

An aerial photograph of a coastal town, likely Aberystwyth, Wales. In the foreground, a railway track for the Aberystwyth Cliff Railway runs down a grassy cliff. The town is built into the hillside, with numerous colorful houses and buildings. The sea is visible in the background, with a large ship docked at a pier. The sky is overcast.

CONTROL 
TECHNIQUES

DAY TRIPPER'S DREAM

ABERYSTWYTH CLIFF RAILWAY | ENTERTAINMENT AND LEISURE

DRIVE OBSESSED

AFTER 200,000 TRIPS 30-YEAR-OLD DRIVE GETS A REFURB

The Motor Control Warehouse is an industrial automation distributor and system integrator located in Newtown, Wales. With over 100 years of experience and worldwide distribution, the company supplies a variety of AC and DC drives, motors, gearboxes, soft starts, and panel builds ranging from small basic systems to full turnkey solutions.

Overview

- **Controlled stops**
- **Safety and reliability improvements - now meets SIL3 Category 1**
- **Easy to maintain**

The Challenge

Constitution Hill, Aberystwyth, rises dramatically from the sea, providing spectacular and uninterrupted views of the town, Cardigan Bay, and on a clear day 26 mountain peaks spanning the length of Wales. A popular and relaxing way to enjoy this majestic panorama is to travel by train on the longest funicular electric cliff railway in Britain, which has been transporting visitors to the summit since 1896.

Client to The Motor Control Warehouse, Aberystwyth Cliff Railway, had a challenge to solve. The company realised the railway's control system was becoming harder to maintain due to components being made obsolete.

The original control panel was built in the 1980s and utilised Control Techniques' first-generation Mentor DC drive - the world's first variable speed drive to use a microprocessor in its control system.

"Due to the advancement in technology, the railway sought to improve the safety of the system. From our investigatory work, we found the original safety circuit to consist of single-channel limit switches, emergency stops, and over speed detection devices - all wired in series with a basic latching circuit, on a single e-stop contactor. A single fault on any of the limit switches, E-Stops, Overspeed detection device, or E-Stop contactor could cause a catastrophic failure. Therefore, our main design objectives were to build a system comprised of readily available components, with several fail-safes in place to prevent a single component failure potentially causing a dangerous situation."

Gez Evans

Manufacturing Director of The Motor Control Warehouse





The Solution

Control Techniques' Mentor MP was central to the winning solution. Readily available, Mentor MP eradicates the previously experienced maintenance issues. Controlled stopping was implemented using a four-quadrant drive, and additional fail-safes to stop the motor under an emergency stop condition, including limit switches to improve safety in case of failure. The solution was further enhanced by moving the safety circuit to a dual-channel, bringing the system up to date - now meeting SIL3 Category 1.

"Thanks to the new system Aberystwyth Cliff Railway now comply with the relevant safety standards. They spend less time fixing and sourcing parts, but the sheer fact that the original drive was in service for over 30 years is a testament to the quality that is associated with Control Techniques. The flexibility and performance of the product range makes it ideal for any application."

Gez Evans

Manufacturing Director of The Motor Control Warehouse



The Benefit

The new super modern control system has improved the operability of the 124-year-old railway system for both tourists and staff. The replacement system was fully implemented before the railway's annual seasonal opening. Amazingly, the original Mentor drive was still operational at the point when the old system was decommissioned, having completed approximately 200,000 round trips in its lifespan.

"After consulting with the HSE, it was decided to investigate a new control system. We knew that Control Techniques in Newtown supplied the original, they suggested we get in touch with The Motor Control Warehouse for the design and installation of the new system. The Motor Control Warehouse team was very professional. As with any work of this magnitude, there were going to be challenges to solve, but they overcame them efficiently, and we now have a state-of-the-art control system which will run for many years to come."

Alun Davies

Aberystwyth Cliff Railway





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