

Pq: Update your standards and add them to your bid packages.

It's time for a design check

Pay closer attention to energy efficiency and impose standards

Although it's true that equipment efficiency has been improving, some companies do n't complete an energy review or have energy standards for new unit designs. Construction cost is all that matters for the job bidders, so you need to build your energy efficiency standards into the engineering design and codes for the bid packages. Off -the-shelf designs were probably great when cost of energy was low, but many need a fresh look in today's environment. Energy standards sho uld allow flexibility in design but require justification when they aren't met. Also, energy standards are meant to produce the minimal acceptable design and anywhere energy can be minimized shouldn't be overlooked because it was n't in the standard.

First, add a simple heat recovery standard requiring all streams above 350 °F to be recovered. Any heat transferred to storage, water, or air over 350 °F is probably being wasted. The alternative for this standard is a requirement for all units to be reviewed for heat integration by a specialist.

The second energy standard should apply to fired heaters. If you 've done a great job on heat recovery, you have saved money with a smaller furnace, but you have to make sure dollars aren't being blown out the stack. Either set a 91% minimum efficiency requirement or require a stack temperature below 350 °F and flue gas oxygen below 2%.

Speaking of furnace design, I suggest a standard requiring that the final furnace design be checked by a Computational Fluid Dynamics (CFD) model. Older furnace designs were based on burners that do n't control NO_x. The low-NO_x burners have higher flame heights which can lead to furnace problems in older designs. A simulation of the flow pattern inside the box will reduce heat distrib ution problems and ensure the furnace is designed for low-NO_x or ultra low-NO_x burners.

Other areas where efficiency in design is widely abused are pumps, motors and hydraulics. The NEMA premium standard should be in your standards as these motors have a very short payback period as well as require less overall maintenance as the tighter windings makes the motor cooler. Specifications and systems can really bind optimum performance as control valves, backpressure controls and restrictive line size can reduce the system efficiency below 50%. Require a hydraulic review so you can right -size your pumps and motors and put thought into the control system and control valves.

When laying out the equipment, the maintenance department always lobbies for easy access. This shouldn't be ignored but adding a standard for the designs to minimize piping runs between the major connected equipment will cut heat loss and hydraulic requirements. Anything you can do to reduce piping of your la rgest streams between equipment will save you money. Once you have your equipment design standards in place, you will probably need to upgrade your utility system standards to deliver the lowest cost energy.

Just having energy standards is n't enough. The design has to be reviewed. A few years back, I was floored when a heater designed by a major manufacturer for a new unit came across my desk with only 73% overall efficiency. I knew that we had a company

standard of 91% minimum efficiency, but because that wasn't in the bid package, it was completely ignored to reduce project costs. Looking further into the project, I found the steam system wasn't optimized, the exchangers didn't recover all the excess heat, and a unit layout that increased energy cost. I insisted on a redesign. At first the project people complained that project costs would spiral out of control, but it turns out that the more efficient design required less auxiliary equipment and piping which kept the total cost in check. Furthermore, the internal rate of return went up because of reduced future expenses.

Don't copy the mistakes of the past. Update your standards and add them to your bid packages.

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