

HEATING/PIPING/AIR CONDITIONING  
**HPAC**  
 ENGINEERING

# Flowmeters Help University Recover Over \$1.25 Million in Annual Billings

**With swirl meters, steam losses go from 16 to 5 percent**

**O**n Virginia Commonwealth University's campus in downtown Richmond, Va., the steam plant consists of three identical boilers, each capable of generating 125,000 lb of steam per hour at 120 to 200 psi. The outlet lines for each boiler are 10-in. pipes, which lead to a 14-in. main. The main takes steam to a distribution network reaching nearly 60 buildings.

During the 2006-2007 fiscal year, the plant generated about 420 million lb of steam, but billed the buildings and departments it serves for only 353 million lb, a discrepancy of 16 percent. The plant was using old steam and condensate meters to monitor usage.

In part because most buildings lacked the long steam-pipe runs required for many kinds of flowmeters, the university decided to install swirl meters from ABB Instrumentation, which require less straight pipe before and after metering locations—just three pipe diameters up-



**Pat Dillon, electrical and control technician, views a new swirl flowmeter.**

stream and one downstream.

The swirl meters have built-in temperature sensors and automatically compute readings to indicate steam usage in pounds (mass flow).

An element at the inlet called a swirler conditions and imparts a sideways twist to steam flow. Acting somewhat like vortex flowmeters, swirl meters are highly accurate, with comparatively good turn-down ratios—up to 30-to-1.

In April 2007, the university began

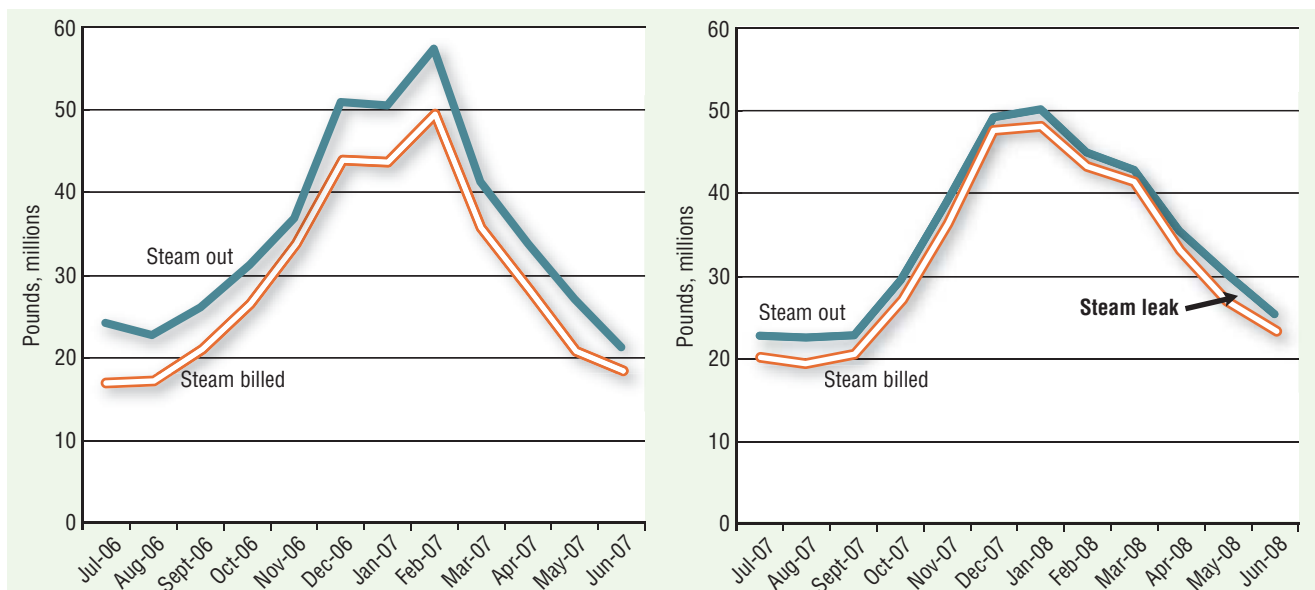
installing swirl flowmeters in campus buildings for billing. So far, about 40 buildings have been outfitted with swirl meters ranging in pipe size from 1 to 6 in. The meters help to pinpoint system leaks and faulty steam traps (Figure 1). Moreover, they promote energy conservation, as departments move to minimize utility costs.

Most swirl-flowmeter readings are taken manually twice a month. However, automated data collection is ongoing, with about 12 buildings online.

As a result of the installation of the flowmeters, steam losses have dropped to about 5 percent, and the steam plant is recovering more than \$1,275,000 in increased billings annually.

*Information and photograph courtesy of ABB Instrumentation.*

Contact ABB at +1-215-674-6000 or [www.abb.com/instrumentation](http://www.abb.com/instrumentation)  
 Email: [instrumentation@us.abb.com](mailto:instrumentation@us.abb.com)



**FIGURE 1. New swirl flowmeters have closed the gap between steam delivered and steam billed at Virginia Commonwealth University.**