



IEC/TC OR SC: <b>TC 96</b>	SECRETARIAT: <b>Germany</b>	DATE: <b>2016-08-01</b>
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**A. STATE TITLE AND SCOPE OF TC 96****Background and 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.

**Title**

Transformers, reactors, power supply units and combinations thereof

**Scope**

Standardization in the field of safety, EMC, EMF, energy efficiency and environmental aspects of transformers, reactors, power supply units, and combinations thereof.

The standardization does not cover transformers, reactors and power supply units intended to be a part of distribution networks (covered by TC 14).

TC 96 has group safety function in accordance with IEC Guide 104 for transformers other than those intended to supply distribution networks, in particular transformers and power supply units intended to allow the application of protective measures against electric shock as defined by TC 64, with no limitation of rated output power, but in certain cases including limitation of voltage.

The general limitations for voltages are:

- rated supply voltage not exceeding 1 000 V a.c.;
- rated output voltage not exceeding 1 000 V a.c. or 1 500 V ripple free d.c.;

however, internal voltages may exceed 1 000 V a.c. or 1 500 V ripple free d.c.

For high-voltage applications, other than distribution networks (covered by TC 14), the rated output voltage can exceed 1 000 V a.c. or 1 500 V ripple free d.c. but the no load output voltage shall not exceed 15 000 V a.c. or 15 000 V d.c.

The general limitations for the rated output are:

- The maximum rated output depends on the type of transformer or linear power supply unit does in most cases not exceed 25 kVA for single-phase products and 40 kVA for three phase products;
- the maximum rated output does not exceed 1 kVA for both single-phase and three phase Switch Mode Power Supplies;
- the general limitations for the rated core power are 25 kVA for single-phase auto transformers and 40 kVA for three phase auto transformers;
- the general limitations for the rated power are 50 kvar for single-phase reactors and 80 kvar for three phase reactors.

For special transformers, reactors and power supply units and combinations thereof there are no limitation of rated output, rated core power and rated power.

## **B. MANAGEMENT STRUCTURE OF THE TC 96**

### **Organisation of TC 96**

A maintenance team (MT1) is established by TC 96 in order to control the work of the maintenance teams (MT), working groups (WG) 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 groups, maintenance teams, project teams and as well the project leaders and convenors are generally appointed by TC 96.

### **New Chair and Assistant-Secretary appointed**

Mr Jörg Reichelt was appointed the new Chair of TC 96, succeeding Mr Gert Bukkjaer.

Mr Alexander Nollau was appointed new Assistant-Secretary of TC 96, succeeding Mr Michael Hilgner.

### **Current maintenance teams, working groups and project teams**

#### **Maintenance teams:**

Currently 19 members participate in MT1 and perform the coordination for appropriate maintenance of the IEC 61558-series.

The MT62041 deals with the third Ed. Of IEC 62041 about "EMC requirements for power transformers, power supply units, reactors and similar products". The convenor is Andre Lühring.

#### **Working groups:**

IEC/TC96 has no working groups at the moment.

#### **Project teams:**

The PT1 deals with all subjects regarding to symbols and the communication with IEC/SC 3C. It contains 3 Members at the moment.

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 and 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.

## **C. BUSINESS ENVIRONMENT**

### **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 TCs/SCs, 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.

#### **D. MARKET DEMAND**

TC 96 is responsible for IEC 60989, IEC 62041 and the IEC 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 IEC 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.

#### **E. TRENDS IN TECHNOLOGY AND IN THE MARKET**

##### **Trends in technology**

The aim of TC 96 is 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 purposes, 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.

##### **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.

##### **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.

**F. SYSTEMS APPROACH ASPECTS (REFERENCE - AC/33/2013)**

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 / TC 51	Magnetic components, ferrite and magnetic powder materials
	IEC / TC 55	Winding wires
	IEC / TC 112	Evaluation and qualification of electrical insulating materials and systems
Product and System committees (TC 96 role of supplier)	IEC / TC 22	Power electronic systems and equipment
	IEC / SC 22E	Stabilized power supplies
	IEC / TC 34	Lamps and related equipment
	IEC / SC 34C	Auxiliaries for lamps
	IEC / TC 61	Safety of household and similar electrical appliances
	IEC / TC 62	Electrical equipment in medical practice
	IEC / SC 62A	Common aspects of electrical equipment used in medical practice
	IEC / TC 64	Electrical installations and protection against electric shock
	IEC / TC 66	Measuring, control and laboratory equipment
	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 / SC 77A	Low frequency phenomena
	IEC / TC 106	Methods for the assessment of electric, magnetic and electromagnetic fields associated with human exposure
	IEC / TC 109	Insulation co-ordination for low-voltage equipment
	IEC / TC 111	Environmental standardization

**G. CONFORMITY ASSESSMENT**

The standards of TC 96, especially IEC 61558-1, include test specifications, reproducible test requirements, and test methods. Our publications are in line with the requirements related to conformity assessment aspects, but there are no likely to be special conformity assessment requirements generated by any standards projects.

**H. 3-5 YEAR PROJECTED STRATEGIC OBJECTIVES, ACTIONS, TARGET DATES**

STRATEGIC OBJECTIVES 3-5 YEARS	ACTIONS TO SUPPORT THE STRATEGIC OBJECTIVES	TARGET DATE(S) TO COMPLETE THE ACTIONS
IEC 60989	Valid standards IEC 61558-2-10 and IEC 61558-2-14 will replace or add the last sections of IEC 60989	2017 withdrawn
CDV of IEC 61558-1 Edition 3	Revision of IEC 61558-1 Edition 2 for general requirements and tests	2017-08 publication
CDV of IEC 62041 Edition 3	Revision of IEC 62041 Edition 2 for EMC requirements	2017-09 publication
All parts 2 of IEC 61558 series	Will be revised after IEC 61558-1 is valid	Foreseen publication date: 2020 for the series.

Note: The progress on the actions should be reported in the RSMB.