



Maintaining uptime, even in the world's worst weather

Location:
Mt. Washington, N.H.

Segment:
Weather and research

Challenge:
The Mt. Washington Observatory is home to the world's worst weather, so its power supply and quality is unreliable. It's also located at the summit of a 6,288-foot mountain, making it difficult to reach in winter.

Solution:
Eaton® 9355 UPS, service, eNotify, environmental monitoring probe

Results:
By deploying the 9355 UPS, replacing its batteries and implementing a service plan, the Mt. Washington Observatory is able to achieve 100 percent uptime and maintain its 80-year continuous weather history.

The Mt. Washington Observatory can't have any interruptions in power, which is why we have the Eaton UPS. We're collecting data continuously, and those types of instruments do not like interruptions in power. It's also holding together our entire IT infrastructure.

Cyrena-Marie Briedé, director of summit operations

Background
The Mt. Washington Observatory (MWO) is a private, non-profit scientific and educational institution dedicated to advancing the understanding of the natural systems that create the Earth's weather and climate. The summit of Mt. Washington is home to some of the most dangerous and unpredictable weather in the world, so MWO maintains a mountaintop station to conduct research, oversee educational programs and collect real-time data that feeds into the National Weather Service's forecast models. The

observatory also provides daily reports for higher summits hikers and is the go-to weather source for search and rescue teams.

"Our observations are taken every hour on the hour, 24 hours a day, seven days a week," explained Cyrena-Marie Briedé, director of summit operations. "These observations are helping people understand what's happening with the weather and are also very important from a public safety standpoint."



In winter, the Mt. Washington Observatory is an ice and snow palace, battered by hurricane-force wind gusts.





Even in the best weather conditions, getting to the Mt. Washington summit is no easy feat.



Winters that include 20-foot snow drifts make reaching the top of Mt. Washington even more difficult.



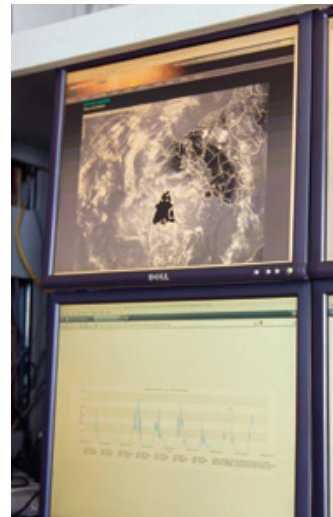
Downtime isn't an option for MWO.

Challenge

On a clear day, you can see for more than 100 miles from the Mt. Washington summit, but 60 percent of the time, the summit is encased in fog. At an elevation of 6,288 feet, the observatory is prone to direct lightning strikes; during winter, conditions become even more treacherous with ice, snow and blistering hurricane-force wind gusts—all of which can knock out electricity.

It is critical that we have power at all times. Our entire computer system and IT infrastructure need that constant power.

Cyrena-Marie Briedé



MWO collects real-time data 24/7 that feeds into the National Weather Service's forecast models and supports global climate research.

Up here, our energy costs are extremely high—about four times what they are in the valley. Having a highly efficient UPS like the one from Eaton is very important.

Roger Pushor

Solution

Years ago, MWO deployed a 15 kVA Eaton 9355 uninterruptible power system (UPS) with more than 170 minutes of runtime to help ensure that even when the most extreme weather hits, the organization can continue gathering and storing vital data.

The solution—which replaced numerous APC desktop UPSs—was selected for its unparalleled reliability, central management capabilities, high efficiency, scalability and ability to integrate into the building's three-phase power system.

When an outage happens, the 9355 immediately kicks on to keep MWO's systems operating until its generator can power up. Although this usually takes just a matter of seconds, without a highly reliable UPS to bridge the gap, those seconds could result in holes in the organization's 80-year continuous weather history.

"We find ourselves switching about six weeks out of the year between line power and generators," Briedé revealed. "It's the Eaton UPS that keeps us going during those times."

In addition to braving the wrath of Mother Nature, the observatory must also contend with an electricity supply line that is less than reliable. And it's only been in the last seven or eight years that MWO received line power from the valley. Before that, facilities on the mountaintop were powered solely by generator.

"Having guaranteed power 24/7 means that we can collect data even in the most extreme conditions, which is why we're here," added Roger Pushor, a weather observer and IT specialist at MWO. "It also means that our equipment is protected. Since we've had the Eaton UPS in place, we've never lost a piece of equipment connected to it. Our partners at the other end of the building are on the same grid power and they regularly lose equipment due to direct lightning strikes."

While the 9355 performed flawlessly through the years, by 2014, its batteries needed to be replaced. The MWO IT team reached out to Eaton to arrange a battery replacement and get the UPS on a service plan.



A service call was scheduled and two Eaton field technicians trekked to the top of Mt. Washington.



The replacement involved installing four new strings of batteries and removing the other two cabinets and their batteries.



We safely removed 32 trays of batteries and two cabinets—about 3,840 pounds of materials.



We also performed preventive maintenance as part of a new two-year service contract.

Ahead of the replacement, Brian Tenters, Eaton's Northeast area supervisor, conducted a site assessment and power usage study to determine the battery backup time required. "We like to get an overall view of the entire site and what its needs are," explained Tenters.

Discovering that MWO had reduced its equipment since the UPS was first installed, Tenters determined that 90 minutes of runtime—rather than the originally slotted 170 minutes—would be more than sufficient for the organization. "This gives them time to respond to a generator issue if it were to occur, and still have plenty of battery backup," Tenters said.

Tenters and another field technician, Phil Percoski, trekked to the top of Mt. Washington in August with four new strings of batteries for the observatory. "We safely removed 32 trays of batteries and two cabinets—about 3,840 pounds of materials. This helped MWO significantly consolidate its UPS solution, saving valuable space at the summit," noted Tenters.

Tenters and Percoski also performed comprehensive preventive maintenance on the 9355 as part of a new, two-year service agreement. Under the contract, Eaton will provide after-hours and preventive maintenance on the UPS and batteries twice a year, as well as an eight-hour response time in the event of an alarm.

"By performing preventive maintenance, we can predict future catastrophic failures such as the batteries or capacitors going bad, and even just small failures like a fan or circuit board," Tenters said.

Tenters, Percoski and all of Eaton's field technicians have access to the latest firmware and upgrade kits and an extensive parts inventory to handle maintenance and repairs quickly. They're backed by a 24/7 customer support center and 24/7 parts logistics and remote monitoring team to help coordinate service calls.

"We're in an extreme environment here...we have to fix things on site and there's no hardware store just down the street," Pushor said. "Even in the best of conditions, we're a difficult place to get to. Eaton still manages to provide service on a regular basis and when we need it."

MWO also received Eaton's eNotify service, which provides real-time monitoring of more than 100 UPS and battery alarms. Monthly reports on the UPS status include information on voltages, loads, temperature and humidity and summarize battery events, availability percentage, comparative status against recommended specification and the top 10 performance and environmental parameters. If any type of power anomaly is detected, MWO will be notified immediately.



With the service upgrades, MWO received eNotify, which makes it easier to monitor the UPS from the valley and from our monitoring center in Raleigh, NC.

An additional benefit of eNotify is that Eaton remotely monitors the UPS and batteries at all times. This allows for some issues to be resolved remotely—often before a customer even knows a potential problem exists. In instances where a site visit is required, Eaton will automatically dispatch a technician within the specified response time window.

“Even though we’re staffed 24/7, we’re not staffed with technical folks 24/7,” Pushor explained. “I’m really excited about having eNotify provide email notices if there is something wrong with the UPS.”

The upgrade to eNotify came with an Eaton environmental monitoring probe too, which Pushor deems a “super bonus.” The small, single module enables remote monitoring of environmental conditions such as temperature and humidity.

“Now I can actually know what’s going on in my computer room and know if the temperatures or humidity are going out of bounds through email notifications. This saves me having personnel onsite to monitor our equipment,” he reported.

Results

With a more compact UPS solution, real-time system updates and the addition of an environmental monitoring probe, MWO is in an excellent position to preserve its 80-year weather history and capture as much data as possible during extreme weather.

“Having the Eaton UPS in place means that Mt. Washington Observatory is guaranteed 100 percent power 24/7. This allows us to collect weather data for the National Weather Service that is ultimately fed into the hourly models for forecasting the Northeast,” Pushor summed up. “It’s clear that the observatory has chosen the best here.”

With the upgraded 9355 in place, MWO is able to:

- Ensure the highest availability and uptime and protect critical equipment even in the most extreme weather, when power reliability and quality aren’t guaranteed
- Keep a constant pulse on equipment with eNotify
- Monitor computer room conditions with the environmental monitoring probe
- Maintain the health of its UPS solution and get help quickly with an Eaton service plan



We helped MWO significantly consolidate its UPS, saving valuable space at the summit.



The MWO team was thrilled with the slimmer UPS, system updates and new environmental monitoring probe.

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Printed in USA
Publication No. CS161005EN
October 2014

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