

U.S. Controlled Air Base in Bagram Equipped with Superior Essex Cable

Premise and OSP Copper Cables as well as Optical Fiber Cables Help the Base Maintain Mission Critical Communications and Meet Mission Demands



U.S. Army Sgt. 1st Class Ricky Bryant is last in line to board a C-130H2 Hercules aircraft at Bagram Air Base, the busiest airfield within U.S. Central Command. (Photo courtesy of U.S. Department of Defense)

Located in northeastern Afghanistan, the Bagram Air Base plays a key role in efforts by U.S. and allied forces to strengthen and stabilize Afghanistan. On average, the base supports more than 125,000 flight operations (air traffic, takeoffs and landings) each year and houses approximately 13,000 allied forces and civilians. With no plans to reduce flight operations or personnel in the immediate future, an extensive overhaul and expansion project that has already spanned more than four years is underway; and Superior Essex cable products are being installed to help the base meet growing mission demands.

The Bagram Air Base is situated less than 50 miles north of Kabul. The base was built and formerly controlled by the Soviets during its occupation of Afghanistan.

Today it is controlled by the U.S. Army's 10th Mountain and 101st Airborne divisions: the Army is responsible for overall operations; and the Air Force, for providing aerial support for U.S. and coalition forces on the ground.

Over time, conditions deteriorated at the war-ravaged and aged compound. In response, the U.S. military identified projects to improve the overall airfield operations and safety. Included in the overall runway improvement plans (i.e. construction of a new runway, service taxiways, and aprons that meet U.S. Air Force standards) were new construction projects for guard towers and fencing that encircles the perimeter, an entry control point facility, a new replacement air traffic control tower, barracks, ammunitions supply point, and bulk fuel storage areas.

To support the new facilities, the cabling infrastructure for classified and non-classified communications at the 1,110-acre base would have to be addressed.



A small American flag hangs from the Pat Tillman United Service Organization (USO) Center at Bagram Air Base, Afghanistan. (Photo courtesy of U.S. Department of Defense)

The Challenge

Virginia-based Contrack International, Inc. was awarded the individual construction bids for the airfields and support buildings, as well as individual installation bids for the communications systems at each of the new structures. Contrack in part used Afghani workers trained at its Construction Training Center in Kabul where they learned U.S. Safety and quality control methods for communications networking, electrical workings, plumbing, painting, masonry, steel work, HVAC, welding, and carpentry.

Contrack is a leading international engineering, procurement and construction company that specializes in large U.S. Government-funded projects around the globe. The company was established in 1985 and consistently ranks as one of the “Top International Contractors” in the world by Engineering News Record-Magazine. Over the last 21 years, Contrack has successfully completed \$2 billion of work for agencies such as the U.S. Army Corps of Engineers, USAID and the U.S. State Department’s Bureau of Overseas Buildings Operations.

Contrack designed and installed the communications systems for data networking, telephone service, video capabilities, airfield lighting controls as well as Internet access in the identified areas.

Before the more than 150,000 feet of Superior Essex cable could be buried or pulled, land mines hidden along the installation path had to be removed. The base is littered with small-arms munitions, hand grenades, cluster munitions, rockets, and bombs. According to military reports, more than 25,000 pieces of unexploded ordnance and hundreds of anti-personnel and tank mines were cleared from the base in one year alone.

The Solution

Assem Iskander, Contrack's Manager Electrical Division, explained, "The nature of this multifaceted job required that we purchase from a manufacturer that could supply us with a breath of copper and fiber optic voice, data and video communications products that would meet the mission critical needs of the U.S. military, including performance in temperature extremes of minus 51 degrees Fahrenheit in the Winter to 118 degrees the Summer. With Superior Essex I have one reliable supplier of quality products and excellent customer service to cover all of my cabling applications."

Voice Services

Contrack selected Outside Plant and Premises copper cables from Superior Essex for the voice communications services along the secured fence line and guard towers, air traffic control tower, entry control point facility, bulk fuel storage buildings, and barracks.

For the OSP cables, SEALPIC®-F and SEALPIC-FSF were installed to interconnect the voice services. SEALPIC products are high quality moisture protected copper cables that feature aluminum shielding and a compound that completely fills the interstices between the pairs.



Superior Essex SEALPIC-F Cable

For added cable safeguards, Contrack installed CASPIC®-F and CASPIC-FSF copper products at the entry control point facility, guard towers, ammunitions supply point, and fence project. The CASPIC product line has all the features of the SEALPIC product line, plus an additional metal armor that protects the cable in high-risk areas where extra mechanical or rodent protection is required.

Contrack also chose a combination of CAT 3 and CAT 6 copper cabling as well as single and multimode fiber optic cables from Superior Essex to accommodate the voice and data demands.

The innovative design of the Series 77 product line, a CAT 6 cable that meets TIA/EIA 568-B.2-1 specifications, facilitates individual voice connections and data networking at the sites. Features of the Series 77, which does not utilize cross web fillers, include a smaller cable diameter than most other CAT 6 cables, the QuickCount® marking system, ColorTip™ Circuit Identification System, and BrakeBox™ payout control system, all of which helps make installation of the cable easier.

The CAT 3 cables chosen were installed in the backbone to support the PBX phone system.

Video and Data Services

Contract selected loose tube fiber products (single tube, single jacket all dielectric and armored loose tube single jacket, single mode fiber) from Superior Essex to stream critical security video to the monitoring control room and send mission critical data to and from the base operations center.

All Superior Essex loose tube cable products utilize PFM™ Gel filled tubes. The core tube is then helically wrapped with water-blocking strength members and encased in a black polyethylene jacket.

The PFM (polymer filling matrix) material used in the loose tube fiber optical cables is an exclusive water-blocking compound from Superior Essex. PFM gel can be easily removed from optical fiber and hands, and is less sticky than other gel materials.

Additionally, PFM gel offers the advantages of an all-dry design without the problems that an all-dry design can bring.

Iskander said, "Our technicians found that the PFM gel enabled faster tube removal and reduced potential for optical fiber breakage during the fiber preparation process. Additionally, the PFM gel can be cleaned from fibers and hands without the use of cleaning solvents."

The loose tube product line is tested to verify reliable transmission performance characteristics in a broad range of temperatures, -50° C to +70° C. This feature makes the Superior Essex cable ideally suited for the harsh Afghan weather.

At the entry control facility, guard tower, and along the fencing, Contract added an armored loose tube single jacket, single mode fiber cable on the backbone. This tied the networked security cameras and SCADA system (a large scale data collection and control system used at the supervisory level) back to the security control center.

This rugged single mode fiber cable line from Superior Essex is designed with all the features of the all dielectric, single jacket optical fiber products with an added corrugated steel armor element.

The Results

The scope of the major cabling infrastructure upgrade required cabling solutions that addressed various applications. With the expertise of Superior Essex in both OSP and premises fiber and copper products, the base mission critical transmissions at the busiest airfield within U.S Central Command remain secured. (Bagram Air Base mission numbers surpass flight operations at U.S. air bases across Europe and most other bases outside the Continental United States.)



U.S. Air Force Senior Airman Thomas Elsworth surveys the airfield after his C-17 aircraft arrived at Bagram Air Base. (Photo courtesy of U.S. Department of Defense)