



## CASE STUDY

### INDUSTRY: EDUCATION



**CUSTOMER:** Western Michigan University

**LOCATION:** Kalamazoo, MI, USA

**BACKGROUND:** Western Michigan University has 25,000 students on campus with over 8.8 million ft<sup>2</sup> (817,546 m<sup>2</sup>) of building space within 151 buildings. WMU's facilities include a central steam/electric (co-generation) plant and a decentralized chilled water plant that are operated by 99 skilled-trade employees and a 29-person management staff.



WMU's steam and condensate utilities include 13.9 miles (22.3 km) of underground steam and condensate lines, 2.3 miles (3.7 km) of utility tunnels, four steam zones, six condensate zones, twenty-years of steam trap testing of 4,329 traps, and one full-time employee testing traps hourly. WMU's steam system has a capacity of 256,000 lb/hr (116,100 kg/hr) generated at 200 psi (13.7 bar) by a natural gas-fired powerhouse and distributed at 50 psi (3.4 bar).

**SCOPE OF WORK:** After being partners for over a decade, Armstrong International and WMU implemented a steam trap management program in 1988 to reduce steam usage, reduce water hammer, increase cost savings, boost heat transfer efficiency and increase comfort for students and staff.

With Armstrong's support, WMU initially implemented a comprehensive building inspection to test traps in pursuit of decreasing emergency maintenance calls and reducing heat exchanger bundle and coil issues and back pressure in return lines as well as extend the life of piping and other components. WMU conducts yearly manual testing of traps and rely on 24/7 SteamEye<sup>®</sup> wireless monitoring and vault testing. SteamEye<sup>®</sup> monitors, measures and manages steam trap data to improve the steam system and maintenance of the steam traps.

The success of WMU's steam trap management program relies on their detailed annual trap testing and wireless technology. Wireless trap testing is conducted on all high pressure traps regardless of confined spaces and difficult to access areas. All electronic data collected is transferred to create executive summaries and reports for trending analysis.

**BENEFITS** WMU's campus sustainability has been strengthened and influenced by reducing natural gas consumption and carbon emissions on campus. WMU has also reduced steam consumption while increasing their campus footprint. Over the past 20 years, WMU has lowered their steam trap failure rate from 25% to 1.4%, which is almost 20% below the industry average. WMU demonstrates unparalleled standards that have encouraged other universities to duplicate efforts. In fact, over 37 universities have implemented a steam trap management program modeled after WMU's success.

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