

Engineers' News

December 2015

Vol. LXXVIII No. 4

[www.FortWayneEngineersClub.org](http://www.FortWayneEngineersClub.org)

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## December Social

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[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. The FWEC will also sample cupcakes. Sweets So Geek will have deserts, chocolate, ice cream and beverages available for purchase.

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## 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](#).

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## January Tour

# Sweetwater

[Sweetwater](#)

[5501 US Hwy 30 W, Fort Wayne, IN 46818](#)

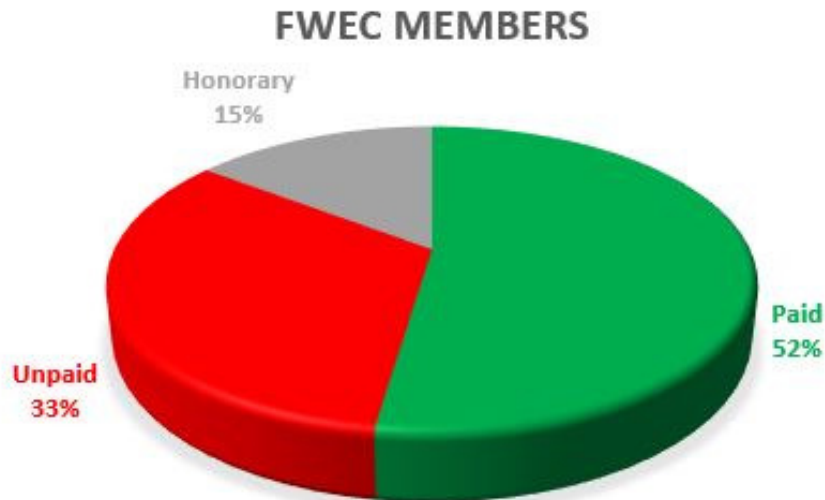
Thursday, January 28th at 7:00 PM

FWEC board member Ellsworth Smith has arranged a tour of Sweetwater. Tour participants are encouraged to arrive early to take advantage of the Sweetwater cafe and coffee shop. In addition to the tour Sweetwater has a two story slide available to try for the brave and to view for the rest. The tour will include at least one mechanical room. Spouses and guests are welcome!

Parking is available on the North side of the complex.

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## Membership Dues



Fiscal Year 2016 is now upon us and it is time to ensure that all members dues are current.

**Any unpaid members will be considered delinquent as of January 1st.** Anyone unsure of their dues status can contact Treasurer Ryan Stark at [FortWayneEngineersClub@yahoo.com](mailto:FortWayneEngineersClub@yahoo.com).

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.

[Dues paid online](#) are subject to an additional fee of \$1 for processing.

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## **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.

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## **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 Philipot

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](mailto:info@fortwayneengineersclub.org) for information on specific duties on board positions.

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## Welcome New FWEC Member

The FWEC would like to welcome the following new member.

Student Member: Andrew Whiteman

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## FWEC Board Meetings

Fort Wayne Engineers' Club board meetings are open to all FWEC members. The next FWEC board meeting will be Tuesday January 5th at 7:00 PM. Board meetings are held on the [Indiana Tech campus in the Academic Center](#) in room ACC-201.

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A black rectangular box with a white border. Inside the box, the words 'In Memoriam' are written in a white, serif font. Above and below the text are decorative white flourishes.

The Fort Wayne Engineers' Club would like to remember [Jim Stark](#). Jim founded Blackstone Labs and was assembling a [RV-12 kit airplane](#), a recent [FWEC tour](#). Jim was the father of FWEC Treasurer Ryan Stark.

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**ENGINEERS WEEK**  
FEBRUARY 21-27, 2016

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## **Advertise in the Engineers' News**

The FWEC provides 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](mailto:info@fortwayneengineersclub.org).

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## **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.

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## **November Tour History - AEP Sorenson Substation**

FWEC President Rod Vargo provides our November tour history.

American Electric Power (AEP) hosted the FWEC in the eighteenth-floor conference room of the Indiana Michigan Power Center, formerly Summit Square, on November 24. The crystal clear dark evening provided wonderful viewing. Twenty-three members and guests of FWEC, four representatives of AEP, and a General Motors representative attended a presentation and active discussion led by AEP's regional transmission design engineer, Eric Swanger. In this situation, "regional" meant multiple states and a section of Canada.

A big surprise was the extent of power-industry organizations, regulations, governmental organizations, and political policies which largely determine investment and infrastructure-retirement decisions. Mercury and coal policies, for the most part, are leading to the retirement rather than mothballing of an astonishing 100 "generation units", essentially locations, in the region between the Hudson River, Chicago, southern border of Virginia, and southern shores of the Great Lakes. Since the quality (precisely timed 3-phases coming at 60 cycles/second) and level (voltage, current) of electrical power cannot be stored to any great extent, it is a moment to moment (essentially 0.017 second) phenomenon. The loss of "generation units" is leading towards a reduction in adequate "reactive" generation capability.

The loss of reactive generation capability has or can result in low voltage, low current, or loss of proper 3-phase timing at voltages below 345 kV (kilovolts). The 765 kV lines would typically experience overvoltages and heat. (Editorial note: Simplistically, the 765 kV "interconnects" respond differently because of massive capacitance built up as ionized air around the lines along lengths of roughly 600-1000 miles.)

Computer models are used to predict power quality and consistency for all customers across large regions of North America which are interconnected in various ways. These models are utilized to provide 0-5 year and 8-15 year infrastructure plans which can be vetted and discussed through the layers of decision making mentioned above. The level of local geographic detail available through the models was impressive.

The Allen County and Fort Wayne area is further complicated by infrastructure originally laid out as long ago as 1925. For instance, the existing easements are often too narrow for higher voltages, may share space with roadways which need widening, and/or contain decades of inappropriate buildings or landscaping. The older electrical installations often do not meet new reliability standards against intrusion by animals. Existing equipment or even chain-link fences can be energized electromagnetically by installing higher voltages nearby. So, AEP's improvements in our area are predominately complete replacements intended to provide the basis for another 50 years of appropriate safety, performance, and cost.

Local demand for power has also shifted over those 90 years. Large industrial users have arisen in rural areas while urban demand often declined due to more efficient lighting and cooling technologies. There are also strategies to shift electrical loads (such as air conditioning or some manufacturing processes) into nighttime hours, thereby reducing the infrastructure needed to meet peak daytime demands. (Editorial note: Industrial facilities are also widely adopting rooftop solar arrays for daytime applications, when conventional electricity is typically most expensive.)

Local upgrades include a patented (by AEP) tower design called BOLD (Breakthrough Overhead Line Design). The tower is effectively a round metal pole topped with a downwardly curved cross-member, also a metal tube. The transmission lines are kept in place by attachments to both structural members. The design is able to carry voltages as high as 345 kV using perhaps 33% narrower easements, 33% lower towers, and a radical (unspecified) reduction in the footprint of each tower. BOLD towers constructed in Fort Wayne are often 40 feet higher than theoretically needed as a safety factor because the design is new.

The breakthrough design works by clustering each of the three circuit phases in a nearly ideal electromagnetic relationship with each other. This reduces conductor (line) heating, coronal effects, surge impedance (by as much as 40%), and surrounding electromagnetic field strength. Currently, each tower may carry as many as two groupings of three-phase circuits (six circuits total) up to 345 kV each. Each circuit may have multiple subconductors.

Extended discussion resulted in the idea that 85% of power produced at a generator's contacts actually reaches customers. Half of the 15% loss is probably used by downstream

equipment within the generating plants. Most of us assumed much greater losses along the transmission system than are supported by AEP or independent online sources.

The current renovation of the power transmission system in just the immediate Fort Wayne area was budgeted at a third of a billion dollars over roughly 3 years. This seemed controversial given public expectations for "local" development of "green" energy. Reflecting our discussion and other sources, future need for a transmission grid will decline with further development of suitable batteries. The technology at this level of power, duration, and cost may be anywhere from 3 to 35 years away. Once available, the history of electrical technology is a slow adoption over a generation or more due to cost and safety realities. For example, the difference between a battery and a firebomb can be tenuous.

In the meantime, a reliable electrical supply has become largely mandatory for basics such as water supply, furnaces, gasoline, and even natural gas. Federal energy reliability and Homeland Security requirements also helped drive AEP's investments. Several FWEC members at the AEP presentation were not happy about two widespread power outages across northern Fort Wayne caused by a squirrel shorting out an electrical backbone erected in 1925. A renovated nearby neighborhood now has sustained and correct voltage, eliminating chronic issues with home electronics and apparently the need for individual backup generators.

Sincere thanks to AEP, Eric Swanger, and longstanding FWEC member and supporter Ron Cotant of AEP.

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## Fort Wayne Coder Dojo





[Fort Wayne Coder Dojo](#) is technology club for kids of all ages but is now comprised of +/- 10 to 14 year olds who share an interest in Minecraft modifications. The next club meeting will take place on Saturday December 5th at 1:00 on the [Indiana Tech campus in the Zollner Engineering Center](#) room Z103.

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## **Fort Wayne Astronomical Society**



**Fort Wayne Astronomical Society, Inc.**

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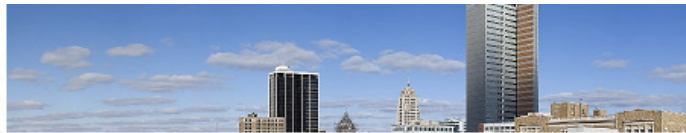
[FortWayneAstronomicalSociety.com](http://FortWayneAstronomicalSociety.com)

The [Fort Wayne Astronomical Society](#) will have a Christmas potluck as their next general meeting on Tuesday December 15th at 6:30 pm at the [University of Saint Francis Schouweiler Planetarium](#).

The December General Meeting will be our Annual Christmas Potluck. All are invited to bring a dish, dessert, or cookies to share. Ham and Turkey and drinks will be provided along with tableware. Please bring your own serving utensils. See you there.

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## **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.

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## **Northeast Indiana DiscoverE Committee Meeting**



[Northeast Indiana DiscoverE](#) is a standing committee of the FWEC. The committee will meet on Monday December 7th and Monday January 4th 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](mailto:fwtoolman@hotmail.com).

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## 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):

### December 1985

Science museum and projects scheduled for January meeting.

Eureka Express, designed as a traveling museum, to bring to Indiana people working exhibits primarily of electrical history and development with hands-on experiments for the entire family from children to adults. This will be a family program so plan to save the fourth Thursday for this unique program.

Science museum proposed for Fort Wayne:

Following a beginning in the Eureka Express science exhibit, planned as a traveling exhibit, talk of establishing a permanent exhibit with working models in the old City Light Plant, is a possible welcome use for an aged and no longer viable power plant.

Much of the existing equipment could be included in the initial exhibit. Much cleanup would be required, but with the many volunteer organizations in the city including RSVP, and

the recent restoration of the Embassy Theater this project could be entirely feasible.

With the past history of Fort Wayne as a world center for many industries this museum could well augment the current museum in the old City Hall which is oriented more to the social background of the city. This would parallel the Chicago concept of the original and separate Field and Rosenwald museums of history and science.

It would serve as an educational tool and stimulus to tomorrow's youth in their vocational direction. Fort Wayne has been very successful in its past technical and manufacturing direction and to maintain this position or to recover some of its past success we need this kind of promotion and goal setting values to attract and impress today's and tomorrow's youth.

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