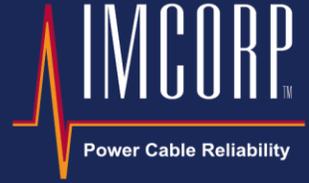


Using Factory Grade® Technology to Ensure International Airport Grid Reliability



2 mile-long airport feeder cable system with multiple defects is now reliable

HIGHLIGHTS

OVERVIEW

Quality issues on new critical cable system identified with Factory Grade® technology and repaired.

CHALLENGE

International airport cable system installed with multiple hidden defects threatening traveler safety and grid reliability.

RESULTS

IMCORP's Factory Grade® technology effectively pinpoints multiple substandard components and confirms repairs meet industry standards preventing multiple outages at a major international airport.

In 2017, a major southeastern international airport was shut down due to a power outage attributed to a fault found in the underground cable system feeding the airport. No utility wants to experience this kind of negative publicity. The normally bustling airport handles 275,000 travelers a day plunged into darkness for nearly 11 hours, leaving some passengers stranded on the tarmac for hours. Utilities take precautions to prevent this type of scenario but are still vulnerable to critical outages due to hidden defects. One way to prevent such an incident is to assess the condition of underground assets, whether new or aged, using a test comparable to the manufacturers' standards. IMCORP's **Factory Grade®** technology is the assessment that can qualify installed cable systems meet those standards.

Learning from the 2017 experience, another southeastern utility with a major international airport decided to proactively perform the IMCORP **Factory Grade®** test on newly installed cable systems. The utility already had extensive positive experience with this approach on other new and aged cable systems, but this was their first-time checking airport cable systems. According to IMCORP database analytics on over 180,000 cable assessments, up to 20% of newly installed 3-phase cable systems have at least one substandard component. The utility expected to find some minor issues with splices and terminations, but nothing prepared them for the extent of the problem they uncovered.

The subject airport feeder was approximately 12,000 ft in length, having multiple connection points linked through an underground conduit and vault system. Long cable lengths generally make achieving factory comparable test and locating defects difficult. However, the IMCORP **Factory Grade®** technology was able to overcome these challenges through the use of superior sensors, adaptive machine learning techniques, and digital location matching technology.

Working with the utility and contractor crews, IMCORP assessed all the newly installed cable segments. While the joints and terminations performed better than average and a few repairs were made onsite, two different types of factory defects were found at multiple cable locations necessitating the removal of two sections. IMCORP was able to pinpoint all of the serious insulation issues and confirm repairs met industry standards, preventing multiple major outages at an international airport, and demonstrating the need to perform an effective cable condition assessment during the commissioning process.

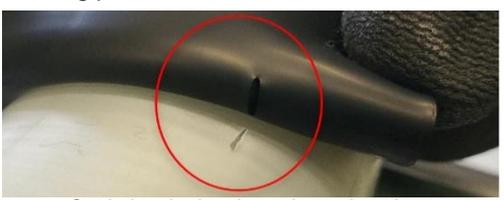


Component Standard	Testing Frequency	Thresholds*	
		Sensitivity	Voltage
Terminations IEEE 48	50/60 Hz	5pC	≤1.5 Uo
Joints IEEE 404	50/60 Hz	5pC	≤1.5 Uo
Separable Connectors IEEE 386	50/60 Hz	5pC	≤1.3 Uo
MV Extruded Cable ICEA S-97/94-682/649	50/60 Hz	5pC	≤4.0 Uo^A
HV / EHV Extruded Cable ICEA S-108-720	50/60 Hz	5pC	≤2.0 Uo

* No partial discharge should be observable above the sensitivity threshold up to the voltage threshold
^200 V/mil



Removing cable section



Cut in insulation through semicon layer



Gouge in semicon layer