

Engineers' News

November 2015

Vol. LXXVIII No. 3

www.FortWayneEngineersClub.org

November Presentation



Indiana Michigan Power Transmission System Improvements

[Indiana Michigan Power Center, 110 E. Wayne St, Fort Wayne, IN 46802](#)

Tuesday, November 24th at 7:00 PM

(Plan to arrive by 6:40 PM)

****Note the Tuesday date****

The November presentation will complement our October tour and highlight the transmission system improvement projects in the Fort Wayne area. The presentation by the I&M/AEP Transmission planner is intended to cover the planning criteria justification for the Sorenson project along with a few other system improvement projects in the area, and the expected benefits to be achieved. Other AEP Transmission representatives will be in attendance to answer questions that the system planner may not be able to answer.

The meeting will take place in the video conference room on the 18th floor of the Indiana Michigan Power Center (former One Summit Square) located at 110 E. Wayne St.

The building is not open to the public after 6:00 PM so an I&M employee will meet club members at the Washington Blvd. street level entrance to the building to escort attendees up to

the 18th floor. Plan to arrive by 6:40 PM so all attendees can be escorted up to the 18th floor in time to begin the meeting at 7:00 PM.

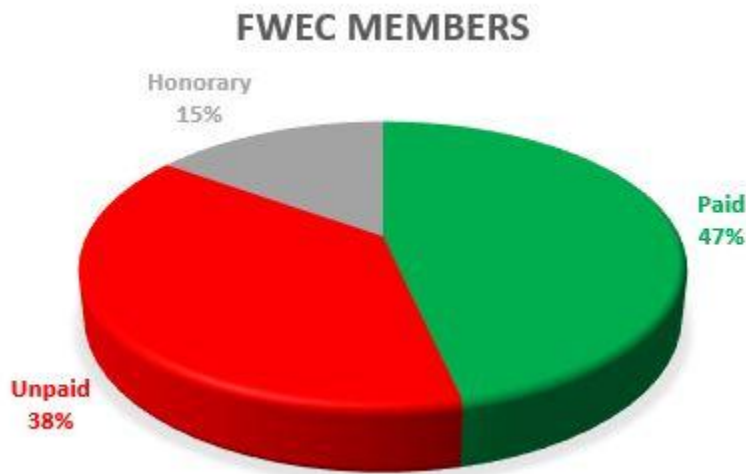
Join the FWEC on Social Media

The Fort Wayne Engineers' Club now has a group on LinkedIn®. This group is open to all existing and potential FWEC members. We'll post FWEC tour reminders, photos, tour discussions, and more on the group's page.

Join our group : [Fort Wayne Engineers' Club](#)

Additionally, the Fort Wayne Engineers' Club now has a [Facebook page](#).

Membership Dues



Fiscal Year 2016 is now upon us and it is time to ensure that all members dues are current. Dues to the FWEC have remained constant in our ever changing economy at \$10/year for full and associate members and only \$5/year for student members. Review the address label on the mailed September newsletter; anything less than FY16 requires payment to be current. [Dues paid online](#) are subject to an additional fee of \$1 for processing.

Northeast Indiana DiscoverE

Academic Award Donations



[Northeast Indiana DiscoverE](#) is a standing committee of the FWEC. Northeast Indiana DiscoverE is accepting contributions toward its Academic Awards that are given to regional engineering students during the Engineers Week banquet each February. Please consider a donation to this fund in addition to your FWEC membership dues.

December Social



[Sweets So Geek](#)

[3410 N Anthony Blvd, Fort Wayne, IN 46805](#)

Thursday, December 10th from 6:00 PM to 8:00 PM

The FWEC will hold their December Social at Sweets So Geek. We will hear about how they have used 3D printing to create unique molds for their creations as well as sample cupcakes. They will have deserts and beverages available for purchase.

2015-2016 Membership Year FWEC Board

President: Rod Vargo
Vice President: Dave Schaller
Treasurer: Ryan Stark
Secretary: Elizabeth Garr
1st Year Board Members: Marna Renteria & Ellsworth Smith
2nd Year Board Members: Mike Magsam & Jack Phlipot
3rd Year Board Members: John Magsam & Rob Cisz
Northeast Indiana DiscoverE Committee Chair: Jake Dinius
Resident Agent: Ryan Stark

Board positions are crucial to the planning of tours and events for the FWEC. Please consult the [FWEC constitution](#) or contact us at info@fortwayneengineersclub.org for information on specific duties on board positions.



Fluid Power, Safety and Automation Specialists

Jake Dinius Sales Engineer (260) 797-9819 Cell
jdinius@sidenereng.com (260) 423-2595 Office



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Contact Jake for your **FLUID POWER, SAFETY & AUTOMATION** needs: (260) 797-9819
Visit the **SIDENER ENGINEERING** website at: www.SidenerEng.com

Welcome New FWEC Members

The FWEC would like to welcome the following new members.

Full Members: David Beck and Phyll Havens

Associate Members: Derek Faulk, Brian Wallace, and Joan Woerner

Student Member: David Woerner





swe[™]
Society of Women Engineers
Indiana-Purdue University, Fort Wayne

In collaboration with the IPFW
College of Engineering, Technology, and
Computer Science

13th Annual

OPPORTUNITY BANQUET

November 13, 2015 4:30-9:30
Walb Classic Ballroom, WU 126

Join us for a career fair and a networking dinner before the guest speaker,
Mark O. Federle, PE, PhD, CPC, F. ASCE

COMPANIES

City of Fort Wayne Design Collaborative Eaton Corporation Engineering Resources, Inc. Enspire Software Extension Healthcare Franklin Electric General Dynamics Mission Systems General Motors Defiance Goldshield Fiberglass	Logikos Michelin North America, Inc. myStaffingPro New Millennium Building Systems Nucor Building Systems Nucor Fastener Regal Beloit Corporation Setex, Inc. Shambaugh & Son	Shuttleworth LLC Steel Dynamics, Inc. TN Solutions LLC Ultra Electronics - USSI Valbruna Slater Stainless Steel, Inc. WaterFurnace International, Inc. Wayne Combustion Systems Wayne Metals LLC Zuno Engineering
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Ticket sales open to the general public Sept. 25—Nov. 5, 2015. Make checks (\$30) payable to the Society of Women Engineers and mail to

Elizabeth A. Thompson, Ph.D.
IPFW — Department of ECE
2101 E. Coliseum Blvd., ET 327E
Fort Wayne, IN 46805-1499

Include your dinner selection: Beef Brisket, Breast of Chicken Rosemary, or Grilled Vegetable Kebob.

Also include your title (e.g., IEEE member).

ATTIRE: Business Formal

Questions? Contact Dr. Thompson at (260) 481-6361

NO TICKETS SOLD AT THE DOOR

FWEC Board Meetings

Fort Wayne Engineers' Club board meetings are open to all FWEC members. The next FWEC board meeting will be Tuesday December 1st at 7:00 PM. Board meetings are held on the [Indiana Tech campus in the Academic Center](#) in room ACC-201.



The Fort Wayne Engineers' Club would like to remember [Joseph Barta Jr.](#) Joseph was a longtime FWEC member and retired from Indiana & Michigan Power and AEP.

Advertise in the Engineers' News

The FWEC will be selling advertising space within the Engineers' News. Advertisements are \$10 per issue and limited to ½ page of content. For submissions please contact info@fortwayneengineersclub.org.

FWEC Membership

The FWEC exists through funding of its membership. Please forward your copy of the Engineers' News to prospective members and encourage their attendance at tours. Remember, the FWEC is the best deal in town, annual membership is \$10. We offer free monthly tours September through May. Please be sure to recommend FWEC membership to your colleagues and friends.

Editor's Correction - Get Fresh Farms Tour History

The FWEC would like to correct the September Get Fresh Farms tour history with the following notes.

Get Fresh Farms does not have a business manager; it is run by Victoria and Patrick with some part time staff. We incorrectly attributed the design of the greenhouse to Patrick which is false. Additionally, the water temperature is kept near to 73 F as a compromise; too cold for the fish and too warm for the plants. Get Fresh Farms fish are a warmer water species and would prefer water temperatures near 80 F.

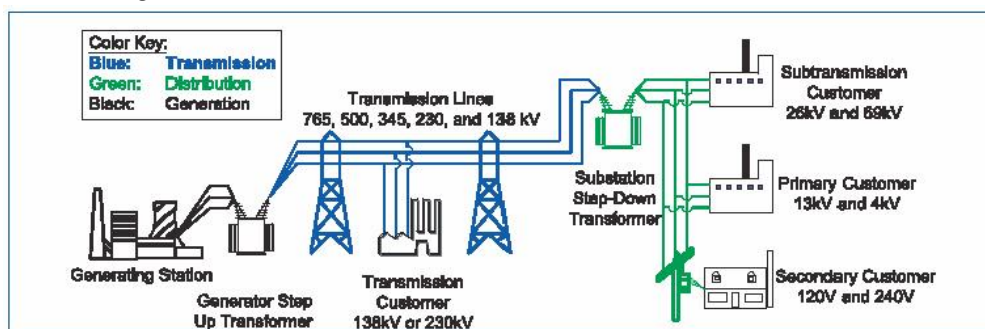
October Tour History - AEP Sorenson Substation

FWEC President Rod Vargo provides our October tour history.

Twenty-four FWEC members and guests were hosted by FWEC member and AEP employee Ron Cotant, plus nine AEP employees or contractors (all engineers in various fields), at the Sorenson Substation near Roanoke on October 15. A 765 kilovolt (kV) power line between South Bend, IN, and Marysville, OH, is being diverted to also include this substation.

Considerable archaeological, floodplain, environmental, wetlands, public input, and other studies were needed over some three years. A few elements of the substation improvements still await ongoing studies.

Sorenson is actually three substations. Two pre-existing units provide and/or boost 138 or 345 kV high voltage power lines to supply relatively local residential and commercial customers. These old substations cover about 11 acres and are being largely replaced *in situ*, one phase circuit at a time (six total). They suffered from age, deterioration, Homeland Security concerns, recent Federal reliability regulations, and not being designed for upcoming 765 kV electromagnetic influences.



[Image original source: [US Department of Energy](https://www.energy.gov)]

The 765 kV yard under construction, alongside the older substations, covers a much larger area, about 25 acres, in part because the massive voltage can creep or flash over across

greater distances. Invisible underground elements include an extensive grid of copper for electrical grounding, buried pipes as conduits for high voltage cables between different sections of the overall substation(s), and storm water systems. Dozens of footers were in place at the substation, waiting for transformers, high voltage switches, buses, and related equipment. (Internet sources indicate the many transformers will weigh 100-400 tons each, take up to 20 months to obtain, are typically made overseas, and are 97-98% efficient at these high kV ranges.)



The 765 kV yard will feed over to and help supply the existing 138/345 kV services, while also continuing the 765 kV transmission between South Bend and Marysville. (Figure 1 shows transmission lines terminating instead of continuing.)

Towers of different designs spread across the countryside to/from the substation(s). Footers for individual legs of these towers average 25-30 feet deep and 6-7 feet in diameter, filled with concrete and steel. The initial holes tended to be drilled with an auger of that size. Tubular towers are often used instead of "Erector set" latticework due to much less parts and labor. Latticework is still preferred for some applications.



Glass insulators are gradually being displaced by various fiberglass and plastics, generally with an outer coating to shed ice. The new 765 kV line is using a series of glass insulators interconnected by flexible steel shackles.

Cables, better known as conductors, are built up using solid strands of aluminum or galvanized steel, each strand about one-eighth inch in diameter. Aluminum provides lower electrical resistance and steel greater tensile strength. A sample for 345 kV had a center steel strand with another steel layer twisted around it. Three layers of aluminum strands then twisted over the steel core. Each successive layer of either material spiraled in opposite directions. The sample (donated to FWEC) was about 1.25 inch in diameter and weighed 1.2 pounds/foot. The 765 kV conductor has an additional layer of aluminum and approaches 1.5 inches in diameter. Corrosion was not discussed.

Each conductor is actually a subconductor when used on lines carrying 138 or more kV. The 345 kV system used four subconductors held apart by square and/or X-shaped spacers located periodically along the overall run. Six of the 1.5 inch-diameter subconductors are utilized as a 765 kV line. (Three lines per tower, one for each phase circuit.)

Even the peripheral fences need to be extensively grounded (to the underground copper grid) because of electrical power induced from the high voltage. Grounding straps are generally copper, but copper-clad steel is required by code in locations prone to metal thieves. Measures are taken to flag and track metal as stolen.

Thin wires, barely visible, are strung between the tops of towers as lightning shields. These

are also grounded into the earth at each tower.

An easy read for more info is [Infrastructure, A Field Guide To the Industrial Landscape](#) by Brian Hayes.

Fort Wayne Astronomical Society



Fort Wayne Astronomical Society, Inc.
P.O. BOX 11093 • FORT WAYNE, IN 46855 • USA 1959
FortWayneAstronomicalSociety.com

The [Fort Wayne Astronomical Society](#) will have their next general meeting on Tuesday November 17th at 7:30 pm at the [University of Saint Francis Schouweiler Planetarium](#).

Visiting the World's Largest Telescopes, the Telescopes of Mauna Kea: By Ken Haenftling

FWAS member Ken Haenftling will present images and notes he took while visiting the telescopes of Mauna Kea, Hawaii.

The Society conducts public observing sessions at [Jefferson Township Park](#) every clear Saturday evening, from April through November, conducted by trained and experienced Society members. Public observing starts 1-hour after sunset and continues for two hours.

TekVenture Fall 4 Making



A Public Art & Technology Laboratory
Interconnecting Imagination, Technology and Community

TekVenture's FALL 4 MAKING WORKSHOPS feature over 30 workshops begin Saturday October 10th at TekVenture's new building 1800 Broadway @ Swinney Streets. Subjects range from Welding for Women to 3D Printing to Setting up a Milling Machine to Quilting for Guys.

All workshops \$30 unless otherwise stated. 20% discount for members. Kids under 12 must be accompanied by an adult. Advanced Registration is Required!

www.tekventure.org/eventbrite or call 260.432.1095

Nov. 7,9 - 4 Electronics for Makers: Design a Simple Circuit Board Then Make It.
Using Eagle, a free-ware, CAD-type software, create a circuit board by laser-printing a design, heat-transferring the image to a copper-clad board, then etching, cleaning and drilling the board. After a lunch break, then solder components onto the board to create a simple electronic circuit device. Participants should bring a laptop computer to download and work the Eagle program. Workshop cost: \$60 including kit cost.

Nov. 7, 9 - Noon Machining For Makers: Metal Lathe
A master machinist introduces you to the manual metal lathe set up, truing, cutters and cutting, measuring and reading drawings.

Nov. 7, 1 - 4 Machining For Makers: Metal Lathe Refresher
You know a little about using a metal lathe; review set-up, cutting and cutters, knurling, boring and taper turning from a master machinist.

Nov. 7, 1- 4 The WoodMaker's Tool Box: Turning
Learn the tools, material selection and lathe set-up, tool sharpening, and basic techniques of spindle and bowl turning.

Nov. 14, 9 - Noon Using My Multimeter and Other Test Instruments
Learn to get the most use from your meter, oscilloscope, variable power supplies, clamping meters, household watt meters. Meter Kit cost \$5.

Nov. 14, 1 - 4 Make a Hobby Servomotor
Make little things move! Understand servo control, feedback, and programming. Build a battery stick-powered, potentiometer-controlled hobby servo. Kit cost \$10

Nov. 14, 9 - Noon The WoodMaker's Tool Box: CNC Machine Non-metals
Based on freeware SketchUP® learn how to set up and use the TekVenture CNC (Computer Numeric Control) Router to cut designs from card, plastic, foam or thin wood stock.

Nov. 14, 1 - 4 The WoodMaker's Tool Box: CNC Machining of Non-metals
Introduction to the CNC language of G-Code: writing and editing it is not as hard as you think. Then use the TekVenture CNC Router to cut designs from card, plastic, foam or thin wood stock.

Nov. 21, 9 - Noon or 1 - 4 Deconstruct Your Computer for Fun, Knowledge & Profit!
Novice makers are demystified about the fundamental components of the common desktop

computer while simultaneously increasing their comfort in replacing internal components. Also learn methods of maximizing profits in recycling circuit boards and components. Bring your old computer(s)!

Northeast Indiana Chapter Project Management Institute



Summit City Brewerks' PM Presentation and Tour

Will Long and David Tomaszewski, Executive owners of [Summit City Brewerks](#) present "Applying the Principles of Project Management by the Brew Masters at Summit City Brewerks"

Project management is necessary in the formation of small business as it is in any arena of a functioning entity. Before you have the chance to design products or decide if they show signs of viability, a means is necessary. Summit City Brewerks went through many stages of planning, designing, and execution before it became a reality. The two founders risked everything for a dream, and are reaping the benefits of self employment.

Meal details:

- Buffet and vegetarian option
- Two drink tickets good for alcoholic and non-alcoholic options (included in meal price)
- Other drinks can be procured with cash purchase at location

[Register now](#) and meet with us at [Summit City Brewerks](#). Networking begins at 5:30 PM, dinner will be served at 6:00 PM, chapter announcements at 6:45 PM and the presentation begins at 7:00 PM. Reservations end 11/25/2015.

- NEIC chapter members: dinner and speaker-\$20, speaker only-free
- PMI Hardship Provision or PMI Student Membership-\$10
- Non-members: Dinner and speaker-\$30, Speaker only-\$10 Register Now
- Pay when RSVP with credit card. No pay at the door option will be available

Will Long and David Tomaszewski are lifelong friends that love beer and the entrepreneurial spirit. David comes from a Culinary background and used to lead teams of up to 20 people

through the planning, preparation, and execution of events for up to 1,000 people. Will previously managed shipping logistics for a trucking company that executed the distribution of every Silverado made in America. Together, the skills possessed by the team are greater than the sum of their parts, and exist to create a working model of a craft brewery that is on the forefront of the market locally and regionally.

Northeast Indiana DiscoverE Committee Meeting



[Northeast Indiana DiscoverE](#) is a standing committee of the FWEC. The committee will meet on Monday December 7th at 12:00 PM at [MSKTD & Associates](#) in the Main conference room. This is a planning meeting to discuss the needs of DiscoverE for the upcoming year. Northeast Indiana DiscoverE functions include:

- [Middle school bridge competition](#)
- [High school bridge competition](#)
- [Academic awards](#) for college students
- [Citizen Engineer](#) award for professionals
- [Engineers Week banquet](#)
- And more...

Maumee Valley Blacksmiths



The Maumee Valley Blacksmiths, part of the [Maumee Valley Antique Steam & Gas Association](#), meet on the 2nd Saturday of each month in the blacksmith building at showgrounds of [Jefferson Township Park](#), New Haven and also meet on the 4th Saturday of each month at the [Solomon Farm](#).



For more information please contact John Schamber via e-mail at:
fwtoolman@hotmail.com.

Engineers' News Past

The FWEC has a significant history; Treasurer Ryan Stark and his wife were able to find past Engineers News documents dating back to 1938! Here is an excerpt of the past newsletter (a scanned copy of the entire newsletter is available through the FWEC website):

October/November 1987

October meeting will be joint with IEEE at the Indiana Institute of Technology with Irving Fogel speaking on "Engineer's Liability", a vital, current subject where engineers as well as owners and managers are held legally responsible for accidents, with extravagant awards made by juries for injuries. This can involve most any phase or type of engineering in remotely related types of accidents. The meeting will be held in the Anthony Building on the Indiana Institute of Technology (IIT) campus at 7:30 PM in room 360.

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