Applied Power Quality Solutions (APQS)
Rad-X Medical Power Filtration System® (Rad-X Filter)
One Year Case Study

BACKGROUND

Bay Regional Medical Center, a McLaren Health Systems hospital located in Bay City Michigan, purchased and installed a new Philips Allura Xper FD20 CATH Lab in July 2005. Philips power quality specifications for this product called for a maximum of 3.0 volts peak to peak (Vpp) of high frequency electrical noise, and no more that one voltage impulse greater than 25 volts peak (Vp) per hour, on the incoming power lines.

Bay Regional Medical Center also purchased and installed a Rad-X Filter for the new Philips CATH Lab in order to minimize failure rates, and more importantly, to maximize up-time. As part of the Rad-X Filter installation, the quality of power was recorded before and after filter activation. Pre Rad-X Filter activation monitoring revealed high frequency electrical noise levels as high as 5.0 Vpp and voltage impulses as high as 66 Vp. (**page 2**). Post Rad-X Filter activation monitoring revealed the effective elimination of both high frequency electrical noise and voltage impulse activity (**page 3**).

RESULTS

"Looking at the first twelve months of service data," comments Mr. Dave Dickey, corporate director of Clinical Engineering for McLaren Health Systems, "the CATH Lab experienced a total of five events requiring corrective maintenance. The one major event was a pre-mature failure of the digital detector assembly. The cause for this failure turned out to be a faulty electronic switch. The other four events were minor issues. In all, system availability during the first year of operation exceeded 99%."

CONCLUSIONS

As part of Mr. Dickey's efforts to keep service costs down and system availability high, he plans for the installation of Rad-X Filters on all of McLaren Hospitals' high end imaging and radiology systems. Naturally, this is based on the manufacturer's power quality specifications and the Filter's ability to meet or exceed them. According to Mr. Dickey, the cost of each Filter, when depreciated over seven years, is about $2,580 per year. Therefore, if each Filter reduces the cost of failures by at least that amount, the capital investment is well worth it. In this case study as well as with other imaging suites where Filters have been applied at McLaren Hospitals, the results have consistently exceeded expectations and more than justified Mr. Dickey's approach.

Pre-Rad-X Filter Activation

A BMI/Dranetz, Model 8800, eight channel disturbance analyzer was used to record the following pre and post Rad-X Filter activation data. The recording of this data is an important component of the Rad-X Filter installation process.

Figure 1 is a status report graph illustrating initial conditions with the Philips CATH Lab in idle mode and the Rad-X Filter not yet activated. The blue arrows point to elevated levels of high frequency electrical noise on all three phases (ideal levels are below 0.5 Vpp). **Figure 2** is a one-hour time graph recorded with the Philips CATH Lab in operation and the Rad-X Filter not yet activated. The green arrow points to Phase A current which is only 11.6 Amperes (Arms). This indicates that a light clinical procedure was being performed. The blue arrows point to high frequency electrical noise levels remained high and the red circles indicate low level voltage impulses were recorded on all three phases.

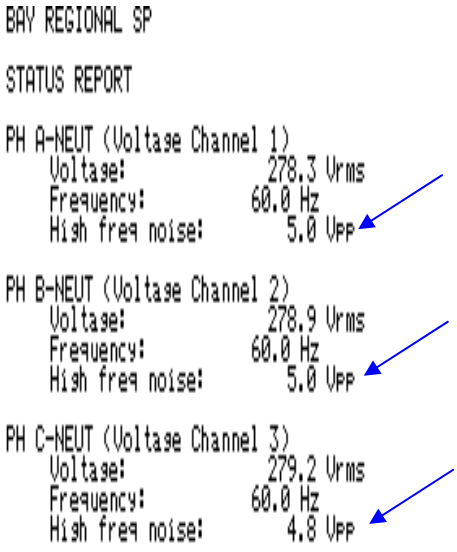

Figure 1

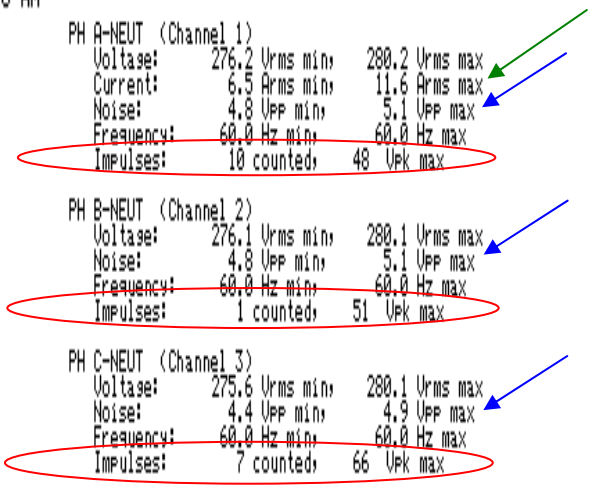

Figure 2

Post Rad-X Filter Activation

Figure 3 illustrates initial conditions with the Philips CATH Lab in idle mode and the Rad-X Filter activated. The blue arrows point to dramatically reduced levels of high frequency electrical noise. **Figure 4** illustrates conditions with the Philips CATH Lab in operation and the Rad-X Filter activated. The green arrow points to 76.9 Arms of Phase A current, which indicates a much heavier clinical procedure in progress. The blue arrows point to very low levels of high frequency electrical noise in spite of the heavier procedure. The red circles highlight the fact that no voltage impulses were recorded.

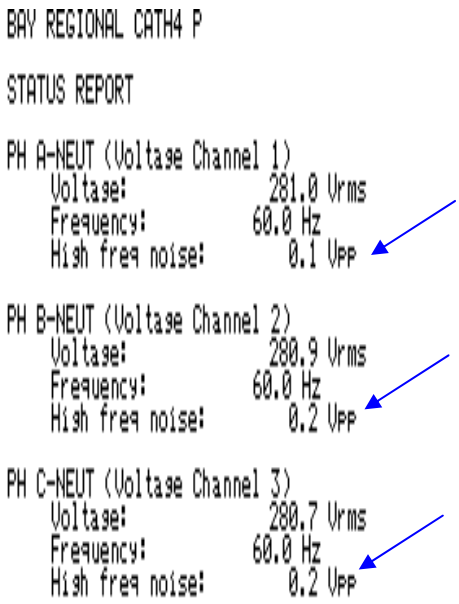

Figure 3

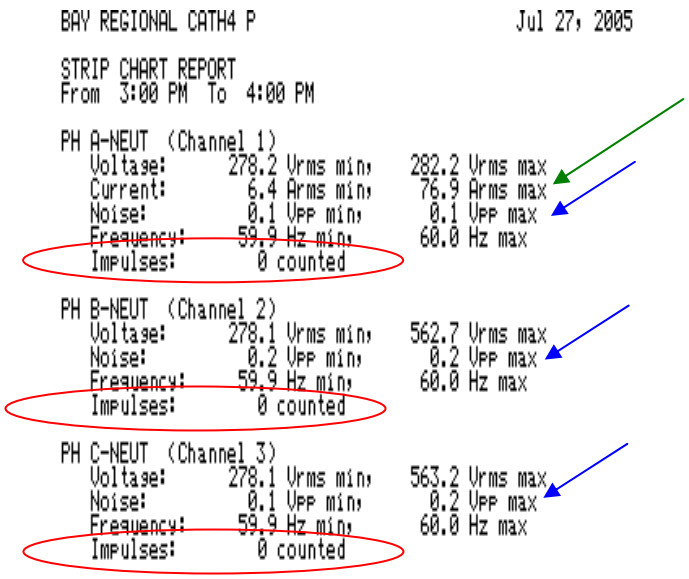

Figure 4