Myth Busters

James Eade
Power consultants for the events industry

#1 Phase separation

Have you heard the one about keeping equipment supplied from different phases or supplies spaced apart by a touching distance? Or that you can't have more than one phase in enclosures such as a 19" server bay or AV equipment rack? Well it is a regular misconception and still persists today – it even features in older HSE guidance such as INDG247 (which is under revision).

Interestingly this myth does have a foundation in previous editions of the IEE Wiring Regulations, hence it still persists. The last reference can be traced back some considerable time to the 14th Edition of the IEE 'Regulations for the Electrical Equipment of Buildings' issued in 1966. Regulation A20 of the same was as follows:

"A.20 All socket-outlets in any one room shall be connected to the same phase (or pole of a 3-wire system). *Exemption: In non-domestic premises, if it is clearly impractical to comply with Regulation A.20, more than one phase (or pole) of the supply may be utilized provided that all socket-outlets on one phase (or pole) are grouped together and are not intermingled with socket-outlets connected to a different phase (or pole); and provided that in no circumstances may a socket- outlet be installed at a distance less than 6 feet from any socket-outlet connected to a different phase (or pole)."*

The reason for this separation rule is unclear, but it is likely that it was because of the lack of effective protection compared to today's use of circuit breakers and RCDs. In 1966 protection relied on fuses and it was very hard to measure circuit parameters such as earth loop impedance for example. The type of test equipment used today was still very much in its infancy. In fact when AVO purchased Megger in the mid-1970s, a very crude version was being worked on, but it wouldn't work with circuit breakers as it kept tripping them. It was around 10 years later when the instruments used today became more widely available. As disconnection times and hence effective protection could not be assured, in order to help protect a user from the effects of a prolonged 415 V shock between two faulty appliances the safest option was to make sure it would be unlikely that they could be touched simultaneously.

In 1970 the Regulations were metricated and the '6-foot' rule became 2 m; it was not until the 15th Edition in 1981 that this was removed. However in the 15th Edition, Regulation 514-4 required labelling as necessary. It stated that *"Every item of equipment or enclosure within which a voltage exceeding 250 volts exists, and where the presence of such a voltage would not normally be expected, shall be so arranged that before access is gained to live parts, a warning of the maximum voltage present is clearly visible."* It went on to also require a warning label between items of equipment that could be simultaneously touched, if the same voltage limit applied.

There is no reference to such separation in current or recent editions, the only exception being that Regulation 514-4 has morphed into Regulation 514.10.1. This requires a warning label to be affixed where an item of equipment has supplies inside *exceeding* 230 V to earth (i.e. 400 V between lines) *and* it would be unreasonable to expect a person to be aware of it.

So for most typical installations it is unlikely that labelling would be required, and there is certainly no restriction on polyphase supplies in equipment enclosures or equipment racks. If nothing else, it shows the authority that the Wiring Regulations command – a rule that is over 34 years old still abounds!