usage
Technical Presentation. PowerEnergy2016-59543
***Nick Gritz, Jeff Koestner**, POWER Engineers, Norcross, GA, United States*

TRACK 1-4
STEAM TURBINE-GENERATORS, ELECTRIC GENERATORS, TRANSFORMERS, SWITCHGEARS, ELECTRIC BOP & AUXILIARIES

Session 1-4-3: Steam Turbine Component Design, Analysis and Performance

West Meeting Rooms, Charlotte Convention Center, 202A

Session Organizer: **John Sassatelli**, *GE Power, Albany, NY, United States*
Session Co-Organizer: **Bob Scott**, *GE Power, Midlothian, VA, United States*

Integrating Valve Specifications In Super Critical Power Plant Design
Technical Paper Publication. PowerEnergy2016-59081
***Rana Bose**, Rana Bose and Associates Inc, Montreal, QC, Canada*

A Study on Superheat Utilization of Extraction Steam in a 1 000MW Double Reheat Ultra-Supercritical Unit
Technical Paper Publication. PowerEnergy2016-59129
***Weiliang Wang, Hai Zhang, Junfu Lv**, Tsinghua University, Beijing, Beijing, China, **Weidou Ni**, Tsinghua University, Beijing, Beijing, China, **Yongsheng Li, Jianmin Liu**, Guodian Science and Technology Research Institute, Nanjing, Nanjing, China*

Life Extension and Efficiency Improvement: Ghazlan (Saudi Arabia) Power Plant Units 1-4 Steam Turbine Upgrade Project
Technical Presentation. PowerEnergy2016-59891
***Michael Smiarowski**, Siemens Energy Inc, Orlando, FL, United States*

TRACK 1-5
PLANT OPERATIONS, RELIABILITY, AND PERFORMANCE

Session 1-5-7: RAM2

East Meeting Rooms, Charlotte Convention Center, 211A

Session Organizer: **Brian Wodka**, *RMF Engineering, York, PA, United States*
Session Co-Organizer: **Edward Dundon**, *Dominion Power, Clinton, CT, United States*

Operational Reliability and Modernization of Refineries in Mexico: How? Why? and Where?
Technical Paper Publication. PowerEnergy2016-59146
***Luis Ivan Ruiz Flores, Rafael Castellanos Bustamante, Jorge Guillermo Calderon Guizar**, Instituto de Investigaciones Electricas, Cuernavaca, Morelos, Mexico*

The Application of Smart, Connected Power Plant Assets for Enhanced Condition Monitoring and Improving Equipment Reliability
Technical Paper Publication. PowerEnergy2016-59189
***Michael Reid**, Duke Energy, Charlotte, NC, United States, **Bernie Cook**, Duke Energy, Semora, NC, United States*

Techniques for Developing an ASME RAM Program
Technical Paper Publication. PowerEnergy2016-59441
***Brian Wodka**, RMF Engineering, York, PA, United States*

TRACK 1-6
COMBUSTION TURBINES

Session 1-6-4: Combined Cycle Plant Performance Monitoring

West Meeting Rooms, Charlotte Convention Center, 208A

Session Organizer: **Nick Gritz**, *POWER Engineers, Norcross, GA, United States*

Gas Turbine Common Issues, Failures Investigation, Root Cause Analysis, and Preventative Actions
Technical Paper Publication. PowerEnergy2016-59352
***Zuhair Ibrahim**, Exponent, Failure Analysis Associates, Los Angeles, CA, United States, **Stephen Garner**, Exponent, Chicago, IL, United States*

Owner Furnished Equipment Contracting Strategies For Combined Cycle Plants
Technical Presentation. PowerEnergy2016-59519
***Jeff Cummings**, HDR, Saline, MI, United States*

Effect of Blade Deflection Angles, Pressure Drop, Flow and Work Co-Efficient's on Stage Performance of a Gas Turbine Shrouded HP Compressor Blade
Technical Paper Publication. PowerEnergy2016-59328
***Vinayaka N. Nilotpal Banerjee**, National Institute of Technology Durgapur, Durgapur, West Bengal, India, **B.S. Ajay Kumar**, Bangalore Institute of Technology, Bangalore, Karnataka, India, **Kumar K. Gowda**, Vivekananda Institute of Technology, Bangalore, Karnataka, India*

TRACK 1-7
RENEWABLES: SOLAR, WIND, HYDRO, & GEOTHERMAL

Session 1-7-1: Distributed and Small Scale Generation

West Meeting Rooms, Charlotte Convention Center, 205

Session Organizer: **David MacPhee**, *University of Alabama, Tuscaloosa, AL, United States*

An Insight Of Electricity Generation From The Turbulence Of Sea Waves
Technical Presentation. PowerEnergy2016-59772
***Prinan Banerjee**, SRM University, Chennai, Tamil Nadu, India, **Dia Chatterjee**, Jogamaya Devi College (Calcutta University), Kolkata, India, **Prathik Kumar Devalla**, SRM University, Chennai, India*

Evaluating Solar Energy Options For Nigeria's Niger Delta
Technical Presentation. PowerEnergy2016-59805
***Kelvin Ovie Okotie-Eboh**, Sofaed Services Nigeria Limited, Effurun, Delta, Nigeria*

Evolutionary Configurations of Renewable Energy Hybrid Systems for Mitigation of Stochastic Output Power in Off-Grid Distributed Generation
Technical Presentation. PowerEnergy2016-59865
***Mohammed Yekini Suberu**, Federal Polytechnic Nasarawa, Nasarawa State, Nigeria, **Saidu Shettima Abdulkadir**, Federal Polytechnic Nasarawa, Nasarawa, Nigeria*

SESSION 1-7-6: ADVANCED TECHNOLOGIES FOR WIND ENERGY 2

West Meeting Rooms, Charlotte Convention Center, 201B

Session Organizer: **Navid Goudarzi**, *University of Maryland, Columbia, MD, United States*
Session Co-Organizer: **David MacPhee**, *University of Alabama, Tuscaloosa, AL, United States*

Power Output and Efficiency Evaluation of a Small Wind Turbine: UAE Case Study
Technical Paper Publication. PowerEnergy2016-59242
***Mohamed Gadalla**, American University of Sharjah, Sharjah, Sharjah, United Arab Emir., **Sayem Zafar**, Department of Mechanical Engineering, Sharjah, Sharjah, United Arab Emir., **Mohammad Alnaiser**, American University of Sharjah, Sharjah, Sharjah, United Arab Emir.*

Site Characterization and the Aerodynamics of an Offshore Wind Power Plant- Statistical, Analytical and Numerical Approaches.
Technical Paper Publication. PowerEnergy2016-59303
James Agbormbai, *University of Maryland, Baltimore County, Baltimore, MD, United States*, ***M Yu***, *University of Maryland, Baltimore County, Baltimore, MD, United States*, ***Weidong Zhu***, *University of Maryland, Baltimore County, Baltimore, MD, United States*

Cost-Performance Tradeoff Study of Wind Systems: Grid-Scale Storage and Transmission
Technical Paper Publication. PowerEnergy2016-59461
Navid Goudarzi, *University of Maryland, Columbia, MD, United States*, ***John Rudesill***, *University of Maryland, Baltimore County, Baltimore, MD, United States*, ***Alex Pavlak***, *Future of Energy Initiative, Severna Park, MD, United States*

Turbulence Intensity Distribution Identification and Application in Wind Energy
Technical Presentation. PowerEnergy2016-59815
Weifei Hu, *Cornell University, Ithaca, NY, United States*

TRACK 1-9
REGULATORY, CODES, AND STANDARDS COMPLIANCE

Session 1-9-1: Carbon Reduction Technologies Panel Discussion

West Meeting Rooms, Charlotte Convention Center, 208B

Session Organizer: **Frank Michell,** *Westerville, OH, United States*

The panel session will focus on Carbon Reduction Technologies. Speakers: Lynn Brickett, Carbon Dioxide Capture R&D Portfolio Manager Strategic Planning – Environmental Sustainability, National Energy Technology Laboratory (NETL), *Perspective on Carbon Capture*; Traci Rodosta, Carbon Dioxide Storage R&D Portfolio Manager Strategic Planning - Environmental Sustainability National Energy Technology Laboratory (NETL), *Perspective on Carbon Storage*; Klaus Lackner, Director, Center for Negative Carbon Emissions School of Sustainable Engineering and the Built Environment Arizona State University, *Closing the Carbon Cycle*; Dr. Raghubir Gupta, Vice President, Energy Technology Division RTI International Research Triangle Park, North Carolina, *International Perspective on Carbon Management*; Frank Michell, Manager, Applications Engineering & Balance of Plant American Electric Power (AEP), *panel moderator and Utility Perspective (ie cost effectiveness... implementing all of the above).*

10:15 AM – 12:00 PM
ASME 2016 10TH INTERNATIONAL CONFERENCE ON ENERGY SUSTAINABILITY

TRACK 2-4
ENVIRONMENTAL, ECONOMIC, AND POLICY CONSIDERATIONS OF ADVANCED ENERGY SYSTEMS

Session 2-4-4: Carbon Reduction Technologies Panel Discussion

West Meeting Rooms, Charlotte Convention Center, 208B

Session Organizer: **Robert Braun**, *Colorado School of Mines, Golden, CO, United States*

The panel session will focus on Carbon Reduction Technologies. Speakers: Lynn Brickett, Carbon Dioxide Capture R&D Portfolio Manager Strategic Planning – Environmental Sustainability, National Energy Technology Laboratory (NETL), *Perspective on Carbon Capture*; Traci Rodosta, Carbon Dioxide Storage R&D Portfolio Manager Strategic Planning - Environmental Sustainability National Energy Technology Laboratory (NETL), *Perspective on Carbon Storage*; Klaus Lackner, Director, Center for Negative Carbon Emissions School of Sustainable Engineering and the Built Environment Arizona State University, *Closing the Carbon Cycle*; Dr. Raghubir Gupta, Vice President, Energy Technology Division RTI International Research Triangle Park, North Carolina, *International Perspective on Carbon Management*; Frank Michell, Manager, Applications Engineering & Balance of Plant American Electric Power (AEP), *panel moderator and Utility Perspective (ie cost effectiveness... implementing all of the above).*

TRACK 2-8
CONCENTRATING SOLAR POWER

Session 2-8-7: Receivers IV

West Meeting Rooms, Charlotte Convention Center, 210A

Session Organizer: **Sheldon Jeter**, *Georgia Institute of Technology, Atlanta, GA, United States*

Part Load Behavior of Molten Salt Cavity Receiver Solar Tower Plants under Storage Mode Operational Mode
Technical Paper Publication. PowerEnergy2016-59703
Seyed Saeed Mostafavi Tehrani, Robert Taylor, *UNSW, Sydney, New South Wales, Australia*, ***Pouya Saberi***, *K.N.Toosi University of Technology, Tehran, Iran*, ***Ardalan Shafiei Ghazani***, *Sharif University of Technology, Tehran, Iran*

Optical Performance of Bladed Receivers for CSP Systems
Technical Paper Publication. PowerEnergy2016-59693
Ye Wang, *Australian National University, Canberra, ACT, Australia*, ***Charles-Alexis Asselineau, Joe Coventry, John Pye***, *Australian National University, Canberra, ACT, Australia*

Multi-Objective Method for Receiver Design Optimization Using N-Dimensional Stochastic Pareto Front Detection.
Technical Presentation. PowerEnergy2016-59694
Charles-Alexis Asselineau, Joe Coventry, John Pye, *Australian National University, Canberra, ACT, Australia*

Comparative Analysis of Evacuated and Non-Evacuated Absorber Tube Receiver for a Commercial Linear Fresnel CSP System
Technical Presentation. PowerEnergy2016-59895
Marco Procopio, Mattia Cagnoli, *Dipartimento Energia, Politecnico di Torino, Torino, Italy*, ***Domenico Mazzei, Valeria Russo***, *ENEA - Centro Ricerche della Casaccia, Rome, Italy*, ***Laura Savoldi, Roberto Zanino***, *Dipartimento Energia, Politecnico di Torino, Torino, Italy*

10:15 AM – 12:00 PM
ASME 2016 14TH FUEL CELL SCIENCE, ENGINEERING, AND TECHNOLOGY CONFERENCE

TRACK 3-5
BATTERIES AND ELECTROCHEMICAL ENERGY STORAGE

Session 3-5-1: Batteries and Energy Storage Session

West Meeting Rooms, Charlotte Convention Center, 209A

Session Organizer: **Todd Bandhauer**, *Colorado State University, Fort Colins, CO, United States*
Session Co-Organizer: **George Nelson**, *University of Alabama in Huntsville, Huntsville, AL, United States*

Observation of Enzymatic Electrochemical Cells using Neutron Radiography and Tomography
Technical Presentation. PowerEnergy2016-59439
George Nelson, Erin Looney, Zachary K. Van Zandt, *University of Alabama in Huntsville, Huntsville, AL, United States*, ***Yevgenia Ulyanova, Sameer Singhal***, *CFD Research Corporation, Huntsville, AL, United States*, ***Louis Santodonato, Hassina Bilheux***, *Oak Ridge National Laboratory, Oak Ridge, TN, United States*

Synthesis and Performance Evaluation of a Solid Electrolyte and Air Cathode for a Rechargeable Lithium-Air Battery
Technical Paper Publication. PowerEnergy2016-59448
Susanta Kumar Das, *Kettering University, Grand Blanc, MI, United States*, ***Abhijit Sarkar***, *Michigan Molecular Institute, Midland, MI, United States*

Multi-Functional Electrolyte for Thermal Management of Lithium-Ion Batteries
Technical Paper Publication. PowerEnergy2016-59460
Kevin Westhoff, Todd Bandhauer, *Colorado State University, Fort Collins, CO, United States*

Effect of Mass-Transfer Characteristics of the Separator on the Performance of Redox Flow Batteries
Technical Presentation. PowerEnergy2016-59731
Seunghun Jung, Ho-Young Jung, *Chonnam National University, Gwangju, Korea (Republic)*

Evaluation of the Effect of Cycling Profile on the Durability of Commercial Lithium Ion Batteries
Technical Presentation. PowerEnergy2016-59863
Karthik Radhakrishnan, *Virginia Tech, Blacksburg, VA, United States*

10:15 AM – 12:00 PM
ASME 2016 ENERGY STORAGE FORUM

TRACK 6-6
THERMAL ENERGY STORAGE SYSTEMS

Session 6-6-2: Thermal Energy Storage Systems II

West Meeting Rooms, Charlotte Convention Center, 209B

Session Organizer: **Leland Weiss**, *Louisiana Tech University, Ruston, LA, United States*

Liquid Air Power and Storage
Technical Presentation. PowerEnergy2016-59809
William Conlon, *Pintail Power LLC, Palo Alto, CA, United States*

Small-Scale Thermal Energy Storage with Capillary Conductivity Enhancement
Technical Paper Publication. PowerEnergy2016-59582
Leland Weiss, *Louisiana Tech University, Ruston, LA, United States*, ***Aryn Hays, Eric Borquist, Debbie Wood, Davis Bailey***, *Louisiana Tech University, Ruston, LA, United States*

Experimental Investigation of Reciprocating Compressors and Expanders for Pumped Thermal Electricity Storage
Technical Paper Publication. PowerEnergy2016-59631
Paul Sapin, *Imperial College London, London, United Kingdom*, ***Drazen Fabris***, *Santa Clara University, Santa Clara, CA, United States*, ***Aly Taleb***, *Imperial College London, London, United Kingdom*, ***Alexander J. White***, *Cambridge University Engineering Department, Cambridge, Cambridgeshire, United Kingdom*, ***Christos Markides***, *Clean Energy Processes (CEP) Laboratory, Department of Chemical Engineering, Imperial College London, London, United Kingdom*

Numerical Modeling and Experimental Validation of a Solar Thermochemical Energy Storage Reactor
Technical Presentation. PowerEnergy2016-59848
Abhishek Singh, *German Aerospace Center, Köln, Germany*, ***Stefania Tescari, Gunner Lantin, Stefan Breuer***, *German Aerospace Center (DLR), Cologne, Germany*, ***Matthias Lange, Christos Agrafiotis***, *Deutsches Zentrum für Luft- und Raumfahrt e.V., Cologne, Germany*, ***Martin Roeb***, *Deutsches Zentrum für Luft- und Raumfahrt e.V., Koeln, Germany*, ***Christian Sattler***, *German Aerospace Center DLR, Koeln, Germany*

1:30 PM – 3:15 PM
ASME 2016 POWER CONFERENCE

TRACK 1-1
FUELS, COMBUSTION & MATERIAL HANDLING

Session 1-1-4: Advanced Gasification & Torrefaction Systems

West Meeting Rooms, Charlotte Convention Center, 204

Session Organizer: **Ashwani Gupta**, *University Of Maryland, College Park, MD, United States*

Grindability of Torrefied-Biomass
Technical Presentation. PowerEnergy2016-59176
Ezra Bar-Ziv, *Michigan Technological University, Houghton, MI, United States*

Operation and Safety Issues Related to the Biomass Torrefaction Process
Technical Presentation. PowerEnergy2016-59178
Ezra Bar-Ziv, *Michigan Technological University, Houghton, MI, United States*

Torrefied-Biomass from Municipal Solid Waste for Power Production
Technical Presentation. PowerEnergy2016-59179
***Ezra Bar-Ziv**, Michigan Technological University, Houghton, MI, United States*

TRACK 1-3
HEAT EXCHANGERS, CONDENSERS, COOLING SYSTEMS, AND BALANCE-OF-PLANT

Session 1-3-5: Panel Discussion - Existing Heat Exchanger Challenges and Their Resolutions

West Meeting Rooms, Charlotte Convention Center, 201A

Session Organizer: **Daniel Janikowski**, *Plymouth Tube, Lake Geneva, WI, United States*
Session Co-Organizer: **David Nesbitt**, *RetubeCo, Ooltewah, TN, United States*

This session will initiate with some examples of problems with existing heat exchangers and systems and how they were resolved. Those examples will be used to encouraging attendees to discuss some of their problems with support from the panel. All attendees offering reasonable questions to the Panel will be given an opportunity to draw their name to win an iPad at the end of the session (iPad provided by RetubeCo).

Heat Exchanger Challenge 1
Panel Presentation. PowerEnergy2016-59956
***Frank Michell**, AEP, Westerville, OH, United States*

Existing Heat Exchanger Challenge and Resolution
Panel Presentation. PowerEnergy2016-59957
***Darren Nightingale**, Thermal Engineering International, Santa Fe Springs, CA, United States*

Existing Heat Exchanger Challenge and Resolution
Panel Presentation. PowerEnergy2016-59958
***Michael Catapano**, Powerfect, Middletown, NJ, United States*

TRACK 1-4
STEAM TURBINE-GENERATORS, ELECTRIC GENERATORS, TRANSFORMERS, SWITCHGEARS, ELECTRIC BOP & AUXILIARIES

Session 1-4-4: Increasing Efficiency and New Methods for Generating Electric Power

West Meeting Rooms, Charlotte Convention Center, 202A

Session Organizer: **Steven Greco**, *We Energies, Milwaukee, WI, United States*

Generation Of Electricity From Tires Using Faraday's Law
Technical Presentation. PowerEnergy2016-59759
***Prinan Banerjee, Aman Srivastava**, SRM University, Chennai, Tamil Nadu, India*, ***Dia Chatterjee**, Jogamaya Devi College (Calcutta University), Kolkata, India*, ***Prathik Kumar Devalla**, SRM University, Chennai, India*

Performance Analysis of a PbTe-Based Thermoelectric Generator Device with Consideration of Heat Loss and Temperature-Dependent Material Properties
Technical Presentation. PowerEnergy2016-59921
***Eurydice Kanimba**, Virginia Polytechnic Institute and State University, Blacksburg, VA, United States*, ***Zhiting Tian**, Virginia Tech, Blacksburg, VA, United States*

TRACK 1-5
PLANT OPERATIONS, RELIABILITY, AND PERFORMANCE

Session 1-5-1: Power Plant Pumping Systems Optimization - Tutorial

East Meeting Rooms, Charlotte Convention Center, 211A

Session Organizer: **M. John Constable**, *Con Edison, Mount Vernon, NY, United States*
Session Co-Organizer: **Brian Langel**, *Omaha Public Power District, Omaha, NE, United States*

Pumping systems account for a significant portion of power plant auxiliary power usage. Increased pump system efficiency is needed to reduce pump wear and tear associated with heat and vibration, lengthen equipment lifespan, and decrease downtime for maintenance and repairs. This session sponsored by the Hydraulic Institute provides a mini-course on motor driven pumping system optimization to improve reliability and reduce operating costs.

Pumping Systems Optimization: Key to Lower Maintenance Costs, Improved Reliability, and Higher Profitability
Technical Presentation. PowerEnergy2016-59083
***William Livoti**, WEG Electric Corp / Electric Machinery in Conjunction with the Hydraulic Institute, Winter Haven, FL, United States*, ***Mark Sullivan**, Hydraulic Institute, Parsippany, NJ, United States*

SESSION 1-5-8: PERFORMANCE TESTING

East Meeting Rooms, Charlotte Convention Center, 211B

Session Organizer: **Matthew Dooley**, *Alstom Power, Granby, CT, United States*

On-line Performance Monitoring and Diagnostics for Large Combined Cycle Power Plant
Technical Paper Publication. PowerEnergy2016-59020
***Boris Chudnovsky**, Israel Electric Corp, Haifa, Israel*, ***Alexander Talanker**, Israel Electric Company, Haifa, Israel*, ***Leonid Levin, Vladimir Mankovsky, Alina Kunin**, Israel Electric Corp, Haifa, Israel*

Effect of Exclusion of Gas Turbine from the PTC 46 Test Scope on the Performance Test Measurement Uncertainty of Combined Cycle Plant
Technical Presentation. PowerEnergy2016-59468
***Cecil Lawrence**, Fluor, Aliso Viejo, CA, United States*

Performance Analyze of Ultra-Low Emission of Thermal Power Generation Based on Multi-objective Optimization and Fuzzy Rouhg Set
Technical Paper Publication. PowerEnergy2016-59583
***Xiaoen Li, Ningling Wang, YuMeng Zhang, Yongping Yang**, North China Electric Power University, Beijing, China*

TRACK 1-6
COMBUSTION TURBINES

Session 1-6-2: Gas Turbine Designs and Upgrades 1

West Meeting Rooms, Charlotte Convention Center, 208A

Session Organizer: **Lilia Papadopoulos**, *Sargent & Lundy, Chicago, IL, United States*

Producing the World's Finest Heat Engine
Technical Paper Publication. PowerEnergy2016-59103
***Bernard Koff**, TurboVision, Palm Beach Garden, FL, United States*

The FlameSheet™ Combustor System : A (R)evolutionary Step Change Improvement in the Flexibility of Installed F-Class Gas Turbines
Technical Presentation. PowerEnergy2016-59342
***Hany Rizkalla**, Power Systems Mfg, LLC, Jupiter, FL, United States*, ***Peter Stuttaford**, Power Systems Mfg. LLC, Jupiter, FL, United States*, ***Jeffrey Benoit**, Power Systems Mfg, LLC, Jupiter, FL, United States*

Application of Ramberg-Osgood Plasticity to Determine Cyclic Hardening Parameters
Technical Paper Publication. PowerEnergy2016-59317
***Thomas Bouchenot, Bassem Felemban, Cristian Mejia**, University of Central Florida, Orlando, FL, United States*, ***Ali Gordon**, University of Central Florida, Orlando, FL, United States*

Transient Stress Analysis and High Cycle Fatigue life Estimation of a Gas Turbine Shrouded HP Compressor Blade
Technical Paper Publication. PowerEnergy2016-59336
***Vinayaka N, Nilotpal Banerjee**, National Institute of Technology Durgapur, Durgapur, West Bengal, India*, ***B.S. Ajay Kumar**, Bangalore Institute of Technology, Bangalore, Karnataka, India*, ***Kumar.K. Gowda, Tulsidas. D**, Vivekananda Institute of Technology, Bangalore, Karnataka, India*

TRACK 1-7
RENEWABLES: SOLAR, WIND, HYDRO, & GEOTHERMAL

Session 1-7-9: Advanced Technologies for Wind Energy 3

West Meeting Rooms, Charlotte Convention Center, 201B

Session Organizer: **David MacPhee**, *The University of Alabama, Tuscaloosa, AL, United States*
Session Co-Organizer: **Navid Goudarzi**, *University of Maryland, Columbia, MD, United States*

A Numerical Study on the Performance of Fixed Oscillating Water Column Wave Energy Converter at Steep Waves
Technical Paper Publication. PowerEnergy2016-59142
***Morteza Anbarsooz, Ali Faramarzi**, Quchan University of Advanced Technology, Quchan, Iran*, ***Amirmahdi Ghasemi**, Worcester Polytechnic Institute, Worcester, MA, United States*

Numerical Investigation of Novel Blade Geometry Design of Vertical-Axis Wind Turbines for Performance Improvement
Technical Paper Publication. PowerEnergy2016-59210
***Mosfequr Rahman, Travis Salyers, Emile Maroha**, Georgia Southern University, Statesboro, GA, United States*, ***Mahbub Ahmed**, Southern Arkansas University, Magnolia, AR, United States*, ***Sirajus Salekeen**, Georgia Southern University, Statesboro, GA, United States*

1:30 PM – 3:15 PM
ASME 2016 10TH INTERNATIONAL CONFERENCE ON ENERGY SUSTAINABILITY

TRACK 2-3
CHP AND HYBRID POWER & ENERGY SYSTEMS

Session 2-3-2: Hybrid Energy Systems

West Meeting Rooms, Charlotte Convention Center, 202B

Session Organizer: **Mohammad Abutayeh**, *Khalifa University, Palm Beach Gardens, FL, United States*

Utilizing Waste Heat From Hybrid Energy Systems for Pyrolysis and Other Processes
Technical Paper Publication. PowerEnergy2016-59355
***Kelley M. Verner, Lee Ostrom**, University of Idaho, Idaho Falls, ID, United States*, ***Michael G. McKellar**, Idaho National Laboratory, Idaho Falls, ID, United States*

Design and Evaluation of Hybrid Energy Systems
Technical Paper Publication. PowerEnergy2016-59452
***Robin McDaniel**, Nibor Institute, Lake Villa, IL, United States*

Importance of Minimizing Waste of Renewable Energy in Designing Standalone Hybrid Energy Systems
Technical Paper Publication. PowerEnergy2016-59518
***A. T. D. Perera**, EPFL, Lausanne, Switzerland*

Performance of the Semi-closed Oxy-fuel Combustion Combined Cycle Adopting a Recuperator
Technical Presentation. PowerEnergy2016-59873
***B.S. Choi**, Inha Graduate School, Incheon, Korea (Republic)*, ***M.J. Kim**, Inha University, Incheon, Korea (Republic)*, ***Tong-Seop Kim**, Inha University, Incheon, Korea (Republic)*

TRACK 2-4
ENVIRONMENTAL, ECONOMIC, AND POLICY CONSIDERATIONS OF ADVANCED ENERGY SYSTEMS

Session 2-4-2: Energy Systems Modeling and Trends

West Meeting Rooms, Charlotte Convention Center, 208B

Session Organizer: **Jordan Macknick,** *National Renewable Energy Laboratory*
Session Co-Organizer: **Pouria Ahmadi,** *Simon Fraser University (SFU)*

On the Recent Climatological and Energy Trends in Mexico City
Technical Paper Publication. PowerEnergy2016-59320
***Alvaro Lentz**, CCNY, Fort Lee, NJ, United States*, ***Moises Angeles, Equisha Glenn**, City College of New York, New York, NY, United States*, ***Nazario Ramírez**, University of Puerto Rico-Mayagüez, Mayagüez, PR, United States*, ***Jorge Gonzalez**, City College of New York, New York, NY, United States*

Energy Offsets and Alternative Futures A Semi-empirical Model of the U.S. Energy System
Technical Presentation. PowerEnergy2016-59744
Francis Kulacki, *University of Minnesota, Minneapolis, MN, United States*

Development of Cradle To Cradle Life Cycle Model: Towards the Sustainable Manufacturing
Technical Presentation. PowerEnergy2016-59843
Vishal Bhise, Bhagwan Jogi, *Dr. Babasaheb Ambedkar Technological University, Lonere, Dist. Raigad, Maharashtra, Maharashtra, India*

A Field Survey on Multipot Biomass Cookstove over Entire Division of Maharashtra, India
Technical Presentation. PowerEnergy2016-59878
Rohan R. Pande, Vilas R. Kalamkar, *Visvesvaraya National Institute of Technology, Nagpur, India*

TRACK 2-6
SOLAR CHEMISTRY

Session 2-6-1: Redox Systems for Solar Fuel Production

West Meeting Rooms, Charlotte Convention Center, 210B

Session Organizer: **Justin Lapp**, *German Areospace Center, Köln, Germany*
Session Co-Organizer: **Alexander Muroyama**, *Georgia Institute of Technology, Atlanta, GA, United States*

Model-Free Thermodynamic Relationships for Non-Stoichiometric Metal Oxides (MOx-d) from d-Temperature-PO2 Experimental Measurements
Technical Presentation. PowerEnergy2016-59959
Ellen Stechel, *ASU, Tempe, AZ, United States*, ***James Miller, Andrea Ambrosini, Sean Babiniec, Eric Coker***, *Sandia National Laboratories, Albuquerque, NM, United States*, ***Anthony McDaniel***, *Sandia National Laboratories, Livermore, CA, United States*

Dopant-Induced Stress to Alter the H2O/CO2-Splitting Behavior of Redox Materials
Technical Presentation. PowerEnergy2016-59113
Christopher Muhich, *ETH-Zurich, Zurich, Switzerland*, ***Aldo Steinfeld***, *ETH Zurich, Zurich, Switzerland*

Thermodynamic Characterization of Yttrium Strontium Manganite (YSM) Perovskites
Technical Presentation. PowerEnergy2016-59600
Conrad Cole, Jonathan Scheffe, *University of Florida, Gainesville, FL, United States*

A Framework for Determining the Optimal Material for Two-Step Partial Redox Cycles
Technical Presentation. PowerEnergy2016-59662
Asegun Henry, *Georgia Institute of Technology, Atlanta, GA, United States*

TRACK 2-8
CONCENTRATING SOLAR POWER

Session 2-8-8: Thermal Energy Storage I

West Meeting Rooms, Charlotte Convention Center, 210A

Session Organizer: **Zhiwen Ma**, *NREL, Golden, CO, United States*

Solar Thermochemical Heat Storage Based on Redox Cycles of BaO2/BaO: Re-evaluating an Old Concept
Technical Presentation. PowerEnergy2016-59120
Alfonso J. Carrillo, Daniel Sastre, David P. Serrano, Patricia Pizarro, Juan M. Coronado, *IMDEA Energy Institute, Móstoles, Spain*

Thermodynamic Analysis of a Thermochemical Energy Storage Subsystem Using Perovskite Oxide Particles
Technical Presentation. PowerEnergy2016-59149
Kevin Albrecht, Robert Braun, *Colorado School of Mines, Golden, CO, United States*

Design and Start-Up of Two Pilot Plants for Molten Salts Storage Testing
Technical Paper Publication. PowerEnergy2016-59268
Luisa F. Cabeza, *University of Lleida, Lleida, Spain*, ***Cristina Prieto***, *Abengoa Research, Sevilla, Spain*, ***Laia Miró, Jaume Gasia, Gerard Peiró***, *University of Lleida, Lleida, Spain*

1:30 PM – 3:15 PM
ASME 2016 14TH FUEL CELL SCIENCE, ENGINEERING, AND TECHNOLOGY CONFERENCE

TRACK 3-1
POLYMER ELECTROLYTE MEMBRANE, DIRECT METHANOL, & ALKALINE FUEL CELLS

Session 3-1-1: Polymer Electrolyte Membrane, Direct Methanol, & Alkaline Fuel Cells - I

West Meeting Rooms, Charlotte Convention Center, 209A

Session Organizer: **Anthony Santamaria**, *Western New England University, Springfield, MA, United States*
Session Co-Organizer: **Prodip K. Das**, *Newcastle University, Newcastle Upon Tyne, United Kingdom*

Quantitative Analysis on the Components of the Oxygen Transport Resistance through a PEMFC
Technical Presentation. PowerEnergy2016-59244
Hwanyeong Oh, Yoo-Il Lee, Guesang Lee, Kyoungdoug Min, *Seoul National University, Seoul, Korea (Republic)*

Investigation of Water Transport within a Proton Exchange Membrane Fuel Cell by Diffusion Layer Saturation Analysis.
Technical Paper Publication. PowerEnergy2016-59408
Logan Battrell, Aubree Trunkle, Erica Eggleton, *Montana State University, Bozeman, MT, United States*, ***Lifeng Zhang***, *University of Saskatchewan, Saskatoon, SK, Canada*, ***Ryan Anderson***, *Montana State University, Bozeman, MT, United States*

Effect of Fabrication Method on Oxygen Transport Resistance and Water Distribution wihtin PEFC Catalyst Layer
Technical Presentation. PowerEnergy2016-59479
Takashi Sasabe, Ting-Chu Jao, Aya Shingai, Yoshihiko Aoki, Shuichiro Hirai, *Tokyo Institute of Technology, Tokyo, Japan*

In-Plane Neutron Radiography Study of the Effect of Cross Flow on Water Distribution in the Gas Diffusion Layer
Technical Presentation. PowerEnergy2016-59792
***Nathanial Cooper**, University of California, Davis, Davis, CA, United States, **Anthony Santamaria**, Western New England University, Springfield, MA, United States, **Maxwell Becton**, University of California, Davis, Davis, CA, United States, **Jae Wan Park**, UC Davis, Davis, CA, United States*

1:30 PM – 3:15 PM
ASME 2016 ENERGY STORAGE FORUM

TRACK 6-2
COMMERCIAL APPLICATIONS OF ENERGY STORAGE

Session 6-2-1: Commercial Applications of Energy Storage

West Meeting Rooms, Charlotte Convention Center, 209B

Session Organizer: **Bobby Bailie,** *Dresser-Rand, a Siemens business*

Mapping Energy Storage Physics to Application Economics
Technical Paper Publication. PowerEnergy2016-59597
***Irene Berry, Glen Merfeld, Patrick Riley**, GE Global Research, Niskayuna, NY, United States*

Energy Storage Applications in Distributed Generation & Cogeneration Power Plants
Technical Presentation. PowerEnergy2016-59849
***Joel Wilson**, MMR Power Solutions, Fresno, CA, United States*

Energy Storage, Renewable Power Generation, and the Grid
Technical Presentation. PowerEnergy2016-59736
***Zhiwen Ma**, NREL, Golden, CO, United States*

Electrical Grid Benefits of Pumped Storage Projects, Recent Advances in Pumped Storage Technology
Technical Presentation. PowerEnergy2016-59420
***Juliusz Kirejczyk**, HDR, Hernando Bch, FL, United States, **David Summers**, HDR, Gastonia, NC, United States, **Rick Miller, John Sigmon**, HDR, Charlotte, NC, United States*

Safety and Design Considerations in the Deployment of Battery Based Energy Storage Systems
Technical Presentation. PowerEnergy2016-59831
***Michael D. Eskra**, Eskra Technical Products, Inc., Saukville, WI, United States, **Bryan J Eskra**, Power Engrs Collaborative Llc, Brookfield, WI, United States*

4:00 PM – 5:45 PM
ASME 2016 POWER CONFERENCE

TRACK 1-1
FUELS, COMBUSTION & MATERIAL HANDLING

Session 1-1-2: Advanced Combustion Systems and Issues - II

West Meeting Rooms, Charlotte Convention Center, 204

Session Organizer: **Ezra Bar-Ziv**, *Michigan Technological University, Houghton, MI, United States*

Simulation and Validation of Hydrogen Production from Hydrogen Sulfide Pyrolysis
Technical Paper Publication. PowerEnergy2016-59036
***Jeanne Commenges, Ahmed ElMelih, Ashwani Gupta**, University of Maryland, College Park, MD, United States*

Role of Catalyst in Pyrolysis and Steam Gasification of Paper and Cardboard Wastes
Technical Paper Publication. PowerEnergy2016-59039
***Kiran Raj Goud Burra, Ashwani Gupta**, University of Maryland, College Park, MD, United States*

Experimental Insight into the Effect of Sound Intensity on Diffusion Flames
Technical Presentation. PowerEnergy2016-59021
***Vinayak Malhotra, Pratik Tiwari, Abdur Rasheed, Navya Narayanam, Hrishikesh Srivatsav**, SRM University, Chennai, India*

Wet Partial Oxidation of JP8 in a Well-Insulated Reactor
Technical Paper Publication. PowerEnergy2016-59515
***Richard Scenna**, US Army CERDEC CPI, Aberdeen Proving Ground, MD, United States, **Ashwani Gupta**, University Of Maryland, College Park, MD, United States*

TRACK 1-3
HEAT EXCHANGERS, CONDENSERS, COOLING SYSTEMS, AND BALANCE-OF-PLANT

Session 1-3-4: Heat Transfer Studies

West Meeting Rooms, Charlotte Convention Center, 201A

Session Organizer: **Kellen Muldoon**, *American Exchanger Services, West Allis, WI, United States*
Session Co-Organizer: **Andrew Rister**, *Duke Energy, Owensville, IN, United States*

Influence of Rotational Speed on Thermal Performance of Tri-sector Rotary Regenerative Air Preheater
Technical Paper Publication. PowerEnergy2016-59551
***Xun Chen, Xue-nong Duan**, State Grid Hunan Electric Power Corporation Research Institute, Changsha, China, **Limin Wang**, Xi'an Jiaotong University, Xi'an, China, **Yi Yang**, Hunan Electric Power Corporation Research Institute, Changsha, China, **Dun-dun Wang**, State Grid Hunan Electric Power Corporation Research Institute, Changsha, China, **Yiping Chen**, Hunan Electric Power Corporation Research Institute, Changsha, Hunan, China, **Guangming Zhu**, State Grid Hunan Electric Power Corporation Research Institute, Changsha, China, **Defu Che**, Xi'an Jiaotong University, Xi'an, China*

Experimental Study on the Heat Transfer Enhancement by the Combination of Transverse Groove Tube and Twisted Tape Inserts
Technical Paper Publication. PowerEnergy2016-59449
***Miao Gui, Qincheng Bi**, State Key Laboratory of Multiphase Flow in Power Engineering, Xi'an Jiaotong University, Xi'an, China, **Yajun Guo**, School of Environmental and Municipal Administration Engineering, Xi'an University of Architecture, Xi'an, Shan'xi, China*

Benchmark Thermodynamic Modelling Comparison of a Novel Modular Air-Cooled Condenser with current Dry-Cooling Methodologies
Technical Paper Publication. PowerEnergy2016-59589
***Alan O'Donovan**, Stokes Institute, Limerick, Ireland, **Ronan Grimes**, University of Limerick, Limerick, Ireland, **Jorge Rodríguez**, Torresol Energy Investments, Seville, Spain, **Borja Herrazti, Benat Amade**, Sener, Biscay, Spain*

TRACK 1-5
PLANT OPERATIONS, RELIABILITY, AND PERFORMANCE

Session 1-5-2: Power Plant Pumping Systems Optimization - Panel Session

East Meeting Rooms, Charlotte Convention Center, 211A

Session Organizer: **M. John Constable**, *Con Edison, Mount Vernon, NY, United States*
Session Co-Organizer: **Brian Langel**, *Omaha Public Power District, Omaha, NE, United States*

This panel session will focus on the challenges and opportunities associated with pumping system optimization. The panelists work in various power plant generation engineering roles at various large electric utilities. The panelists will share their work experience and expertise related to the challenges of pumping system optimization. Each presenter will discuss key considerations, challenges, evaluation, and economics associated with large pumping systems.

Strategic Energy Programs Changing the Way Utilities are Thinking
Panel Presentation. PowerEnergy2016-59949
Perry Stephens, *Duke Energy Corporation, Charlotte, NC, United States*

Key Aspects Regarding Preventative Maintenance Initiatives on Pumping Systems
Panel Presentation. PowerEnergy2016-59942
Victor Arzani, *Duke Energy Corp, Charlotte, NC, United States*

Challenges Solving Pump Vibration Issues
Panel Presentation. PowerEnergy2016-59943
Ernie Phillips, *Tennessee Valley Authority, Chattanooga, TN, United States*

The Challenge of Improving Existing Pumping Systems
Panel Presentation. PowerEnergy2016-59948
Othman Mjahed, *Arizona Public Service, Glendale, AZ, United States*

TRACK 1-6
COMBUSTION TURBINES

Session 1-6-3: Gas Turbine Designs and Upgrades 2

West Meeting Rooms, Charlotte Convention Center, 208A

Session Organizer: **Himanshu Bhatnagar**, *Siemens Energy, Charlotte, NC, United States*

Optimization of Inlet Air Filtration for Gas Turbines
Technical Presentation. PowerEnergy2016-59909
Dale Grace, *Electric Power Research Institute, Palo Alto, CA, United States*, ***Josh Barron***, *Southern Company, Birmingham, AL, United States*, ***Christopher Perullo***, *Georgia Institute of Technology, Atlanta, GA, United States*

Efficiency Optimization of Four Gas Turbine Power Plant Configurations
Technical Paper Publication. PowerEnergy2016-59157
Abdullah Alabdulkarem, Sultan Almodarra, *King Saud University, Riyadh, Saudi Arabia*

Design Optimization of T-Root Geometry of a Gas Engine HP Compressor Rotor Blade for Lifing the Blade against Fretting Failure
Technical Paper Publication. PowerEnergy2016-59331
Kumar.K. Gowda, *Vivekananda Institute of Technology, Bangalore, Karnataka, India*, ***S.L. Ajit Prasad***, *P.E.S. College of Engineering, Mandya, Karnataka, India*, ***Vinayaka N***, *National Institute of Technology Durgapur, Durgapur, West Bengal, India*

TRACK 1-8
THERMAL HYDRAULICS & CFD

Session 1-8-1: CFD Methods and V&V

West Meeting Rooms, Charlotte Convention Center, 203A

Session Organizer: **Donna Guillen**, *Idaho National Laboratory, Idaho Falls, ID, United States*
Session Co-Organizer: **Sanjeeb Pal**, *Bechtel Nuclear, Security & Environmental Inc., Reston, VA, United States*

Validation of a Computational Fluid Dynamics and Heat Transfer Model of a Waste Glass Melter
Technical Presentation. PowerEnergy2016-59782
Donna Guillen, Alex Abboud, *Idaho National Laboratory, Idaho Falls, ID, United States*

Multi-objective Optimization of Geometrical Parameters of Corrugated-Undulated Heat Transfer Surfaces using CFD, Artificial Neural Networks and Genetic Algorithms
Technical Paper Publication. PowerEnergy2016-59489
Limin Wang, Chenglong Ji, *Xi'an Jiaotong University, Xi'an, China*, ***Xun Chen***, *State Grid Hunan Electric Power Corporation Research Institute, Changsha, China*, ***Lei Deng***, *Xi'an Jiaotong University, Xi'an, China*, ***Yiping Chen***, *Hunan Electric Power Corporation Research Institute, Changsha, Hunan, China*, ***Defu Che***, *Xi'an Jiaotong University, Xi'an, China*

Verification and Validation of CFD Model to Predict Jet Loads and Blast Wave Pressures from High Pressure Superheated Steam Line Breaks
Technical Paper Publication. PowerEnergy2016-59675
Sanjeeb Pal, Chanthy Iek, Leonard Peltier, Andrei Smirnov, Kelly Knight, Dong Zheng, Julie Jarvis, *Bechtel Nuclear, Security & Environmental Inc., Reston, VA, United States*

Numerical Study on Layout of Refractory Belt and Fouling Deposition in Tangentially Fired Boiler
Technical Paper Publication. PowerEnergy2016-59570
Qiongliang Zha, Kai Chen, *Xi'an Jiaotong University, Xi'an, China*, ***Jianwen Zhang, Jiangtao Li***, *Shanghai Boiler Works Co., Ltd., Shanghai, China*, ***Chang'an Wang, Defu Che***, *Xi'an Jiaotong University, Xi'an, China*

TRACK 1-10
STUDENT COMPETITION

Session 1-10-3: Student Competition

West Meeting Rooms, Charlotte Convention Center, 206A

Session Organizer: **Rachel Willis**, *University of Central Florida, Orlando, FL, United States*
Session Co-Organizer: **Joseph Ciras**, *Business Owner, Westminster, MA, United States*

Research on Flow-Induced Energy Harvesting by Flexible Piezoelectric Plate with Upstream Square Cylinder
Technical Paper Publication. PowerEnergy2016-59659
***Li Zhang, Zesheng Yang, Lin Ding, Yanrong Chen**, Chongqing University, Chongqing, China*

Aero-Structure Interaction for Mechanical Integration of Laced LP Compressor Blades in a Gas Engine Rotor
Technical Paper Publication. PowerEnergy2016-59319
***Vinayaka N, Nilotpal Banerjee**, National Institute of Technology Durgapur, Durgapur, West Bengal, India, **B.S. Ajay Kumar**, Bangalore Institute of Technology, Bangalore, Karnataka, India, **Kumar.K. Gowda**, Vivekananda Institute of Technology, Bangalore, Karnataka, India*

Energy Efficiency Increase in Cement Industry Through Implementation of Up and Bottoming Cogeneration Cycles
Technical Paper Publication. PowerEnergy2016-59308
***Cristian Camilo Soles Agamez**, Universidad Del Norte, Barranquilla, Colombia, **Lesmes Corredor**, Universidad De Norte, Barranquilla, Colombia*

4:00 PM – 5:45 PM
ASME 2016 10TH INTERNATIONAL CONFERENCE ON ENERGY SUSTAINABILITY

TRACK 2-3
CHP AND HYBRID POWER & ENERGY SYSTEMS

Session 2-3-3: Modeling and Optimization of Unconventional Power Systems

West Meeting Rooms, Charlotte Convention Center, 202B

Session Organizer: **Hohyun Lee**, *Santa Clara University, Santa Clara, CA, United States*
Session Co-Organizer: **Dervis Demirocak**, *Texas A&M - Kingsville, Kingsville, TX, United States*

Cost Optimal Strategies of High Temperature Thermal Energy Storage Systems in Combined Heat and Power Applications
Technical Paper Publication. PowerEnergy2016-59471
***Parker Wells, Karthik Nithyanandam**, University of California, Los Angeles, Los Angeles, CA, United States, **Richard Wirz**, University of California, Los Angeles, Los Angeles, CA, United States*

Design Optimization of Electrical Hubs using Hybrid Evolutionary Algorithm
Technical Paper Publication. PowerEnergy2016-59517
***A. T. D. Perera**, EPFL, Lausanne, Switzerland, **Vahid Nik**, University of Lund, Lund, Sweden, **Dasaraden Mauree, Jean-Louis Scartezzini**, EPFL, Lausanne, Switzerland*

Optimal Operation of an Integrated Power Generation and Desalination Plant
Technical Presentation. PowerEnergy2016-59811
***Andrew Reimers, Michael Webber**, University of Texas at Austin, Austin, TX, United States*

Performance Analysis of an Organic Rankine Cycle Applied to a Combined Cycle Cogeneration Plant using Off-Design Model
Technical Presentation. PowerEnergy2016-59872
***Inseop Kim**, Inha University, Incheon, Korea (Republic), **Tong-Seop Kim**, Inha University, Incheon, Korea (Republic), **Jong Jun Lee**, Korea district heating corporation, Seoul, Korea (Republic)*

Techno-economic Comparative Study on Hydrogen and Electricity Cogeneration Systems with CO2 Capture
Technical Paper Publication. PowerEnergy2016-59433
***Angineh Zohrabian**, Energy Engineering Department, Sharif University of Technology, Glendale, CA, United States, **Mohammad Mansouri Majoumerd**, University of Stavanger, Stavanger, Rogaland, Norway, **Mohammad Soltanieh**, Sharif University of Technology, Tehran, Iran, **Øystein Arild**, International Research Institute of Stavanger (IRIS), Stavanger, Rogaland, Norway*

TRACK 2-4
ENVIRONMENTAL, ECONOMIC, AND POLICY CONSIDERATIONS OF ADVANCED ENERGY SYSTEMS

Session 2-4-3: Technology Advancements and Regional Variations

West Meeting Rooms, Charlotte Convention Center, 208B

Session Organizer: **Jordan Macknick,** *National Renewable Energy Laboratory*
Session Co-Organizer: **Pouria Ahmadi,** *Simon Fraser University (SFU)*

HTR-PM Technology in Energy Supply of Petrol Chemical Industry in China - An Economic Feasibility View
Technical Paper Publication. PowerEnergy2016-59092
***Gang Zhao**, Tsinghua University, Beijing, China, **Ping Ye**, Inet,Tsinghua University, Beijing, China, **Jie Wang, Xiao Yong Yang**, Tsinghua University, Beijing, China*

Investigation of Grain Harvesting and Drying Strategies to Improve Energy Efficiency and Profitability
Technical Paper Publication. PowerEnergy2016-59531
***Evan Almberg, Michael P. Twedt**, South Dakota State University, Brookings, SD, United States, **Stephen Gent**, South Dakota State University, Brookings, SD, United States*

An Integrated Dairy Manure Treatment System Economic and Environmental Sustainability
Technical Presentation. PowerEnergy2016-59695
***Donna Guillen, Chaston Ellis**, Idaho National Laboratory, Idaho Falls, ID, United States*

TRACK 2-6
SOLAR CHEMISTRY

Session 2-6-2: Solar Thermochemical Fuel Production

West Meeting Rooms, Charlotte Convention Center, 210B

Session Organizer: **Christopher Muhich**, *ETH-Zurich, Zurich, Switzerland*
Session Co-Organizer: **Jesse Fosheim**, *University of Minnesota - Twin Cities, Minneapolis, MN, United States*

A Directly-Irradiated Solar Receiver-Reactor for Reduction of Particulate Redox Material Under Vacuum
Technical Presentation. PowerEnergy2016-59380
Justin Lapp, *German Areospace Center, Köln, Germany*, ***Abhishek Singh***, *German Aerospace Center, Köln, Germany*, ***Johannes Grobbel***, *German Aerospace Center, Jülich, Germany*, ***Stefan Brendelberger***, *German Aerospace Center (DLR), Koeln, Germany*, ***Martin Roeb***, *Deutsches Zentrum für Luft- und Raumfahrt e.V., Koeln, Germany*, ***Christian Sattler***, *German Aerospace Center DLR, Koeln, Germany*

Design and Demonstration of a Lab-scale Paddle-mixer Reactor for the Oxidation of Solar Zn Particles by CO2 to Produce CO
Technical Presentation. PowerEnergy2016-59847
David Weibel, Zoran R. Jovanovic, *ETH Zurich, Zurich, Zurich, Switzerland*, ***Erik Koepf***, *The Paul Scherrer Institute, Villigen-Psi, Switzerland*, ***Aldo Steinfeld***, *ETH Zurich, Zurich, Switzerland*

Experimental Investigation of the Heterogeneous Hydrolysis of Zn Vapor Under Cooling Conditions
Technical Presentation. PowerEnergy2016-59898
Matthew Lindemer, *University of Delaware, Newark, DE, United States*, ***Suresh Advani, Ajay Prasad***, *University Of Delaware, Newark, DE, United States*

A 100 kW Solar Thermochemical Reactor Pilot Plant for ZnO Dissociation: Technology Status and Outlook
Technical Presentation. PowerEnergy2016-59899
Erik Koepf, *Paul Scherrer Institute, Villigen-Psi, Switzerland*, ***Willy Villasmil***, *Paul Scherrer Institute, Villigen, Switzerland*, ***Anton Meier***, *Solar Technology Laboratory, Villigen-PSI, Switzerland*

TRACK 2-8
CONCENTRATING SOLAR POWER

Session 2-8-9: Thermal Energy Storage II

West Meeting Rooms, Charlotte Convention Center, 210A

Session Organizer: **Luisa F. Cabeza**, *University of Lleida, Lleida, Spain*

A Transient Numerical Model of an Ammonia-Based Energy Recovery System
Technical Paper Publication. PowerEnergy2016-59654
Gabriela Bran-Anleu, *University of California, Los Angeles, Los Angeles, CA, United States*, ***Hossein Kavehpour***, *University of California, Los Angeles, Los Angeles, CA, United States*, ***Adrienne Lavine***, *University of California, Los Angeles, Los Angeles, CA, United States*

High Performance Reduction/Oxidation Metal Oxides for Thermochemical Energy Storage (PROMOTES)
Technical Paper Publication. PowerEnergy2016-59660
James Miller, *Sandia National Laboratories, Albuquerque, NM, United States*, ***Hany Al-Ansary***, *King Saud University, Riyadh, Massachusetts, Saudi Arabia*, ***Andrea Ambrosini, Sean Babiniec, Eric Coker, Clifford Ho***, *Sandia National Laboratories, Albuquerque, NM, United States*, ***Sheldon Jeter***, *Georgia Institute of Technology, Atlanta, GA, United States*, ***Nathan Johnson***, *Arizona State University, Mesa, AZ, United States*, ***Peter Loutzenhiser***, *Georgia Institute of Technology, Atlanta, GA, United States*, ***Ellen Stechel***, *Arizona State University, Tempe, AZ, United States*

Doped Calcium Manganites for Thermochemical Energy Storage below 1000 deg. C
Technical Presentation. PowerEnergy2016-59860
Luca Imponenti, Kevin Albrecht, Robert Braun, Gregory Jackson, *Colorado School of Mines, Golden, CO, United States*

4:00 PM – 5:45 PM
ASME 2016 14TH FUEL CELL SCIENCE, ENGINEERING, AND TECHNOLOGY CONFERENCE

TRACK 3-1
POLYMER ELECTROLYTE MEMBRANE, DIRECT METHANOL, & ALKALINE FUEL CELLS

Session 3-1-2: Polymer Electrolyte Membrane, Direct Methanol, & Alkaline Fuel Cells - II

West Meeting Rooms, Charlotte Convention Center, 209A

Session Organizer: **Prodip K. Das**, *Newcastle University, Newcastle Upon Tyne, United Kingdom*
Session Co-Organizer: **Anthony Santamaria**, *Western New England University, Springfield, MA, United States*

Synthesis and Performance Evaluation of an S-POSS Based PBI Electrolyte for High Temperature PEM Fuel Cell Applications
Technical Paper Publication. PowerEnergy2016-59214
Susanta Kumar Das, *Kettering University, Grand Blanc, MI, United States*, ***K. Joel Berry***, *Kettering University, Flint, MI, United States*

Electrohydrodynamic-jet Deposition of Pt-based Fuel Cell Catalysts
Technical Paper Publication. PowerEnergy2016-59454
Adam S. Hollinger, *Penn State Erie, The Behrend College, Erie, PA, United States*, ***Paul J.A. Kenis***, *University of Illinois at Urbana-Champaign, Urbana, IL, United States*

Analysis of Out-of-Specification Cell in an Operating Fuel Cell Stack
Technical Presentation. PowerEnergy2016-59696
Pinkhas Rapaport, Manish Sinha, *General Motors, Pontiac, MI, United States*, ***Hiromichi Yoshida***, *Honda Motors Co, Tochigi, Tochigi, Japan*, ***Shohei Toyota***, *Honda Motor Co, Tochigi, Tochigi, Japan*, ***Srikanth Arisetty***, *General Motors, Pontiac, MI, United States*

Effect of Operating Parameters on the Performance of Polymer Electrolyte Membrane based Passive Direct Ethanol Fuel Cell
Technical Presentation. PowerEnergy2016-59739
Rajkumar Chadge, *Yeshwantrao Chavan College of Engineering, Nagpur, Nagpur, India*, ***Naveen Shrivastava***, *Georgia Institute of Technology, Atlanta, Atlanta, GA, United States*, ***Pritam Ahire***, *Yeshwantrao Chavan College of Engineering, Nagpur, Nagpur, India*

Influence of Clamping Bolt Torque on the Performance of Liquid Feed Passive Direct Methanol Fuel Cell using Electrochemical Impedance Spectroscopy
Technical Presentation. PowerEnergy2016-59877
Ranjan Kishore Mallick, Shashaikant B Thombre, *Visvesvaraya National Institute of Technology, Nagpur, Maharashtra, India*

POWER CONFERENCE

ENERGY SUSTAINABILITY CONFERENCE

FUEL CELL CONFERENCE

GAS TURBINE FORUM

ENERGY STORAGE FORUM

THURS. 6/30

PLENARY SESSIONS & SPEAKERS

Thursday, June 30, 2016
8:00 am – 9:45 am

ENERGY SUSTAINABILITY CONFERENCE PLENARY SESSION

Room 203B

Peiwen Li, Professor University of Arizona

High Temperature Heat Transfer Fluids and Heat Transfer in Solar Collectors—the Critical Demand for Concentrated Solar Power Technology

Dr. Li is a full professor in Aerospace and Mechanical Engineering Department at the University of Arizona. He received his Ph.D. in thermo-science for energy and power engineering from Xi'an Jiaotong University, China in 1995. Since then, he worked as a Research Scientist in National Mechanical Engineering Laboratory, Japan, and Kyoto University, and a Research Associate in University of Pittsburg, before joining the faculty of the University of Arizona in 2006. He has involved in energy and power related research and teaching including subjects of heat transfer and enhancement for convective flow, boiling and condensation heat transfer, turbulent flow drag reduction and drag-reduced fluid heat transfer and enhancement, electrochemical and heat/mass transfer processes in fuel cells and electrolyzers, hydrocarbon fuel processing and reforming for hydrogen production, flow field analysis for algal biofuel production, studies on thermal energy storage technologies for solar thermal energy. Currently he is leading a MURI project to develop a high temperature heat transfer fluid for concentrated solar thermal power systems. Dr. Li has authored and co-authored 78 articles on peer reviewed journals, 4 book chapters, over 90 articles on peer reviewed conferences, and one US patent. Dr. Li is an ASME member, he serves as an Associate Editor of Journal Solar Energy on thermal storage and heat transfer fluids for CSP.

Wojciech Lipinski, Professor Australian National University

Advances in High Temperature Solar Energy Conversion

Wojciech Lipiński received his MSc Eng degree from Warsaw University of Technology (2000), and doctorate (2004) and habilitation (2009) from ETH Zurich. He is Professor and the Leader of the Solar Thermal Group at the Australian National University, and Privatdozent at ETH Zurich. His research interests are in thermal and chemical sciences, optics, and applications to energy, environmental, biomedical and space engineering. Lipiński has published over 100 articles in peer-reviewed journals and conference proceedings, and contributed to several books, edited books and e-books. He was awarded the 2006 Hilti Award for Innovative Research from ETH Zurich, the College of Science and Engineering 2010–2011 Outstanding Professor Award from the University of Minnesota, and the 2013 Elsevier/JQSRT Raymond Viskanta Award in Radiative Transfer. Since 2011, he has served as the Associate Editor in Bioconversion and Solar Chemistry for the ASME Journal of Solar Energy Engineering. He is a member of the Scientific Council of the International Centre for Heat and Mass Transfer, ASME and several other professional societies.

Professor Alan W. Weimer, University of Colorado

Solarthermal Chemistry – The Path Forward

Alan(Al) W. Weimer, H. T. Sears Memorial Professor of Chemical and Biological Engineering, joined the faculty of the University of Colorado in 1996 after a 16-year career with the Dow Chemical Company. He was named recipient of the Dow Spangenberg Ceramics Founders Award in 1991, named Dow Central Research Inventor of the Year in 1993, and received Dow's coveted "Excellence in Science Award" in 1995 for commercializing ultrahigh-temperature processing to produce advanced ceramic materials (from lab curiosity to the 1st commercial plant). He is recipient of the 2005 DOE Hydrogen Program R&D Award for developing solar-thermal technology to split water, the 2009 AIChE Thomas Baron Award in Fluid-Particle Systems for his pioneering effort to functionalize fine particles with thin films, and the 2010 AIChE Excellence in Process Development Research Award for his persistence to commercialize his academic discoveries. He recently received both the 2015 AIChE Nanoscale Science and Engineering Forum and the 2015 Research Excellence in Sustainable Engineering Awards. His former students have co-founded two spin-off companies out of his university laboratory (ALD NanoSolutions (www.ALDNanoSolutions.com) in 2001 and Copernican Energy, now Sundrop Fuels (www.SundropFuels.com), in 2006). Two additional companies are expected to be spun out of his laboratory over the next year resulting from research carried out using ARPA – E funds. Prof. Weimer is an inventor on 33 issued U.S. patents and an author of 175 peer-reviewed publications. He has been involved in the research & development of solarthermal chemical processing since 1996.

Thursday, June 30, 2016
8:00 am – 9:45 am

POWER CONFERENCE PLENARY PANEL SESSION - NEW DEVELOPMENTS IN TODAY'S AND TOMORROW'S ULTRA SUPERCRITICAL AND ADVANCED-ULTRA SUPERCRITICAL POWER PLANT TECHNOLOGY

Room 203A

Dr. Qiurong Chen, Senior Product Manager, GE Power

Qiurong Chen has a Ph D degree in mechanical engineering. He graduated at the Zhejiang University in China in 1982. In 1991 he made his doctoral thesis at the University Stuttgart in Germany.

Between 1991 and 1992, he was a postdoctoral research fellow at the University Stuttgart. His major research areas are thermodynamics, heat

transfer, and technologies for renewable energy.

In 1992 he jointed ALSTOM (now GE Power). He has been the principal engineer for the boiler design, R&D manager to lead German and European R&D programmes, product director of tower boilers and the senior product manager for steam power plants.

Qiurong CHEN has authored and presented many papers at international conferences and made publications in international magazines. The topics are ultra-supercritical technology, 700 °C boiler and plant designs, advanced materials development, lignite upgrading, and different clean coal technologies.

Professor Weizhong Feng, General Manager of Shanghai Waigaoqiao No. 3 (WGQ3) Power Generation Co., LTD., General Manager of Shanghai Shenergy Energy Technology Co., LTD.

Achieve the Cleanest and Most Efficient Coal Power in the World--Feng's 5E Technology and its Effect

Weizhong Feng is the General Manager of Shanghai Waigaoqiao No. 3 (WGQ3) Power Generation Co., LTD., and at the same time is also the General Manager of Shanghai Shenergy Energy Technology Co., LTD. He is a professor of engineering, and an adjunct professor in Tsinghua University, Shanghai University of Electric Power, North China Electric Power University, and Southeast University. He is also a vice chairman of the China Energy Society, a boiler committee member of the Chinese Society of Power Engineering and a turbine committee member of the Chinese Society for Electrical Engineering and a vice president of the automation committee of Shanghai Society for Electrical Engineering. He owns more than 40 patents and has published 42 academic studies. At present his research interests are Ultra-supercritical power generation technology and energy saving and emission reduction technology.

Jeffrey Phillips, Ph.D., Senior Program Manager, Electric Power Research Institute (EPRI)

United States Advanced Ultra-supercritical Component Test Facility with 760°C Superheater and Steam Turbine

Dr. Phillips is a Senior Program Manager at the Electric Power Research Institute (EPRI) where he is responsible for EPRI's research activities focused on developing advanced fossil fuel-based power plants that include the capture and storage of CO2. Dr. Phillips has a PhD in Mechanical Engineering from Stanford University, a BSME from Washington University and a BA from Austin College. He worked for Shell Oil Company, Molten Metal Technology and Fern Engineering before joining EPRI in 2004. In addition to his work at EPRI, he is in the fourth year of a four-year term on the Cabarrus County Board of Education, which supervises a public school district serving 31,000 students.

Michael Wechsung, MS, Head of R&D Coordination, Technology and Front End Development, Siemens

8:00 AM – 9:45 AM

ASME 2016 14TH FUEL CELL SCIENCE, ENGINEERING, AND TECHNOLOGY CONFERENCE

TRACK 3-2
PHOSPHORIC ACID, MOLTEN CARBONATE, & SOLID OXIDE FUEL CELLS

Session 3-2-1: Phosphoric Acid, Molten Carbonate, & Solid Oxide Fuel Cells - I

West Meeting Rooms, Charlotte Convention Center, 209A

Session Organizer: **George Nelson**, *University of Alabama in Huntsville, Huntsville, AL, United States*
Session Co-Organizer: **David Tucker**, *National Energy Technology Laboratory, Morgantown, WV, United States*

Sensitivity Analysis and Computational Optimization of Fuel Reformer
Technical Paper Publication. PowerEnergy2016-59110
***Arman Raoufi, Sagar Kapadia, James C. Newman III**, University of Tennessee-Chattanooga, Chattanooga, TN, United States*

A Non-Dimensional Analysis of the Transport-Reaction-Microstructure Interaction in Solid Oxide Cell Electrodes
Technical Presentation. PowerEnergy2016-59347
***Zachary K. Van Zandt, George Nelson**, University of Alabama In Huntsville, Huntsville, AL, United States*

Simulation of Model Predictive Control for a Fuel Cell/Gas Turbine Power System Based on Experimental Data and the Recursive Identification Method
Technical Paper Publication. PowerEnergy2016-59378
***Bernardo Restrepo**, Universidad del Turabo, Gurabo, PR, United States, **Larry Banta**, White Hat Engineering, Morgantown, WV, United States, **David Tucker**, National Energy Technology Laboratory, Morgantown, WV, United States*

Real-time Model of a Fuel Manifold in a Solid Oxide Fuel Cell Stack for Fuel Flexibility Studies
Technical Paper Publication. PowerEnergy2016-59429
***David Tucker**, National Energy Technology Laboratory, Morgantown, WV, United States, **Valentina Zaccaria, Nor Farida Harun**, U.S. Department of Energy, NETL, Morgantown, WV, United States*

Development & Modeling of Intermediate Temperature Protonic Ceramic Fuel Cells
Technical Presentation. PowerEnergy2016-59911
***Robert Braun, Alexis Dubois, Kevin Albrecht, Chuancheng Duan, Ryan O'Hayre, Hanping Ding, Neal Sullivan, Long Le Quoc**, Colorado School of Mines, Golden, CO, United States*

10:15 AM – 12:00 PM

ASME 2016 POWER CONFERENCE

TRACK 1-1
FUELS, COMBUSTION & MATERIAL HANDLING

Session 1-1-3: Advanced Combustion Systems and Issues - III

West Meeting Rooms, Charlotte Convention Center, 204

Session Organizer: **Ashwani Gupta**, *University Of Maryland, College Park, MD, United States*

Burning Methanol and Its Blends Attractive Alternative for Emission Reduction
Technical Paper Publication. PowerEnergy2016-59025
***Boris Chudnovsky**, Israel Electric Corp, Haifa, Israel, **David Livshits**, Turbulent Energy LLC, Buffalo, NY, United States, **Shaya Baitel**, DOR Cemicals, Haifa, Israel*

Measurements of Hydrogen Enriched Combustion of Jet Fuel in an Open Flame
Technical Paper Publication. PowerEnergy2016-59591
***Michael Seibert**, US Army RDECOM CERDEC, Aberdeen Proving Ground, MD, United States, **Sen Nieh**, Catholic University of America, Washington, DC, United States*

Theoretical Study on Chemical-Kinetic Characteristics of Oxy-Coal MILD Combustion
Technical Paper Publication. PowerEnergy2016-59032
***Ruochen Liu, Enke An, Kun Wu**, Tongji University, Shanghai, China*

Implications of an External Heat Source on Smoldering Combustion
Technical Presentation. PowerEnergy2016-59482
***Vinayak Malhotra, Pratik Tiwari**, SRM University, Chennai, India*

TRACK 1-2
BOILERS & HEAT RECOVERY STEAM GENERATORS

Session 1-2-1: Steam Generators I

West Meeting Rooms, Charlotte Convention Center, 205

Session Organizer: **Henry Wong**, *AECOM, Princeton, NJ, United States*
Session Co-Organizer: **Paul Weitzel**, *Babcock and Wilcox Company, Canal Fulton, OH, United States*

Thermal Performance and Stress Monitoring of Power Boiler
Technical Paper Publication. PowerEnergy2016-59082
***Jan Taler**, Cracow University of Technology, Malopolska, Poland, **Bohdan Weglowski, Tomasz Sobota, Dawid Taler, Marcin Trojan, Piotr Dzierwa**, Cracow University of Technology, Cracow, Poland, **Magdalena Jaremkiewicz**, Cracow University of Technology NIP: 675-000-62-57, Cracow, Poland, **Marcin Pilarczyk**, Cracow University of Technology, Cracow, Poland*

Nucleate Pool Boiling of Surfactant Solutions
Technical Paper Publication. PowerEnergy2016-59351
***Birce Dikici, Basim Qasim Alsukaini**, Embry-Riddle Aeronautical University, Daytona Beach, FL, United States*

TRACK 1-5
PLANT OPERATIONS, RELIABILITY, AND PERFORMANCE

Session 1-5-3: Optimizing Power Plant Efficiency and Flexibility

East Meeting Rooms, Charlotte Convention Center, 211A

Session Organizer: **Christopher Marcella**, *Able Engineering Services, Methuen, MA, United States*
Session Co-Organizer: **Brian Langel**, *Omaha Public Power District, Omaha, NE, United States*

The Generalized Regeneration Theory and its Energy Saving and Emission Reduction Effects on Coal-Fired Power Generation
Technical Paper Publication. PowerEnergy2016-59166
Weizhong Feng, *Shanghai Waigaoqiao No.3 Power Generation Co.,LTD., Shanghai, China*

Cross Compound Turbine Generator Unit with Elevated and Conventional Turbine Layouts
Technical Paper Publication. PowerEnergy2016-59720
Weizhong Feng, *Shanghai Waigaoqiao No.3 Power Generation Co.,LTD., Shanghai, China*

The Research and Development of Highly Efficient and Clean Coal-Fired Power Plant Technology
Technical Presentation. PowerEnergy2016-59734
Weizhong Feng, *Shanghai Waigaoqiao No.3 Power Generation Co.,LTD., Shanghai, China*

TRACK 1-7
RENEWABLES: SOLAR, WIND, HYDRO, & GEOTHERMAL

Session 1-7-3: Advanced Technologies for Solar Energy

West Meeting Rooms, Charlotte Convention Center, 209B

Session Organizer: **David MacPhee**, *University of Alabama, Tuscaloosa, AL, United States*

An Integrated Design Approach of Local Control System of a Linear Drive Single Facet Heliostat
Technical Paper Publication. PowerEnergy2016-59375
Mohamed Rady, *Helwan University, Helwan, Egypt*, ***Amr M. A. Amin***, *Academy of Scientific Research and Technology - ASRT, Cairo, Egypt*, ***Radwan Abdel-Hamid, Adel El-Samahy, Mahmoud Nageb***, *Helwan University, Helwan, Egypt*, ***David Olasolo***, *Fundacion Tekniker, Eibar, Spain*

Numerical Modeling of Liquid-to-Vapor Phase Change in Porous Medium under Solar Heat Localization
Technical Paper Publication. PowerEnergy2016-59259
Hamidreza Ghasemi Bahraseman, *Tennessee Technological University, Cookeville, TN, United States*, ***Ehsan Languri***, *Tennessee Technological University, Cookeville, TN, United States*

Enhancement in Photovoltaic Performance of Dye Sensitized Solar Cells using Ag:Cu:TiO2 photoanode.
Technical Paper Publication. PowerEnergy2016-59477
Sehar Shakir, *University of Malaya, Kuala Lumpur, Wilayah Persekutuan (KL), Malaysia*, ***Hafiz M. Abd-ur Rehman***, *King Fahd University of Petroleum and Minerals, Dhahran, Saudi Arabia*

Projected Area Comparison between Two Types of Central Receiver Tanks for Concentrating Solar Power System.
Technical Presentation. PowerEnergy2016-59814
Afreen Saad Al Deen, *Al Mustansiriyah University-Mechanical Department, Baghdad, Iraq*

TRACK 1-8
THERMAL HYDRAULICS & CFD

Session 1-8-3: Industrial Applications of CFD

West Meeting Rooms, Charlotte Convention Center, 203A

Session Organizer: **George Mesina**, *Idaho National Laboratory, Idaho Falls, ID, United States*
Session Co-Organizer: **Yesaswi N. Chilamkurti**, *North Carolina State University, Raleigh, NC, United States*

Heat Transfer Characteristics of Subcooled Water Flow Boiling in Circular Channels with Non-Uniform Heating Fluxes
Technical Paper Publication. PowerEnergy2016-59475
Ge Zhu, *Xi'an Jiaotong University, Xi'an, China*, ***Qincheng Bi***, *State Key Laboratory of Multiphase Flow in Power Engineering, Xi'an Jiaotong University, Xi'an, Shan'xi, China*, ***Jianguo Yan, Qizheng Yuan, Haicai Lv, Hui Pan***, *Xi'an Jiaotong University, Xi'an, China*

Hydraulic Model Calibration of a Nuclear Plant Service Water System
Technical Paper Publication. PowerEnergy2016-59062
Erin Onat, *Purple Mountain Technology Group, Colorado Springs, CO, United States*, ***Trey Walters***, *Applied Flow Technology, Colorado Springs, CO, United States*, ***James Mead***, *Duke Energy Carolinas, LLC, Huntersville, NC, United States*, ***David Mobley***, *AREVA, Charlotte, NC, United States*

Design and Application of Low Flow Steam Siphon Jet Pumps
Technical Paper Publication. PowerEnergy2016-59748
Robert Leishear, *Leishear Engineering, LLC., Aiken, SC, United States*, ***William Bennett, Jackie Cooper***, *Savannah River Nuclear Solutions, Aiken, SC, United States*

10:15 AM – 12:00 PM
ASME 2016 10TH INTERNATIONAL CONFERENCE ON ENERGY SUSTAINABILITY

TRACK 2-6
SOLAR CHEMISTRY

Session 2-6-3: Solar Thermochemistry

West Meeting Rooms, Charlotte Convention Center, 210B

Session Organizer: **Brandon Hathaway**, *University of Minnesota, Minneapolis, MN, United States*
Session Co-Organizer: **Conrad Cole**, *Univ. of Florida, Gainesville, FL, United States*

Out-of-Lab Solar Photocatalytic Hydrogen Production in the Presence of Methanol Employing the Solar Concentrator SoCRatus
Technical Paper Publication. PowerEnergy2016-59239
Michael Wullenkord, Christian Jung, *German Aerospace Center (DLR), Koeln, Germany*, ***Christian Sattler***, *German Aerospace Center DLR, Koeln, Germany*

Numerical simulation of a helical tube solar receiver for solar-driven high temperature electrolysis
Technical Presentation. PowerEnergy2016-59274
Meng Lin, *École Polytechnique Fédérale De Lausanne, Lausanne, Switzerland*, ***Sophia Haussener***, *EPFL, Lausanne, Switzerland*

Experimental Evaluation of a 1 kWth Solar Reactor Prototype for Thermochemical CO2 Capture or High-temperature Energy Storage via Calcination-Carbonation Chemical Looping
Technical Presentation. PowerEnergy2016-59437
Lindsey Yue, Kevin Coelho, Roman Bader, *Australian National University, Canberra, Australian Capital Territory, Australia*, ***Alicia Bayon Sandoval, James Hinkley***, *CSIRO Energy Technology, Mayfield, NSW, Australia*, ***Terrence Simon***, *University of Minnesota, Minneapolis, MN, United States*, ***Wojciech Lipinski***, *The Australian National University, Canberra, ACT, Australia*

Thermodynamic and Kinetic Analyses of Calcination-Carbonation Chemical Looping Reactions Based on CaCO3, SrCO3 and their Mixtures for High-Temperature Solar Thermochemical Energy Storage
Technical Presentation. PowerEnergy2016-59216
Larissa Fedunik-Hofman, *University of Newcastle, Callaghan, NSW, Australia*, ***Alicia Bayon Sandoval, James Hinkley***, *CSIRO Energy Technology, Mayfield, NSW, Australia*, ***Wojciech Lipinski***, *Australian National University, Canberra, ACT, Australia*, ***Scott W. Donne***, *University of Newcastle, Callaghan, Australia*

Solar Electricity via an Air Brayton Cycle with an Integrated Two-Step Thermochemical Cycle for Heat Storage Based on Non-Stoichiometric CaAl0.2Mn0.8O3-x Redox Reactions: Kinetic Analysis
Technical Presentation. PowerEnergy2016-59890
Robert Gill, *Georgia Institute of Technology, Atlanta, GA, United States*, ***Evan Bush***, *George W. Woodruff School of Mechanical Engineering, Atlanta, GA, United States*, ***Andrew Schrader***, *Georgia Institute of Technology, Atlanta, GA, United States*, ***Sean Babiniec, Andrea Ambrosini, James Miller***, *Sandia National Laboratories, Albuquerque, NM, United States*, ***Peter Loutzenhiser***, *Georgia Institute of Technology, Atlanta, GA, United States*

TRACK 2-8
CONCENTRATING SOLAR POWER

Session 2-8-10: System Design and Analysis I

West Meeting Rooms, Charlotte Convention Center, 210A

Session Organizer: **Asegun Henry**, *Georgia Institute of Technology, Atlanta, GA, United States*

Comparison Analysis for TES System in Solar-Aided 600 MW Coal-Fired Power Generation System and Solar-Alone Power Generation System
Technical Paper Publication. PowerEnergy2016-59491
Junjie Wu, Hongjuan Hou, Yongping Yang, *North China Electric Power University, Beijing, Beijing, China*

Annual Simulation of the Thermal Performance of Solar Power Plant for Electric Production Using TRNSYS
Technical Paper Publication. PowerEnergy2016-59516
Mohamed H. Ahmed, *National Research Center, Dokki, Cairo, Egypt*, ***Amr M. A. Amin***, *Academy of Scientific Research and Technology - ASRT, Cairo, Egypt*, ***Alberto Giaconia***, *ENEA-Casaccia Research Center, Rome, Italy*

A Case Study Of Augmenting Solar Power Generation With Thermal Energy Storage
Technical Paper Publication. PowerEnergy2016-59019
Mohammad Abutayeh, *Khalifa University, Palm Beach Gardens, FL, United States*, ***Anas Alazzam***, *Khalifa University of Science, Technology & Research (KUSTAR), Abu Dhabi, United Arab Emir.*, ***Dr. Bashar El-Khasawneh***, *Khalifa University, Abu Dhabi, OO, United Arab Emir.*

High Temperature Concentrated Solar Power Using Liquid Metal - Cost Considerations
Technical Presentation. PowerEnergy2016-59661
Asegun Henry, *Georgia Institute of Technology, Atlanta, GA, United States*

TRACK 2-10
THERMODYNAMIC ANALYSIS OF ENERGY SYSTEMS

Session 2-10-1: Exergy Analysis of Energy Systems

West Meeting Rooms, Charlotte Convention Center, 201A

Session Organizer: **Wahiba Yaici**, *Natural Resources Canada/CanmetENERGY, Ottawa, ON, Canada*

A Process Simulation of Guayule Biorefining including an Exergy Analysis
Technical Paper Publication. PowerEnergy2016-59084
John Larkin, Nelson Macken, *Swarthmore College, Swarthmore, PA, United States*, ***Mark Schaffer, Yaseen Elkasbi, Charles Mullen, Akwasi A. Boateng***, *USDA, Wyndmoor, PA, United States*, ***Lars Bjornebo, Sabrina Spatari***, *Drexel University, Philadelphia, PA, United States*

Exergy Analysis of Solar Chimney for Saudi Arabia Weather Conditions
Technical Paper Publication. PowerEnergy2016-59211
Faisal M Hussain, Fahad Al-Sulaiman, *KFUPM, Dhahran, Saudi Arabia*

Exergetic and Thermoeconomic Analysis of the "Villa de Reyes" Steam Power Plant Operating on Partial Load
Technical Paper Publication. PowerEnergy2016-59680
Juan Antonio Jimenez Garcia, *Universidad Autonoma del Estado de Mexico, NEZAHUALCOYOTL, Mexico*, ***MA Dolores Duran Garcia***, *Universidad Autonoma del Estado de Mexico, Edo de Mex, Mexico*, ***Bernd Weber***, *UAEM - U. Autonoma Del Estado De Mexico, Toluca, Mexico, Mexico*

Comprehensive Exergy Analysis and Comparison of Three IGCC Power Plants with CO2 Capture
Technical Presentation. PowerEnergy2016-59901
Nicholas Siefert, Sarah Narburgh, Yang Chen, *National Energy Technology Laboratory, Pittsburgh, PA, United States*

TRACK 2-11
BIOFUELS, HYDROGEN, SYNGAS, AND ALTERNATE FUELS

Session 2-11-1: Analyses and Tests of Biofuel Engines and Power Systems

West Meeting Rooms, Charlotte Convention Center, 201B

Session Organizer: **Gary A. Anderson**, *South Dakota State University, Brookings, SD, United States*
Session Co-Organizer: **Dr. Hiregoudar Yerrennagoudaru**, *Rao Bahadur.Y. Mahabaleshwarappa Engineering College, Bellary, India*

A Fuzzy Based Multi-Responsive Optimization of Engine Performance and Exhaust Emission Parameters of a Direct Injection Diesel Engine Using Thumba and Neem Biodiesel with Ethanol as an Additive
Technical Presentation. PowerEnergy2016-59071
G. Ravi Kiran Sastry, *National Institute of Technology Agartala, Tripura, India*, ***Gaurav Sharma***, *Rungta Engineering College, Raipur, India*, ***Mrinal Bhowmik***, *NIT Agartala, Agartala, India*, ***Jibitesh Kumar Panda***, *National Institute of Technology Agartala, Agartala, India*, ***Madhujit Deb, Arindam Majumder***, *NIT Agartala, Agartala, India*

Experimental Study on Emissions of Hydrogen Enriched Diesel Engine with Varied Combustion Chamber Geometry
Technical Paper Publication. PowerEnergy2016-59164
Jyothi US, *Gokaraju Rangaraju Institute of Engineering and Technology, Hyderabad, India*, ***K Vijaya Kumar Reddy***, *JNTUH, Hyderabad, India*

Operation of a Porous Membrane Photobioreactor
Technical Paper Publication. PowerEnergy2016-59625
Gary A. Anderson, Sarmila Katuwal, *South Dakota State University, Brookings, SD, United States*, ***Anil Kommareddy***, *University of Maryland, College Park, MD, United States*, ***Stephen Gent***, *South Dakota State University, Brookings, SD, United States*

10:15 AM – 12:00 PM
ASME 2016 14TH FUEL CELL SCIENCE, ENGINEERING, AND TECHNOLOGY CONFERENCE

TRACK 3-2
PHOSPHORIC ACID, MOLTEN CARBONATE, & SOLID OXIDE FUEL CELLS

Session 3-2-2: Phosphoric Acid, Molten Carbonate, & Solid Oxide Fuel Cells - II

West Meeting Rooms, Charlotte Convention Center, 209A

Session Organizer: **David Tucker**, *National Energy Technology Laboratory, Morgantown, WV, United States*
Session Co-Organizer: **George Nelson**, *University of Alabama in Huntsville, Huntsville, AL, United States*

Fuel Cell Temperature Control with a Pre-combustor in SOFC Gas Turbine Hybrids during Load Changes
Technical Paper Publication. PowerEnergy2016-59278
Valentina Zaccaria, *U.S. Department of Energy, NETL, Morgantown, WV, United States*, ***Zachary Branum***, *Arizona State University, Tempe, AZ, United States*, ***David Tucker***, *National Energy Technology Laboratory, Morgantown, WV, United States*

Testing And Preliminary Modelling Of A 2.5 kW Micro-CHP SOFC Unit
Technical Paper Publication. PowerEnergy2016-59327
Luca Mastropasqua, Stefano Campanari, *Politecnico di Milano, Milan, Italy*, ***Gianluca Valenti***, *Politecnico di Milano, Milano, Italy*, ***Anna Guariniello***, *Politecnico di Milano, Milan, Italy*, ***Stefano Modena, Francesco Ghigliazza***, *SOLIDpower S.p.a, Mezzolombardo, Italy*

Pressurized SOFC Test Stand Development at Washington State University
Technical Presentation. PowerEnergy2016-59906
Dustin McLarty, *Washington State University, Pullman, WA, United States*

Development of Solid Oxide Fuel Cell and Homogeneous Charge Compression Ignition Engine Hybrid System for 100-kW Distributed Power Generation
Technical Presentation. PowerEnergy2016-59918
WonJae Choi, Seonyeob Kim, Sechul Oh, Jaehyun Kim, Yongtae Kim, Han Ho Song, *Seoul National University, Seoul, Seoul, Korea (Republic)*

Investigation on the Characteristics of Anode Off-gas Composition for Molten Carbonate Fuel Cell - Homogeneous Charge Compression Ignition (MCFC - HCCI) Engine Hybrid Power Generation System
Technical Presentation. PowerEnergy2016-59919
Sechul Oh, Seonyeob Kim, WonJae Choi, Yongtae Kim, Jaehyun Kim, Han Ho Song, *Seoul National University, Seoul, Korea (Republic)*

1:00 PM – 2:45 PM
ASME 2016 POWER CONFERENCE

TRACK 1-1
FUELS, COMBUSTION & MATERIAL HANDLING

Session 1-1-5: Advanced Internal Combustion Engines

West Meeting Rooms, Charlotte Convention Center, 204

Session Organizer: **Ashwani Gupta**, *University Of Maryland, College Park, MD, United States*

Combustion and Emission Characteristics of a Brassica Carinata FAME and n-butanol blend
Technical Paper Publication. PowerEnergy2016-59397
Martin Muinos, Spencer Harp, Benoit Kindo, Remi Gaubert, Valentin Soloiu, *Georgia Southern University, Statesboro, GA, United States*

Indirect Combustion Technology with Renewable Non-edible Transesterified Oil Feedstock
Technical Paper Publication. PowerEnergy2016-59398
Valentin Soloiu, Jose Moncada, Tyler Naes, Martin Muinos, Spencer Harp, *Georgia Southern University, Statesboro, GA, United States*

Experimental Investigations on PCCI Engine Using External Mixture Formation Technique
Technical Paper Publication. PowerEnergy2016-59052
Girish Bhiogade, J.G. Suryawanshi, *Visvesvaraya National Institute of Technology, Nagpur, Maharashtra, India*

TRACK 1-2
BOILERS & HEAT RECOVERY STEAM GENERATORS

Session 1-2-2: Steam Generators II

West Meeting Rooms, Charlotte Convention Center, 205

Session Organizer: **Paul Weitzel**, *Babcock and Wilcox Company, Canal Fulton, OH, United States*
Session Co-Organizer: **Henry Wong**, *AECOM, Princeton, NJ, United States*

Pool Boiling Heat Transfer Enhancement with Structured surfaces
Technical Paper Publication. PowerEnergy2016-59364
Birce Dikici, Basim Qasim Alsukaini, *Embry-Riddle Aeronautical University, Daytona Beach, FL, United States*

Design of Advanced Ultra-supercritical Component Test Facility with 760°C Superheater and Steam Turbine
Technical Presentation. PowerEnergy2016-59882
Horst Hack, *Electric Power Research Institute, Charlotte, NC, United States*, ***Vito Cedro III***, *NETL/DOE, Pittsburgh, PA, United States*, ***Robert Purgert***, *Energy Industries of Ohio, Independence, OH, United States*, ***Paul Weitzel***, *The Babcock and Wilcox Company, Canal Fulton, OH, United States*, ***James Pschirer***, *GE Power, Windsor, CT, United States*, ***Christine Zemsky***, *GE Power, Schenectady, NY, United States*

Increasing Load Flexibility and Plant Dynamics of Thermal Power Plants via the Implementation of Thermal Energy Storages
Technical Paper Publication. PowerEnergy2016-59181
Peter Steiner, *TU Wien, Vienna, Austria*, ***Karl Schwaiger***, *Technische Universität Wien, Vienna, Austria*, ***Markus Haider, Heimo Walter***, *Vienna University of Technology, Vienna, Austria*, ***Martin Hämmerle***, *TU Wien, Vienna, Austria*

TRACK 1-5
PLANT OPERATIONS, RELIABILITY, AND PERFORMANCE

Session 1-5-4: Plant Operations and Maintenance Challenges and Solutions

East Meeting Rooms, Charlotte Convention Center, 211A

Session Organizer: **John Green II**, *EME Homer City Generation, Homer City, PA, United States*
Session Co-Organizer: **M. John Constable**, *Con Edison, Mount Vernon, NY, United States*

Automatic Flexible Seal Leakage Control System For Rotary Regenerative Heat Exchangers
Technical Paper Publication. PowerEnergy2016-59022
Manojkumar Marimuthu, *L&T Howden Private Limited, Surat, Gujarat, India*

Challenges in Meeting the Electricity Needs of South Africa
Technical Paper Publication. PowerEnergy2016-59085
Joseph Roy-Aikins, *Eskom, Sandton, South Africa*

Inviting Disaster? Code Compliance for Covered Piping Systems
Technical Presentation. PowerEnergy2016-59818
Pamela Hamblin, *Thielsch Engineering, Inc., Boca Raton, FL, United States*

TRACK 1-7
RENEWABLES: SOLAR, WIND, HYDRO, & GEOTHERMAL

Session 1-7-7: Advanced Technologies for Solar Energy 2

West Meeting Rooms, Charlotte Convention Center, 209B

Session Organizer: **John Fall**, *American Electric Power, Columbus, OH, United States*
Session Co-Organizer: **David MacPhee**, *University of Alabama, Tuscaloosa, AL, United States*

Assessment of Power Consumption of an Electrodynamic Dust Shield to Clean Solar Panels
Technical Paper Publication. PowerEnergy2016-59371
Jennifer Chesnutt, *University of Florida, Gainesville, FL, United States*, ***Bing Guo***, *Texas A&M University at Qatar, Doha, Qatar*, ***Chang-Yu Wu***, *University of Florida, Gainesville, FL, United States*

Revisiting Parabolic Trough Concentrators for Industrial Process Heat in the United States
Technical Paper Publication. PowerEnergy2016-59621
Craig Turchi, *National Renewable Energy Laboratory (NREL), Golden, CO, United States*, ***Parthiv Kurup, Guangdong Zhu***, *National Renewable Energy Laboratory, Golden, CO, United States*

Mechanical Stress Optimisation in a Directly Illuminated Supercritical Carbon Dioxide Solar Receiver
Technical Paper Publication. PowerEnergy2016-59664
Wilson Gardner, *CSIRO, Mayfield West, NSW, Australia*, ***Jin-Soo Kim***, *CSIRO Energy Centre, Newcastle, NSW, Australia*, ***Daniel Potter***, *CSIRO, NSW, Australia*, ***Wes Stein, Robbie McNaughton***, *CSIRO, Newcastle, NSW, Australia*

Design and Fabrication a Novel Hybrid Solar Distillation with the Ability to Recycling Brine.
Technical Presentation. PowerEnergy2016-59832
Arash Ranjbaran, Mahdi Norozi, Sajjad Norouzi, *Islamic Azad University, Tabriz, Iran*

TRACK 1-8
THERMAL HYDRAULICS & CFD

Session 1-8-2: Numerical Studies of TH & CFD

West Meeting Rooms, Charlotte Convention Center, 203A

Session Organizer: **George Mesina**, *Idaho National Laboratory, Idaho Falls, ID, United States*
Session Co-Organizer: **Amr Kaood**, *Fayoum University, Fayoum, Egypt*

Numerical Investigation of the Flow Fields and Thermal Patterns in a Large Cold Store (I)
Technical Paper Publication. PowerEnergy2016-59077
Amr Kaood, *Fayoum University, Fayoum, Egypt*, ***Essam E. Khalil***, *Cairo University, Dokki, Egypt*, ***Gamal El hariry***, *Cairo University, Cairo, Egypt*

Combined-Cycle Start-Up Procedures: Dynamic Simulation and Measurement
Technical Paper Publication. PowerEnergy2016-59286
Nicolas J. Mertens, Falah Alobaid, Bernd Epple, *TU Darmstadt, Darmstadt, Germany*, ***Hyun-Gee Kim***, *Doosan Heavy Industries Fluid Research Team, Changwon-Shi, Kyoungsangnam-Do, Korea (Republic)*

Numerical Modeling and Simulation of Injection Cooling and Wet Gas Compression
Technical Paper Publication. PowerEnergy2016-59400
Shyam Kishor, *Hicor Technologies, Inc., Houston, TX, United States*

Numerical Modeling and Simulation of Viscous Shear in Hydrostatic Bearing
Technical Paper Publication. PowerEnergy2016-59410
Shyam Kishor, *Hicor Technologies, Inc., Houston, TX, United States*

1:00 PM – 2:45 PM
ASME 2016 10TH INTERNATIONAL CONFERENCE ON ENERGY SUSTAINABILITY

TRACK 2-6
SOLAR CHEMISTRY

Session 2-6-4: Solar Chemistry

West Meeting Rooms, Charlotte Convention Center, 210B

Session Organizer: **Erik Koepf**, *Paul Scherrer Institute, Villigen-Psi, Switzerland*

Thermodynamic Model of a Solar Receiver for Superheating of Sulfur Trioxide and Steam at Pilot Plant Scale
Technical Paper Publication. PowerEnergy2016-59167
Alejandro Guerra Niehoff, Dennis Thomey, Moises Alfonso Romero Gonzales, Hans-Peter Streber, *German Aerospace Center, Cologne, Germany*, ***Justin Lapp***, *German Areospace Center, Köln, Germany*, ***Martin Roeb***, *Deutsches Zentrum für Luft- und Raumfahrt e.V., Koeln, Germany*, ***Christian Sattler***, *German Aerospace Center DLR, Koeln, Germany*, ***Robert Pitz-Paal***, *German Aerospace Center (DLR), Koln, Germany*

Operational Performance of the 45kWel Multi-source High-flux Solar Simulators at The Australian National University and École Polytechnique Fédérale de Lausanne
Technical Presentation. PowerEnergy2016-59426
Roman Bader, *Australian National University, Canberra, ACT, Australia*, ***Gaël Levêque***, *EPFL-LRESE, Lausanne, Switzerland*, ***Lutz Schmidt***, *Kinoton Digital Solutions GmbH, Germering, Germany*, ***Sophia Haussener***, *EPFL, Lausanne, Switzerland*, ***Wojciech Lipinski***, *Australian National University, Canberra, ACT, Australia*

Demonstration of a Prototype Solar Gasification Reactor Utilizing Molten Alkali Carbonate Salts
Technical Presentation. PowerEnergy2016-59752
Brandon Hathaway, Jasper Adamek-Bowers, *University of Minnesota, Minneapolis, MN, United States*, ***Jane Davidson***, *University of Minnesota, Wayzata, MN, United States*

Producing Solar Syngas via the Partial Oxidation of Methane-Ceria Redox Cycle: Conversion, Selectivity, and Efficiency
Technical Presentation. PowerEnergy2016-59846
Peter Krenzke, *Taylor University, Upland, IN, United States*, ***Jesse Fosheim***, *University of Minnesota - Twin Cities, Minneapolis, MN, United States*, ***Jingyang Zheng***, *University of Minnesota, Minneapolis, MN, United States*, ***Jane Davidson***, *University of Minnesota, Wayzata, MN, United States*

Kinetic Analyses of Gasification and Combustion Reactions of Carbonaceous Feedstocks for a Hybrid Solar/Autothermal Gasification Process to Continuously Produce Synthesis Gas
Technical Presentation. PowerEnergy2016-59884
Alexander Muroyama, Peter Loutzenhiser, *Georgia Institute of Technology, Atlanta, GA, United States*

TRACK 2-8
CONCENTRATING SOLAR POWER

Session 2-8-11: System Design and Analysis II

West Meeting Rooms, Charlotte Convention Center, 210A

Session Organizer: **Roman Bader**, *The Australian National University, Canberra, ACT, Australia*

A Particle/sCO2 Heat Exchanger Testbed and Reference Cycle Cost Analysis
Technical Paper Publication. PowerEnergy2016-59607
Matt Carlson, *Sandia National Labs, Albuquerque, NM, United States*, ***Clifford Ho***, *Sandia National Laboratories, Albuquerque, NM, United States*

High Temperature Concentrated Solar Power Using Liquid Metal
Technical Presentation. PowerEnergy2016-59657
Asegun Henry, *Georgia Institute of Technology, Atlanta, GA, United States*

Considerations for the Design of a High-Temperature Particle Reoxidation Reactor for Heat Extraction in Thermochemical Energy Storage Systems
Technical Paper Publication. PowerEnergy2016-59646
Sean Babiniec, James Miller, Andrea Ambrosini, *Sandia National Laboratories, Albuquerque, NM, United States*, ***Ellen Stechel***, *ASU, Tempe, AZ, United States*, ***Eric Coker***, *Sandia National Laboratories, Albuquerque, NM, United States*, ***Peter Loutzenhiser***, *Georgia Institute of Technology, Atlanta, GA, United States*, ***Clifford Ho***, *Sandia National Laboratories, Albuquerque, NM, United States*

Compact, Ceramic Heat Exchangers for High Efficiency Energy Systems
Technical Presentation. PowerEnergy2016-59677
Charles Lewinsohn, *Ceramatec, Inc., Salt Lake City, UT, United States*, ***Joseph Fellows***, *Ceramatec.com, Salt Lake Clty, UT, United States*

Hardware Selection and Use for Concentrated Solar Power Operations: Lessons Learned at the National Solar Thermal Test Facility
Technical Presentation. PowerEnergy2016-59156
Joshua Christian, William Kolb, John Kelton, Daniel Ray, Clifford Ho, *Sandia National Laboratories, Albuquerque, NM, United States*

TRACK 2-10
THERMODYNAMIC ANALYSIS OF ENERGY SYSTEMS

Session 2-10-2: Water Desalination Systems and Power Cycles

West Meeting Rooms, Charlotte Convention Center, 201A

Session Organizer: **Fahad Al-Sulaiman**, *KFUPM, Dhahran, Saudi Arabia*

Experimental Investigation of a Solar Driven Multi-Stage Stepped Bubbler Humidifier for Humidification-Dehumidification (HDH) Water Desalination System
Technical Paper Publication. PowerEnergy2016-59209
Hafiz Abd-Ur-Rehman, Fahad Al-Sulaiman, *KFUPM, Dhahran, Saudi Arabia*, ***Mohamed Antar***, *Kfupm, Dhahran, Saudi Arabia*

Analysis and Design of Novel Absorption Power Cycle Plants
Technical Paper Publication. PowerEnergy2016-59272
Vaclav Novotny, *Faculty of Mechanical Engineering, CTU in Prague, Department of Energy Engineering, Prague 6, Czech Republic*, ***Michal Kolovratnik***, *Faculty of Mechanical Engineering, CTU in Prague, Department of Energy Engineering, Prague, Prague, Czech Republic*, ***Monika Vitvarova***, *Faculty of Mechanical Engineering, CTU in Prague, Department of Energy Engineering, Prague 6, Czech Republic*, ***Jana Jakobsen***, *Sintef ER, Trondheim, Norway*

Analysis of Off-Design Behavior of a Solar-Fossil Hybrid Combined Cycle Plant Using a Small Particle Heat Exchange Receiver (SPHER) with a Variable Guide Vane Gas Turbine.
Technical Paper Publication. PowerEnergy2016-59467
Matthew Virgen, *San Diego State University, Chula Vista, CA, United States*, ***Fletcher J. Miller***, *San Diego State University, San Diego, CA, United States*

TRACK 2-11
BIOFUELS, HYDROGEN, SYNGAS, AND ALTERNATE FUELS

Session 2-11-2: Thermal and Energy Analyses in Fuel Processing and Biofuel Systems

West Meeting Rooms, Charlotte Convention Center, 201B

Session Organizer: **Kevin Nwaigwe**, *University of South Africa, Johannesburg, South Africa*
Session Co-Organizer: **Peiwen Li**, *University of Arizona, Tucson, AZ, United States*

Comparative Analysis of a Locally Developed Biogas Digester Using Selected Substrates
Technical Paper Publication. PowerEnergy2016-59047
Kevin Nwaigwe, *University of South Africa, Johannesburg, South Africa*, ***Christopher Enweremadu***, *University of South Africa, Florida Campus, Johannesburg, Gauteng, South Africa*

Hydrogen Production via Catalytic Autothermal Reforming of Desulfurized Jet-A Fuel
Technical Paper Publication. PowerEnergy2016-59095
Shuyang Zhang, Xiaoxin Wang, Peiwen Li, *University of Arizona, Tucson, AZ, United States*

Effect of Thermal Depolymerization of Wasted Food Extracts on Alternate Fuel Production
Technical Paper Publication. PowerEnergy2016-59535
Marcus Herndon, *Florida International University, Miami, FL, United States*

Analysis of Heat transfer from a Photobioreactor
Technical Paper Publication. PowerEnergy2016-59628
Gary A. Anderson, Sarmila Katuwal, *South Dakota State University, Brookings, SD, United States*, ***Anil Kommareddy***, *University of Maryland, College Park, MD, United States*, ***Stephen Gent***, *South Dakota State University, Brookings, SD, United States*

Optimizing the Efficiency of a Gasoline Engine, by the On-Board Production of HHO Gas
Technical Presentation. PowerEnergy2016-59778
Anshul Kumar, Shashwat Tripathi, *JSS Academy of Technical Education, Noida, India*, ***M.K. Shukla***, *CSIR-IIP, Dehradun, India*

1:00 PM – 2:45 PM
ASME 2016 14TH FUEL CELL SCIENCE, ENGINEERING, AND TECHNOLOGY CONFERENCE

TRACK 3-3
FUEL CELL ANCILLARY SYSTEMS AND BALANCE-OF-PLANT

Session 3-3-1: Fuel Cell Ancillary Systems and Balance-of-Plant - I

West Meeting Rooms, Charlotte Convention Center, 209A

Session Organizer: **Alex Tsai**, *United States Coast Guard Academy, New London, CT, United States*
Session Co-Organizer: **Tooran Emami**, *U. S. Coast Guard Academy, New London, CT, United States*

An Optimal Predictive Control of 0.75 kW PEM Fuel Cell Cogeneration with Home Appliances for Efficient PV Utilization
Technical Paper Publication. PowerEnergy2016-59285
Akira Yoshida, *Waseda University, Tokyo, Japan*, ***Jun Yoshikawa***, *Department of Applied Mechanics, Waseda University, Tokyo, Japan*, ***Yu Fujimoto***, *Advanced Collaborative Research Organization for Smart Society, Waseda University, Tokyo, Japan*, ***Yoshiharu Amano***, *Research Institute for Science and Engineering, Waseda University, Tokyo, Japan*

Robust PID Controller Design of a Solid Oxide Fuel Cell Gas Turbine
Technical Paper Publication. PowerEnergy2016-59602
Tooran Emami, Alex Tsai, *U. S. Coast Guard Academy, New London, CT, United States*, ***David Tucker***, *National Energy Technology Laboratory, Morgantown, WV, United States*

Multiple Model Adaptive Estimation of a Hybrid Solid Oxide Fuel Cell Gas Turbine Power Plant Simulator
Technical Paper Publication. PowerEnergy2016-59656
Alex Tsai, *United States Coast Guard Academy, New London, CT, United States*, ***David Tucker***, *National Energy Technology Laboratory, Morgantown, WV, United States*, ***Tooran Emami***, *U. S. Coast Guard Academy, New London, CT, United States*

Adaptive Control for Robust Air Flow Management System in Automotive Fuel Cell System
Technical Presentation. PowerEnergy2016-59923
Jaeyoung Han, *Chungnam National University, Daejeon, Korea (Republic)*, ***Mooncheong Jung***, *Chungnam National Univ., Daejeon, Korea (Republic)*, ***Sangseok Yu***, *Chungnam National University, Daejeon, Korea (Republic)*, ***Sun Yi***, *North Carolina A&T State University, Greensboro, NC, United States*

3:15 PM – 5:00 PM
ASME 2016 POWER CONFERENCE

TRACK 1-1
FUELS, COMBUSTION & MATERIAL HANDLING

Session 1-1-7: Fuel Safety Issues

West Meeting Rooms, Charlotte Convention Center, 204

Session Organizer: **Ezra Bar-Ziv**, *Michigan Technological University, Houghton, MI, United States*

Investigation of Flame Height from Multiple Liquefied Natural Gas Fire
Technical Paper Publication. PowerEnergy2016-59567
Tsz Chung Ho, Sau Chung Fu, *Hong Kong University of Science and Technology, Hong Kong*, ***Christopher Y. H. Chao***, *Hong Kong University Science & Tech, Kowloon, Hong Kong*

Assessment the Safety of Alternative Aviation Fuels in Aero-engine
Technical Paper Publication. PowerEnergy2016-59520
Shuiting Ding, Xiaoyi Yang, *Beihang University, Beijing, China*, ***Ziyu Liu***, *Cambridge University, Beijing, China*

TRACK 1-5
PLANT OPERATIONS, RELIABILITY, AND PERFORMANCE

Session 1-5-5: Advances in Plant Dispatching, Scheduling, and Decision Making

East Meeting Rooms, Charlotte Convention Center, 211A

Session Organizer: **Brian Langel**, *Omaha Public Power District, Omaha, NE, United States*
Session Co-Organizer: **Christopher Marcella**, *Able Engineering Services, Methuen, MA, United States*

A Game Equilibrium of a Retail Electricity Market with a High Penetration of Small and Mid-Size Suppliers
Technical Paper Publication. PowerEnergy2016-59388
Saeed Azad, Ehsan Ghotbi, *Alfred University, Alfred, NY, United States*

CPS-based Intelligent Load Dispatching for Thermal Power Generation: a Big Data Analytics Approach
Technical Paper Publication. PowerEnergy2016-59650
Ningling Wang, Pengpai Feng, Bin Shi, Zhiping Yang, *North China Electric Power University, Beijing, China*

Operation Scheduling Optimization Framework for Gas Turbines Based on System Degradation
Technical Presentation. PowerEnergy2016-59749
Tarannom Parhizkar, *University of California, Los Angeles, Los Angeles, CA, United States*, ***Maryam Khoshtinat Nikoo***, *Rakhshanfar Co, Los Angeles, CA, United States*, ***Ramin Roshandel***, *Sharif University of Technology, Tehran, Iran*, ***Ali Mosleh***, *University of California, Los Angeles, Los Angeles, CA, United States*

Energy Innovation: A Focus on Power Generation Data Capture & Analytics in a Competitive Market
Technical Presentation. PowerEnergy2016-59709
Salvatore Dellavilla, *Strategic Power Systems Inc, Charlotte, NC, United States*

TRACK 1-8
THERMAL HYDRAULICS & CFD

Session 1-8-4: Applications of Commercial Software

West Meeting Rooms, Charlotte Convention Center, 203A

Session Organizer: **Lina Xu**, *FS-Elliott Co.,LLC, Export, PA, United States*
Session Co-Organizer: **Ranjit Patil**, *BITS Pilani, Zuarinagar, Goa, India*

Discrete Element Studies of Gravity-Driven Dense Granular Flows in Vertical Cylindrical Tubes
Technical Paper Publication. PowerEnergy2016-59159
Yesaswi N. Chilamkurti, *North Carolina State University, Raleigh, NC, United States*, ***Richard Gould***, *North Carolina State University, Raleigh, NC, United States*

Effect of Novel Swirling Perforated Distributor on Fluid Dynamic Characteristics of Circulating Fluidized Bed Riser
Technical Paper Publication. PowerEnergy2016-59165
Meet Kalola, *University of Michigan, Ann Arbor, Michigan, MI, United States*, ***Mahesh Dasar***, *BITS Pilani, Zuarinagar, Goa, India*, ***Kedar Shete***, *SKF India Ltd., Pune, India*, ***Ranjit Patil***, *BITS Pilani, Zuarinagar, Goa, India*

Numerical Study on Flame Mesoscopic-Characteristics of Oxy-Coal MILD Combustion
Technical Paper Publication. PowerEnergy2016-59006
Ruochen Liu, Enke An, Kun Wu, *Tongji University, Shanghai, China*

3:15 PM – 5:00 PM
ASME 2016 10TH INTERNATIONAL CONFERENCE ON ENERGY SUSTAINABILITY

TRACK 2-8
CONCENTRATING SOLAR POWER

Session 2-8-12: Advanced Power Cycles I

West Meeting Rooms, Charlotte Convention Center, 210A

Session Organizer: **Fletcher J. Miller**, *San Diego State University, San Diego, CA, United States*

Effect of Pressure Drop on Thermal and Exergetic Performance of Supercritical CO2 Recompression Brayton Cycle Integrated with a Central Receiver
Technical Paper Publication. PowerEnergy2016-59015
Ricardo Vasquez Padilla, Yen Soo Too, Andrew Beath, Robbie McNaughton, Wes Stein, *CSIRO, Newcastle, NSW, Australia*

Reduced Order Bubbling Fluidized Bed Heat Exchanger Model for Perovskite Oxide Reoxidation and Heat Addition to s-CO2 Power Cycles
Technical Presentation. PowerEnergy2016-59150
Kevin Albrecht, Robert Braun, *Colorado School of Mines, Golden, CO, United States*

Experimental Testing of s-CO2 Regenerator for Use as a Replacement to High Cost Printed Circuit recuperators for Use in s-CO2 Recompression Brayton Cycle
Technical Paper Publication. PowerEnergy2016-59615
Jacob Hinze, Mark Anderson, *University of Wisconsin-Madison, Madison, WI, United States*, ***Gregory Nellis***, *University Of Wisconsin, Madison, WI, United States*

Modeling and Simulation of Regenerative Heat Exchangers for Supercritical CO2 Cycles
Technical Presentation. PowerEnergy2016-59869
Evan Reznicek, Robert Braun, *Colorado School of Mines, Golden, CO, United States*

TRACK 2-10
THERMODYNAMIC ANALYSIS OF ENERGY SYSTEMS

Session 2-10-3: Thermodynamic Analysis of Cooling Systems

West Meeting Rooms, Charlotte Convention Center, 201A

Session Organizer: **Yunho Hwang**, *University of Maryland, College Park, MD, United States*

CFD Based Study on an Earth Pipe Heat Exchanger with Different Pipe Geometries
Technical Paper Publication. PowerEnergy2016-59234
Shashank Srivastava, *Lovely Professional University, Varanasi, Uttar Pradesh, India*, ***Aashish Sharma, Ketan Ajay***, *Lovely Professional University, Phagwara, Punjab, India*

A Review on Desiccant Coated Heat Exchangers
Technical Paper Publication. PowerEnergy2016-59369
Asadullah Saeed, Ali Al-Alili, *The Petroleum Institute, Abu Dhabi, United Arab Emir.*

A Dynamic Model of a Single-Stage LiBr-H2O Absorption Chiller
Technical Paper Publication. PowerEnergy2016-59383
Prangtip Samutr, Ali Al-Alili, *The Petroleum Institute, Abu Dhabi, United Arab Emir.*

Thermodynamic Analysis of a Mini Hybrid Solar Driven Cooling-Desalination System
Technical Paper Publication. PowerEnergy2016-59524
Nasiru I. Ibrahim, *King Fahd University of Petroleum & Min., Dhahran, Saudi Arabia*, ***Fahad Al-Sulaiman***, *KFUPM, Dhahran, Saudi Arabia*, ***Saidur Rahman***, *King Fahd University, Dhahran, Saudi Arabia*

Numerical and Experimental Investigation of Air-Cooled Condensers
Technical Presentation. PowerEnergy2016-59924
Kaipo Kekaula, *University of Nevada, Las Vegas, Las Vegas, NV, United States*, ***Yi-tung Chen***, *University of Nevada, Las Vegas, NV, United States*

TRACK 2-11
BIOFUELS, HYDROGEN, SYNGAS, AND ALTERNATE FUELS

Session 2-11-3: Economic and Feasibility Studies for Biomass Technologies

West Meeting Rooms, Charlotte Convention Center, 201B

Session Organizer: **Philip Panicker**, *New York University in Abu Dhabi, Abu Dhabi, United Arab Emir.*
Session Co-Organizer: **Stephen Gent**, *South Dakota State University, Brookings, SD, United States*

Economic Feasibility of Corn Stover Torrefaction for Distributed Processing Systems
Technical Paper Publication. PowerEnergy2016-59530
Evan Almberg, Michael P. Twedt, Christina Gerometta, *South Dakota State University, Brookings, SD, United States*, ***Stephen Gent***, *South Dakota State University, Brookings, SD, United States*

Investigation of Fast Pyrolysis of Camelina Sativa Meal in an Auger Reactor
Technical Paper Publication. PowerEnergy2016-59601
Evan Almberg, Gregory Michna, *South Dakota State University, Brookings, SD, United States*, ***Stephen Gent***, *South Dakota State University, Brookings, SD, United States*

Microwave Plasma Gasification For Enhanced Oil Recovery and Sustainable Waste Management
Technical Paper Publication. PowerEnergy2016-59630
Philip Panicker, Amani Magid, *New York University in Abu Dhabi, Abu Dhabi, United Arab Emir.*

Microwave Plasma Gasification For The Restoration of Urban Rivers and Lakes, And The Elimination Of Oceanic Garbage Patches
Technical Paper Publication. PowerEnergy2016-59632
Philip Panicker, Amani Magid, *New York University in Abu Dhabi, Abu Dhabi, United Arab Emir.*

Experimental Investigation of an Offshore Wind Turbine With Modified Tension Leg Platform Under Waves Effect in the Northern Sea
Technical Presentation. PowerEnergy2016-59119
Mohamed Amine Maskrout, *Pusan National University, Busan, Korea (Republic)*

3:15 PM – 5:00 PM

ASME 2016 14TH FUEL CELL SCIENCE, ENGINEERING, AND TECHNOLOGY CONFERENCE

TRACK 3-3
FUEL CELL ANCILLARY SYSTEMS AND BALANCE-OF-PLANT

Session 3-3-2: Fuel Cell Ancillary Systems and Balance-of-Plant - II

West Meeting Rooms, Charlotte Convention Center, 209A

Session Organizer: **Tooran Emami**, *U. S. Coast Guard Academy, New London, CT, United States*
Session Co-Organizer: **Alex Tsai**, *United States Coast Guard Academy, New London, CT, United States*

Lightweight System Design Optimization of High Reliability Compact Air Independent PEMFC Power Systems for Aerial and Space Vehicles
Technical Paper Publication. PowerEnergy2016-59574
Robert Utz, Bob Wynne, Scott Ferguson, Mike Miller, Bob Sievers, Ying Song, *Teledyne Energy Systems, Hunt Valley, MD, United States*

Improving PEM Fuel Cell Systems' Efficiency- Stack Diagnostics, System Modelling
Technical Presentation. PowerEnergy2016-59762
Rajalakshmi Natarajan, *ARCI, Chennai, Tamil Nadu, India*, ***Parthasarathy Vasanth***, *ARCI, Chennai, Tamil Nadu, India*, ***Dhathathreyan KS***, *ARCI, CFCT, Chennai, India*

Assessment of a Cryogenic Cycle System for Improved Hydrogen Liquefaction through Heisenberg Vortex Separation
Technical Presentation. PowerEnergy2016-59765
Zhiwen Ma, *NREL, Golden, CO, United States*, ***Chris Ainscough, Genevieve Saur***, *National Renewable Energy Laboratory, Golden, CO, United States*, ***Jacob Leachman***, *Washington State University Pullman, Pullman, WA, United States*, ***Elijah Shoemake***, *Washington State University, Pullman, WA, United States*

System Characterization of a De-Coupled Hybrid Fuel Cell - Gas Turbine
Technical Presentation. PowerEnergy2016-59907
Garrett Hedberg, Dustin McLarty, *Washington State University, Pullman, WA, United States*

ENERGY STORAGE FORUM TRACK CHAIRS

Track 6-1 Battery Systems

Track Organizer: Christopher Rahn, Penn State University

Track Co-Organizer: Bobby Bailie, Dresser-Rand, a Siemens business

Track 6-2 Commercial Applications of Energy Storage

Track Organizer: Christopher Rahn, Penn State University

Track Co-Organizer: Bobby Bailie, Dresser-Rand, a Siemens business

Track 6-4 Compressed Air and Mechanical Energy Storage Systems

Track Organizer: Christopher Rahn, Penn State University

Track Co-Organizer: Bobby Bailie, Dresser-Rand, a Siemens business

Track 6-6 Thermal Energy Storage Systems

Track Organizer: Christopher Rahn, Penn State University

Track Co-Organizer: Bobby Bailie, Dresser-Rand, a Siemens business

Track 6-7 ASME 2016 Energy Storage Forum Plenary

Track Organizer: Bobby Bailie, Dresser-Rand, a Siemens business

Track Co-Organizer: Christopher Rahn, Penn State University

ENERGY SUSTAINABILITY CONFERENCE TRACK CHAIRS

Track 2-1 Sustainable Building Energy Systems

Track Organizer: Jorge Gonzalez, City College of New York

Track Co-Organizer: M. Keith Sharp, Univ of Louisville

Track 2-2 Sustainable Infrastructure and Transportation

Track Organizer: Dervis Demirocak, Texas A&M - Kingsville

Track 2-3 CHP and Hybrid Power & Energy Systems

Track Organizer: Amanda Smith, University of Utah

Track 2-4 Environmental, Economic, and Policy Considerations of Advanced Energy Systems

Track Organizer: Jordan Macknick, National Renewable Energy Laboratory

Track Co-Organizer: Pouria Ahmadi, Simon Fraser University (SFU)

Track 2-5 Energy Storage

Track Organizer: Reza Baghaei Lakeh, California State Polytechnic University, Pomona

Track 2-6 Solar Chemistry

Track Organizer: Erik Koepf, The Paul Scherrer Institute

Track 2-7 Photovoltaics

Track Organizer: Bing Guo, Texas A&M University at Qatar

Track 2-8 Concentrating Solar Power

Track Organizer: Nathan Siegel, Bucknell University

Track Co-Organizer: Roman Bader, The Australian National University

Track 2-9 Wind Energy Systems and Technologies

Track Organizer: Jie Zhang, University of Texas at Dallas

Track 2-10 Thermodynamic Analysis of Energy Systems

Track Organizer: Ali Al-Alili, The Petroleum Institute

Track 2-11 Biofuels, Hydrogen, Syngas, and Alternate Fuels

Track Organizer: Peiwen Li, University of Arizona

Track Co-Organizer: Stephen Gent, South Dakota State Univ

Track 2-12 Geothermal, Ocean, and Emerging Energy Technologies

Track Organizer: Chris Schmitt, GE Power & Water

Track Co-Organizer: Mansour Zenouzi, Wentworth Inst of Tech

Track 2-13 Poster

Track Organizer: Mark Lausten, US Department of Energy

Track 2-14 ASME 2016 10th International Conference on Energy Sustainability Plenary

Track Organizer: Robert Braun, Colorado School of Mines

FUEL CELL CONFERENCE TRACK CHAIRS

Track 3-1 Polymer Electrolyte Membrane, Direct Methanol, & Alkaline Fuel Cells

Track Organizer: Prodip K. Das, Newcastle University

Track Co-Organizer: Eon Soo Lee, New Jersey Institute of Technology (NJIT)

Track 3-2 Phosphoric Acid, Molten Carbonate, & Solid Oxide Fuel Cells

Track Organizer: George Nelson, University of Alabama in Huntsville

Track 3-3 Fuel Cell Ancillary Systems and Balance-of-Plant

Track Organizer: George Nelson, University of Alabama in Huntsville

Conference Track Chairs

Track 3-5 Batteries and Electrochemical Energy Storage

Track Organizer: Partha Mukherjee, Texas A&M University

Track Co-Organizer: Todd Bandhauer, Colorado State University

Track 3-6 Poster Session

Track Organizer: Soumik Banerjee, Washington State University

Track 3-8 Commercial Applications of Fuel Cells

Track Organizer: George Nelson, University of Alabama in Huntsville

GAS TURBINE FORUM TRACK CHAIRS

Track 5-1 Markets for Gas Turbine Power Generation

Track Organizer: Richard Dennis, US Department of Energy, National Energy Technology Laboratory

Track 5-2 Integrating Gas Turbine Based Power Systems with Energy Storage / Renewable Power Systems

Track Organizer: Richard Dennis, US Department of Energy, National Energy Technology Laboratory

Track 5-3 Advanced Manufacturing for Gas Turbines

Track Organizer: Richard Dennis, US Department of Energy, National Energy Technology Laboratory

Track 5-4 ASME 2016 IGTI Gas Turbine Forum Plenary

Track Organizer: Richard Dennis, US Department of Energy, National Energy Technology Laboratory

POWER CONFERENCE TRACK CHAIRS

Track 1-1 Fuels, Combustion & Material Handling

Track Organizer: Christopher Blazek, BeneTech

Track Co-Organizer: Ashwani Gupta, University Of Maryland

Track 1-2 Boilers & Heat Recovery Steam Generators

Track Organizer: Henry Wong, AECOM

Track Co-Organizer: Paul Weitzel, Babcock and Wilcox Company

Track 1-3 Heat Exchangers, Condensers, Cooling Systems, and Balance-of-Plant

Track Organizer: James Smith, RetubeCo Inc

Track Co-Organizer: Eric Svensson, Powerfect, Inc.

Track Co-Organizer: Gary Fischer, Conco Services Corporation

Track 1-4 Steam Turbine-Generators, Electric Generators, Transformers, Switchgears, Electric BOP & Auxiliaries

Track Organizer: Thomas Bauer, SvoBaTech, Inc.

Track Co-Organizer: Jay Leavitt, Siemens

Track Co-Organizer: Blanca Ramirez, Lectrodryer, LLC

Track Co-Organizer: Alex Atoui, FM Global

Track 1-5 Plant Operations, Reliability, and Performance

Track Organizer: Steve Kaercher, DTE Energy

Track Co-Organizer: Brian Langel, Omaha Public Power District

Track Co-Organizer: Matthew Dooley, Alstom Power

Track Co-Organizer: Brian Wodka, RMF Engineering

Track Co-Organizer: Christopher Marcella, Able Engineering Services

Track 1-6 Combustion Turbines

Track Organizer: Bob Aslin, FM Global

Track Co-Organizer: Tony Clark, Power Engineers, Inc.

Track Co-Organizer: Lilia Papadopoulos, Sargent & Lundy

Track 1-7 Renewables: Solar, Wind, Hydro, & Geothermal

Track Organizer: Reza Arghandeh, Florida State University, Center for Advanced Powe r

Track Co-Organizer: John Fall, American Electric Power

Track Co-Organizer: Navid Goudarzi, University of Maryland

Track Co-Organizer: Victor Osorio, San Francisco State University

Track Co-Organizer: Douglas Reed, Dominion Power

Track 1-8 Thermal Hydraulics & CFD

Track Organizer: George Mesina, Idaho National Laboratory

Track Co-Organizer: Donna Guillen, Idaho National Laboratory

Track 1-9 Regulatory, Codes, and Standards Compliance

Track Organizer: Jane Connelly, Zachry Nuclear Engineering

Track 1-10 Student Competition

Track Organizer: Rachel Willis, University of Central Florida

Track 1-12 Posters

Track Organizer: Tina Toburen, T2E3, Inc.

Track Co-Organizer: Greg Hall, POWER Engineers

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Fuel Cell	6/30/2016	03:15 PM - 05:00 PM	3-3-2	PowerEnergy2016-59574	Bob	Sievers
Fuel Cell	6/29/2016	10:15 AM - 12:00 PM	3-5-1	PowerEnergy2016-59439	Sameer	Singhal
Fuel Cell	6/29/2016	04:00 PM - 05:45 PM	3-1-2	PowerEnergy2016-59696	Manish	Sinha

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Fuel Cell	6/30/2016	10:15 AM - 12:00 PM	3-2-2	PowerEnergy2016-59918	Han Ho	Song
Fuel Cell	6/30/2016	10:15 AM - 12:00 PM	3-2-2	PowerEnergy2016-59919	Han Ho	Song
Fuel Cell	6/30/2016	03:15 PM - 05:00 PM	3-3-2	PowerEnergy2016-59574	Ying	Song
Fuel Cell	6/28/2016	05:45 PM - 07:30 PM	3-6-1	PowerEnergy2016-59791	Siou-Sheng	Su
Fuel Cell	6/30/2016	08:00 AM - 09:45 AM	3-2-1	PowerEnergy2016-59911	Neal	Sullivan
Fuel Cell	6/28/2016	01:30 PM - 03:15 PM	3-8-1	PowerEnergy2016-59855	Neal	Sullivan
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Fuel Cell	6/29/2016	04:00 PM - 05:45 PM	3-1-2	PowerEnergy2016-59696	Shohei	Toyota
Fuel Cell	6/29/2016	01:30 PM - 03:15 PM	3-1-1	PowerEnergy2016-59408	Aubree	Trunkle
Fuel Cell	6/30/2016	01:00 PM - 02:45 PM	3-3-1	PowerEnergy2016-59602	Alex	Tsai
Fuel Cell	6/30/2016	01:00 PM - 02:45 PM	3-3-1	PowerEnergy2016-59656	Alex	Tsai
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CHARLOTTE CONVENTION CENTER
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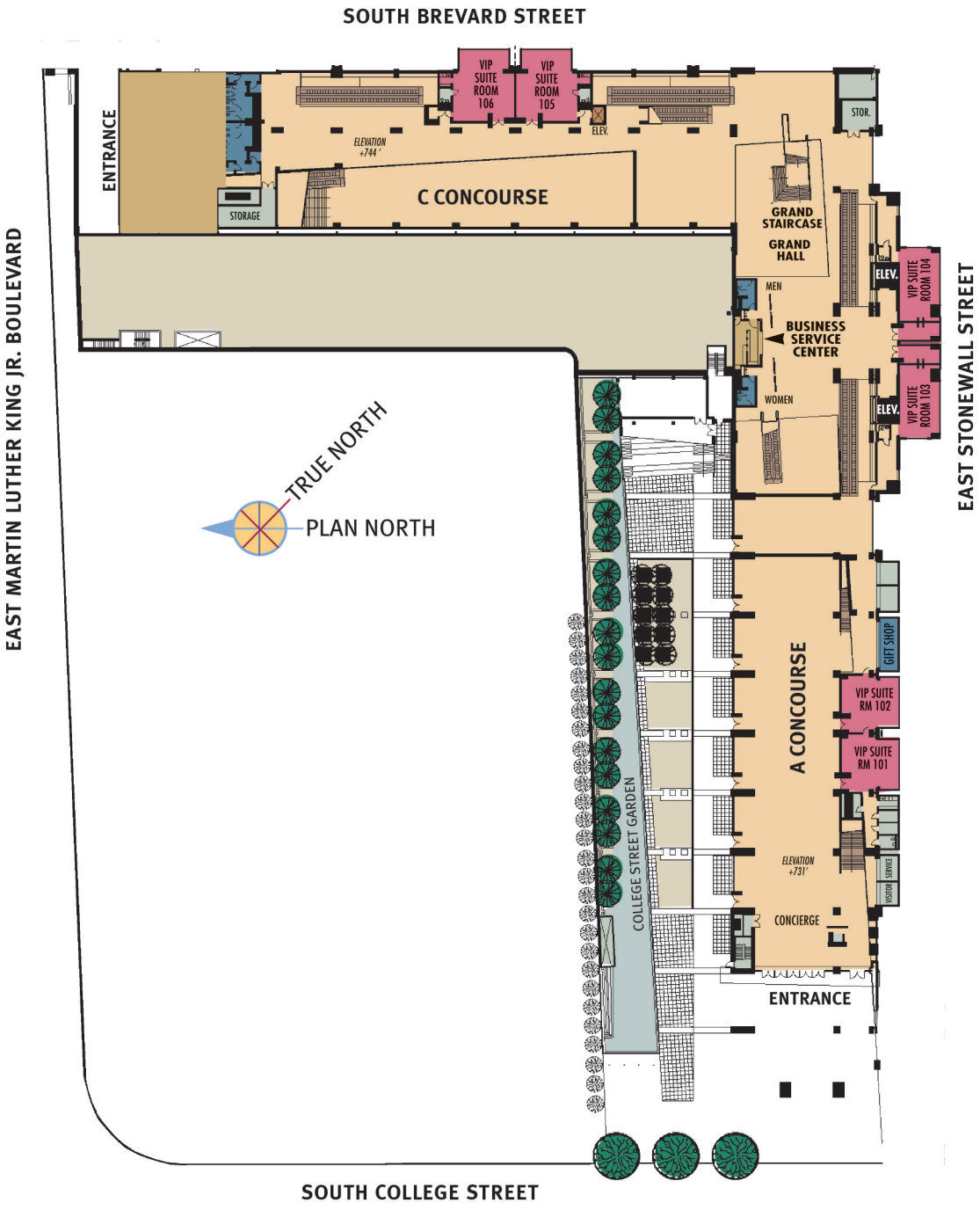

Floor Plans

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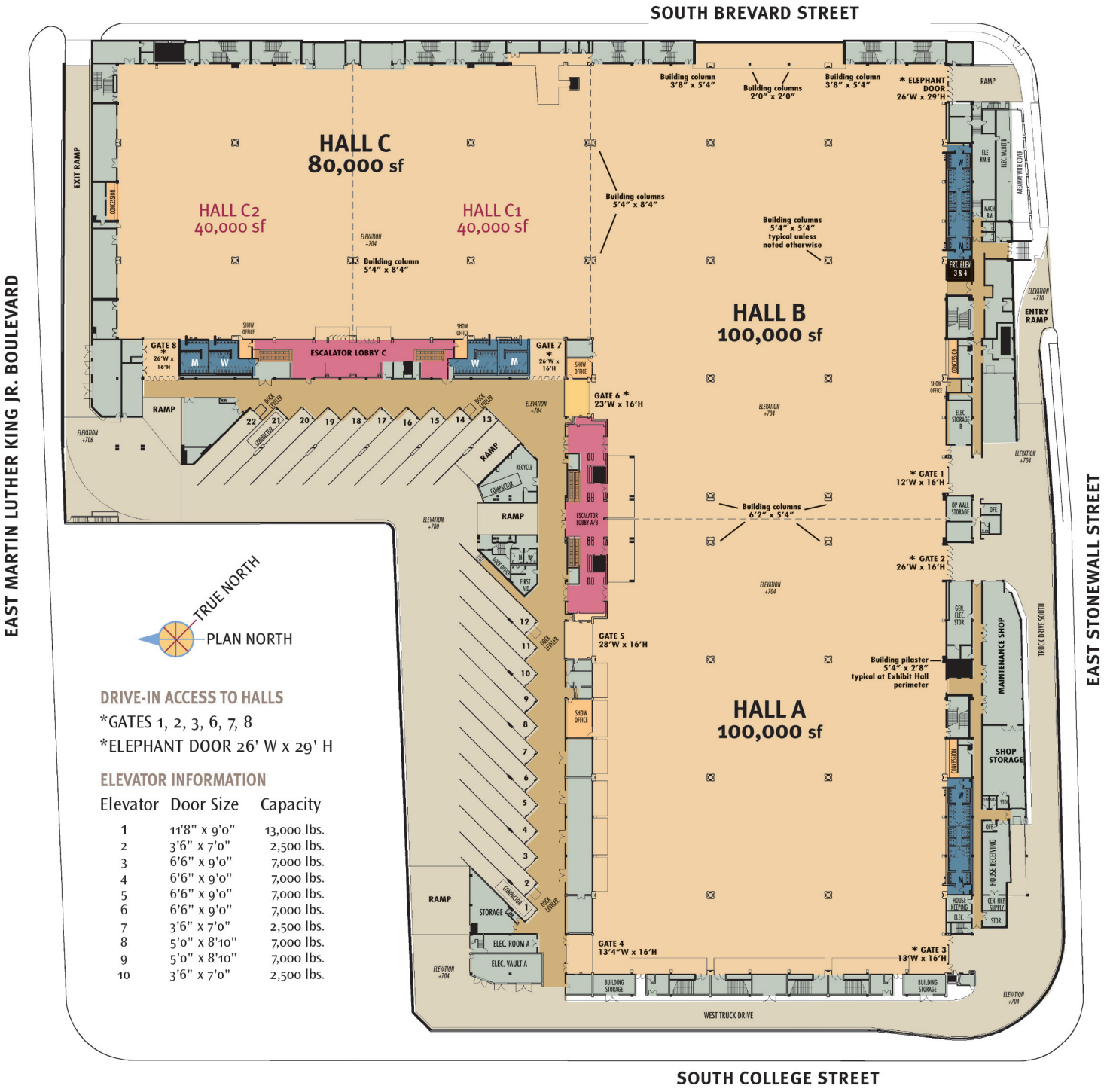


DRIVE-IN ACCESS TO HALLS

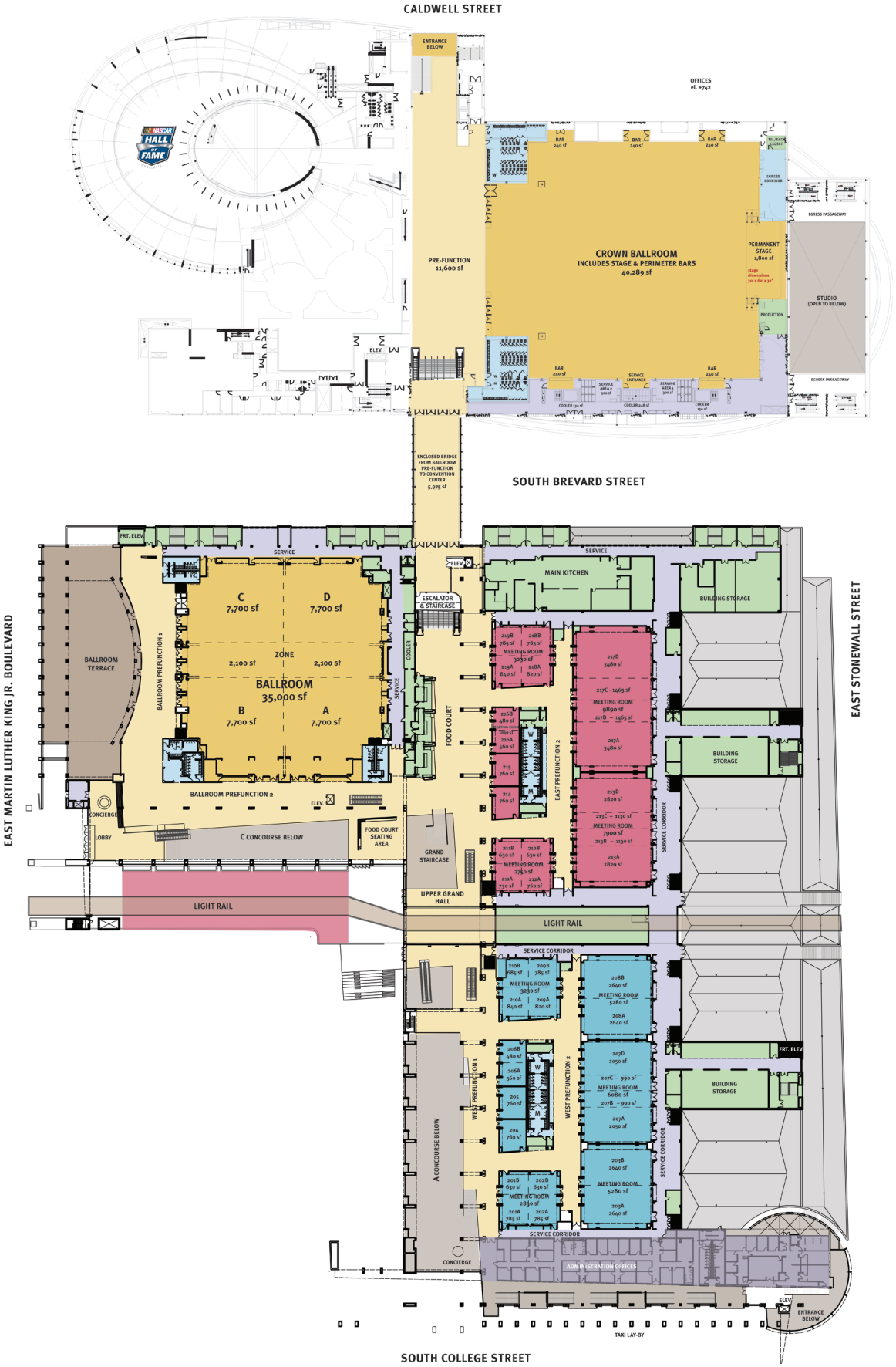
*GATES 1, 2, 3, 6, 7, 8

*ELEPHANT DOOR 26' W x 29' H

ELEVATOR INFORMATION

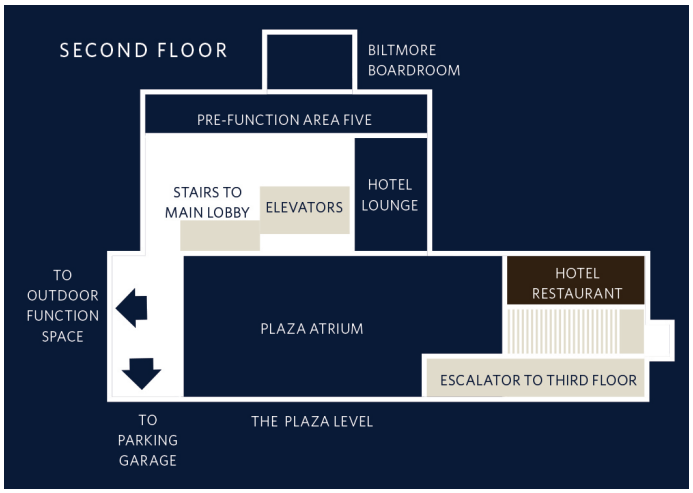
Elevator	Door Size	Capacity
1	11'8" x 9'0"	13,000 lbs.
2	3'6" x 7'0"	2,500 lbs.
3	6'6" x 9'0"	7,000 lbs.
4	6'6" x 9'0"	7,000 lbs.
5	6'6" x 9'0"	7,000 lbs.
6	6'6" x 9'0"	7,000 lbs.
7	3'6" x 7'0"	2,500 lbs.
8	5'0" x 8'10"	7,000 lbs.
9	5'0" x 8'10"	7,000 lbs.
10	3'6" x 7'0"	2,500 lbs.

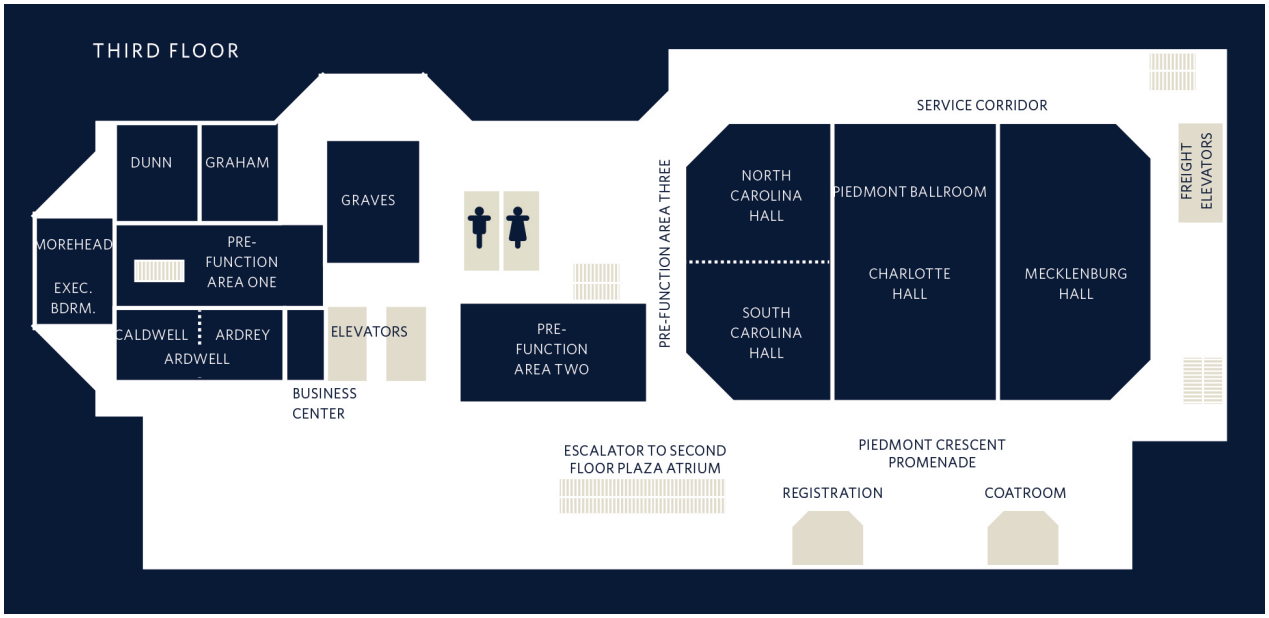
CHARLOTTE CONVENTION CENTER
BALLROOM & MEETING ROOM



Floor Plans

HILTON
MEETING ROOMS





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