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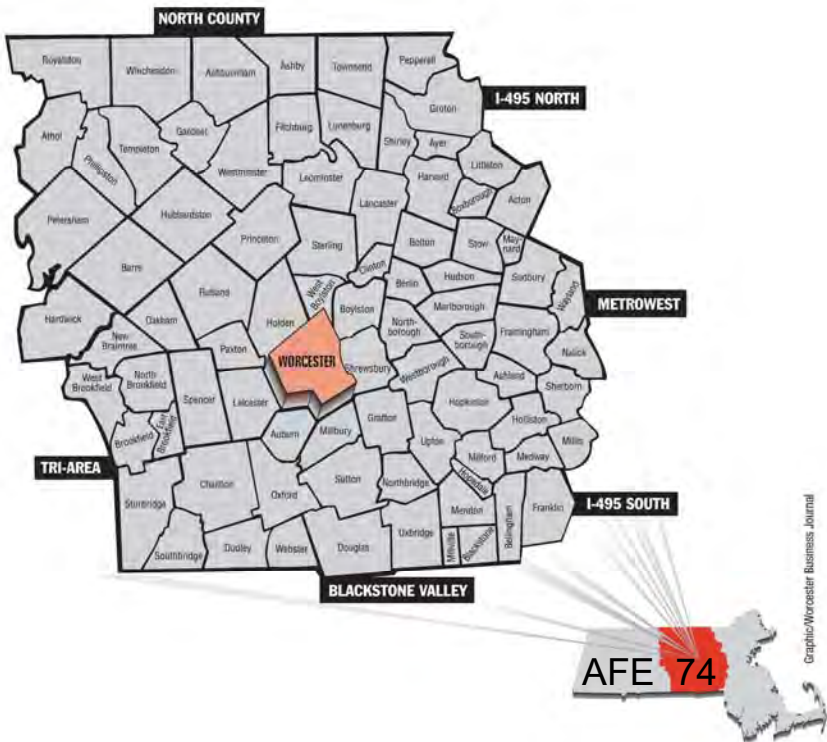
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# *President's Message*

Hello Chapter Members, Supporters and Guests,

2016 is the Chapters 50<sup>th</sup> Anniversary, which is quite an accomplishment! It takes dedicated volunteers and a great succession plan to carry along a nonprofit board of directors for a continuous 50 years. I am happy to report that for 2016 we have a very active Board that will be working hard to provide the best facility tours, meetings and training opportunities for all our members.

I would like to thank Immediate Past President Glenn Carter, CPE/CPMM for all his hard work the last two years along with the 2015 Board of Directors. It's a pleasure working with a great group of people who want to give back to the facilities profession and local community.

This year we have decided to do a Greatest Hits Tour to celebrate our 50th Anniversary and have pulled the best tours from the last 10 years to highlight what's still great in Worcester County. The season brings an excellent variety of tours; from ancient armor and ship propellers to glass making plants and biomedical research centers. Technical presentations will cover Piping, HVAC, Excavation and Energy. Don't forget our 15th Annual Golf Tournament at Stow Acres on June 16th.

Our monthly chapter meetings and events offer great networking, interesting tours and technical information that you can bring back to your facility and put to use right away. We look forward to seeing you all at the upcoming meetings this year where we can Learn, Lead and Influence the facilities engineering profession.

Regards

*Don Gillis*

Don Gillis, CPE  
2016 President, AFE Chapter 74



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## Chapter Meeting and Tour Schedule – 2016

<b>2016</b>	<b>Tour</b>	<b>Presentation</b>
JAN 20 *	Worcester Art Museum Worcester, MA	Awards Night 50 <sup>th</sup> Anniversary
FEB 18	Rolls Royce Naval Walpole, MA	Piping
MAR 17	Ardagh Group Milford, MA	Networking Event
APR 21	Wachusett Brewery Westminster, MA	Energy
MAY 19	Milton CAT Milford, MA	Excavation
JUN 16	Golf Outing - Stow Acres	15 <sup>th</sup> Annual
JUL	Summer Break	
AUG	Summer Break	Board of Directors Meeting
SEP 15	Wyman Gordon Grafton, MA	Ground Penetrating Radar
OCT 20	UMASS Sherman Center Worcester, MA	Maintenance Management
DEC	No Chapter Meeting	Board of Directors Meeting

*\* All Tours and Presentations are tentative and will be confirmed in the monthly newsletter*

*Tours are scheduled for the third Thursday of the month unless otherwise noted*



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# **A**FE Code of Ethics

We, the CPE/CPMM/CPS certificants of AFE, realizing the importance of our industry focus and its affect to the quality of plant/facility engineering worldwide, and understanding our personal obligation to our profession, other related industries, our members, vendors and the communities we serve, do hereby commit ourselves to ethical and professional conduct above reproach; furthermore agree:

1. to accept responsibility in making plant/facility engineering decisions consistent with the safety, health and welfare of the public, organizations we serve, work and live;
2. to avoid real or perceived conflicts of interest whenever possible, and immediately disclosing them to affected parties when they do exist;
3. to be honest, forthright and display a level of integrity in both work and personal conduct;
4. to reject bribery, theft and related acts, in all forms, that may dishonor, defame, and/or disparage the organization, its members or vendors;
5. to improve the understanding of technology, its appropriate application, and potential benefits;
6. to maintain and improve our technical competence via continuing professional development, credentialing and/or networking opportunities, and to undertake technological tasks for others if qualified by training or experience, or after full disclosure of related limitations;
7. to seek, accept, and offer honest criticism of technical work, and/or research, to acknowledge and correct errors, and to credit properly the contributions of others;
8. to treat fairly all persons regardless of their race, religion, gender, disability, age, or national origin;
9. to avoid injuring others, their property, reputation, or employment by false or malicious action;
10. to assist colleagues and co-workers in their professional development and to support them in following this code of ethics.



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Account Manager at 508-740-4185.



## Who we are...

AFE provides education, certification, technical information and other relevant resources for plant and facility engineering, operations and maintenance professional



**2016 Chapter 74 Board of Directors:** L-R Ron Stachelek, Tom Wall, Rich Chown, Erik Parzych, Don Gillis, Glenn Carter, Mark Maguire, Bill LaRoche, Steve Nicholas, Ron Cote, Matt Shields, Mark Strati. Not Present: Mike Kolakowski

## ***Our History***

AFE can trace its earliest roots back to 1915 with a group of plant engineers who informally pooled their talents in Boston. In 1954, the group took the name AIPE or American Institute of Plant Engineers.

Since 1956, AFE went international with the formation of a chapter in Montreal, Canada. In 1995, AFE members voted to change the organization's name to the Association for Facilities Engineering, to better identify with the broader-based technical expertise of its members. Today, AFE is an international organization with active chapters throughout the United States and around the world.

The Worcester Area - Central Massachusetts Chapter 74 has been in existence since 1966. Come join us for a monthly meeting to take advantage of our 50 years' experience in hosting facilities tours.

***Learn, Lead and Influence your profession through AFE...***

**Join today online. [www.afe.org](http://www.afe.org)**

Association for Facilities Engineering (AFE)  
8200 Greensboro Drive, Suite 400, McLean, VA 22102  
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# 2016 AFE Chapter #74 Officers

## **Chapter President**

**Don Gillis, CPE**

Energy Specialist – Harvard Medical School

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## **Chapter Vice President**

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## **Chapter Treasurer**

**Mike Kolakowski, CPE**

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## **Chapter Secretary**

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## **Immediate Past President, Scholarship Chairman**

**Glenn Carter, CPE, CPMM**

Facility Manager - Insulet Corporation

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## 2016 AFE Chapter #74 Directors

### **Board Member, Past President**

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### **Newsletter Editor, Board Member**

**Ron Stachelek, CPMM**

Retired

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### **Board member, Past President**

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### **Board member**

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## 2016 AFE Chapter #74 Directors

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#### **Bill LaRoche, CPMM**

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### **Board member**

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### **Board member**

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2015

# AFE 74

Past Tours

## January Tour – DCU Center – Worcester, MA



AFE Chapter 74 toured the DCU center's \$23 Million dollar concourse renovation including the new main entrance, lobby and box office. A new streetscape along Major Taylor Boulevard and Foster Street sides of building. That included 1,200 square foot retail space at corner of Commercial and Foster Street. We also saw upgrades to mechanical and electrical systems, particularly HVAC system - chiller, cooling tower and emergency generator.



Afterwards we had dinner, networking in the Shark tank followed by premier seats to the Worcester Sharks vs Manchester Monarchs hockey game.

2015

# LIFE 74

Past Tours

## February Tour – Mt Wachusett Community College

Chapter 74 had a great behind the scenes tour of the Mt Wachusett Community College alternative Energy Solutions.

The schools four energy sources were reviewed: two Windmills for a total of 1.5 megawatts, 95KW Solar Field and a Wood Burning Biomass Plant 50KW Gas production module powered by the waste wood chips.



Mt Wachusett has a Total facility square footage of 700,000 sq ft. and services approximately 10,000 students both day and night.

Upcoming energy initiative: New Roof LED lighting with an estimated savings of \$15,500/year.

The tour was followed by a brief meeting; networking and dinner at The Gardner Ale House which was enjoyed by all.



2015

# A FE 74

Past Tours

## March Tour – Lenze Americas Corp

A FE was treated to a great behind the scenes tour of the Lenze Americas Corp facility; formally AC Tech in Uxbridge MA.



Lenze is a global manufacturer of electrical and mechanical drives, motion control and automation technology. Our products can be found in many industries, including packaging, automotive, material handling and logistics, robotics, and commercial equipment (pumps/fans). A global network of distributors and representatives make Lenze perfectly positioned to meet the motion control needs of customers worldwide. Lenze Americas, the subsidiary of Lenze SE of Germany, is headquartered in Uxbridge, MA, with a mechanical assembly and logistics facility located in Glendale Heights, IL.



Following the tour we ate at Gia Ristorante in Uxbridge, MA to Network, conduct a brief business meeting, dinner and a presentation by Don Juozaitis on VFD bearing failure.



2015

# IFE 74

Past Tours

April Tour – MEMA Framingham, MA

Massachusetts Emergency Management Association



Chapter 74 was treated to an interesting behind the scenes tour of the MEMA headquarters. This is the nerve center of the state when we're expecting a natural disaster or other state wide emergency. We found out firsthand what it takes to prepare, activate and respond to state wide

emergencies like the 2015 epic winter snowstorms or preparing for upcoming spring floods and the Boston Marathon.

Built in 1960's on the orders of President John F. Kennedy for every state to have an emergency operations bunker, this Framingham location is one of the only centers to be completed. We saw some cold war technology such as 3' thick cement walls, toilets on bomb rated springs and the front entrance blast door that is 82" high x 76" wide and 9" thick made of ¼" steel weighing 5,600 lbs, to the newly renovated command center where town, city and regional emergency response teams work together during emergencies. MEMA operates with a daily staff of 50 and has 24/7 coverage but that can double during emergencies. There's sleeping quarters with a food and water supply for 30 days if needed. Afterwards we had a great meal and networking at the Aegean Restaurant on RT 30 in Framingham.



**Voted 2015 Tour and Presentation of the year.**

## May Tour- Milford Water Plant



The water treatment facility was placed in service on May 30, 2013 and has a treatment capacity of 5.4 million gallons per day. The Plant treats water from Echo Lake,

Charles River, Clarks Islands and Dilla Street sources utilizing both (Dissolved Air Flotation) filters and (Granulated Activated Carbon) filters to process the raw water. The



(Dissolved Air Flotation) filters combine air and recycled water to form bubbles which float the impurities in the water to the surface of the filter leaving the clean water on the bottom of the filter

which then travels through the plant to the (Granulated Activated Carbon) filters where the water filters through the carbon which removes any remaining organics before it is fed out to the distribution system. Afterwards we had a nice meal at the Alamo restaurant in Milford MA.



2015

# A FE 74

Past Tours

## September Tour- Gillette Stadium –Foxboro



Our fall season kicked off with a AFE Region 8 -New England Social event and tour of Gillette Stadium which is the home of the 2015 Superbowl Champion New England Patriots. We had a nice networking event with 125 guests in the stadiums exclusive Putnam club followed by a great dinner and tour of the stadium, where we saw the locker rooms, stood on the field and enjoyed the sights.



2015

# IFE 74

Past Tours

## October Tour – Ken's Foods

The focus of the tour was Ken's Foods new CHP (Combined Heat & Power) co-generation system. The system will utilize natural gas and biogas to produce steam, hot water, and electricity for the manufacturing plant.



Ken's Foods on-site 2.2 million gallon Anerobic Digester, processes over 125,000 gal of process wastewater per day, and produces a consistent source of fuel (biogas) that will be used in the co-gen system.



Afterwards we had a great dinner at Kennedy's Restaurant in Marlboro followed by a presentation by PPL Savage Alert outlining the operation of the CHP system.



*Liquid on right is from processing plant, on left is water after treatment*



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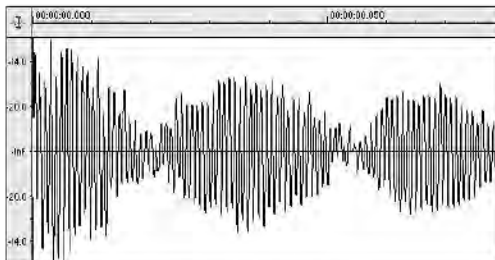
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# Worcester Area – Central Massachusetts

Worcester County lies at the center of Massachusetts and largely defines the Commonwealth's Central Region. Economic flows here have traditionally run north and south along the Blackstone River Valley—a natural link connecting the city of Worcester to Providence, Rhode Island. The development of new knowledge-based industries over the past decade, however, has enhanced the region's ties to the east, and especially to the Greater Boston economy. Central Massachusetts offers countless opportunities.



Worcester is the only city in the country to be a four-time recipient of the All American City Award

- One million people live within a 25 mile radius
- Six million people live within a 50 mile radius
- Eight million people live within a 75 mile radius

Worcester, MA, with a population of about 170,000 people, is a leading New England industrial center and the second largest city in Massachusetts. It is located in central Massachusetts, about midway between Boston and Springfield. Manufacturing, insurance, transportation, and most recently, biotechnological research, are important industries for the city. Worcester County has a current population of 813,745.

The AFE Worcester/Central MA Chapter 74 received its charter to form an engineering association from AIPE (now AFE) in 1966.

Info from [massbenchmarks.org](http://massbenchmarks.org) and [centralma.org](http://centralma.org). Photo courtesy of [vistadome.com](http://vistadome.com)



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## **Benefits of AFE Membership**

### **Networking**

Our members tell us that one of the most valuable benefits of belonging to AFE is the ability to network with others in the profession. Becoming involved in AFE pays off when you need it most. As a member of AFE you'll be able to solve problems and find answers to technical problems through a number of networking avenues.

### **Chapters**

Join a local chapter and network with other professionals in the facilities industry. Local chapters provide programming to specifically meet the local facilities communities' needs. Plant tours are frequently scheduled to view for yourself what others in your community are implementing as best practices. Speakers bring a local perspective to topics of interest in your area. And of course, by meeting with others in your area you'll build a personal and professional network of contacts and friends who will be there when you need help. Here's only one example of how networking with AFE paid off for an AFE member - Jim Dolan, PE, who recently wrote to us.

"To all members of AFE, whom I had contacted last week, let me give you the results of my job search:

Monday - Notice of RIF

Monday - Contact AFE Network

Tuesday - First responses

Wednesday - First resume mailings

Thursday - Follow-up to secure interview

Friday - Call for interview/Interview/Secure position

When I first agreed to "help out" with AFE, Chapter 52, it was with the above type of response that I hoped would be made available for all our AFE members. It worked for me, and it will work for all our fellow members... I want to thank all of you, and I want you to remember that this is what can be done for all... Networking works..." You, too, can access this kind of support with AFE membership.

## **Member to Member Directory**

Need to find someone with some specific expertise? Log on to the members-only area at [afe.org](http://afe.org) and look up another member who can help you. Want to provide help for others? They'll find you here.

## **Career Advancement**

### **Certification**

Did you know that by becoming a Certified Professional Maintenance Manager (CPMM), Certified Plant Engineer (CPE) or Certified Plant Supervisor (CPS), you could earn up to \$11,000 more a year than your co-workers without certification? It's true. Our research has shown that members demonstrating knowledge with AFE's certification programs earn more than those without certification. For more information on the CPE, CPMM or CPS programs, click on the program name.

Learning For professional or personal growth, AFE offers members discounts on educational events tailored to your needs. And AFE makes it easy for you with on-line classes. Click here for more information about your professional development with AFE.

### **AFE Career Center**

Looking for a job? Looking for an employee? Here's the marketplace for facilities experts to find employment opportunities. Click here to post your personal career profile or open position.

### **Webinars**

Timely information on trends, topics, and/or technology all in bite-size time formats of 60 minutes each. They're just the key to fill the educational void of the overly busy plant/facilities professional. These live seminars are jam-packed with useful information for the engineering, operations, and/or maintenance professional, and those who want to work more effectively with related personnel. Miss a live webinar? Don't Worry. Each live webinar is recorded for future member download. All programs and downloads are FREE to members.

### **Information**

AFE Facilities Engineering Journal

Members receive this highly regarded, information-packed magazine six times a year. Members have access to the online archive of articles from the past issues of the Journal.

## **Web**

Your 24/7 portal to the facilities engineering world. Members have access to the members-only area for exclusive information, services, and links to what you want to know.

## **Build Leadership Skills**

### **Professional and Personal Skill Building**

Members who become involved in AFE leadership positions have the opportunity to "spread their wings" by learning new skills. Members can become involved in the local, regional, or national level. Aspire to be president? You can do it with AFE. If president seems too much for you, then serve as a committee chairman to build expertise and leadership skills you can take back to work with you. Click here for local chapter information. Email AFE to volunteer for a leadership position here.

## **Industry Recognition**

### **Get Published**

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## **Worcester Area Chapter #74**

### **Past Presidents – 1966-2015**

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## Certified Plant Engineer

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The Certified Plant Engineer (CPE) program establishes a standard of knowledge for all plant engineers. By targeting specific areas of expertise in a wide variety of fields it enables your staff to produce at a more efficient level in all aspects of their jobs. Some of the areas covered include: Electrical Engineering, Mechanical Engineering, Civil Engineering, OSHA, HVAC, and Economics/ Management. Having a certified staff assures a level of job understanding across the board, creating a unified team able to tackle problems in a timely, cost efficient manner.

What does the exam cover? What is it like?

The Certified Plant Engineer exam is an eight-hour exam with a total of 100 questions in multiple-choice format. Questions cover the electrical engineering, mechanical engineering, civil engineering, economics/management, environmental engineering, maintenance, OSHA, energy, controls and instrumentation, and HVAC. A score of 67% is required to pass.

Am I eligible?

There are two CPE Certification Categories. The first is the CPE category A. With this certification you are eligible if you have a minimum of four years in management in plant/facility engineering or six years in the field overall with a four-year degree in engineering, architecture or a related field. If you do NOT have a degree you must have minimum of six years in management in plant/facility engineering or eight years in the field overall.

With the CPE Category B, You are eligible if you have a minimum of four years experience as a registered professional engineer. Category B applicants are exempt from the examination.

## Chapter 74

### Certified Plant Engineers



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John Cannon, CPE	Henry Marc, CPE
Glenn Carter, CPE	Charles Perry, CPE
Mark Collette, CPE	<i>Your name here for 2016-2017!</i>



## Certified Professional Maintenance Manager



Plant and facilities maintenance professionals today must confront a wider variety of complex issues than ever before and therefore must possess an extensive knowledge of the many facets of maintenance management. Earning the Certified Professional Maintenance Manager credential will clearly validate to both your employer and industry officials that you

possess in-depth expertise in plant and facilities maintenance management. The CPMM program will also help you remain current with the evolving techniques and technologies in maintenance management.

This credential is designed to validate that the certified person possesses the professional expertise and knowledge required to successfully perform plant and facilities supervisory activities.

### **What does the exam cover? What is it like?**

This four-hour exam has a total of 200 questions in true/false and multiple-choice format. Questions cover maintenance management, preventive maintenance, inventory and procurement, work orders/workflow planning and scheduling, CMMS, training and work cultures, predictive maintenance, reliability centered maintenance, total productive maintenance, maintenance financials and return on investment, safety, indoor air quality, and documentation. A score of 70% is required to pass.

### **Am I eligible?**

You are eligible if you have a minimum of two years in maintenance management or a minimum of five years in the field overall.

### **Local Review Classes**

Region 8 offers two CPMM Review courses per year. Chapter Members are given a reduced rate. Please see chapter newsletter or website [www.afe74.org](http://www.afe74.org) for announcement of course dates and costs.

## Chapter 74

### Certified Professional Maintenance Managers

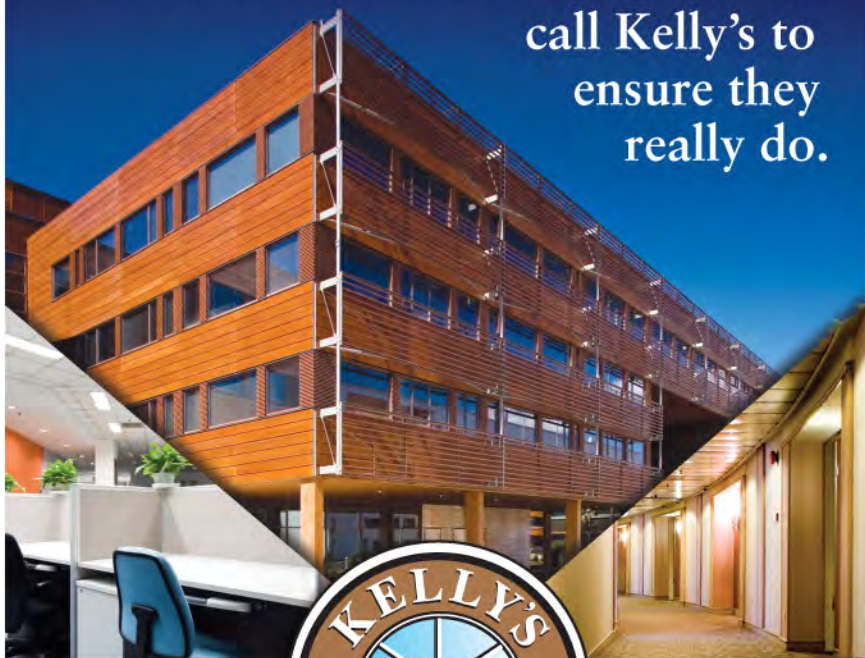


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**When:** June 16, 2016 Thursday@10 AM

**Tournament:** Best Ball - Shot Gun Start

**Cost:** \$125.00 per player/ \$500 Foursome



**Includes** 18 hole green fees, golf cart, ½ hour pro lesson covering chipping & putting, use of the driving range, practice greens, longest drive, closest to the pin, awards banquet, with Raffle Drawings and lots of prizes!

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# **AFE Region 8 – New England**

Remember as an AFE member your welcome to attend any chapter meeting. Please feel free to check out other chapters in the area. You can find meeting schedules on the regions website [www.afe8.org](http://www.afe8.org)



Region 8 has 15 chapters n the New England area. Please check on [www.afe.org](http://www.afe.org) to contact a chapter president regarding chapter information

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## ***A/E Chapter #74***

### ***Professional Development Scholarship***

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The Professional Development Scholarship offered by the chapter is not just for CPE, CPMM, and CPS certifications. Although applications for these certifications will take a front seat. In any situations that the committee has to decide who is eligible for the scholarship, any course that will provide professional development opportunities to a member of the chapter will be considered. This could be at a college or university or and On Line course. Up to **\$500** is available for each member. The scholarship by-laws are published in the 2016 Worcester Chapter directory and offer more details. Contact the committee chairman, Glenn Carter, CPE/CPMM for an application. [gcarter@insulet.com](mailto:gcarter@insulet.com)



### **Past Recipients**

Brian Bloomfield, CPMM

Mark Butler, CPMM

Glenn Carter, CPE/CPMM

Ron Cote, CPMM

Don Gillis, CPE

Joseph Chip Mannarino, CPE

Brian McCarthy, CPE

Steve Nicholas, CPMM

Eric Parzych, CPMM

Tim Rivers, CPMM

Tom Wall, CPMM

<p><b>Jeremy Adams CPMM</b> Facilities Manager <b>Intel</b></p>	<p><b>Marcel Alix CPMM</b> <b>Monadnock Community Hospital</b></p>
<p><b>Robert Antczak</b> <b>Karl Storz Facilities</b></p>	<p><b>George Antonopoulos CPMM</b> Maint. DL <b>Intel</b></p>
<p><b>Nathan Audette</b> Energy Efficiency Account Executive</p>	<p><b>John Baker</b> Associate Vice Chancellor Facilities <b>UMass Medical School</b></p>
<p><b>Richard Barry CPE/CPMM</b> Facility Manager <b>Liberty Mutual Insurance</b></p>	<p><b>Scott Bigelow CPE</b> President <b>Bigelow Electrical Co., Inc./ BigPower</b></p>



<p><b>Windsor Bigelow CPE</b> Consultant <b>Tufts University</b></p>	<p><b>Robert Blackmer</b> Asst. Vice President Facilities/Purchasing <b>Commerce Insurance</b></p>
<p><b>Paul Bourque CPE/CPMM</b> Sr. Facilities Mechanical Engineer <b>Intel</b></p>	<p><b>Aime Bresse</b> Facilities <b>Karl Storz Facilities</b></p>
<p><b>John Cannon CPE</b> Dir of Facilities Operations <b>College of the Holy Cross</b></p>	<p><b>Richard Cantillon CPMM</b> Module Team Manager <b>Intel</b></p>
<p><b>David Caravetta CPMM</b> Maintenance Manager <b>Unicorr</b></p>	<p><b>Tom Caron</b> Production Manager <b>Karl Storz Facilities</b></p>

<p><b>Glenn Carter CPE/CPMM</b>  Facility Manager  <b>Insulet Corporation</b></p>	<p><b>Richard Chown</b>  Account Manager  <b>F.W.Webb Company</b></p>
<p><b>Christopher Cipro</b>  Service Manager  <b>Grodsky Service, Inc.</b></p>	<p><b>Marc Colcombe</b>  Mechanical Group Manager  <b>EMCOR Services New England</b>  <b>Mech./Mass Ggroup</b></p>
<p><b>Mark Collette CPE</b>  Director of Building &amp; Grounds  <b>Sodexo / Anna Maria College</b></p>	<p><b>Ronald Cote CPMM</b>  Building Systems Supervisor  <b>EMC</b></p>
<p><b>Joseph Couture</b>  EngineeringManager  <b>Emcor/MIT Facilities</b></p>	<p><b>S. Raymond Desmarais</b></p>

<p><b>Joe DeWolfe CPMM</b>  Director of Facilities  <b>Sera Care Life Sciences</b></p>	<p><b>Kevin DiPerri</b>  Trades Maintenance Manager  <b>Mass. Water Resources Authority</b></p>
<p><b>Jeffrey Fadden CPMM</b>  Site Manager - Coporate Services  <b>Intel</b></p>	<p><b>Norman Faucher CPE, FAFE</b>  Sales Manager  <b>DR Guilbeault Air Compressor</b></p>
<p><b>John Feehly</b>  Facilities Supervisor  <b>Genzyme</b></p>	<p><b>Scott Ford</b>  <b>Karl Storz Facilities</b></p>
<p><b>Donald Gillis CPE</b>  Energy Specialist  <b>Harvard Medical School</b></p>	<p><b>Barry Golden</b>  President  <b>Gurney Water Treatment NE</b></p>

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<p><b>John Lennon CPMM</b> Construction Manager</p>	<p><b>Craig Lizotte</b> Manager Land Development Services <b>VHB</b></p>
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<p><b>Mark Markarian</b> Manager, Facilities Engineerin <b>University of Massachusetts Medical School</b></p>	<p><b>Sarah Maston</b> President <b>Green Footprints Commissioning, Inc.</b></p>



<p><b>Kathleen McCarthy CPMM</b> Program Manager <b>Intel</b></p>	<p><b>John Monteiro CPMM</b> Electrical Discipline Lead <b>Intel</b></p>
<p><b>Nicholas Morin</b> Project Manager <b>Notch Mechanical Constructors</b></p>	<p><b>Stephen Nicholas</b> President <b>Air Industries</b></p>
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<p><b>Matthew Shields CPMM</b> Facilities Manager <b>Milton Cat</b></p>	<p><b>Hunter Smith</b> District Rep <b>Nalco</b></p>

<p><b>David Spang CPMM</b> Bulk Chemical/Gas Facilities Eng <b>Intel</b></p>	<p><b>Ron Stachelek CPMM</b> Retired</p>
<p><b>Thomas St. Pierre</b> Plant Engineer <b>AstraZeneca LP</b></p>	<p><b>Mark Strati</b> Sales <b>Aqual Labs</b></p>
<p><b>Christopher Sullivan</b> Sales Engineer <b>Frank I Rounds</b></p>	<p><b>Jeffrey Supernor CPMM</b> FMS/LSS Engineer <b>Intel</b></p>
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<b>Tom Wall CPMM</b> Project Manager <b>National Grid</b>	<b>Matthew Westort CPMM</b> Senior Facilities Engineer <b>Intel</b>
<b>Paul Willwerth CPMM</b> Mechanical/Cleanroom Manager <b>Intel</b>	<b>Brian Zagrodny</b> Area Sales Manager <b>Ayer Sales</b>

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<p><b>Questions about Membership</b> <b>Contact Chapter 74's Membership Chairman</b> Rich Chown P 800-872-0211 <a href="mailto:sls276@fwwebb.com">sls276@fwwebb.com</a></p>	<p><b>AFE 74</b> AFE 74 is on line at <a href="http://www.afe74.org">www.afe74.org</a></p> <p>AFE Chapter 74. P.O. Box 3431. Worcester, MA 01613 Email: <a href="mailto:Chapter74@afe.org">Chapter74@afe.org</a></p>



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Contact us by email at [Chapter74@afe.org](mailto:Chapter74@afe.org)

Check out the newly revised Region Web site [www.afe8.org](http://www.afe8.org)

Need to update your member profile, contact info or find another member check out [www.afe.org](http://www.afe.org) members only section

## **Frequently asked questions regarding AFE membership.**

### **Are there any requirements for membership?**

Anyone with an interest in the facilities field can join AFE.

### **Are there different classifications of membership for vendor members?**

No, all individual members are treated equally. Employees of vendor companies are not assessed higher dues than end-user members.

### **What are AFE dues rates?**

New individual members pay \$195 for first-year dues.

### **My company pays my dues, what happens if I change jobs?**

If you joined as an individual member, the membership is held in your name and belongs to you. It does not matter who paid the invoice. If you change jobs, your membership is yours to take with you. Please be sure to let HQ know your new address.

### **Is there a company or corporate membership?**

Yes, AFE offers a Corporate membership. The corporate membership package offers companies the opportunity to own AFE memberships. The Company Membership discount program is designed to give organizations with large numbers of end-users a price break based on volume of membership. The price of membership varies based on the number of employees who will be included in the program. The memberships are transferable under the corporate membership. Corporate membership brochure can be seen [here](#).

### **I'm a student, can I join?**

We encourage and welcome student members. AFE membership is a great way to get started building relationships in the facilities world. And you'll have access to resources to help with your studies.

To join as a student member, you must be enrolled full time in an accredited college or university.

### **How much are student dues?**

Student dues are only \$25 a year.



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### **What does AFE do with my dues?**

Your dues go to support the various activities and benefits of AFE membership.

More specifically, \$25 of each member's dues goes to support chapter activities, \$15 goes to support region activities and volunteers. Your dues also pay for the activities of the Board of Directors. Dues support a small headquarters staff to provide individual member service, as well as support chapter, region, and committee activities. Among other HQ activities, we also publish the journal, develop and maintain the web site, provide centralized administrative functions, manage the certification programs, develop, coordinate and provide training and resources, and work with member volunteer committees to bring members new resources for professional advancement.

### **What benefits do I get for my dues?**

AFE membership provides both tangible and intangible benefits.

You get the Facilities Engineering Journal 6 times a year. Free member training webinars. Member-to-member virtual directory. 24/7 access to AFE.org for information. Threaded discussions. Free skills self assessment. Free energy audit for your facility. Employment help. Local networking and plant tours with chapter membership. Free resources such as the Blue Book and Thomas Register. And savings on shipping, industry events, training and education, books, energy, legal services, car rental, insurance programs, and more. We are always adding new benefits for members.

There are additional benefits that aren't as tangible, such as the ability to become involved in AFE leadership and build new skills. You'll make new friends. You'll find resources you wouldn't have otherwise. You'll network to increase your knowledge, find solutions, get answers, and advance your career.

### **I just lost my job, do I get a break on my dues?**

We know that AFE membership can help you locate a new position, so we don't want to deprive you of our valuable resources when you need them the most. If you lose your job, don't worry about your membership — give us a call at Headquarters and we'll extend your membership for the period of your unemployment in six-month increments for a maximum of 18 months.



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**I just retired, are my dues the same?**

When you retire your dues drop to \$80 a year. But, be sure to let us know that you have retired.

**Is there ever a point when I don't have to pay dues and can still be a member?**

Yes, after 30 years of continuous membership you reach Life Member status and no longer pay membership dues.

**Can AFE help me with a job search?**

Yes, you can post an anonymous resume on AFE Career Center. You can browse the openings and apply on-line.

**How do I become more involved as a volunteer member?**

That's easy, simply let AFE headquarters know you're interested in becoming more involved and we'll send you the volunteer application. Or go online and complete the volunteer information application.

**Are there requirements for AFE volunteer leadership?**

A commitment to seeing the organization thrive, along with the willingness and ability to make time, financial, and talent commitments. The most important thing to remember when you volunteer to do something in any organization is that others are relying on you to honor your commitments.

**How can AFE help me and my company?**

When you join AFE you'll have access to a variety of benefits and resources to improve your job performance. Your company benefits by having a knowledgeable employee for more efficient and effective facility operations. Your company also saves time and money on training with benefits such as free webinars, AFE brings the training to you, saving time and expense.

**I have a product to sell to facilities professionals, how can AFE help me?**

Membership in AFE isn't a requirement to advertise in the Facilities Engineering Journal or on the AFE web site, or to buy the AFE mailing list. But it's with membership that you can create the personal connection with members and generate referral business on a local and national level.





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## HVAC/R Useful Formulas

Air changes per hour:  $N = 60Q/\text{Volume}$

N = number of air changes per hour

Q = Volumetric flow rate of air in cubic feet per minute (cfm)

Vol = Space volume L x W x H, in cubic feet

Btu's CFM x T differential (approx. 10-15 Degrees Fahrenheit) x air density (typically 1.085) = Btu's delivered

Absolute pressure PSIA = Gauge + 14.7 or 0 PSIG = 14.7 (14.7 = 101.3kPa or 15psi = 100kPa)

Roughly 2 inches Hg = 1psi or 20Hg = 10psi and will 23 ft. IS equivalent for Btu's is the Joule [J]

A joule is a small amount of heat, 1000 J's or (KJ) is used for Refrigeration Formulas. 1 kg of water = approx. 1 liter  
The amount of heat to raise 1 kg of water 1 degree Celsius is = 4.187 KJ

Specific heat	Btu's/LB/f	kj/kg/k
Water	1.0	4.187
Ice	.50	2.11
Air	.24	
Superheat	.47	

Latent heat of fusion	$C = (f-32)/1.8$	roughly
Latent heat of vaporization	$F = [C*1.8] + 32$	double

450 CFM = 1 ton      1000 Ton = 2000 GPM

1 Ton Refrigeration = a ton of ice melted in 24 hr 2000 x 144 = 288000Btu's /hr

1Kw/hr = 3415 Btu's	1Hp = 1Ton
1ton = 12000 Btu	1kw = 1.34 hp
1 Btu = 778 ft/lb.	1 watt 3.413 Btu
.746 Kw/hr = 1hp hr	1 Kw/hr = 1.34 hp/ hr

## Useful Formulas

### Hydraulic data

Feet head (HD) x .434 = PSI	Inches water x .0730 = in. hg
PSI x 2.31 = ft. HD	Inches of mercury x 1.1337 = ft HD
PSI x 27.72 inches HD	ft HD x .8853 = inches mercury
1gal water = 8.3lbs	1 cu in. of water = .036 = wet in lb.
1gal# 2 oil =7.2lbs	1cu.ft. = 7.48 gal.
1 cu ft = 1728cu inches	1 gal water =2.31 cu inches
1 cu ft. water = 62.428 lbs/39 deg	A perfect vacuum at sea level = 29.9 inches of mercury or 33.95 ft water

### Area data

Pi = 3.1416	ID = circumference x 0.318
circumference = diameter pi [3.1416]	Area of Circ = Dia 2nd x .7854
pi R 2nd =area	

# CONVERSION FACTORS

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	MULTIPLY	BY	TO OBTAIN
Length	Centimeters	x .3937	= Inches
	Feet	x 12.0	= Inches
	Feet	x .3048	= Meters
	Inches	x 2.54	= Centimeters
	Inches	x 25.4	= Millimeters
	Kilometers	x .6214	= Miles
	Meters	x 3.281	= Feet
	Meters	x 39.37	= Inches
	Meters	x 1.094	= Yards
	Miles	x 5280.0	= Feet
	Miles	x 1.609	= Kilometers
	Millimeters	x .03937	= Inches
	Yards	x .9144	= Meters
Area	Circular mils	x $7.854 \times 10^{-7}$	= Square inches
	Circular mils	x .7854	= Square mils
	Square centimeters	x .155	= Square inches
	Square feet	x 144.0	= Square inches
	Square feet	x .0929	= Square meters
	Square inches	x 6.452	= Square centimeters
	Square meters	x 10.764	= Square feet
	Square meters	x 1.196	= Square yards
	Square millimeters	x .00155	= Square inches
	Square mils	x 1.273	= Circular mils
Volume	Square yards	x .8361	= Square meters
	Cubic centimeters	x .061	= Cubic inches
	Cubic feet	x .0283	= Cubic meters
	Cubic feet	x 7.481	= Gallons
	Cubic inches	x .5541	= Ounces (fluid)
	Cubic meters	x 35.31	= Cubic feet
	Cubic meters	x 1.308	= Cubic yards
	Cubic meters	x 264.2	= Gallons
	Cubic yards	x .7646	= Cubic meters
	Gallons	x .1337	= Cubic feet
	Gallons	x 3.785	= Liters
	Liters	x .2642	= Gallons
	Liters	x 1.057	= Quarts (liquid)
	Ounces (fluid)	x 1.805	= Cubic inches
	Quarts (liquid)	x .9463	= Liters
Pressure	Atmosphere	x 101325	= Pascals
	Atmosphere	x 14.7	= Pounds per square inch
	Pascal	x .102	= Kilograms per square meter

# USEFUL FORMULAS

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## MOTOR APPLICATION FORMULAS—CONTINUED

### SHAFT STRESS

$$\text{Shaft stress (psi)} = \frac{\text{hp} \times 321,000}{\text{rpm} \times D^3}$$

$$\text{Shaft stress (kg/mm}^2\text{)} = \frac{\text{kW} \times 4.96 \times 10^6}{\text{rpm} \times D^3}$$

Where:

D = Shaft diameter (in or mm)

hp = Motor output

kW = Motor output

psi = Pounds per square inch

rpm = Revolutions per minute

kg/mm<sup>2</sup> = Kilograms per square millimeter

## CENTRIFUGAL APPLICATIONS

### AFFINITY LAWS

$$\frac{\text{Flow}_1}{\text{Flow}_2} = \frac{\text{rpm}_1}{\text{rpm}_2}$$

$$\frac{\text{Pres}_1}{\text{Pres}_2} = \frac{(\text{rpm}_1)^2}{(\text{rpm}_2)^2}$$

$$\frac{\text{HP}_1}{\text{HP}_2} = \frac{(\text{rpm}_1)^3}{(\text{rpm}_2)^3}$$

Where:

Pres = Pressure

rpm = Revolutions per minute

### FANS AND BLOWERS

$$\text{hp} = \frac{\text{cfm} \times \text{psf}}{33000 \times \text{Efficiency of fan}}$$

$$\text{hp} = \frac{\text{cfm} \times \text{piw}}{6343 \times \text{Efficiency of fan}}$$

$$\text{hp} = \frac{\text{cfm} \times \text{psi}}{229 \times \text{Efficiency of fan}}$$

Where:

cfm = Cubic feet per minute

piw = Inches of water gauge

psf = Pounds per square foot

psi = Pounds per square inch

### PUMPS

$$\text{hp} = \frac{\text{gpm} \times \text{ft} \times \text{Specific gravity}}{3960 \times \text{Efficiency of pump}}$$

$$\text{hp} = \frac{\text{gpm} \times \text{psi} \times \text{Specific gravity}}{1713 \times \text{Efficiency of pump}}$$

Where:

ft = Head in feet\*

gpm = Gallons per minute

psi = Pounds per square inch

\* Head in feet = 2.31 x pounds per square inch gravity.

---

### VOLUME OF LIQUID IN A TANK

$$\text{Gallons} = 5.875 \times D^2 \times H$$

1 gallon (US) of water weighs 8.35 lb

Specific gravity of water = 1.0

Where:

D = Tank diameter (ft)

H = Height of liquid (ft)

## USEFUL FORMULAS

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### TEMPERATURE CORRECTION OF WINDING RESISTANCE

$$R_C = R_H \times \frac{(K + T_C)}{(K + T_H)}$$

$$R_H = R_C \times \frac{(K + T_H)}{(K + T_C)}$$

VALUE OF K	
Material	K
Aluminum	225
Copper	234.5

$R_C$  = Resistance at temperature  $T_C$  (Ohms)

$R_H$  = Resistance at temperature  $T_H$  (Ohms)

$T_C$  = Temperature of cold winding ( $^{\circ}$  C)

$T_H$  = Temperature of hot winding ( $^{\circ}$  C)

### MOTOR APPLICATION FORMULAS OUTPUT

$$\text{Horsepower} = \frac{\text{Torque (lb-ft)} \times \text{rpm}}{5250}$$

$$\text{Kilowatts} = \frac{\text{Torque (N-m)} \times \text{rpm}}{9550}$$

$$\text{Torque (lb-ft)} = \frac{\text{Horsepower} \times 5250}{\text{rpm}}$$

$$\text{Torque (N-m)} = \frac{\text{Kilowatts} \times 9550}{\text{rpm}}$$

### SPEED—AC MACHINERY

$$\text{Synchronous rpm} = \frac{120 \times \text{Frequency (Hz)}}{\text{Number of poles}}$$

$$\text{Percent slip} = \frac{\text{Synchronous rpm} - \text{Full-load rpm}}{\text{Synchronous rpm}} \times 100$$

### TIME FOR MOTOR TO REACH OPERATING SPEED (IN SECONDS)

$$\text{Seconds} = \frac{Wk^2 \text{ (lb-ft}^2\text{)} \times \text{Speed change (rpm)}}{308 \times \text{Avg. accelerating torque (lb-ft)}}$$

$$Wk^2 = \text{Inertia of rotor} + \frac{\text{Inertia of load} \times \text{Load rpm}^2}{\text{Motor rpm}^2}$$

$$\text{Average accelerating torque} = \frac{[(\text{FLT} + \text{BDT})/2] + \text{BDT} + \text{LRT}}{3}$$

Where: BDT = Breakdown torque  
FLT = Full-load torque  
LRT = Locked-rotor torque



# USEFUL FORMULAS

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## FORMULAS FOR ELECTRIC MOTORS

TO FIND	DIRECT CURRENT	SINGLE PHASE	THREE PHASE
Horsepower	$\frac{E \times I \times \text{EFF}}{746}$	$\frac{E \times I \times \text{EFF} \times \text{PF}}{746}$	$\frac{1.732 \times E \times I \times \text{EFF} \times \text{PF}}{746}$
Current	$\frac{746 \times \text{hp}}{E \times \text{EFF}}$	$\frac{746 \times \text{hp}}{E \times \text{EFF} \times \text{PF}}$	$\frac{746 \times \text{hp}}{1.732 \times E \times \text{EFF} \times \text{PF}}$
Efficiency	$\frac{746 \times \text{hp}}{E \times I}$	$\frac{746 \times \text{hp}}{E \times I \times \text{PF}}$	$\frac{746 \times \text{hp}}{1.732 \times E \times I \times \text{PF}}$
Power Factor	—	$\frac{\text{Input watts}}{E \times I}$	$\frac{\text{Input watts}}{1.732 \times E \times I}$

E = Volts

EFF = Efficiency (decimal)

hp = Horsepower

I = Amperes

PF = Power factor (decimal)

## FORMULAS FOR ELECTRICAL CIRCUITS

TO FIND	DIRECT CURRENT	SINGLE PHASE	THREE PHASE
Amperes	$\frac{\text{Watts}}{\text{Volts}}$	$\frac{\text{Watts}}{\text{Volts} \times \text{Power factor}}$	$\frac{\text{Watts}}{1.732 \times \text{Volts} \times \text{Power factor}}$
Volt-Amperes	—	Volts x Amperes	1.732 x Volts x Amperes
Watts	Volts x Amperes	Volts x Amperes x Power factor	1.732 x Volts x Amperes x Power factor

OHMS LAW	CAPACITANCE IN MICROFARADS AT 60 HZ
Ohms = Volts/Amperes ( $R = E/I$ )	Capacitance = $\frac{2650 \times \text{Amperes}}{\text{Volts}}$
Amperes = Volts/Ohms ( $I = E/R$ )	Capacitance = $\frac{2.65 \times \text{kVAR}}{(\text{Volts})^2}$
Volts = Amperes x Ohms ( $E = IR$ )	

# Emergency Generator Sizing

**EMERGENCY GENERATOR SIZING CHART**  
**3 PHASE AMPERES - 80% POWER FACTOR\***

<b>kVA</b>	<b>kW</b>	<b>120</b>	<b>208</b>	<b>240</b>	<b>480</b>
6	<b>5</b>	30.1	17.4	15.1	7.5
13	<b>10</b>	60.2	34.7	30.1	15.1
19	<b>15</b>	90.3	52.1	45.2	22.6
25	<b>20</b>	120.4	69.5	60.2	30.1
31	<b>25</b>	150.5	86.8	75.3	37.6
63	<b>50</b>	301.1	173.7	150.5	75.3
94	<b>75</b>	451.6	260.5	225.8	112.9
125	<b>100</b>	602.1	347.4	301.1	150.5
156	<b>125</b>	752.6	434.2	376.3	188.2
188	<b>150</b>	903.2	521.1	451.6	225.8
250	<b>200</b>	1204.2	694.8	602.1	301.1
313	<b>250</b>	1505.3	868.4	752.6	376.3
625	<b>500</b>	3010.6	1736.9	1505.3	752.6
938	<b>750</b>	4515.9	2605.3	2257.9	1129
1250	<b>1000</b>	6021.2	3473.8	3010.6	1505.3
1563	<b>1250</b>	7526.5	4342.2	3763.2	1881.6
1875	<b>1500</b>	9031.8	5210.6	4515.9	2257.9
2188	<b>1750</b>	-	-	5268.5	2634.3
2500	<b>2000</b>	-	-	6021.2	3010.6
3130	<b>2500</b>	-	-	7526.5	3763.2
3750	<b>3000</b>	-	-	9031.8	4515.9
4375	<b>3500</b>	-	-	10537.1	5268.5
5000	<b>4000</b>	-	-	12042.4	6021.2
<b>kVA</b>	<b>kW</b>	<b>120</b>	<b>208</b>	<b>240</b>	<b>480</b>

Chart approximates the amperage of a generator based on the size of the generator and the load on the generator at 100 percent of capacity. Table is intended to be used as an estimator is not an exact representation due to various factors that can increase or decrease amperage. For more info <http://www.generatorjoe.net>

# BTU Energy Conversions

1 kWh	3,412 Btu
1 joule	0.0009478 Btu
1 ft <sup>3</sup> natural gas	1,000 Btu
1 Ccf natural gas	100 ft <sup>3</sup> natural gas
1 Mcf natural gas	1,000 ft <sup>3</sup> natural gas
1 therm natural gas	100,000 Btu
1 barrel crude oil	5,100,000 Btu
1 ton coal	25,000,000 Btu
1 gallon gasoline	125,000 Btu
1 gallon ethanol	84,400 Btu
1 gallon #2 fuel oil	140,000 Btu
1 gallon LP gas	95,000 Btu
1 HP	746 Watts
1 Mbtu	1,000 Btu
1 MMBtu	1,000,000 Btu
1 Decatherm	1,000,000 Btu
1 therm	100,000 Btu
1 Quad	1x10 <sup>15</sup> Btu
1 MW	1,000,000 Watts

A BTU (British thermal unit) is the amount of heat necessary to raise one pound of water by 1 degree Fahrenheit (F).

1 British Thermal Unit (BTU) = 1055 J (The Mechanical Equivalent of Heat Relation)

1 BTU = 252 cal = 1.055 kJ

1 Quad = 10<sup>15</sup> BTU (World energy usage is about 300 Quads/year, US is about 100 Quads/year in 1996.)



## **CHAPTER #74 BYLAWS**

### **ARTICLE I—NAME AND LOCATION**

The name of this chapter shall be the Worcester Area-Central MA Chapter #74 of the Association for Facilities Engineering. This chapter, located in the greater Worcester - Central Mass area which is defined as its major geographic service area.

### **ARTICLE II—OBJECTIVES**

The objectives of this chapter shall be similar as the organization purposes defined in the AFE National Bylaws. The major focus of this chapter's programs and activities shall be in fulfillment of the needs and expectations of members generally located in the chapter's service area.

The purpose of Chapter #74 shall be

- a. To promote the interest of plant engineers and facilities engineering as a profession.
- b. To be an organized and functioning chapter for the advancement of scientific knowledge in the field of plant and facilities engineering
- c. To be an organization devoted to the exchange of information concerning the everyday problems of the plant and facility engineer and not just social gathering of engineers
- d. To disseminate knowledge required in the field of plant and facilities engineering by means of lectures, discussions, papers, movies, conferences, research and plant tours

### **ARTICLE II – SECTION TWO: DEFINITION OF TERMS**

- a. Plant and facility engineers are defined as those: exercising responsible supervisory charge of, or an executive responsibility for all or some phase of

- design, layout, construction, operations, maintenance and/or control of fixed or mobile facilities or plant; or, who by high standards of technical knowledge and experience qualify to practice the profession
- b. Facilities or plant is defined in its broad sense as machinery, apparatus, buildings, real estate and all else, exclusive of raw materials.

### **ARTICLE III – PURPOSE**

The purpose of AFE shall be to advance the profession of facilities and plant engineering and facilities management in order to fulfill AFE's mission. **AFE's Mission**

**Statement:** AFE provides education, certification, technical information and other relevant resources for plant and facility engineering, operations and maintenance professionals worldwide.

### **ARTICLE IV—USE OF FUNDS**

The chapter shall use its funds only to accomplish the purposes noted in Article III. Income from all chapter activities shall accrue solely to AFE. No funds or income shall come into use for the benefit of, or be distributed to, the members or elected officers or directors of this chapter. (Note: This standard clause that protects the chapter. It should not be construed to preclude member expense reimbursement or tuition reimbursement where duly authorized by the Chapter.)

### **ARTICLE V—MEMBERSHIP CATEGORIES**

All members of this Chapter must be individual members of AFE as defined by AFE. All requirements for membership—application, rights and privileges, and expulsion are defined in the AFE National Bylaws.

*Retired Status:* An elective status for a Member, Associate or Affiliate (defined above) who is retired from active employment and not engaged in paid consulting. Entitled to reduced dues

*Student:* An individual enrolled as a full-time student in an accredited institution of higher learning who intends to pursue a career which would involve-or interface with-plant engineering/facilities management. This class of

membership may have voting rights within their respective chapters only. Entitled to reduced dues

## **ARTICLE VI—DUES**

AFE membership includes chapter membership with annual dues paid to AFE. AFE International Headquarters rebates a fixed amount per member, as determined by the AFE Board of Directors, for each AFE member assigned to the chapter. No funds are rebated to the chapter unless the chapter has a current Officer Report on file at AFE Headquarters and has a current Chapter Financial Form on file at AFE Headquarters. The chapter understands that if the chapter has not complied with the form filing requirements by the end of AFE's fiscal year, the money will revert to AFE International.

The chapter may not establish dues over this amount, but may charge members and non-members fees for chapter activities.

## **ARTICLE VII—MEETINGS**

**Section 1: Chapter Meetings.** Regular meetings of this Chapter shall be held on the third Thursday of the month, (unless otherwise noted) at the time and place designated by the chapter President, chapter Executive Committee or the chapter's Board of Directors, upon 15 days notice.

**Section 2: Voting.** An official vote or approval shall consist of 51% of the (voting) Members. A majority of those members present and voting shall govern. A quorum must be present before any business may be conducted or any motions passed. A quorum shall consist of five (5) members in good standing, of which at least two (2) must be elected Chapter officers.

**Section 3: Conduct of Chapter Meetings.** Chapter meetings shall be chaired by the chapter President. In the absence of the President, meetings are chaired by the Vice President, or other chapter officer selected by the

President. The meeting shall be conducted according to Article XII of these Bylaws (Robert's Rules of Order).

**Section 4: Notice of Meetings** Notice of chapter, committee and board meetings shall be distributed no later than 14 days prior to the meeting date. The chapter shall meet no less than two times in a year to meet active status.

**Section 5: Special Meetings** Special meetings of the general membership, board, or committee may be called at the request of the president, 2/3 of the full board, or 51% of the general membership.

## **ARTICLE VIII—BOARD OF DIRECTORS**

**Section 1: Authority.** The chapter's Board of Directors shall be the governing body of the chapter. The Board may delegate portions of its authority to the chapter Executive Committee. The board of directors is responsible for the overall policy and direction of the chapter.

**Section 2: Composition.** The Board shall consist of no more than fifteen individuals, which shall include no less than three of the five officers. The officers shall constitute the Executive Committee. All are elected by the voting Members of the Chapter. The President is the Chapter Delegate to the AFE National meetings. Alternate would be the Vice President or a duly elected delegate.

**Section 3: Nomination and Election.** (A) Nominating Committee: The Immediate Past President shall be the chairman of the Nominating Committee, which shall be composed of two to four additional members selected by the Executive Committee. (B) Timing; Nominating Process: In the fall of each year, the Nominating Committee shall present at least one candidate from among the members of the chapter for each position on the Board about to be vacant. Elections may be conducted at a regularly scheduled chapter meeting or by 15-day email ballot.

**Section 4: Term of Office.** The term of office is one year for all officer positions, and two years for the other director positions. Any officer may serve a maximum of four



consecutive terms in the same office. Directors may serve unlimited two-year terms. All terms of office, as well as the administrative and fiscal year, shall commence on January 1. Vacancies on the board may be filled for the remainder of the term by presidential appointment. A board member may resign at any time. A board member shall be removed if they have 2 unexcused absences from the board meetings in a year.

**Section 5: Board Meetings; Quorum.** The Board shall meet no less than three times each year at the time and place designated by the chapter president. In meetings of the Board, a majority of the members of the Chapter Executive Committee shall constitute a quorum or 7 BOD members shall constitute a quorum. Meetings shall be conducted according to Article XII (Robert's Rules of Order).

## **ARTICLE IX—DUTIES OF OFFICERS AND DIRECTORS**

**A. President:** Presides at all meetings of the Chapter, Board, and Executive Committee; appoints all committees; is responsible to the chapter members for efficient and effective conduct of chapter affairs.

**B. Vice President:** In the absence of the President, presides at all meetings. Reports to chapter president, chairs the program committee, and as such shall be responsible for the program of all meetings, chairs chapter membership committee and coordinates membership retention and new membership activities with regional membership chairman. Additional duties are as assigned by the president.

**C. Secretary:** Responsible for official meeting minutes; chapter records, chapter communications and related activities.

**D. Treasurer:** Keeps an accurate record of all receipts and disbursements; submits yearly financial report to AFE Headquarters; makes payments with approval of the Executive Committee; submits reports at each chapter meeting or otherwise as directed by the President;

prepares annual budget. Secretary and Treasurer Positions may be combined into one Secretary/Treasurer position.

**E. Immediate Past President:** Chairs the Nominating Committee, serves as advisor to the President.

**F. Directors:** The duties of the directors are as defined by the President, with the approval of the Board.

## **ARTICLE X—SPECIAL AND STANDING COMMITTEES**

### ***Section 1: Standing Committees***

There shall be, among others, the following standing committees:

- (A) Nominating
- (B) Membership
- (C) Programs
- (D) Professional Advancement/ Scholarship Committee
- (E) Executive committee - The four officers plus immediate past president

***Section 2: Special Ad Hoc Committees.*** The President, with the approval of the Board, may appoint such task forces, study groups, sub-committees and the like as warranted.

***Section 3: Authority; Reporting.*** The specific charge of each committee—both standing and special—shall be as specified by the President, with the approval of the Board. All committees shall report to the Board of Directors through the committee's chairman or otherwise as directed by the Board.

## **ARTICLE XI—FINANCE**

In advance of the upcoming year, a budget shall be developed under the direction of the treasurer, and approved by the Board of Directors, covering the next fiscal year.

## **ARTICLE XII—RULES OF ORDER**

The rules contained in the current edition of Robert's Rules of Order, Revised shall govern the conduct of all meetings.

### **ARTICLE XIII—DISSOLUTION**

In the event of dissolution of the chapter, all funds and other assets will be turned over to AFE.

### **ARTICLE XIV—AMENDMENTS**

Amendments may be proposed by: (1) the chapter's Board of Directors on its own initiative; (2) written petition signed by 25% of the (voting) Members of the chapter. (3) As necessitated by changes in AFE bylaws and governing procedures.

Amendments will be approved upon a 51% vote of those Members qualified and voting by 14 day written or email notice of action to be taken at the next chapter business meeting in order to become an effective ballot.

The regular meeting notice mailed to the entire membership shall be accompanied by a complete description of all amendments that are to be considered at the meeting.

### **ARTICLE XV – SCHOLARSHIP**

#### **A. NAME**

The name of this scholarship shall be “Worcester Chapter 74 AFE -Professional Development Scholarship”

#### **B. PURPOSE**

1. The purpose of this scholarship is to encourage members of Worcester Chapter 74 Association for Facilities Engineering (AFE) to further their careers by taking approved / accredited courses in facilities related educational activities.
2. The primary criteria for consideration of this scholarship will be for courses, classes, and seminars relating to the thirteen (13) disciplines of the AFE certification programs. i.e CPE, CPMM , CPS
3. The secondary criteria for consideration of this scholarship will be any type of course, class, or seminar, relating to their facilities career education

or CEU recertification. Final approval of the validity or appropriateness of the course is at the discretion of the Scholarship Committee.

4. Applicant must successfully complete approved course to qualify for scholarship award, and present proof of completion to the scholarship committee.

#### **C. SCHOLARSHIP COMMITTEE**

1. Scholarship committee will consists of a minimum of 3 to a maximum of 5 members, all active members of Worcester Chapter 74.
2. The chapter president, with the approval of the executive committee, appoints members.
3. Terms of office for the for the scholarship committee to be concurrent with time of the executive committee.
4. One member is the sitting Vice President; one member is the sitting Treasurer and three other members at large. One of these three members at large is to be chairperson and coordinate activities of the committee.
5. A quorum will be a majority of members of the total committee present for the meeting. A minimum of three members is required. Email voting will be an acceptable alternative.
6. Approval of scholarship funds must be by majority vote of committee members present. Email voting will be an acceptable alternative.
7. Committee will meet when necessary to evaluate applications.
8. Within two weeks of submittal of the application to the chairperson of the scholarship committee, the committee will evaluate the validity of the course, or seminar, and issue a notice to the applicant that the application has been approved or denied in either verbal or written form.
9. Records of disbursements are to be kept with the Treasurer's Records.

#### **D. APPLICANTS**

1. Applicant must be a fully paid member of Worcester Chapter 74 for at least 1 year before applying for scholarship funds if other than AFE Certification
2. Submit application, course syllabus, costs and any other pertinent information prior to taking the course.
3. Members are eligible for only one award per calendar year; every 3 years for non AFE courses unless it's an AFE sponsored course
4. It is recommended that the chairperson be directly notified by any means, (email, phone, or letter), to inform him of the pending application.
5. It is the applicant's responsibility to follow up with their application.

#### **E. THE SCHOLARSHIP**

1. Scholarship will consist of a maximum disbursement of \$500.00 per application, and actual disbursement amount is at the discretion of the scholarship committee.
2. In the event of multiple applications being submitted, a total of \$2,500.00 per calendar year (if available) may be dispersed at the discretion of the scholarship committee. If there are more applicants in a calendar year than the the \$2500 stated the board of directors shall have the authority to increase the scholarship fund up to a maximum of \$5000 per year as approved by a majority vote by the Chapter Board of Directors.
3. Funds will be dispersed directly to the applicant in the form of a check duly issued by the Chapter 74 Treasurer.
4. Non-disbursed monies do not carry over to the next year.

#### **F. FUNDING OF THE SCHOLARSHIP**

1. The Board of Directors of the Worcester Chapter 74 decides the means of providing funds for the continuation of this scholarship.

2. Methods can include but not be limited to Annual Directory, Golf Tournaments, Advertising, Donations and any other means that are available.
3. Funds for the scholarship can be kept in the general fund of the chapter.

#### **G. AMENDMENTS TO THESE BY-LAWS**

1. These By-laws may be amended at any regular meeting of the Worcester Chapter 74 - Board of Directors.

#### **REVISIONS:**

**Full review by 2015 BOD on 9/30/15 and unanimous vote by membership on 10/17/15 Chapter Meeting**





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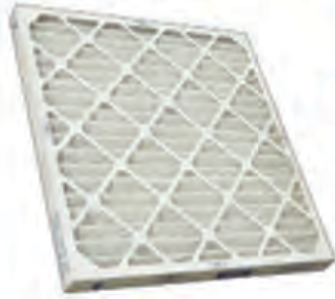
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