

Article

PCS100 AVC - Protecting the worlds most powerful climate reasearch supercomputer



A uniquely compact and energy efficient ABB power quality solution is protecting one of the world's most powerful climate research supercomputers from potentially destructive effects of power surges and voltage sags

The ABB solution is installed at the National Institute of and Atmospheric Research (NIWA) in Wellington, New Zealand, where it protects the new climate modeling supercomputer and the entire NIWA site from voltage fluctuations

The new IBM supercomputer is the most powerful climate research computer in the southern hemisphere. It can perform 34 trillion calculations a second (this will be upgraded to 65 trillion/sec in 2011), and is designed to provide fast and accurate weather and environmental forecasting as well as early warnings of severe hazards like flooding and storm surge.

Protection of the US\$ 9.5 mil super-computer and its invaluable data from damage or destruction is vital. The computer is housed in a purpose built clean room that is designed to withstand natural and manmade disasters like severe earthquakes, tsunamis and fire from within.

It is also protected from the equally devastating effects of power surges and voltage sags that have the potential to shutdown the computing facility and damage the highly sensitive equipment. This is provided by an ABB PCS100 AVC active voltage conditioner.

The PCS100 AVC is an inverter based system that protects sensitive industrial and commercial loads from unpredictable voltage disturbances. An ABB innovation, it provides fast, efficient, accurate voltage sag and surge correction as well as continuous voltage regulation and load voltage compensation.

With a system efficiency approaching 99 percent, the PCS100 offers significant energy savings compared to the conventional alternative of uninterruptible power supplies (UPS), the efficiency levels of which typically lie in the mid-90s. This is especially important for energy-intensive supercomputer facilities, which consume large quantities of electricity and require constant cooling to dissipate the heat they generate.

Whereas UPS batteries are a power storage device that release energy when needed, the PCS100 is continuously on-line, monitoring the power network and injecting an appropriate power correction within 1-2 milliseconds of sensing a deviation. This is fast enough to protect even the most sensitive environments like a supercomputer or wafer lab from a disturbance.

Storage batteries are high maintenance and have a short operating life of between 5-10 years.

ABB active voltage conditioners, on the other hand, require virtually no maintenance and have a much lower total cost of ownership.

ABB AVCs are protecting sensitive commercial and industrial applications in a broad range of applications worldwide, including semiconductor factories and wafer labs, solar cell manufacturing facilities, food and beverage plants, and the process industries.

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