

Steady-State (Continuous) Power Supply Quality Characteristics

Meeting the minimum requirements for steady-state power quality characteristics is essential for the proper functioning of equipment. Steady-state power quality characteristics exhibit normal variations that can be observed over time and analyzed using statistical distributions. Due to their statistical nature, these characteristics can be expressed in terms of specific levels of statistical representation.

The concept of "compatibility level" in relation to a steady-state voltage quality characteristic is depicted in the figure below, which also shows a time trend of the characteristic.¹

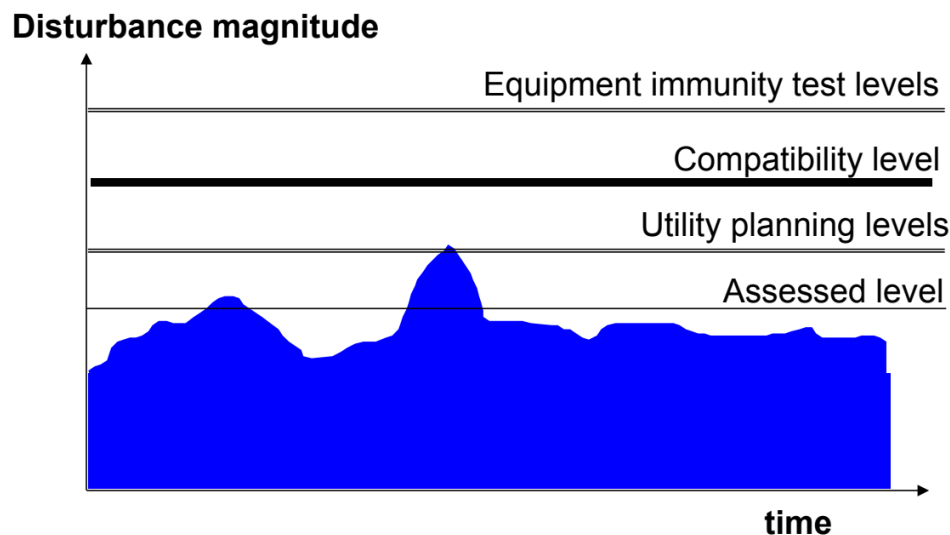


Figure 1: Important concepts for evaluation of the steady-state voltage quality

- **Equipment damage level:** The level of quality that can endanger the well-being of equipment is known as the equipment damage level. It is crucial to recognize and avoid such circumstances whenever feasible. Several examples of these circumstances include high neutral currents, harmonic resonance, overheating, and others. Maintaining a gap between the compatibility level for the supply and the equipment damage level is essential.
- **Equipment immunity level:** The equipment immunity level is the degree of quality that can influence equipment performance if surpassed. It is established statistically, and a gap between the compatibility level for the supply and the equipment immunity level is critical.

¹ IEEE Std 1250-2011

- **Planning level:** The planning level is the quality level that the electric utility sets as its design target. Typically, the planning level is defined below the compatibility level to ensure that the actual compatibility level is not exceeded. For example, if the compatibility level for harmonic voltage distortion is %8, the planning level may be set at %5 to ensure that the %8 level is not surpassed.
- **Assessed level:** The assessed level is the current quality level present in the system, which is usually determined through measurements. For example, the European standards evaluate performance based on measurements taken over a week-long period, and the assessed level is compared with the minimum performance

If the power quality levels are achieved at the supply point, the steady-state quality should be deemed acceptable, and it should not cause any issues for the customers. But our units can still provide value for you regarding power factor improvement.

Different types of equipment have varying capabilities to handle steady-state voltage variations. The steady-state voltage variation limits for specific equipment are usually specified in the equipment specifications. These limits indicate the range of voltage variations that the equipment can handle without malfunctioning or becoming damaged. It is important to ensure that the steady-state voltage variations do not exceed the specified limits for the equipment to prevent any adverse effects on its performance or lifespan.

To figure out more about your specific facility status, our team can conduct a power quality audit to assess the quality of your electrical power supply and identify any issues that may be affecting your equipment's performance or efficiency. Feel free to reach out to us for more details.

