ARTICLE

No delay at an Hong Kong cargo terminal with an AVC installed

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01 The Hong Kong cargo terminal protected with the PCS100 AVC in the foreground
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02 Staff at the cargo handling facility are given site training to ensure successfulinstallation and application.
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03 PCS100 AVC

An PCS100 AVC Active Voltage Conditioner has been installed in a large air cargo container handling facility in Hong Kong which processes thousands of pieces of containerised cargo per day using an Automatic Stacker Reclaimer Crane. The operation runs 24 hours per day, seven days a week, unloading, sorting and reloading freight from the passenger and freighter aircraft passing through the major airport hub.

Hong Kong is subject to serious weather events such as typhoons and also more frequent electrical storms and heavy rain which can all impact on the electrical supply. During inclement weather, sags on the electrical distribution system resulted in significant down time for the airports robotic container stackers. In many cases a power disturbance would cause the cranes to trip mid-cycle with manual intervention required to resolve the chaos created. Ground staff would often have to physically enter the crane to reset the motor controllers and re-establish the automatic routine. This process takes time, reduces productivity, repetitively exposes the robotic crane to damage and puts staff at risk of serious injury.

Once voltage sag events were identified as the primary problem, various solutions were investigated and a case prepared for a voltage conditioning solution. The aim was to improve productivity, reduce damage, reduce maintenance costs and ensure a safe working environment for staff. The airport also wished to avoid the significant cost and passenger impact resulting from flight delays due to late loading of cargo.

The solution selected was a 300kVA, 400V, 50Hz PCS100 which can connect in series with the crane supply. The AVC uses the latest microprocessor and power electronics to monitor the electrical supply and inject the correction vectors required to hold the crane voltage constant and eliminate the sags from the protected crane. Installed in March 2007, the PCS100 AVC is the latest in power conditioning technology correcting events in milliseconds. The unit is a highly efficient (99% typical) industrial machine that offers continuous voltage regulation while protecting all load types from sags and surges.

The cranes uses DC motors and DC motor controllers which are sensitive to voltage magnitude changes and phase shifts. The PCS100 AVC restores both the phase angle and the magnitude during a PQ event. The crane can be regenerating power back into the utility when lowering a load which creates a problem for many alternative options (a UPS for example). The AVC offers true The Hong Kong cargo terminal protected with the PCS100 AVC in the foreground and is able to correct sags and swells while the load is consuming power or regenerating. A rugged industrial rating was also a requirement for this installation as the stores warehouse in which the crane is installed is not air conditioned and exposed to extremes of humidity, especially during a tropical thunder storm.

The installation has been very successful resulting in improved productivity, increased safety and greater passenger satisfaction (less flight delays). All of this has been provided with a system with extremely high electrical efficiency and resultant energy savings when compared with alternative legacy solutions.

To find out more about ABB's power protection solutions:
Web: www.abb.com/ups
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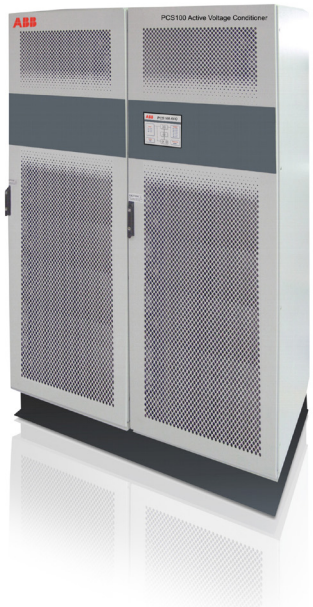

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