SMB/3528/R

STRATEGIC POLICY STATEMENT

IEC/TC or SC	Secretariat	Date
14	United Kingdom	07 June 2007

Please ensure this form is annexed to the Report to the Standardization Management Board if it has been prepared during a meeting, or sent to the Central Office promptly after its contents have been agreed by the committee.

Title of TC
Power transformers

A. Background

TC 14 was created by the Committee of Action in 1939 and first met in 1949.

Scope: "To prepare international standards for power transformers, on-load tap-changers and reactors above 1 kVA single phase and 5 kVA polyphase.

The committee is not responsible for:
Instrument transformers
Testing transformers
Traction transformers mounted on rolling stock
Welding transformers"

TC 14 has 36 P-member countries:
Australia, Austria, Belgium, Canada, China, Czech Republic, Denmark, Egypt, Finland, France, Germany, India, Israel, Italy, Japan, Korea (Republic of), Mexico, Netherlands, Nigeria, Norway, Poland, Portugal, Romania, Russian Federation, Serbia, Slovakia, Slovenia, South Africa, Spain, Sweden, Switzerland, Thailand, Turkey, Ukraine, United Kingdom, United States of America.

Formal liaisons exist with
IEC/TC 10 - IEC/SC 17C - IEC/TC 42 - IEC/TC 89 - IEC/TC 112
A category A liaison exists with CIGRE/SC A2 - ISO/TC 108/SC 5

External links exist with: PES and CLC/TC14.

Working Groups:
WG 21: Converter transformers
WG 30: Gas-filled-type power transformers
WG 31: IEC 60076-16

Maintenance Teams:
MT 3: IEC 60076-6
MT 4: Design and application of liquid-immersed power transformers using high-temperature insulation materials
MT 5: IEC 60076-1
MT 6: IEC 60076-2
MT 7: IEC 61378-1
MT 27: Dry type transformers

B. Environment

B.1 Business environment

Power transformers are traded widely across frontiers without problems. This trade relies on a corpus of international standards against which transformers can be purchased, manufactured, tested and inspected. The low failure rate of transformers in service provides objective evidence of the success in TC14 in this area.

B.2 Market demand

Market demand for new power transformers has levelled out in industrialised countries, but as much of the existing network transformers were installed 30 to 40 years ago, there is a recognized demand for the replacement, refurbishment or life-extension of these existing transformers. Replacement transformers are usually of a more modern design having lower losses and embodying the most recent technical innovations. Demand for new transformers is still growing in newly developed and recently industrialised countries. It is clear that purchasers in both these areas require modern equipment that has been designed and produced to meet the most recent standards.

In many countries, the deregulation of the electricity supply industry may lead to a higher demand as networks are reinforced to allow power to be transmitted through the network between third parties.

There are market pressures to develop equipment to meet this need for standardization of transformers used in flexible a.c. transmission systems in combination with HVDC systems. These transformers will be controlled by power electronics switching equipment and will be subjected to high harmonic currents and fast.

B.3 Trends in technology and trade

Significant innovation has taken place in the combination of equipment (generators and transformers). There is an increasing market demand for transformers with low fire risk that can be used in densely inhabited areas which has resulted in the introduction of high rating power transformers using SF_6 as both insulant and coolant.

The widespread introduction of power electronics equipment is affecting the harmonic content of load currents and control currents handled by the equipment. As the use of power electronic equipment increases it may be necessary to initiate work to provide standard information regarding the performance of windings and cores carrying high harmonic currents.

There is a growing market interest in the introduction of high temperature insulation as a complete system (for traction transformers) or in part (d.c. furnace transformers or mobile transformers). The high temperature insulation could be used in combination with conventional cellulose insulation in oil or as a replacement for cellulose in a synthetic liquid insulation system.

Natural Ester based insulating fluids are being used commercially in North America for small transformers and application for larger power transformers is under development. The main advantage of this fluid that it is more environmentally friendly and extends the life of the insulation.

In both North America and Europe there is a growing pressure from regulatory authorities to introduce low loss environmentally friendly transformers. This trend does not necessarily match the aims of purchasers of distribution transformers and there is a growing divergence of requirements between low loss and low capital cost equipment. Transformer standards will need to address these issues.

In the same way that a combined generator and transformer has been manufactured, there will be further integration of individual plant items in transmission and distribution substations. For this type of new product, standards will eventually be required.

The introduction of system automation will affect communication systems concerning transformers but the major impact is likely to be in the area of transformer protection, monitoring systems and

the remote control of fans, pumps and tap-changers. There is an increasing interest in monitoring systems and the integration of this equipment in transformers will need to be address when the relevant standards are next revised. This will include systems to monitor the moisture dynamics and insulation ageing.

There is an emerging interface problem between switchgear and transformers where large transients generated by the switchgear operation introduce dangerous transient voltages in the transformer windings. Work in IEEE and CIGRE is being undertaken to explore this phenomena.

When work has been further developed it may be necessary to introduce new testing criteria as well as protection measures into transformer standards.

B.4 Ecological environment

The use of high-voltage transformers requires stringent safety precautions to avoid accidents involving persons or equipment. Materials used in the manufacture of transformers may be considered dangerous to persons or the environment. The development of adequate safety precautions and control of materials to minimize this danger is an integral part of the standardization process. This is particularly true for used oil from transformers which can be recycled.

The noise generated by transformers is becoming more important due to environmental requirements in particular load noise.

C. Work programme

C.1 Current work

The current work program of TC 14 is shown on the IEC database and in document 14/557/PW.

C.2 Resources/infrastructure needed

The primary administrative support for the TC resides with the Secretariat, which is held by the British Electrotechnical Committee. The resources needed are based on one plenary meeting every two years and central support activities for the processing (including editing) of draft standards or amendments to current standards.

C.3 Safety aspects (only for committees which do not have a reference to safety in their scope)

Transformers are normally kept in secure environments. However TC 14 is aware of the need to safeguard personnel working on the equipment this is covered by IEC guide 111.

D. Future work

Consideration by IEEE for IEC IEEE dual logo standards.

Revision of IEC 60076-7.

E. Maintenance cycle

Publication no.	Date of publication	Review date	Maintenance result date	Responsibility (Maintenance Team)
IEC 60076-1	2000-04	in progress	2009	MT 5
IEC 60076-2	1993-04	in progress	2009	MT 6
IEC 60076-3	2000-03		2008	
IEC 60076-4	2002-06		2009	
IEC 60076-5	2006-02		2008	
IEC 60076-6		in progress		MT 3
IEC 60076-7	2005-12		2008	
IEC 60076-8	1997-11		2009	
IEC 60076-10	2005-07		2008	
IEC 60076-10-1	2005-10		2008	
IEC 60076-11	2004-05		2010	
IEC 60076-12		in progress		MT 27
IEC 60076-13	2006-05		2009	
IEC/TS 60076-14	2004-11	in progress	2009	MT4
IEC 60076-15		in progress		WG 30

Publication no.	Date of publication	Review date	Maintenance result date	Responsibility (Maintenance Team)
IEC 60076-16		in progress		WG 31
IEC 60214-1	2003-02		2008	
IEC 60214-2	2004-10		2008	
IEC 60289	1988-05		2007	
IEC/TR 60616	1978-01		2010	
IEC 60905	1987-12		2007	
IEC 61378-1	1997-09	In progress	2008	MT 7
IEC 61378-2	2001-02		2008	
IEC 61378-3	2006-04		2008	
IEC 62032	2005-03		2008	

Name or signature of the secretary
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