Fort Wayne ENGINEERS' Club

Engineers' News November 2018 Vol. 81 No. 3

www.FortWayneEngineersClub.org

Find us on

November Tour

Gordon Tool
1301 OH-49, Payne, OH 45880
Thursday, November 15th at 6:00 PM

November Tour - Hobby, Job, and/or Career Opportunities In Machining.

(Editorial note: Please think about bringing young people and spouses. This has endured as a flexible, well-paid, and healthy long-term income opportunity even during the 2008 recession, sometimes offering paid on the job training. Age or gender have not been much of a factor, including spouses with empty nests.)

Anyone interested in Machining, Design, Engineering, or any other mechanically oriented line of work will find this worthwhile. It is intended to be an educational tour for anyone regarding the fields of Tool & Die, Design, or Engineering.

Gordon Tool is a small privately held Machine Shop. The tour will encompass the advantages of and challenges of manufacturing both prototype and small run parts used in all areas of the American economy. Parts produced at Gordon Tool can be

found in ambulances, Olympic ski-sled, mold or progressive dies used to manufacture any variety of consumer product. Skilled tradesmen at Gordon Tool take pride in their abilities to produce high-quality parts from engineering drawings provided by customers. This evening will include the machine shop with a number of CNC machines including Mills, Lathes, Wire EDM, and Water Jet.

Annual Membership Dues

PLEASE SEND DUES. Your dues payment $5-$11 is extremely important in sustaining the opportunities for yourself and others, including young people of your families and the Fort Wayne area in general.

Dues are $5 for students and $10 for non-students, plus another $1 if paying online (FortWayneEngineersClub.org). Checks made out to "Fort Wayne Engineers Club" may be mailed to Ryan Stark, 828 West Oakdale Drive, Fort Wayne, IN 46807.

Thank you, sincerely, for supporting a year's worth of tours, newsletters, and special activities. A lot gets done at $5 and $10. Fort Wayne Engineers Club is a nonprofit 501(c)(6).

December Social

An Open House (come and go as you please) informal social is being planned for Saturday, December 8, from probably 4:00-8:00 pm at the Rod Vargo and Joan Woerner home at1123 Ludwig Park Drive, just south of Smith Field's newer terminal.

PLEASE BRING YOUR OWN DRINKS EXCEPT for bottled water (tap water also "award-winning"). Folks have too many strong preferences to anticipate needs. Two dedicated refrigerators will be available, and multiple microwaves for the hot end of needs.

The house has a lifetime of curiosities and such, including for kids (but not child-proofed). Three of Joan's & Rod's young adult sons will be here, likely full of good chat including paths to becoming self-sufficient. One has a decade of experience importing honey and other items from around the world, particularly parts of west and east Africa "where no one has seen a white person before." He grew up in California and is based in downtown Boston. Another son, visiting from Minneapolis, has spent a decade focused on managing urban environments. A third is an EE from Rose-Hulman (2017) who is becoming responsible for electrical aspects of a steel mill near Lake Michigan. A young friend may attend who trained at FWCS-Anthis and Ivy Tech in airline engines and maintenance. A popular woodstove in an enclosed back porch will also be available.

Expect pizza and a variety of food. Requests and suggestions prior to the gathering are very welcome (416-0986).

Some parking will be on the grass. Look for blue lines. Do NOT park on the asphalt part of the driveway because that blocks parking spaces.

Future Tours

January tour: Northeast Indiana Regional Coordinating Council (NIRCC)
Thursday, January 24, 7:00 pm, Citizens Square, Room 030 (the nice "Courtroom", NOT the Omniroom, in the basement)

The Director of NIRCC will provide an overview and then be open for serious give and take regarding virtually all transportation planning and priorities from now through 30 years into the future. NIRCC has a history of following through on properly researched suggestions. They tend to effectively navigate political factors, various trends and fads, and funding sources.
Contact Rod Vargo (416-0986) if needed.

March tour (nothing available yet for February):
TekVenture's new location and expanded areas of interest.
March 21, 2019, at 1550 Griffin Street, near the Hosey Dam.
Starting time will probably be 6:30 or 7:00 pm.

TekVenture has steadily upsized and updated since its start in a trailer downtown. Current plans for March 21 call for TekVenture's specialists to demonstrate the work areas and guidance which are available to young people and adults. A few simple projects may be available to make during our tour.

Most of TekVenture is intended for all ages. Expansions include theater, woodworking, and an active Fort Wayne Inventors Club. The FW Inventors Club is also potentially helpful if interested in patent law.

Northeast Indiana DiscoverE

This chapter of DiscoverE is a subcommittee of Fort Wayne Engineers Club and its annual cycle revolves around national "Engineer's Week" each February (officially the 17th-23rd this season). Pertinent dates for 2019 (see www.DiscoverE.in if needed):

- December 31, 2018: Requested deadline for committing to a college scholarship donation this year. Are tax-deductible and/or suitable as advertising expenses but NOT as a charitable deduction.
- January 11 (Friday): DEADLINE FOR COLLEGE STUDENT SCHOLARSHIP APPLICATIONS (each $1,000, plus Banquet expenses).
- January 26 (Saturday): Future Cities competition (physical models) at Purdue University, Fort Wayne.
- February 8: deadline for reserving February 23rd Banquet tickets.
- February 16 (Saturday): Junior high school (i.e., middle school) Bridge Building competition (destructive testing) at Concordia Lutheran High School.
- February 23 (Saturday): High school level Bridge Building competition (destructive testing) at Purdue University, Fort Wayne.
- February 23 (Saturday) evening: DiscoverE Awards Banquet (awards, scholarships, and speaker) at Parkview Field.

TekVenture Activities & Classes

These are NOT tours. TekVenture is not part of Fort Wayne Engineers Club. They are all volunteers and have relocated to 1550 Griffin Street, near the Hosey Dam. They expanded activities including theater, woodworking, and an active Fort Wayne Inventors Club (also potentially helpful if interested in patent law). Most activities intended for all ages.

- TekVenture is currently running a three-session Introduction to Blacksmith Forging conducted by Brett Wilds, their Master Blacksmith (494-4424). The instruction might be repeatable on a later date upon request.
- ClayWorx is open to interested folks wanting to learn ceramics. Call Tom Sherondy at (260) 580-1964.
- Mick Bierbaum (michaelbierbaum@youthbot.org) is their ElectroWorx guru and running electronics workshops on November 7 & 21 (Wednesdays) at 5 PM.
- AMUG (Arduino and Microcontroller User Group) meets first Mondays of every month at 7 PM at TekVenture. Free to any who are interested in micro controller projects.
- The purpose of TekVenture is to provide space and/or support for essentially any personal or business projects.
- TekVenture also hosts Fort Wayne Inventors Club once a month, typically Thursday evenings but quarterly on Saturday mornings (such as December 8).

FY19 FWEC Board Opening

The FWEC is looking for a Vice-President for the FY19 (2018-2019). 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.

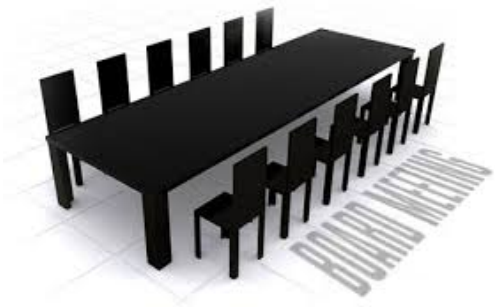
FWEC roster for FY2018-2019

Proposed FWEC roster for FY 2018-2019:
President: John Magsam
Vice President: Open and under discussion; comments and suggestions welcome.
Treasurer: Ryan Stark.
Treasurer Trainee: Volunteer needed.
Secretary: Marna Renteria.
First-year Board Members: Morgan Miller. Another volunteer needed.
Second-year Board Member: Dave Gordon. Another volunteer needed.
Third-year Board Member: Rod Vargo. Craig Welch.
Editor of Engineer News: Maruf Ahmad.
Membership and Contact Chair: Dave Schaller.
Northeast Indiana DiscoverE Chair: Rob Cisz.

Sincere thanks to outgoing Officers and Board Members: Bharat Rajghatta, Elizabeth Garr, Ellsworth Smith, and Jon Cook.

PLEASE CONSIDER STEPPING UP INTO ONE OF THE OPEN POSITIONS. Most require
very little time. The economy is booming, so tasks are being distributed across more people. The outgoing individuals are experiencing increased demands
outside FWEC. Historically, Board Member ages range from high school through retirement. Participation tends to return more than it takes.

FWEC Board Meetings



Fort Wayne Engineers' Club board meetings are open to all FWEC members. The next FWEC board meeting will be on Tuesday, December 4th at 7:00 PM. Board

meetings are held on the Indiana Tech campus in the Academic Center in room ACC-201.

September Tour Summary

BOLT Custom Trucks and Manufacturing tour, October 18, 2018.

Fourteen members participated in an October 18, 2018, tour of BOLT Custom Trucks and Manufacturing at 3900 Transportation Drive in Fort Wayne. This is legally three entities, comprised of BOLT Custom Sleepers; Service Star Trucks or SST; and TEK Coat and Spraying. All are housed in one large modern building capable of housing all operations and large trucks under their care, sometimes for over a year. BOLT exists because mass-produced truck units may not address mandatory requirements for performance, comfort (sustainable ergonomics), and/or specialized operations. BOLT up-fits new refurbished and used vehicles.

They are hiring and willing to train. Employees are the limiting factor in meeting demand.

BOLT Custom Sleepers provides an array of somewhat-standardized to one-of-a-kind choices for the space between a driver's cab and a load of virtually any truck, including legal and safety compliance. These choices range from modifications of mass-produced units to completely novel designs. They prefer to work with aluminum up to half-inch thickness, including cabinetry, but a woodshop is onsite. There is usually a ride-softening suspension, often air-ride type, between their finished unit and the truck frame.

Service Star Trucks (SST) provides customized utility working bodies, including the option of the crane(s) up to 7 tons. SST ranges from modifying existing equipment to designing/building from basic materials. They primarily work with steel up to one-inch thickness, interspersed with aluminum where possible to conserve weight. The SST fabrication area could converge at least three bridge (overhead trolley) cranes on a project.

TEK Coat and Spraying was recruited to provide proper in-house protection and finish to the "sleepers" and truck bodies. They also accept outside work, particularly

high-end pontoon boat pieces from our September 2016 tour host, Brunswick boats. As Brunswick emphasized, properly protecting scratch-built metal structures is highly technical, demands attention to detail, and requires multiple dedicated spaces for proper lighting, dust, heat, and atmospheric control. BOLT customers apparently demand the same flawless lack of imperfections and dust as for Brunswick's boats and Allied Recreation Group's bus-like Class A RVs (October 2014 tour) despite huge surface areas.

Outside local partners are utilized for a limited number of specialty components such as fiberglass roof units, various aspects of refrigeration, and extra-thick metal work. BOLT also manages various aspects of aerodynamics and styling. Aerodynamics can be functional and/or aesthetic. EPA priorities seem to have evolved from engines to aerodynamics.

Except for woodwork, virtually all work starts with CAD designs which in turn generate crisp laser-cut metal pieces and then precision PLC instructed bending/braking, among the thickest and largest seen on our tours. These are hand assembled into impressively crisp assemblies using jigs and other supports, welded and adhesive caulked, prepped for corrosion control/painting, insulated, and other steps. CAD designs require days to weeks of labor to develop and are considered their second most important resource, after their employees. Wood is used primarily for some aesthetic considerations (such as some cabinet doors) or when CAD design (required for laser cuts) would be too costly in labor for some one-of-a-kind units. They employ six engineers with degrees and another six who are self-taught but equally capable. An unspecified number of additional employees are on first shift. A lack of available people limits the second shift, which we toured.

The all-metal structures are clearly designed to interconnect for structural integrity and transfer of forces for long-term fatigue and vibration resistance, as well as crash safety. Widespread use of Huck Bolts (as well as welding) was repeatedly emphasized for those same reasons and for advantages compared to welding (Ed.: www.afshuck.net/us/en). Cabinet lips and bends appear mutually reinforcing and often clearly designed to retain potential flying objects in cabinets. (Their literature claims the best integrity in actual crashes and top-end durability.)

Regulations regarding the overall length of trucks are more flexible in the United States (not necessarily Canada or Mexico) than years ago or what the internet may say. A truck-tractor may be up to 40' long and still normally haul a standard 53' trailer. "Straight" truck or RV frame lengths can be more variable, depending in part on axles (number and strength) and what level of license the driver holds. There are also criteria for onboard cranes and outriggers, particularly concerned with a torsional twisting of the truck's frame.

Weight and number/positioning of axles now receive more stringent enforcement nationwide. Normally, a longer truck has the same legal gross weight as any other truck, so its payload is theoretically less.

Factors driving much of BOLT's businesses are (in rough order of importance) scarcity of commercial drivers ("CDLs"), increasing need to accommodate two adults per truck, more stringent enforcement of weight limits, and computerized logging of driver rest periods. The driver shortage is primarily due to workers and spouses demanding sustainable lifestyles and relationships, which now often includes better onboard accommodations and/or spouses traveling together. The need to accommodate two adults also often includes one person driving while a second driver (increasingly a spouse) is properly restrained in bed. Strict enforcement of weight limitations and enlarged equipment specifications (tool, compressor,

generator, spare parts) have driven utility trucks from two axles to three, seriously disrupting traditional designs of utility bodies. Computerized logging reduces faking of logs to some extent, but significantly forces rest stops in awkward situations or timings for many industries.

"Sleepers" are now routinely 8' or 12' long (8.5' wide) with ample headroom and potentially RVs (including shower). A nearly 21' unit with wheelchair accommodations (for a wife) was being assembled during our tour. Married couples of virtually any age are in great demand (one or both with CDLs), working for regular income or for retirement touring. There can be time for sightseeing before choosing another load and destination. Some retired truck drivers prefer an RV with a real truck chassis.

Many Sprinter vans have been equipped with accommodations for two drivers in the Sprinter's existing mid-section and a specialized cargo area in the existing rear section. These provide "expedited" services which operate effectively nonstop until a delivery is completed. Sprinter vans are somewhat outdated and being replaced by full-size trucks with sleeper and cargo boxes blended on one frame. These loads often require refrigeration, which BOLT partially designs and installs, and partially subcontracts to specialists.

Another primary application for large "sleepers" is when loads or equipment require 24/7 oversight while parked. These routinely include business or household moving services, transport of new vehicles, and defense contracts.

A full-sized "sleeper" application currently undergoing extensive research and development by BOLT is crew cabs for 5-7 people, with 4-6 doors. Demand for these includes "recreational" uses (auto racing or large boats), the oil industry (heavily dressed large people traveling huge distances under difficult year-round conditions), defense contractors, and presumably emergency response teams (not much interest yet). The oversized crew cab dual-rear-wheel pickups and SUVs are too small and light duty. (Ed.: The need routinely witnessed in vast Dakota and West Texas regions.)

A variation on the crew cab is space for automatic pickup or deployment machinery (such as trash or construction zone "barrels") immediately behind the driver's position, often with the driver moved to the right side of the vehicle. This could accommodate BOLT's custom-made cranes.

A downsized application is space for 1-2 sleeping bunks on medium and light duty trucks. Various industries in remote U.S. locations need to sleep when possible or comply with Federal regulations for rest. Distances or time can prohibit shuttling to/from homes or motels, before considering motels in oil regions are typically full and command $200-$400/night.

Established BOLT scratch-built designs have typically undergone extensive safety testing and considered customer feedback. Variations on these are often less expensive than modifying existing mass-produced equipment. Many modifications or truly one-of-a-kind requests require destroying an expensive prototype by a certified third-party testing contractor (also expensive) for regulatory compliance of seat belt performance, bed safety restraints (typically nets), and various crush resistance of the roof structure (factoring in payload behind the cab and accommodations).

The full-size "sleeper" variations typically have a one-piece (rarely two) fiberglass roof with a hidden indentation in the middle and rear. This provides structural strength for roof regulations and a functional location for conventional RV air conditioner, roof vent(s), satellite receiver(s), and more.

An auxiliary power unit (APU), typically diesel, can service sleepers and/or truck bodies. Most trucks do not idle their main diesel engines for long because of idling clogs pollution control filters, increases maintenance costs/downtime, and has other disadvantages. The APU (minimum 8000 kW), batteries, and rectifier(s) (minimum 18 amps @ 110 v) typically provide heat, roof-mounted AC, power roof vent, conventional 7 c.f. Norcold refrigerator with separate freezer, hot and cold running water, convection/microwave oven, cooktop, and various electrical and electronics options (RV-style plug-ins, satellite, etc.). Toilet was mentioned as at least a porta-potty, which can be quite satisfactory nowadays (see June 8, 2017, report).

Service Star Trucks increasingly designs components which can be varied in size. This allows mixing and matching cabinet types and sizes, load beds, and load-bed roofing as needed despite varying axle requirements, crane outrigger requirements, ages of trucks, and other unique factors. Essentially instead of a rear bumper, a complex working platform can extend behind the utility body. The underlying truck is frequently a refurbished older unit being repurposed, or remodeled after an accident. Real-world requirements have steadily grown bigger, heavier, and more brutal.

In addition to cranes, already mentioned, SST installs lighting, power supplies, compressors, shelving, and more. There were scores of details such as blowers to pressurize cabinets for the exclusion of off-roading dust.

Our deepest sincere thanks for a remarkable peek inside the ever-changing demands and economics of heavy trucking.

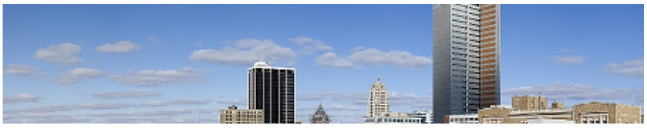
FWEC Membership

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.

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.

Northeast Indiana Chapter Project Management Institute



PMI Student Night- Thurs, Nov 15th, 2018: 6 pm

This is an outreach function of the Project Management Institute - Northeast Indiana Chapter were we help northeast Indiana manage projects. Each year we place students in close proximity to Project Management Professionals in a variety of verticals such as business, information technology, healthcare, manufacturing, construction, etc. These professionals represent several area companies. Some may be looking for interns or employees. It is a networking event so bring your "A" game. Be prepared to meet people.

This free event is a part of the PMI NEIC outreach to our project management community. This event is open to any collegiate students studying components of project management, majoring in project management, or studying to sit for the project management professional certification.

The evening will feature a casual networking atmosphere with a few icebreakers, soft drinks, heavy hors-d'oeuvres. Members of the local chapter will host the students. The PMI-NEIC want to place these students in proximity to current project management professionals, companies, and recruiters looking to hire individuals that understand how to manage projects.

The event is free to attend but space is limited. Students of local colleges are invited.

Details

Who: Project Management Institute Northeast Indiana Chapter
What: Student Night
When: Thursday, November 15, 6 to 8 PM
Where: The Fort Wayne Woman's Club, 402 W Wayne St, Fort Wayne, 46802
Attire: Not less than business casual
Cost: Free - RSVP required – space is limited to 40 guests
For more information or to register contact Clifford Clarke at commoutreach@pmi-neic.org