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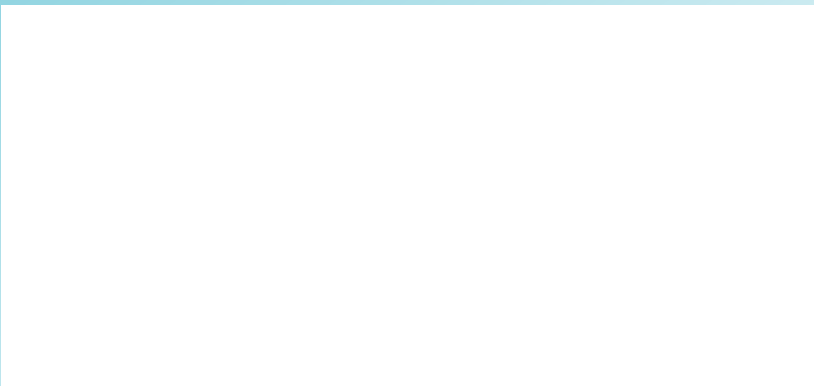
Case Study: COVID-19 Vaccine Distribution Center Relies on Generac Industrial Power for Critical Backup Power

Stack Testing Best Practices to Ensure Accurate Results

Meet Your EGSA Director Brian VenHorst

Meet the 2020 Technician of The Year Award (TOYA) Winner, Matthew Erickson

ComAp Company Profile

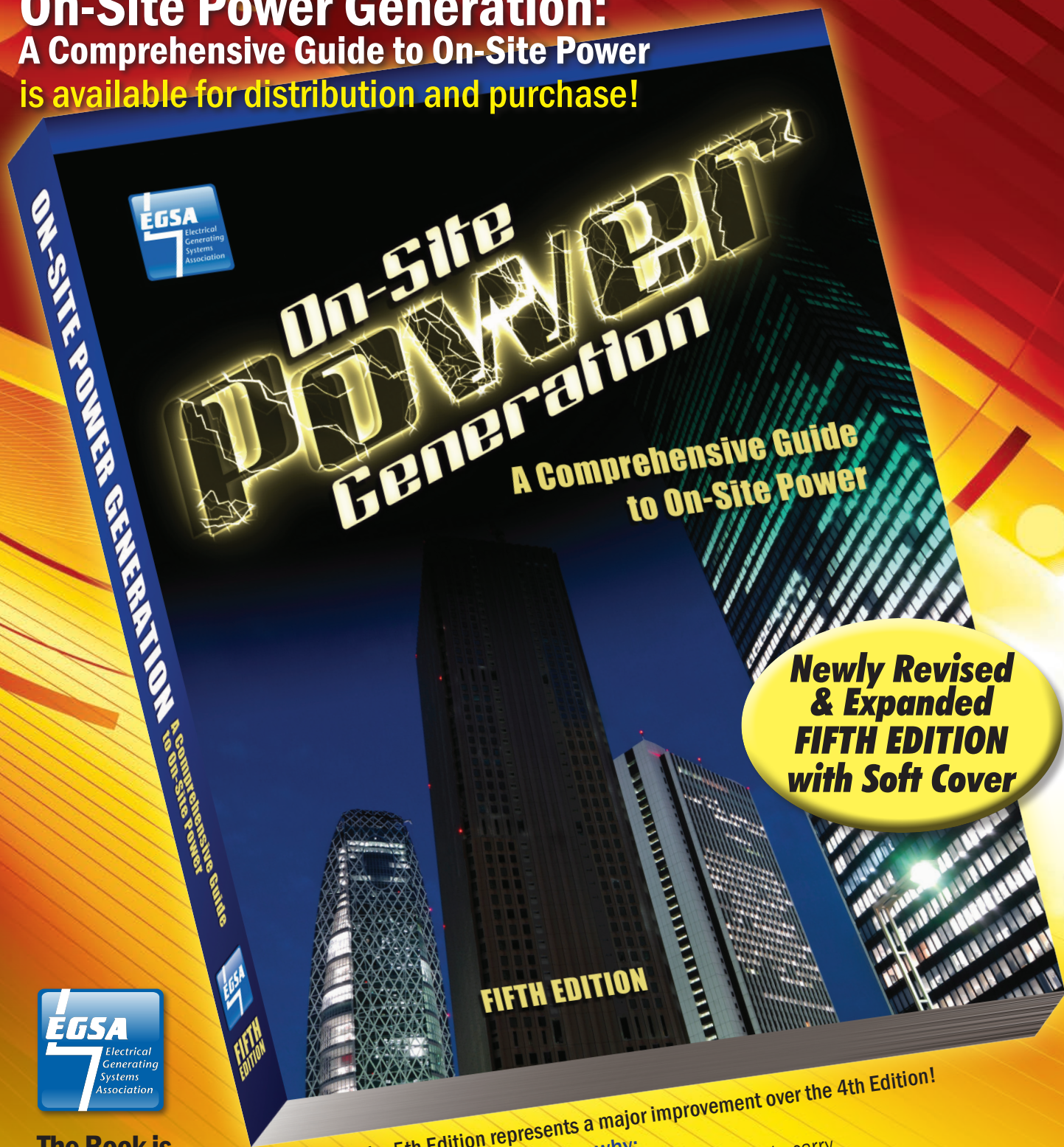


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Stack Testing Best Practices to Ensure Accurate Results

By Don Peterson, Senior Applications Engineer, MTI Climate Energy, a Rolls-Royce Company

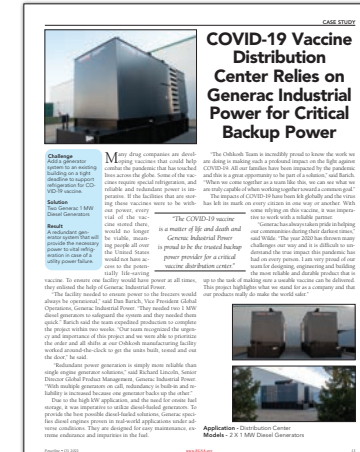
There are several different test methods that may be performed to measure the engine's exhaust gas emissions. Every method has its own advantages and disadvantages. However, different methods can lead to different results for the same pollutant being measured. On the following pages, the stack testing process is outlined in regard to the procedures required and the factors to be considered from the engine side. In addition, a guideline is provided to help ensure that the results of a stack test are valid and not impacted by either engine malfunction or errors in the testing process.

Abstract

Throughout the world, various legislation on governing new diesel engines, more efficient exhaust gas emission methods are being utilized. Although we already have a lot of these regulations, we are an increasing number of countries. In fact, all world-class diesel engine manufacturers are required to meet the factors to be considered from the engine side. In addition, a guideline is provided to help ensure that the results of a stack test are valid and not impacted by either engine malfunction or errors in the testing process.

There are several different test methods that may be performed to measure the engine's exhaust gas emissions. Every method has its own advantages and disadvantages. However, different methods can lead to different results for the same pollutant being measured. On the following pages, the stack testing process is outlined in regard to the procedures required and the factors to be considered from the engine side. In addition, a guideline is provided to help ensure that the results of a stack test are valid and not impacted by either engine malfunction or errors in the testing process.

*Best Practices:
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COVID-19 Vaccine Distribution Center Relies on Generac Industrial Power for Critical Backup Power

The Oklahoma State is incredibly proud to know the work we are doing in making such a profound impact on the fight against COVID-19. Our facilities have been impacted by the pandemic and this is a great opportunity to be part of a solution. Our facilities are critical to the state's health and well-being. Our facilities are critical to the state's health and well-being. Our facilities are critical to the state's health and well-being.

Challenge

Our facilities are critical to the state's health and well-being. Our facilities are critical to the state's health and well-being. Our facilities are critical to the state's health and well-being.

Solution

Our facilities are critical to the state's health and well-being. Our facilities are critical to the state's health and well-being. Our facilities are critical to the state's health and well-being.

Result

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*Case Study:
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EVENTS CALENDAR

Conferences

EGSA 2021 Spring Conference

April 18-20, 2021; Naples Grande Beach Resort, Naples, FL

EGSA's Annual Spring Conferences feature educational sessions on a broad range of issues impacting the On-Site Power Industry. More information is available at www.EGSA.org or by calling (561) 750-5575.

EGSA 2021 Fall Conference

September 19-21, 2021; Hyatt Regency Lake Washington, Seattle (Renton), WA

EGSA's Annual Fall Conference features educational sessions on a broad range of issues impacting the On-Site Power Industry. More information will be available at www.EGSA.org or by calling (561) 750-5575.

EGSA 2021 George Rowley Schools of On-Site Power Generation

For information, visit www.EGSA.org or call (561) 750-5575.

Basic Schools

June 7-10 - Houston, TX

October 18-21 - Las Vegas, NV

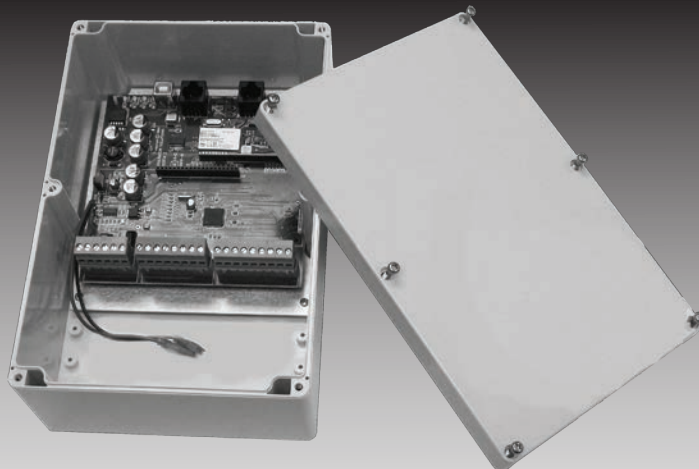
Advanced Schools

May 17-20 - Kansas City, MO

July 19-22 - Atlanta, GA

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Kurtiss E. Summers (Kurt)
2020/2021
EGSA Board Chair
kurt.summers@
austingenerator.com

EGSA... Stand-By for Stand-By

As I write this article a little more than a week since Uri, the historic winter storm sent all of Texas into a deep freeze. I cannot help but ponder how this singular event will impact the demand for Power Generation for years, especially here in Texas. The five continuous days, and in some places up to ten continuous days, at below freezing temperatures all during major electrical power outages made our experiences difficult, and was even life threatening for many. The property damage is expected to top \$200 Billion. That's more than hurricanes Harvey and Ike, and nearly three times the cost of Superstorm Sandy. One thing we had in common with Sandy, diesel fuel was in short supply or difficult to deliver. Several emergency generators ran out of fuel at the peak of the storm, causing a myriad of other problems. Many EGSA member companies on the Eastern and Gulf

been aware of the impact of Texas heat and the need to add building air conditioning to emergency generator systems. Building heating systems are now a major subject of conversation and planning. What was once a luxury for many, has become a necessity.

Last year, the increased demand for residential generator systems created by COVID outstripped the supply by several months, making it impossible to provide hundreds of paying customers with installed systems before this winter storm hit. Many of our EGSA member companies who manufacture emergency generator systems are working hard to shore up their supply chain and expand their manufacturing. This will take months, or even years to resolve. For Dealers who are on the front lines it would seem they are in a great position, and in many ways they are. But major supply limitations over time will translate into customer frustration that will push Dealers to their limits in terms of fulfilling their commitment to customer service. I believe EGSA member companies, working together, will meet the challenge. As EGSA members, we can provide one another insight and best practices to be successful. I remain quite optimistic and excited about the future of our industry and the future of our Association. EGSA members are at the forefront throughout North America to meet the need for standby generator power for life safety, business continuity and personal security applications. Our friends, neighbors and the entire country are all depending us.

Consider the valuable products and services provided by EGSA. Our programs are recognized as critical to the success of our members and for the industry at large. The years of work by our Government Relations Committee to explore a partnership with FEMA where EGSA members play a key role in disaster planning and disaster response, makes more sense with every emergency disaster event. Initiatives from our Education Committee, our Distributor/Dealer Committee and our Technical Oversight Committee to advance member education, training & certifications are programs designed to equip our members for success, programs vital to helping



Coasts have been dealing with increasing demand for some time because of their own weather disasters like Harvey and Sandy. Now it seems all of Texas is awake and millions are ready to invest in their own standby generator. Residential homeowners represent a large majority of interested new buyers. Businesses are also looking to increase their investment in backup power. From expanding their existing standby power systems or fuel systems for extended run time or both, many will make generators their top priority in their updated disaster plan. Another troubling consequence was in our nursing homes, where they found facility heating systems inoperable, creating an unexpected life safety emergency even with fully functioning, code compliant standby generators. We have

Continued on page 9



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- Mobile Generators

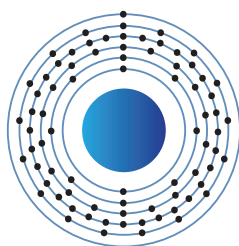


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FROM THE TOP

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our frontline workers today. And certainly, our industry will continue to experience evolving governmental policy in which our Codes & Standards Committee will play a key role to both have a positive influence and in providing membership awareness. Our Microgrids Committee along with our Market Trends Committee and our International Trade Committee remain at the forefront of industry innovations and trends, many of which are accelerating in both development and in market acceptance. The work of our Membership Committee, Conference Planning Committee and Marketing & Communications Committee will be instrumental to increasing national exposure of EGSA's value proposition to hundreds of industry professionals looking for guidance from power generator industry professionals like you.

In closing, I am reminded how much of the work of EGSA is accomplished by volunteer men and women like you... industry professionals who have been blessed working in this industry and who simply want to give back, to make a difference. We all owe a debt of gratitude to so many! For those of you who've

made the sacrifice, thank you! EGSA is indeed the leading industry Trade Association because of you! As we move into the future and experience record breaking growth in our industry, we will continue to depend on our volunteer members. And under the leadership of our new CEO, we'll see our quality programs and services developed faster, come to market quicker, and accelerate membership growth beyond our wildest dreams. With our first Conference just weeks away, it will be my honor to finally stand as your Chairman of the Board where so many great men and women have stood before. I will not be the best but I will do my best. And I remain committed to laying the ground work for and provide support to our incoming CEO. Yes, our future is as bright as ever!

I look forward to seeing many of you next month!

Kurt Summers
EGSA Board Chair

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Back to Business



Nathan Harris
EGSA Director
of Education
n.harris@EGSA.org

We're back in business... well, kind of. 2020 was a strange year for all of us and it is finally in the rear-view mirror. Last year EGSA was only able to host a handful of live schools: one On-Demand School, two George Rowley Basic Schools of On-Site Power, and two Load Bank Certification Schools. We were very lucky to squeeze this much in-person training into 2020. Now that restrictions are beginning to be lifted, we are returning to our normal slate of in-person schools. Safety will be at the forefront of all live events EGSA offers this year and we will also make adjustments based on any regulations and/or restrictions that are passed throughout the year. All of our schools will enforce social distancing requirements and we have adjusted the size of our meeting spaces to accommodate this requirement. Masks and individual hand sanitizers will also be provided to attendees at all of our schools this year.

To keep in theme with education, last year forced most of us into some real learning opportunities. A lot of administrative work was done remotely, sales calls were held virtually, technicians had less in-person contact with customers in the field, and there are countless other adjustments that were made. Now is the time to review all of those strategic pivots that were made in 2020 and see what adds real value for the industry moving forward. One of the initiatives that EGSA began last year was offering live webinar sessions from our George Rowley Basic and Advanced Schools of On-Site Power. During the live sessions, attendees have the opportunity to ask questions to the instructors in real time. Nothing can replace the feeling of being in the same room with your peers and sharing your experiences, but we hope these online sessions can provide an opportunity to attend training while many organizations continue to limit travel. One additional bright spot the live webinars have brought is that over half the attendees have been non-members. This means that more people are discovering what our association has to offer which can grow membership.

New Online Learning Preview

EGSA is also excited to announce that our new learning management system will be up and running soon. It will include new content and features that we hope will provide a better learning experience for students. Here is a closer look at some of the new features that will be offered:

Discussions: Each course will include a discussion board that will allow learners to post questions or discuss areas they may need additional information about. Subject matter experts (and even other learners) can post responses and share real-world experiences that may provide additional examples of problems and solutions.

Game Center: The game center will include questions and puzzles from the course and the scores will be posted for everyone to see. Learners will be able to rate their knowledge against others from across the industry. A leader board with high scores will be available for all to see.

Flashcards: Flashcards for each course will allow learners to review content at their own pace. These will provide definitions and key information from the course that will assist the learners in passing any quizzes included within the course. Flashcards also help with general retention of information on each topic.

Rate Your Confidence: Throughout each course learners will be able to rate their confidence level in different topics. This allows learners to track what they need to focus on. Learners will also have the ability to go back and review content they were not confident in and focus on those sections.

The ultimate goal is to provide a better learning experience for our current members and open the door to possible new members. We hope you all come visit the new site once it is up and if you have any further questions please reach out to me at n.harris@egsa.org. ■

New Interactive Study Plans

Set goals for yourself

Provide feedback about each course

See how you stack up against your peers

Track your strengths and weaknesses

Rate your confidence as you move through the course

Test your knowledge against students from other companies in the Game Center

Discussion Forum serves as a message board for sharing information

Flash Cards for retention exercises

Highlight information you want to focus on and bookmark your progress

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COVID-19 Vaccine Distribution Center Relies on Generac Industrial Power for Critical Backup Power

Challenge

Add a generator system to an existing building on a tight deadline to support refrigeration for COVID-19 vaccine.

Solution

Two Generac 1 MW Diesel Generators

Result

A redundant generator system that will provide the necessary power to vital refrigeration in case of a utility power failure.

Many drug companies have developed vaccines that could help combat the pandemic that has touched lives across the globe. Some of the vaccines require special refrigeration, and reliable and redundant power is imperative. If the facilities that are storing these vaccines were to be without power, every vial of the vaccine stored there, would no longer be viable, meaning people all over the United States would not have access to the potentially life-saving

vaccine. To ensure one facility would have power at all times, they enlisted the help of Generac Industrial Power.

“The facility needed to ensure power to the freezers would always be operational,” said Dan Barich, Vice President Global Operations, Generac Industrial Power. “They needed two 1 MW diesel generators to safeguard the system and they needed them quick.” Barich said the team expedited production to complete the project within two weeks. “Our team recognized the urgency and importance of this project and we were able to prioritize the order as all shifts at our Oshkosh manufacturing facility worked around-the-clock to get the units built, tested and out the door,” he said.

“Redundant power generation is simply more reliable than single engine generator solutions,” said Richard Lincoln, Senior Director Global Product Management, Generac Industrial Power. “With multiple generators on call, redundancy is built-in and reliability is increased because one generator backs up the other.”

Due to the high kW application, and the need for onsite fuel storage, it was imperative to utilize diesel-fueled generators. To provide the best possible diesel-fueled solutions, Generac specifies diesel engines proven in real-world applications under adverse conditions. They are designed for easy maintenance, extreme endurance and impurities in the fuel.

“The Oshkosh Team is incredibly proud to know the work we are doing is making such a profound impact on the fight against COVID-19. All our families have been impacted by the pandemic and this is a great opportunity to be part of a solution,” said Barich. “When we come together as a team like this, we can see what we are truly capable of when working together toward a common goal.”

The impacts of COVID-19 have been felt globally and the virus has left its mark on every citizen in one way or another. With some relying on this vaccine, it was imperative to work with a reliable partner.

“Generac has always taken pride in helping our communities during their darkest times,” said Wilde. “The year 2020 has thrown many challenges our way and it is difficult to understand the true impact this pandemic has had on every person. I am very proud of our team for designing, engineering and building the most reliable and durable product that is

up to the task of making sure a useable vaccine can be delivered. This project highlights what we stand for as a company and that our products really do make the world safer.” ■

“The COVID-19 vaccine is a matter of life and death and Generac Industrial Power is proud to be the trusted backup power provider for a critical vaccine distribution center.”



Application - Distribution Center
Models - 2 X 1 MW Diesel Generators



2021 EGSA Annual Spring Conference

EGSA Hits the Sunny Beaches of Naples, Florida!

The Conference App is Back and Better than Ever!

This is the year of touchless, and what better way to do that than with our conference app! The app provides easy access to speakers, sessions, exhibitors, sponsors, venue info, and more. We will also utilize the app to send out daily links to your morning health screening questionnaire, which will be required for entry.

Trade Show – Time to Bring Business Back!

Our EGSA trade show has been growing each conference, and this time will be no different. Grab your breakfast plate in the morning and see what our exhibitors have to offer. Keep an eye on your app notifications for sponsored giveaways throughout the event.

New in 2021: Microgrid Courses on Sunday

On Sunday, April 18, EGSA is offering three Microgrid classes taught by Brian Ponstein of MTU Onsite Energy. Each educational session will build on the information presented in the previous session to broaden your knowledge of this increasingly important topic in our industry. Each of these courses is one hour long and costs an additional \$25. Advance registration is highly recommended.

Microgrids 101 - Combining Multiple Power Sources for Maximum Efficiency and Uptime

Microgrids 201 - Integrating Renewables and Battery Storage into Your Power Solutions

Microgrids 301 - Tying Multiple Power Systems Together with Intelligent Controls



Brian Ponstein
Sr. Application Engineer, MTU America Inc.



Tom Drake
Sr. Sales Manager Gas Power Systems North America, MTU America Inc.

Monday, April 19, 2021

Keynote Speaker – Jason Schenker
Sponsored by Gillette Generators, Inc.



Jason Schenker prepares leaders for the future. He has written twenty books on technology, energy, finance, and economics. As the President of Prestige Economics, he has been ranked the #1 forecaster in the world by Bloomberg News in 25 different categories for his financial market forecast accuracy since 2011. He was also ranked one of the top 100 most influential financial advisors in the world by Investopedia in 2018. As Chairman of The Futurist Institute, Mr. Schenker trains analysts, consultants, executives, and national security professionals to become futurists and incorporate new and emerging technology risk into their strategic planning. Mr. Schenker advises private companies, public corporations, institutional investors, and the U.S. Department of Defense. He writes columns for Bloomberg Opinion, and he has done over 1,000 television interviews, including on CNBC, ABC, NBC, and the BBC. He has also been a frequent Guest Host on Bloomberg Television.

In his presentation titled, “**The Economic and Financial Future After COVID-19**”, Jason focuses on the economic, financial, and business impacts of the COVID-19 pandemic. The discussion includes forecasts for the economy, recession risks, and financial markets, as well as the outlooks for fiscal policy, Fed monetary policy, commodity markets, domestic manufacturing, global trade, real estate, employment and jobs, energy, finance and FinTech, food and agriculture, healthcare, national security, international relations, and travel. Topics in this talk come from Jason Schenker’s recent book “**The Future After COVID: Futurist Expectations for Changes, Challenges, and Opportunities After the COVID-19 Pandemic.**”

Distributor/Dealer Committee Meeting

In this Spring’s meeting, the DD Committee will discuss the evolving TOYA for 2021, including the nomination process, and proposed revision to the scoring process. They will also be going over NFPA 110 / NEC 2020 updates for 2022, which covers acceptance of fuel cells, changes to fuel maintenance, and more.

Tuesday, April 20, 2021

Microgrid Renewables & CHP Committee Meeting

“Microgrid Design for Efficiency and Resiliency”

Combined Heat and Power (CHP) systems are becoming an important part of the energy mix as the drive to create resilient, efficient and low-carbon solutions increases. CHP systems can economically help cities, states and businesses reach zero carbon energy goals by 2050 using varying strategies to achieve decarbonization and maintain resilience.

At this session we will identify the components of a microgrid, a review of the conditions in the current market that are driving the installation of microgrids in the commercial and industrial sectors, tools available for modeling the operation and ROI of microgrids and overview of site conditions that need to be understood when undertaking the installation of a microgrid.

Microgrid Case Studies from Industry Experts



Bill Becker

Renewable Energy
Sales Manager, ComAp
Controls



David Stringer

Sr. Business Development
Manager, DEIF, Inc.



Brian Ponstein

Sr. Application Engineer,
MTU America Inc.

Networking Activities

Raptor Bay Golf Tournament

Experience nature's beauty on this spectacular 18-hole Raymond Floyd – designed championship course. Transportation is included in this tour and a boxed lunch will be waiting for you on your carts.



Fishing Tournament

Inshore Backcountry Fishing for snook, tarpon, redfish and more! As always, we will be naming specific fish to catch for a prize! Transportation is included in this tour and a boxed lunch will be waiting for you on the bus.

Dine-Around Naples Beach Resort

Stay safe within the walls of the resort as we create an experience similar to Epcot's "Food Around the World!" Several different food stations will be paired with specialty beverages as you make your way around from station to station. This event is 50% indoors, 50% outdoors, so please dress accordingly. ■

2021 EGSA Spring Conference: On-Site COVID-19 Protocols

At EGSA, the health and safety of our members and conference attendees is our number one priority. We also understand that we have to get back to face-to-face meetings so you can continue to grow your business and network. That's why we are taking the necessary precautions to create the safest environment we can as we bring back our first meeting in more than a year.

Here are some of the protocols we will enforce in order to protect you.

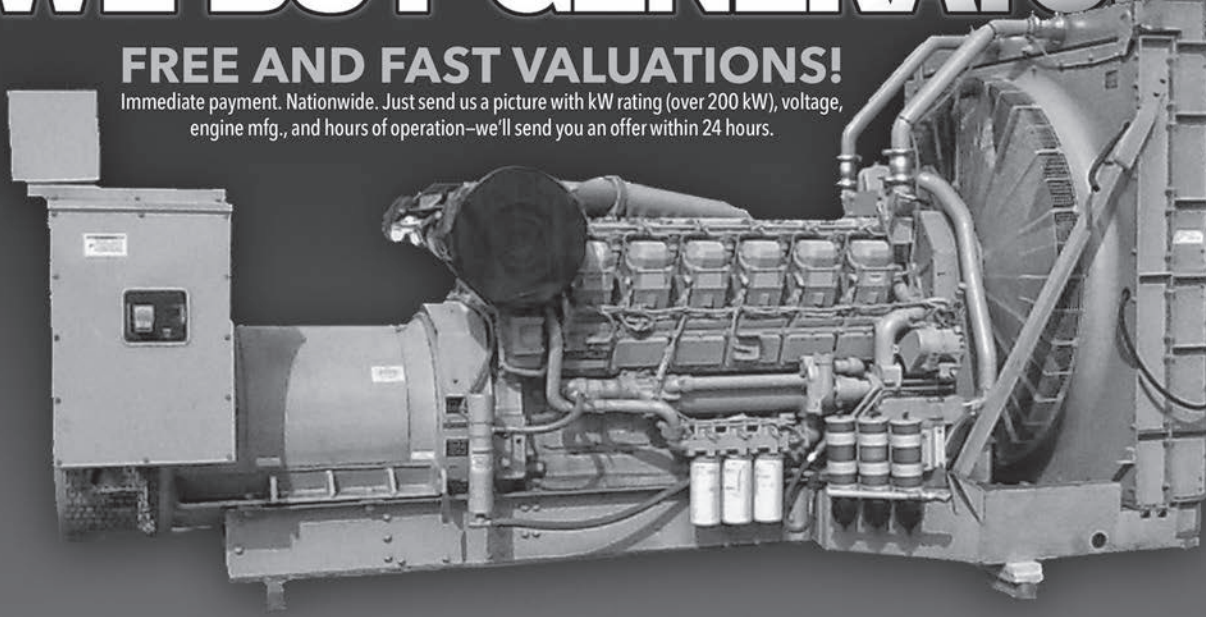
All protocols MUST be followed whether vaccinated or not:

1. ALL attendees (including guests/spouses) are required to wear a medical mask at all times, except when eating and drinking. EGSA will be providing medical grade masks at registration.
2. Each morning, attendees will scan a QR code and fill out a health screening questionnaire from their phone. If the questions are answered correctly and there is no concern for COVID exposure, a green checkmark will pop-up on their screens. They can then bring their phone to staff at an entry point, who will take their temperature and give them a wristband for the day. Anyone with a temperature over 100.4 will not be permitted into the event. This applies to EGSA staff as well.
3. Social distancing protocols will be strictly enforced. Rooms will be set for one person per 6' table, or four to five people per round table.
4. EGSA Staff will utilize an event app that all attendees will have access to prior to the meeting. Attendees can message staff anytime, and staff can send out push notifications throughout the event.
5. There will be a Pandemic Compliance Advisor (PCA) on-site for the duration of the event.
6. There will be a COVID-19 Compliance Officer (C19CO) on-site for the duration on the event.
7. We will go 100% paperless. All information will be entered into the event app.
8. All food and beverage will either be individually wrapped and/or handed to you by an attendant behind a sneeze-guard.
9. Receptions will be seated instead of open to mingle, and attendees will be called to the food line by table number.
10. Hand Sanitizer machines will be outside of every elevator bank on each floor, as well as throughout the meeting space.
11. Outdoor event space will be utilized as much as possible – weather permitting.
12. We are working with local authorities to follow procedures if someone gets sick.
13. Due to the CDC guidelines and protocols, we have capped the event at 200 people.

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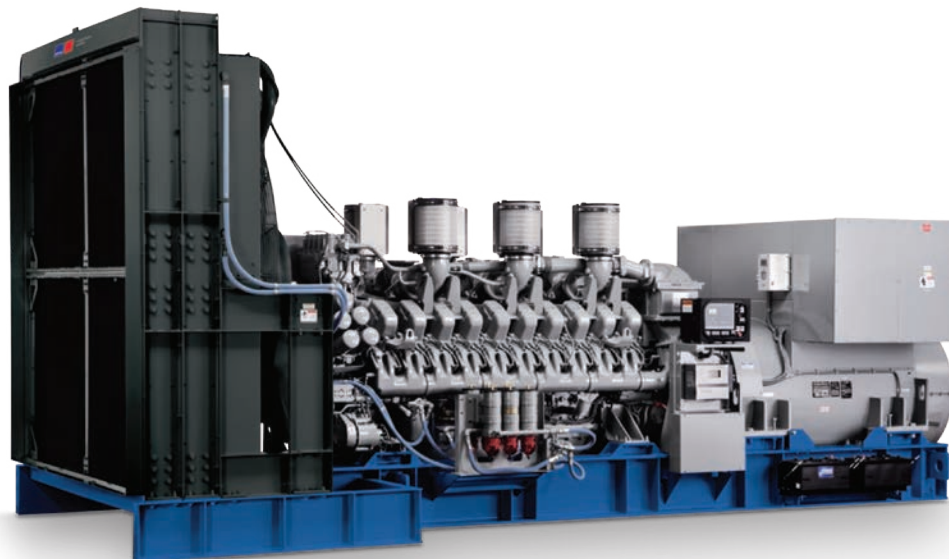
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Stack Testing Best Practices to Ensure Accurate Results

By: Brian Ponstein, Senior Application Engineer, MTU Onsite Energy, a Rolls-Royce Company

There are several different test methods that may be performed to measure the engine's exhaust gas emissions. Every method has its advantages and disadvantages. However, different methods can lead to different results for the same pollutant being measured. On the following pages, the stack testing process is analyzed in regards to the procedures required and the factors to be considered from the engine side. In addition, a guideline is provided to help ensure that the results of a stack test are valid and not impacted by either engine malfunctions or errors in the testing process.

Abstract

Throughout the world, emission legislations are becoming more common. To meet the more stringent emission standards for diesel engines, many different exhaust gas optimization methods are being utilized. Although we already have a lot of these regulations worldwide, we see an increasing number of so-called "local air boards" that have additional requirements regarding emissions or immissions. These requirements differ on the one side at the limits for certain emissions, on the other side which kind of emissions are taken into account.

Diesel genset owners/operators are often required to provide exhaust gas emissions information to the local permitting authorities regarding their diesel engines. For MTU diesel engines from Rolls-Royce, this information is made available by the "Emission Data Sheets."

Figure 1: Schema of test equipment acc. EPA Method 5 & 202 (based on <https://www.epa.gov/sites/production/files/2016-06/documents/m-05.pdf>)

Many times the local permitting authority is looking to verify that engine emissions match the reported emission values provided by the manufacturer. Otherwise, the wanted effect against air pollution may not take place. Local air boards are requiring

various testing methods to verify engine emissions. In the USA and many other countries stack testing of an in-use engine is the preferred method to validate the manufacturer's statements.

Stack testing is most commonly performed by placing probes in the stack following an approved and defined procedure, e.g., EPA Reference Test Method 5 or 202 for particulate (PM) measurement. The EPA Reference Test Methods define everything from the position of the probe within the stack to the Quality Assurance Quality Control (QAQC) methods to be utilized.

There are several different test methods that may be performed to measure the engine's exhaust gas emissions. Every method has its advantages and disadvantages, however different methods can lead to different results for the same pollutant being measured. This variability may be the result of:

- The method in which the emissions are measured. For example, particle emissions can be of different sizes. Some test methods measure almost all particles, some measure only particles of a specific size and greater, and some measure only dry particles. Rolls-Royce's experience and testing has determined that in the field exhaust gas emissions measurements of particulate matter following EPA Method 202 are generally not comparable with the measurement results obtained from emissions measurement equipment as described in 40 CFR part 1065.
- Reliability and repeatability of the test method. In field tests, equipment can be hard to handle, and small mistakes can lead to a large deviation in the results. Other methods were not designed to measure the low level of emissions from today's cleaner engines.

In an effort to assist the customer in dealing with these difficulties, this white paper will provide:

- An overview of the procedures required for stack testing,
- A definition of the factors to be considered from the engine side,



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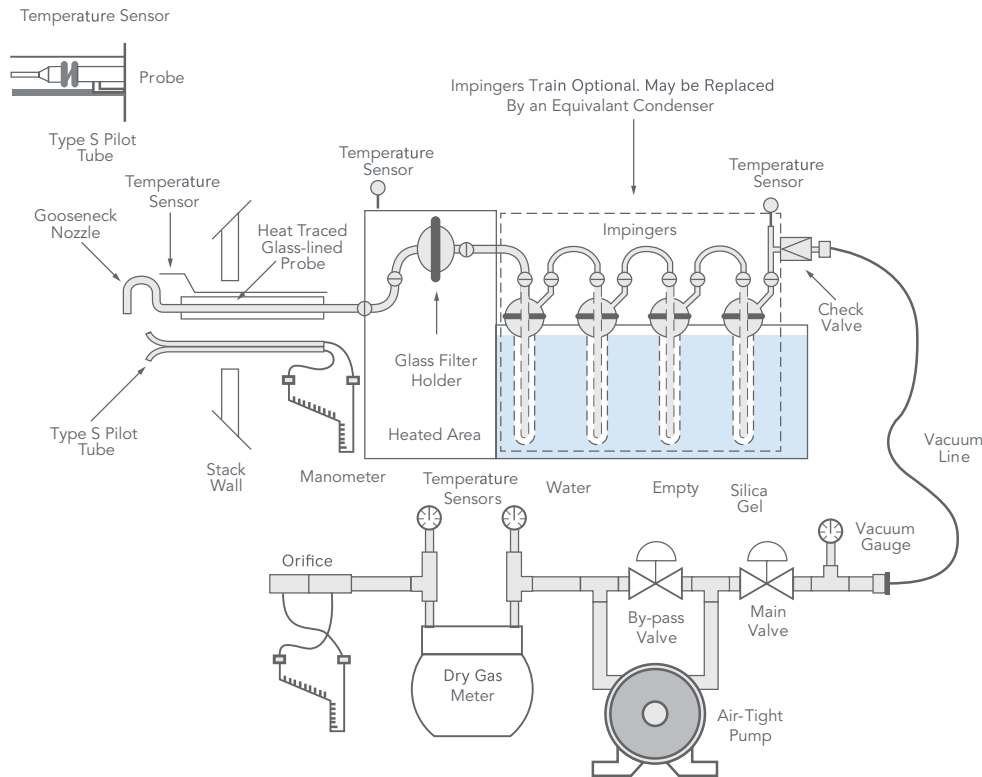


Figure 1: Schema of test equipment acc. EPA Method 5 & 202
(based on <https://www.epa.gov/sites/production/files/2016-06/documents/m-05.pdf>)

- A guideline to ensure the results of a stack test are valid and not impacted by either engine malfunctions or errors in the testing process.

If you have any further questions or suggestions, please feel free to contact your local sales engineer.

Requirements Regarding Test Equipment

Most stack tests for particulate matter in the United States are done according to EPA Methods 5 and 202. The test equipment must be suitable for these methods to produce valid results.

Before scheduling a stack test, clarify all testing requirements and test methods e.g. particle emissions. This information is important for determining the proper test equipment for the required test methods and estimated emission concentrations is utilized. Avoid using equipment with minimum or maximum measurement ranges near the expected emission range for the compound being tested. For example, if stack test equipment can be used to measure particle emissions between 2000 g/h and 100 g/h, ensure the tolerances are low throughout the entire test range. A tolerance of ± 10 g/h has little influence at 1200 g/h, however diesel engine particle emissions may be as low as 110 g/h. At this concentration a ± 10 g/h tolerance results in a 10% margin of error.

Stack Test Preparation

Design factors

A well-designed stack test ensures reliable results. Testing should be designed to minimize the amount of time the genset is out of service. To achieve this goal, please consider the following items prior to testing:

- **Equipment:** Can it be brought safely on site? Is lifting equip-

ment required to get equipment and testing personnel near the stack? It is recommended that the genset be run under load in the weeks prior to testing to ensure everything is in working order when the testing team arrives.

- **Engine Load Requirements:** Can the required load be applied to the genset? Is a load bank needed? A constant and stable load is required for a successful stack test. Often, this can't be realized by electric consumers installed on site.
- **Timeline:** A stack test is very time consuming, 6-7 hours per engine is not unusual.
- **Effects on surrounding areas:** Some authorities prohibit the usage of gensets at certain times (nights, periods of poor air quality, etc.).
- **Fuel quality and quantity:** Take into account that the engine will run for several hours at full load. Fuel consumption for the duration of testing should be calculated with an appropriate buffer to ensure an adequate fuel supply will be available for testing. Also, ensure the fuel is of a sufficient quality. Aging fuel may be a problem and can lead to clogging of fuel filters. A fuel sample should be taken for analysis purposes.
- **Costs:** Certainly cost is a factor in selecting the stack testing company. It is not recommended to sacrifice the quality of the equipment or experience of the testing personnel in favor of lower cost. In many cases the fuel costs account for a significant portion of the overall testing cost. An experienced testing team with well-maintained equipment will minimize the chance that a test will require repeating. Additionally, an experienced testing team may have a better understanding of test methods that ensure a fast and accurate stack test is completed.

BEST PRACTICES

Required Information

In preparation of the stack test, it is useful to have the following information on hand:

- **Test method:** What test methods are mandated by the authority?
- **Stack diameter and height:** This is important information for the testing company and will ensure that they have the proper equipment and probes when they arrive. Additionally, the stack test company will need to know the location and size of all available test ports.
- **Engine serial number:** If any questions arise during the stack test this is helpful information when you need to get in contact with After Sales/Application.
- **Maximum applicable load:** Please consider that most gensets are unable to operate the engine at 100% mechanical power due to limited generator power. This is also important to understand when comparing the test results with the emission data sheets.

Equipment

The testing company will bring the required test equipment. Additional equipment may be required to measure other parameters (fuel flow meters). A list of all equipment used during the test should be generated and should include any relevant calibration or service dates for each piece of equipment. Ensure to provide access to power for the test equipment. The power requirements of the equipment should be discussed prior to the test crew arriving.

Please note that in some cases the ECU (Engine Control Unit) offers calculated values only, e.g., fuel consumption. For this reason, follow these recommendations:

- The usage of a calibrated fuel flow meter.
- Recalculation of engine power from electrical power output.
- Recording of the exhaust gas temperature on the same point where the emission sample is collected.

Stabilization Run

During low load operation, oil, unburned fuel etc. accumulates in the exhaust pipes. To minimize the influence of this material on the test results, it is important to ensure this material is removed from the stack prior to beginning any testing.

A stabilization run is recommended to ensure the stacks are clean. A stabilization run consists of two hours of continuous operation at maximum load. The stabilization run will ensure the oil/unburned fuel gets burned prior to testing. Ideally the stack test will begin immediately following the stabilization run so there is no need to reduce load or shut the engine down.

Performing the Stack Test

Ambient Conditions

The ambient conditions at the time of testing have a significant influence on the result. Standard ambient conditions are the basis for the engine to fulfill the not-to-exceed values of the data sheet.

Important conditions to record include:

- **Air pressure, temperature and humidity:** These parameters must be recorded near the air intake of the engine. Many times a testing company records from the internet a

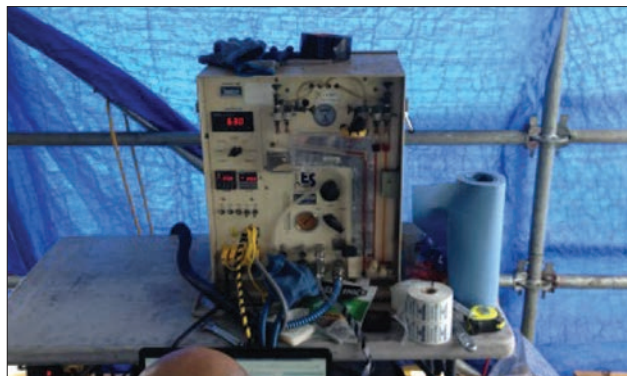


Figure 2: Typical Equipment for Stack tests acc. EPA Method 5 & 202

one time reading obtained from a nearby weather station. These values are not sufficient. It is important to obtain real measurements on site during the testing. During a stable weather situation, these parameters should be measured on site at least every 30 minutes, starting at the beginning of testing. If weather conditions are changing rapidly, the ambient conditions should be recorded more frequently.

- **Altitude:** Altitude also has an influence on the emissions and must be accounted for when evaluating the test results.
- **Air intake depression/exhaust gas back pressure:** These two parameters influence the power output of the engine. If the engine loses power due to these factors, use the values on the emission data sheet according to the absolute power output and not the percentage value.
- **Air mass ratio “Q” from the ECU as an indicator of lack of oxygen:** Air mass ratio should be recorded with DiaSys. A list of other recommended parameters to be recorded during the test is provided in Appendix B.

Fuels and Lubricants

The fuels and lubricants used will also have an influence on the results of the stack test. Refer to the emission data sheet for the type of fuel used during factory emission testing (e.g. fuel according to EN590 or US EPA 40CFR89 & coolant and lubricant according to specification).

The fuels and lubricants used must meet the requirements of the Fuels and Lubricants Specifications. If there is any uncertainty about the quality and specifications of the fuel and lubricants used during testing, a sample of the fuel and engine lubricant should be collected and analyzed.

Engine Operation

Emission values improve with time as the engine nears steady-state conditions. Emission values provided on the emission data sheet were collected with the engine at steady-state conditions.

If engine loads are adjusted during the stack test, the engine should be allowed to run a minimum of 10 minutes at the new load point to reach steady-state conditions prior to starting emission testing.

If the engine has been subjected to a higher number of cold starts it should be run for at least 30 minutes to reach steady state conditions.

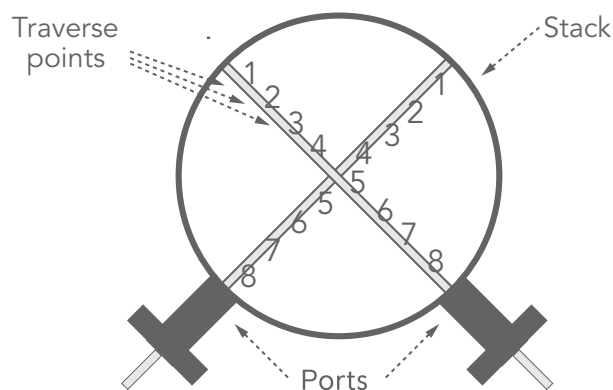


Figure 3: Example of traverse points in Stack <24 in.

Performing the Test

The stack testing company should have a solid knowledge of the test methods and testing equipment, however from time to time mistakes are made. The following points are the most significant deviations observed in the field and are meant to help someone not familiar with stack testing have a general idea of what to look for. There may be exceptions to items listed below. Identify and document any deviations from the test plan and always discuss this with the person performing the stack test, if something looks different than mentioned below.

Sampling and velocity measurements must be performed at a site at least eight stack diameters downstream and two stack diameters upstream from any flow disturbance (e.g. elbows).

The number of traverse points is dependent on the stack diameter. For circular stacks:

- 12 points for a stack diameter greater than 0.61 meters/24 in.
- 8 points for a stack diameter between 0.30 and 0.61 meters/12 and 24 in.

The total testing time/time per port depends on many factors, e.g., stack diameter, exhaust gas flow, expected quantity of particulate and condensable. The longer the test, the more reliable the results, but also the greater the time and expense. Discuss testing time with the stack test company prior to testing. EPA mandates a minimum time of 1 hour per run and 30 minutes per port.



Figure 4: Probe aligned in stack

The sampling time per traverse point should always be the same. For example, for a one hour test on a stack with diameter of 0.45 meters/18 in., a sample time of 3:45 min. per traverse point is required: eight traverse points required for test; each stack has two ports; one hour test; 30 minutes per port; 3:45 per traverse position.

It is important that the position of the probe meets the regulatory requirements. Different stack test companies use different methods to ensure the right position. Document how the stack test company ensures that the probe is at the right position for the right time.

The pitot tube should be aligned perpendicular in the exhaust flow. Document how the stack test company ensures that the pitot tube is correctly aligned, e.g., by a water-level.

The sample probe for collecting carbon dioxide and the oxygen samples must be placed in centroid of the stack. The probe for determining particulate should be placed in the ports according to the stack traverse points. The port not in use must remain closed and the port in use for the probe should be sealed as much as feasible to prevent introducing fresh air into the exhaust stream. The probe must not make contact with any portion of the stack at any time. Also make sure the probe is not bumped while inside the stack. The ports must be cleaned prior to testing to remove any soot or other contaminants.

The EPA recommends a pre-test leak check of the particulate probe assembly. The post-test leak check is mandatory following each sampling run and must be done according to EPA method.

The filters should be removed from the filter-impinger in a clean area protected from wind to prevent contamination of the filter from airborne particles.

After each run, the probe must be cleaned with acetone and a nylon brush. This must be done until the acetone comes out clean.

Checking the Test Results

The results of each test should be checked regardless if the test passed or failed. When the engine runs without problems and the recorded Diasys values imply no instability, you should have the values and results of the stack test. It should not fluctuate by more than around five percent. Large fluctuations in the data could indicate improper equipment handling.

A checklist is provided in Appendix A to help determine if all steps and processes have been completed.

For Testing:

- How are the particle filters conditioned and weighted (before and after sampling)?
- Filters and equipment need to fit to each other otherwise leakage can occur
- Filters need to be installed flat and not wavy
- How are the filters handled (in separate containers, which are in an extra box to prevent moisture from the air)?
- Where is the connection of the PM measurement device in the exhaust pipe?
- Design of the exhaust pipe before measurement point (e.g. after elbow is not good)
- Measurement points always same distance from engine and last bend in exhaust line
- Measurement in laminar flow (measurement position)
- Use same nozzle for all measurements

BEST PRACTICES

- Fixed probe positions across stack diameter
- Probe in line with flow
- Measure exhaust gas mass for each measurement
- Fixed duration of measurement
- Maintain boundary conditions
- Exhaust gas from nearby engines might influence results

Hints to Check Results

- Are the results, e.g. particle emission, steady during the test?
- Are the results reproducible?
- Are the protocols completed?
- Was a fuel used according to fuels and lubricants specification?
- Are the boundary conditions (weather etc.) listed in the report?

Conclusion

The results of a stack test depend on many influences and factors. Therefore, it is very important to perform the test as carefully and precisely as possible. If you encounter unforeseen problems, please feel free to contact your local sales engineer.

Appendix A:

Checklists

| Preparation | Yes | No |
|---|-----|----|
| Stack diameter known by stack test performing company | | |
| Position for stack test is performed at a site at least eight stack diameters downstream and two stack diameters upstream from any flow disturbance | | |
| Stabilization run needed | | |
| Fuel and engine oil is according to specifications | | |
| Particle limit corresponding to mechanical power, not electrical power | | |
| Wind-shielded and clean area nearby available for replacing and sealing the filters | | |
| Lighting is available if the stack test takes longer than planned | | |
| Ports are mounted at the recommended position and are accessible | | |
| Your HS&E department is informed about the stack test | | |
| All persons needed on site have access to this area, including instructions | | |
| Measuring time per port is discussed and agreed | | |
| Are the particle filters conditioned and weighted before sampling? | | |

| Stack Run Test | Yes | No |
|--|-----|----|
| Stabilization run done on the engine | | |
| Ports/stack are clean of soot etc. | | |
| Time per port/test run is according to the agreement | | |
| Filters fit in the test equipment | | |
| Leakage tests are done and fulfilled at least after each run | | |
| Filters are taken in or out of the measurement equipment in a clean and wind-shielded area | | |
| Filters are handled correctly in separate containers, which are in an extra box to prevent moisture from the air | | |
| Same nozzle diameter is used for all tests | | |
| Probe is perpendicular to the exhaust gas flow | | |
| Exhaust gas from nearby engines doesn't influence the test | | |
| Positioning of the probe is comprehensible | | |
| Ambient conditions are recorded several times during the stack test | | |
| Notes are taken in a professional way, e.g., lists or in a notebook | | |
| Unused port is closed, airflow through open port is minimized | | |
| Probe is handled with care, nozzle is not dragged through port etc. | | |
| Probe is cleaned correctly with acetone and a nylon brush, acetone comes out clean after last flush | | |
| Connection points in the test equipment are not open during the test unless needed. In this case, they are cleaned before reconnecting | | |

| After Stack Test | Yes | No |
|---|-----|----|
| Are the results of the single test runs comparable to each other? | | |
| Are the boundary and ambient conditions considered in the results? | | |
| Is the test method, date, etc. mentioned on the report? | | |
| When the stack test failed, are the possible causes on engine side (see appendix C) checked? | | |
| Are the results from test run to test run stable? E.g. fluctuating residual oxygen is an indicator for leakages in the equipment. | | |
| Also, particle emissions varying from run to run are untypical and may be a sign of too short test run time. | | |
| Was the fuel according to specifications? | | |
| Are the protocols complete? | | |

Appendix B:**Engine Parameters for Recording**

1_0100_001_P_Lube_Oil_after_Filter
 1_0101_001_P_Coolant_
 1_0102_001_P_Fuel_
 1_0103_001_P_Charge_Air
 1_0104_001_P_HD_Common_Rail_
 1_0106_001_P_CrankCase
 1_0109_001_P_Lube_Oil_before_Filter
 1_0120_001_T_Coolant
 1_0121_001_T_Charge_Air
 1_0122_001_T_Fuel
 1_0124_001_T_Coolant_InterCooler
 1_0125_001_T_Lube_Oil
 1_1020_506_BOI_Main_Injection
 1_1020_601_Main_Fuel_Mass_per_Cycle
 1_1075_042_Max_Torque_LDA
 1_1075_046_Max_Torque_DBR_corrected_
 1_1075_052_Torque_Limit_Corr___Q_Air_
 1_1075_056_Max___Torque_MCR_corrected_
 1_1075_061_Charge_Air_Mass
 1_1075_065_Torque_Limitation_Code
 1_1100_503_BOI_Norm
 1_1100_504_BOI_Hot_Engine
 1_1100_505_BOI_Cold_Engine
 1_1100_506_Norm_Air_Mass
 1_1300_100_P_Railfuel_Demand__Map_
 1_2500_044_Engine_Speed_ECU_
 1_8009_002_ECU_Operating_Hours
 1_8009_003_ECU_Operating_Minutes
 2_1000_048_Maximum_Requested_Torque
 2_1000_049_Requested_Torque
 2_8009_015_Fail_Code

These parameters are good to be collected additionally:

1_0108_001_P_Ambient_Air
 1_1005_012_Engine_Power
 1_1020_554_Injector_Drift_PW_Correction
 1_1075_041_Max___Torque_DBR_at_Rated_Power
 1_1075_054_Max___Torque_MCR_at_Rated_Power
 1_1100_512_AirMassRatio_Trans___Norm_filt
 1_1100_515_Injector_Drift_BOI_Correction
 1_1100_516_Steady_State_BOI_Correction
 1_1100_517_Delta_BOI_Correction
 1_1300_105_Number_of_active_Cylinders

Appendix C:**Possible Engine Malfunctions that Could Effect Particulate Emissions****Wrong injection timing and/or rail pressure**

- Broken, blocked or worn out nozzle
- Malfunction of high pressure pump and/or pressure valve
- Blocked fuel filters
- Low battery voltage
- Wrong high pressure sensor

Air-related issues

- Blocked air filters
- Turbo charger malfunction
- Malfunction of charge air cooler might lead to high charge air temperature
- Loss of charge air pressure
- Blocked silencer
- Air leakages at engine (e.g. charge air pipes)
- Blocked air pipes

Crank case ventilation system

Crank case ventilation system without filter elements (oil before turbocharger, low crank case pressure)

Additional possible causes

- Wrong valve adjustment
- Leaking gasket at cylinder head

Appendix D:**Terms and Definitions**

DiaSys: An MTU specific tool to record various engine parameters during operation and to communicate and change engine parameters on the ECU.

ECU: Engine Control Unit

Port: An opening in the stack that should easily be closed if not needed, even when the engine runs. It must be closed during the stack test when not needed.

Probe: The probe for particle measurement consists of the pitot probe and a hook probe for collecting the exhaust gas.

Stack Test: An exhaust gas measurement performed directly at the stack / exhaust pipe. This is an in-use test method for particles, NOx etc. Two ports are required, attached to the stack in a 90° angle, in which the probe is put into. A second probe is stacked into the port through an additional hole. A stack test usually takes three test runs, the results are averaged.

Test run: A test run consists of two measurements, one per port. A test run takes at least one hour according EPA regulatory.

**About the Author**

Brian Ponstein is a Senior Application Engineer, MTU Onsite Energy, a Rolls-Royce Company. At MTU, Mr. Ponstein is responsible for analyzing market needs and requirements in North America and working with engineering to provide solutions for MTU Onsite Energy's customers.

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Meet Your EGSA Director

Brian VenHorst

In each of the upcoming issues we will be sharing information on some of the volunteers who donate their time for the betterment of the Electrical Generating Systems Association and the industry as a whole. Without their hard work and dedication to EGSA, much of the efforts and directives simply wouldn't be possible.



EGSA Director - Brian VenHorst - Term 2019-2021

Brian has been the National Accounts Executive for Tramont for more than nine years. It is an outside sales/business development role and his territory is North America (world). Brian's focus is managing Tramont's business relationships with all OEMs, their distributors/dealers and specifying engineers. From CEOs to the technicians in the field, he gets to know them on both a professional and personal basis. He also assists specifying engineers from across the country with best practice guidance on jobsite design considerations for different fuel system projects and offers CEU classes as well. Prior to this Brian worked in the electrical distribution world.

How/Why did you first become involved in EGSA?

Tramont was already a member when I joined, and I am the company representative at these types of industry conferences and trade shows.

What leadership positions have you held within EGSA?

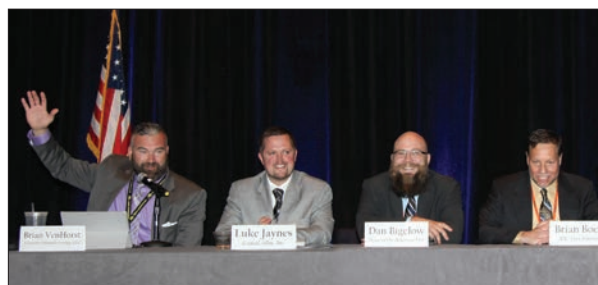
Conference Planning Committee – Secretary
 Membership Committee - Liaison
 BOD (2019-present)
 Co-Captain of the most stylish golf team at EGSA

What do you like to do in your free time?

Spend time with my family and friends, travel, golf, Brazilian Jiu Jitsu (BJJ), spend time outdoors, hunt, fish, watch MMA fights and other sports.

What is one thing most EGSA Members probably do not know about you?

I was the ordained minister for a customer's wedding in Mexico. ■



Top: Brian as the Co-Captain of the self-proclaimed "Most stylish golf team at EGSA."

Middle: Participating as a member of the Diesel Fuel Maintenance Panel at the 2015 Fall Conference in Denver, CO.

Bottom Left: With fellow EGSA Member, Jacob Petty, at the 2018 Spring Conference in Albuquerque, NM.

Bottom Right: With 2013 EGSA President, Deb Laurents at the 2018 Fall Conference in Nashville, TN.



Meet the 2020 Technician of The Year Award (TOYA) Winner, Matthew Erickson

In the seventh year of the TOYA, it was a year like no other due to the COVID-19 Pandemic that gripped our nation and the world. In the absence of the EGSA Fall Conference, that was cancelled due to the pandemic, the TOYA award was instead presented at a small lunch gathering in Houston, TX on December 4th, 2020. Matthew was presented his award by EGSA President and Chairman of the Board, Kurt Summers. A video of the award presentation can be found on the EGSA's YouTube channel at <https://youtu.be/7mgzTFZ2akM>. Our 2020 TOYA winner will be attending the 2021 EGSA Spring Conference in Naples, FL on April 18th through 20th. If you are in attendance we encourage you to seek out our winner to offer your congratulations to him for being recognized as the best in his field.

Matthew Erickson is an accomplished Field Engineer for PowerSecure Service. He is a graduate of the Naval Nuclear Power Training Command where he learned his rock-solid base of electrical knowledge. Matthew has been working in the field of Power Generation for over seventeen years working on everything from small home use generators to large stream turbine generators. The best part of his job is being challenged and learning new things. PowerSecure is a leader in Microgrid technology and being a part of this company has allowed for Matthew to be continuously exposed to new applications and schemes. Matthew is blessed to be the husband of a remarkable woman named Kristin and the proud father of six children.

We hope you enjoy our interview with Matthew about his life and career as a generator technician.

How did you come to be a generator technician?

My journey began when I joined the Navy as a Nuclear Electrician's Mate where I was stationed on the USS Ohio SSGN 726. After the Navy I was hired as Industrial Technical Support Representative for a major generator manufacturer. From there I was a Service Advisor for one of the Distributors for the same manufacturer. I made my way to Texas where I now work for PowerSecure.

Is there any issue you encounter that could be prevented with additional training for either the installing contractor or the end user?

Indeed. I have often seen a misunderstanding of the use of the neutral, proper bonding, and grounding. I have seen ATS wired with the utility and the load swapped, no neutrals, floating neutrals, and wiring the stinger leg incorrectly on a three phase Delta system. All could have been prevented with attention to detail and a better understanding of the system.

What job stands out as the one that is your proudest moment as a power generation professional? And, why?

The day I became fully qualified as a Nuclear Electrician's Mate was one of the proudest moments in my career. Years of studying and testing to finally prove that I was a qualified professional. This is also why I wanted to become an EGSA Journeyman technician - because it is proof of my accomplishment.

Do you have any advice for someone reading this that thinks they may want to pursue on-site power generation as a career? Where should they start?

A career in onsite power generation is physically and mentally challenging. It is also very dangerous to those who do not respect electricity or disregard safety. However, I think it's a great career field to be in. The different situations you find yourself in can be challenging but exciting at the same time. The other day I had to read through PLC logics and controller programming to learn how a system works so that I could properly troubleshoot it. I enjoy days like that.

What do you think would be the best way to introduce and attract "Millennials" to the lucrative onsite power generation industry?

I, being at the beginning of the "Millennial" generation, have found that a major issue is trying to convince people you can make a good living turning wrenches without a college degree. So many in my generation think you must have a college education to make a good living and ones I know do not want to

work hard either. I find physical labor rewarding and the mental challenges I have faced in my career have been rewarding. Troubleshooting an engine failure in the morning to PLC issues on switchgear in the evening makes for challenging days that are never the same. Many experienced workers in my line of work clear six figures a year - most without a college degree.

What do you think is the biggest challenge facing our industry today?

An aging infrastructure and constant regulations continue to force our industry to change and advance. I see this as an exciting challenge. As stewards of the Earth, I feel we should strive to reduce emissions regardless of one's view of climate change. I am a huge proponent of the tier 4 engines PowerSecure uses for our microgrids. We are meeting the power demands while reducing emissions.

Looking back, would you do it all again? Why or why not?

Absolutely. This line of work has provided me with everyday challenges and an ability to learn daily while making a good living.

What is the one thing that motivates you every day about your job?

Every day brings different challenges and that keeps the job exciting.

How do you balance your family life with your career?

This is a constant challenge. I'm always asked when I'll be home and in this field one can never be certain. A basic day can be turned upside down with just one service call. My wife is amazing and with her support we are able to maintain our family of six children on our farm. This line of work has provided us with a good lifestyle and I always try my best to make sure to not work too much. In the latest winter storms here in Texas, while others are stuck at home, me and other field engineers were out every day working 15+ hours. This weighs heavily on my family, but they know I'm out working to help others.

What has been the biggest advancement in generator set and ATS technology that has improved generator performance and reliability, since you first entered the industry?

Microgrid technology and applications with the tier 4 engines have made a huge impact on our industry. I am proud to be part of a company who excels in Microgrid technology.

What made you decide to become an EGSA Certified Journeyman Technician?

I worked my way to the lead generator tech of the company I worked at and desired more. Being lead tech didn't really prove what qualifications I had or knowledge level. I wanted a nationally recognized certification to prove myself. I took it upon myself to study and take the test on my own time. I passed the first time taking the test and was proud to have a certification to support my resume.

Did you have to travel far to take the test?

Not at all. A local community college was a testing site.

Did you do much studying prior to taking the Journeyman test?

I did. I studied my electrical theories and laws. I read up on books and manuals prior to taking the test.

Was the Journeyman test more difficult than you expected?

It was challenging but the studying I did paid off.



What are the benefits of being an EGSA Certified Journeyman Technician?

In my career I have worked with individuals with an impressive resume who did not achieve the level expected from said resume. With the EGSA certification it proves to employers and customers that the individual understands onsite power generation and has proven it.

What would you say to other Technicians out there that are not EGSA certified?

I strongly recommend getting certified. It not only helps the individual but also our industry. I would like to see every technician in our field have either the Apprentice or Journeyman certifications.

Do your customers know you are an EGSA Certified Technician, and therefore part of an elite group?

Once I received notice that I passed the test I immediately added it my email signature. My current salesman for my region is using my certification and even my winning of the TOYA to convey our commitment to our industry. ■



ComAp

comap-control.com

Founded in 1991 in Prague, Czech Republic, ComAp designs and manufactures control products for Standby/Prime Power, Rental, Microgrid, Switchgear, CHP, Renewable, and Dual Fuel Markets along with associated accessories and software. ComAp is leading the way in providing intelligent electronic control products and solutions that are highly flexible, intuitive, and scalable.

ComAp continues to invest in a Global Specialist Network which enables them to maintain excellence in customer service, empowering their people and partners to deliver the highest standards of technical expertise, and local support to our customers across the world.

ComAp

Another in Our Series of Powerline Company Profiles

ComAp's main office in Holešovice, Czech Republic

Since its inception as a company, ComAp has realized that the closer they are to the customer, the better they can support, understand, and deliver the results their customers need. ComAp's founders understood this idea. To capture the North American market they knew that the company would need to be closer than ever to the large OEM's and packagers. As a result, ComAp established its first subsidiary in North America in 2007. ComAp has invested heavily in North America. That investment has paid off significantly. In 2018, after seeing the result of investing in local assets, the company took the next steps by investing in local resources to support Canada as well. Additionally, they are now committed to getting even more local by developing a Channel Partner Network across the United States and Canada. Because ComAp is recognized as a Global Leader in Power Management Controls, ComAp has significantly grown their Brand Recognition in North America and Latin America.

30 Year Anniversary

This year marks ComAp's 30th year anniversary. To help make ComAp's 30th Anniversary even more special, they will be releasing the largest number of products in the history of the company. Ok, maybe that's a coincidence but it does not take away from the fact that this is a momentous achievement for the company. All of these products have been designed with customer and market feedback. ComAp has proactively reached out to receive input from the multiple market segments that they serve and has put that feedback into the products that are being developed and released. By taking customer feedback and implementing it into product design, there is no doubt that this will be an equation for successful product launches.

Local Engineering

Today the Power Generation market is changing at a rate that makes keeping up with it and understanding it even more of a challenge for their customers. To answer this growing challenge ComAp again invested in a local engineering team located within North America that understood the markets, requirements, and the complexities of their markets. By bringing local engineers to the team, they have worked side by side with their customers helping them understand what they need to know to move their business forward together.

IntelliLite4



- > Fully remote communication
- > Cybersecurity in its DNA
- > Configurable U/I/R
- > USB host
- > Drag & drop PLC
- > RS 485 onboard



Retrofits Made Easy

North America has one of the largest installed bases of standby generators of anywhere in the world. In many cases these products are outdated from a control standpoint, but still have a lot of mechanical life in them. Outdated controls can put an end-user in a very high risk situation and can also put the end-user's servicing partner in a situation that could create a lot of headaches for them. ComAp has a solution for this. ComAp has proactively taken the steps to engineer a retrofit kit that is designed to be as much of a plug and play solution as possible. By mitigating the risk of unnecessary downtime, trying to source obsolete products, and unnecessary wiring in the field; these solutions have received a lot of positive recognition from the market.

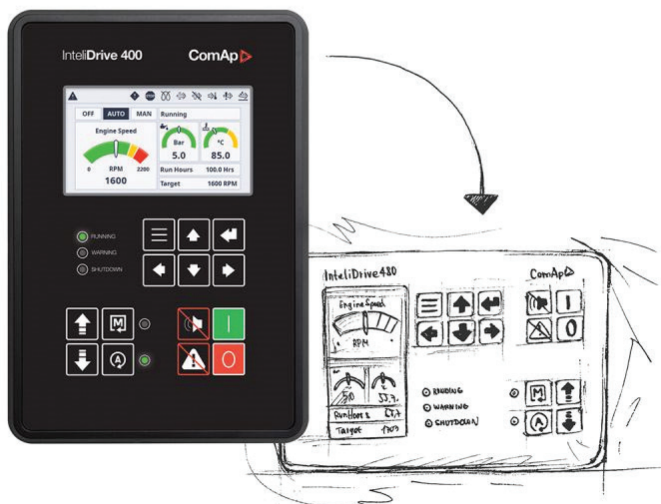
The Next Thirty Years

Looking into the next 30 Years, ComAp will continue to invest into their Products, People and Culture. This includes ComAp's Network of Channel Partners and Distributors. ComAp knows that their Partner Network will be a very big piece of their success moving into the future. ComAp is seeking to partner with the most reputable and innovative partners for the markets they serve.



IntelliDrive 400

A Quantum Leap Forward in Engine Control



The EGSA Connection

ComAp has been a member in good standing now for 16 years and counting. In addition to being regular attendees at EGSA conferences, the firm also takes advantage of EGSA sponsorship and advertising opportunities and has exhibited in the EGSA On-Site Power Pavilion at POWERGEN International since 2007.

ComAp also regularly contributes via their employees, who have volunteered their time for leadership roles on both the EGSA Board, as well as at the Committee level. ■

NEW EGSA MEMBERS

MF=Manufacturer DD=Distributor/Dealer CI=Contractor/Integrator MR=Manufacturers Rep
EM=Energy Management Co. AA=Trade Publication AB=Trade Association AC=Engineer
AD=End-User AE=Service AG=Educational Institution AM=Military AR=Retiree AF=Student

| | | |
|---|---|--|
| Acoustical Sheetmetal Company, LLC MF Virginia Beach, VA (757) 456-9720 <i>acousticalsheetmetal.com</i> Margaret Shaia, CEO Acoustical Sheetmetal Company manufactures sound attenuated and weather protective packaging for on-site power generation equipment, fuel systems and emissions control systems. | with an emphasis on, but not limited to, exhaust after treatment solutions, exhaust piping and noise reduction solutions for both stationary power and combined heat and power applications, including greenhouse CHP with CO2 recovery. | SEG Electronics GmbH MF Kempfen, Germany (970) 889-8322 <i>segelectronics.de</i> Brenda Brown, Strategic Account Manager - North & South America SEG Electronics GmbH develops, manufactures and distributes robust and reliable protection relays / IEDs (Intelligent Electronic Devices) for Power Generation and Power Distribution applications. We protect the relevant components of electrical energy generation and energy distribution: generators, transformers, motors, cables and overhead lines as well as busbars. |
| Alaska Energy AuthorityAC Anchorage, AK (907) 771-3000 <i>akenergyauthority.org</i> The Rural Energy side of AEA provides small, usually diesel-powered, power plants to isolated communities in rural Alaska. | Fred BranhamAF Plymouth, MA | Simson Maxwell MF Edmonton, AB Canada (780) 434-6431 <i>simson-maxwell.com</i> Ryan Yamniuk, President Simson-Maxwell is a leading supplier of industrial engines, power generation products, services and custom solutions. Our product support group boasts over 3500 preventative contracts ensuring reliability for power generation and industrial equipment within western Canada. We provide quality, innovative products and projects through the Simmax brand name. Branches in: Canada: Edmonton, AB; Calgary, AB; Port Coquitlam, BC; Nanaimo, BC; Prince George, BC |
| Alaska Vocational Technical Center - AVTEC AG Seward, AK (907) 224-6174 <i>AVTEC.edu</i> Jerry Blitz, AVTEC Power Plant Operator/Bulk Fuels Instructor We teach power plant operator and bulk fuels operator courses at a state run, AVTEC, post-secondary vocational technical center in Seward, AK. | Gerald CastilleAM Church Point, LA | Site Solar MF Tulsa, OK (877) 706-7483 <i>sitesolar.us</i> Kevin Clark, Director of Operations Randy Heckenkemper, Chief Operations Officer Michael VanHoesen, Business Development Zeke Waite, Asset Coordinator Site Solar mobile solar-powered generators are fueled by the sun and provide reliable, silent, emissions-free power where and when needed. Each unit's SunPower solar panels charge during daylight hours (even on cloudy days) and provide 110VAC power to run jobsite trailers, communications towers, event essentials, and power and charge tools. |
| Ancona Controls, Inc. DD Wixom, MI (248) 924-2747 <i>anconcontrols.com</i> Barry Leckner, Generator Division Manager Sales, service and installation of back-up electrical equipment including UPS equipment, inverters and generators for industrial and commercial customers in the Midwest US. Products we offer include Gillette and Briggs & Stratton generators, ATS, Toshiba UPS equipment and Flooded and VRLA batteries. | Adam CataldoAF Dedham, MA | Yerachmiel (Rocky) Taub AI Lakewood, NJ |
| Array Industries Inc. CI Northfield, IL (248) 861-3525 <i>arrayindustries.com/nl</i> Dan Howland, Business Development Manager, North America Array Industries Inc. specializes in the design, engineering and manufacturing of partial and complete balance of plant (BoP) solutions for stationary reciprocating engine driven applications. Our expertise includes both prime power diesel and gaseous power generation | Jared Conner AD Lynchburg, VA (434) 247-0164 End User for Liberty University. | Leighton YoungAF Brockton, MA |
| | Robert CorriganAF Freehold, NY | |
| | Ryan DavisAF Kingston, MA | |
| | Gaines Oil CompanyAE Goldston, NC <i>gainesoil.com</i> RJ Johansen, Sales Specialist Gaines Oil is a nationwide fuel delivery company. We specialize in quality fuel delivery for generators, fuel analysis, tank cleaning and fuel polishing. GOC has 24/7 emergency fueling dedicated to the generator industry. | |
| | Lee Hoover AI Pelham, GA | |
| | Michael JohnsonAM Gurley, AL | |
| | Bob Niederhauser AI Tomball, TX | |
| | Benja RarivasonAM Augusta, GA | |

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Application for Membership

Under the leadership of its Board of Directors and operating through its various committees and staff, EGSA strives to educate, provide networking opportunities and share relevant knowledge and trends with industry professionals including manufacturers, distributor/dealers, engineers, manufacturer representatives, contractor/integrators and others serving On-Site Power consumers.

EGSA MEMBER CLASSIFICATION & DUES SCHEDULE (Please complete form on next page)

| FULL MEMBERSHIP | | Annual Dues | Initiation | TOTAL DUE | |
|---|--|-------------|---------------|----------------|--------------|
| These Full Memberships categories are for corporations and their memberships cover all employees of the company. | | | | | |
| MF Manufacturer Membership Any individual, sole proprietor, partnership or corporation seeking membership must apply for a Full Membership as a manufacturer if they meet one or more of the following criteria: <ol style="list-style-type: none"> 1. They manufacture prime movers for power generation. 2. They manufacture generators or other power conversion devices producing electricity. 3. They manufacture switchgear or electrical control devices. 4. They manufacture or assemble generator sets, UPS systems, solar power, hydropower, geothermal, or any other power production or conversion system including related components or accessories for national or regional distribution. 5. They are a wholly owned subsidiary of a firm that qualifies under rules one through four. | | \$1,055 | \$200 | \$1,255 | |
| DD Distributor/Dealer Membership Any individual, sole proprietor, partnership or corporation actively engaged as a distributor or dealer for products listed under Manufacturer Membership may apply for Full Membership as a Distributor/Dealer. If an organization qualifies under Manufacturer Membership, it is not qualified under this section. | | | | | |
| CI Contractor/Integrator Membership Any individual, sole proprietor, partnership or corporation actively engaged as a Contractor or Equipment Integrator of products listed under Manufacturer Membership, not bound by brand, geographic territory or contractually obligated as a Distributor/Dealer of a specific product. These firms typically purchase products from a Distributor/Dealer, Manufacturer or Retailer, adding value through installation, product knowledge, relationships, unique services, etc., and then re-sell the resulting product to an end-user. | | \$395 | \$100 | \$495 | |
| MR Manufacturer's Representative Membership Any individual, sole proprietor, partnership or corporation actively engaged in the representation of products listed under Manufacturer Membership may apply for Full Membership as a Manufacturer's Representative. If an organization qualifies under Manufacturer Membership, it is not qualified under this section. | | | | | |
| EM Energy Management Company Membership Any individual, sole proprietor, partnership or corporation engaged in energy management, including Energy Service Companies (ESCOs), Independent Power Producers (IPPs), Integrators, Aggregators, and other similar enterprises may apply for Full Membership as an Energy Management Company. | | \$270 | \$100 | \$370 | |
| ASSOCIATE MEMBERSHIP | | Annual Dues | Initiation | TOTAL DUE | |
| EGSA has two Associate Member types, Associate Regular and Associate Full . Companies have the choice of joining as an Associate Regular Member or Associate Full Member. Individuals can join as an Associate Regular Member only. | | | | | |
| Associate Regular Membership (Select Appropriate Category Below) | | \$270 | \$100 | \$370 | |
| Associate Full Membership Any individual, sole proprietor, academic institution, student, partnership or corporation meeting the requirements of Associate Regular Membership may apply for Full Membership at their option to enjoy the privileges of Full Membership, including the rights to vote and to serve on EGSA's Board of Directors. Initiation fees and annual dues will be assessed at the existing non-manufacturer Full Member rates. (Select Appropriate Category Below) | | \$395 | \$100 | \$495 | |
| Associate Membership Categories | | | | | |
| Associate Regular Membership Categories | AA Trade Publication Membership Any trade publication dealing with the electrical generating systems industry or its suppliers may apply for Associate Membership—Trade Publications. | | | | |
| | AB Trade Association Membership Any trade association made up of individual or company members sharing a common interest in the electrical generating systems industry may apply for Associate Membership. | | | | |
| | AC Engineer Membership Any consulting or specifying engineer may apply for Associate Membership—Engineer. Membership may either be held in the employer's name or individual's name under this classification. Individuals whose employer qualify as a Full Member, as described in the Full Membership section, do not qualify for this category. | | | | |
| | AD End-User Membership Any individual employee of a company who owns or operates electrical generating equipment and/or related switchgear or components, whose responsibility to his employer includes planning, design, installation, supervision, or service of such equipment may apply for Associate Membership—User. Membership may either be held in the employer's name or individual's name under this classification. Individuals whose employer qualify as a Full Member, as described in the Full Membership section, do not qualify for this category. | | | | |
| | AE Service Membership Any individual, organization or academic institution that offers services such as research, testing or repair to the electrical generating systems industry may apply for Associate Membership—Services. Membership may either be held in the individual's name or the organization's name under this classification. Individual companies whose employer or parent organization qualifies as a Full Member, as described in the Full Membership section, do not qualify for this category. | | | | |
| | AG Educational Institution Membership Any postsecondary vocational-technical school or college offering on-site power generation-related instruction may apply for Associate Membership—Education Institution. | | | | |
| | AI Individual Membership Any individual who was previously employed in the on-site power generation industry but is no longer actively employed in the industry. | | \$110 | N/A | \$110 |
| | AM Military Membership Any individual who is currently enlisted, or who has been discharged, or has retired from the US or Canadian Military may apply for membership within this category. Proof of military engagement is required by either current Military ID card or honorable discharge documents. | | \$65 | N/A | \$65 |
| | AR Retiree Membership Any individual who retires from a member company may apply for Associate Membership—Retired. This classification does not apply to any individual who is employed more than 20 hours per week. | | Complimentary | | \$0 |
| | AF Student Membership Any individual currently enrolled at an academic institution may apply for Associate Membership—Student. | | Complimentary | | \$0 |

1. Contact Information

Company _____
 Address _____
 City _____ State/Province _____
 Zip/Postal Code _____ Country _____
 Phone _____ FAX _____
 Official Representative _____ Title _____
 Representative's E-Mail _____ Company's Web Address _____
 How did you hear about EGSA? Web site Powerline magazine Colleague POWER-GEN Other _____
 Why are you joining EGSA? Certification Program CEU Program Power Schools Buying Guide Listing Other _____

2. Member Classification

Please use the worksheet on page one of this application to determine your membership type.

Full Memberships

- Manufacturer (MF)
- Distributor/Dealer (DD)
- Contractor/Integrator (CI)
- Manufacturer's Representative (MR)
- Energy Management Company (EM)

Associate Memberships

- Regular Associate Membership →
- Full Associate Membership →

(Select Appropriate Category)

- Trade Publication (AA)
- Trade Association (AB)
- Engineer (AC)
- End User (AD)
- Service (AE)
- Educational Institution (AG)
- Individual (AI)
- Military (AM)
- Retiree (AR)
- Student (AF)

3. Membership Dues

(Please fill in the appropriate TOTAL amount from the dues schedule on page one.)

Membership Dues \$ _____
 Membership Plaque (optional)** \$ 85.00**
 On-Site Power Generation: A Comprehensive Guide to On-Site Power (optional)** \$ 216.00**
Florida Residents: Add 7% Sales Tax to ** items \$ _____
 ** Shipping and handling is included for Continental US & Canadian Residents.
 All others should call EGSA Headquarters for shipping charges for **items. \$ _____
TOTAL \$ _____

4. Payment Method

(Payable in US\$ drawn on U.S. bank, U.S. Money Order, or American Express)

Check # _____ Amount Due \$ _____
 Mastercard Visa American Express
 Card # _____ Exp. Date _____
 Signature: _____
 Print Name: _____

5. Products/Services

Please describe the nature of your business (50 words or less, NOT ALL CAPS). If you are a Manufacturer's Representative or Distributor/Dealer, please indicate which manufacturers you represent and/or distribute for; if you are a student, please provide the name and location of your school, your major and your anticipated graduation date:

Do you buy AND sell equipment? Yes No Do you manufacture packaged equipment? Yes No

6. Sponsor(s)

A "Sponsor" is an EGSA Member who interested you in filling out this application. It is not mandatory that you have a sponsor for the Board to act favorably on this application; however, if a Member recommended that you consider membership, we request that individual's name and company name for our records.

Sponsor Name _____ Company Name _____

Available Codes:

- | | | | | |
|-----------------------------------|--|--|---|--------------------------------------|
| 01 ---Batteries/Battery Chargers | 07 ---Engine Starters/Starting Aids | 12 ---Governors | 18 ---Relays, Protective or Synchronizing | 22 ---Trailers, Generator Set |
| 02 ---Control/Annunciator Systems | 08 ---Filters, Lube Oil, Fuel or Air | 13 ---Heat Recovery Systems | 19 Silencers/Exhaust Systems/Noise Abatement | 23 ---Transformers |
| 29 ---Education | 28 ---Fuel Cells | 14 Instruments and controls, including meters, gauges, relays, contactors, or switches | 20 ---Solenoids | 24 ---Uninterruptible Power Supplies |
| 30 ---Emission Control Equipment | 03 Fuel Tanks and Fuel Storage Systems | 15 ---Load Banks | 21 ---Switchgear and Transfer Switches (Automatic or Manual), Bypass Isolation Switches, and/or Switchgear Panels | 25 ---Vibration Isolators |
| 04 ---Enclosures, Generator Set | 09 ---Generator Laminations | 16 ---Motor Generator Sets | | 26 ---Voltage Regulators |
| 05 ---Engines, Diesel or Gas | 10 ---Generator Sets | 17 ---Radiator/Heat Exchangers | | 27 ---Wiring Devices or Receptacles |
| 06 ---Engines, Gas Turbine | 11 ---Generators/Alternators | | | |

Enter codes here: (Limit 10 codes per category)

Products sold: _____
Products rented: _____
Products serviced: _____

7. Official Representative's Authorization

Signature _____ Date _____

EGSA JOB BANK

EGSA Job Bank Guidelines

EGSA will advertise (free of charge) EGSA Member company job openings in the Job Bank. Free use of the Job Bank is strictly limited to companies advertising for positions available within their own firms. Companies who are not members of EGSA and third-party employment service firms who service our industry may utilize the Job Bank for a \$300 fee. Blind box ads using the EGSA Job Bank address are available upon request; company logos may be included for an additional fee. EGSA reserves the right to refuse any advertisement it deems inappropriate to the publication. To post an EGSA Job Bank ad (limited to approximately 50 words) please visit www.EGSA.org/Careers.aspx.

USA Mid-Atlantic

EPG Field Service Technician

Carter Machinery Co.
Location: Baltimore, MD

Carter Machinery, the mid-Atlantic Caterpillar dealer, is seeking an EPG Technician at our Elkridge, Maryland location. Performs service, installation, inspection, and preventative maintenance on electric power generation systems and associated components. Carter Machinery Co. Inc. is an EEO/AA Employer. Carter Machinery is a drug-free workplace.

To apply: www.cartermachinery.com/careers

Generator Service Technician

Martin Energy Group
Location: Ephrata, PA

Seeking full-time technician to join the growing Martin team on support and maintenance of Standby Generator Systems. Also, opening in CHP cogen segment. Good customer service mentality and integrity are essential.

To apply: Daniel tel. 717-449-4571 or dmsensenig@martinenergygroup.com

USA Midwest

Field Service Technician - Master Level

Clifford Power Systems
Location: Dallas/Ft Worth, TX

Clifford Power Systems is looking for experienced Generator Field Service Technicians in the Mansfield or Garland, TX area. Techs will be responsible for preventive maintenance; new equipment start-ups; warranty work. Inspect, diagnose, repair generator systems including automatic transfer switches. Military, EGSA and factory certifications preferred.

EGSA Certified Technicians Preferred.

To apply: <https://www.paycomonline.net/v4/ats/web.php/jobs?clientkey=2A518A736F79A1B70B942BDFB12C29F>
F&=amp;jpt=

USA National

Application Engineer - BiFuel

ComAp LLC

Location: Remote Opportunity

ComAp's looking for energetic, passionate and customer service driven Application Engineer to provide the highest standard of support to our technical sales efforts through customer visits, on-site assistance & remote communications. Keys to providing superior support through effective and efficient problem solving, training, installation assistance, commissioning, and validating ComAp controls and solutions.

To apply: <https://comap-control.jobs.cz/>

USA Northeast

Technician

Cannondale Generators

Location: Wilton, CT

Generator Technicians Wanted! Cannondale Generators in Wilton, CT is looking for motivated field technicians who want to work for a reliable, family owned business that values its employees and rewards hard work. We can offer immediate full-time employment to qualified candidates, with benefits including health, dental, 401k, and PTO.

To apply: Contact us through our website at www.cannondalegenerators.com or call us at 866-762-2608.

Generator Service Technician

Martin Energy Group

Location: Long Island, New York City

Seeking full-time technician to join the growing Martin team on support and maintenance of Standby Generator Systems. Also, opening in CHP cogen segment. Good customer service mentality and integrity are essential.

To apply: Daniel tel. 717-449-4571 or dmsensenig@martinenergygroup.com

USA Southwest

Sales Southwest Territory

Felling Trailers, Inc.

Location: CA, NV, AZ, & NM

We are searching for a driven Sales Professional who is interested in growing professionally and financially by representing our products to new and existing dealers/customers.

• 3 years trailer industry experience needed. The position is home office based with extensive travel, 70% of the time, throughout the assigned region.

To apply: Submit resume to: Nathan.uphus@felling.com.

Application Deadline: 5/2/2021

USA West

Field Service Power Generation Technician

Cummins

Location: Bakersfield, CA

Completing preventative maintenance and/or basic repair activities on generators or components at the customer site with minimal direction.

Applying the use of specialized tools and following documented procedures and policies to diagnose and complete basic repairs, including preparing required parts and tools.

Hands on exposure working on power generation products.

EGSA Certified Technicians Preferred.

To apply: <https://cummins.jobs/bakersfield-ca/power-generation-field-technician-5k-sign-on-bonus/96CF8EA366A14B6EB9FDA5844C11C8C0/job/>

Application Deadline: 5/1/2021

Western Regional Sales Manager

MIRATECH

Location: California

We are looking for a driven Sales Professional to grow our business in the Western Region including CA, NV, AZ, OR, WA, AK, and HI. The candidate should have 5+ years Power Gen industry experience, will office from home, with 65% travel. Position reports to the Power Gen Division Manager.

To apply: <https://www.miratechcorp.com/about-us/careers/>
Application Deadline: 4/30/2021

Manufacturer's Rep Seeking Principals

Leading Mid-South manufacturer's rep is seeking additional product lines. We have decades of experience in all aspects of the onsite power generation industry. We are interested in adding quality complementary manufacturers to our line of superior products serving the industry. Our record of outstanding success can help you achieve your sales and market share goals. Please respond if you have an area where you desire additional sales and market share.

Please respond to: J.Kellough@EGSA.org
(Reference PLMJ13JB-1)

EGSA Remembers Jim Wright, our 1990 EGSA President and Active EGSA Member from 1973- 2012

It is with great sadness that we inform you of the passing of James B. Wright on February 9, 2021.

Jim was a career engineer; first for Lima Electric and had retired as a senior product engineer for Marathon Electric.

He was a member of the Electrical Generating Systems Association (EGSA) from 1973-2012. Jim was a forefather of EGSA's education programs and the namesake for the Education Award as well as an author of two chapters for the EGSA Reference Book.

Jim served the EGSA On-Site Power Generation School since its inception in 1983. Jim has also been a featured speaker at a number of national and regional conventions and technical conferences. He has written numerous technical articles for EGSA's Powerline Magazine.

Jim served on the Technical & Standards Committee (1973-78) and chaired the Education Committee (1985-94). He also served as Secretary-Treasurer (1987), Second Vice President (1988), First Vice President (1989) and President (1990). He was awarded the Timmler Award in 1989, the Carpenter Award in 1992 and the Gordon Johnson Lifetime Achievement Award in 2016 for a career



dedicated to the betterment of the Association and the on-site power industry.

Jim was born on November 19, 1931, to the late Bailey and Alice (Pratt) Wright in Dayton, OH. He attended Central High School in Lima, OH, graduating in 1949.

Wright received a BS in Nautical Science from the U.S. Merchant Marine Academy, Kings Point, NY. After serving with the Merchant Marines, he was commissioned as an Ensign in the U.S. Navy and served from 1955 to 1964.

Jim married Sue Ebling in 1965. She preceded him in death on January 28, 2000. He is survived by his daughter, Stacie (Ray) Huang; and granddaughter, Audrey Huang.

Elks Lodge Military Honors will be held in Jim's honor at a later date. Private interment will be in Memorial Park Cemetery in Lima, OH. In lieu of flowers, memorials may be directed to The American Cancer Society and The American Heart Association.

Remembering Jim

Jim's contributions to EGSA are numerous and have helped to mold the Association into the organization we know today. Here is a video featuring an interview with Jim (<https://www.youtube.com/watch?v=pd3cLCL8xq8&t=2s>) that was published in 2015 for EGSA's 50th Anniversary. ■

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2021 EGSA Board

As a part of EGSA bylaws and in order to support continuity within the Association, EGSA has policies in place to provide our Membership with ample leadership opportunities.

We are happy to showcase the 2021 EGSA Board along with a formal list of their accomplishments. While a list like this can never reflect all of a Member's valuable input, it is a great reflection on their "formal accomplishments" on behalf of the Association.

These folks are to be commended for their leadership and volunteer spirit. Without Members like the ones showcased here, as well as others who have shaped the EGSA community, we would not be where we are today. We salute the 2021 EGSA Board of Directors! ■

2021 EGSA Officers



Kurt E. Summers (Kurt) – Chairman of the Board
Austin Generator Service

Executive Committee: 2017-current
 Director: 2016-2017
 Committee Chair: Distributor/Dealer 2018-2019
 Committee Officer: Distributor/Dealer 2015-2017, 2006-2008
 Conference Presenter: Fall 2015



Thomas Black – Vice Chair
ASCO Power Technologies

Executive Committee: 2019-current
 Director: 2017-2018
 Committee Chair: Conference Planning 2017-2019
 Committee Officer: Conference Planning 2016-2017
 Powerline Author: ✍️



Justin McMahon – Secretary-Treasurer
Nidec Electric Power Generation

Executive Committee: 2020-current
 Director: 2017-2019
 Committee Chair: Market Trends 2019-2020
 Committee Officer: Green 2015, Market Trends 2015-2019



Hal Walls – Treasurer
MineTerra Corporation

Executive Committee: 2021-current
 Director: 2017-2019
 Committee Chair: Conference Planning 2016-2017
 Committee Officer: Conference Planning 2014-2018
 Conference Moderator: Fall 2016
 Conference Emcee: 2017-current

2021 EGSA Directors



Dan Barbersek *Waukesha-Pearce Industries*

Director: 2020-current
 Committee Chair: Marketing & Communications 2019-2020
 Working Group Chair: ELS 2017
 Conference Presenter: Spring 2018



Dan Bigelow *Reverso Pumps*

Director: 2020-current
 Committee Chair: Technical Oversight 2019-2020
 Committee Officer: Technical Oversight 2016-2018
 Conference Presenter: Fall 2015
 Powerline Author: ✍️



Chris Nagle *Siemens Engines*

Director: 2019-current
 Committee Officer: Market Trends 2017-2019
 Committee Chair: Market Trends 2020-current
 Conference Presenter: Spring 2014, Fall 2019
 Powerline Author: ✍️



Lee Newton *Bay Diesel Corporation*

Director: 2021-current
 Committee Officer: Distributor/Dealer 2019 & 2020
 Working Group Chair: TOYA 2018 & 2019



Bob Niederhauser *Thrustmaster of Texas*

Director: 2021-current
 Committee Officer: Membership 2019 & 2020



Walter Petty *Atlantic Power Solutions*

Director: 2013-2015, 2021-current
 Committee Chair: Membership 2015-2017
 Committee Officer: Green 2011, Membership 2013-2015



Michael Sanford *Cummins Power Systems*

Director: 2020-current
 Committee Officer: Membership 2016-2019
 Conference Presenter: Spring 2016
 Powerline Author: ✍️



Kate Thomas – Director *Rx Monitoring Services, Inc.*

Director: 2021-current
 Committee Officer: International Trade 2018-current



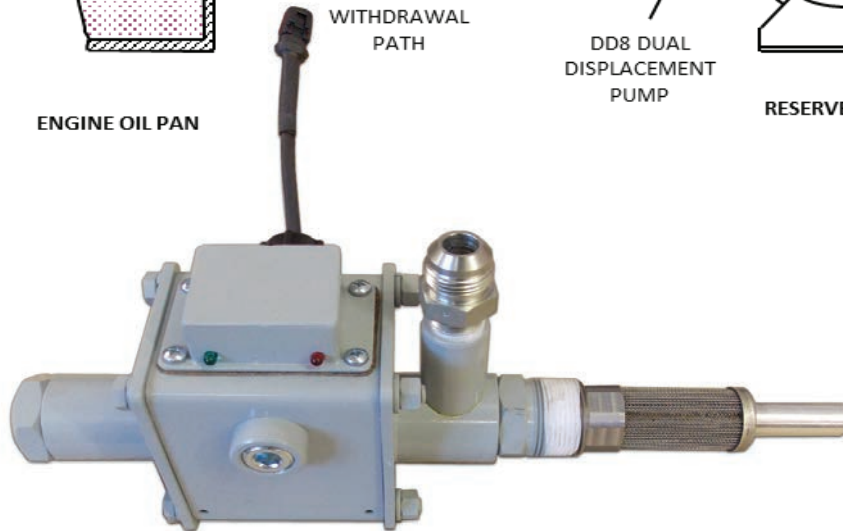
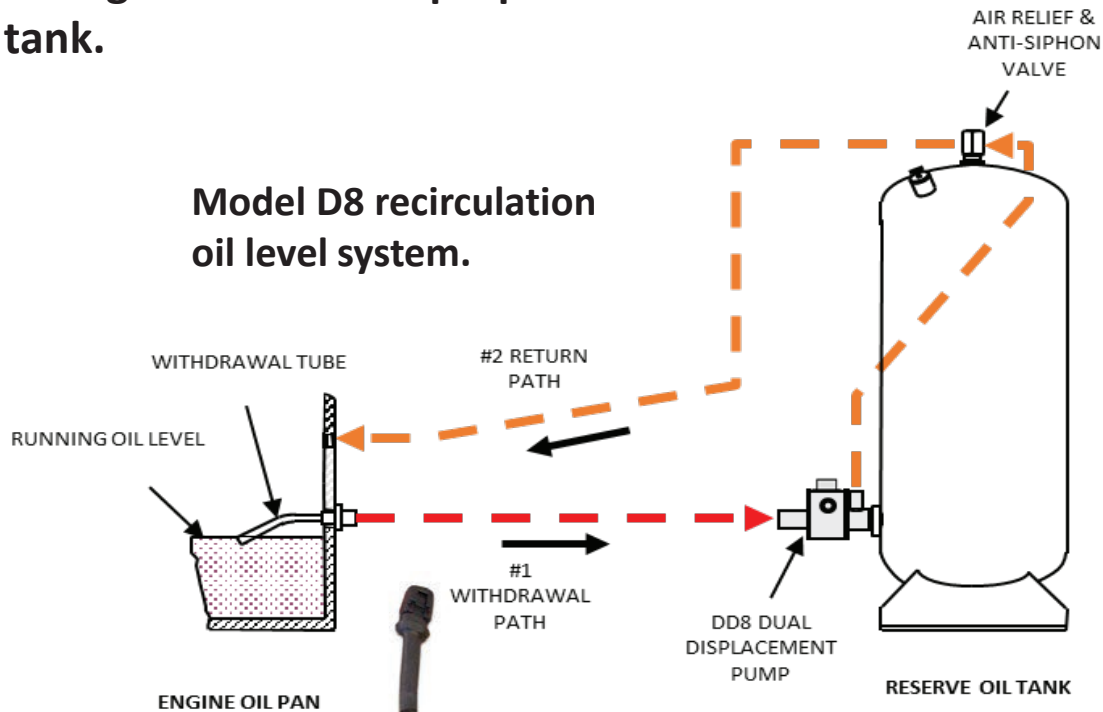
Brian VenHorst *Tramont Manufacturing, LLC*

Director: 2019-current
 Committee Officer: Conference Planning 2013-2016
 Conference Presenter: Fall 2015

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