U.S. National Committee of the International Electrotechnical Commission,
A Committee of the American National Standards Institute

Technical Advisory Group for IEC TC 14

TAG Administrator:
National Electrical Manufacturers Association
1300 North 17th Street, Suite 1752, Rosslyn, VA 22209
Tel: 703-841-3252, fax: 703-841-3353

MINUTES

PLACE OF MEETING:	Omni Houston Hotel 4 Riverway Houston, TX 77056
DATE AND TIME:	**Monday, March 8, 2010** 8:15 AM
PRESIDING OFFICER:	P. Hopkinson, Technical Advisor

Members Present:

R. Ahuja	Waukesha Electric Systems
P. Hopkinson	HVolt, Inc., Technical Advisor
M. Kennedy	Doble Engineering
S. Kennedy	Niagara Transformer
M. Locarno	Doble Engineering
R. Marek	Dupont Advanced Fibers Systems
H.J. Sim	Waukesha Electric Systems
S. Choinski	NEMA Staff, TAG Administrator

Members Absent:

C. Colopy	Cooper Power Systems
J. Corkran	Cooper Power Systems
L. Dix	Quality Switch
J. Foldi	Foldi & Associates

Others present:

J. Alvarez	Prolec GE
P. Arrascaeta	Cordoba-Argentina
R. Asano	ABB
N. Brush	Consultant
A. Cancino	IEM-Mexico
R. deFay	Copper Development Association
R. Girgis	ABB
M. Gromlovits	Federal Pacific
J. Haasz	IEEE

T. Holdway	Intermountain Electronics
M. Heathcote	Martin Heathcote Associates LTD
A. Kraemer	Reinhausen
P. Jarman	National Grid, IEC TC14 Chairman
B. Lopez	Prolec GE
D. Marlow	TBEA Transformer
H. Nordman	ABB Oy, Transformers
D. Patel	Hammond Power Solutions
C. Ploetner	ABB
J. Puri	Transformer Solutions, Inc.
E. Rawls	Howard Industries
O. Rolzman	Intellpower, Australia
Z. Roman	Areva T&D
D. Sawer	Cooper Power Systems
M. Schenk	Siemens
E. Smith	H-J Enterprises, IEEE Transformer Committee Chairman
E. Tolachir	Tubos trans Electric
S. Tuli	Delta-Star, Inc
T. Turvey	Specialty Switch

1. CALL TO ORDER

The meeting was called to order, meeting guidelines reviewed and attendance recorded. The requirements for official TAG membership was discussed.

2. APPROVAL OF THE AGENDA

The Agenda was approved as written. The Technical Advisor noted that the Agenda was well prepared.

4. APPROVAL OF THE PREVIOUS MINUTES

Minutes of the meeting held October 26, 2009 in Lombard, Illinois, are submitted for approval.

Minutes TC-14 TAG Oct 09.doc

5. REVIEW AND UPDATE OF USNC ROSTERS FOR TC 14

A roster was circulated and corrections were noted. The official roster of paying TAG members:
Raj Ahuja
Craig Colopy
Jerry Corkran
Larry Dix
Joe Foldi (Liaison to Canada)

Phil Hopkinson (Technical Advisor)
Matt Kennedy
Sheldon Kennedy
Mario Locarno
Rick Marek
Jin Sim
Scott Choinski (TAG Secretary)

6. REPORT ON 2009 PLENARY MEETING

Highlights of the 2009 Plenary meeting of IEC TC14 held in Rosslyn, Virginia. Discussion occurred in the individual agenda items below.


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7. STANDARDS ACTIVITIES

7.1 IEC 60076-1 Ed. 3.0 - Power transformers - Part 1: General (MT5 Convenor: P. Hopkinson)

Comments from CDV were addressed by MT5. An editorial team addressed the editorial comments in January. A review of the comments and document version are needed and it will then be prepared/circulated as FDIS. If all goes well, document will be published late this year.

There was a lot of discussion at the Plenary meeting on the meaning of frequent energization. A questionnaire was circulated to the National Committees and the consensus was more than 24 energizations per year. This was put into the document.

7.2 IEC 60076-2 Ed. 3.0 - Power transformers - Part 2: Temperature rise for oil-immersed transformers (MT6 Convenor: A. Bossi)

A meeting was held in January 2010 in Milan. Technical comments were addressed. The FDIS should be available for vote this year.

7.3 IEC 60076-3: Power transformers - Part 3: Insulation levels, dielectric tests and external clearances in air: (MT 60076-3 Convenor: Yukiyasu Shirasaka)

First meeting of MT held November 17-18 at NEMA. The expected target dates for the development or IEC 60076-3 are as follows:
CD 2010-06, CDV 2011-04, FDIS 2012-01, IS 2012-04
It is expected that Dielectric test tables from the IEEE document will be included. Next meeting scheduled for Paris in a few weeks.
Mr. Raj Ahuja is the US expert

7.4 IEC 60076-10 Ed. 2.0 - Power transformers - Part 10: Determination of sound levels (MT 60076-10 Convenor: Dr. C. Ploetner)

The WG has not met yet, No US expert identified.
Jeewan Puri has done a lot of work in the IEEE on sound levels. There was extended discussion on harmonization between IEC and IEEE documents and the value of establishing Joint WGs.

7.5 IEC 60076-16 Ed. 1.0 - Power transformers - Part 16: Transformers for wind turbines applications (WG31 Convenor M. Sacotte)

The commenting period for the CDV closed on 08 January 2010.
No US expert identified.
IEEE TF Wind Power Transformers is looking at this document and the next meeting is Tuesday morning at 8 am. Will consider becoming a WG.

7.6 IEC/TR 60076-17 Ed. 1.0 - Evaluation of electromagnetic fields around power transformers

Revised draft due to the Secretary /Central Office by 2010-02. Once the comments have been incorporated the document can be published. There was a discussion about the incorporation of calculation of electromagnetic fields into the document, but it was agreed to invite the Canadian NC to make a proposal for a new work item to include these changes if a suitable convenor is found.

7.7 IEC 60076-18 Ed. 1.0 - Power transformers - Part 18: Measurement of frequency response (PT 60076-18 Convenor: Patrick Picher)

Convenorship was transferred from Paul Jarman to Patrick Picher. This document has now been progressed to the CD stage. (14/626/CD). Deadline 19 February 2010.
Matt Kennedy and Mario Lozano are the US experts.
This document is similar to C57.149, which is almost ready for ballot. C57.149 seems to be more of an application guide.

7.8 IEC 61378-1 Ed. 2.0 - Convertor transformers - Part 1: Transformers for industrial applications (MT7 Convenor U. Piovan)

The next MT meeting was planned for February 2010. The FDIS will be submitted to the TC 14 Secretary by 2010-06.
Sheldon Kennedy has been identified as the US expert for this standard.

7.9 Other proposed standards

7.9.1 CLC EN 50216-9: Power transformer and reactor fittings - Part 9: Oil-to-water heat exchangers

The Chairman suggested that either all parts of the EN 50216 series or none of the parts should be adopted. Most comments within 14/615/INF show that the majority of members are in favor of the adoption. It was agreed to circulate all 16 parts of the EN 50216 series to NCs asking for comments and a proposal for a Project Leader. The Chairman agreed to consider all comments on the CENELEC documents and reports back during the next meeting.

7.9.2 CLC EN 50216-10: Power transformer and reactor fittings - Part 10: Oil-to-air heat exchangers

See above

7.9.3 CLC/EN/TR 50462 (Rules for the determination of uncertainties in the measurement of the losses on power transformers and reactors)

A Project Team will be formed with Antonio Bossi (IT) as a project leader to simplify the European Standard and to introduce this Standard as IEC Technical Specification into the IEC/TC 14 work program.

7.10 New Projects

7.10.1 IEC 60214-1: Tap-changers – Part 1: Performance requirements and test methods

Revision, Convenor: Axel Kraemer

7.10.2 IEC 61378-2 (Convertor transformers - Part 2: Transformers for HVDC applications)

It was agreed to start the revision of IEC 61378-2 once the outcome of the CIGRE joint working group A2/B4.28 has been published. The Convenor will be Anders Lindroth

7.10.3 IEC 61378-3 (Converter transformers - Part 3:Application guide)

No information available on this project.

7.10.4 IEC 62032 (Guide for the application, specification, and testing of phase-shifting transformers)

This is a dual logo standard (IEC/IEEE). IEEE is revising this Standard (PC57.135). As a dual logo standard the procedure of AC 24/2007 needs to be followed. The Secretary agreed to circulate document PC57.135 as a DC document. This DC will also serve as a call for experts to participate in the joint group to revise IEC 62032. Jin Sim agreed to convene the joint group. This work should begin when the IEEE document is complete.

7.10.5 Develop a Standard for distribution transformers

There was a general agreement that a new standard for distribution transformers would be useful. However, no Convenor has been identified so the work will not commence. Will be revisited once IEC 60076-1 is completed.

If this is to proceed, power ratings will need to extend beyond the existing limit of 2.5 MVA up to 10 MVA, voltage ratings up to 69 kV.

A JWG between IEC and IEEE should be considered. Dave Aho did a lot of work in the past, but is no longer active in the transformer committee. Perhaps he could be coaxed back for this project. Mr. Hopkinson will seek other candidates for the Convenor.

8. OTHER ISSUES

8.1 Scope change for TC14 and 60076-1

A comment from the Italian NC results in certain low voltage transformers being excluded from IEC 60076-1 that had previously been procured against it. It was agreed that these transformers be included, which requires a change to IEC 60076-1 and to the scope of TC14. Consultation with TC96 is required, and a DC will be circulated to the NCs for comment.

8.2 Energy efficiency

Work is already going on in CENELEC/Europe. It was agreed to start work with Michel Sacotte as a Project Leader. Michel Sacotte will circulate the new work item proposal.
It seems that there would be a common methodology for determining energy efficiency, though each country may have different efficiency levels.
A lot of work is underway in the US with DOE rulemaking. MV and Liquid rulemaking is being opened early due to a lawsuit by environmental groups who were looking for the effects of CO_2 reductions to be considered.

8.3 IEC 60076-6-1 to cover variable and saturable reactors.

Russia agreed to issue a new work item proposal to produce a standard. Prof. Andrey Lokhanin will be the project leader.

8.4 Transformers for Off-shore power transmission

No action needed from TC14 at this time, but this may be appropriate for Wind Transformers to consider.

8.5 Transformers for nuclear installations

Proposed to start work on a new IEC standard based on the existing IEEE standards (IEEE 638, 323, 344). It was agreed to issue a DC which will also include a request for nomination of a project leader.

8.6 Upgrade IEC TS 60076-14 (Power transformers - Part 14: Design and application of liquid-immersed power transformers using high-temperature insulation materials) to a full Standard.

Finland proposal. Work could start next year at the earliest, as the MRD is 2012. An MCR will be issued with the US (Rick Marek) as a Project Leader. Rick Marek agreed to send some documentation to the Secretary for circulation with the MCR.

C57.154 is the complementary IEEE document, but is diverging from -14. Becoming more of a standard rather than a guide.

8.7 IEEE C57.15 D8.3 - IEEE Standard Requirements, Terminology, and Test Code for Step-Voltage Regulators

It was agreed to circulate a DC asking National Committees for their opinion on whether to issue this draft as a dual logo Standard and to ask the question if they see any conflict with other Standards. Craig Colopy (US) is proposed as a Project Leader and he will consider the comments on the DC.

8.8 TC14 Liaison to ISO/TC 108/SC 5 - Condition monitoring and diagnostics of machines

Matthew Kennedy (US) agreed to take over from Paul Jarman.

8.9 Establishment for Category D liaison with IEEE

It was requested that a category D liaison be established with IEEE – Power and Energy Society Transformers Committee – with several WGs/MTs of IEC/TC 14. The meaning of Category D liaison is described in the ISO/IEC Directives Part 1 (1.18.3.1). IEEE will need to send a letter to IEC/TC 14 (Secretary/Chairman) requesting the liaison and giving reasons for this liaison. The IEC SMB would need to vote on the liaison. Delegates present were unanimously in favor of establishing this liaison.

Jodi Haasz wasn't sure if Cat D Liaison is the path to proceed. The liaisons are for specific WGs and a higher level liaison may be needed. More discussion between IEEE and IEC is needed.

8.10 JWG between IEC/TC 10 (Fluids for electrotechnical applications) and IEC/TC 14 to revise IEC 61181 (Mineral oil-filled electrical equipment - Application of dissolved gas analysis (DGA) to factory tests on electrical equipment) and IEC 60076-2 (Power transformers, Part 2 Temperature rise for liquid-immersed transformers)

It was agreed to invite IEC/TC 10 to revise IEC 61181. A joint working group would need to be created and the US (Tom Prevost) will offer to lead this project or to assist in the development of the work. US to propose the revision.

8.11 Plenary Meeting 2010

The Chinese NC offered to host the next meeting in China. The provisional date for the Plenary meeting will be the 18/19 November 2010. The preceding three days will be used for MT/WG meetings.

9. NEW BUSINESS

There was no new business.

9. DATE AND PLACE OF THE NEXT MEETING

The next meeting will be held in October, 2010, in Toronto, Canada during the IEEE Transformer committee meetings.

9. ADJOURN

Meeting adjourned at 9:45 am.

Reported By: S. Choinski March 8, 2010

14/628/RM

For IEC use only

2009-11-27

INTERNATIONAL ELECTROTECHNICAL COMMISSION

TECHNICAL COMMITTEE No. 14: POWER TRANSFORMERS

UNCONFIRMED MINUTES OF THE MEETING OF IEC/TC 14 HELD AT THE HOLIDAY INN HOTEL, ROSSLYN AT KEY BRIDGE, WASHINGTON D.C., USA, ON THURSDAY 19 NOVEMBER AND FRIDAY 20 NOVEMBER 2009

PRESENT

Chairman – Mr Paul Jarman (United Kingdom)

Secretary - Mr Bernd Borchert (United Kingdom)

IEC Central Office - Mr Charles Jacquemart

COUNTRY	DELEGATE
Austria	Mr Wolfgang Schirl
Canada	Mr Joseph Foldi Mr Christoph Ploetner
China	Mr Chuanlong Mi Mr Dehua Wang Mr Xianzhong Zhang Mr Juntao Zhong Mrs Liu Yan Mr Jian Wang Mrs Peipei Zhang Mr Zhongguo Zhang Mr Quin Li Mr Shuqi Zhang Mr Bo Li Mr Zhenyan Guo
Finland	Mr Hasse Nordman
France	Mr Michel Sacotte
Germany	Mr Karl-Heinz Haeger Mr Axel Kraemer
Italy	Mr Flavio Mauri Mr Antonio Cammarota
Japan	Mr Yukiyasu Shirasaka Mr Takayuki Kobayashi Mr Yoshihito Ebisawa
Mexico	Mr Juan Castellanos

COUNTRY	DELEGATE
	Mrs Tania Kalinka Cerda Sauvage
Netherlands	Mr Andre van Boetzelaer Mr Huub Reijnders
Russian Federation	Mr Andrey Lokhanin Mr Vasily Larin
Sweden	Mr Anders Lindroth
United Kingdom	Mr Thomas Breckenridge
USA	Mr Scott Choinski Mr Phil J. Hopkinson Mr Richard P Marek Mr Jin Sim Mr Matthew Kennedy Mr Larry Dix Mr Raj Ahuja

Note: The Delegation Leaders are underlined

		DOCUMENT REFERENCE
1	**Opening of the meeting** (9.00 am) The Chairman opened the meeting, welcomed members to the meeting and thanked the American host (NEMA) for the arrangements of the meeting and the US National Committee for the invitation. The Chairman welcomed the Technical Officer from IEC, Charles Jacquemart, to the meeting. A roll-call took place and everybody introduced themselves. Phil Hopkinson welcomed delegates to the beautiful city of Washington. Scott Choinski invited delegates to a dinner in a restaurant in Georgetown, sponsored by NEMA. Delegates from 14 countries (RU, JP, CN, CA, UK, FR, DE, US, AT, FI, IT, MX, NL, and SE) attended the meeting.	
2	**Approval of the Agenda** The agenda was approved without comments. The Chairman suggested to discuss 'Transformers for Offshore substations' under 'Any Other Business' (This was discussed und item 6 Strategic planning)	14/617A/DA
3	**Note the confirmation of the minutes of the meeting held in Sao Paulo/Brazil on 19 November 2008**	14/596A/RM

DOCUMENT REFERENCE

The Minutes of the Meeting were approved without comments.

3.1 – Matters arising from the last meeting

3.1.1 – To decide on the need for a 'Good working practice' document

Proposal from the Chairman: No good working practice document is required in view of the information available on the IEC website

The issue of a 'Good Working Practice' document was discussed and it was agreed not to develop such a document.

4 Information from the IEC Central Office 14/627/MTG

NOTE: All presentations and reports given at the meeting are available from the IEC document server under reference 14/627/MTG.

Charles Jacquemart (IEC, Technical Officer) gave a presentation on the latest developments within IEC and explained the major changes that have recently been introduced in the development of Standards.

Charles Jacquemart said that 2 Standards have been published by IEC/TC 14 since the last Meeting in Sao Paulo, namely IEC 60076-12 and IEC/TS 60076-14.

The editing stage within IEC was explained. IEC will edit the draft at CDV stage during the voting period and the IEC editorial comments will be sent to the TC 14 Secretary who will forward to the Convenor and Chairman.

It was agreed that in general documents should be sent to BSI for editorial checks before CDV circulation in order to reduce the number of editorial comments after the CDV vote.

Charles Jacquemart pointed out the changes within the new 7th edition of Part 1 of the IEC/ISO Directives.

A CD can now be circulated for a period of 2, 3 or 4 months; this will be decided by the Technical Committee. It was agreed that the circulation will be 3 months, unless the Chairman, Secretary and Convenor decide that a different balloting period is appropriate for a specific document.

Members preferred to see the CDV time reduced. This can not be decided by IEC, as this period is based on internal

DOCUMENT REFERENCE

CENELEC requirements in the case of parallel voting documents. France proposed to contact CENELEC to shorten the CDV commenting time. Charles Jacquemart proposed that the request would need to be made through European National Committees. Most members agreed to the reduction of the CDV circulation time.

Action: France

The Chairman asked about the reason for the period of 4 weeks for circulation of documents before a meeting. An option was to use the IEC Collaboration tool for circulation of documents before the meeting. The intention will be that documents could be circulated after the 4 week deadline.

The presentation from Charles Jacquemart will be circulated after the meeting as part of 14/627/MTG.

Christoph Ploetner (Canada) pointed out that Convenors who volunteer for a project should make sure they have the time to carry out the work. This is very important to develop a good Standard.

5 Progress on current projects

5.1 IEC 60076-1 ed3 (MT5 – Phil Hopkinson) 14/612/CDV
- Power transformers, Part 1 General
Status: CDV closing date 30 October 2009
Matters arising from the MT5 meeting held on Tuesday/Wednesday

Phil Hopkinson gave a presentation on the development of IEC 60076-1. This presentation will be circulated after the meeting.
The Maintenance Team considered all technical comments at the MT meeting.

A discussion took place to change the scope of IEC 60076-1 or even the main scope of IEC/TC 14. This would need to be coordinated with IEC/TC 96. A continuation of this discussion will follow under Strategic Planning.

The Chairman proposed to issue a document for comment (DC) for circulation to National Committees to get a view what the term 'frequent energization' means within their country. The commenting period will be six weeks. The Secretary will send the replies to the Chairman. US, IT and FR are against circulation of such a DC, but there was the majority in favour.

Action: Chairman

The question of Energy efficiency was discussed. A possibility could be to produce a guide on energy efficiency. This will be further discussed under Strategic Planning.

DOCUMENT REFERENCE

Within IEC 60076-1 a reference will be made to IEEE C57.142, as an informative reference in the Bibliography. FR is against this decision and the majority was in favour.

Christoph Ploetner (Canada) asked if the term 'ambient temperature' should still be used, as there is a mix of different terms in the Standard. It was proposed to use the term 'external cooling medium'. However, the main issue is to use the same term within the Standard. Another option was to define the word 'ambient' in the Standard.
It was agreed to use the term 'external cooling medium' instead of 'ambient' when referring to temperature.

For the future it was agreed that if the CDV has line numbers then the commenting template with line numbers should be used and if not the one without line numbers should be used. This will make the compilation of comments easier.

Editorial comments on the CDV will be discussed in January 2010 in London and the FDIS should be available by Spring 2010.

5.2 IEC 60076-2 ed3 (MT6 – Antonio Bossi) 14/613/CDV
- Power transformers, Part 2 Temperature rise for liquid-immersed transformers 14/624/INF
Status: CDV closing date 30 October 2009

Flavio Mauri presented a report from the Convenor, Antonio Bossi, which was circulated before the meeting under reference number 14/624/INF.

The next meeting is planned for January 2010 in Milan. The FDIS should be available for vote by March 2010.

5.3 IEC 60076-3 ed3 (MT60076-3 – Yukiyasu Shirasaka) 14/608/MCR
- Power transformers, Part 3 Insulation levels, dielectric tests and external clearances in air 14/611/INF 14/621/INF
Status: AMW

The Convenor, Yukiyasu Shirasaka, presented his brief report which will be circulated after the meeting.

A PT meeting was held on Tuesday and Wednesday before the TC meeting.

Christoph Ploetner requested that the appropriateness of using 'Um' as the basis for the test levels should be

DOCUMENT REFERENCE

considered by the MT. This was accepted by the Convenor.
The points raised in the presentation were considered as broadly acceptable, but comments will be made on the CD in the normal way.

The expected target dates for the development or IEC 60076-3 are as follows:
CD 2010-06, CDV 2011-04, FDIS 2012-01, IS 2012-04

5.4 IEC 60076-10 ed2 (MT60076-10 – Christoph Ploetner) 14/601/MCR
- Power transformers, Part 10 Determination of sound levels
Status: AMW

The WG has not met yet.

The Convenor proposed to revise the Guide IEC 60076-10-1 at the same time as the main part 10. Germany did not agree.
The Chairman asked around if both documents should be revised at the same time.
The following were against this proposal: FR, DE, SE but UK, US, FI, IT, NL, AT were in favour.

Charles Jacquemart proposed and it was agreed that the Secretary will issue a MCR with a proposed scope for the revision of IEC 60076-10-1. The Project Leader will be Christoph Ploetner (Canada), who agreed to provide a document to be attached to the MCR.

Action: Secretary and Canada

5.5 IEC 60076-16 ed1 (WG31 – Michel Sacotte) 14/618/CDV
- Power transformers, Part 16 Transformers for wind turbine applications
Status: CDV closing date 08 January 2010

The Convenor, Michel Sacotte, presented a brief report which will be circulated after the meeting as part of 14/627/MTG.

The commenting period for the CDV closes on 08 January 2010.

5.6 IEC/TR 60076-17 ed1 (Paul Jarman) 14/602/DTR
- Power transformers, Part 17 Evaluation of electromagnetic fields around power transformers
Status: DTR closing date was 01 May 2009
- to consider specific comments on 14/602/DTR

The comments were discussed during the meeting. The

DOCUMENT REFERENCE

comment from Canada were noted and it was decided not to modify the table.
The comments from Egypt were agreed.

The Chairman agreed to incorporate the agreed comments into the draft and send the revised draft to the Secretary / Central Office by 2010-02.

Action: Chairman

Once the comments have been incorporated the document can be published. There was a discussion about the incorporation of calculation of electromagnetic fields into the document, but it was agreed to invite the Canadian NC to make a proposal for a new work item to include these changes if a suitable convenor is found.

14/597/NP

5.7 IEC 60076-18 ed1 (PT60076-18 – Patrick Picher) 14/607/RVN

Status: NP closed 20 March 2009
- Power transformers, Part 18 Measurement of frequency response
- to agree change of convenor from Paul Jarman to Patrick Picher

This document has now been progressed to the CD stage. (14/626/CD). Deadline 19 February 2010

It was also agreed to change the Convenor to Patrick Picher (Canada) from Paul Jarman (UK).

Action: IEC/CO

14/610/CDV

5.8 IEC 61378-1 ed2 (MT7 – Ugo Piovan) 14/623/RVC

- Convertor transformers, Part 1 Transformers for industrial applications

Status: CDV closed 09 October 2009

Flavio Mauri presented the report on behalf of Ugo Piovan.

The next MT meeting is planned for February 2010.

The FDIS will be submitted to the TC 14 Secretary by 2010-06.

Action: Project leader

6 Strategic planning

6.1 Update the Program of Work of TC 14 as recorded by IEC Central Office 14/622/PW

6.2 Agree on changes to the maintenance review dates

DOCUMENT REFERENCE

The Maintenance result dates have been reviewed and amended. (see attached)

6.3 Proposal to revise IEC 60214-1 (Tap-changers - Part 1: Performance requirements and test methods) and -2 (Tap-changers - Part 2: Application guide)

It was agreed to issue a MCR for Part 1 only. Axel Kraemer (DE) agreed to be the Project Leader.

The Project Leader to provide a scope and target dates.

Action: Germany

6.4 Proposal to revise IEC 61378-2 (Convertor transformers - Part 2: Transformers for HVDC applications) and -3 (Converter transformers - Part 3: Application guide)

It was agreed to start the revision of IEC 61378-2 once the outcome of the CIGRE joint working group A2/B4.28 has been published. The Convenor will be Anders Lindroth (Sweden), who agreed to submit a document for circulation with the MCR at the appropriate time.

Action: Sweden

6.5 Proposal to revise IEC 62032 (Guide for the application, specification, and testing of phase-shifting transformers)

This is a dual logo standard (IEC/IEEE). IEEE is revising this Standard (PC57.135). As a dual logo standard the procedure of AC 24/2007 needs to be followed.

The Secretary agreed to circulate document PC57.135 as a DC document. This DC will also serve as a call for experts to participate in the joint group to revise IEC 62032. Jin Sim agreed to convene the joint group.

Action: Secretary

6.6 Proposal to develop a Standard for distribution transformers

A discussion took place if there is a need for such a Standard.

There was a general agreement that a new standard for distribution transformers would be useful. However, no Convenor has been identified so the work will not commence. Once IEC 60076-1 is complete, the proposal from CENELEC to develop a Standard on distribution transformers will be considered again.

DOCUMENT REFERENCE

7 **To review the Strategic Business Plan (SBP)** 14/614/INF

The Secretary received the following statement from the Czech Standards Institute before the meeting: '…agree with the documents 14/614/INF in all extend'

The draft Strategic Business Plan was presented and the Chairman gave a presentation on the important points that need to be decided on before the document is updated.

Following a comment by the Italian NC on the 60076-1 CDV that certain low voltage transformers would be excluded from the standard that had previously been procured against it, it was proposed that they should be included by changing the wording. This would technically require a change in the scope of TC14.

China agreed that the inclusion of low voltage to low voltage transformers in the scope of TC14 and 60076-1 was required.

Since the scope of IEC/TC 96 includes transformers of up to 1100 V but only covers these transformers for certain aspects, like health and safety a consultation with this TC is necessary.

To change the scope of a Technical Committee, a 'Question of principle' would need to be submitted to the IEC SMB. To give NCs the possibility to comment on the proposed change of scope a DC document will be circulated to National Committees. It was agreed that this process should be started and the Chairman agreed to send the proposed change to the scope the Secretary for circulation as a DC.

Action: Chairman, Secretary

The question was raised if work should be started on Energy efficiency.
The Chairman reported that work is already going on in CENELEC/Europe.
It was agreed to start work with Michel Sacotte as a Project Leader. Michel Sacotte will circulate the New work item proposal.

Action: France

Russia proposed to add controllable reactors to the SBP. This was agreed.

Russia agreed to issue a new work item proposal to produce a standard IEC 60076-6-1 to cover variable and saturable reactors. Prof. Andrey Lokhanin will be the project leader. The main part of IEC 60076-6 will not be revised at this stage.

Action: Russia

DOCUMENT REFERENCE

China requested that transformers for nuclear installations should be added to the SBP. This was agreed as there are already existing Standards within IEEE (IEEE 638, 323, 344).
It was proposed to start work on a new IEC standard based on the existing IEEE standards. It was agreed to issue a DC which will also include a request for nomination of a project leader. The Chairman agreed to provide the Secretary with some documentation for DC circulation.

Action: Chairman, Secretary

The Chairman brought up the question raised by IEC SMB that Offshore power transmission should be considered by relevant TCs. He considered this to be relevant to TC 14, but it was agreed that no specific action was required at this stage.
Finland proposed to upgrade IEC TS 60076-14 to a full Standard. Work could start next year at the earliest, as the MRD is 2012. An MCR will be issued with the US (Rick Marek) as a Project Leader. Rick Marek agreed to send some documentation to the Secretary for circulation with the MCR.

Action: US and Secretary

The meeting frequency was discussed and it was agreed to meet in 12 months time again.

12 month – US, DE, FR, IT, MX, NL, CN, SE, RU,
18 months – AT

The next question was whether to hold the TC meetings separately to the IEC General Meeting.

CA, MX, CN, US were in favour of holding the meetings in conjunction with the General Meeting. DE, RU, FR preferred that the meetings would be held separately. Other delegates had no opinion. It was therefore concluded that the Chairman and Secretary would decide as appropriate.

8 **IEEE document - potential document for dual-logo Standard** AC/2008-22

8.1 – IEEE C57.15 D8.3 - IEEE Standard Requirements, Terminology, and Test Code for Step-Voltage Regulators

A paper copy of the draft was circulated during the meeting for discussion and an electronic copy will be circulated after the meeting.

DOCUMENT REFERENCE

Phil Hopkinson gave an outline on the draft IEEE C57.15 D8.3.

There was the option to make it a dual logo standard or to change it and make it an IEC Standard.

It was agreed to circulate a DC asking National Committees for their opinion on whether to issue this draft as a dual logo Standard and to ask the question if they see any conflict with other Standards. Craig Colopy (US) is proposed as a Project Leader and he will consider the comments on the DC.

Action: Secretary and US

9 Liaison – to receive reports and to confirm the liaisons and liaison officers

9.1 IEC/TC 10 - Fluids for electrotechnical applications (Mr Sam Hall)

The Chairman reported, as Sam Hall was not attending the meeting. The report will be circulated after the meeting.

9.2 IEC/TC 36 – Insulators

It was agreed to discontinue the liaison with IEC/TC 36.

9.3 IEC/SC 36A – Insulated bushings

It was agreed that Flavio Mauri (Italy) will act as liaison officer.

9.4 IEC/TC 37 – Surge arresters

It was agreed to discontinue the liaison with IEC/TC 37.

9.5 IEC/TC 42 - High-voltage testing techniques (Mr Sam Hall)

The Chairman reported, as Mr Hall was not attending the meeting. The report will be circulated after the meeting.

The Chairman pointed out that IEC 60060-1 has passed the CDV vote and will be important to the work of MT 60076-3.

9.6 IEC/TC 89 – Fire hazard testing (Mr John-Bjarne Sund)

John-Bjarne Sund did not attend the meeting. The Chairman presented a report which will be circulated after the meeting.

9.7 IEC/TC 95 - Measuring relays and protection equipment

DOCUMENT REFERENCE

It was agreed to discontinue the liaison with IEC/TC 95.

9.8 IEC/TC 112 - Evaluation and qualification of electrical insulating materials and systems (Mr Sam Hall)

The Chairman reported, as Sam Hall was not attending the meeting. The report will be circulated after the meeting.

Rick Marek agreed to be a Deputy Liaison officer for IEC/TC 112, in case Sam Hall was not able to attend a meeting.

9.9 IEC/TC 114 - Marine energy - Wave, tidal and other water current converters

It was agreed not to establish a liaison with IEC/TC 114.

9.10 CIGRE SC A2 - Transformers (Mr Shirasaka)

Yukiyasu Shirasaka gave a presentation on the activities within CIGRE SC A2. This presentation will be circulated after the meeting.

9.11 ISO/TC 108/SC 5 - Condition monitoring and diagnostics of machines (Paul Jarman)

So far the Chairman acted as a Liaison Officer, but he does not want to continue. Matthew Kennedy (US) agreed to take over from Paul Jarman.

9.12 Establishment for Category D liaison with IEEE

It was requested that a category D liaison be established with IEEE – Power and Energy Society Transformers Committee – with several WGs/MTs of IEC/TC 14.

The meaning of Category D liaison is described in the ISO/IEC Directives Part 1 (1.18.3.1).

IEEE will need to send a letter to IEC/TC 14 (Secretary/Chairman) requesting the liaison and giving reasons for this liaison. The IEC SMB would need to vote on the liaison.

Delegates present were unanimously in favour of establishing this liaison.

Action: IEEE/US

9.13 Proposal for a new liaison with IEC/TC 96 - Transformers, reactors, power supply units and similar products for low voltage up to 1100 V -

It was agreed not to establish a full liaison with IEC/TC 96, however, the Chairman is prepared to keep an eye on the developments within IEC/TC 96 and to agree the scope

DOCUMENT REFERENCE

changes with IEC/TC 96.

Action: Chairman

9.14 Proposal for a new liaison with IEC/TC 115 - High Voltage Direct Current (HVDC) transmission for DC voltages above 100 kV (provisional) -

China (Li Bo) agreed to be the official Liaison for IEC/TC 115.

10 Any other business

10.1 Introduction of CLC/EN 50216-9 (Power transformer and reactor fittings -- Part 9: Oil-to-water heat exchangers) into the work programme of IEC/TC 14

14/605/DC
14/615/INF

The Chairman suggested that either all parts of the EN 50216series or none of the parts should be adopted.

Most comments within 14/615/INF show that the majority of members are in favour of the adoption.

It was agreed to circulate all 16 parts of the EN 50216 series to NCs asking for comments and a proposal for a Project Leader. The Chairman agreed to consider all comments on the CENELEC documents and reports back during the next meeting.

Action: Secretary and Chairman

10.2 Introduction of CLC/EN 50216-10 (Power transformer and reactor fittings -- Part 10: Oil-to-air heat exchangers) into the work programme of IEC/TC 14

14/606/DC
14/616/INF

See above

10.3 Introduction of CLC/EN/TR 50462 (Rules for the determination of uncertainties in the measurement of the losses on power transformers and reactors) into the work programme of IEC/TC 14

The Czech Standards Institute submitted the following statement before the meeting: 'We agree with the introduction of document CLC/EN/TR 50462 into the work programme of IEC/TC 14'

It was agreed to introduce EN TR 50462 into the IEC/TC 14 work programme. A Project Team will be formed with Antonio Bossi (IT) as a project leader to simplify the European Standard and to introduce this Standard as IEC Technical Specification into the IEC/TC 14 work programme.

The Italian NC is invited to submit a new work item proposal

DOCUMENT REFERENCE

for circulation to IEC/TC 14 to transform CLC TR 50462 into a IEC/TS.

Action: Italy

10.4 Proposal from Germany to create a JWG between IEC/TC 10 (Fluids for electrotechnical applications) and IEC/TC 14 to revise IEC 61181 (Mineral oil-filled electrical equipment - Application of dissolved gas analysis (DGA) to factory tests on electrical equipment) and IEC 60076-2 (Power transformers, Part 2 Temperature rise for liquid-immersed transformers)

It was agreed to invite IEC/TC 10 to revise IEC 61181. A joint working group would need to be created and the US (Tom Prevost) will offer to lead this project or to assist in the development of the work. US to propose the revision.

The Chairman agreed to contact the Chairman of IEC/TC 10 once the proposal is received.

Action: US and Chairman

11 Date and place of the next meeting

The Chinese NC offered to host the next meeting in China.

The provisional date for the Plenary meeting will be the 18/19 November 2010. The preceding three days will be used for MT/WG meetings.

The Chairman thanked the Chinese delegates for their kind offer.

12 Close of the meeting

The Chairman asked for comments on improvements of future meetings. It was agreed to draft resolutions during future meetings.

The Chairman thanked everybody for attending the meeting and the host, Scott Choinski and NEMA for the provision of the excellent meeting room facilities and the dinner on Thursday night.

Annex 1: IEC TC 14 roster (by country, head and delegates)

Annex 2: TC 14 maintenance cycles as agreed at the meeting

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Revised as of November 18, 2009

IEC TC 14 ROSTER (BY COUNTRY, HEAD & DELEGATES)
IEC TC 14 POWER TRANSFORMERS MEETING
HOLIDAY INN ROSSLYN AT KEY BRIDGE

	Last Name	First Name	Country	Email Address	H/D/O	Signature
1	Schirl	Wolfgang	Austria	Worlfgang.schirl@siemens.com	Head	
2	Foldi	Joseph	Canada	Foldi.joseph@ieee.org	Head	
3	Ploetner	Christoph	Canada	Christoph.h.ploetner@ca.abb.com	D	
4	Zhenyan	Guo	China	~~stizxz@163~~.com guozhenyan@tom.	Head	
5	Bo	Li	China	libo@epri.ac.cn libo@epri.ac.cn	D	
6	Chuanlong	Mi	China	Clmi5299@163.com	D	
7	Dehua	Wang	China	wangdh@xdxb.com.cn	D	
8	Jian	Wang	China	Tbea_wangjian@163.com	D	
9	Juntao	Zhong	China	~~stizxz@163.com~~ zhongjt@126.com	D	
10	Peipei	Zhang	China	~~libo@epri.ac.cn~~ zpp@epri.sgcc.com.cn	D	
11	Qin	Li	China	liqinsx@126.com	D	
12	Shuqi	Zhang	China	libo@epri.ac.cn	D	
13	Xianzhong	Zhang	China	stizxz@163.com	D	
14	Yan	Liu	China	liuy@sunten.com.cn	D	
15	Zhongguo	Zhang	China	Zhangzg1688@163.com	D	
16	Nordman	Hasse	Finland	Hasse.nordman@fi.abb.com	Head	
17	Sacotte	Michel	France	Michel.sacotte@fr.schneider-electric.com	Head	
18	Haeger	Karl-Heinz	Germany	Karl-heinz.haeger@areva-td.com	Head	
19	Kraemer	Axel	Germany	a.kraemer@reinhausen.com	D	
20	Jacquemart (Cent. Ofc.)	Charles	IEC CO	cj@iec.ch	Other	
21	Mauri	Flavio	Italy	Flavio.mauri@enel.it	Head	
22	Cammarota	Antonio	Italy	Antonio.cammarota@enel.com	D	
23	Shirasaka	Yukiyasu	Japan	Shirasaka-yukiyasu@mb.jaeps.com	Head	

24	Ebisawa	Yoshihito	Japan	Yoshihito.ebisawa@toshiba.co.jp	D	
25	Kobayashi	Takayuki	Japan	Kobayashi.takayuki@tepco.co.jp	O	
26	Castellanos	Juan	Mexico	Juan.castellanos@ge.com	Head	
27	~~Sauvage~~ Cerda Sauvage	Tania Kalinka	Mexico	Tania.cerda@ance.org.mx	D	
28	Van Boetzelaer	Andre	Netherlands	Andre.vanboetzelaer@kema.com	Head	
29	Reijnders	Huub	Netherlands	h.f.reijnders@smit-trafo.nl	D	
30	Lokhanin	Andrey	Russia	lokhanin@vei.ru	Head	
31	Larin	Vasily	Russia	vlarin@vei.ru	D	
32	Lindroth	Anders	Sweden	Anders.lindroth@se.abb.com	Head	
33	Borchert (Secretary)	Bernd	Secretary	Bernd.borchert@bsigroup.com	Other	
34	Breckenridge	Thomas H.	UK	tom@tbtcs.co.uk	D	
35	Jarman	Paul	Chairman	Paul.jarman@uk.ngrid.com	O	
36	Hopkinson	Phil	USA	phopkinson@hvolt.com	Head	
37	Ahuja	Raj	USA	Raj.ahuja@spx.com	O	
38	Choinski	Scott	USA	Sco_choinski@nema.org	D	
39	Dix	Larry	USA	ldix@qualityswitch.com	D	
40	Kennedy	G. Matthew	USA	mkennedy@doble.com	O	
41	Marek	Richard P.	USA	Richard.p.marek@usa.dupont.com	D	
42	Sim	~~Phil~~ Jin	USA	Jin.sim@ieee.org	D	
	TOTALS					

Work Programme	Publication Number	Publication Date	Review Date	MRD			**proposed dates**
X	IEC 60076-1 Ed. 2.0	1993-03-19		2010	MT 5	IEC 60076-1 Ed. 3.0 (CCDV)	
X	IEC 60076-1am.1 Ed. 2.0	1999-09-30		2010	19	IEC 60076-1 Ed. 3.0 (CCDV)	
X	IEC 60076-1 Ed. 2.1	2000-04-07		2010		IEC 60076-1 Ed. 3.0 (CCDV)	
X	IEC 60076-2 Ed. 2.0	1993-04-07		2009	MT 6	IEC 60076-2 Ed. 3.0 (CCDV)	
X	IEC 60076-3 Ed. 2.0	2000-03-21		2010	24	IEC 60076-3 Ed. 3.0 (AMW)	
	IEC 60076-4 Ed. 1.0	2002-06-06		2010			**2011**
	IEC 60076-5 Ed. 3.0	2006-02-07		2010	MT2		**2011**
	IEC 60076-6 Ed. 1.0	2007-12-13		2011	MT3		
	IEC 60076-7 Ed. 1.0	2005-12-15		2010	MT1		**2011**
	IEC 60076-8 Ed. 1.0	1997-11-14		2010	19		**2011**
X	IEC 60076-10 Ed. 1.0	2001-05-22		2010	25	IEC 60076-10 Ed. 2.0 (AMW)	
	IEC 60076-10-1 Ed. 1.0	2005-10-17		2010	25		
	IEC 60076-11 Ed. 1.0	2004-05-27		2010			**2011**
	IEC 60076-12 Ed. 1.0	2008-11-05		2011	MT 27		
	IEC 60076-13 Ed. 1.0	2006-05-24		2009	28		**2011**
	IEC 60076-14 TS Ed. 2.0	2009-05-13		2012	MT 4		
	IEC 60076-15 Ed. 1.0	2008-02-27		2010	WG 30		**2012**
	IEC 60214-1 Ed. 1.0	2003-02-12		2009	26		**2010**
	IEC 60214-2 Ed. 1.0	2004-10-14		2009	MT26		**2012**
	IEC 60616 TR Ed. 1.0	1978-01-01		2010			**2012**
X	IEC 61378-1 Ed. 1.0	1997-09-10		2009	MT 7	IEC 61378-1 Ed. 2.0 (CCDV)	
	IEC 61378-2 Ed. 1.0	2001-02-08		2010	21		**2011**
	IEC 61378-3 Ed. 1.0	2006-04-27		2010	21		**2012**
	IEC 62032 Ed. 1.0	2005-03-02		2010			