InSight remote monitoring case study

Challenge

Finding the right monitoring system to better maintain sample integrity in cold storage can be a challenge. The School of Public Health at a large, prestigious research academy had an aging fleet of ultra-low temperature (ULT) freezers. Challenges included increased cost of usage, unpredictable maintenance costs, and sample integrity threatened by the risk of equipment failure.

Many factors can affect equipment performance, including frequency of maintenance, usage behavior, power fluctuations, and mechanical stress over time. Based on a diverse set of customers, indications show 30–50% of even well-maintained ULTs in the US are operating out-of-spec and exhibiting signs of mechanical stress. An average of 12% of ULTs will have a significant alarm condition each year. If the instruments fail to maintain settings accurately, then scientific products are at risk.

In addition to sample risk, stressed ULTs waste significant amounts of energy. A ULT freezer that's 10 years old or older can consume as much energy as a house: on average, 30 kWh/day. Today's Thermo Scientific™ ULT freezers with green, hydrocarbon (HC) refrigerants reduce CO_2 emissions by over 30%* and can save over 50% on energy usage and costs.

To support a retirement and replacement program, the emergency management director at the academy analyzed their aging install base with a focus on sustainability and asset management. They wanted a better system that offered state-of-the-art monitoring and alarms for temperature fluctuations, power outages and surges, energy consumption, and more.

Solution

The Thermo Scientific™ InSight system provided the monitoring solution they needed, with multiple benefits such as wireless monitoring and asset management. The emergency management director's analysis of operating costs, unplanned maintenance costs, and product and sample loss provided realized value of their return on investment (ROI).

The InSight system provides peace of mind with remote notifications by text or email to help protect irreplaceable samples.

1. Monitor critical parameters

2. Lab equipment health and efficiency assessment

3. Scalable design

4. Easy to use and maintain

5. Customized solutions

6. Minimize hardware investment

7. End-to-end support and service

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Proactive data analytics

The InSight system assists in managing fleet assets by providing information from multiple sensor parameters. The proactive data analytics allow visibility into equipment that requires service and preventive maintenance.

Details energy usage to support sustainability

This monitoring solution supports sustainability efforts by listing assets according to energy efficiency, calculating energy savings attributed to proactive maintenance, and providing kilowatt-hour (kWh) consumption information.

Notifies the customer remotely when an alarm sounds

InSight ULTs provide peace of mind with remote notification by text and/or email to help protect irreplaceable samples.

Results

By implementing the InSight solution, the customer now has a ULT fleet operating at sustainable levels and the data to support equipment retirement programs with focused fleet identification. Retiring old ULTs can result in energy cost savings of $1,000 per ULT per year, on average. And the hydrocarbon refrigerants, in addition to being better for the environment, promote lower pressures and temperatures in the refrigeration system. This drastically improves the mechanical wear and tear on the refrigeration components, extending the system's life.

	Average 10+-year-old ULT with ozone-depleting refrigerants	Thermo Scientific™ STP ULT models with hydrocarbon refrigerants	Thermo Scientific™ TSX ULT models with hydrocarbon refrigerants
Average energy usage (kWh/day)	30	12.5	8.8
Average annual energy costs (including HVAC)	$1,488	$620	$435

* Data based on internal testing May 2017. Reduction in CO_2 emissions is dependent on freezer size.

Find out more at **thermofisher.com/insight**

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