



Refreshing old-school UPSs with modern technology

Location:

Bethel, Alaska

Challenge:

Significant power quality issues, the need for unparalleled uptime at school sites and its remote location causing major logistical challenges for equipment delivery combined to create a perfect storm for the Alaskan school district.

Solution:

The Eaton 9PX lithium-ion UPS; Gigabit Network Card; and Tripp Lite series PDUs

Results:

Since standardizing on the Eaton solution, the district has dramatically increased uptime across its school sites, while enjoying considerably easier and faster UPS shipments, as well as decreased refresh and maintenance requirements.

“Some schools have equipment that has maintained uptime for 18 or 19 months now because of the UPSs. For us, this is an extraordinary feat.”

Gabe Carmichael, Network Manager

Background

Located in Bethel, Alaska, the Lower Kuskokwim School District is the state's second largest rural school district in terms of geographical area, with roughly 22,000 square miles of roadless tundra encompassing an area equivalent in size to the state of West Virginia. Comprised of 29 K-12 school sites, the district's mission is to ensure bilingual, culturally appropriate and effective education for its 3,960 students, providing them with the opportunity to be responsible, productive citizens.

Challenge

When it comes to ensuring uptime within the Bethel, Alaska school district, the challenges can be as abundant as the snowfall. “Our power isn't the cleanest, nor is it the most reliable,” emphasizes Network Manager Gabe Carmichael, noting that availability can vary dramatically among sites. “Some schools experience power outages on a daily basis, while others have weekly blackouts. Still others might only lose power when their generators need maintenance.”

Despite the tests and trials sparked by power quality conditions, downtime just isn't an option for the district. “In today's learning environment, just about everything of any real instructional value requires

online access,” Carmichael emphasizes.

With K-12 education provided at each of the district's 29 school sites— some of which also support preschools — each location is responsible for maintaining its own network and equipment, which includes a VMware server, voice over IP (VoIP) solution, LAN/WAN infrastructure, distance delivery technologies and staff and student devices. While most schools have backup generators in place, Carmichael acknowledges that the equipment can be prone to routine malfunctions.

Ensuring that each school's network and internet remain up and running at all times is absolutely essential for the district, which facilitates more than 40 online distance learning classes each day in six specifically designed studios. “We provide these classes to augment learning needs in places where staff is limited on site,” Carmichael explains. “When a teacher isn't available in a certain area, such as a certified geometry or algebra teacher, we deliver those subjects online.”

To achieve continuous, high availability of technology, the Lower Kuskokwim School District recognized the need to upgrade its power protection solution. The organization



Powering Business Worldwide

desired an alternative to the hodgepodge of uninterruptible power system (UPS) brands and capacities that were scattered among school sites and failed frequently. "We were looking for something different, because we were tired of replacing hundreds of small UPSs all the time," Carmichael says.

Another difficulty would be the process of shipping new UPSs to the school sites. Due to the district's remote location, all supplies and equipment must be shuttled in on small planes, which creates a unique challenge considering the weight of lead-acid UPS batteries. "Because each one weighs about 100 pounds, most of these planes can't carry many at one time," Carmichael says. "We have multiple constraints anytime we need to purchase equipment."

The district turned to its CDW representative, Inside Solution Architect Rob Pepper, for help determining the optimal UPS solution. "We look to him for most of our outside project equipment," Carmichael explains, "and he recommended the option of standardizing on Eaton lithium-ion UPS technology."

Solution

The Eaton 9PX lithium-ion UPS proved to be an A+ solution to overcome the multitude of challenges experienced by the Lower Kuskokwim School District. Initially trying out a few units, the district was so impressed with the technology that it promptly standardized on the 2000 VA model and to date has rolled out 120 units.

Providing two to three times more runtime at full load compared to lead-acid batteries, the double-conversion UPS offers a set-it-and-forget-it deployment ideal for remote sites and distributed "edge" environments, requiring little on-site support from IT staff or maintenance personnel. "The set-it-and-forget-it factor was huge for us," Carmichael emphasizes. "Where lead-acid UPSs might have a three- or four-year lifespan anywhere else, in our harsh environment we were lucky to get two years and we never knew when the batteries might die."

Also of key importance to the Lower Kuskokwim School District is the unit's lightweight design, which, at 40% less than a comparable lead-acid UPS, has significantly mitigated the challenge of delivery to Alaska. "Because the 9PX is about half the weight of a standard 2000 VA UPS, we can bring in more units at a time and it makes life so much easier," Carmichael reports.

Providing eight to 10 years of life expectancy, the 9PX lithium-ion UPS not only lasts longer than lead-acid UPSs but optimizes long-term cost savings by minimizing battery maintenance expense. The model also offers the same reliable features as the 9PX lead-acid UPS, including load segments for prioritized shutdowns, remote power on (RPO), remote on/off (ROO) and output relay ports that increase control capabilities.

Furthermore, the 9PX li-ion models provide remote firmware upgrade functionality, enabling users to keep their firmware up-to-date anywhere across the globe. This feature is especially advantageous for remote locations like the Lower Kuskokwim School District, as well as environments with limited IT resources to maintain a UPS fleet.

The district paired each 9PX lithium-ion UPS with an Eaton Gigabit Network Card, the first UPS connectivity device to meet both UL and IEC cybersecurity standards. The card improves power system reliability by providing warnings of pending issues and helping to perform orderly, graceful shutdown of servers and storage.

Another appealing feature of the 9PX lithium-ion UPSs is they require less amperage to charge quickly. "When we had lead-acid UPSs, at some sites they were put on underpowered circuits and would trip," Carmichael explains.

Lower Kuskokwim School District is also benefitting from the 9PX's space-saving footprint. "The size was definitely a concern," Carmichael acknowledges, "because some of our communication closets are purpose-built rooms and others are not. Some are literally janitorial closets where we ducted air flow into when the schools were wired in the mid-90s."

Additional reliability, performance and peace of mind are achieved through the UPS's proven Lithium Iron Phosphate (LFP) chemistry and built-in battery management system (BMS), which actively monitors temperature and charge.

The Lower Kuskokwim School District complemented its power protection solution with Tripp Lite series power distribution units (PDUs) that feed switches on different groups of UPSs.



Results

Since deploying the Eaton 9PX lithium-ion units, Carmichael reports that the district's internal outages have decreased significantly. "Some schools have equipment that has maintained uptime for 18 or 19 months now because of the UPSs. For us, this is an extraordinary feat."

Since standardizing on the Eaton solution, the district has experienced a courseload of advantages, not the least of which is dramatically improved uptime. "We no longer cringe every time our ISP notifies us of an outage, or we get a call from a site saying that we lost power," Carmichael reveals. "The UPSs keep the equipment up and running."

With the 9PX lithium-ion UPSs in place, Lower Kuskokwim School District is now able to:

- **Ensure continuous uptime** across its school sites, despite frequent power quality issues
- **Easily receive UPS shipments**, thanks to the reduced weight of the lithium-ion UPSs
- **Ease maintenance issues** with a set-it-and-forget-it deployment
- **Save space** in cramped quarters with the UPS's small footprint

Eaton
1000 Eaton Boulevard
Cleveland, OH 44122
United States
Eaton.com

© 2024 Eaton
All Rights Reserved
Printed in USA
Publication No. CS153116EN / GG
January 2024

EATON
Powering Business Worldwide

For more information, visit
[Eaton.com/9PX](https://www.eaton.com/9PX)

Eaton is a registered trademark.
All other trademarks are property
of their respective owners.

Follow us on social media to get the
latest product and support information.

