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CE + CE does not equal CE

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CE + CE does *not* equal CE

Keith Armstrong warns against the flawed assumption by panel and system builders that an installation is automatically compliant with all relevant Directives if its component parts are all CE marked

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The subject of this column is a common practice in custom-engineering, panel-building, systems (including Industrial Ethernet) and installations, which is based upon the idea that if a number of items of equipment are purchased 'in good faith' and all of them are CE marked, then a panel or system constructed solely from them needs no further work to be able to be CE marked and declared compliant with all relevant Directives.

In the case of fixed installations, which are not CE marked but still must comply with relevant Directives, it is assumed that this practice also achieves the necessary compliance.

This is known colloquially as 'the CE + CE = CE approach', and *it is fatally flawed in every way*.

There has never been any legal or technical justification for this approach, but this has not stopped it from being widely used at all levels of all industries all across Europe, for compliance with the LVD (safety) and EMC Directives. It seems the reasons it has been allowed to continue are:

- a) There is very little enforcement of EU directives applied to custom-engineered equipment
- b) No-one has yet been killed as a result. Or, if they have, the use of the CE + CE = CE approach was not suspected as being a reason.

This approach *is* legally acceptable for end-users who are not constructing equipment, systems or installations professionally. An example would be when we – as consumers – buy a new item of audio or video equipment and connect it into our home multi-media system.

But, for manufacturing companies, the CE + CE = CE approach is not an acceptable method, when used on its own, for achieving compliance with EU Directives and their corresponding national laws.

As far as legal issues are concerned, this approach was tested in the courts by Cardiff Trading Standards under the original EMC Directive, in October 1997. A local computer company had assembled computers from CE-marked components and then sold them without testing their EMC. When Cardiff Trading Standards tested them in an EMC test laboratory, they failed. The computer company relied on the CE + CE = CE argument, but lost the case and was fined.

Several Trading Standards offices (e.g. Warwickshire, Nottingham, Warrington) have posted documents on their websites explaining how the concept of 'due diligence' is applied in UK law, briefly describing the relevant court cases. The easiest way to find these documents is to Google "ensuring compliance with trading standards law".

These documents make it quite clear that, since 1970, the idea that 'buying in good faith' provides a manufacturer with sufficient evidence that they have met their legal duty of 'due diligence', is simply laughable.

The EC's official guide to the new EMC Directive 2004/108/EC, includes the following statement:

"It should be noted that combining two or more CE-marked finished appliances does not automatically produce a "compliant" system e.g.: a combination of CE-marked Programmable Logic Controllers and motor drives may fail to meet the protection requirements."

This should make it much harder for anyone using the flawed CE +CE = CE approach to try to pretend that their product, system or fixed installation complies with the EMC Directive.

As for technical issues, the first thing to understand is that according to official figures from the European Commission, approximately one-third of all products sold in the EU do not comply with the relevant Directives. So on average, any system or installation that incorporates three or more CE-marked purchased items, and has been constructed using the CE+CE=CE approach alone, will not itself comply.

For safety issues and compliance with the Low Voltage Directive 2006/95/EC, it is easy to see that a control panel that incorporates a number of purchased items of mains-powered equipment, can easily exceed the permissible earth leakage current in the relevant safety standard. Each of the purchased items could have earth leakage at the maximum permissible level, so just two of them would put the panel over the limits and make it dangerous to users. Of course, it would be easy to follow BS7671 and fit a high-integrity earth, but then the panel manufacturer would be doing some actual safety engineering, and would not simply be following the flawed $CE + CE = CE$ approach.

In a similar example concerning the EMC Directive 2004/108/EC, the radio-frequency emissions that are allowed from an item of equipment are based on the possibility that they might interfere with radio or TV reception. So the emissions limits for an industrial component such as a PLC, power supply or motor drive are effectively the same as the limits for a control panel, system, or installation.

Simply following the flawed $CE + CE = CE$ approach can thus easily result in control panels, systems and installations that cause interference with nearby radio or TV sets. This could attract the interest of Trading Standards Officers, who have the power to shut down installations they believe to be non-compliant, and have been known to use it.

For more information on why $CE + CE$ does not equal CE , and what to do about it in practice ...

The REO (UK) Ltd Guide on "*Good EMC Engineering Practices for Panel Builders*" describes the problems and what to do instead of $CE+CE$. Its advice is generally also appropriate for system integrators and fixed installations, who will find the upcoming REO Guide "*Good EMC Engineering Practices in the Design and Construction of Fixed Installations*" more relevant. Both guides are available from www.reo.co.uk/knowledgebase.

For those who wish to further investigate EMC in general, the Directives and Regulations, and their official guides, plus a great deal of useful and practical information, are available as described in the document: '*Some Useful References on EMI and EMC*' posted on this site.