



CASE STUDY

Denver's CBS4--KCNC-TV and ABC7--KMGH-TV Keep the Power Flowing with GE Digital Energy's Uninterruptible Power Supplies

To help ensure uninterrupted power for their stations and continuous broadcasts for their viewers in the event of a utility power outage, Denver, Colorado's CBS4--KCNC-TV and ABC7--KMGH-TV, are using GE Digital Energy's Uninterruptible Power Supply (UPS) products to keep the power flowing. UPS are back-up power sources that, in the event of a power outage, bridge the gap between utility power and an alternate back-up power source, such as a generator, until utility service can be restored.

CBS4 and ABC7 are using the UPS products as a back-up, redundant power source in the new, consolidated digital television (DTV) tower and building located on Lookout Mountain in suburban Denver. The new Lookout Mountain DTV tower and building was constructed by a consortium of four Denver television stations to support the move to digital transmission by February 17, 2009, as required by the US Federal Communications Commission (FCC). Ensuring power stability in the new DTV tower and building was a priority for CBS4 and ABC7. Television towers are very susceptible to lightning strikes, which can potentially cause power outages, brownouts or online power spikes, so a strong, reliable back-up power solution was critical.

"Providing on the air news and information remains a fundamental tenant of who we are. In a crisis, natural disaster or weather emergency, television is a critical resource for the community," said David Layne, CBS4 Building Operations and Engineering Director. "A few years ago, television stations may have been willing to go without back-up power. Now, with new digital technologies, our responsibility to the community, and the 24/7 news cycle, it is critical to remain uninterruptible."

Following a power instability in one of their studios in 2005, both stations started working with GE to find UPS solutions. Based on their very positive experience, both stations developed a GE UPS solution for their facilities at Lookout Mountain.

"The Lookout Mountain project gave us the opportunity to build a state of the art back-up power system from the ground up," said Eric Buckland, CBS4 Engineering Manager. "Based on the critical needs of this project, the strength and reputation of GE's UPS products, and their strong local sales and service team, we decided to go with a dual GE UPS system."

CBS4 installed a 300 KVA UPS to support its primary transmitter. An additional 150 KVA UPS supports its backup transmitter. The UPS responds to any power excursion within a half a cycle, allowing the station to continue operating the plant and stay on the air. Each UPS provides 30 seconds of power at full load, allowing ample time for standby generators to come online. Both UPS are powered by a stored energy device (in lieu of batteries) which utilizes a flywheel to store and generate electric energy for the UPS. The stations opted not to use a battery-based solution due to regulatory

requirements, potential environmental issues created by battery disposal, and the replacement costs.

ABC7 installed a 150 KVA UPS to support its primary transmitter. The UPS provides 30 seconds of power at full load and is powered by a stored energy device, used in place of batteries.

After significant testing, both stations went online on May 19, 2008, and the system was tested just a few months later. A power failure hit the Lookout Mountain site in late summer 2008. CBS4 and ABC7's competitors went off the air but GE's UPS kept their power and broadcasts going. In fact, CBS4 and ABC7 were unaware of the power failure until they heard about it from the other stations. "Our GE UPS systems operated flawlessly and kept our power and broadcasts going," said Layne.

"In today's digital world, where uptime is critical, GE's investment in UPS technology is helping Denver television viewers stay tuned in," said Steve Smith, General Manager – Power Quality, GE Digital Energy. "We are committed to helping our customers ensure reliable, uninterrupted power for mission critical operations, from television stations to hospitals and data centers. Using industry leading GE technology, we are proud to say we are helping Denver television viewers stay connected."

GE's UPS has a unique software feature that works very well with broadcast antenna loads and is used in the broadcast industry. Analog and digital transmitter signals are power quality sensitive. Many of these transmitters use inductive output tubes (IOT) that are protected by a "crowbar circuit." In the event of a power outage or online spike, the crowbar circuit creates a short circuit to dissipate the energy (called a "crowbar event") which protects the IOT from costly failure and damage.

GE's advanced UPS software algorithm helps minimize the effect of crowbar events and increases the life of the transmitter tube, keeping power reliable and costs down for television stations. For a transmitter to protect an IOT, the UPS must transfer to bypass immediately to support this crowbar event (seen as a short circuit to the electrical system) until it clears. If the UPS does not transfer to bypass fast enough, the UPS inverter will not be able to support the crowbar event (short) and the load (transmitter) is dropped. GE's UPS software can transfer to static bypass quickly to support crowbar events on transmitters using IOT tubes. GE's SG Series UPS uses dynamically stiff inverters with Space Vector Modulation (SVM) to support the transmitter's short (step load) until transferring to static bypass.

To learn more about GE Digital Energy's UPS products, visit: www.gedigitalenergy.com/pg.