LEC Lightning Protection for Public Transportation Boosts Productivity and Commerce in Resort Towns

The resort town of Mountain Village, Colo., operates one of the world's most unique transit systems – a publicly funded, free gondola route that takes 2.5 million people a year between Mountain Village and neighboring Telluride, Colo. The electric-powered gondola transit system also provides a tremendous environmental benefit, slashing carbon emissions by turning what would be a 45-minute one-way drive around a mountain into a three-mile, 13-minute ride over the mountain. ®

According to Jim Loebe, Gondola Maintenance Manager for the Town of Mountain Village, those environmental benefits easily translate into economic benefits. The transit system, he notes, is much more cost-effective than the shuttle buses used when the gondola is taken off-line for maintenance. Running the buses full-time to handle the same passenger capacity would require maintaining and fueling 50 buses – all while giving riders a much longer commute.

The gondola system's efficiency is what makes it such a success for a resort area that has grown from a hub for winter skiing to a year-round tourist destination with popular festivals and events. It is also why having a Lightning Eliminators & Consultants, Inc. (LEC) lightning protection system – a Dissipation Array® System (DAS®), Chem-Rod® Grounding Electrodes and Spline Ball Ionizer® terminals – has a

positive impact on Mountain Village's and Telluride's tourist economies during the busy, but stormy, summer months.

Reducing downtime from hours to minutes

Summers in Mountain Village and Telluride typically come with short, daily thunderstorms, particularly in July and August. The towers along the gondola system's cable line were frequent targets for lightning, and each direct strike to a tower would trip electric switches that make the entire gondola system inoperable. It is a typical challenge for gondola operators, and most do what they can to avoid having passengers waiting during any time where a strike could leave riders stranded. Over in Europe, for example, a 2012 lightning strike at a gondola operation serving an Austrian tourist destination left approximately 150 people stranded at the top of a mountain.

Prior to having a lightning protection system in place, transit operations between the two towns frequently ceased operation for several hours whenever there was a sign of lightning in the vicinity. In those instances, the Town of Mountain Village was then forced to switch to the less-efficient bus system.

"We were shutting down for lightning storms that were off in the distance, and many times, it would be for storms that never end up coming our way," said Loebe. "We needed to maximize the uptime we have with the gondola to make sure people are getting to their destination as fast as possible. Having people where they want to be, especially during peak season, benefits the towns economically, so we needed a system that could reduce the downtime we faced from storms."

The Town of Mountain Village did extensive research on lightning protection systems in the late 1990s. It decided against lightning rod systems that capture strikes, based on the risk they felt they would face by drawing lightning into the area. Instead, they purchased LEC equipment, installing a one-of-a-kind DAS configuration in 2000 and 2001 that reduced storm-related downtime to a fraction of what it was previously.

Now, for passenger comfort, gondola downtime is limited to when storms are directly overhead and is typically minutes instead of hours. Riders are able to wait out the storm instead of using a back-up shuttle system for a bus ride that takes three times as long as the short gondola commute. And it means the transit system doesn't have to shut down for storm threats that never fully materialize.

Complete isolation from lightning strikes

Unlike lightning rod systems, LEC's DAS completely isolates facilities from a direct lightning strike by bleeding off the induced charge on the protected area during the course of a thunderstorm, reducing it to a much lower level in relationship to the surrounding environment. This suppresses the formation of an upward rising streamer, one of the required elements of the strike process, thus avoiding the strike.

It is the only such system where the lightning impulse is not encouraged, but discouraged. In fact, DAS technology has proven to be more than 99.87% effective in eliminating all strikes to protected areas.

Discouraging strikes ends up being a significant benefit. In addition to the increased uptime, the transit system achieves significant savings in repair costs for electric switches that used to get destroyed every time one of its towers took a direct strike.

"We went from spending tens of thousands of dollars a year in lightning storm-related repairs to a couple of hundred dollars," said Loebe.

LEC and charge transfer technology

LEC is dedicated to providing integrated, industrial lightning protection and prevention solutions, products and services by utilizing innovative, patented charge transfer technology, grounding systems testing, surge protection, design and comprehensive consulting resources, based on physics combined with state-of-the-art engineering principles. To date, LEC has installed over 3000 solutions in over 69 countries and throughout the United States, providing lightning protection to companies in the petrochemical, oil and gas, biochemical, information technology, nuclear energy, utilities and manufacturing industries.

Roy B. Carpenter, Jr., a former chief engineer for NASA's Apollo Moon Landing Missions and the Space Shuttle design engineering teams, founded LEC in 1971 to study and apply engineering principles to lightning protection. This unique form of the charge transfer process – the patented technology used in the LEC DAS solution – reduces the rapid transfer of electrons that occurs with lightning to a slow pre-strike drip by dissipating storm-induced electric charge in the atmosphere, above a protected site, and lowering the electric field within the envelope of protection. With more than 40 years of lightning protection success, LEC is able to issue a full no-strike warranty to each of its DAS customers, as long as proper installation and maintenance are observed.