SkyFoundry

UTAH OLYMPIC PARK

Sliding Track Optimization Project
Achieving the Fastest Ice on Earth

TABLE OF CONTENTS

Background

The Utah Olympic Park **Slide Track** was built for the bobsled, skeleton, and luge events at the 2002 Winter Olympics. Carefully crafted to meet demanding competition requirements and limit impact to the land and its wildlife, the slide track's course follows the mountain's natural contours, allowing it to blend in with the landscape. Today the track serves as a training center for Olympic & Paralympic National Team members and developing athletes, hosts numerous local and international competitions, and offers exhilarating bobsled rides to the general public.

The Challenge: In 2019, the World Cup bobsled and skeleton event was cancelled due to mechanical issues at the Utah Olympic Park track. This was a huge disappointment for all parties involved.

The event had to be moved from Park City, Utah, to Lake Placid, New York. Although World Cup events do occasionally get cancelled due to equipment issues or weather conditions, this was the first time Utah Olympic Park had to cancel a major event in their 18-year history. Changing the venue was not without cost, as bobsleds had to be shipped to Lake Placid, and athletes' travel arrangements had to be changed. Utah Olympic Legacy Foundation (UOLF), which manages the Utah Olympic Park, was transparent with the issues they experienced throughout the process of switching venues and was consistent in their resolution to fix the issues and make Park City the premier world-class slide track.

The refrigeration problem with the cooling of the middle section of the one-mile track had persisted for a couple of years. During the summer of 2019, the operations team at UOP replaced hundreds of valves that control the flow of heat-extracting ammonia in an attempted remedy but did not observe positive results. In the end, they reached a conclusion that the problem originated back down to the plant refrigeration pumps. Because the original pumps were custom-made in Germany, replacements would take months to arrive.

Solutions

In March 2020, the Utah Olympic Legacy Foundation selected ETC Group (now Bernhard) for evaluating and improving their Slide Track operating systems. The main goal of the project was to bring the UOP facility back to "world-class levels" suitable for hosting its second Winter Olympics in 2030.[i] ETC Group assessed the refrigerant system of the 25-year-old slide track and came up with a design to modernize it and replace worn-out and outdated controls through a multi-phase project. A combination of deep domain knowledge in refrigeration systems with advanced data analytics would be key to achieving a world class sliding track.

Phase 1

In Phase 1 of the Slide Track Optimization project, the focus was to make the track ready to perform reliably for the 2020 slide track season. This involved transforming the most problematic middle zone of the track section with a fully operational Refrigeration Controls System. This new system includes one main panel in the Ammonia Plant with new track temperature sensors and automatic refrigerant valves replacing manually operated valves. It also included installation of a new fiber-optic communication network.

To make the system more reliable and minimize mechanical failure, a new track control system that could supply more real-time information was critical. ETC Group worked with sister company BuildingFit, to implement the SkySpark analytics platform to quickly extract and analyze system data to detect operational issues and verify/improve system performance metrics. Being able to collect and perform advanced analytics on the data in one unified platform enabled resolution of existing refrigeration system issues and streamlined ongoing maintenance and continuous optimization of system performance.

The original 1995 pumps have been replaced. Having backup pumps ready in

case of possible mechanical failure was crucial for the future events.

Phase 2 – Sensor Data and Analytics

The primary goal of second phase of the project was to ensure reliable, optimal performance of the entire sliding track for the 2021/2022 season – ultimately building towards the 2030 Winter Olympics. The changes implemented in the first phase of the project have resulted in consistent temperature control and improved performance allowing the track continues to build on its reputation as "the Fastest Ice on Earth," a moniker that originated during the 2002 Olympic Winter Games.

In Phase 2, ETC Group expanded the efforts from the Phase 1 to encompass the entire 1.25-mile track. The project team built upon lessons learned in Phase 1 with the added benefit of extensive trend data and analytics performed during the last season of operation and the impact of modified sequences of operation.

The solutions achieved in Phase 2 made the UOP Track one of the most sophisticated sliding tracks in the world with technologies and control strategies that were never before attempted:

- Temperature and flow sensors readings at each evaporator along the entire track.

- Increased monitoring and analytic capabilities to help maintain uniform "sweet-spot" track temperatures under varying climate conditions.

- Data-driven track maintenance utilizing SkySpark® for automated fault detection in place to catch issues before they degrade the quality of the ice.

- Data visualization and analysis helped the team confirm results and optimize system settings. Analytic rules detected faults and patterns in the data.
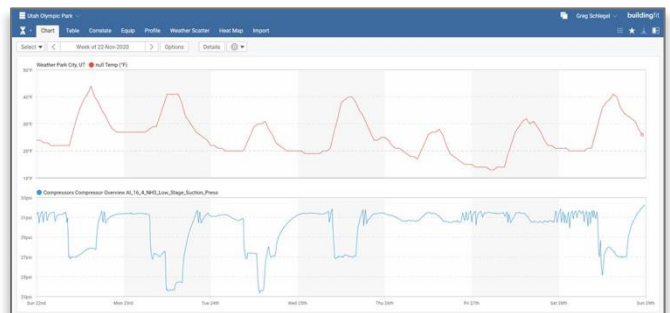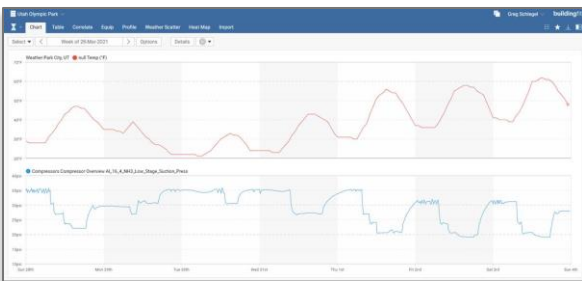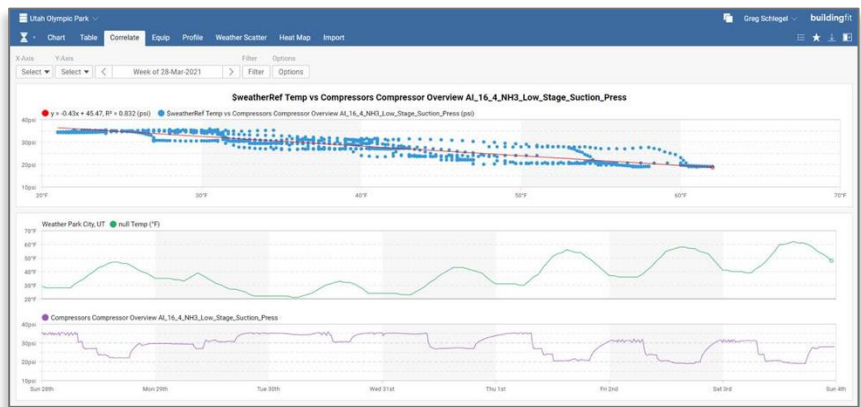
"ETC presented a group of best-in-class specialist contractors to upgrade and improve our refrigeration system. We are extremely pleased with our decision to select ETC Group as our partner to deliver our sliding track refrigeration upgrade," says **Calum Clark, Chief Operating Officer of Utah Olympic Legacy Foundation**. *"The improvements the ETC team have made to our track greatly improved all aspects of the operations and helped our foundation serve the Winter Olympic sporting community for future generations of these sports on this legacy infrastructure from the 2002 Olympic Winter Games."*

Note: Bernhard Announces Acquisition of ETC Group; Further Advancing Technological Operations
February 22, 2022
https://bernhard.com/bernhard-acquires-etc-group/

A Team Effort

Like any other projects of this scale, the UOP sliding track project has been truly a team effort. **ETC Group** has assembled a world-class team with a wealth of slide track project experience. **Harris Companies** was responsible for control of the ammonia valves and other related slide track controls. **Skyline Electric** performed all the electrical for the project including wiring associated with the automatic ammonia valves and ammonia detection system. **Minus Nine** was responsible for all refrigeration piping and valve installation.

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**.

www.skyfoundry.com

info@skyfoundry.com