

CASE STUDY: STEAM MUSEUM – PIONEERING STEAM METERING FOR HERITAGE ENGINES

Case Study



The London museum of water and steam is dedicated to preserving the history of London's water supply. It sits on the former Kew Bridge waterworks site which was opened in 1838. The museum houses world's largest collection of stationary steam pumping engines, many still in their original location. These pumped clean water in to the homes of millions of Londoners between 1838 and 1944. The oldest dates back to 1820, while the largest—built in 1846 and 1869—feature steam cylinders up to 100 inches in diameter. Today, these engines are operated monthly for visitors, though not under full load conditions.



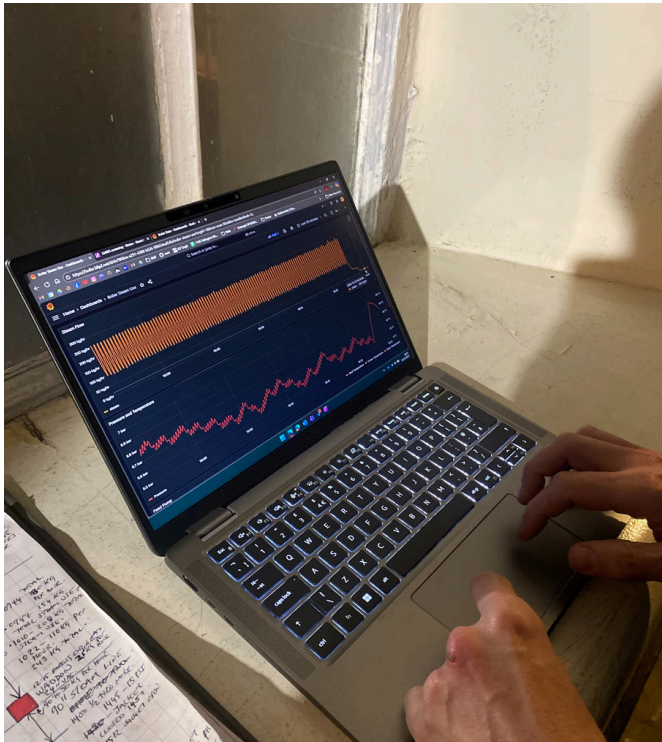
THE PROBLEM

To support a groundbreaking green energy initiative, the Museum needed precise data on steam consumption across its site. This included:

- Total daily steam usage.
- Individual engine consumption during warming, starting, and running phases.
- Losses through steam traps and radiation.

Accurate measurements were essential for designing a future renewable-powered steam boiler system in partnership with Steamology, a company developing zero-emission steam technology.





THE SOLUTION

The Museum partnered with Flowhire to deploy an F200 Prowirl flowmeter with datalogger. This modern metering technology was installed in a modified section of 3-inch steam pipe connected to the boiler. Over four days, all engines were run in rotation—individually and combined—while steam flows were logged against operating conditions. Additional data on gas, water, and electricity usage was collected to provide a complete energy profile.

- **Meter Installation:** Quick and efficient integration into existing steam infrastructure.
- **Data Collection:** Continuous recording of steam flow velocities, pressure, and kilograms of steam every few seconds.
- **Testing Protocol:** Engines operated under varying conditions to capture comprehensive performance data.

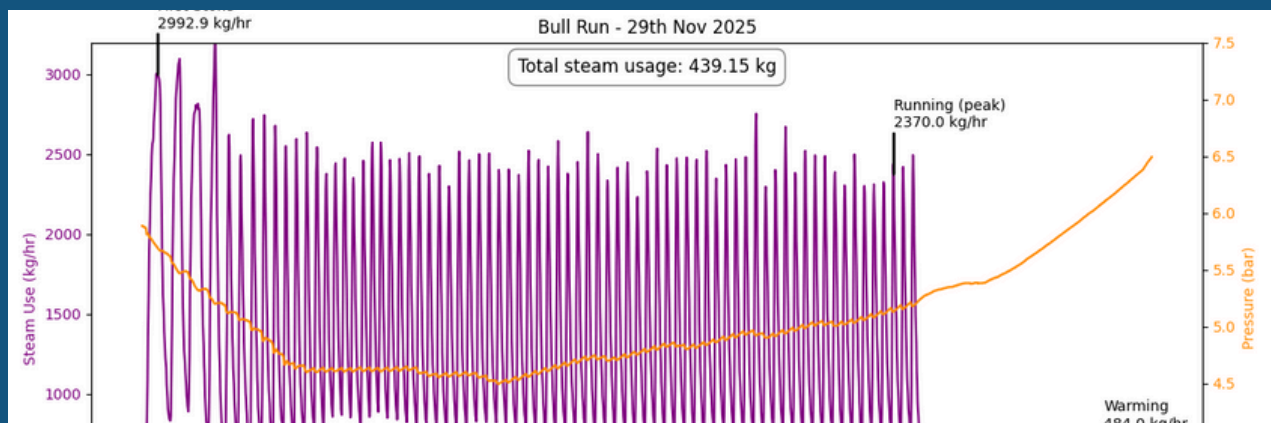
RESULTS

- **First-of-its-kind achievement:** Likely the first heritage site globally to conduct steam metering using modern flowmeter technology.
- **Detailed insights:** Precise cost analysis for running individual engines, enabling better financial planning for the charity.
- **Energy efficiency opportunities:** Identification of areas to reduce operating and energy costs.
- **Future planning:** Data will inform the specification and sizing of new renewable-powered steam boiler plant.

This project is a critical step toward making the Museum the UK's first large-scale demonstration site for green steam technology. The planned system will use solar or wind power to electrolyze water, producing hydrogen and oxygen gases that combine in an exothermic reaction to generate zero-emission superheated steam.

Reflecting on the collaboration, Richard Albanese, Chief Engineer, commented: “Flowhire proved to be helpful, proactive, and efficient, ensuring smooth execution and valuable collaboration.”

You can find more information on London's Museum of water and steam [here](#)



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