

Success Story: Tarrant County 9-1-1 District

Markets Served
Data Centers & IT

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Kevin Kleck, technical operations manager

Eaton answers the call for complete needs of 9-1-1 center

Location:

Fort Worth, Texas

Segment:

9-1-1 Emergency Services

Problem:

In order to successfully build out a series of backup data centers, the county needed a complete power quality and distribution solution, coupled with data center enclosures and furniture.

Solution:

Eaton 9355 UPS, Software, Service, Racks, Surge Protection Devices, EMPs, Connectivity, Input Breakers, Output Panels, Modular Furniture, Enclosure Systems

Results:

An end-to-end, high reliability solution was delivered by Eaton, enabling Tarrant County 9-1-1 to successfully plan, implement and complete a potentially complicated project.

Background

Undeniably, Tarrant County 9-1-1 District is tasked with an enormous responsibility: helping to ensure the ongoing safety of some 2.2 million citizens. In addition to protecting the population that resides within the county boundaries, the district also provides 9-1-1 services to several outlying cities. Handling more than 5,000 calls per day, Tarrant County 9-1-1 District is driven by its mission to continuously provide reliable, accurate, responsive, and effective emergency communication networks and services to its member jurisdictions.

Yet five years ago, the county's IT administrators honed in on an alarming trend. "The thing we realized, looking back over a 10-year span, was that most of our equipment failures were related to power issues," recalls Kevin Kleck, technical operations manager for the district. "Whether it was a lightning strike, or an ice storm knocking out power lines, or rolling blackouts during the summer, we started noticing that our sites were vulnerable to these types of outages."

The realization prompted the district to seek out a comprehensive power protection solution. With a handful of Eaton® uninterruptible power systems (UPSs) already installed in existing facilities, Tarrant County turned to an Eaton channel partner to help mitigate its various threats.

"That initiative led Tarrant County 9-1-1 District to significantly expand our Eaton offering," Kleck reveals, noting that the organization has since rolled out a wide range of Eaton power quality and power distribution products. "District wide, we began migrating to more redundant and fault-tolerant power systems."

Challenge

In 2011, after investigating new technologies that enable emergency calls to be dynamically re-routed to other locations, Tarrant County 9-1-1 District decided to establish a regional backup data center. The intent behind the new data center was to provide a backup site where other 9-1-1 municipalities that did not have a redundant facility could relocate operations in the event of a disaster.



Powering Business Worldwide

Then, in early 2012, Tarrant County 9-1-1 District was faced with a unique opportunity. A consolidation of a local city jail that falls within its coverage area yielded some coveted open space in the form of three jail cells, a site that would ultimately be designated for a second backup data center.

“This provided a prime opportunity for us to do something disaster recovery-related there,” says Kleck. “So we decided to lease the space from the city and complete some modifications to make the space more data center-oriented.”

In order to successfully bring the two ventures to fruition, the district found that it required an extensive range of power quality and distribution products — as well as the expertise to merge all of the different components together.

“One of the critical criteria was that we needed a single integrator that understood the product, the environmental aspects, and how to actually go from concept all the way to completion of a full, turn-key solution,” Kleck explains.

Among the primary challenges of both projects was how to safeguard the broad range of critical 9-1-1 equipment that would be housed at the data center sites, including controllers, interfaces to public safety systems, telephony equipment and data base servers.

Tarrant County 9-1-1 District needed a UPS solution that would not only deliver the highest level of reliability, but also offer the capability of expanding with the organization’s plans for growth. Extended runtime, small footprint and the ability to monitor equipment remotely were other factors in its decision.

UPS Solution

Tarrant County 9-1-1 District found everything it was looking for from Eaton, beginning with the 9355 UPS. The three-phase unit delivers superior power protection, coupled with scalable configurations that can be upgraded without additional hardware to provide 50 percent more power. By deploying a pair of units at each of the two data center sites, as well as extended battery cabinets, the 9-1-1 organization was able to satisfy its primary requirements.

“We chose the 9355 because of the kVA level and the scalability of what it could go to,” Kleck reports.

“It was a good size match for what we were trying to do. We’ve used a lot of Eaton 9170+ units in smaller sites where we didn’t have as much potential for growth, and where we didn’t have such a need for extended runtime or capacity. With the 9355, we were really looking at scalability and future-proofing.”

Another boon for the district was the 9355’s form factor, which offers a sleek, end-of-row tower design and the smallest footprint of any comparable UPS. The compact unit — which features standard internal batteries — was especially advantageous to the district at the jail, where the UPSs had to fit into a small space.

“The size did make a difference,” says Kleck. “Because of the unit’s design, we were able to put in the 9355s plus an extra battery cabinet, and still leave space for a second battery cabinet should we need it down the road. We wanted at least an hour of runtime in case our generator didn’t kick on or something, so the battery scalability was a big plus.”

The 9355 enables up to four UPSs to be paralleled for either capacity or redundancy using Eaton’s patented Powerware® Hot Sync® technology. However, Tarrant County chose a different option, configuring the units as dual power systems. While both options provide redundancy, with one UPS taking over the load in the event another fails, Tarrant County chose to attach the two 9355 units to separate outlet panels, which in turn lead to separate input panels and automatic transfer switches (ATSS) within the jail cells.

Tying in the power infrastructure

The potentially complicated connection process was made seamless by deploying Eaton’s input breakers, output panels, and automatic transfer switches, which provide reliable, rugged, versatile and compact assemblies for transferring essential loads and electrical distribution systems from one power source to another.

“We’ve achieved a single point of merging power and infrastructure,” notes Kleck. “Each cell has the capability of pulling off both UPSs. And since there’s two of them, we can dual power any of our critical systems, and the other UPS can take over other load if one ever failed or needed to be taken off-line for maintenance.”

Furthermore, the district safeguards against the threat of incoming transient surges by adding Eaton surge protection devices upstream of the UPS. “Before it hits the UPS, we’ve already protected it,” explains Kleck.



Eaton 9355 and External Battery Cabinet with 9355 General Duty Safety Switch

Bolstering the solution with monitoring and management

To gain a clear view of its network, Tarrant County 9-1-1 District relies on Eaton's Intelligent Power® Software Suite, which incorporates monitoring and management of power devices across the network from a single interface, as well as automatic graceful shutdown in the event of an extended outage to prevent data loss.

"This is especially critical since most of our sites are unmanned and the best way for us to gain information in the field is through our network," Kleck explains. "With IPM, we, we are able to watch the load or any alarms and traps remotely, and we're notified if there's any kind of usual event. And we can also statistically pull information without actually physically being there."

Each of the district's UPSs also include an Eaton ConnectUPS Web/SNMP network card, which enables remote monitoring and provides HTTP, SNMP, SMTP, WAP, Telnet, SSL, SSH compatibility and advanced RS232 communications.

In order to achieve manageability, monitoring and automatic transfer switching, the district also deployed Eaton's zero-U ePDU® models at all locations, as well as standard PDUs rack-mounted to power strips where L5-20P or L5-30P input is required.

Also operating throughout the four data center sites are approximately 50 Eaton environmental monitoring probes (EMP), a device that enables the Web/SNMP adapters and web-enabled ePDUs to monitor temperature and humidity. The information from the EMP is available on the web interface as well as through SNMP, with various notification options and user-defined thresholds.



ConnectUPS-X Web/SNMP Card

Furthermore, the organization placed Eaton's modular furniture in two of the three data center facilities, as well as a Paramount Enclosure in one jail cell. Other Eaton enclosures and furniture are deployed within other district facilities, including Profile Command Consoles used by call-takers and dispatchers in the county's 9-1-1 center.

More of a good thing

The success of Tarrant County's data center venture gained momentum quickly. Another site was being completed to provide a geo-redundant expansion of the 9-1-1 system. This facility was designed to house a data center, as well as the capability to support a live 9-1-1 call center for agencies that needed to evacuate their primary facility. Before the project was even completed at the jail — which posed the most complex installation — the District requested that another site be constructed within a new facility it was building. That was followed by revamping a space within a fourth location oriented toward providing a backup location for the Sheriff's Department.

"As we had new sites brought up, we put Eaton equipment in," Kleck says. "All four data centers will support the 9-1-1 system, and three of the sites have twin 9355s."

One of the greatest advantages of the overall project was the ability for Tarrant County 9-1-1 District to obtain every piece of its power quality and distribution solution from a single provider.

"In some cases, we needed a full protection solution from the utility entrance to the outlet level," Kleck shares. "And in other cases, where we may not own a facility but are leasing and simply have our equipment placed, we protect as much as possible. But always, our primary goal is to protect the 9-1-1 equipment, and we have done so with Eaton at every site."

Eaton's channel partner worked with other local Eaton representatives to deliver the complete solution to Tarrant County 9-1-1. Acknowledging that it is not easy to find a single source capable of meeting all of its data center power needs — from UPS protection to distribution components and modular furniture — Kleck reveals that Eaton has come through, both from a product and support standpoint.

"The Eaton solution that we use is certainly meeting our needs and is exactly what we were looking for to help us manage the variety of locations and sites," Kleck reveals. "We were able to work through all of the environmental threats — from power outage to temperature issues — at our sites, and we gained a lot more information and vantage into those locations."

One of the greatest advantages of the overall project was the ability for Tarrant County 9-1-1 District to obtain every piece of its power quality and distribution solution from a single provider.

“The solution not only gives us diversity and redundancy, but also provides disaster recovery so others can sustain 9-1-1 services in the event of an emergency,” Kleck adds.

With a variety of natural threats facing the four data centers on an ongoing basis — ranging from tornadoes to ice storms — Tarrant County 9-1-1’s new power system has already been put to the test more than once.

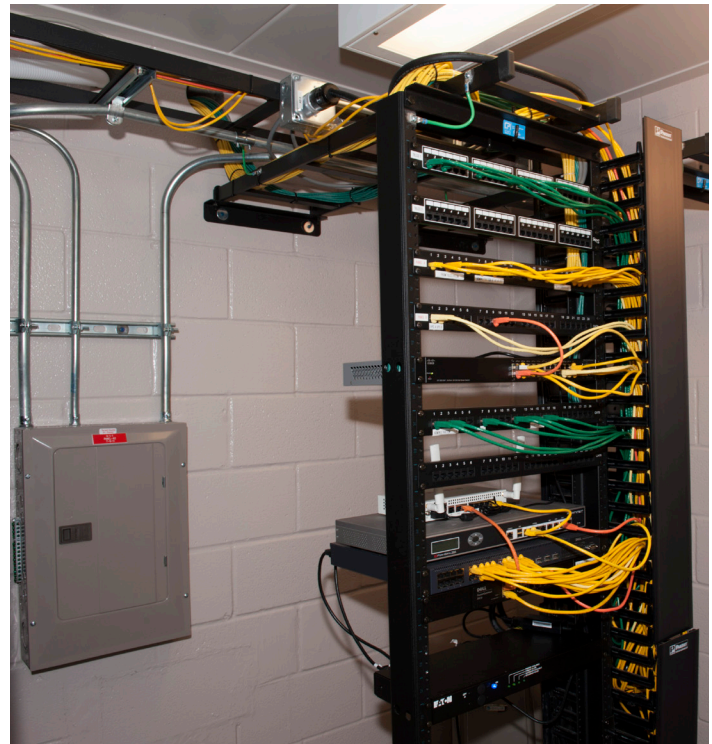
“We’ve experienced blackout issues as storms swept through and we’re able to watch our sites still stay functional during those times,” Kleck reports. “We get great information communicated back to us so we understand exactly what’s happening at each site.”

Results

“We like Eaton because of the reliability, the stability of the company, and the quality of products it can provide,” Kleck sums up, adding that he also values the support he receives from both his local Eaton channel partner and internal Eaton representatives.

With its comprehensive Eaton solution in place, Tarrant County 9-1-1 District is now able to:

- Ensure the ongoing reliability of its 9-1-1 system between all locations
- Provide four disaster recovery sites where emergency 9-1-1 operations can be maintained
- Expand its UPS solution as needed with the scalability of the 9355
- Remotely monitor and manage sites with IPM
- Rely on the expertise and convenience of a single source for its comprehensive power quality, power distribution, data center rack, command and control console needs



Eaton Load Center Panel and 2-post IT rack with Eaton Automatic Transfer Switch

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