

December 2003



Plumbing Design Class

Date: Tuesday, December 16, 2003

Time: 5:30 - 9:00 PM - Dinner and Plumbing Design Class

Cost: Members ASPE, ASSE: No Charge
Non-members: \$15.00

Location:

PMC Center
14801 W. 8 Mile Rd.

Topic: Domestic Hot Water Generation Design and Sizing

Speaker: Mr. Alan Deal, Performance Engineering Group

Sponsors:

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- Meek / Beck Associates
- Performance Engineering Group
- Quality Water and Air

Please confirm your attendance through the web site at aspeemc.org

PRESIDENT'S REPORT

**Douglas W. Cryer, CSI CIPE/CPD
President**



Happy Holidays and best wishes to all of you readers and members.

First of all, I'm sorry that the November meeting was not as successful as our Board had planned. Stuff happens and speakers don't respond in a timely manner. A few respected (yes, you know who you are) individuals noticed and voiced their opinions about the technical and code deficiencies in this presentation, as being lacking and obvious.

Please, I mean no disrespect to the speakers and their expertise in the areas that were covered. The data given was sufficient and I took some "rules of thumb" notes, myself, as I noticed others doing. That, in itself, was worth the meeting. Some people gathered useful knowledge or perhaps more than that. Our ASPE Chapter aims to offer you information and useful technical application data and problem solving skills that are so often overlooked in the "university" setting. We try to be more of a hands-on and technical (why we do it and show me) organization.

If you attend the December 16th technical session on Domestic Hot Water Generation, Design and Sizing class, then you will be challenged like you never had imagined at an ASPE meeting. I promise you total enjoyment (for Holiday Cheer) and an informative session with more problem solving for our attendees to calculate.

Alan Deal of Performance Engineering Group in Livonia will be the "Host", if you will, for the evening. ASPE meets Alec Trebeck. "Hot Water Terms for \$200 Alan," Barry exclaimed, while buzzing in to describe the question to the answer. Get it? Hot Water Jeopardy. How much fun can six contestants and a zany host have at an ASPE meeting on a cold December evening?

Did I mention that there would be calculations to solve? Yes, I think I did. Do not be afraid my comrades. You will be broken up into groups like we

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American Society of Plumbing Engineers

Eastern Michigan Chapter 2003-04 Technical Classes

*Held monthly at the
(except where noted)*

PMC of Detroit
14801 West 8 Mile Road
Detroit, MI 48235

September 23, 2003
Sanitary and Storm Piping

October 28, 2003
Domestic Water Distribution, Boosters,
Treatment and Sizing

November 18, 2003
Commercial Laundry and Kitchen Requirements

December 16, 2003

Domestic Hot Water Generation Design and Sizing

January 10, 2004
First Saturday Technical Review Course (8 hours)

January 20, 2004
Professional Plumbing Practices, Estimating
and Test Taking Skills

Friday, February 20, 2004
ASPE/ASHRAE Meeting at Compuware Arena for
Snow Melting and Plumbing for the Ice Arena

March 23, 2004
New Michigan Plumbing Code Review
with Mr. Robert Konyndyk

April 3, 2004
Second Saturday Technical Review Course (8 hours)

April 27, 2004 - Architectural and Structural
Interferences, Coordination and
Value Engineering Panel Discussion

May 25, 2004
Open Microphone Night for Vendors and
BBQ @ PMC Detroit

Thank you to our sponsors...

A special thank you to the following manufacturers' representatives for sponsoring this month's meeting. Let them know you saw their names here.

Mike Burdette - Howely Agency Sales

Jason Loverich - Lochinvar

Mike Ostrowski - Lozuaway & Associates

Ross Beck - Meek / Beck Associates

Alan Deal - Performance Engineering Group

Alec Bien - Quality Water and Air

***Mark your calendars for
January 10 for the
Technical Review
and
January 20 for
Professional Plumbing
Practices, Estimating
and Test Taking Skills***



January



Sun	Mon	Tue	Wed	Thu	Fri	Sat
				1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	31

ASPE News is published 10 times per year (September through May, plus one summer issue). Yearly advertising rates are \$250.00 per ad for members and \$300.00 for non-members. Insert advertisements are \$250.00 per newsletter for one oz., \$100 for every oz. over. Help Wanted ads, fifty words or less, \$100.00 per issue. For quarter-page and half-page product ads, please contact Joe Hernandez. Checks should be made payable to ASPE E. Mich. Chapter and send check with inserts or ad to Joe Hernandez. Circulation 400-Distributed to: Engineers, Contractors, Inspectors, and other industry professionals in Michigan. For contributing articles contact Joe Hernandez, Newsletter Editor at newslettereditor@aspeemc.org.

President's Report

continued from pg. 1

did in October. One worker, one thinker, one writer and a few listeners; it doesn't matter which one you are. Just get into it and do your best. If you make a mistake or do not understand what is happening, then this is the forum to get your concerns and questions answered. There will be staff on hand to help you, if needed. It's only a test to get you thinking and asking questions to the people around you, instead of "Your Boss or worse yet, an OWNER!"

"Corroding Anodes for \$2000 Alan," Doug yelled into the cell phone from the sun and warm weather of the Florida beaches!

Now, that I've got everyone's attention. Our Chapter has been in the forefront of the Plumbing Code and Engineering Design realm for more years than I know. With the departure of Jill Dirksen, our very educated, involved and beloved Vice President Technical, to the elevated position of person in charge of Technical Papers and Articles for the National ASPE Publication, we are in need of volunteers. Not to replace Jill but to fill additional places that will be required for others moving up through the ranks.

As I said, I need some attention please. Some people heard my plea at the last meeting and approached me about joining the Board. It isn't about joining. It's about helping others benefit from your own experiences. Everyone in our membership can become a Board Member in some capacity. We welcome all newcomers. We will break you in slowly. Please do not worry about getting in over your head, unless you have aspirations of becoming the VP Education, Technical or President of the Chapter. I guarantee somebody out there will gladly replace my position in less than five years. We are grooming people behind the scenes, as I write this, to carry on the legacy of being in a position of decision making for the Eastern Michigan Chapter of ASPE. I want and request others to infuse their personalities and knowledge to help shape and define the legacy of this chapter for the next 20 years.

We have so many connections in the trades and engineering society that I cannot understand why more major engineering firms do not embrace our technical abilities along with our collective voice at the "National Code Hearings" to generate increased interest in our Society, as a whole.

The 4 Rules of Plumbing only apply to those who are unknowing. Some of the plumbing installers possibly know what I'm referring to? Please give ASPE more credibility. Encourage fellow contractors, designers, engineers and inspectors to get involved with our group.

Let me also remind you that we will be having an in-depth overview of the first four months of this technical year on Saturday, January 10, 2004 from 9:00 - 3:00. Lunch and materials will be provided for \$10.00 per person. Instructors

will be Esteban Cabello, PE, CPD, and Joe Hernandez, CPD. Please RSVP for this special meeting with the registration form (upcoming) as soon as you receive it.

"Hot Water Storage for \$500 Alan," the confident engineer asked."

Hot Water Storage for \$500 it is!

The Daily Double!!!!!!!!!!!!!!

Our host asks, "Your wager please?"

"The engineer says, \$1,500."

The answer is...

Please, where is the suspense? Come, be a contestant on Plumbing Jeopardy.

P.S. Good wishes to you, Jill. Everyone knows you'll do your best.

See all of you in 2004 and some of you not soon enough!

GO BLUE!



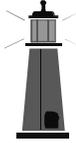
Doug

Night at the Races

Friday, March 19, 2004



Northville Downs



Spotlight on our Members

Jill Dirksen, our Eastern Michigan Chapter Vice President Technical, has taken the position of Director of Technical Services with national Society. She will be in charge of the ASPE Data Books, assist with the ASPE Magazine (start looking for her name!) and other publications.

Jill has been very active in the Eastern Michigan ASPE Chapter since 1999 filling the positions of

Awards/Nominations, Treasurer, VP Legislative and VP Technical. She has been with Albert Kahn for the past five years.

After spending the holidays with her family in Kansas, Jill will be moving to Chicago for this new position which starts on January 5.

Good luck Jill - we're proud to say you were from the Eastern Michigan Chapter!

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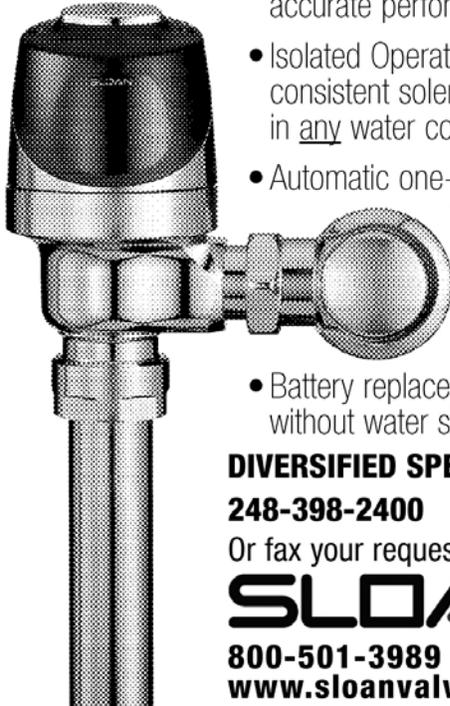
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Professor Plumber sez...

**Bill Grayzar, CPD
VP Education**

The topic for the December ASPE meeting is Domestic Hot Water Generation Design and Sizing. In keeping with the monthly topic I would like to briefly discuss domestic hot water systems.

Domestic Hot Water Design:

The design of the domestic hot water supply system for any building is important. Careful planning on the basis of all available data will ensure an adequate supply of water at the desired temperature to each fixture at all times. A properly designed system must conform with all the regulations of the authorities having jurisdiction.

The key objectives for the design of an efficient hot water distribution system include:

Providing adequate amounts of water at the prescribed temperature to all fixtures and equipment at all times in a timely manner.

A system that will perform its function safely.

The utilization of an economical heat source.

A cost effective and durable installation.

An economical operating system with reasonable maintenance.

Any well designed system should deliver the prescribed temperature at the outlet almost instantaneously to avoid the wasteful running of water until the desired temperature is achieved. The hot water should be available any time of the day or night and during low-demand periods as well as during peak flows.

Safety must be built into any hot water system and the safety features must operate automatically. The two main dangers to be guarded against are excessive pressures and temperatures. Exploding water heaters and scalding water at fixtures must be prevented in the design stage.

An economical heat source is of prime importance in conserving energy. Various sources are coal, gas, electric, oil, steam, condensate and waste hot water. The availability and cost of any of these sources or a combination of these sources will dictate the selection.

All economical and durable installation can be achieved by judicious selection of the proper materials and equipment. The piping layout will also have an effect on economics and will later determine the ease of maintenance, replacement and repair.

Following installation, cost-effective operation and maintenance also depend upon the proper selection of materials and equipment. The choice of instantaneous or storage type heaters, the selection of insulation on heaters and piping, the location of piping (avoiding cold, unheated areas), the ease of circulation (avoiding drops and rises in piping), bypasses around pumps and tanks, and adequate valving accessibility are all items that affect the economical operation and maintenance of a system.

Hot and Cold Water Mixing:

The following formula will determine the number of gallons of hot water that, when mixed with one (1) gallon of cold water, produces a given mixed water temperature.

$$G_H = (T_M - T_C) / (T_H - T_M)$$

G_H = Hot water required (gal)

T_M = Mixed water temperature (°F)

T_C = Cold water temperature (°F)

T_H = Hot water temperature (°F)

For example, if hot water provided at 180 °F and cold water at 40 °F are to be mixed to produce a mixed water temperature of 120 °F, then as shown below 1.3 gallons of hot water would be required for every gallon of cold water supplied to achieve the mixed water temperature of 120 °F.

$$G_H = (120 - 40) / (180 - 120) = (80) / (60) = \boxed{1.3 \text{ gal}}$$

Revising the formula slightly, it can be utilized to determine the percentage of hot water required to achieve various mixed water temperatures.

Professor Plumber sez...

continued from previous page.

$$P = ((T_M - T_C) / (T_H - T_C)) \times 100$$

P = Percentage of the mixture that is hot water (%)

T_M = Mixed water temperature (°F)

T_C = Cold water temperature (°F)

T_H = Hot water temperature (°F)

Using the example above, if hot water provided at 180 °F and cold water at 40 °F are to be mixed to produce a mixed water temperature of 120 °F, then as shown below 57 % of the mixture must be hot water.

$$P = (120 - 40) / (180 - 40) \times 100 = (80) / (140) \times 100$$

$= 57\%$

Water Heaters in Brief:

There are basically two types of water heaters: instantaneous and storage type water heaters. In brief, instantaneous type water heaters must have sufficient input capacity to meet all demands simultaneously. This type of heater has no built in storage volume because it is designed to provide the full load instantly and continuously. The fuel is automatically controlled by the flow of water in and on-off or a modulated system. The heat input is fixed at the factory. Heat input for this type of water heater is high to ensure the required discharge rate and temperature of hot water.

Instantaneous water heaters are typically used where heating demands are level and constant, such as for swimming pools, certain dishwasher boosters, and industrial processes.

The primary reason for using a storage type water heater instead of an instantaneous water heater is to smooth out the peak demands on heating systems where there are large volume changes in hot water demand, such as in gymnasiums (showers), laundries, kitchens, and industrial washrooms. When correct storage capacity is combined with the correct recovery capacity and the proper size heating medium control valve, a substantial reduction of the peak heating fluid demand can be realized. This results in a smaller boiler and less heating medium piping.

To determine if a proposed water heater is capable of providing the required BTUH or KWH, the fol-

lowing formulas can be utilized to determine input heating capacity.

Instantaneous (gas or hot water to water)

$$(GPM \times 60 \times DR \times 8.33) / TE = BTUH$$

Storage (gas or hot water to water)

$$(GPH \times DR \times 8.33) / TE = BTUH$$

Instantaneous (electric)

$$(GPM \times 60 \times DR \times 8.33)$$

$$(3412 \times 98\% \text{ eff.}) = KWH$$

Storage (electric)

$$(GPH \times DR \times 8.33)$$

$$(3412 \times 98\% \text{ eff.}) = KWH$$

GPM = Gallons per minute of water supply

GPH = Gallons per hour of water supply

DR = Degree rise in °F from water input temperature to required use temperature.

TE = Thermal efficiency of the water heater (%)

The above formulas will be covered in more detail at the January 10th, 2004 review meeting.

Some additional conversion factors you will need and should know for the CPD Exam that relate to hot water systems are listed below. You should be able to pull these conversions from memory prior to the exam.

1 gallon of water weighs 8.33 pounds

(1 gal = 8.33 lbs)

1 Watt of electricity can produce to 3.41 btu/h

(1 Watt = 3.41 btu/h)

1 btu can be produced from 0.293 Watts of electricity

(1 btu = 0.293 Watts)

Look for more calculations in the January ASPE newsletter and watch for a separate flier in December for information and registration for the January 10th review course.

Bill



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Febco - backflow prevention assemblies, **Hot Box** - insulated valve & meter enclosures, **Mr. Steam** - residential & commercial steamroom generators, saunas, **NDS** - exterior drainage & landscape products, valve & meter boxes, channel drain, flexible couplings & saddles, equipment pads, tree grates, grass pavers, root barriers, drip & micro irrigation, **Plumberex-ADA Handy Shield™** trap & supply safety covers, **Sioux Chief** - commercial drainage products, roof drains, water hammer arresters, commercial hangers & brackets, trap primers, preformed copper, plumbing specialties, **Spears Mfg. Co.** - PVC/CPVC fittings, DWV fittings, ball, lab, check, diaphragm, butterfly valves, CTS fittings & valves, irrigation specialties, fabricated fittings, CPVC fire sprinkler fittings, actuation, dual-containment, CPVC lab waste systems, LXT ultra-pure water systems, PVC compression fittings, PVC saddles, **Toilet Partitions**

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Powers Process Controls - pressure equalizing & thermostatic blending valves, fotopanel, hydropanel, electronic plumbing, self-actuated temperature regulators, pneumatic temperature controllers, **Haws Drinking Faucet Company** - emergency showers & eye wash fountains, drinking fountains & water coolers, **Coyne-Delany** - flush valves, sensor plumbing, **J.D. Gould** - electric solenoid valves, bronze & stainless steel

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A.O. Smith - water heaters, boilers, commercial & residential, **American Plumber**-water filtration products, **Bemis/Church** - plastic, wood and medic-aid, residential & commercial toilet seats, **Boots Plumbingware**-steel lavs & tubs, **Howell Metal** -copper tubing, **Jones Stephens Corp**-plumbing specialties, **Little Giant Pump Co.** -sump, sewage & condensate, **Mansfield Plumbing**-plumbing products, china/steel/brass, **Plastic Trends** - PVC SDR 35 gasketed 4"-24", PVC SDR26 heavy wall gasketed 4"-18", PVC SDR 35 solvent weld 4"-24", styrene solvent weld 3"-6", PVC/DWV solvent weld 8"-24", **Plumco** -specialty products, **Royal Quickstop**-fire protection systems, **Swirl-way**-acrylic whirl-pool tubs, Vandem-no hub cast iron soil pipe and fittings

Aero Mfg-stainless steel sinks, **Bradley Corp.** - washfountains, emergency, patient care & security fixtures, **Central Brass**-faucets & plumbing brass, **Chronomite** - point of use water heaters, **Dwyer Kitchens** - compact kitchens, **Halsey Taylor** - electric water coolers & drinking fountains, **Leonard** - shower & water mixing valves, thermostatic & pressure balanced, **McGuire**-brass fittings, **Santana** - toilet & shower compartments , **Truebro** - trap & supply covers

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Nibco - copper & plastic fittings, plumbing valves, pressure rated valves, industrial plastic fittings & valves

Aldrich-steel tube, oil & gas-fired boilers. Low pressure steam, hydronic and volume hot water heating systems, **Autotrol**-water purification by deionization. Capacities up to 20,000 gallons per day, **Holby Valve Co.**-low/standard range thermostatic mixing valves 1/2" to 4", **Lawler Valve Co.**-low/standard range thermostatic hot water mixing valves, emergency shower valves, temperature and pressure balanced mixing valves 1/2" to 2", **Raypak**-copper-fin hydronic and domestic hot water supply boilers, booster heaters & storage tanks. Sizes from 30 MBTU to 4,000 MBTU, **Ruud Manufacturing**-commercial & residential gas-fired and electric hot water heaters & booster heaters, **Thaw-Pak**-custom in-slab & underfloor heating designs & materials for radiant floor heating, snow melting and de-icing systems, **Valley**-commercial water softeners with metered & non-metered regeneration control, pre-wired and pre-plumbed multi-tank systems

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Alsons-shower heads, hands showers & accessories, **Campbell Mfg.**-water system & filtration products, **CTS**-copper flange adapters, **Flint & Walling**-well pumps, jet pumps, water conditioning, **Laco Industries**-fluxes, sealants, penetrants, caulk, putty, **PHD Mfg.**-pipe hangers, strut & accessories, **Raychem**-heat tracing products, pipe freeze protection, **Seminole**-pipe nipples, couplings, steel fittings, **Stadler-Viega** - in-floor radiant heat, potable water pex, **Topp Industries**-fiberglass and poly basins, **Viessmann Mfg.**-boilers, controls & energy management, **Ward Mfg.**-malleable & cast iron fittings, wardflex, **Waterless**-waterless urinals, **Zoeller Pump Co.**-sump, sewage & wastewater pumps & accessories

Anaco-no hub couplings, transition couplings, SV gaskets, **Aquarius** - acrylic & gel coat shower/tub-shower surrounds, **Chicago Faucet**-residential, hospital, industrial, commercial, lab & decorative faucets, **Eemax**-electric tankless water heaters, **Geberit**-commercial product division. sensor flush valves & faucets, pressure assisted toilet systems, metering faucets, **Guardian Equipment**-emergency eye wash & shower equipment, **Husky** - heavy duty & mid-range no hub couplings, **Intersan Mfg.**-stainless steel and polyresin washfountains, **Orion Fittings**-corrosion resistant piping systems, high purity water & dilution tanks, **Stern-Williams Co.**-terrazzo mop sinks & shower floors, drinking fountains, **Tyler Pipe**-Tyler soil pipe & accessories, Rufwall systems

Aqua Bath-acrylic ADA tub & shower units, **Cooper Bline**-pipe hangers & strut systems, **Dupage Products**-threaded rod & hose clamps, **Green Mfg. Inc.**-loading racks & stairs, **Hayward Industrial Products**-plastic pvc, epvc valves, basket strainers, filters, pneumatic & electric actuators & solenoid valves, **Webster Pumps** -immersible & centrifugal pumps, **Insul-Tek**-preinsulated piping systems, **Homestead**-plug valves, **Hydrotek International Inc.**-sensor operated faucets & flush valves, **Mission Rubber Co.**-"heavyweight" no hub couplings, **Noble Co.**-anti-freeze non-toxic, CPE shower pan lining, **Richmade Co.**-pvc shower pan lining, **Rockford Sanitary Systems**-grease interceptors, oil separators, **OPW Engineered Systems**-loading arms, sight flos, iso rings & swivel joints

AC Fire Pump Systems - horizontal split case, end suction & in-line fire pumps, ul & fm packaged systems including skids & pre-fabricated houses, **Floway Pumps**- vertical turbine fire pumps, **Cla-Val** - fire control valves, ul & fm, **Guardian** - Guardian fire equipment, hose equipment and brass, **Xerxes** - underground water storage tanks, **Modern** - pressure & steel water storage tanks.

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Watts Regulator Co. -regulators, control valves, relief valves, backflow preventers, ball valves, gate valves, butterfly valves, hydronic valves, tempering valves and other plumbing specialties

ASPE NEWS

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