Administrative Circular	AC/33/2013
	2013-09-20

TO ALL NATIONAL COMMITTEES

TO TECHNICAL COMMITTEE AND SUBCOMMITTEE OFFICERS

Dear Sir/Madam,

Systems Activities

SMB approved the work of SMB/ahG 35 on Systems Work in the IEC.

The document attached describes a new approach to work on systems, that is, "*a group of interacting, interrelated, or interdependent elements forming a purposeful whole of a complexity that requires specific structures and work methods in order to support applications and services relevant to IEC stakeholders*".

Three new kinds of entity will be created under this new approach, Systems Evaluation Groups (SEGs), Systems Committees (SyC) and a System Resource Group (SRG). These are all described in detail in the attached document.

The concepts which need to be implemented will require a major programme of training and workshops to the IEC community and this will be put into place, in collaboration with the National Committees over the next 12 months. A specialized staff member is being recruited by IEC Central Office to be responsible for this activity

Following the approval of the principle of the Systems work, SMB also agreed to the setting up of two SEGs (Systems Evaluation Groups), on Smart Grid and Smart Cities. The SEG Smart Grid corresponds to a transformation of SG 3, Smart Grid. SEG Smart Cities is currently in the planning stage and a call for experts will be made shortly.

Yours faithfully,

F.W.P. Vreeswijk
General Secretary & CEO

Annex

jrs

International Electrotechnical Commission, 3, rue de Varembé, PO Box 131, CH-1211 Geneva 20, Switzerland
Telephone: +41 22 919 02 11 Telefax: +41 22 919 03 00 E-mail: inmail@iec.ch Web: www.iec.ch

Systems Activities in IEC

1 Introduction and Generalities

The IEC has recognized the need for a way to address complex technical standards at the level above traditional standards for individual products. In 2004, an administrative circular outlined an approach that could be used by Technical Committees to address some of the needs at the systems level. The SMB has reviewed the progress to date, and noted that for those areas where the span of work is fully contained within an existing Technical Committee, there are several groups where this need has been addressed. However, as we are living in a complex technical world of innovation and convergence, it has become apparent that still more is needed. The IEC Masterplan specifically identifies this as a strategic objective of the IEC going forward, and the consensus among the SMB is that an additional approach and processes are needed. The expectations of our constituency is that these higher level deliverables for a system are often needed sooner rather than later and are essential for the standardization work as the product or component levels as well.

SMB has identified and developed the following approach to systems standardization, recognizing that within some TCs there are existing projects dealing with systems aspects of the technologies they cover, and those efforts do not require changes. This document outlines the new approach to address those issues spanning the work of multiple technical committees and emerging new technologies.

The proposals for systems activity are intended to promote the use, in the IEC, of system engineering methodologies for complex systems. It is not intended to be used for conflict resolution between TCs. The use of the term “system” in the title of an existing TC/SC does not presume any kind of hierarchy between TCs. Any transformation of existing TC/SCs will be possible by making use of the procedures described below.

The choice of the term “Systems Committee” was made in order to be consistent with the use of the expression “TCs with a System Function” described in AC/7/2004.

The Systems Activities are proposed in response to the IEC Masterplan 2011,

> The multiplicity of technologies and their convergence in many new and emerging markets, however – particularly those involving large-scale infrastructure – now demand a top-down approach to standardization, starting at the system or system-architecture rather than at the product level. System standards are also increasingly required in sectors such as environment, safety and health.
>
> Although the introduction of such processes in the IEC began some years ago, a major effort is now required to improve understanding of them and to widen their application. It will be necessary to take account of the implied need for increased co-operation with many other standards-developing organizations, as well as with relevant non-standards bodies in the international arena. There will also be implications for the IEC’s conformity assessment systems and processes.
>
> ...
>
> - define and strengthen the systems approach throughout the technical community to ensure that highly complex market sectors can be properly addressed and supported;
> - identify new technical areas and anticipate emerging markets/technologies that require a systems approach;
> - define and implement enhancements to the TC/SC structure for improved functionality, notably to improve coordination on issues that cross traditional boundaries;
> - extend the use of strategic or other horizontal groups to bridge areas covered by more than one or two TC/SCs
> - develop architecture proposals and roadmaps for system-level standardization and, if appropriate, related conformity assessment activities

2 Terms and Definitions / Glossary

For the purpose of IEC systems activities referenced in this document, the following definitions apply:

a) **System**: a group of interacting, interrelated, or interdependent elements forming a purposeful whole of a complexity that requires specific structures and work methods in order to support applications and services relevant to IEC stakeholders.

b) **Systems Evaluation Group (SEG)**: a larger, open group used in the first stage of systems development whose role is to engage the community of experts, identify the relevant stakeholders and define the general architecture and boundaries of the problem to be addressed.

c) **Systems Committee (SyC)**: a specialized Committee working at the systems instead of the product level to define reference architectures, use cases and appropriate standards and guidance on the interfaces, functionality and interaction of a system within the scope of their charter.

   Remark: A SyC can publish international standards, as well as other IEC deliverables. It functions generally in the same manner as a conventional TC, but with special procedures for the groups involved as liaisons to the SyC.

d) **Systems Resource Group**: a group populated by systems experts whose purpose is to guide the development and use of specialized tools and software applications for Systems, and encourage the use of these tools and sharing of best practices within the Systems Committees.

e) **Technical Committees** (and **Subcommittees**): one of the existing technical committees or subcommittees within the IEC. Their focus is principally on product standardization, however within that TC/SC, there may be some self-contained activities with a system function, consistent with AC/7/2004.

3 Overview of structure and processes for Systems Activities

This document includes a process with two stages of systems activity and an additional group to serve as a resource for all groups undertaking this systems activity.

The first stage, a Systems Evaluation Group is intended to be an open and broad engagement with the stakeholder community. It represents an opportunity to define the scope and extent of activity, mapping and identifying participants, and establishing an overview within the stakeholder community of the type and timing of work needed.

In the second stage, a Systems Committee can be set up upon approval by the NCs following validation of a proposal by the SMB. In this stage, more focused technical work and deliverables are anticipated, including international standards, reference architectures, use cases, and other projects. The SyC would be very similar to a conventional TC, but there will be additional obligations imposed on the participation of liaisons and interaction with TCs. Unlike conventional TCs, the SyC will also retain some aspects of the functions of a Strategic Group and an Advisory Committee.

A Systems Resource Group will also provide for the development of tools and processes as well sharing of best practices among all the groups undertaking Systems level work.

4 Systems Work in a single TC versus multiple TCs

Often a component that is part of one system can also be viewed as a system made up of multiple components, and this can sometimes continue across multiple layers. One example is an electricity transmission and distribution system, a transformer is a component, but a transformer is actually made up of many components. This is why the definition of a system was chosen in 2a) above.

There are examples within the IEC where systems level activity is undertaken within the domain of a single TC. Requests to transform a TC to a Systems Committee based on its internal activity will not normally be accepted by the SMB.

Any requests to form a Systems Committee shall be based on a span of work that extends across multiple Technical Committees (existing or new) and possibly other standardization organizations recognized by the IEC.

5 Systems Evaluation Group, SEG (Phase 1)

a) Purpose

The purpose of the Systems Evaluation Group is to evaluate work that covers a broad area of technology, normally covering the work of more than one TC. Whilst an SEG will more usually be set up to evaluate new areas of technology, there may be good reasons to set them up for existing areas of technology. An SEG is more open than a current IEC/SG, given the composition and objectives described below

b) Setting up a Systems Evaluation Group

A proposal for the creation of an SEG should include information on as many of the following as relevant:

- Market needs, market relevance and business drivers.
- Regulatory demands or other restriction in countries or regions.
- Related work or other valuable information from other organizations or Industries.
- Which IEC TC/SC should participate
- Which other stakeholders, including ISO TC/SCs and ITU SGs, fora and consortia outside of IEC should be engaged in the work?
- Identify and evaluate environmental, energy and safety considerations for the System work.
- Gaps in standards or other deliverables. What is missing and what needs to be changed?
- Recommendation of needed expertise and administrative structure of the SEG.
- Proposal for an appropriate name of the SEG.
- Proposal for a convenor.

The setting up of an SEG requires approval of the SMB.

c) Task of an SEG

An SEG will be set up to identify stakeholders, scope and propose architectures, road-maps, to plan and organize the standardization activities in the area under consideration. An SEG would not normally undertake detailed standards work, but could and should publish the outcome of its work, so that it can be viewed by all interested parties. Its task does not include on-going technical coordination of work between technical committees, but does include the identification of TC/SCs concerned. If an SEG finds it is doing technical coordination work, consideration should be given to setting up (see below), a new Systems Committee (SyC).

SEG shall establish a mapping of closely related system activities to clearly position the expected new systems work with the active participation of the existing SyCs.

Such a mapping shall get the full support of these respective SyCs.

These committees shall establish liaisons as recommended.

The outcome of the following tasks shall be included in the final report to SMB:

- Identify market needs, market relevance and business drivers;
- Identify potential participants in the work from inside and outside IEC: this includes: IEC TC/SC, IEC/SyCs, ISO TC/SCs and ITU SGs, fora and consortia outside of IEC;
- Identify and list related work or other valuable information from other organizations or Industries;
- Valuate Identify and evaluate environmental, energy and safety conditions considerations for the System work;

- List regulatory demands or other restriction in countries or regions;
- Develop a relevant/suitable model or reference architecture, based on the methods provided by the System Resource Group, which actively supports this process;
- Collect a first set of use-cases, generalize and map them to the reference architecture or model to prove its validity;
- The need for an SyC shall be supported by:
    - scope, activities and consistency;
    - an appropriate name;
    - the structure with subgroups and a Chairman's Advisory Group;
    - a roadmap to be detailed and fulfilled by the SyC.

d) SEG Membership

There should be a strong competence on user-requirements within the membership of an SEG and that may require participation from experts outside the normal IEC community. It is expected that all interested experts be present and contribute constructively to the work and there will be an open call for participation of experts from both within and outside IEC. There should clearly be representation from the TC/SCs concerned, as well as a representation from interested SMB members and National Committees. Administrative support should be provided by Central Office resources, though the Convenor should be from one of the proposers of the area of activity. Where appropriate, participation from Conformity Assessment (CA) systems, external organizations, such as ISO or ITU is encouraged. IEC should encourage broad participation, with representatives from outside organizations being accepted on the SEG. The final membership will be approved by SMB, but there is no definitive limitation on numbers.

e) Progress Reports

An SEG should submit progress reports after every meeting to SMB.

f) Life Cycle of an SEG

An SEG has a limited life, normally of 18 to 24 months and will not have on-going tasks. Once the primary task of an SEG has been accomplished and if further on-going needs for technical coordination are evident, consideration should be given to the setting-up of a Systems Committee. A review by the SMB shall be carried out between 18 and 24 months after setting up.

6 Systems Committee, SyC (Phase 2)

There should be a special structure to deal with the needs of systems standardization. The SyC should be as similar as possible to TCs in the structure and operation, but a few exceptions are described below. Overall the group should follow the established procedures in the Directives as much as possible

a) Relationship with TCs (and SCs)

A SyC operates at a level consistent with the definition of systems given in 2a). It sets high level interfaces and functional requirements which potentially span multiple TC/SC work areas. However, a SyC does not have the authority to dictate to the TCs what work should be started, stopped or changed within the TC domains. That power is still reserved exclusively for the SMB. Rather the SyCs should work through collaboration and consensus with relevant TCs to achieve a work plan that is followed by the SyC as well as those relevant TCs through the commitment gained by their investment made in the development of the plan, as an active participant.

b) Formation of an SyC

To form a SyC, the process outlined in the ISO/IEC Directives is followed:

1) A recommendation is made to the SMB by the System Evaluation Group, a National Committee or the SMB itself to set up an SyC.

2) The SMB takes the decision that forming an SyC is appropriate.

3) The Question is put before the IEC National Committees for a formal vote and decision (as for any new TC).

The SyC shall have a numbering assignment distinctive from the TC numbering systems. To avoid confusion with existing TCs but to maintain a distinction over this group of committees, the new Systems Technical Committees shall be assigned acronyms (e.g. SyC-AAL, SyC-EE, …)

c) Deliverables of an SyC

A SyC will produce deliverables including reference architectures, domain definitions, use cases, interoperability, etc. The structure and format of these deliverables will need to be worked out with the Directives Maintenance Team in conjunction with the Systems Resource Group, but it is expected that all documents shall follow the normal IEC voting processes for the type of publication.

In addition, the SyCs shall have the ability to produce any IEC deliverables including International Standards.

Considering the proximity of SyC to users, they are also expected:

- to promote the IEC portfolio of standards in establishing communication tools such as selection guides, white papers, websites, events, forum…
- to facilitate the access to the content of the set of standards by users.

When the SyC produces an interim document it may be issued to all liaisons based on consensus of the formulating Working Group or Project team, with the consent of the SyC CAG.

SyCs shall not duplicate or undertake documents that are in the domains of the TCs. Their documents should be at the higher level of the system only. Any documents produced shall not be intended to replace, supersede or overlap the work of the TCs. Likewise, the TCs shall respect the Product / System boundary (as defined in the SyC) and shall not develop any documents that would be in the domain of the SyC.

All National Committees have voting rights in accordance with the Directives. For non-IS deliverables, the consensus process for all P-members and liaisons should be used and comments from all recognized participants (NCs, Liaison technical groups (TC/SCs and CA experts) and recognized external liaisons) should be included in all documents submitted for vote

d) Structure of an SyC

Like current TCs, the proposer may nominate a Chairman and the NCs will indicate their interest through P-Membership and vote on the Chairman and documents in the usual manner.

The secretariat of a SyC will be provided by the Central Office to facilitate the coordination and interaction of the technical work among the many TCs involved in the systems effort.

Each SyC shall have a Chairman's Advisory Group (CAG), resourced through a core group of experts, to review the overall management and coordination of the work in the SyC and to review any interim or working documents.

Within the SyC, there shall be two functional roles which are critical. One or more individuals shall be assigned to carry out these roles, but the exact implementation is left to the SyC to choose from the available options (e.g. the use of the Vice-Chair role, or the use of a special ad hoc group or other as appropriate).

The two critical roles are:

- Coordination of the activity with liaisons and ensuring communication and collaboration among the stakeholder groups.

- Coordination, tracking and managing the project plan of the work and its implementation across the SyC and the TCs. It is important to have accurate and timely understanding of the status of the projects of interest outlined in the work plan.

e) Liaisons and linkages between the TCs and SyCs

The normal process of TC – TC liaisons can apply but with certain modifications. First, any TC which wishes to be part of the Systems activity should have the right to declare and self-nominate as a liaison with the SyC. If there is interest from the TC, the SyC cannot refuse to accept the request for liaison unless the TC fails to fulfil its obligations and participation in that liaison. In principle liaisons shall include those identified by the SEG.

If a TC wishes to have a liaison to a SyC, then they should also have the obligation to be fully engaged in that liaison relationship and an active participant should be named to the SyC on their behalf. A passive liaison is not acceptable. This is done so that active discussion around the work plan can be undertaken, and once consensus is reached, it should represent the interests of all the participating stakeholders including the relevant TCs. If a TC is sufficiently invested in the plan, then the TC will be much more likely to be motivated to execute a plan where they have partial ownership. This is especially true noting that as a result of the plan it is likely that the TCs will need to undertake new work projects, so any concerns and reservations on the part of the TCs should be voiced early and fully addressed in development of the SyC work plan, so that once the work plan is agreed, the execution of the plan can proceed.

In the case of entities outside of the IEC, these same expectations regarding passive vs. committed, involved and engaged liaisons are expected to apply. An external liaison shall apply to the SyC which would approve the liaison in the same manner as for TCs (A- or D-liaison)

The SyC shall have consensus within the SyC before advancing a document for introduction or voting in the IS process.

Finally, the normal IEC process allows for comments of the TC officers with the introduction of an NP document. The opportunity shall be provided in the interest of transparency, for the addition of comments from the Liaisons and TCs for each document circulated for vote or comment.

The SBP of the SyC shall include a review of adjacent activities, taking into account new market relevant requirements as well as new and disbanded committees. The SBP for SyCs shall be reviewed within 2 years.

Figure 1 illustrates the interactions between SyCs and TCs.

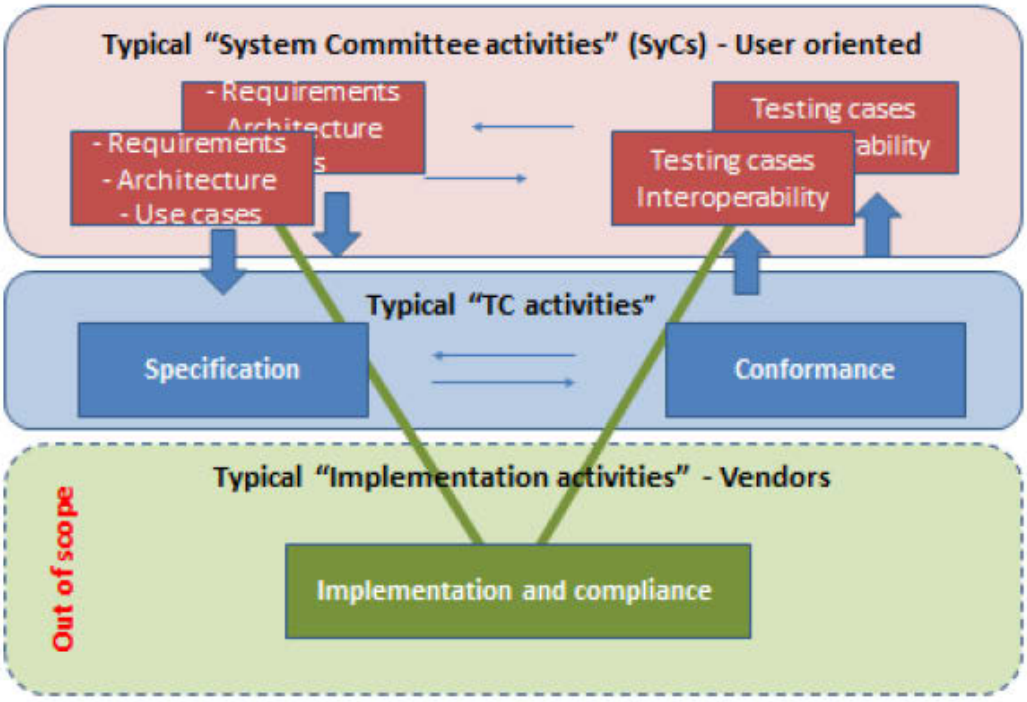

Figure 1 – Interactions between SyCs and TCs

f) Role of Technical Officer (TO) / secretariat function

The TO performing the secretariat functions for a SyC will have skills and/or experience in systems engineering methodology.

The TO shall be actively engaged in facilitating the communication with the TCs and outside organizations, as well as the project management role.

g) Reliance On Systems Resource Group For Tools And Processes

A Systems Resource Group for tools and processes, which is described below, will be established. Each SyC shall work with this Systems Resource Group to fully utilize the available tools and ensure sharing of best practices across all IEC groups engaged in the systems effort.

h) Life Cycle of an SyC

Once established, a SyC shall function in the same manner as a TC. Meeting reports, Reports to the SMB, an SBP, periodic dialogs with the SMB, shall all apply. When reviewing the materials provided to the SMB by the SyC, the normal questions of the effectiveness, longevity, and continued need and relevance of the SyC shall be reviewed, like that of any other TC.

7 Systems Resource Group (SRG) – SRG Structure and Role

A Systems Resource Group is a group formed by the SMB to accomplish the following:

- Serve as a support and consulting Resource to SyCs and SEGs
- Collect and share best practices between SyCs and SEGs
- Specify, have built and perform acceptance tests for tools and guidance for specialized functions such as:
  - Architecture Models
  - Roadmapping
  - Use Cases
- Serve as a repository of tools and methods developed by SyCs and SEGs

The SRG is principally focused on the science of systems standardization and development of supporting infrastructure, and shall not engage in technical work of the systems groups themselves.

The SRG works with all SyCs, but is intended to be different from SMB advisory committees. The membership of the SRG will be mostly systems experts, whereas the normal composition of technical advisory committees includes representatives of product TCs. The members will be experts appointed by the NCs and approved by SMB. The experts must have strong systems expertise.

To perform this role well, the SRG will need to have a strong linkage to the IEC IT Staff in the utilization of databases, collaborative tools, etc.

There is also an enhanced role for the staff TO for this group.

That person will need to perform the normal role, but should be able to provide guidance to the SRG on approaching the system standards function and use of the available tools. This person will also need to facilitate the consulting role to SyCs and to assist with project management.

The TO for this group will deliver strong systems experience, IT skills or understanding, technical writing skills as well as project management skills.