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| IEC/TC OR SC:<br><b>112</b> | SECRETARIAT:<br><b>DE</b> | DATE:<br><b>2015-09-04</b> |
|-----------------------------|---------------------------|----------------------------|

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.

**A. STATE TITLE AND SCOPE OF TC**

Are there any new or emerging trends in technology that will impact the scope and work activities of the TC? **No.** Do you need to update your scope to reflect new and emerging technologies? **No.**

**Title:** Evaluation and Qualification of Electrical Insulating Materials and Systems

**Scope:**

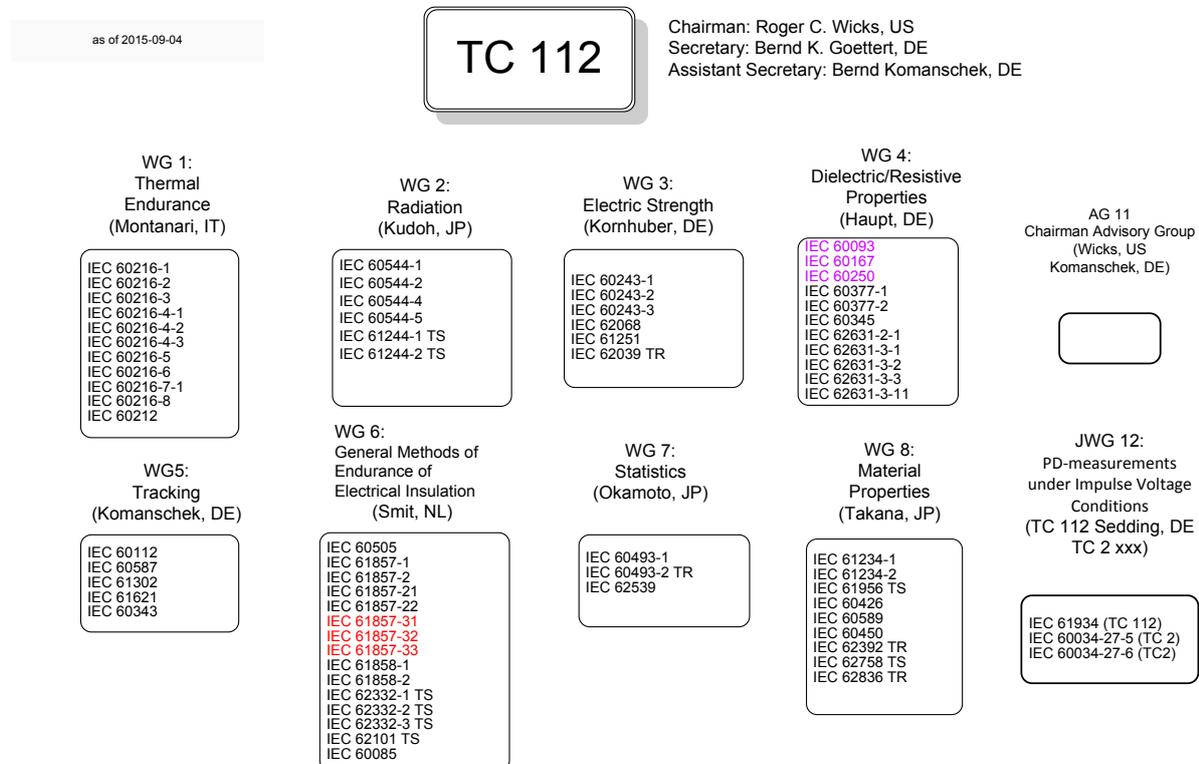
To prepare International Standards covering methods of evaluation and qualification for electrical and electronic insulating materials, and electrical insulation systems.

Horizontal Safety Function:

Test methods for resistance to tracking.

NOTE: An electrical insulating material has negligibly low electric conductivity, used to separate conducting parts at different electrical potentials. An electrical insulating system is an insulating structure containing one or more electrical insulating materials together with associated conducting parts employed in an electrotechnical device.

**B. MANAGEMENT STRUCTURE OF THE TC**



Note: The information on the IEC website is complete.

TC 112 last reviewed its management structure in 2013-10 and again at its last plenary meeting in 2015-09 with these changes made: Assistant Secretary appointed 2014-11; New convenor appointed for WG 3 and

WG 8; MT 10 merged with WG 3; MT9 was disbanded.

TC 112 intends to review its current management structure again at its next meeting in 2016-10. However, it is not foreseen that the TC will have any major changes in its current structure in the future due to new and emerging technologies, product withdrawal, change in regulations etc.

#### **C. BUSINESS ENVIRONMENT**

Methods of Test for Electrical Insulating Materials and Electrical Insulation Systems (EIS) covers testing of thermal endurance, electrical strength, radiation, resistance to tracking, dielectric and resistive properties, evaluation of electrical insulation systems, space charge measurements, partial discharge measurements. The whole range of materials and combinations with electric conductors (electrical insulation systems) starting from glass and ceramic, sleeveings and press boards, films and laminates, mica products and tapes, and ending up with varnishes and resins are concerned. Insulating materials and systems are used in the field of electrical power generation and distribution, in electrical motors and transformers, in all kind of electrical and electronic appliances and electrical equipment. Appropriate selection and methods of use of insulating materials enhance the reliability and safety of electrical equipment.

Electrical insulation systems are generally the limiting component in establishing service life. This service life is a critical performance parameter for users in determining the economic viability of equipment. TC112 is developing the tools to make these EIS evaluations, and cooperates with product TCs to apply the general procedures to specific products.

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

Equipment TCs, manufacturers, and testing laboratories are using TC 112's standards to evaluate electrical insulation systems to assure acceptable service life of new/modified EIS, in new environments and when subjected to new stresses. The demand for these evaluations comes from the ultimate users who consider service life an essential parameter when purchasing new equipment. It is essential to the user that EIS be evaluated using the same basic test procedure for all products. System tests are essential e.g. in the case of high value products or for life evaluation. These tests are usually performed using models of the whole product or models of part of the product. In some cases parts of the product may be used as a model. Electrical Insulation systems are elements of according products.

A relatively small number of manufacturers, the most important of which are multinational, produce basic electrical insulating materials which are sold through local and regional distributors and fabricators. The materials and user technologies are well-established and globally similar. The market for these insulating materials exceeds 1 billion US\$ per year. Innovation is driven by manufacturers' efforts to better serve specific market segments. Standards of TC112 are widely used all over the world. For example test methods for resistance to tracking, especially for determining the CTI, are one of the most important tools for determining the suitability of electrical insulating materials and thus one of the most important design criteria. Customers of TC112 reside in all parts of the supply chain, but are primarily insulating materials manufacturers, equipment manufacturers and certain materials specification organisations.

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

The major technological trends impacting TC 112's work are:

- Development of new materials or materials with improved properties needs TC 112 to continuously monitor the market in order to ensure that the appropriate test standards are available;
- Nanotechnology is leading to the development of new electrical insulation materials for which conventional test methods may not apply;
- Trend from AC to DC applications make necessary to detect space charges which may lead to failure;
- New measurement technology driving the revision of existing publications;
- Environmental safety requires in some cases new testing indicators, e.g. chemicals used earlier may have been banned by environmental laws;
- DC distribution system (low voltage);
- Electro-chemical systems including batteries and EDLCs;
- Bio-oriented materials and systems;
- Green-oriented materials and systems;
- Newly developed equipment and systems.

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

Does your TC/SC have a need for a systems approach?

If so:

- Will the Systems work be in a single TC or in multiple TCs? **Multiple TCs**
- Will a Systems Evaluation Group (SEG), Systems Committee (SyC), or Systems Resource Group be required? **No**
- Is your TC/SC work of relevance to ISO? **partly**
- Is or are there fora or consortia working in parallel to IEC? Is there a chance to integrate this work in your TC/SC? **No**

**Table 1 TC 112 relationships**

|  |              |   |
|--|--------------|---|
| Component committees (IEC TC112 - role of a customer)        | IEC TC 10    | Fluids for Electrotechnical Application                             |
|  | IEC TC 15    | Solid electrical insulating materials                               |
|  | IEC TC 55    | Winding wires   |
| Other system committees (IEC TC112 - the role of a supplier) | IEC TC 2     | Rotating machinery  |
|  | IEC TC 14    | Power Transformers  |
|  | IEC SC 17 A  | High-voltage switchgear and controlgear                             |
|  | IEC SC 121 B | Low-voltage switchgear and controlgear                              |
|  | IEC SC 34 C  | Auxiliaries for lamps   |
|  | IEC TC 36    | Insulators  |
|  | IEC SC 61C   | Safety of household and similar electrical appliances               |
|  | IEC TC 96    | Transformers, Reactors, Power Supply Units and combinations thereof |
| Other committees   | IEC TC 109   | Insulation coordination for low voltage equipment                   |

**G. CONFORMITY ASSESSMENT**

With reference to clause 6.7 of Part 2 of the ISO/IEC directives, are all your publications in line with the requirements related to conformity assessment aspects? **Yes**

Will the TC/SC publications be used for IEC Conformity Assessment Systems (IECEE, IECEx, IECQ, IECRE)? **Yes**

Will any of your standards include test specifications, reproducible test requirements, and test methods? **All**

Are there likely to be special conformity assessment requirements generated by any standards projects? If yes, list which projects. **No special requirements**

All of TC 112 publications are in line with the requirements related to conformity assessment aspects and suitable to be used for IEC Conformity Assessment Systems. TC 112 standards include test specifications, reproducible test requirements, and test methods.

**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 |
|---|--|--|
| Future IEC 61858-3: Electrical insulation systems - Thermal evaluation of modifications to an established electrical insulation system (EIS) - Part 3: Clarification of major and minor components                | Project supported by WG 6  | Expected 2020                          |
| Future IEC 61934 Ed.1: Electrical insulating materials and systems - Electrical measurement of partial discharges (PD) under short rise time and repetitive voltage impulses                                      | Planned to establish JWG with TC 2 to upgrade IEC TS 61934 to a cross sectional IS and to develop product standards for TC 2 based on future IEC 61934 | Expected 2020                          |
| Future IEC 62631-3-4 Ed.1: Dielectric and resistive properties of solid insulating materials - Part 3-4 Method of test for electrical resistance and resistivity of insulating materials at elevated temperatures | New structure of standards for dielectric and resistive properties.- Supported by WG4  | Expected 2022                          |
| Future IEC 60112 Ed.5: Method for the determination of the proof and the comparative tracking indices of solid insulating materials   | RRT and research planned for possible d.c. method  | Expected 2022                          |
| Future IEC 60587 Ed.4: Electrical insulating materials used under severe ambient conditions - Test methods for evaluating resistance to tracking and erosion  | RRT and research planned for possible d.c. method  | Expected 2022                          |
| PWI/TR 112-3 Ed. 1.0: Effects of radiation under non-ambient environments; - effect of temperature  | Project supported by WG 2  | Expected 2020                          |

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