



PRODUCT APPLICATION NOTE

Hydroelectric Power Protection

Variable Frequency Drive Protection Electrical Protection at Hydroelectric Power Facilities

Ensure unparalleled reliability and availability of variable frequency drive (VFD) equipment and operational infrastructures with Strikesorb technology, field proven to protect mission-critical applications worldwide.



Figure 2: Bonneville Dam and Locks circular fish ladder, Oregon USA.



Figure 1: Cushman river floating surface fish collector in Washington USA.

The Challenge

Variable frequency drives (VFDs) at hydroelectric power plants often control critical systems such as irrigation, water levels, fish management devices or flood gate control systems. In many cases the VFDs may already be equipped with manufacturer-installed line side surge protective devices (SPDs) to protect against spikes

generated by switching motor loads. However, these built in SPDs may not be adequate to protect the sensitive drives from damage by repeated large spikes or surges generated by lightning or the utility. To further protect the VFDs, integrators and electrical contractors will often recommend that additional surge protection be installed prior to a drive being put into service, further protecting the VFDs before costly failures occur.

A recent incident at a large energy utility operating a number of hydroelectric facilities in the Pacific Northwest of the United States highlights the need for additional surge protection. The utility had installed floating surface fish collectors (FSC) at one of its dams. After installation, a switching error occurred that caused the power plant to be completely disconnected from the grid. Even though each of the VFDs had 10% line impedance and conventional surge protectors installed by the drive manufacturer, the resulting voltage surge damaged several of the VFDs installed on the FSC. Only after this happened did the utility install Raycap's Rayvoss® SPDs on each of the floating surface fish collectors. This additional protection tames the surges and spikes much more effectively than the conventional surge protection built into the VFDs by the manufacturer.

Raycap



INNOVATING POWER PROTECTION WORLDWIDE

Solution

Raycap's solutions can provide a stable electrical environment and virtually eliminate the losses caused by electrical overvoltage events. Its Rayvoss systems, featuring the patented Strikesorb technology, are trusted to protect sophisticated electrical equipment from damage caused by lightning surges, or large load switching occurring either

in house or caused by industrial neighbors. Once installed inside or adjacent to the VFD, Rayvoss SPDs will effectively and consistently protect the critical systems which depend upon the function of the VFDs. Rayvoss SPDs are designed to handle multiple surge events without ever requiring maintenance.

Conclusion

Hydroelectric power plant managers know that providing a safe environment is the most critical factor in effective operations, and that protecting sensitive mission-critical equipment from catastrophic failure and ensuring the reliability and availability of all mandatory functions is key to successful facility operations.



“ Strikesorb, the surge suppression module found at the core of Rayvoss systems, is a high surge capacity protection element able to efficiently manage high-energy transient currents. Rayvoss systems offer maintenance-free protection and are perfectly suited for mission-critical applications in rugged environments. ”

Greg Miller
Manufacturing Representative
Control Components
Northwest



Rayvoss SPD installed in series in a Motor Control Center (MCC).



Strikesorb Benefits

- Maintenance-free operation
- Safe operation: No smoke, fire or explosion
- Unique capability to withstand multiple high-energy transients
- Low let-through voltage, therefore providing excellent protection compared with competitive SPD products
- Class I/Class II compliant SPD per IEC 61643-11
- Global standards compliance: UL 1449 5th Edition, IEC, IEEE, NEMA
- 10 year global product warranty

Raycap is a trusted partner, providing maintenance-free electrical protection solutions for mission-critical applications in hundreds of thousands of installations worldwide. For a detailed presentation on how Raycap's Strikesorb-based solutions can protect your hydroelectric power facility, contact us today!

Raycap

www.raycap.com

