

Electrical Blog No. 14 - Power Quality (PQ)

We all look for quality nowadays: food quality, life quality, asset quality, etc. Power Quality (PQ) also attracts increasing attention. In Hong Kong, we need not worry much about the availability of electricity as blackout is rare. PQ is not the concern about supply interruption but rather ‘imperfections’ in it. Commonly encountered imperfections are voltage dip and harmonic. Voltage dip is a partial depression of the supply voltage for a split of a second; harmonics are like high frequency noises in the supply. They are results of disturbance to the electrical supply system, just like a small object plunges into a lake creates ripple spreading over the water surface. They are nothing new but natural phenomena in the electricity world.

Electrical appliances in general are robust against these imperfections and most users get no problem, except maybe some Hi-Fi fans with ‘golden ears’. However, with the popularity of electronic technology, some electronic and computerized devices are more susceptible to small variations in the electricity supply. This incompatibility may cause them to malfunction or be tripped off by their protection mechanism.

Incompatibility has to be addressed from both ends. To prevent a person from illness, a living place of good hygiene for him is necessary, but equally important, his body should have a good degree of immunity instead of expecting the environment to be germ free. Similarly, to deal with the PQ issue, whilst the disturbances in the supply should be minimised as far as practical, the immunity of sensitive equipment should also be suitably enhanced. Very often, only certain elements in the equipment are sensitive: control or sensing circuitries are the common culprits. These elements can be immunised by mitigation devices like UPS (Uninterruptible Power Supply) or proper parameters adjustment. The better way is to build the immunity into the equipment when it is designed.

*The Electrical Blog is contributed by the Electrical Division. If you would like to know more about this topic, please contact the Division Hon Secretary, Ir Simon Chung at simon.chung@arup.com