RECIROPCATING ENGINES FOR SUPERIOR OPERATIONAL FLEXIBILITY

A closer look at costs, reliability and trends

January 13-14, 2020
Sheraton Dallas Hotel by the Galleria
Dallas, TX

FEATURING A SITE TOUR

Denton Energy Center
A 225-MW facility with 12 natural-gas-fired Wärtsilä 18.8-MW reciprocating engine generators
MONDAY, JANUARY 13, 2020

EUCI is authorized by IACET to offer 0.8 CEUs for the symposium
OVERVIEW

The costs of a power outage to a business can be substantial, including losses in product, revenue, productivity, and customers. With increasing severe weather events and disasters triggering greater numbers of costly power outages, there is a growing interest in generators for flexible backup power. Businesses are either considering installing backup generators or—in the case of facilities such as hospitals and airports that are required to and already have backup power—are considering redundant backup systems for added resilience against grid outages. Uninterrupted electrical supply is a necessity and blackouts result in broad economic losses as well as public health, safety and security concerns.

Given today's need for reliable power, it's little surprise that use of reciprocating engine generators is expected to increase. In fact, diesel reciprocating engine generators represent the fastest-selling, least expensive form of distributed generation technology in the world.

This symposium examines the expansion of renewable power and what works best while discussing the cost and benefits of backup generator configurations and feature case studies on the role reciprocating engines play with improving efficiency, reliability and costs. Key insights into fuel choices with back up generation, balanced renewables, operation and maintenance will be examined.

LEARNING OUTCOMES

- Discuss generators for reliable backup power
- Review the economics of project development
- Discuss lessons learned from engine plant development
- Assess advancements in engine technology that increase operational flexibility
- Evaluate best fit technologies
- Evaluate reliability and resiliency
- Review avoiding strict operating limitations imposed by pollutant emissions
- Assess the value of reciprocating engines in today’s energy market
- Analyze resource planning with reciprocating engines
- Review reciprocating engines to support future growth in renewable energy
MONDAY, JANUARY 13, 2020

8:00 – 8:30 am   Registration & Continental Breakfast

8:30 – 9:15 am   Why Reciprocating Engines Are Being Chosen for Reliable Back Up Power: Keys to Successful Project Execution
Burns & McDonnell (BMcD) is an industry leading EPC provider for reciprocating engine power plants. With over 1700 MW designed and constructed, BMcD will describe keys to successful project execution.
Objectives:
• Describe the development, permitting, design and construction process
• Identify areas in each phase that need specific attention to mitigate cost and or schedule overruns
• Describe contracting execution methods and the advantages/disadvantages of each
Attendees will learn:
• Project development execution strategies
• Project design & construction risk mitigation measures
• Project execution concepts
Brian Elwell, EPC Project Director, Burns & McDonnell

9:15 – 10:00 am  Lessons Learned: Reciprocating Engine Plant Project Development
In support of variable renewable generation SMUD undertook a study as to how reciprocating engine power plants would support increased penetration of renewables. The result was promising, so SMUD elected to pursue a pilot project that installed a limited amount of new capacity that would allow SMUD to test flexible natural gas-powered capacity in its service area to shape and firm variable renewable resources, primarily wind and solar. A study of suitable sites in the service area was undertaken and a bid package for an Engineer, Procure and Construct contract was developed. The Request for Proposals (RFP) was placed on the street, bids were received and reviewed. Unfortunately, by the structure of the project, the prices received made it uneconomic. This presentation is a discussion of the lessons learned in what the cost drivers were for the project and how to reduce them in future projects.
Objectives:
• Discuss why SMUD elected to pursue this project
• What did SMUD learn from developing this project and the cost drivers
• Why was the project terminated?
• Lessons for future developments
Attendees will learn:
• Steps in reciprocating engine generation project development
• Cost drivers
• Bidding process
• Evaluation of bids
• Lessons learned
John (Buck) Cutting, Manager, Project Development and Renewable Generation Assets, Power Generation, Sacramento Municipal Utility District

10:00 – 10:30 am  Morning Break
AGENDA

MONDAY, JANUARY 13, 2020 (CONTINUED)

10:30 – 11:15 am  **Reciprocating Engines for Rural Reliability**
Sebewaing Light and Water (SL&W), a rural electric provider experienced an ever-increasing number of outages from the local grid. The impact on industrial customers was severe. SL&W Utility began an investigation to install distributed generation to provide its own power for the community. After the economics and environmental permitting needs were determined to be acceptable, a contract was awarded to install reciprocating engines. The unique seasonal load was addressed with 2 different size units. The contract was awarded as turnkey to address the lack of project management resources within SL&W

**Objectives:**
- Economics of the project
- Unique seasonal load requirements
- Project installation schedule
- Contractor availability and interconnection challenges with utility

**Attendees will learn:**
- Steps used to award the contract
- System integration with new engines
- Permitting requirements
- Financing process

*Melanie McCoy, Superintendent, Sebewaing Light and Water*

11:15 – 12:00 pm  **PANEL: Understanding Challenges with Implementation**
- Fuel choices
- Economics with project development
- Learning engine size and best fit scenarios

*Dan Shelledy, Senior Business Development Manager, Wärtsilä Energy*
*Brian Elwell, EPC Project Director, Burns & McDonnell*
*Melanie McCoy, Superintendent, Sebewaing Light and Water*

12:00 – 1:00 pm  **Group Luncheon**

1:00 – 2:00 pm  **Overview of the Denton Energy Center**
The site tour will feature the 225MW Denton Energy Center which supplies power to the city of Denton, Texas. The plant provides balancing power to the community, which is moving towards green, low emissions power system aiming to have 70% of its energy produced from renewables by 2019 as part of the Renewable Denton Plan. The plant includes 12 18-cylinder Wartsila 50SG engines operating on natural gas.

*Dan Shelledy, Senior Business Development Manager, Wärtsilä Energy*
The city of Denton is a leader in integrating renewable energy into its power system. It receives more than 40% of its energy from wind power—an achievement recognized by the American Power Association and the US Department of Energy. Because of the fluctuations in the supply produced by renewables, the engines technology will be used to balance the output. The solution will decrease the city’s emissions by 78% deliver reliable, affordable electricity to its customers and saves hundreds of millions of dollars in electricity production costs.

*Tour led by Jason Brown, Plant Manager*
(Deadline for Tour Registration is January 6, 2020)

5:00 pm
**Arrive Back at Hotel/End of Day 1**

TUESDAY, JANUARY 14, 2020

8:00 – 8:30 am
**Continental Breakfast**

8:30 – 9:30 am
**Reciprocating Engines Operating in the ERCOT Only Energy Market**
Over 800MWs of reciprocating engine plants are now operating in Texas ranging in size from 25 to 225 MW. These peaking plants that typically operate from 1,500 to 3,000 hours per year with as many as 350 starts per engine per year. The plants provide energy to the grid but are also valuable for providing ancillary services and other products.

**Objectives:**
- Highlight reference plants in Texas and throughout the US
- Learn about the value of flexibility in ERCOT

**Attendees will Learn:**
- Evaluating best fit technologies
- How to avoid strict operating limitations imposed by pollutant emissions
- How reciprocating engines can be a hedge to price spikes in the electric market
- The value of ancillary services and black start capability

*Alicia Price, General Manager, Greenville Electric Utility Systems*
*Dan Shelledy, Senior Business Development Manager, Wärtsilä*

9:30 – 10:00 am
**Morning Break**
TUESDAY, JANUARY 14, 2020 (CONTINUED)

10:00 – 11:00 am  Resource Planning with Reciprocating Engines
In an environment of rapid deployment of renewable energy on energy grids, resource planners are increasingly evaluating flexible resource options for renewable integration and reliability services. Reciprocating engines provide a flexible, fast and dispatchable option as part of an integrated approach that balances environmental performance, cost, and reliability. Stakeholders in resource planning typically have little exposure to RICE technology and therefore clear communication about the benefits and trade-offs must be made to gain support. This presentation will cover how Ascend performs resource planning analysis around reciprocating engines and how we communicate with stakeholders to gain buy-in for the technology.

**Learning Objectives:**
• How to write resource plan for reciprocating engines
• How to properly model reciprocating engines in your resource plan
• Learn about trends reciprocating engines play in resource portfolio
• Discuss cases and models for electric utility that have shown value

*David Millar, Director of Resource Planning, Ascend Analytics*

11:00 – 12:00 pm  Reciprocating Engines to Support Future Growth in Renewable Energy
The growth of wind and solar generation has caused increased volatility in the electric grid. Quick start and flexible generation technologies are required to manage this intermittent capacity to provide reliability to the system.

**Engine Characteristics that Support Flexibility and Reliability**
• Attendees will learn about starting and shutdown times
• Minimum load capabilities and efficiency at part load
• Equipment available for various levels of emission control

*Chris Whitney, Manager of Sales Support, Wärtsilä*

**Resource Planning & Reciprocating Engine Modeling**
• Market trends with renewables
• Learn about modeling flexibility in the power system

*Joe Ferrari, General Manager, Utility Market Development, Wärtsilä*

**Engine Operations and Maintenance**
• Learn about maintenance planning & schedules
• Programs available for managing spare parts

*Scott Hannen, Account Manager Services, Wärtsilä*

12:00 pm  End of Conference
INSTRUCTORS

John (Buck) Cutting  
**Manager, Project Development and Renewable Generation Assets, Power Generation, Sacramento Municipal Utility District**

Mr. Cutting is a licensed Mechanic Engineer in the State of California with over 30 years’ experience in the energy conversion business. He has developed and managed wind generation, natural gas pipeline, hydro generation, thermal generation and transit projects.

Melanie McCoy  
**Superintendent, Sebewaing Light and Water**

Melanie McCoy has been involved in the Construction, Operation and Management of Power Generation facilities for over 35 years. She is currently the Superintendent of Sebewaing Light and Water, a Municipal Utility in the Thumb of Michigan providing Electric, Water and Internet to its 1700 residents. Sebewaing became the first “Gigabit” Community in Michigan in 2015.

Prior to Sebewaing she was General Manager with Wyandotte Municipal Services in Wyandotte, MI and where an Integrated Renewable Energy Program was initiated including Solar, Geothermal and Energy Efficiency. A Mechanical Engineer from Lehigh University, Melanie previously served as Plant Manager and then Director of Environmental Projects at DTE Energy.

Joseph Ferrari  
**General Manager, Utility Market Development, Wärtsilä**

Joseph Ferrari is an engineer and scientist with master’s degrees in aerospace engineering and natural resource science. He has authored numerous articles on topics ranging from design of combined cycles, emission control systems, integrated resource planning, the impact of coal retirement and enabling renewables using flexible generation. Mr. Ferrari worked at the University of Maryland for 5 years as a research scientist; 5 years at Wärtsilä North America, Inc. as a sales engineer for installation of over 1 BUSD in power plant projects in North and Central America; 5 years as the Market Development Analyst for Wärtsilä in the Americas, 2 years as Business Development Manager, and most recently has assumed the role of General Manager, Utility Market Development. His responsibilities include strategic market development, asset evaluations and portfolio planning for applications in the US and Latin America. Central to his work in the energy industry is a search for ways to optimize energy systems in light of ever-expanding renewable penetration.

Chris Whitney  
**Manager of Sales Support, Wärtsilä**

Chris is a Mechanical Engineer who has worked for Wartsila for 30 years, first as a Project Manager for Power Plants, and is currently the Manager of Sales Support for Wartsila, located in Annapolis, Maryland. He worked initially for Schlumberger Offshore Services as a Field Engineer in the Gulf of Mexico and following that as the Chief Engineer of a small Independent Oil Company based in Lafayette, Louisiana. His current responsibilities include preparation of the technical specifications, performance data, and cost estimates for new offers produced by Wartsila for gas fired, and diesel and heavy fuel fired reciprocating engine plants. In addition, during his tenure at Wartsila he sold the first Wartsila power plant operating on crude oil, and the first Wartsila power plant operating on LPG fuel.
INSTRUCTORS

Dan Shelledy  
**Senior Business Development Manager, Wärtsilä**  
Dan Shelledy, Senior Business Development Manager is responsible for Wärtsilä Energy Business sales in Texas and the Gulf Coast US. He has more than 30 years’ experience in the energy industry spanning both US and international markets in power generation, pipelines and mining. He has worked the past eight years for Wärtsilä in Houston, TX. Mr. Shelledy received his B.S. in Mining Engineering at Missouri University of Science and Technology and is a registered professional engineer.

Scott Hannen  
**Account Manager Energy Business Services, Wärtsilä**  
Scott Hannen is an Account Manager for Wärtsilä's Energy Business Services Team and is responsible for providing Lifecycle Solutions Support to Wärtsilä's energy customers within the central region of the United States. Scott began his career with Wärtsilä in 2015 as a Contract Manager in which he was responsible for the administration and support of several Long-Term Service Agreements with Wärtsilä's oil and gas customers. Prior to joining Wärtsilä, Scott held several positions in sales support, operations management, and services coordination for high speed diesel and marine propulsion equipment distributors in the Gulf Coast area.

David Millar  
**Director of Resource Planning, Ascend Analytics**  
David leads Ascend’s resource planning consulting practice, providing clients with deep expertise in modern techniques for long-term resource planning, valuation, and renewable integration. He leads a team of seven full time analysts and a nationwide client portfolio of major investor owned utilities, municipal utilities, and electricity retailers across the US. Mr. Millar holds a master’s degree in Energy Economics & Policy from Duke University and bachelor’s degrees in Earth Sciences and Political Science from the University of California, Santa Cruz.
INSTRUCTORS

Alicia Price  
**General Manager, Greenville Electric Utility Systems**

Alicia Price currently serves at the General Manager for the Greenville Electric Utility System (“GEUS”), Texas’ oldest municipally-owned utility, in Greenville, Texas. GEUS has provided electricity to the Greenville community for more than 128 years and cable and Internet since 2009. In her current role, Ms. Price is responsible for implementing all GEUS Board polices and direction as necessary to improve operational efficiency, drive financial success, enhance reliability, maintain lower rates, and manage relationships with customers, employees, regulators and legislators to achieve the strategic goals of the utility.

Alicia serves as Vice President of the Texas Public Power Association and earned her Public Power Manager Certification from APPA.

Alicia is a Member of Women in Energy. She graduated Summa Cum Laude, with a degree in Business from Texas A&M University (Commerce). Alicia has a passion for serving people and has worked in the public sector for more than 27 years.

Brian Elwell  
**EPC Project Director, Burns & McDonnell**

As a Business Unit Manager for Recip Power and EPC Project Director at Burns & McDonnell, Brian focuses his efforts on the development and execution of energy-related design-build solutions. His duties include preliminary feasibility studies, comprehensive program analyses including financial analyses, conceptual and detailed design and complete design-build program management from conception through implementation. Brian has spent the last several years of his 28-year career at Burns & McDonnell specializing in the development, design and construction of reciprocating engine power plants ranging from 25 MW – 220 MW installations.
REQUIREMENTS FOR SUCCESSFUL COMPLETION

Participants must sign in/out each day and be in attendance for the entirety of the course to be eligible for continuing education credit.

INSTRUCTIONAL METHODS

PowerPoint presentations and case studies will be used for this course.

PROCEEDINGS

The proceedings of the course will be published, and one copy will be distributed to each registrant at the course.

EVENT LOCATION

A room block has been reserved at the Sheraton Dallas Hotel by the Galleria, 4801 Lyndon B. Johnson Freeway, Dallas, TX 75244, for the nights of January 12-13, 2020. Room rates are $119 plus applicable tax. Call 1-972-661-3600 for reservations and mention the EUCI event to get the group rate. The cutoff date to receive the group rate is December 23, 2019 but as there are a limited number of rooms available at this rate, the room block may close sooner. Please make your reservations early.

IACET CREDITS

EUCI has been accredited as an Authorized Provider by the International Association for Continuing Education and Training (IACET). In obtaining this accreditation, EUCI has demonstrated that it complies with the ANSI/IACET Standard which is recognized internationally as a standard of good practice. As a result of their Authorized Provider status, EUCI is authorized to offer IACET CEUs for its programs that qualify under the ANSI/IACET Standard.

EUCI is authorized by IACET to offer 0.8 CEUs for this course.

REGISTER 3, SEND THE 4TH FREE

Any organization wishing to send multiple attendees to this conference may send 1 FREE for every 3 delegates registered. Please note that all registrations must be made at the same time to qualify.
PLEASE REGISTER

- RECIPROCATING ENGINES FOR SUPERIOR OPERATIONAL FLEXIBILITY COURSE
  JANUARY 13-14, 2020: US $1395
  Early bird on or before January 10, 2020: US $1195

- YES, I WOULD LIKE TO ATTEND THE OPTIONAL SITE TOUR OF DENTON ENERGY CENTER
  MONDAY, JANUARY 13, 2020
  (DEADLINE FOR TOUR REGISTRATION IS JANUARY 6, 2020)

How did you hear about this event? (direct e-mail, colleague, speaker(s), etc.)

Print Name

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What name do you prefer on your name badge?

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List any dietary or accessibility needs here

CREDIT CARD INFORMATION

Name on Card

Billing Address

Account Number

Billing City

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Security Code (last 3 digits on the back of Visa and MC or 4 digits on front of AmEx)

Billing Zip Code/Postal Code

OR Enclosed is a check for $ to cover registrations.

Substitutions & Cancellations

Your registration may be transferred to a member of your organization up to 24 hours in advance of the event. Cancellations must be received on or before December 13, 2019 in order to be refunded and will be subject to a US $195.00 processing fee per registrant. No refunds will be made after this date. Cancellations received after this date will create a credit of the tuition (less processing fee) good toward any other EUCI event. This credit will be good for six months from the cancellation date. In the event of non-attendance, all registration fees will be forfeited. In case of course cancellation, EUCI’s liability is limited to refund of the event registration fee only. For more information regarding administrative policies, such as complaints and refunds, please contact our offices at 303-770-8800. EUCI reserves the right to alter this program without prior notice.