



# IEC 61439:2009



THE LONG AWAITED LAUNCH OF THE NEW LOW VOLTAGE SWITCHGEAR AND CONTROLGEAR ASSEMBLIES STANDARD, HAPPENED IN JANUARY OF 2009.

UNUSUALLY FOR SUCH AN IMPORTANT DOCUMENT, IT WAS ISSUED AS A TECHNICAL REVISION, MEANING IT IMMEDIATELY SUPERSEDES THE 60439 VERSION. CRAIG MCKEE OF 3 PHASE DESIGN LOOKS AT SOME OF THE TRAINING NEEDS CREATED BY THE NEW STANDARD'S ARRIVAL

THIS NEW standard is a significant change from the previous one, one of the most surprising changes for some will be the removal of the terms 'type tested assembly' and 'partially type tested assembly', these have been replaced by 'design verification'. With the well known seven type tests increasing to 12 design verification characteristics. A further change is that Part 1 is now 'general rules' with Part 2 now also required to be used for all power switchgear and controlgear assemblies. Part 6 (which is yet to be published) is to cover busbar trunking as previously covered by Part 2 of the IEC60439 series.

## Design Verification;

The 12 design verification characteristics are split down into two main areas, that of 'construction' and 'performance'.

The construction tests cover such areas as:

- Strength of materials and parts – which looks at the suitability of plastics and metals to prove the long term capabilities of the equipment.
- Degree of protection of enclosures – referencing the same standard as before.
- Incorporation of switching devices and components – this requires the panel builder to ensure that devices are installed in line with manufacturer's instructions.
- Terminals for external conductors – again putting the onus onto the panel builder to ensure that the contractor will be able to terminate his cables onto the switchboard.

The performance areas cover, among others;

- Temperature Rise – one of the biggest areas of change in the standard revolves around this area. No longer can you fit a device into a compartment and rate it at a level it would not be capable of carrying without exceeding the limits set by the standard. The standard now requires that the maximum current a circuit is capable of carrying, within the temperature limitations, is noted as its rating, irrespective of what the device manufacturers claims for the device alone.
- Short circuit withstand strength – this is



principally the same set of tests as per the previous version of the standard, with a few amendments.

- Mechanical operation – this ensures the components of the system are mounted in such a way that through normal use, they will not fail or change the capabilities of the switchboard. In this case the test value is set at 200 operations.

After successfully completing all 12 design verification characteristics, the benchmark will be set for future adaptations of the design, since IEC61439 now accepts both verification by design rules and verification with a reference design, when carried out in line with the standard, are equal and equivalent to verification by test. This is another area of change that can be misinterpreted and needs full clarification by reading and understanding what options are open to users for each clause of design verification, since not all are acceptable under each clause.

Upon completion of the above, and moving into production, the standard requires routine verification be carried out by the switchboard manufacturer to ensure continued compliance to the design verified solution is met. These routine verifications must be carried out on each and every board that is manufactured and is principally a simplified subset of the 12 design verification characteristics, but this cannot be seen just as a job for the final QC department, since important areas such a device ratings, terminal sizes, swapping of components etc. needs to be fully investigated prior to any work being started.

The above has concentrated on the panel builder.

However consultants must also be aware of the changes that IEC61439 will bring, with some being slightly more subtle than other, but nevertheless important to what can be supplied. An excellent example of this is the slightly flawed thought we currently hold of a Form 4 assembly. Currently, most people would expect this to mean a multi compartmentalised assembly with each device being housed in its own 'zone'. IEC60439 did not give a clear account of what an acceptable segregation method was. However clarifications within IEC61439 now confirm the outer case of a device ie an MCCB is acceptable to create a Form 4 assembly, without any further segregation. If the end user and consultants require a multi compartment assembly, their specifications will need to be updated to take account of this, or they could end up with a switchboard being supplied in line with the standard, but not what they actually wanted.

With these changes, the daunting thought of reading through the IEC61439 standard with no one to give guidance, and the inevitable costs in this current economic climate, it is easy to think it will be pushed into the sidelines or lie at the bottom of the 'to-do' list until it is too late. Using a good quality training provider with in-depth experience in the subject matter is essential to gain the most efficient use of both time and money. With this in mind, 3 Phase Design has created a training programme that explains the standard in a relevant and interesting way making it easier to understand – with the added benefit of being able to give completely independent advice on any area within IEC61439, including specification checking and switchboard testing support.



3 Phase Design is a specialist Technical Consultancy company, We provide assistance to companies looking to design, manufacture or type test electrical switchgear and control gear in accordance with IEC 61439.

If you would like to know more about IEC 61439 or the other services that 3 Phase Design can offer, please contact us, where we can discuss your requirements in more detail.

- Technical Guidance
- Training
- Inspection
- Design

All of our courses & services are tailored to your exact requirements.

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