

What are the main causes of power quality problems?



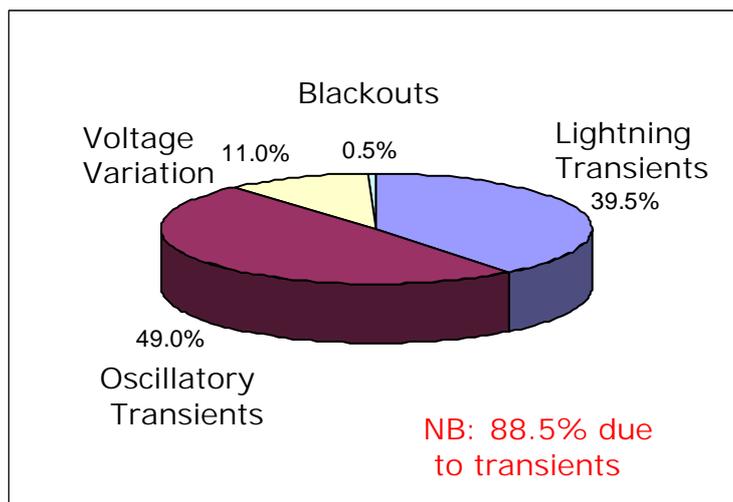
The diagram on the left is an attempt to show, in diagrammatic form, the various EMC phenomena that can influence power quality, where the network is highly reliable (conforms to EN 50160:2000 Voltage characteristics of electricity supplied by public distribution systems).

The closeness to the centre of the target indicates the significance of the phenomena. Therefore it can be seen that transients are the most prolific. Arrows that are on the left –hand side indicate the problems that are more likely to be caused by external influences – the supply network. Whilst those on the right-hand

side indicate that the problems are more likely to be self-inflicted. It is interesting to note that the arrow representing transients is nearly central, indicating that this phenomena is just as likely to be generated from an internal source as an external one e.g. heavy plant.

It is a little known fact that transients account for the largest percentage of power quality problems. Probably because the event is very short (nanoseconds to milliseconds in duration) and in most instances it is not apparent. Occurrence is also random and spontaneous which makes transients very difficult to monitor.

It is difficult to obtain meaningful statistics on failures due to power phenomena, however there was one survey carried out for IBM by Allen & Segall, relating to the incidence rates of harmful power disturbances causing computer equipment failures. The results can be seen below.....



Therefore, in terms of protection or fault finding it would be logical to consider transients as the most likely source of power quality problems, not forgetting that these are just as likely to be generated from an internal source as an external one.



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