

# The Drawing Board

NSPE-PA

® READING CHAPTER  
PENNSYLVANIA SOCIETY OF  
PROFESSIONAL ENGINEERS

March 2020

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## *Future Chapter Events*

- Berks Packing
- Bollman Hats

## Tour Summary

### *Glen –Gery Mid-Atlantic Plant*

On December 12, 2019, the Reading Chapter and guests were hosted by the Glen-Gery Mid-Atlantic Plant for a tour of their brick manufacturing operation, located off of Route 61 in Shoemakersville. Tour guide Rick Bogoniewski (in center of photo below) provided an excellent walk through of the entire plant and was able to effectively answer all the questions that our group of engineers could throw at him. The Glen-Gery Mid-Atlantic Plant was constructed in 1970 and is able to produce over 90 million bricks per year and can store an inventory on-site up to 22 million bricks. Two shale quarries adjacent to the facility provide raw materials for the brick product. The shale is first coarsely crushed and then crushed to a finer state before being screened. Other materials such as sand are added to the formulation to achieve certain finishes. The 400,000-square foot facility includes a mass production facility that utilizes large-scale equipment to shape, fire, and finish the brick product. Along the way we were able to witness specific equipment in action and adjustments needed by the manufacturing staff, which was a tour highlight. Another highlight was witnessing manual artistry in the custom brick manufacturing area, which features numerous custom-shaped brick molds to satisfy specific customer requests. Visit a Glen-Gery supply center and see what a diverse product line they offer!



## Message from the President

Growing up in Massachusetts, this time of year I was filled with hope that during the night, enough snow had fallen to cancel school for the next day. I would gladly shovel out the driveway for a chance to build snow forts and watch The Price is Right! Not much has changed, I still do like the occasional snowfall and what is typically a slower few months after the holidays.

This winter has been a little different than those of recent memory. Not only have we seen little to no snow, but also for the last few months both my workload and PSPE events have been keeping me very busy! I wanted to highlight a few of the PSPE sponsored events and activities that our Board has been involved with which shine a light at the amount of talent that can be found right here in Berks County and our state of Pennsylvania.

A hearty thanks to those who volunteered at the annual MathCounts competition, which our Chapter organizes and runs. We had about 100 middle-school students ranging from 6<sup>th</sup> to 8<sup>th</sup> grade participate. The highlight for me is the lightning round, which is more like a Jeopardy-style question and answer. Questions which would take me about 2 minutes to answer are typically answered by competitors within 10 seconds!

During the past week, I was lucky enough to serve as a judge in the BCIU (Berks County Intermediate Unit) PA Governor's STEM (Science-Technology-Engineering-Math) Competition. There were seven Berks high schools that competed in a written and oral presentation on a product that would improve the lives of Pennsylvanians. Products to improve the nutrient removal in our waterways were a highlight and very creative.

As some may have heard, the annual NSPE conference will be held in Philadelphia this year. Our Chapter assisted in deciding the presentations and seminars which will be held during this event. After reading through multiple abstracts regarding innovation in engineering, the conference should be an exciting event not to be missed!

Events planned in March include the annual Science Fair for high school students held at Albright College and a seminar being held at Penn State Berks on the first Monday. Many more opportunities will be forthcoming for those who are interested in getting involved. Feel free to contact me.




### *Pennsylvania Society of Professional Engineers* Reading Chapter

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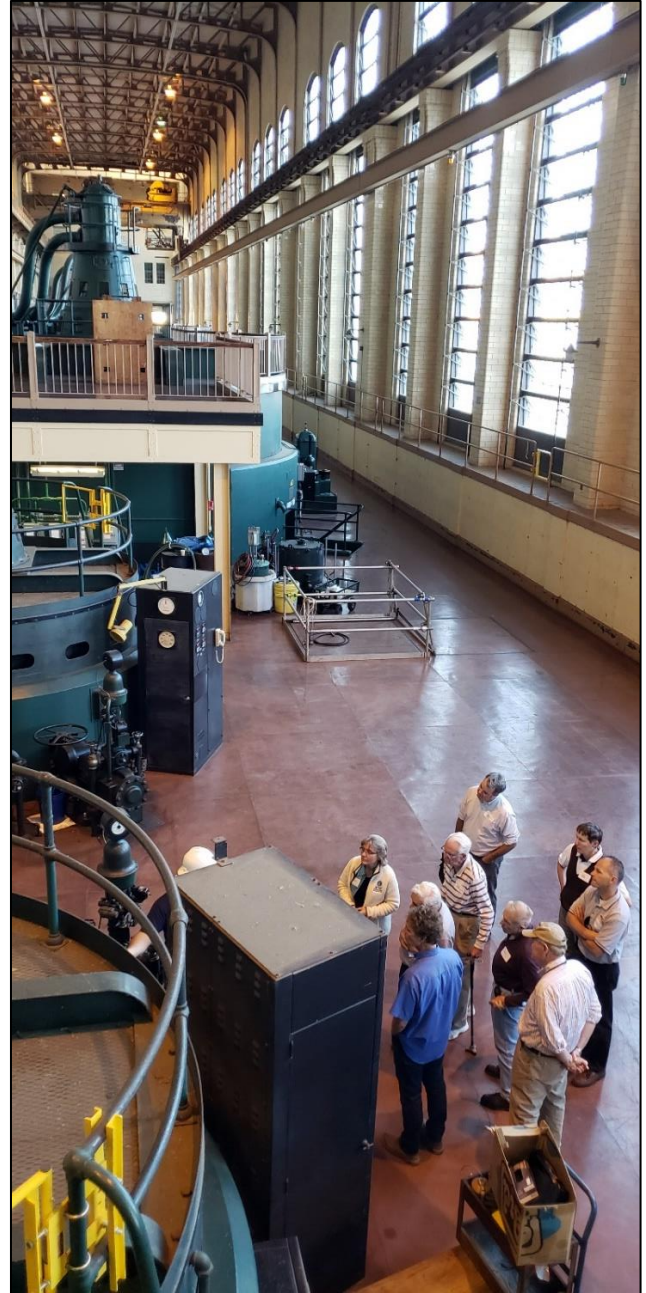




## Tour Summary

### *Safe Harbor Hydroelectric Dam*

The Reading Chapter and guests took a comprehensive tour of the Safe Harbor Hydroelectric Dam on October 10, 2019. The nearly 90-year old concrete gravity dam is located on the Susquehanna River between York and Lancaster Counties. Technical Manager Erik Schlagnhauer led the group tour, which ended up being a highlight for the year based on Erik's knowledge and the sheer magnitude and condition of the hydroelectric plant. The facility can generate over 400 megawatts of power from its 12 turbines, and can be operated remotely due to recent improvements made after it was acquired by Brookfield Renewable in 2014. The tour group was particularly impressed by the instrumentation in the original control room. The dam also features a fish lift to ensure that American Shad looking to spawn upriver can pass.





# Hard Hats are not Forever!

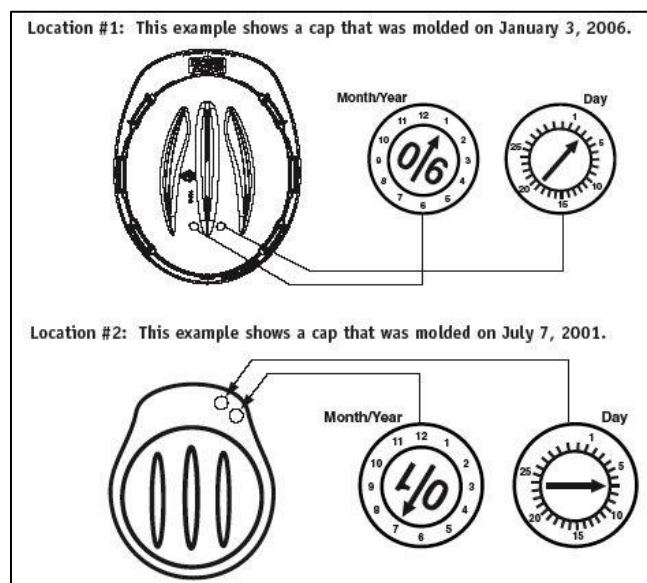
*Matt Boggs and Ron Hunsicker*

Two years ago, Ron attended “*Job Site Safety Fundamentals for Architects and Engineers*” at the headquarters of the Eastern Pennsylvania Chapter of the Associated Builders and Contractors (ABC). In fall 2018, seeing all the hard hats on the classroom tables at the start of the tour of the Reading wastewater plant, he was reminded that, barring damage, the ABC recommends discarding hard hats when they become five years old. A date code, usually on the underside of the brim, indicates when the hat was manufactured. A second date, often written on the ANSI stamp, which is usually on the underside of the crown, is the date the hat was placed in service. Hoping to rile the wastewater plant tour attendees, Ron asked, “How old is your hard hat?” Matt’s 1993-vintage hard hat (since replaced) was not the winner; one from 1987 took the “prize.”



**Ron’s heirloom 1971 hard hat. Only the year is marked.**

Neither the American National Standards Institute (ANSI), which promulgated the physical requirements for the several types of hard hats (ANSI Z89.1-2014 (R2019)), nor OSHA, which mandates when a hardhat must be worn (29 CFR 1926.100\*), have regulations or suggestions about when to discard them. For that, we have to rely on recommendations from labor and contractor organizations and vendors—those who sell hard hats.



**Examples of date code markers**

Answer “yes” to any **one** of the following questions compiled from a number of sources and it is time to replace your hard hat:

1. Has your hard hat been in service for more than five years? Not when it was made, when it was placed in service. This date should be marked by the user or issuer on the ANSI label or a similar label, (A black Sharpie® works well.) As a practical matter, few likely record the in-service date, so rely on the date of manufacture. (In industrial occupations, hard hats should be replaced after three years of use.)
2. Is your hard hat fading, chalky, or brittle? Grasping a hard hat in both hands and squeezing the hat is a crude physical test. If you hear creaking or other odd sounds, it is time to replace your hard hat
3. Is your hard hat dented, cut, or deeply scuffed?
4. Does your job involve exposure to harsh chemicals? Chemicals, even vapors, can degrade a hard hat. Replace it more frequently.
5. Has your hard hat suffered an impact (Have you “used” it)?
6. Do you leave your hard hat in the car? Heat and sun degrade the plastic.
7. Is the suspension damaged or deteriorated? Even if pristine, the suspension should be replaced every 12 months.

Remember that five years and 12 months are maximums!

Hard hats have looked like hard hats for 70 years. That may change. Current United States testing procedures only have requirements for resisting linear motion. Real impacts and real brain damage often result from rotational forces. A European firm, Guardio Safety, has developed a suspension system that accommodates some of the rotational movement associated with real impacts, absorbing from 10 to 15 cm (0.4 to 0.6 inch) of rotational movement. Absorbing the rotational movements partially insulates the brain from them, limiting rotational injuries. According to An article in the January 20/27, 2020 issue of Engineering News Record, hard hats using this suspension system will be available in the United States this year. (Visit: <https://guardiosafety.com/guardio-armet.html> and scroll down for the video.)

\* 29 CFR 1926.100 regulates the use of hard hats by construction, demolition, and renovation workers. Hard hat use in other industries is regulated by 29 CFR 1910.135.

### Background

When to wear hardhats and when to discard hard hats are discussed in these articles:

<https://www.graphicproducts.com/articles/osha-ansi-hard-hat-requirements/>  
<https://www.coopersafety.com/hard-hat-faq>  
<https://oshatraining.com/osha-hard-hat-questions-blog.php>

There is an interesting discussion of hardhats in the July 2014 issue of Occupational Health and Safety magazine. Go to the following link to read it.

<https://ohsonline.com/Articles/2014/07/01/Twelve-Frequent-Hard-Hat-Questions.aspx?Page=1&p=1>

In its October 1, 2019 edition, The New York Times ran a story about the evolution of hard hats:

<https://www.nytimes.com/2019/10/01/business/hard-hat-history.html>

LinkedIn wades in, too with an excellent article:

<https://www.linkedin.com/pulse/hard-hat-life-based-upon-recommendations-law-terry-penney/>

Finally, strange persons do strange (but illuminating) things to hard hats:

<https://www.youtube.com/watch?v=RPq53jVTHSc>  
<https://www.youtube.com/watch?v=60YHaWiEMeM>

## Off the Board

### What is your name and engineering discipline?

*Lisa Peterson*

*Electrical Engineering, Environmental Engineering, and years of on-the-job experience in manufacturing and operations*

### Where do you or did you work?

*Aftan Engineering, LLC*

### How long have you worked there or been in business?

*Aftan Engineering was started in 1996 by my father, Karl Peterson, doing custom electronic solutions, typically for automation of manufacturing processes. In 2019, Karl turned the business over to me, so I've been president a little over 1 year now.*

### What do you do there?

*Aftan Engineering provides customized solutions to improve manufacturing processes and ergonomic challenges, Lean Six Sigma consulting, and Environmental Life Cycle Assessment modeling.*

### Any work accomplishments you would like to speak of?

*The greatest joys through my career in industry have been the breakthrough improvements that our teams have accomplished which drove millions of dollars of bottom line savings, improved time efficiency, improved customer satisfaction, and resolved ergonomic issues for our employees. Now on the consulting side, I continue to get great joy out of these improvements for any company interested in pursuing them.*

### Are there other notable employers in your career?

*I spent the first 13 years of my career at AT&T Bell Laboratories and Lucent Technologies, starting as an integrated circuit designer, then with the undersea cable team, and finally with the fiber optics group. After AT&T/Lucent, I joined CeLight, a venture funded start-up company doing LiNbO<sub>3</sub> optical modulators. This opportunity ended in Jan 2002 with the dot-com bubble and tech crash. I then did consulting with Aftan Engineering and A. T. Kearney until joining another venture-funded startup, Covega, doing LiNbO<sub>3</sub> modulators and InP lasers. I remained with Covega for 3 years until it was sold to a firm in CA. Wishing to be a real Berks County resident again, rather than an apartment or hotel resident, I joined Brentwood Industries. I served in their wastewater treatment design group, their injection molding operation, and their thermoforming operation. Finally, I spent a brief time with Legendary Arms Works, a manufacturer of high-end precision hunting rifles, improving operational efficiency*

*and preparing the company for sale in accordance with the wishes of the lead investor.*

**What is your educational background?**

*Bachelor's degree in electrical engineering from Lehigh University, Master of Engineering degree in Electrical Engineering with focus on Lasers and Optics from Cornell University, MBA in International Business from National Technological University, and PhD in Environmental Engineering specializing in Life Cycle Assessment and Sustainability modeling from Drexel University.*

**What licenses do you have?**

*I currently hold P. E. licenses in PA, MD and MI.*

*What historical figure do you admire the most?*

*Marie Curie (born Many Salomee Sklodowska) -- She lost her mother at age 11 and persevered through a life of financial and social challenges; yet she remained ever-curious with a passion for learning and won two Nobel Prizes for her work in Physics and Chemistry. She chose to not patent some of her inventions and humbly refused many awards. I see these as actions of a person who places the betterment of society above their own fame and wealth.*

**Tell us about your family.**

*I am the only child of Karl and Anna Mae Peterson. Karl is a P. E. and was actively involved with the local Reading Berks Chapter PSPE throughout his career.*

*Anna Mae was an elementary teacher spending most of her time in 1<sup>st</sup> grade at Governor Mifflin's Brecknock Elementary School. I am married to Mark Smith, also an electrical engineer who worked for AT&T and is still enjoying his career in integrated circuit test engineering. Mark is currently employed by MicroChip and working out of one of the former AT&T Reading buildings on N 13<sup>th</sup> Street. Mark and I have one son, Erik, who is working for Brenntag Northeast LLC as Quality Lab Chemist/Process Analyst and going to Penn State Berks Campus on a part-time basis earning his Electro-Mechanical Engineering Technology degree. We live on a farm in Brecknock Township and spend most of our weekends working outdoors or on equipment.*

**What are your hobbies?**

*I enjoy music, playing violin, oboe, English horn, saxophones, and Renaissance recorders. I play for church services and musicals in the community as well as with the Allegheny Evangelical Lutheran Church Recorder Consort and the Heritage Trio (Baroque and Classical String Trio). I enjoy the outdoors, taking care of our farmland and hunting. Together with my husband, we do ballroom and Latin dancing.*

**What is your favorite quote?**

*"Life's too short to be anything but happy"*  
by Abhishek Shukla

**What is your favorite equation?**

*$P=IE$  because I love dessert, especially homemade fruit pies and custard pies.*

**What is your favorite book?**

*The Runaway Bunny by Margaret Wise Brown – I enjoy reading this book to little ones, which features a lovingly steadfast mother who finds her run-away child every time.*

**What cartoon character best describes you?**

*Lisa Simpson (although my IQ is not that high and I'm not vegetarian)*

**What trait do you most dislike in others?**

*Taking credit for the outstanding work of your team and blaming someone on the team when your team fails.*

**Name something you'd like to learn to do during your lifetime.**

*I'd like to learn to speak German fluently with a vocabulary equivalent to an average native speaker.*

**What or who inspired you to get into engineering?**

*My father and my uncles who are in various fields of engineering.*

**How long have you been a member of PSPE?**

*1 year*

**Any advice for other PSPE members?**

*Love what you do for a job. If you don't currently love what you do, quit and find what you love to do.*

## Reading Chapter Board of Directors

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# PSPE Reading/Valley Forge Annual Golf Outing

**Friday, May 15th, 2020**  
**1:00 PM Sharp (Shotgun Start)**

**Turtle Creek Golf Course**  
**Registration at 11:30 am / 303 W Ridge Pike, Limerick PA**  
**[www.turtlecreekgolf.com](http://www.turtlecreekgolf.com)**

## **Lunch Sponsor (1) \$1,500**

- Name (logo) full-page ad in Program
- Signage in picnic grove and Foursome
- Opportunity to speak about your company at lunch

## **Hole Sponsor and Foursome \$550**

- Name (logo) in Program
- Hole Sponsor sign and Foursome

## **Foursome \$450**

## **Hole Sponsor (No Foursome) \$150**

- Name (logo) in Program
- Hole Sponsor Signage

## **Single Entry Golfer \$135**

- We will team you up with others!

## **Cart Sponsor \$1,000**

- Name (logo) 1/2-page ad in Program
- Name on cart signs and Foursome

## **Beverage Station Sponsor \$500**

- Name (logo) 1/2-page ad in Program
- Sign at Beverage Station

## **Prize Hole Sponsor (4) \$250**

- Name (logo) 1/4-page ad in Program
- Hole Sponsor Sign
- Opportunity to present sponsored hole prize(s)

## **Giveaway Sponsor**

Popular giveaways for goodie bags and gift cards for contests are always appreciated. We will gladly provide sponsorship opportunities in exchange for such donations. Sponsorship levels will vary based on the total of the value of item(s) donated. Please contact Michael Fischer if you are interested in making any kind of donation.

All sponsors are encouraged to golf and enjoy the camaraderie in this great event!

### **Questions?**

Contact Michael Fischer, P.E.  
[mfischer@sitesafe.com](mailto:mfischer@sitesafe.com)  
 215.205.2130

All proceeds benefit the  
**Chapters' Scholarship Funds and**  
**MATHCOUNTS programming**



**Pennsylvania Society of  
Professional Engineers**



# MATHCOUNTS®

The 37<sup>th</sup> annual Berks County MathCounts competition was held on Saturday, February 8, 2020 at Penn State University – Berks Campus. MathCounts is a competitive program designed to improve and encourage the study of mathematics by junior high school students. The program culminates in one day of mathematics exams for both individuals and teams.

A total of 98 sixth, seventh and eighth grade students representing 15 Berks County schools took part in the local competition, which was sponsored and staffed by the Reading Chapter of the Pennsylvania Society of Professional Engineers (PSPE).

The top four finishers, along with the winning team, will travel to Harrisburg on March 13-14 for the State Competition.

This year's winners were as follows:

## Individual Winners:

### 1<sup>st</sup> Place



**Toby Beougher**  
Wilson West Middle School  
Coached by Christie Viscariello

### 2<sup>nd</sup> Place



**Nikita Patel**  
Wilson West Middle School  
Coached by Christie Viscariello

### 3<sup>rd</sup> Place



**Akhil Kagithapu**  
Exeter Township Junior High School  
Coached by Kathy Topper

### 4<sup>th</sup> Place



**Jason Kaufmann**  
Wilson West Middle School  
Coached by Christie Viscariello

# MATHCOUNTS®

**5<sup>th</sup> Place**



**Katelyn O'Conner**  
Boyertown Middle School East  
Coached by Joan Sartor

**6<sup>th</sup> Place**



**Angela Rapp**  
Wilson West Middle School  
Coached by Christie Viscariello

**7<sup>th</sup> Place**



**Mikayla Riehl**  
Twin Valley Middle School  
Coached by Denise Reid

**8<sup>th</sup> Place**



**Adi Nayak**  
Wilson West Middle School  
Coached by Christie Viscariello

**9<sup>th</sup> Place**



**Thomas Weller**  
Wyomissing Area Junior High School  
Coached by Colleen Vargo and Betsy Santoro

**10<sup>th</sup> Place**



**Hansika Kunduru**  
Exeter Township Junior High School  
Coached by Kathy Topper



# MATHCOUNTS®

## Team Winners:

### 1<sup>st</sup> Place

### Wilson West Middle School



#### Team Members:

Toby Beougher  
Jason Kauffmann  
Adi Nayak  
Nikita Patel

#### Coached By:

Christie Viscariello

### 2<sup>nd</sup> Place

### Exeter Township Junior High School



#### Team Members:

Akhil Kagithapu  
Hansika Kunduru  
Jason Nester  
Thomas Curry

#### Coached By:

Kathy Topper

### 3<sup>rd</sup> Place

### Boyertown Middle School East



#### Team Members:

Katelyn O'Conner  
Joshua Reed  
Nolan John  
Steven Levenson

#### Coached By:

Joan Sartor