YATES & COMPANY INC.
Ph: 201-345-3101
info@yatesco.net www.yatesco.net

Confronting The Campus Steam Conundrum

Source: **McCrometer, Inc.**

Steam poses a unique challenge for colleges and universities.
Many schools want to accurately track, and then internally bill, for steam usage in each of their buildings as part of a wider effort to improve resource management. However, traditional steam metering technologies tend to be a less than optimal choice.
Most times, it's necessary to place campus steam meters in the basements of buildings where there isn't a lot of room for piping. That causes issues because flow meters typically require significant runs of straight pipe upstream and downstream of the meter to work correctly.
School administrators also encounter issues by trying to measure steam usage during the low-demand summer months. Common vortex meters, which contain a shedder bar mounted across the diameter of a pipe to measure flow, work well at higher flows. When it comes to low flows, however, they can stop working completely (i.e., **low flow cutoff** problems). Differential pressure (DP) flow meters coupled with the proper electronics, by comparison, can push the low flow cutoff value downward. However, most DP meters can't get around the straight-run requirements.
McCrometer's ExactSteam solution is designed to overcome those hurdles.
The ExactSteam V-Cone Flowmeter works well with short straight-pipe runs, so it addresses the lack of space issues faced by colleges and universities. It also measures steam across the entire range, performing better at lower flows.

The High Cost Of Low Flow Cutoff

Steam system operators can pay a steep price for generating product that passes through a meter but fails to get measured. Also known as low flow cutoff, those losses are a function of the turndown ratio of flow meters. The ratio — defined as the maximum measurement capability of a device compared to its minimum — dictates how wide a flow spectrum can be measured. On campuses, this creates a major issue because demand for steam in the colder weather can be extremely high compared to off-peak times.
ExactSteam is a DP-style flow meter that can be adjusted for colleges during winter months. It contains McCrometer's established V-cone flow meter combined with a newer electronics package to aid in the downward adjustment of the turndown ratio. A growing number of college campuses, especially larger schools, are seeing the benefits of ExactSteam and adopting the technology.
Some examples include:

Case Study #1 - An East Coast University Steam Operation

This school designed its system to measure from 84,000 lbs/hr to 8,400 lbs/hr, which accounted for a 10:1 turndown ratio and velocities of 420'/second to 42'/second. After the meter was installed, system operators determined their actual flow range was 20,000 lbs/hr to 1,000 lbs/hr (a 20:1 turndown ratio) and velocities were 100'/second to 5'/second.
Because flow rates were overstated, the university dropped below the low flow cutoff and wasn't measuring at all during the off-season.
The solution: Purchase another meter with a larger cone that would produce more differential pressure at the correct flows. The school has since installed an ExactSteam V-Cone Flowmeter.

Case Study #2 – A University Hospital Using Both Condensate And Steam Meters

During the winter, the steam meters were always measuring more steam than the condensate meters. The difference was justified because the condensate meters were not capturing steam usage of the autoclaves. However, during the summer, the condensate meters were measuring more than the steam meters, which was impossible.
The steam meter was designed for flows from 14,000 lbs/hr to 1,400 lbs/hr. During the summer months the hospital flows frequently dropped below 1,400 lbs/hr, which was below the low flow cutoff. It was also determined that their highest flow during the summer was 5,000 lbs/hr. The hospital needed more turndown and a lower flow range.
The solution: The ExactSteam V-Cone Flowmeter was installed. It was designed for flows from 6,000 lbs/hr to 300 lbs/hr and was able to fit in the basement between two elbows.

Well Positioned For Campus Use

Key aspects of McCrometer's ExactSteam solution include: a complete flow meter for steam metering, factory-configured for energy metering or mass flow; the ability to measure saturated (dry), superheated, and unsaturated (wet) steam; the V-Cone acts as its own flow conditioner by disrupting all centralized flow disturbances; signal stability allows it to measure a wider range of flow than other meters, minimizing pressure loss; and minimum installation requirements, so retrofitting and new installations are easier.
Because of the inherent conflicts, traditional steam metering technologies are not a good fit for many colleges and universities. However, there are solutions available to campus steam system operators to capture readings from most — if not all — of their steam production, even in less than ideal conditions.