

CASESTUDY

ENGINEERING SERVICES



PROTECTING & SECURING OUR BORDERS

CHALLENGE

The Southern U.S. border is, in places, a vast and desolate region, presenting challenges to border security operations. Ongoing efforts to support the United States Border Patrol (USBP) in these remote areas include the use of electronic sensor systems. Because there is no commercial telecommunications infrastructure, dissemination of the critical data gathered by these systems must be achieved by long range microwave backhaul. Maintaining these microwaves is vital to the success of the mission.

During a recent operation to preemptively address reliability and system obsolescence, a repeater located on a remote mountain accessible only by helicopter could not be serviced due to insufficient power supplies at the location. This critical link, in addition to the sensor system, provides phone and network communications to a USBP forward operations camp and supports USBP land mobile radio communications.

SOLUTION

On site for logistical and technical support, MIL engineers quickly devised a plan to bring power to the site. The mountain top site is powered only by a solar panel array and 12 Volt DC battery bank. In order to power the -48 Volt DC microwave system, the team implemented a solution using a standard automotive 12 Volt DC to 120 Volt AC inverter. With this solution, they were able to power a 48 V DC bench top power supply, however this stopgap fix could only provide enough power for the primary radios, leaving the system without the hot standby radio capability.

Over the next few months, MIL engineers designed a plan to implement a dual redundant DC-to-DC converter power system to fully power the microwave system. The design utilized high-efficiency, environmentally suited DC converters wired within a rack-mount shelf to simplify the installation. Additionally, the design included wiring circuits to the alarm input port of the microwave equipment, which report to maintainers if either converter suffers a failure.

During installation, the MIL team, along with technicians from U.S. Customs and Border Protection, were transported to the site by USBP UH-60 Black Hawk helicopter. After installing the shelf, the power was cut over to the new system and brought online using both primary and secondary radios. In this instance, downtime was less than one hour.

BENEFIT

By implementing a robust power design, this remote microwave link is now more reliable by orders of magnitude. The increased power capacity of the new system allows the site to operate with redundant radio links, adding reliability to the communications. The power system itself has dual redundancy, meaning that either power converter and/or microwave power supplies can fail and the system will stay online. MIL's solution of a highly dependable system is of the utmost importance due to the remote location of the site, which requires routine maintenance and repair.