

March 19th, 2012

## **T&D Europe Position on: “ENTSO-E Draft Requirements for Grid Connection Applicable to all Generators – 27 October 2011”**

### **HV and MV switchgear:**

T&D Europe wishes to express a major concern over the treatment of system voltage tolerances.

Referring to Article 7, Table 5.1 basically the overall isolation coordination shall be carefully examined for the installed base and also for projecting new MV and LV switchgear - taking into account the occurring transformer ratios HV/MV and MV/LV. This applies especially for the extended voltage ranges above 1.1 p.u..

Article 10, Table 5.1 and Table 5.2 shows voltages up to 1.18 p.u. for an unlimited time and up to 1.15 p.u. for short periods (other Tables also make reference to voltage tolerances).

T&D Europe believes that it is essential that the *ENTSO-E Draft Network Code* should comprehensively take into account all aspects of voltage characteristics, particularly those impacting on products integrated in the system, where their performance is currently well defined by reference to long established European and International standardization.

Specific reference should be made to insulation co-ordination standards to ensure performance and safety is fully taken into account in the design and operation of systems i.e.:

- a) EN 60664-1:2007 Insulation coordination for equipment within low-voltage systems - Part 1: Principles, requirements and tests
- b) EN 60071-1:2006+A1:2010 Insulation co-ordination Part 1: Definitions, principles and rules.

In any debate/action over the text it is essential that the defined relationship between the highest voltage of the system and the highest voltage for equipment is maintained according to EN 60071-1:2006 Insulation co-ordination Part 1: Definitions, principles and rules.

The following extracts from EN 60071-1:2006 define the key relationship:

“5.5 Selection of the rated insulation level:

*...The highest voltage for equipment is then chosen as the next standard value of  $U_m$  equal to or higher than the highest voltage of the system where the equipment will be installed.*

*For equipment to be installed under normal environmental conditions relevant to insulation,  $U_m$  shall be at least equal to  $U_s$ .*

*For equipment to be installed outside of the normal environmental conditions relevant to insulation,  $U_m$  may be selected higher than the next standard value of  $U_m$  equal to or higher than  $U_s$  according to the special needs involved.”....*

“3.8 highest voltage of a system  $U_s$

*... highest value of the phase-to-phase operating voltage (r.m.s. value) which occurs under normal operating conditions at any time and at any point in the system”*

*[IEC 601-01-23:1985, modified]*

“3.9 highest voltage for equipment  $U_m$

*highest value of phase-to-phase voltage (r.m.s. value) for which the equipment is designed in respect of its insulation as well as other characteristics which relate to this voltage in the relevant equipment Standards. Under normal service conditions specified by the relevant apparatus committee this voltage can be applied continuously to the equipment*

*[IEC 604-03-01:1987, modified]”*

The fundamental issue is that non compliance with EN 60071-1:2006 Insulation co-ordination Part 1: Definitions, principles and rules, results in conflict with safety, equipment performance and declared type test criteria.

In addition, for HV and MV circuit breakers i.e. switching performance capability must be re-examined with special emphasis to demanding switching operations e.g. switching-off capacitor banks or back-to-back switching operation of capacitor banks. In case of doubt the next higher rated voltage should be taken into account.

Conclusion

It is proposed that appropriate reference to the need for compliance with EN 60071-1:2006 is included in “ENTSO-E Network Code for Requirements for Grid Connection applicable to all Generators”

## **Transformers:**

### Grid codes interfere with existing product standards:

The system of currently used existing standards must be reflected in the grid code. Other terminology and or (voltage-) levels and definitions will lead to excessive cost due to unclear product specifications and tests especially for installed base.

### Grid codes define details of implementation:

The grid codes shall only define the basic requirements and leave details to the standardization process open to all stakeholders

### Flexibility and future proof concept:

The inflexibility of the grid codes as a legal document may prove out to be a security risk for the European Synchronous Areas. Please compare with the efforts in Germany and Italy to get rid of unsuitable automatic frequency disconnection settings.

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## Annex

**T&D EUROPE** is the European Association of the Electricity Transmission & Distribution Equipment and Services Industry whose Members are the European national associations representing the interests of the electricity transmission and distribution manufacturing and product derived solutions. T&D EUROPE results from the merger on the 6<sup>th</sup> of March 2008 of two former European sector committees, CAPIEL HV and COTREL. It represents the following countries: Austria, Belgium, France, Germany, Italy, Portugal, Spain, Netherlands, UK and Turkey.

The companies represented by T&D Europe account for a production worth over € 25 billion, and employ over 200,000 people in Europe. Thereof T&D Europe covers 80 % of European Union transformer manufacturing capacity.

**T&D Europe cooperates with ORGALIME** - the Liaison Group of European Mechanical, Electrical, Electronic and Metalworking Industries. ORGALIME speaks for 33 trade federations representing some 130,000 companies in the mechanical, electrical and metalworking industries of 23 European countries. These industries employ some 7 million people and account for 1175 Billion Euro of annual output, which is a quarter of the EU's output of manufactured products and a third of the manufactured exports of the EU.

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### Switchgear and Controlgear according to EN 62271- Series

#### Switchgear

A general term covering switching devices and their combination with associated control, measuring, protective and regulating equipment, also assemblies of such devices and equipment with associated interconnections, accessories, enclosures and supporting structures, intended in principle for use in connection with generation, transmission, distribution and conversion of electric energy.

#### Control gear

A general term covering switching devices and their combination with associated control, measuring, protective and regulating equipment, also assemblies of such devices and equipment with associated interconnections, accessories, enclosures and supporting structures, intended in principle for the control of electric energy consuming equipment.

### Transformers according to EN 60076 – Series

T&D EUROPE defines transformers as those having a voltage greater than 1000 Volts. These transformers are described in EN 60076-1.

They are typically sold to operators of networks concerned with the transmission and distribution of electricity and also to industrial companies using large quantities of electricity.