"Short Form" Boiler Efficiency Check

- With today's high fuel costs, the importance of maintaining optimum efficiency on boilers cannot be ignored. The use of various instruments to measure the products of combustion (CO₂, CO), excess oxygen, stack temperature, etc. is the ideal way to check on boiler efficiency. However, for various reasons, not all facilities have access to such instrumentation. Nonetheless, it is possible to keep a check on your boiler efficiency with a minimum of instrumentation.

- Basically, the measure of boiler efficiency can be determined by dividing the output (pounds of steam per day) by the input (gallons of oil, MCF of gas, KW-Hrs etc.) In essence, the output is a measure of BTU’s generated while the input is a measure of BTU’s consumed to generate that particular output.

- Since the latent heat of vaporization (i.e. the amount of heat required to change a particular substance from the liquid to the gaseous state without a change in temperature) for water at sea level is 970.4 BTU’s per pound and since the latent heat of vaporization is the major factor in the BTU content of most steam generated, a figure of 1000 BTU’s per pound of steam is a convenient figure to use when computing steam output. Thus an output of 100,000 pounds of steam per day is essentially the equivalent of 100,000,000 BTU’s (100,000 lbs x 1000 BTU/lb).

- The input is a measure of the fuel consumed. Most natural gas sold is in the range of 1000 BTU per cubic foot or 1,000,000 BTU per MCF (one thousand cubic feet). Oil will vary according to type (#2, #4, #6) and gravity. Again, for convenience purposes, a figure of 150,000 BTU/gallon of #6 oil is appropriate. Thus, if we use the example in the previous paragraph of 100,000 lbs of steam per day or 100,000,000 BTU’s per day and we assume a consumption of 125 MCF of gas or 125,000,000 BTU, the efficiency of the boiler expressed in percentage is:

<table>
<thead>
<tr>
<th>BTU Input</th>
<th>Efficiency</th>
</tr>
</thead>
<tbody>
<tr>
<td>100,000,000 BTU</td>
<td>125,000,000 BTU</td>
</tr>
<tr>
<td>80%</td>
<td></td>
</tr>
</tbody>
</table>

If, in the same equation, we use an input of 300 gals. of oil, the efficiency expressed in percentage is:

<table>
<thead>
<tr>
<th>BTU Input</th>
<th>Efficiency</th>
</tr>
</thead>
<tbody>
<tr>
<td>100,000,000 BTU</td>
<td>150,000,000 BTU</td>
</tr>
<tr>
<td>66.7%</td>
<td></td>
</tr>
</tbody>
</table>

Fall 82 Seminar

The Western Mass Hospital Engineers are happy to announce that they will host the 1983 Fall meeting in West Springfield, MA at the beautiful Sheraton Inn at the convenient intersection of the Mass Turnpike and Route 1/91.

The program schedule for this meeting will be the Fire Safety Evaluation System (F.S.E.S.) with certification awarded upon successful completion of the program. The dates of the Fall meeting are from noon October 12 to noon October 17 with round table type meetings on October 12 and two and a half full days of F.S.E.S.

This will be a working meeting so plan to spend the time in class while your guest will be escorted thru the beautiful Pioneer Valley at what we hope will be the peak of the Fall foliage.

NEHES History Correction

Your NEHES secretary should have cleared his recent article with historian Warren Marble. Not only did I forget two names, 1 misstated our founding date. It should have been 1958. First, my apologies to charter members William Pitt, Director of General Services at Kent County Hospital, Warwick, RI, and Leonard Hayward, Vice President of Plant Services and Security, Newport Hospital, Newport, RI. Also, Bernie Dowd advised me that he is not a charter member. The names listed were to have been active NEHES members. On our honorary members list are the following 11 charter members: Manual Carvalho; Vincent Gardner; William Harney; Winslow Harris; James Mace; Gilbert Nessoili; Chester Oliver; Martin Shea; Richard Stockwell; Samuel Thorpe; and Alfred Willette.

Further notes of history indicate that in the fall of 1957 Joe Degan, Lou Hough and George Vera formed a steering committee to initiate the fall meeting in 1958 held at the Parker House in conjunction with the New England Hospital Assembly. At that meeting about 60 engineers voted to accept a regional hospital engineering society. The first formal meeting was in 1959 at the Mass. General Hospital with guest speakers Arthur Barnes, Memorial Hospital, NY and Lee Mamer of St. Lukes Hospital, NY. Our first officers were President, George Vera; Vice President, Richard Stockwell; Treasurer, Joseph Degan; and Secretary, William Harney.

Bradley Memorial Hospital and Health Center

The Director of Engineering and Maintenance, Mr. Anthony Jaskiewicz of Bradley Memorial Hospital and Health Care Center, Southington, Connecticut has announced an overall energy saving of four thousand dollars, ($4,000) plus per month at his seventy four thousand square foot facility.

Mr. Jaskiewicz and his staff re-engineered and accomplished these savings in-house at a relatively low cost in many phases of the plant operation, with special emphasis on the combustion control system of the boiler system, major engineering modification of the hospital's Kathabar Air Handling system, and complete upgrading and redistribution of the electrical load.

The three boilers, all of three hundred horse power size, were previously being fired conventionally with air, using number 4 fuel oil. By replacing atomizing air with atomizing steam, the hospital has realized an overall twenty percent: reduction of total fuel oil consumption. Boiler operating pressure was reduced, and careful monitoring and adjustments were instituted to maintain optimum combustion efficiency under various weather and atmospheric conditions.

Major engineering modifications were made to the Kathabar Air Handling system, which included incorporating the use of a Heppa Air Filter Bank with a 98% air purity.

Eliminating the use of the regenerator has brought a further twenty-eight thousand gallons per year of fuel oil savings.

The reduction of chemicals and maintenance add to the total cost saving realized with this unit. Extensive elimination of support equipment serving this unit continue to produce important energy and dollar savings. This project was also a total in-house undertaking by Mr. Jaskiewicz.

An intensive effort was made to improve the efficiency of electrical load devices. A 20% reduction in electrical usage was accomplished by relamping with "Watt-Miser" fluorescent lamps, by substituting fan coil units for inefficient window air conditioners, and by modification of an inefficient chiller.

Along with the mentioned project energy savers in this article, the hospital is continuing to realize "side effect" savings from these accomplishments, and is pushing ahead with the goal of New England's top energy efficient hospital by retrofit.

— RICHARD POPHAM
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Memorial Hospital

Vermont
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Gifford Memorial Hospital

The Stamford Hospital Promotes George Price

From the Stamford Hospital in Stamford, CT comes the news of promotion of George Price, current Vice President of CHES, to the position of Assistant Vice President of that hospital. Before receiving the new appointment, Mr. Price had been Director of Engineering at the Stamford Hospital since 1975. In his new position, Mr. Price will oversee the construction of a project over $20 Million — containing new facilities for O.R., ICU/CCU, Radiology, Library, Medical Records, Material Management, and Dietary Departments.

George Price is a past treasurer and Program Director of the Connecticut Hospital Engineering Society. He is also a member of the National Society of Professional Engineers, the National Fire Protection Association, and the American Chemical Society.

Construction Management Seminar a Huge Success

For those of you who weren’t able to make it to our Spring seminar, the following information may be of interest to you and your organization.

First, and foremost, the seminar was a huge success. Nearly 150 people attended representing a total of 89 hospitals in the six-state New England region. The presentations, which can only be rated by the attendees, were from a selection of professionals covering a wide cross section of the Construction Management field. NEHES takes their seminars very seriously and that is why the following list of speakers were chosen.

Mr. J. Terry Garrigan
District Manager of Business Development
Gilbane Building Company

Mr. Garrigan has a BS in Civil Engineering from the University of Notre Dame and a MS in Engineering Management from the University of Missouri. He is a Registered PE. Terry discussed the differences between the traditional general contractor rule and the construction management concept, emphasizing the key advantages of the CM approach.

Speaker No. 2 was:

Mr. Richard M. Potter
Principal Member of
Shepley, Bulfinch, Richardson and Abbott Corp.

Mr. Potter received an A.B. and a Masters of Architecture from Harvard University. He is a Registered Architect in Mass., N.H. and Vt. Mr. Potter emphasized the relationship of the architect/engineer, construction manager and the owner, and detailed how the process of the whole project is shortened thru the “fast track” CM method. He illustrated how the triangle of the A/E, CM and Owner remain the key to success.

The next speaker was:

Mr. James F. Lyons
President,
Cape Cod Hospital, Hyannis

Mr. Lyons has been a Senior Medical Facility Planner for the Architects Collaborative, Cambridge, and an Administrator involved in major construction projects at St. Anne’s Hospital, Fall River, MA, Cardinal Cushing Hospital, Brockton, MA, Falmouth Hospital, Falmouth, MA, Goddard Hospital, Stoughton, MA.

From the owner position he offered support of Construction Management methods due to the extensive process of developing a project from conception to completion. There is no viable alternative. Jim Lyons stressed the point that the system will work but the owner must realize the commitment he makes involves the full time responsibility of a senior staff member.

Speaker No. 4 is:

Mr. Paul D. Schwartz
Member of
Ropes and Gray, Boston

Mr. Schwartz earned a BA in Mathematics from Connecticut College and a Master of Architecture from MIT. He went on to earn his doctorate from Harvard Law School.

(Continued on Page 3)

Emergency Transfer Switch Shorted

The emergency transfer switch was installed in 1977 in the same room with the emergency generator. This didn’t seem to be a bad idea until this moment when a diesel engine coolant line sprung a leak and water/ethylene glycol mixture ran down the main feed conduit into the transfer switch and caused the switch to short out. There was only a slim chance for any failing coolant line to direct water onto this transfer switch but somebody should have raised the question of Murphy’s law — if something can happen, it will happen. This fault occurred during a regular week generator test and shut down the entire heating plant for 2 hours at a busy time — 8:15 a.m. Monday morning. Luckily the electrician was unharmed but he could have been burned with engine coolant or if touching the panel — electrocuted. Take another look at where your electrical panels are located and ask yourself if any water of steam lines could fall in this critical area.

— DAVE HATHAWAY

Ambulatory Center Converts Excess Steam Into Energy To Meet Hot Water Needs

Among the energy-conserving features at the 10-story, 283,000 sq. ft. ambulatory care center at Massachusetts General Hospital, Boston, is a heating system, designed by R.G. Vanderweel Engineers, a Boston engineering/consulting firm, that uses excess steam from other buildings in the hospital complex.

Excess steam from the hospital is currently being dumped into sewers, because the utility company that supplies the steam has no condensate return system. The center’s heating system will collect the excess steam and pass it through heat exchangers that will convert the steam into energy to heat the perimeter of the building and supply most of the facility’s hot water needs.

Other energy-conservation features include an exterior surface design that exceeds Massachusetts Energy Code requirements and reduces outside air infiltration, a light, system that consumes less than two watts per sq. ft., and a ventilation feature that takes heat generated within the building and recycles it to the building’s perimeter to minimize heat losses.
Water Heating Costs

A leading New England newspaper carried the following advice as a means of reducing water heating costs. If any of our members disagree, I would like to hear from them. “Most of the hot water used in a home is for bathing and various heating jobs and it must be diluted with cold water. It is wasteful to heat this water to a high temperature and then cool it before it can be used. For instance, for dishwashing you cannot keep you hands in water heated to 120 degrees, and most thermostats are set much higher than this.

Remove the metal covers from the face of the heater, push the insulation aside, and place the thermostat dial at no more than 120 degrees. Check this temperature at a faucet nearest the heater.

The only exception to this setting is that dishwasher manufacturers suggest a temperature of 160 degrees. Before you accept this figure, check the quality of the water at the low temperature. If the water temperature is too high, a small instantaneous water heater can be provided.”

Equipment Potpourri

4 Metro Carts 58”l x 24”w x 5’h. There are adjustable shelves plus two drawers per cart. The units have full swivel 6” casters.


Wanted — Air Shields Isolette. Contact Tom Brady, Nashoba Community Hospital. 617-772-0200 x361

Airtherm propeller fan Model HR-10. 15 units available.

Airtherm Unit Heaters, HR 100- 110,000 BTU, HR 146- 146,000 BTU, HR 209- 209,000 BTU. Tom Galligan, New England Sinai Hospital, 617-458-1411.

Gaymar Selectronic Hyper/Hypothermia Unit, Model H-3000., John Crowley, St. John’s Hospital, 617-458-1411.

Several Hewlett Packard 7807 EKG bedside monitors, 7809 pressure monitors, and 7803 dual channel monitor scopes. 2 B-W model 263 electric beds. 8 Simmons mechanical beds. Al Sherman, University hospital, 617-247-5790.

Several new Bobrick toilet accessories including; liquid soap dispensers, towel holder/dispsesor, paper towel dispensers, handcap mirrors, napkin disposals. John Larson, Lahey Clinic Medical Center. 617-273-8651.

Warren E. Marble to VP

In January of 1982, Mr. John C. Creasy, president, Danbury Hospital (Conn.) announced “with a great deal of pleasure the appointment of Warren E. Marble to the position of Vice President for Engineering Administration. Mr. Marble’s new title reflects the scope and the importance of the position and recognizes the increasing complexity of engineering functions in a health care facility such as ours.

“As we progress in our plans for growth of Danbury Hospital’s physical facilities, Mr. Marble’s task will grow in proportion. I invite all of you to join me in wishing him continued success in his role, and in congratulating him on becoming a Vice President.”

Mr. Marble joined Danbury Hospital in 1957 as construction supervisor on their 2-1/2 million dollar building program. Since that time he has held numerous management positions in engineering, operation of plant, building maintenance and renovations, housekeeping, laundry, materials distribution, to name a few. He will be directly responsible for all new construction design and building.

Did You Know…

that in the United States drunk drivers kill more individuals each year than die from all crimes involving murder, rape, robbery and assault?
that accidents in the developed world are the fourth most important cause of death, exceeded only by heart disease, cancer and stroke?
that accidents in the developed world are the leading cause of death among all persons age 1 to about 40?
that far more accidents occur in the home than in places of employment?
Hospital Construction Management

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