Fort Wayne Engineers' Club

Engineers' News October 2021 Vol. 84 No. 2

www.FortWayneEngineersClub.org

Find us on

October Tour

AQUA SM

An Essential Utilities Company

When: **Thursday, October 21st at 5:00 PM**

Website: https://www.aquaamerica.com/

Info: Aqua Indiana is a regulated public utility that provides water and wastewater services to 30,000 customers across Indiana. Their 44 employees are industry professionals who live in the communities we serve and are committed to protecting and providing Earth's most essential resource – water. Aqua currently provides water and wastewater utility service in Allen, Clark, Crawford, Floyd, Hancock, Hendricks, Huntington, Lake, Marion, Montgomery, Morgan, Porter, St. Joseph, and Whitley counties.

Address: 9741 Woodland Ridge East Fort Wayne, IN 46804

Directions: From downtown, take Jefferson Blvd west past Liberty Mills Road. Turn left on Rolling Hills Parkway. At the traffic circle, take Woodland Ridge East to the right (heading west). Aqua Indiana will be on your left. There is plenty of parking and the

area is well lit. No open-toe shoes are allowed. The facility might be hard to find, so please see the map link below.

https://goo.gl/maps/7dgSKbreVeEJF9XJ8

September Tour Summary

by Rod Vargo

Date: September 16th, 2021

Across the space of 25 years, APT Manufacturing Solutions moved to larger buildings three times and then expanded that last building three times, to currently occupy 75,000 modern square feet. There are about 30 engineers among 95 employees. The business is a tapestry of skills, which merge to create high-speed fully-automated lines, such as material-handling or packaging, for well known corporations. It is ISO 9001 certified.
Their website aptmfg.com is well done and potentially worth sharing, particularly with FWEC adolescents and parents. A dominant factor for its success and worker retention appears to be a long-term commitment to effective in-house education, evolving each individual's role in the company.

For more, click here to read the full summary

New job posting listed

The club accepts both job openings from around the area, as well as resumes from those seeking employment. Please submit these to the following email address: Info@FortWayneEngineersClub.org

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Welcome new members to the Club

Volunteer positions within the Club

This month's spotlight is on the position of Website Editor

The club is currently in need of a website editor. While this might sound like a daunting position, it is really a fairly easy job. It involves making updates to our current website, which is hosted locally and uses a program called WordPress for editing and design. The typical monthly job entails updating the home page to display the current month's tour and any other minor modifications that are needed. It is estimated that you'll spend roughly 30 minutes to an hour each month doing this job. If you're interested in learning a new skill and would like to help the club, please contact Ryan Stark at Info@FortWayneEngineersClub.org

Local Opportunities

Experimental Aircraft Association Chapter 2
The Experimental Aircraft Association's Chapter 2 is very active. Check the EAA-2 website for current information!

TekVenture
See Facebook or www.tekventure.org for updates.

General Info

Fort Wayne Engineers Club dues are $0. Donations are welcome but strictly voluntary. In recent years, club funds have helped support Discover-E, the Regional Science and Engineering Fair, annual bridge building contests in schools, academic awards, networking events, mentoring, our website, and facilitating free tours. Please see FortWayneEngineersClub.org, LinkedIn, or Facebook for updates on current Club activities, other news, and/or prior newsletters.

Those participating in activities through FWEC and our hosts does so strictly at their own risk, including disease exposures. Participation in club events is voluntary, free, nonprofit, and solely for the benefit of participants and the community at large. Anyone

with an interest may participate unless restrictions are specified for specific events, such as minimum age or minimum safety attire.

Interested in hosting a tour?

Contact us at Info@FortWayneEngineersClub.org

FWEC Board Meetings

The FWEC board meets eight times a year to plan and organize tours for our members. These meetings are open for anyone to attend. We are always looking for new members to join our team! If you are interested in being a board member please attend our next board meeting or contact us at info@fortwayneengineersclub.org.

Next Meeting
Date: Tuesday November 2nd, 2021
Time: 7:00 pm
Location: Blackstone Laboratories 502 E Pettit Ave, Fort Wayne, IN 46806

September Tour Summary Continued

Most of the lines are built and finished in-house from scratch except for basics such as robotic arms, PLCs, and a portion of the software (FANUC, Rockwell Automation, Miller, and APT Manufacturing brands apply). A lot was said during our tour about what different colors mean, and why. The "tapestry" mentioned could be thought of in four dimensions including time factors which ranged from the immediate capacities of automated lines, to incessant change in technology, safety, and standard practices. Potential automated lines are designed, built, tested, and initially demonstrated to end users in APT's facility. They are then relocated, installed, and given final testing at the clients' locations by pretty much the same engineers and staff, providing travel and breaks in routine.
APT requires focus and commitment, but also clearly assures time for family life.
The high proportion of engineers among employees reflects the complexity of these individually designed and customized lines. Various approaches including 3-D printing are used to prototype working heads for the robotic arms. Their worker protection techniques can include combinations of physical barriers, invisible light curtains,

sensors to monitor workers in the area, and more. Stresses on moving parts are electronically monitored and distributed as evenly as possible, in order to minimize breakdowns and predict when parts would need replacement during scheduled maintenance periods. A reason for the multiple worker safety features is to slow equipment as workers approach critical areas, avoiding abrupt emergency stops from high speed.

Electrical configurations and cabinets are essentially unique to each line. Literally all of us were deeply impressed by the philosophy and consistent discipline evident in the panels. Anyone could identify the purpose of a wire and follow it without touching the system.

Analogous to APT's wiring philosophies, we were shown features programmed into displays and built into the production lines which speed and foolproof routine maintenance or troubleshooting, with minimal handling or contact. Overall, unscheduled in-person service trips to client facilities have been nearly eliminated.

You would think the clarity designed into the wiring and systems would have become industry standard practices years ago. What we saw was refreshing. Our tours and personal experiences over recent years have increasingly indicated a world where a worker's static electricity can fry the microelectronics in products. OR, at the other extreme, voltages and fields have increased dramatically.

Our tour included projects underway across the breadth of what FWEC might call automated packaging, boxing, palletizing, and logistical load staging.

Structural and other components are designed and fabricated in-house, such as platforms, most parts of conveyers, sensor brackets, barriers, and enclosures. This developed over time. Pieces and parts were being actively extruded, machined, and otherwise produced by largely automated equipment, while a venerable CNC/manual machining station was clearly ready to go for in-house educational purposes. Welding, fabrication, and powder coating effectively have their own shop building with laser cutter (12' x 8' work size?).

An underlying theme behind APT has been successful accretion of business opportunities as they arise. Ideas were embraced as long as they made financial sense, despite additional complexity such as expanding and diversifying manufacturing abilities. This is significantly different in business philosophy from many of our tours, which arose as separate companies because employers had viewed customer requests as a distraction.

As a result, APT is a collection of interwoven ventures. Its commitment to in-house training of promising adolescents and existing employees led to burgeoning demand for educational purposes (small versions of automated equipment, specialized industrial training including correct wiring of electrical control boxes, and support materials).

APT's brackets for holding sensors has mushroomed into a "Swivellink" product line that dominates some types of production lines and fills a 42 page catalog. When time permits, imperfections are machined out of engine castings from another business nearby. Two automated monsters from the 1960's (kept workplace compliant) machine venerable transmission gears. (Most automotive contracts proved unprofitable but

some specialty niches are viable, facilitate nearby business activity, help retain skilled employees year-round, and attract further opportunities.)

APT's quest for effective education resulted in, to quote their accurate website, a "commitment to building training systems and curriculum that teaches Industry 4.0 and IIoT (Industrial Internet of Things) manufacturing in vocational schools, trade schools, and universities throughout the United States." APT coordinates closely with Ivy Tech and is building units for Indiana Tech, among others.

But embracing ideas is not enough. APT consciously develops products in ways to be unique, relatively hard to merely copy, and draws in cooperators such as distributors with existing track records. There is not enough room in this report to relate APT's candor about maintaining organizational rigor in terms of business plans/planning, law, and finance.

Fort Wayne Engineers Club has tried to attract adolescents into engineering and related careers, with mixed results. APT has worked for years through multiple school venues to attract and rigorously screen high school sophomores (from roughly a 25 mile radius) to select 10 of them for an in-house shop, industrial arts, and manufacturing curriculum during most afternoons of the Junior year. The Juniors are mentored to help discover their individual interests, if any. Their program may continue in the Senior year by focusing on the skills needed for each individual's interests. After graduation, training may continue in formally-registered apprenticeship and/or college programs. These require various contractual commitments by employee and APT, but can be exited.

The roles and responsibilities of APT engineers also seem to be moved along to maintain their engagement and expand abilities. Desk spaces are set up in groups, with excess capacity to allow physical relocation as projects change and interactions shift. Sales or marketing seems to be among the pinnacle roles, such as drafting concepts for current customer needs, then passing designing and execution to coworkers. (FWEC has long advised that marketing can be a great engineering career.)

APT seems unusual in formally using design tools from pencil sketches to CAD.

The lifelong in-house training approach tries to determine an individual's best fit before starting professional training. Even the selection process appears to be career counseling. This is largely the opposite of conventional educations.

There was discussion of the difference between "certificates" and "certifications", and the importance of what organization was issuing the certification. Viable certifications, apprenticeships, and degrees are valuable.

There were also refreshing dialogues on so-called "attention deficit disorder" being a functional ability to organize and systematically focus in a stepwise fashion while multiple complex situations compete for immediate attention. It also helps in delegating tasks. Recognizing human factors, particularly in young minds, helped APT evolve its educational approaches, retain skilled workers, and sustain its accretion model with rigor. FWEC and news sources regularly note that about half of current-era technology and entertainment leaders are college dropouts. Successful business startups rarely

involved more than a Baccalaureate.
Some of us noted that a touch of autism helped ignore detractors and/or to function in dire circumstances.
Demand for automation has been strong despite pandemic issues. APT correctly believes on-shoring will continue as globalization adjusts. In that environment, their products can facilitate adequate wages, competitive prices, and wider job opportunities.
THANK YOU to hosts Tony and Shelley Nighswander for a truly deep and candid glimpse of a complex and ever-evolving endeavor.

FWEC roster for FY2021-2022

President: Nate Berndt
Vice President: Open
Secretary: Marna Renteria
Treasurer: Ryan Stark
Treasurer-Trainee: John Magsam
First-year Board Members: John Magsam, Mike Magsam
Second-year Board Member: Dave Gordon, Bert Spellman
Third-year Board Member: Craig Welch, John Renie
Editor of Engineer News: Open - interim: Ryan Stark
Membership and Contact Chair: Dave Schaller
Northeast Indiana DiscoverE Chair: Open

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.
