Panametrics
a Baker Hughes business

MISURA & AUTOMAZIONE

Application note

Croatian data center improves cooling system efficiency through adoption of Panametrics technology

Benefits:

- Easy to set up and program
- No process interruption
- Strong reputation and local support
- Reliability and accuracy

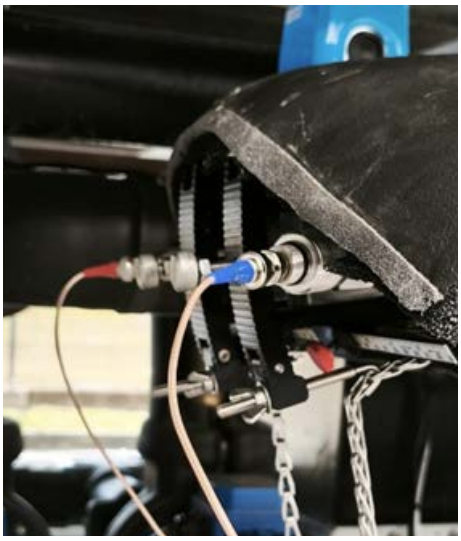

Fig. 1: Portable clamp on installation with C-RS transducers

Summary

The global data center market is expanding rapidly, including Croatia.

In this example, Panametrics' customer has a data center hosting a multitude of servers and computers supporting a number of banks and government authorities in Croatia.

Data centers consume a significant amount of energy, which results in the generation of substantial heat that must be effectively dissipated. Maintaining a controlled ambient temperature in the server rooms is crucial for ensuring the optimal performance of the facility.

If the site experiences a one-day shutdown, the estimated cost is around 200k€. Therefore, it is crucial that the cooling systems are highly efficient and reliable.

Application

Medium:	Water-glycol mix at 70%-30%
Pipe size and material:	Carbon steel 89mm x 3.5 mm (3.5" x 0.14")
Flow rate	Up to 60 m^3/h (264 GPM)
Temperature:	Around 14°C (57°F)
Requested accuracy:	<±2% of reading

Challenges

The customer was experiencing issues with the cooling efficiency of the system, as the room temperature was consistently exceeding the specified limit. The cooling system comprises five chillers, three spares and auxiliary compressors, but the customer could not identify the exact source of the problem. The pumps were running at 100% capacity most of the time, which deviated from the design criteria and the auxiliary compressors were frequently required, a situation that only should occur in extreme cases, and not be relied on as a base situation.

Looking for solutions, this customer contacted Panametrics, to provide measurement consultancy and identify the potential root cause.

Flow measurements were conducted simultaneously at seven different locations within the data center to gather data and enable calculations of the system's parameters and efficiency.

Solution

For this site survey, Panametrics used locally available portable and permanent liquid clamp-on flowmeters including the AT868, AT600, PT878 and PT900 to quickly support the customer. Panametrics is uniquely equipped with an extensive range of readily available solutions to assist customers in urgent situations.

Panametrics' flowmeters were able to log data at one second intervals, a feature that other solutions struggled to achieve.

The conclusion was that the fluid flow velocity in all the measured pipes was too high to enable efficient cooling, as the fluid's duration in the chillers was too short. That issue stemmed from an undersized and poorly designed piping network, which generated excessive pressure drops and even cavitation in some areas. Consequently, the pumps operated beyond their optimal operating range, leading to overheating, increased energy costs, and a reduced lifespan of the pumps.

As a result of Panametrics data analysis and conclusions, the customer now has a clear path forward. The customer is extremely pleased with the results, so much so that it is exploring other applications where Panametrics technology can be adopted to drive efficiency and productivity.

Fig. 2: Flow readings from the Portable PT900 application

Fig. 3: AT10 clamp on transducers

Fig. 4: C-RS clamp on transducers

Panametrics, a Baker Hughes business, provides solutions in the toughest applications and environments for moisture, oxygen, liquid and gas flow measurement.

Experts in flare management, Panametrics technology also reduces flare emissions and optimizes performance.

With a reach that extends across the globe, Panametrics' critical measurement solutions and flare emissions management are enabling customers to drive efficiency and achieve carbon reduction targets across critical industries including: Oil & Gas; Energy; Healthcare; Water and Wastewater; Chemical Processing; Food & Beverage and many others.

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