Title of TC 96

Transformers, reactors, power supply units and combinations thereof

A Background

History
TC 96 was constituted in 1993 from the previous SC 14D itself constituted in 1975 in order to prepare safety requirements for transformers and reactors for general use and for transformers and reactors for specific use.

B Business Environment

B.1 General

In view of the ever increasing use of transformers in industrial applications and in application for commercial and residential field, the necessity to maintain a high safety level has become more and more important. As a consequence, the work has to be developed in accordance with the principles of IEC Guide 104 taking into account the relevant safety pilot and safety group functions by others TC's/SC's, as defined in Guide 104, 2.1.1 and 2.1.2.

The market is affected by a lot of mostly small manufacturers. The pressure on the price is very high and the need for clear technical requirements is undoubtedly high.

B.2 Market demand

TC 96 is responsible for IEC 60989, IEC 62041 and the 61558 series. The manufacturers are broadly represented in the TC, which also includes other interest’s groups.

Today the transformer market requires the reference to a standard, to guarantee safety and quality. IEC 61558, IEC 62041 and 60989 are recognized by the customers in the world as giving these guarantees. As a consequence, these standards have paid their contribution to eliminate the barriers of trade.

The safety requirements of these IEC standards, being more stringent than those in most of the replaced national standards, may have increased the costs in certain cases. However, the standard being used internationally and being used to a wide selection of products, contains a wide range of technically equivalent solutions, which can help to save costs.

To fill the gap between the IEC 61558 series of TC 96 and the IEC 60076 series of TC 14, TC 96 will create new Parts 2.

B.3 Trends in technology

The aim of TC 96 is, as far as possible, to have one set of standards, based on the same basic safety principle as the transformers, for which it has safety group function, and which are adaptive for all relevant product committees.
Transformers for particular purpose and transformers for unique purpose are originated from transformers for general purpose, i.e. the basic types, and only have additional or restrictive requirements in order to be used for specified appliances or circuits respectively to supply specific appliances or equipment.

Transformers for unique purpose, normally used in products of user committees such as SC 22E, SC 34C, TC 61, TC 62, TC 66, TC 97 and TC 108.

New trends in technology considered with high priority.

A very important technological trend will be the use of fully insulated winding wires, which will avoid expensive manual work and lead to new transformer constructions with more simple arrangements of windings respectively combinations of windings and cores.

Higher internal frequencies will lead to new material for cores and windings and result in smaller sizes of transformers and SMPS.

The new technologies also allow the construction of simple and cheap power supplies with transformers and integrated electronics for simple consumer products. This work has now also been initiated.

**B.4 Market trends**

One of the important challenges of the future will be the efficiency (losses of the transformers) which possibly will lead to new material and technologies. Future standards of the IEC 61558 series will pay attention to that fact.

In future there will be a higher demand for combinations of transformers, reactors and power supply units which may be combined with electronic circuits, fuses, switches, temperature sensitive devices, control devices and more within the same product. This will lead to more complicated measures in insulation. Future standards of the IEC 61558 series will contain additional requirements in order to assure a high level of safety.

Furthermore there will be the need to minimize the material usage which may be in contradiction to the efficiency.

For the future TC 96 will also have to monitor the standardisation for E-mobility, smart grid and smart meters as these standards will involve the TC 96 standards.

**B.5 Ecological environment**

Life cycle aspects of the products covered by the scope related to the protection of the environment will be considered in the light of the "environmental aspects" IEC guide 109 and ISO 14000. A contact is established with ACEA in order to find support for dealing with this matter. The outcome of the environmental committee TC 111 will be followed.

Another big challenge could be the increase of extreme environments, such as temperature, harmful gases, air pressure and moisture, which may lead to additional requirements.

For the future it may also be necessary to deal with energy efficiency for our products.

**C System approach aspects**

TC 96 has an interface to several other IEC committees. There are three different groups of committees: committees where TC 96 has a customer function, committees where TC 96 has a supplier function and committees with service/pilot function for TC 96.
Component committees
(TC 96 role of customer)

| IEC/TC55 | Winding wires          |
| IEC/TC51 | Magnetic components and ferrite materials |
| IEC/TC112| Evaluation and qualification of electrical insulating materials and systems |

Product and System committees
(TC 96 role of supplier)

| SC 22E   | Stabilized power supplies |
| SC 34C   | Auxiliaries for lamps |
| IEC/TC 61| Safety of household and similar electrical appliances |
| IEC/TC 62| Electrical equipment in medical practice |
| IEC/TC 64| Electrical installations and protection against electric shock |
| IEC/TC 97| Electrical installations for lighting and beaconing of aerodromes |
| IEC/TC 108| Safety of electronic equipment within the field of audio/video, information technology and communication technology |

Other committees
(These have service or pilot function for TC 96)

| IEC/SC 3C | Graphical symbols for use on equipment |
| IEC/TC 14 | Power transformers |
| IEC/TC 77 | Electromagnetic compatibility |
| IEC/TC 89 | Fire hazard testing |
| IEC/TC 109| Insulation co-ordination for low-voltage equipment |

D Objectives and strategies (3 to 5 years)

The overall objective of TC 96 is to prepare standards in the field of safety, EMC, EMF, energy efficiency and environmental aspects of transformers, reactors, power supply units and combinations thereof, which are demanded by the market.

The strategy to achieve this is to update the existing basic standard IEC 61558-1. Where there is a need by new technology or new applications additional standards for specific types of transformers, reactors, power supply units and combinations thereof will be produced as IEC 61558 part 2 based on the general requirements given in IEC 61558-1.

This strategy is supported by the organisation-structure of TC 96:

Organisation of TC 96

A working group (MT 1) is established by TC 96 in order to control the work of the maintenance teams (MT) and the project teams (PT).

The maintenance teams are dealing with the work of preparing the revision of existing parts of the IEC 61558 series and IEC 62041 and coordinate the work.

The project teams are responsible for the development of new standards.

The working group, maintenance teams, project teams and as well the project leaders and convenors are generally appointed by TC 96.

Current maintenance teams, working groups and project teams

Working Group MT1: For the time being MT 1 consists of about 16 members. It has coordination function for the appropriate maintenance teams and project teams.

Maintenance teams: For the time being there are several maintenance teams dealing with the revision of existing parts 2. The maintenance teams are called after the number of the part they are dealing with, e.g. MT 2-15 is dealing with Part 2-15.
Project teams: For the time being there are several project teams dealing with the preparation of new parts 2 and amendments. The project teams are called after the number of the part they are dealing with, e.g. PT 2-16 is dealing with Part 2-16.

It is recognized that there is only a limited number of experts available, which have limited time to travel and to meet. Therefore as far as possible project meetings will be combined with TC 96 MT1 meetings and TC 96 MT1 will be combined with TC 96 plenary meetings. In addition TC 96 will try to use electronic communication methods to minimize the amount of face to face meetings for developing new standards.

E  Action plan

New Standards
No further projects are planned as new work.

Existing Standards
The work on IEC 61558-1 Ed. 2 amendment 2 is already started.

The work on parts 2-10 and 2-14 replacing the last two sections of IEC 60989 is in process and will be completed within 1 year time. When these standards are available IEC 60989 will be withdrawn.

The work on power supply units for saving energy is in process in PT 2-26 and will be completed in between 1 year time.

The work on part 2-16 amendment 1 is started.

F  Useful links to IEC web site

The IEC/TC 96 dashboard giving access to Membership, TC officers, scope, liaisons, MT/PT structure, publications issued along with their Stability Dates, work programme and similar information for SCs, if any.

Name or signature of the secretary

Wolfgang Reichelt