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? Please describe briefly.

Do you need to update your scope to reflect new and emerging technologies? If yes, will these changes impact another TC’s scope or work activities?

If yes, describe how these will impact another TC(s) and list the TC(s) it would impact.

**Title of TC 99:**

Insulation co-ordination and system engineering of high voltage electrical power installations above 1,0 kV AC and 1,5 kV DC

**Scope of TC 99:**

Standardization of -

a) insulation co-ordination for high voltage systems in specifying basic principles of insulation co-ordination, definitions and standard insulation levels for all type of electrical equipment considering field of applications, minimum air clearances, test requirements and test procedures; and

b) common rules and particular requirements for system engineering and erection of high voltage electrical power installations for power generation, transmission, distribution, and consumer premises, in both indoor and outdoor situations, with particular consideration of safety aspects.

High voltage (HV) covers nominal voltages above 1,0 kV AC and 1,5 kV DC and includes the voltages referred to as medium voltage (MV), extra-high voltage (EHV) and ultra-high voltage (UHV).

Concerning insulation co-ordination, a close cooperation with TC 115 is necessary to establish the field of standardization in respect of HVDC systems.

Concerning system engineering, TC 99 recognizes that there might be some common interests between TC 18, TC 88, TC 115 and TC 99 in the development of standards in the area of off-shore HVDC and HVAC installations, to manage and optimize the performance of electrical transmission systems as well as renewable generation platforms (e.g. wind, PV) or multi-terminal junction platform as they evolve and expand off-shore. Furthermore, the requirements out of TC 122 have to be co-ordinated with existing TC 99 publications.
### B. MANAGEMENT STRUCTURE OF THE TC

Describe the management structure of the TC (use of an organizational chart is acceptable) (should be integrated by CO automatically) and, if relevant (for example an unusual structure is used), provide the rationale as to why this structure is used.

Note: Check if the information on the IEC website is complete.

When was the last time the TC reviewed its management structure? Describe any changes made. When does the TC intend to review its current management structure? In the future, will the TC change the current structure, for example due to new and emerging technologies, product withdrawal, change in regulations etc. Please describe.

Make sure the overview includes:
- any joint working groups with other committees,
- any special groups like advisory groups, editing groups, etc.

**Chair:** Mr Michael Schwan, Germany  
**Vice Chairs:** Mr Mark Kuschel, Germany and Mr Jiansheng Wang, China  
**Secretary:** Ms Erandi Chandrasekare, Australia

**Maintenance Teams:**
- MT 4 Maintenance of IEC 61936-1  
- MT 9 Maintenance of IEC 60071-2  
- MT 10 Maintenance of IEC 60071-1  
- MT 14 Maintenance of IEC/TR 60071-4

**Joint Maintenance Teams:**
- JMT 7 Maintenance of IEC/TS 61936-2 (linked to TC 115, SC 22F)  
- JMT 10 Maintenance of IEC 62477-2 (managed by TC 22)

**Working Groups:**
- WG 12 Principles to be observed in preparation of safety publications-HV installations

**Joint Working Groups:**
- JWG 13 Insulation co-ordination for HVDC systems (linked to TC 115)  
- JWG 22 Atmosphere and altitude correction (managed by TC 42)

**Advisory Groups:**
- AG 11 Advisory Group on Strategy

### C. BUSINESS ENVIRONMENT

Provide the rationale for the market relevance of the future standards being produced in the TC.

If readily available, provide an indication of global or regional sales of products or services related to the TC/SC work and state the source of the data.

Specify if standards will be significantly effective for assessing regulatory compliance.

a) The activities in insulation co-ordination are determined by the extension of system voltages into the UHV range. From the developing application of HVDC systems arises the necessity of standardization of procedures and rated values.

b) The safety of high voltage installations with a lifetime of more than 30 years is of prime importance. Therefore, equipment must be designed, manufactured and installed to ensure - protection against inadvertent contact with live parts; and  
- the safe operation of the equipment and the installation.

The responsibility for the components of the power system remains with the relevant product committees.
D. MARKET DEMAND

Provide a list of likely customers of the standards (suppliers, specifiers, testing bodies, regulators, installers, other TC/SC’s etc.). Do not specify company names, only categories of customers.

The standards on insulation co-ordination are a reference for the Product Committees, which have to elaborate Product Standards on the same common basis. In these standards the evolution of techniques has to be integrated to provide advice for the limitation of overvoltages by using appropriate overvoltage limiting devices and test methods. However, concerning atmospheric air insulation, guidelines are provided since no other standards are available.

The world market for high voltage installations can be considered an open market. In this field IEC standards are accepted world-wide. Many countries that do not have a national standard for high voltage installations will benefit by the work of TC 99.

There is a market need for the development of standards in the area of off-shore HVDC and HVAC installations, to manage and optimize the performance of electrical transmission systems as well as renewable generation platforms (e.g. wind, PV) or multi-terminal junction platform as they evolve and expand off-shore. Customers of the standards are utilities, manufacturers, Engineering Procurement Construction (EPC) and industry, certification bodies and insurances. TC 99 recognizes that there might be some common interests between TC18 and TC99 in developing the standards in this area.

E. TRENDS IN TECHNOLOGY AND IN THE MARKET

If any, indicate the current or expected trends in the technology or in the market covered by the products of your TC/SC.

The insulation co-ordination level has extended to the field of voltage systems exceeding 800 kV AC and 600 kV DC which have to be covered by appropriate standards and guidelines. The increased application of HVDC systems leads to the demand of basic standardization of HVDC insulation co-ordination.

The ever-increasing use of the latest technology leads to the use of new or modified electrical equipment (e.g. compact solution, storage, subsea installations). This drives the need to continual review of the high voltage installation requirements and to provide modifications or add new requirements.

F. SYSTEMS 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?
- Will a Systems Evaluation Group (SEG), Systems Committee (SyC), or Systems Resource Group be required?
- Is your TC/SC work of relevance to ISO?
- Is or are there fora or consortia working in parallel to IEC? Is there a chance to integrate this work in your TC/SC?

This should not only be restricted to the customer/supplier relationships with other TC/SCs indicating types of co-operation (e.g. liaisons, joint working groups) but be of a more generic nature.

If there is no need for a systems approach as outlined in AC/33/2013, is it intended a TC would not be requested to report on general systems approach considerations such as customer/supplier relationships, liaisons, joint WGs, etc. as referenced in the system approach matrix illustrated in slide 14 of the presentation attached to AC/37/2006?

Customer – Committees that use standards produced by TC 99
Supplier – Committees that produce standards used by TC 99
Other committees – Committees to be in liaison with TC 99 for technical consistency
Concerning insulation co-ordination, horizontal standards are provided in the field of transmission and distribution to be used in all high voltage product committees. Therefore, a wide system approach is given with other TCs and organizations as follows:

<table>
<thead>
<tr>
<th>Liaison committee</th>
<th>Role of the liaison committee</th>
</tr>
</thead>
<tbody>
<tr>
<td>TC 8</td>
<td>System aspects of electrical energy supply</td>
</tr>
<tr>
<td>SC 8B</td>
<td>Decentralized Electrical Energy Systems</td>
</tr>
<tr>
<td>TC 9</td>
<td>Electrical equipment and systems for railways</td>
</tr>
<tr>
<td>TC 10</td>
<td>Fluids for electrotechnical applications</td>
</tr>
<tr>
<td>TC 11</td>
<td>Overhead lines</td>
</tr>
<tr>
<td>TC 14</td>
<td>Power transformers</td>
</tr>
<tr>
<td>TC 17</td>
<td>High-voltage switchgear and controlgear</td>
</tr>
<tr>
<td>TC 18</td>
<td>Electrical installations of ships and of mobile and fixed offshore units</td>
</tr>
<tr>
<td>TC 20</td>
<td>Electric cables</td>
</tr>
<tr>
<td>TC 22</td>
<td>Power electronic systems and equipment</td>
</tr>
<tr>
<td>TC 33</td>
<td>Power capacitors and their applications</td>
</tr>
<tr>
<td>TC 36</td>
<td>Insulators</td>
</tr>
<tr>
<td>TC 37</td>
<td>Surge arresters</td>
</tr>
<tr>
<td>TC 38</td>
<td>Instrument transformers</td>
</tr>
<tr>
<td>TC 42</td>
<td>High-voltage and high-current test techniques</td>
</tr>
<tr>
<td>TC 64</td>
<td>Electrical installations and protection against electric shock</td>
</tr>
<tr>
<td>TC 66</td>
<td>Safety of measuring, control and laboratory equipment</td>
</tr>
<tr>
<td>TC 78</td>
<td>Live working</td>
</tr>
<tr>
<td>TC 89</td>
<td>Fire hazard testing</td>
</tr>
<tr>
<td>TC 109</td>
<td>Insulation co-ordination for low-voltage equipment</td>
</tr>
<tr>
<td>TC 115</td>
<td>High Voltage Direct Current (HVDC) transmission for DC voltages above 100 kV</td>
</tr>
<tr>
<td>TC 122</td>
<td>UHV AC transmission systems</td>
</tr>
<tr>
<td>PC 127</td>
<td>Low-voltage auxiliary power systems for electric power plants and substations</td>
</tr>
</tbody>
</table>
G. CONFORMITY ASSESSMENT

With reference to clause 33 of Part 2 of the ISO/IEC directives, are all you publications in line with the requirements related to conformity assessment aspects?

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

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

Are there likely to be special conformity assessment requirements generated by any standards projects? If yes, list which projects.

TC 99 publications will not be used for IEC Conformity Assessment Systems.

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

<table>
<thead>
<tr>
<th>STRATEGIC OBJECTIVES 3-5 YEARS</th>
<th>ACTIONS TO SUPPORT THE STRATEGIC OBJECTIVES</th>
<th>TARGET DATE(S) TO COMPLETE THE ACTIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bring up-to-date AC insulation co-ordination taking into account new techniques and test methods</td>
<td>Revision of IEC 60071-2 Ed.4.0 <em>Insulation co-ordination - Part 2: Application guidelines</em> (Proposed horizontal standard)</td>
<td>CD: 2021-05 CDV: 2022-05 FDIS: 2022-11 IS: 2023-05</td>
</tr>
<tr>
<td></td>
<td>IEC 60071-12 <em>Insulation coordination for HVDC systems - Part 12: Application guidelines for line-commutated converter (LCC) stations</em></td>
<td></td>
</tr>
<tr>
<td>Define principles to be observed in preparation of safety publications - High voltage installations</td>
<td>IEC/TS 61936-0: <em>Power installations exceeding 1 kV a.c. and 1,5 kV d.c – Part 0: Principles to be observed in preparation of safety publications - high voltage installations</em></td>
<td>CD: 2021-06 DTS: 2022-03 TS: 2022-06</td>
</tr>
<tr>
<td>Maintenance of the existing standard for design and erection of high voltage AC installation</td>
<td>Revision of IEC 61936-1: <em>Power installations exceeding 1 kV AC and 1,5 kV DC - Part 1: AC</em></td>
<td>CDV: 2020-05 FDIS: 2021-01 IS: 2021-07</td>
</tr>
<tr>
<td>Define standards for the design and erection of high voltage DC installation</td>
<td>Review the technical specification on DC (IEC/TS 61936-2 <em>Power installations exceeding 1 kV a.c. and 1,5 kV d.c. - Part 2: d.c.), and convert to a standard</em></td>
<td>CD: 2021-06 CDV: 2021-11 FDIS: 2022-11 IS: 2023-03</td>
</tr>
</tbody>
</table>

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