



Temperature Data: The Underrated Superhero for Research Laboratories, Pharmacies and Healthcare Facilities

Three Cases that Highlight the Critical Importance of Using Environmental Monitoring Systems in Research Laboratories

Case One:

Hospital Medication Loss of \$147,000

Situation: Marietta Health Systems in Ohio experienced an unexpected storm over the weekend on an offsite campus, knocking out the power. Hospital personnel returned Monday morning, to find vaccines and medications spoiled due to refrigerators and freezers being out of specification with no warning, no notification, no alarm and no way knowing how long the power had been out.

Solution: Monitoring temperatures of all laboratory equipment with remote alarming capabilities to record point by point data, can help you determine just how long your refrigerators and freezers have been down in the event of an outage. This data can help safeguard against the potential high cost of medication loss.



Case Two:

15 Years of Lost Research – University of North Carolina

Situation: Dr. Steven Spilatro specialized in photosynthesis research at the University of North Carolina, spending several years to develop his research observing plant leaf storage proteins and growth hormone, methyl jasmonate. One weekend in the summer, the power went out in the lab for 12–18 hours with no back-up generator or temperature monitoring system that could send notification. Spilatro lost about 15 years of research ... and his NSF grant!

Solution: A comprehensive monitoring solution that includes remote alarm capability, data logging and an independent sensor can provide peace of mind and help protect irreplaceable research assets.



«I would highly suggest that any person with critical samples consider monitoring.»

Dr. Spilatro, Professor of Biology at Marietta College

Case Three: Irreplaceable Cancer Research – Duke University Medical Center

Situation: Kristi Oristian, at Duke University Medical Center had been conducting research on genetically developed mouse lines for three years, to further study pediatric sarcoma. One evening, an ultra-low freezer had a critical failure. It was connected to Duke's alarm system, sending notification to central security on campus. But with other security priorities, the lab did not receive phone notification. Although they suffered a loss of \$126,000 from three years of research, luckily the liquid nitrogen freezer didn't fail, which contained irreplaceable unique to each mouse.

Solution: Selecting the right type of temperature monitoring system can safeguard against the loss of irreplaceable research samples.

«I had noticed by looking at the graphs [generated by the data logger] that the freezer was taking longer and longer to recover from each cycle and equilibrate back to appropriate temperature. Eventually it stopped reaching the temperature setpoint altogether and was warming up, slowly, over a period of weeks. When a technician attempted to service it, the condenser crashed completely, but we were able to save all of our samples because we knew it was coming – Thank goodness!»
Kristi Oristian at Duke University

Dry Alarm Contacts and Independent Alarm Systems

Dry alarm contacts use the equipment's built-in alarm system to trigger an alarm or phone call notification. The alarm may even be tied into a building management or security system. Before relying on this type of alarm method, you should consider the following:

1. How valuable is your product? What is it worth?
2. How old is your equipment?
3. How often is your equipment calibrated?
4. Is regular equipment maintenance performed?



What is the Ideal Monitoring Setup?

An alarm system alone is not enough to provide a reliable remote notification. Make sure your monitoring solution includes: remote notification, independent sensors and data logging. Unfortunately, unintended occurrences, natural disasters and accidents are going to happen. According to Murphy's Law, «If it can go wrong, it will go wrong,» which is all too common in everyday life. That is why it is crucial to ensure your valuable products and research are safe with the right kind of alarm system in place.

When searching for a solution to protect your research, make sure it includes the following options:

- ✓ **Remote alarm:** Get notification in the event of a temperature excursion in the form of a phone call, text and/or email so that you can respond in a timely manner.
- ✓ **Independent sensor:** Do not rely on the built-in alarms in your equipment. When the equipment fails, so could the alarm system, so it's best to find an autonomous solution.
- ✓ **Data logger:** Temperature data can save the day! Make sure the data logger will record time-stamped, point by point temperature data so that you can view trends and review temperature conditions in the event of an alarm.

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