SkyFoundry

# Case Study

## Refrigeration System Analytics Helps to Correct Expensive New-Construction Mistakes

Case Study
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## Introduction

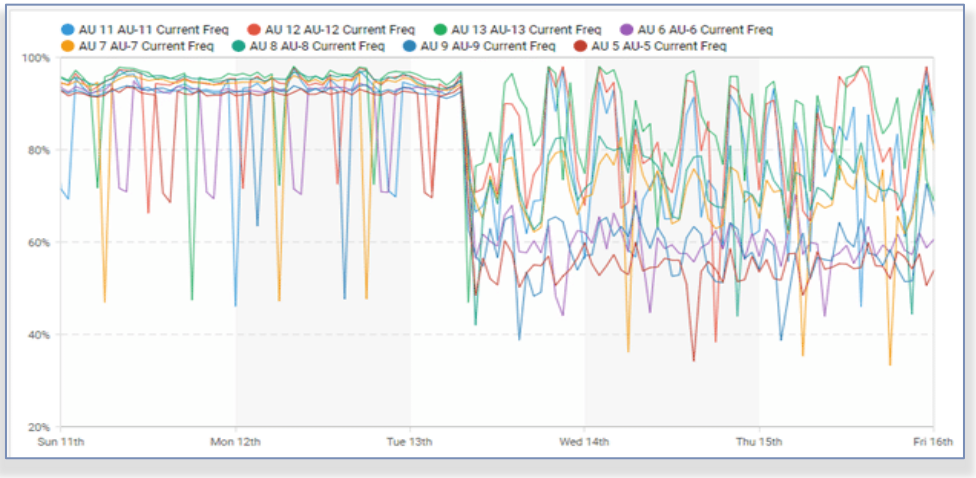
With the help of SkySpark analytics to provide data monitoring and advanced data visualization, the ETC Group was able to help the owners of this facility to save between $20,000 and $24,000 per year, maintain critical temperature setpoints, and deploy a system to continually detect and prevent future issues.

This case study provides a fascinating, real-world example of the power and benefits of analytics.

## Start with Analysis of Trend Data

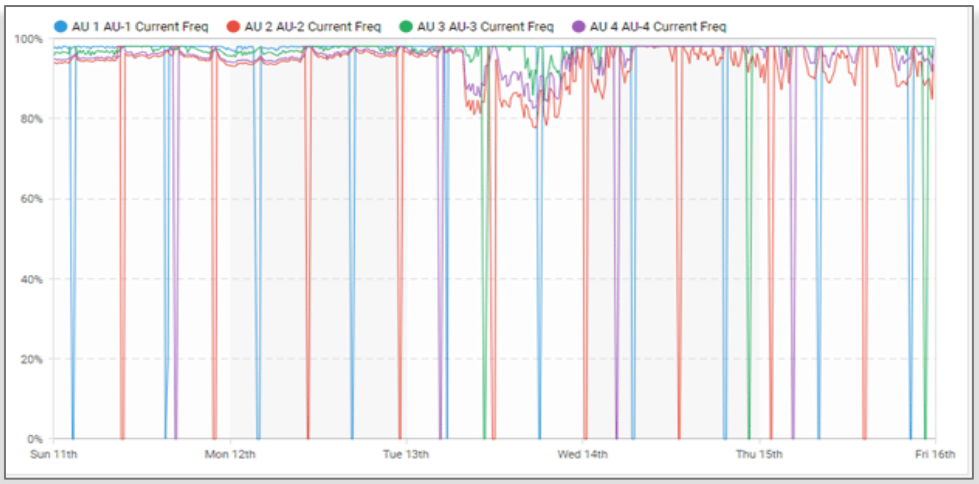
In this new, energy-efficient refrigerated warehouse, the contractor had installed a highly efficient cooling system which included variable speed fans. These were designed to run at slower speeds as the system approached setpoint temperature, but somehow this feature was never enabled.

When we looked at the trend data, we saw the fans running continuously at full speed, as shown below (note that the periodic dips are defrost cycles). When we asked the contractor to investigate, they discovered that the fans' ability to vary speed was not operational. After fixing it, the fans were able to run at a reduce speed, using less energy. This small issue, left uncorrected, would have cost the owner $8,000 to $10,000 per year.




Refrigerator units AU-5, 6, 7, 8, 9, 10, 11, 12, 13

This adjustment did not reduce fan speed in the freezers, however. Fans in the low-temperature freezers continued to run at full speed as shown below.

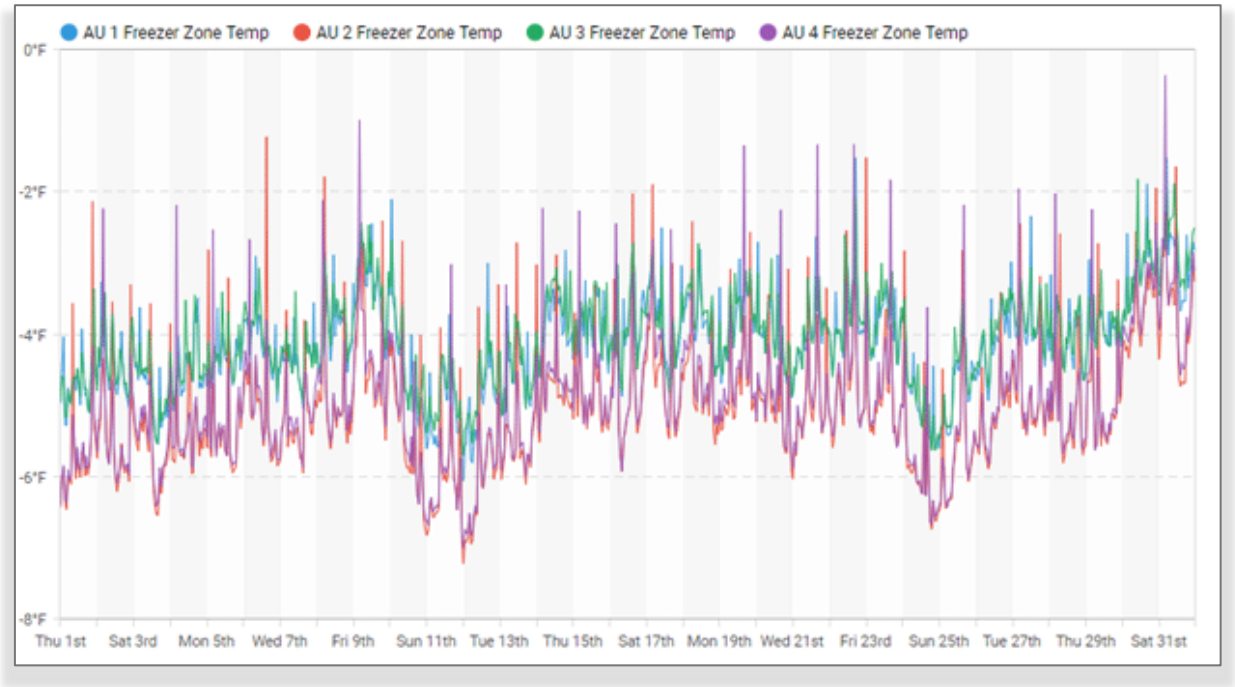



Freezer units AU-1, 2, 3, 4

## Looking Deeper into System Performance - Achieving Desired Setpoint

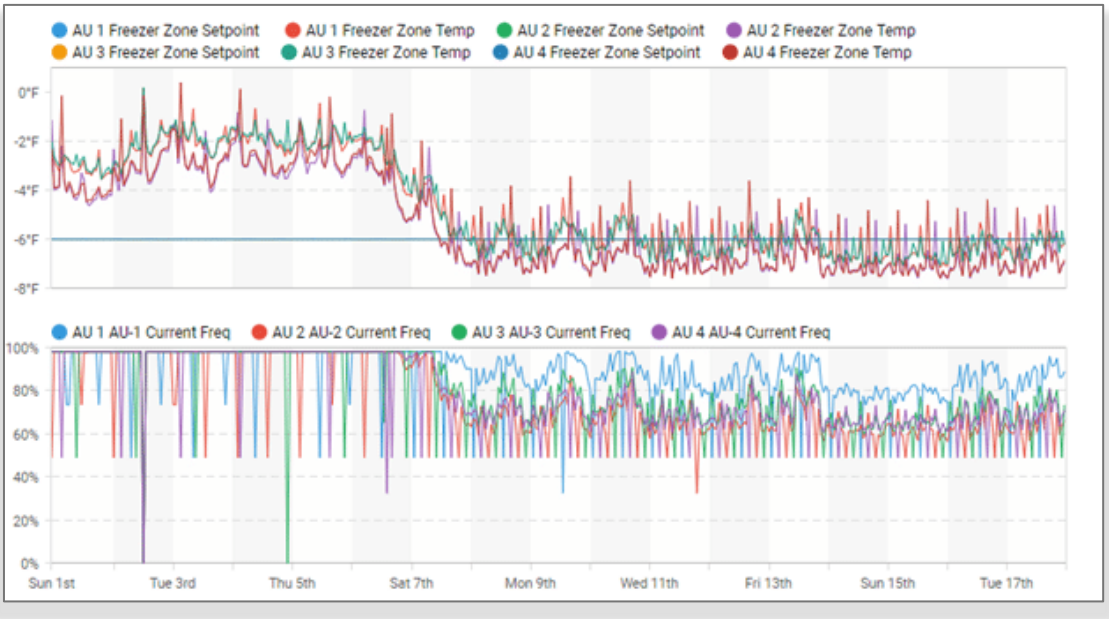
An analysis of the freezer system revealed a more serious problem: the freezers rarely met their setpoint temperature. Despite an ammonia temperature of -27 degF, the system could not maintain a setpoint temperature of -6 degF in the freezers.

The system was less than a year old and was not yet fully utilized. Why were they not meeting setpoint?




Based on the above analysis, we asked the maintenance contractor to investigate the freezer evaporators. He found ice on the coils which limited airflow and prevented the system from delivering adequate cooling. Although the evaporators had defrost cycles, they did not defrost often enough to remove all the ice.

When the contractor increased defrost frequency, coil heat transfer improved, the system met setpoint, and the fans slowed down. Annual fan savings from adjusting the defrost cycle were between $12,000 and $14,000.




**Above – Graphs clearly show the system reaching setpoint after the adjustments**

## Summary

At this specific site, two small and simple adjustments, identified through the use of advanced data visualization, allowed the customer to save between $20,000 and $24,000 per year. Of even more significance, the freezers now maintain their setpoint temperature, critical to operations.

Additionally, they now have a system in place to detect or prevent future problems. Without continuous data monitoring, efficiency 'drift' is an inevitable part of ongoing operation.

This Case Study highlighting the use of SkySpark in refrigeration systems was provided by ETC Group, a long time SkyFoundry partner. Contact them at: https://www.etcgrp.com/

Jim Crockett, PE
ETC Group

ETC group

For 30 years the ETC Group has been providing engineering solutions to improve building performance. We started doing this long before it was cool. Before 'climate change' was in the mainstream. Before 'zero footprints' were a thing. Maybe we still aren't cool, but it does make us knowledgeable.

## SkySpark® – Analytics for a World of Smart Device Data

The past decade has seen dramatic advances in automation systems and smart devices. From IP connected systems using a variety of standard protocols, to support for web services and xml data schemas, it is now possible to get the data produced by the wide range of devices found in today's buildings and equipment systems.

Access to this data opens up new opportunities for the creation of value-added services to help businesses reduce energy consumption and cost and to identify opportunities to enhance operations through improved control, and replacement or repair of capital equipment. Access to the data is just the first step in that journey, however. The new challenge is how to manage and derive value from the exploding amount of data available from these smart and connected devices. SkyFoundry SkySpark directly addresses this challenge.


The new frontier is to efficiently manage and analyze data to **find what matters™**.

## About SkyFoundry

SkyFoundry's mission is to provide software solutions for the "Internet of Things". Areas of focus include:

- Building automation and facility management
- Energy management, utility data analytics
- Remote device and equipment monitoring
- Asset management

SkyFoundry's software helps customers derive value from their investments in smart systems. Learn more and request a demonstration at www.skyfoundry.com.

SkyFoundry

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