

On board power comes in many guises, but on today's hi-tech cruise liners and in any advanced ship Power Quality is becoming of paramount importance.



Sister ships the *Diamond Princess* and *Sapphire Princess* are some of P&O Cruises most advanced Cruise Ships touring around the world with a possible complement of over 3000 passengers all provided with internet access and the latest technology

Case 1: Latest technology fitted in state of the art Cruise ship

The Problem

All on board power is derived from extremely large generators. A profusion of shipboard equipment uses this electrical power for everything from thruster control to lighting and navigation. Since no earth connection is available, the systems are isolated thus generated harmonics and noise are circulated around the ship along with the useful power.

Maritime systems are specifically designed to cope with a generally poor Power Quality with a large harmonic content but all of this adds cost. Plugging in a conventional computer power supply or television in to an unfiltered on board supply can lead to a costly repair.

In a modern Cruise Liner the sheer number of sensitive electronic loads on board calls for a systematic approach to the problem. The ship yard in charge of refurbishing the *Diamond* and *Sapphire Princess*' approached Advance Electronics on the recommendation of P&O Cruises.

The Solution

Advance offered a full solution in its range of Constant Voltage Transformers (CVTs). These devices are already used in Rail and Medical applications where Power Quality is Mission Critical. The CVTs complete sine wave reconstruction and superb voltage stabilisation qualities made it an ideal solution. A range of different CVT sizes were fitted on board protecting everything from the Internet Café to EPOS terminals in the shops and spas on board. Due to the fifty year design life of the CVT it's a truly fit and forget solution.

Case 2: Oil Survey Vessel equipped with advanced data gathering and analysis

The Problem

The survey vessel was fitted with large thrusters as well as conventional diesel generators, making it a highly manoeuvrable platform for Oil surveys. Unfortunately the harmonics generated by these thrusters made the power waveform look like a camel caravan. Total Harmonic Distortion was nearly 30% with measurable problems all the way to the 25th Harmonic. Part of the Equipment requirement was to fit Uninterruptible Power Supplies (UPS) to several systems but these devices were nuisance alarming and failing on a regular basis.

The Solution

Since Constant Voltage Transformers (CVTs) are classified by the DNV as components they were retrofitted to the Vessel without need for reclassification. The resultant pure sine wave output removed all problems for the UPS. The vessel is now plying the seven seas looking for Oil.