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Chapter 74 - Worcester

Facilities Engineering Directory 2018-2019



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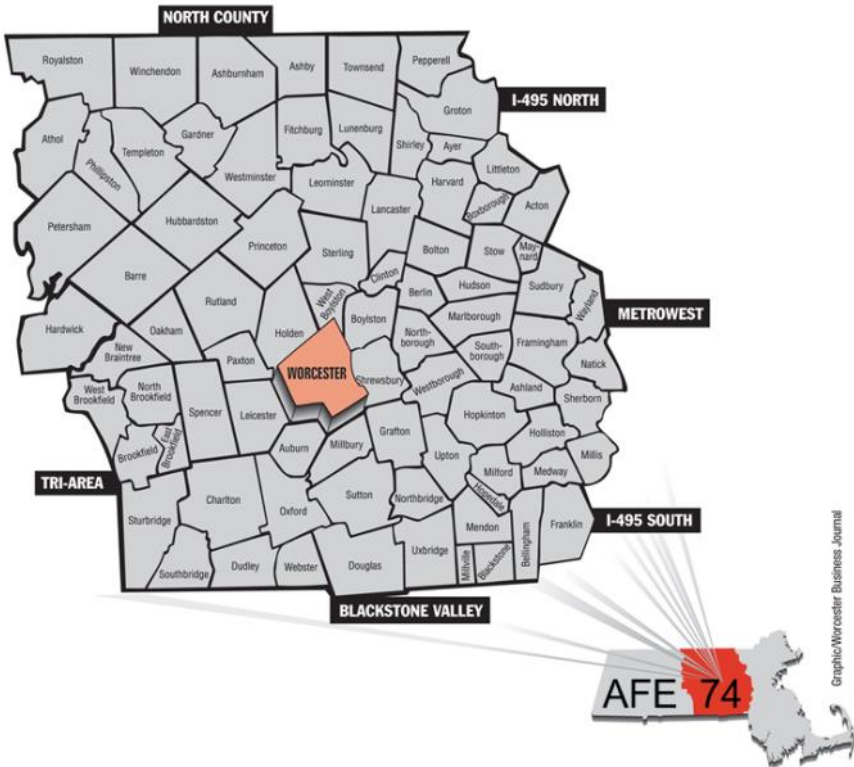
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President's Message

Fellow AFE Members, Sponsors and Supporters of Chapter 74,

We have an opportunity to reflect on another successful year. The 2017 Board of Directors and Executive Board have toured us through a large data center and its power protection, a historic building and its renovation and maintenance challenges, a power plant and its readiness preparedness, a major hospital and its ability to operate in a disaster, a utility storm control room, a local USA made furniture factory, and a major construction site. With the help of the dedicated Board and the enthusiasm of our new Board members, we will continue to bring together those in the facility profession for networking, education and fun.

We hope you appreciate your AFE Chapter 74 Directory. It will help you connect with members, identify services with vendors who support us, as well as provide formulas used in our everyday profession. Other AFE resources available include the AFE Chapter 74 website with links to Region 8 and our National AFE website. The AFE Certification program in CPS, CPMM and CPE continues to be an excellent value and learning opportunity.

With the dedication of our Board of Directors, some new faces and officer succession, we can expect our chapter to continue to be a place we can lead, learn and influence the facilities engineering profession.

This is YOUR chapter. We, as the Board of Directors, are managing this great resource and encourage you to participate. Please get involved by attending a few monthly meetings, volunteering for the Board of Directors and patronizing the vendors who support us. Thank you.

Regards

Matt Shields

Matt Shields CPMM

AFE Chapter #74 President

Website: www.afe74.org

Who We Are...

AFE Mission Statement:

The Association for Facilities Engineering (AFE) is a professional membership and certification organization. We bring together professionals who ensure the optimal operation of high-rise commercial real estate, commercial and industrial plants, campuses of higher education, medical centers, offices at Fortune 500 companies, and (classified/non-classified) government facilities from around the world. All look to AFE as the leading technical and certification resource for facilities engineering. AFE's mission is to provide trade-craft related facilities maintenance industry professionals worldwide.

Our History

AFE can trace its history back over a century to 1915 when a group of engineers and master mechanics from Boston and the surrounding area created the Plant Engineer's Club. Others throughout the nation would follow the model of the Bostonian Plant Engineer's Club creating similar groups where engineers could gain knowledge, share knowledge, and improve the operations of their facilities through a network of peers. Through the years new organizations would appear, names would change, and organizations would merge.

The AFE of today really took shape in 1954 with the creation of the American Institute of Plant Engineers, or AIPE. The AIPE was a national organization created with the goal of bringing together all of the varied engineering societies and organizations from across the country under a single banner. The AIPE became an international organization in 1956 with the acceptance of a chapter in Montreal, Canada. In 1995, 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.

While the names may have changed along with the technology, the aim of AFE is identical to that of the Plant Engineer's Club: learn from the vast experience of the members, and share knowledge to any that can benefit so that we can make sure the machines keep running and the people all go home safe.

The Worcester Area - Central Massachusetts Chapter 74 of the AFE has been in existence since 1966. Join us as we host facilities tours throughout the region, provide educational seminars and technical presentations while providing an opportunity to network with a fantastic group of engineering and facilities professionals.

Learn, Lead and Influence your profession through AFE.

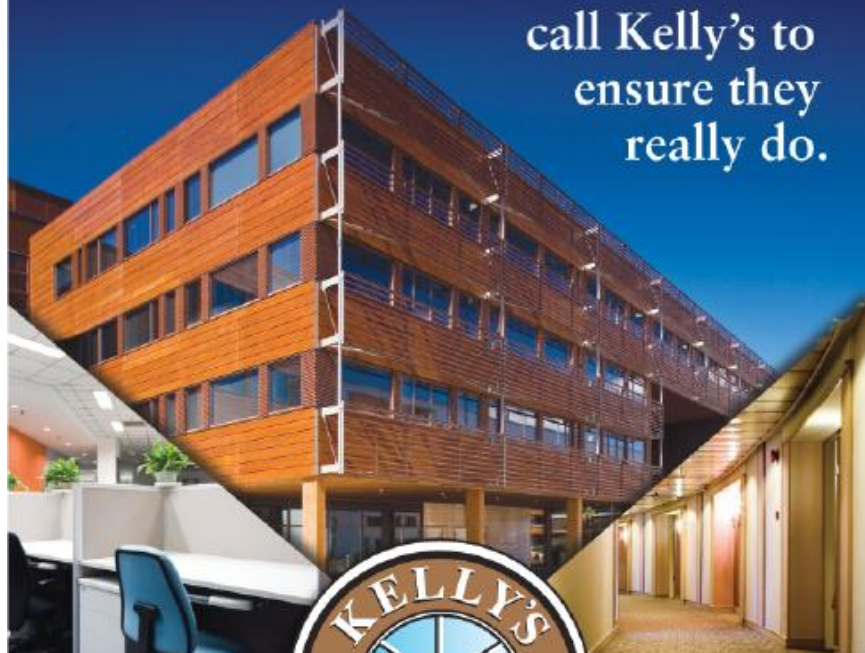
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AFE Code of Ethics

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.

2018 AFE Chapter 74 Officers



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Association for

FACILITIES ENGINEERING®

Chapter 74 - Worcester/Central MA



2018 Tour & Meeting Schedule

- January 18th, **Table Talk Pies**, Worcester
- February 15th, **Dell-EMC**, Franklin
- March 15th, **Vibram**, North Brookfield
- April 19th, **Worcester Polytechnic Institute**, Worcester
- May 17th, **Clark University**, Worcester
- June 14, **17th Annual Golf Tournament**, Stow
- July & August, Summer Break
- September 20th, **Tree House Brewing Co.**, Charlton
- October 18th, **SJC Drum**, Southbridge
- Novembers & December, Winter Break

Dates and events are subject to change.
Unless otherwise noted monthly tours begin at 5:30 PM. Keep an eye on the Chapter 74 newsletter for all the details of our activities throughout the year!





nationalgrid

2017



Past
Tours

January Tour, Dell-EMC Data Center, Hopkinton



Our tour of the Dell/EMC data center began in the facility's Command Center where IT Guru Mike Hayes spoke about the origins, current state and future plans for the Data Center. Key to the present and future is *virtualization*, which allows the data center to operate vastly more efficiently. This is done by using

specialized software to convert one physical server into multiple virtual machines. Each virtual machine then acts as its own unique device.

From the discussion of the virtual world we were treated to a tour of the physical realm of the data center. From the Command Center, Mike led our group through the rows of servers that make up the actual data center.



From the Data Center, Ron Cote took over the tour, focusing on the mechanical aspects of the facility. We saw the multiple measures in place to maintain the environment necessary for the operation of the sophisticated equipment, and the elaborate power supply systems to make sure the electricity stays on, no matter what.

After completing the Data Center tour the AFE 74 members and guests went a short way down the road to the 110 Grill where we had our January chapter meeting.

As the first chapter meeting of the new year the first order of business was to review the events of 2016, and to recognize some of the stand-out events and chapter members of the previous year.

2017



Past
Tours

February Tour, Union Station, Worcester



Our tour began in the rotunda and moved into the Grand Hall where our guide Rick Trifero introduced us to the background of Union Station. Rick spoke about its original design and construction through the massive restoration effort in the 1990's. Our guide detailed how the station was once utilized, and how today it serves as transportation hub, office building, gathering place, and event center.

After having an opportunity to see first-hand some of the challenges of maintaining such a facility, it is not hard to imagine the difficulties involved.



At the end of the day though, the ongoing improvements and plans for the future make you excited that Union Station will be a part of Worcester's skyline, and Worcester's identity, for a long time to come.

Following the tour we held the February Chapter meeting in Luciano's Cotton Club, located right in Union Station.

2017



Past Tours

March Tour, Dynergy Powerplant, Milford



Our Tour began with a brief background presentation by Chris Teta. Chris, with some assistance from his boss Charlie Hill, gave some history of the facility, its current configuration and capabilities, and plans for future improvements.

Throughout the tour our guide described the methods of operation and the challenges of maintaining the plant to our group.

The tour concluded in the power plants control room. In the nerve center of the operation, our guide detailed the modernization project that will soon bring the plant's controls and monitoring systems into the 21st century!



Following the tour chapter members and guests gathered a short distance from the Dynergy power plant at Caffè Sorrento. The meeting began with an excellent & informative presentation on indoor air quality issues by Michael Grifone and Chris O'Korn of AirCare Environmental Services.

2017



Past
Tours

April Tour, Saint Vincent Hospital, Worcester

AFE 74 members and guests gathered in the beautiful atrium at St. Vincent Hospital, and that is where our tour got started. Tony Cammuso began by giving the group some historical background on St. Vincent Hospital (including prior incarnations).

After the background information, Tony went on to speak about the current facility's structure and many unique features. In just a few minutes many of us learned a lot of things we never knew before like: how they change the light bulbs over one hundred feet above the atrium floor, there is such a thing as "clean dirt", the waterfall hides a train tunnel, and the real St. V's bell isn't in the lobby.



The tour then stopped atop the pillars housing the atrium's glass elevators. While the machinery moving the cars was of some interest, most took advantage of the lofty perch to take a few bird's eye photos of the atrium below!

Down from the top of the hospital our guide led us through a maze of mechanical, electrical, maintenance and storage rooms all vital to the daily operation of the hospital.



Following the tour the chapter held its monthly meeting right in one of the hospital's function rooms with and excellent meal (great hospital food!) and an excellent technical presentation on steam trap surveys, maintenance and repairs By Jim Krochune of American Plant Maintenance.

2017



Past
Tours

May Tour, National Grid Storm Room, Worcester

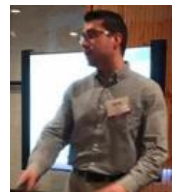
At National Grid's Worcester facility Patrick Cody, National Grid's Central Massachusetts Storm Room Coordinator, gave a detailed description of how National Grid prepares for severe weather outbreaks, and how outages are handled.



The presentation showed how storm and outage response has evolved, and how those changes influenced the design and renovation of the actual Storm Room. It was shown how it was possible to maximize the space available by using much of the space designated for storm operations for "normal business".

At the heart of the operation is the storm room itself. During weather emergencies, the Storm Room becomes the nerve center for National Grid's response. The numerous personnel here are able to manage the enormous volume of calls and new information.

Following the tour the attendees moved to J Anthony's in Auburn for the chapter meeting. Following the regular chapter business Ted Karavedas of Tighe & Bond provided the technical presentation at the meeting. Ted spoke with great knowledge and enthusiasm on a variety of topics concerning generators including generator types, operation, maintenance and safety. **Ted's presentation was voted 2017 Presentation of the Year!**



2017



Past Tours

September Tour, AIS Tucker Facility, Leominster



In September AFE 74 Members and friends had the opportunity to tour the outstanding AIS “Tucker” facility in Leominster. Built in the shell of a former plastics plant, the 650,000 square foot facility is part manufacturing plant, part headquarters, part warehouse, part showroom and part distribution center. A fantastic and modern facility in central Mass, the Tucker facility is the home of AIS, an award winning manufacturer of high quality office furniture.



The tour stretched the length and breadth of AIS’s operations from management and engineering spaces, to modern woodshop and assembly areas as well as the warehouse and distribution center. Throughout the tour attendees were able to see the

extraordinary efficiency and the forward thinking of the facility design and operations.

Following the excellent tour the chapter meeting was hosted on-site by AIS. **This tour was voted 2017 Tour of the Year!**



2017



Past
Tours

October Tour, New Insulet Facility, Acton

In October AFE 74 had the opportunity to tour a facility that has been stripped bare, and is beginning its journey to becoming something new and exciting. A old Digital building in Acton is being transformed into the headquarters and manufacturing facility for cutting edge medical technology. The tour began with a demonstration of how cutting edge technology is being used to plan and organize the renovation and new construction.



From the virtual the tour moved to the reality of the 200,000 square foot building being transformed into a modern multi-purpose facility. When completed the reborn facility will

have areas dedicated to all facets of Insulet's operation. One of the largest undertakings of the project is the construction of a large "clean-room" manufacturing component, and the group was able to see the foundations of the new additions and the ongoing process of leveling the new section with the existing building.

Following the tour the attendees convened the Chapter meeting at the Red Raven Gastropub for a great meal, networking and the election of the chapter leadership for 2018.



AFE 74 17TH ANNUAL GOLF TOURNAMENT



Each year AFE 74 hosts the premier golf outing for the facilities professionals of Central Mass.

AFE 74 is pleased to announce that the tradition will continue for its 17th year at beautiful Stow Acres Country Club, **Thursday June 14th at 10 AM.**

Pricing for the event is \$125 per individual player with foursomes being \$500 to register. Singles, pairs and threesomes are all welcome to join. The registration covers 18 hole green fees, golf cart, use of the driving range and practice greens the day of the event, awards banquet as well as other event perks and prizes.

In addition to the chance to play 18 with friends and colleagues, enjoy a great meal and win some prizes AFE 74 offers tournament and Hole sponsorships to fit any budget big or small. This is a great opportunity for your name and logo to be seen by the region's top facilities professionals!



Check our website, www.afe74.org for more information on tournament sponsorships and registration. For additional questions, or to register, contact Matt Shields, 508-634-5886, matt_shields@miltoncat.com

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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



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 and centralma.org. Photo courtesy of vistadome.com



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 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

Want to see your name in print? Write an article for the Facilities Engineering Journal.

Captive Audiences

Have some expertise you can share with others? Become a speaker locally or nationally. Work with us to develop a learning experience for others in the facilities industry.

Marketing resources

Reach a select group of facilities practitioners with an ad in the AFE Facilities Engineering Journal or with a banner ad on this web site. Rent our mailing list for your direct marketing efforts. Or promote your company locally through the local chapter bulletin ads and sponsorships.

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WORCESTER AREA CHAPTER #74

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1967 BERTIS H. ADAMS	1995 RICK KJERTING
1968 GEORGE D. PANO	1996 HENRY EKNAIAN, JR.
1969 ROBERT G. MEISNER	1997,1998 MARK KUPCINSKAS
1970 ANTHONYJ.RUSKSNAITIS	1999,2000 JIM DENMAN
1971 JOHN C. BETTLY	2001,2002 MARTIN W. MYLLYKANGAS
1972 WILLIAM F. LOCKWOOD JR.	2003 JOSEPH MANNARINO
1973 ALFRED K. BROWN	2004 STEPHEN NICHOLAS
1974,1975 ALBERT C. GARAND	2005-2007 TONY CHIARELLI
1976 WILLIAM B. LAIRD	2008, 2009 DON GILLIS
1977 RICHARD E. HOWARD	2010, 2011 DON JUOZAITIS
1978,1979 KENNETH J. MEEHAN	2012, 2013 TOM WALL
1980,1981 NEIL J. DONOGHUE	2014, 2015 GLENN CARTER
1982 CARROL BELANGER	2016 DON GILLIS
1983 PAUL A. SHEPHERD	2017 MATT SHIELDS
1984 NORMAN E. FAUCHER	<i>SEE YOUR NAME HERE!</i>
1985,1986 W. P. ABRAMOWICZ	
1987 C. E. PERRY	
1988 E. J. CROTEAU	
1989 PETE PETTERSON	
1990 HENRY S. MARC	
1991,1992 PAUL R. STRNISTE	
1993 TODD M. BROWN	



Certified Plant Engineer

The ranks of CPEs include over 2,000 strong and growing. CPEs are filled with success stories of job promotions, substantial pay raises and exciting new career opportunities as a direct result of becoming a CPE. There is simply no better way to demonstrate your expertise in all areas of plant/facilities engineering than becoming a CPE.

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



There is simply no better way to demonstrate your expertise in all areas of plant /facilities engineering than becoming a CPE

Richard Barry, CPE	Norman Faucher CPE,
Scott Bigelow, CPE	Donald Gillis, CPE
Windsor Bigelow III, CPE	Peter Hicks, CPE
Paul Bourque, CPE	Michael Kolakowski, CPE
John Cannon, CPE	Henry Marc, CPE
Glenn Carter, CPE	Charles Perry, CPE
Mark Collette, CPE	<i>Your name here for 2018 -2019!</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 for announcement of course dates and costs.

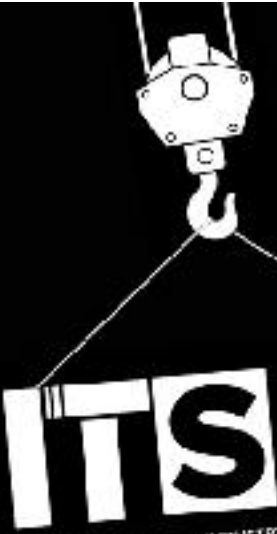
A/FE Chapter 74

Certified Professional Maintenance Managers



*Earning the CPMM credential
clearly validates to both your
employer and industry officials
that you possess in-depth
expertise in plant and facilities
maintenance management*

Jeremy Adams, CPMM	Kathleen McCarthy, CPMM
Marcel Alix, CPMM	John Monteiro, CPMM
George Antonopoulos, CPMM	Scott Morris, CPMM
Rich Barry, CPMM	Steve Nicholas, CPMM
Paul Bourque, CPMM	Erik Parzych, CPMM
Richard Cantillon, CPMM	Waide Pillsbury, CPMM
David Caravetta, CPMM	Timothy Rivers, CPMM
Glenn Carter, CPMM	Matthew Shields, CPMM
Ronald Cote, CPMM	David Spang, CPMM
Joe DeWolfe, CPMM	Jeffrey Supernor, CPMM
Jeffrey Fadden, CPMM	Ronald Stachelek, CPMM
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Ron Jean, CPMM	Steve Walker, CPMM
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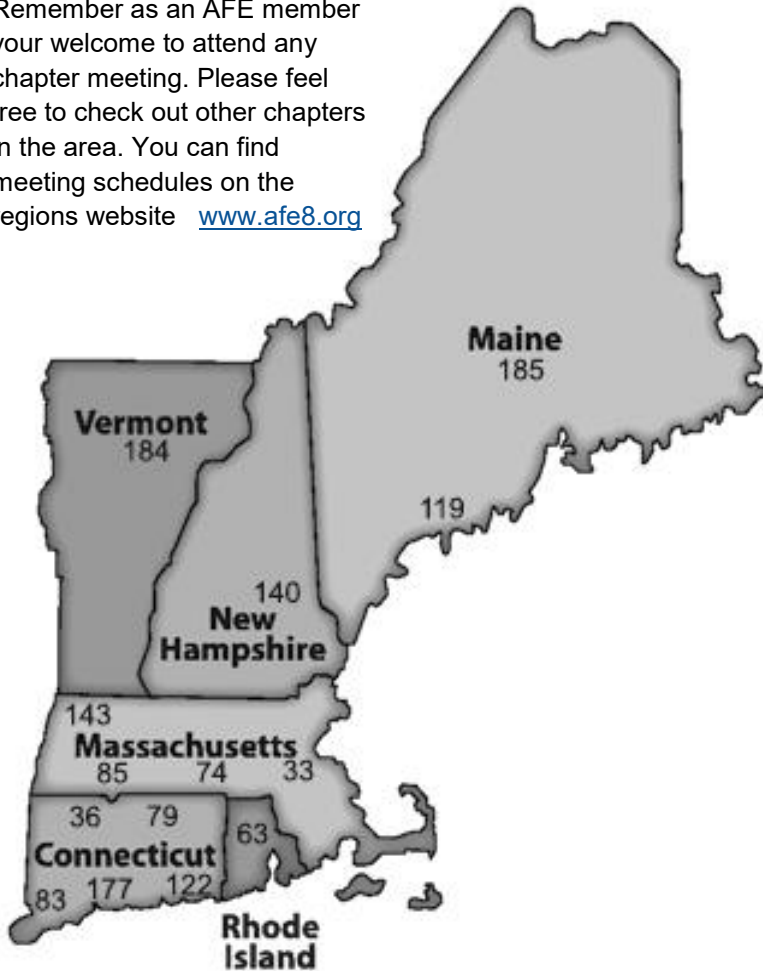
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AFE Region 8 – New England

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



Region 8 has 15 chapters in the New England area. Please check on www.afe.org to contact a chapter president regarding chapter information



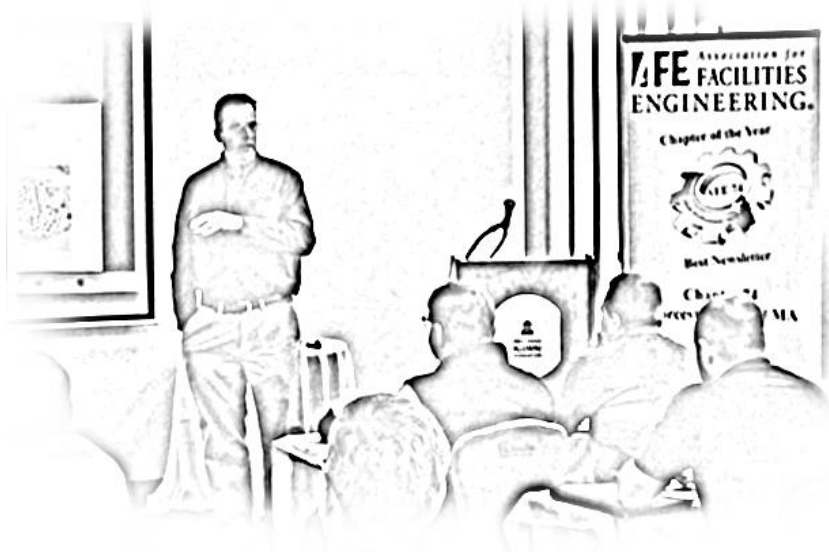
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A/E Chapter #74

Professional Development Scholarship

Available to all Chapter Members



The Professional Development Scholarship offered by the chapter is not just for CPE, CPMM, and CPS certifications. Although applications for these Professional certifications have been pre-approved will take priority. 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 Community College-Tech Schools-University or approved On Line Course. Up to **\$500** is available for each member. The scholarship by-laws are published in the 2018 Worcester Chapter directory and offer more details. Contact the committee chairman, Glenn Carter, CPE/CPMM for an application. gcarter@insulet.com

Past Recipients

Brian Bloomfield, CPMM

Brian McCarthy, CPE

Mark Butler, CPMM

Steve Nicholas, CPMM

Glenn Carter, CPE/CPMM

Erik Parzych, CPMM

Ron Cote, CPMM

Tim Rivers, CPMM

Don Gillis, CPE

Tom Wall, CPMM

Joseph Chip Mannarino, CPE

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AFE Chapter 74

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AFE Association for *Chapter 74 - Worcester/Central MA*
FACILITIES ENGINEERING®

Welcome to AFE 74, the AFE Chapter of the Worcester Area and Central Massachusetts. We're glad you're here. We have a very active chapter that meets every third Thursday of the month at 2:30 PM.

Our focus is to tour all types of facilities, have technical presentations, offer networking opportunities and to have a good time while we do it. Please check our our comments letter below and the links to the left.

Chapter Schedule
Board of Directors
New Member Info
74 Coverage Map
Facilities Directory
Promotion Guide
Past & Future Meetings
Join AFE - AFE.org
Job Opportunities
Contact Chapter 74
Photos and Videos

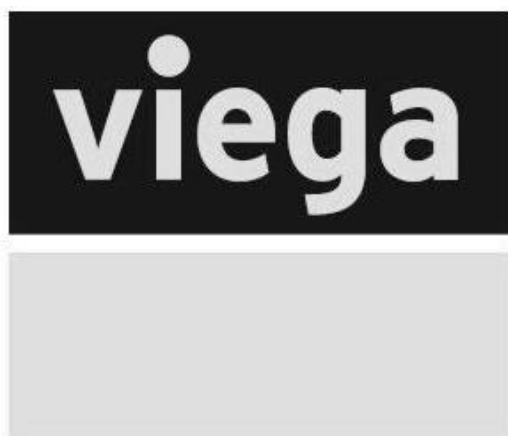
Next Meeting Tour:
A Night at the Museum
Worcester Art Museum Tour
AFE 74's 50th Anniversary Celebration
Wednesday, January 20th
Monthly Newsletter - Tour Information
Sign up for Meeting
Sign up for the AFE Newsletter

[CLICK HERE](http://www.afe74.org) to go to our chapter web site or you can access through www.afe74.org

Contact us by email at Chapter74@afe.org

Check out the newly revised Region Web site www.afe8.org

Need to update your member profile, contact info or find another member check out 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.

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.

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.

How much are dues for Young Professional Members?

Young Members' dues are \$95 annually.

Do Young Professional Members receive the same benefits as regular members?

YPM (Young Professional Members) have all the same membership benefits as full members, but with added incentives to make this your strongest possible career move into facilities engineering.

As you chart your career path, let AFE be your long-term partner in managing your career. Your success achieves our mission of advancing the facilities engineering profession! Partner with us today to ensure your success tomorrow.

Visit the AFE website for more info: <http://www.afe.org/join/faq.cfm>

Contact the local AFE Chapter 74 Membership Chairman

Ronald Cote, CPMM

AFE Chapter 74 Membership Chairman

508-509-5635

E-mail: Ronald.cote@emc.com

Visit the Chapter website at www.afe74.org



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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 $2000 \times 144 = 288000 \text{ Btu's/hr}$

1Kw/hr = 3415 Btu's

1ton = 12000 Btu

1 Btu = 778 ft/lb.

.746 Kw/hr = 1hp hr

1Hp = 1Ton

1kw = 1.34 hp

1 watt 3.413 Btu

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

"Courtesy of Electrical Service Association"
www.esa.com

	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 7.854×10^{-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
	Square yards	x .8361	= Square meters
Volume	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

"Courtesy of Electrical Service Association"
www.esa.com

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/mm² = 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

"Courtesy of Electrical Service Association"
www.esa.com

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

$$\text{Horsepower} = \frac{\text{Torque (lb-ft)} \times \text{rpm}}{5250} \quad \text{Kilowatts} = \frac{\text{Torque (N-m)} \times \text{rpm}}{9550}$$

$$\text{Torque (lb-ft)} = \frac{\text{Horsepower} \times 5250}{\text{rpm}} \quad \text{Torque (N-m)} = \frac{\text{Kilowatts} \times 9550}{\text{rpm}}$$

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)

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

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

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

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

USEFUL FORMULAS

"Courtesy of Electric Service Association"
WWW.EASA.ORG

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*

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

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 ³ natural gas	1,000 Btu
1 Ccf natural gas	100 ft ³ natural gas
1 Mcf natural gas	1,000 ft ³ 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 ¹⁵ 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 = 10¹⁵ BTU (World energy usage is about 300 Quads/year, US is about 100 Quads/year in 1996.)

Energy Formulas

HVAC

One ton of A/C = 12,000 BTU,

One ton hour of A/C = 12,000 btu /hr

EER – Energy Efficiency ratio – ratio of cooling output in Btu to the energy in Wh watt hours to operate.

$$\text{EER} = \frac{\text{Btu of cooling output}}{\text{Watt hour of electric input}} \quad \text{or} \quad \frac{\frac{\text{BTu}}{\text{hr}} \text{ of cooling output}}{\text{Watt of electric input}}$$

$$\text{COP} = \frac{\text{Energy moved from cold space or delivered to hot space}}{\text{Energy Input to operate system}}$$

$$\text{COP} = \frac{\text{EER}}{3.412 \text{ btu/wh}}$$

$$\text{KW/Ton} = 12/\text{EER} = 3.517/\text{COP}$$

Energy Formulas

LIGHTING

- $RCR = (2.5 \times \text{cavity height} \times \text{perimeter}) / (\text{area})$ General
- $RCR = (5 \times \text{height} \times (L + W)) / (L \times W)$ Rectangular room
- Number of lamps = $(FC \text{ desired} \times \text{area}) / (\text{Lumens-per-lamp} \times Cu \times LI \times L2)$
- $FC = \text{Lumens} / d^2$
- Efficacy = Lumens/watt

HEAT FLOW

- $q = u \times A \times \Delta t$ Btu/h
- $q = M \times Cp \times \Delta T$ Btu/h sensible heat only
- $q = M \times Ah$ Btu/h sensible and latent heat
- $Q \text{ cooling} = U \times A \times 24 \times CDD$ Btu/yr
- $Q \text{ heating} = U \times A \times 24 \times HDD$ Btu/y

GEOMETRY

- Area of circle = $\pi \times r^2$
- Circumference of circle = $\pi \times D$
- Area of rectangle = $L \times W$
- Perimeter of rectangle = $2 \times L + 2 \times W$

ELECTRICAL

- $V = I \times R$ Ohm's Law (single phase)
- $P = I^2 \times R$ Ohm's law for power (single phase)
- $kW = (V \times A \times 1.73 \times PF) / 1000$ (3 phase)
- $kW = kVA \times PF$
- $kVA = 1.73 \times kV \times A$ (3 phase)





AFE 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

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 course, 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 \$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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2018

January							February							March						
S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S
	1	2	3	4	5	6					1	2	3					1	2	3
7	8	9	10	11	12	13	4	5	6	7	8	9	10	4	5	6	7	8	9	10
14	15	16	17	18	19	20	11	12	13	14	15	16	17	11	12	13	14	15	16	17
21	22	23	24	25	26	27	18	19	20	21	22	23	24	18	19	20	21	22	23	24
28	29	30	31				25	26	27	28				25	26	27	28	29	30	31

April							May							June						
S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S
1	2	3	4	5	6	7			1	2	3	4	5						1	2
8	9	10	11	12	13	14	6	7	8	9	10	11	12	3	4	5	6	7	8	9
15	16	17	18	19	20	21	13	14	15	16	17	18	19	10	11	12	13	14	15	16
22	23	24	25	26	27	28	20	21	22	23	24	25	26	17	18	19	20	21	22	23
29	30						27	28	29	30	31			24	25	26	27	28	29	30

July							August							September						
S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S
1	2	3	4	5	6	7				1	2	3	4							1
8	9	10	11	12	13	14	5	6	7	8	9	10	11	2	3	4	5	6	7	8
15	16	17	18	19	20	21	12	13	14	15	16	17	18	9	10	11	12	13	14	15
22	23	24	25	26	27	28	19	20	21	22	23	24	25	16	17	18	19	20	21	22
29	30	31					26	27	28	29	30	31		23	24	25	26	27	28	29
														30						

October							November							December						
S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S
	1	2	3	4	5	6					1	2	3							1
7	8	9	10	11	12	13	4	5	6	7	8	9	10	2	3	4	5	6	7	8
14	15	16	17	18	19	20	11	12	13	14	15	16	17	9	10	11	12	13	14	15
21	22	23	24	25	26	27	18	19	20	21	22	23	24	16	17	18	19	20	21	22
28	29	30	31				25	26	27	28	29	30		23	24	25	26	27	28	29
														30	31					