Young Professionals Manual



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Introductory message

Dear Reader,

When the first generation of participants attended the first IEC Young Professionals Workshop 2010 in Seattle, we were very impressed by the standardization community's interest to get young people involved in their network, and the accompanying interest and enthusiasm by the Young Professionals themselves. After the workshop, we realized that we wished to have a short manual that may answer some basic questions and expeditiously enables us to actively participate in the discussions within the IEC community.

We are pleased to present this little introduction to the "hidden world" of standardization, which we have explored. Hopefully the manual helps new members to get in touch and get involved in the international electrotechnical standardization process. We are looking forward to get to know you within the IEC Young Professionals Programme, so let's go ahead, get ahead, together.

The 2010 Young Professional Leaders

1. About the IEC

1.1 General overview

Who we are and what we do

The IEC (International Electrotechnical Commission) is the leading global organization that produces consensus-based International Standards and manages conformity assessment systems for electric and electronic products, systems and services, collectively known as electrotechnology. IEC publications serve as a basis for national standardization and as technical references for regulations or when drafting international tenders and contracts.

The IEC is a not-for-profit organization, founded in 1906. Its members are NCs (National Committees) and they appoint experts and delegates working in industry, government bodies, associations and academia to participate in the technical and conformity assessment work of the IEC.

1.2 Structure and decision-making

Who does what and how decisions are taken

The IEC Statutes and Rules of Procedure are the governing document of the IEC. They detail the rights and obligations of the member NCs, the IEC Officers and the different IEC management boards, including the financial aspects. They also describe the Commission's decision-making procedures.

The organization chart shows the structure of the IEC. The management bodies are as follows:

- Legislative: *Council*
- Decision-making: *CB (Council Board), SMB (Standardization Management Board), CAB (Conformity Assessment Board) and MSB (Market Strategy Board)*
- Executive: *ExCo (Executive Committee)*

The Presidents of all full member NCs are members of Council where decisions are taken on the Statutes and Rules of Procedure, the elections of IEC Officers and members of CB, SMB and CAB, as well as on finances, for example.

The CB is the equivalent of a board of directors. It reports to Council and is responsible for the day-to-day work of the IEC. The SMB, CAB and MSB report to the CB and manage the standardization, conformity assessment and market strategy work of the IEC, respectively.

The ExCo also reports to CB. All IEC Officers are members of the ExCo. It is responsible for implementing CB and Council decisions and for supervising all Central Office operations, through the General Secretary (who is the CEO).

1.3 Role of members

About members, how they are structured and what they do

IEC members are NCs and there can only be one per country. Individuals participate in the IEC's work through their respective NCs (see the web area on experts and delegates for more information). An NC is responsible for coordinating its country's participation in IEC work, including the nomination of experts to participate in the standardization work, as well as commenting and voting on documents.

There are two levels of membership: full members and associate members. (More information about these can be found in this manual under item 3.2.2 and at: http://www.iec.ch/nc_area/mync/memlevel.htm). All IEC members are entitled to adopt and sell IEC International Standards. Full member NCs are members of Council and can nominate individuals for the elections (IEC Officers as well as CB, SMB and CAB members).

One of the commitments taken by all IEC NCs is to have open access to and balanced representation from all relevant stakeholders in the NC's country, including but not limited to:

- power generation and distribution authorities;
- manufacturers;
- research and development establishments;
- testing laboratories and certification bodies;
- professional and teaching institutions;
- consumers;
- the national standards body; and
- government departments concerned with electrical and electronics applications.

This culture of inclusion is key to the IEC. Through the NC structure, users are brought to the forefront of IEC work to ensure that market relevance is maintained.

1.4 Acronyms

Hint for YPs

Hint for YPs: The IEC uses various acronyms and abbreviations, a full list can be found at: http://www.iec.ch/members_experts/refdocs/abbreviations.htm

2. About the IEC Young Professionals Programme

2.1 Introduction to the Programme

Why it came about

The IEC YP (Young Professionals) Programme was established in 2010 to engage with young professionals throughout the world and foster increased participation and involvement in IEC standardization and conformity assessment activities. The goals are to expose and educate young professionals on the various aspects of work done by the IEC, showcase the inner workings of the IEC through management and technical meetings and promote future involvement in standardization and conformity assessment. Through the programme, participants become familiar with how standards are created and how conformity assessment is accomplished.

2.2 Why get involved?

Benefits for you and your company

There are several benefits to being involved in standardization and conformity assessment work at the international level.

- Interact and network with an international community – specialists from around the world participate in the work of the IEC and can provide a wealth of resources and unique insights into various fields.
- Develop awareness of the IEC's work and maximize benefits from being involved in international standardization – learn what is going on in the field, current trends, obstacles, solutions, etc.
- Strengthen your industry's involvement in standards, especially in the international arena – potentially shaping international processes by highlighting strengths and garnering support for proven methods.
- Cultivate long-term involvement – developing expertise in a field and potentially guiding the progression of technological matters.
- Ensure knowledge transfer and develop a culture of innovation – young professionals can learn a great deal from the expertise present in IEC standardization work but they can also provide unique insights from their experiences.
- Shape the future of global standardization and conformity assessment – the future leaders of standardization and conformity assessment will have a solid grasp of the fundamentals.

2.3 How to get involved

In the Programme

Each IEC NC (National Committee) is invited to select two or three young professionals to attend the IEC YP Workshop at the IEC General Meeting. Three participants can be selected by countries that hold eight or more IEC TC/SC (Technical Committee/Subcommittee) Secretariats. Each country is encouraged to have a selection process to choose the young professionals to attend the workshop; however no requirements are placed on the process by the IEC. To become involved, you should contact the NC in your country and find out more about the details of its selection process.

In the technical work

Becoming involved in the IEC's standardization or conformity assessment work begins in the NC that each young professional represents. As will be described in a later section, each NC is invited to participate in TCs or SCs and nominate experts to the respective WGs (Working Groups). Normally NCs set up their own national mirror committees that maintain a somewhat similar structure to the committees in the IEC (however this may differ from country to country). Contact your NC to determine how interaction with the IEC TCs or SCs is conducted, and how best to participate.

Hint for YPs

Hint for YPs: A good starting point is to comment on standards and progress further by writing drafts as familiarity with the process and expertise is gained.

2.4 What to expect at the YP Workshop?

The YP Workshop is structured to provide an overall view of the IEC, including the inner workings at a management level, discussions of the work in which the IEC is involved, examination of how work in the various fields is completed, how issues related to technology and consensus are dealt with, and how technical work (standards development) is accomplished.

In particular, young professionals who participate in the IEC YP Workshop will:

- Join a dedicated workshop to look at IEC standardization strategies and conformity assessment;
- Network with professionals (both technical experts and other young professionals) from all over the world and from different industries and disciplines;
- Have a chance to engage the IEC management to make suggestions and offer opinions on future directions;
- Experience an IEC General Meeting;
- Attend a technical meeting where the planning for future work (standards development) and technical issues are discussed;

- Observe an SMB (Standardization Management Board) meeting; and
- Have a chance to participate in other social and technical events that are planned.

2.5 Success stories of alumni

Diego Oliveira – Brazil (YP2010)

Since the YP Programme in 2010, I have gained a better understanding of how the IEC works and how my country (Brazil) interacts with the IEC. Brazil adopts IEC Standards as national standards; however the Brazilian NC performs the harmonization and translation of these standards into Portuguese. Brazil is a participating member of many TCs within the IEC. The Brazilian NC has divided the standards development work for Brazil in several "Study Commissions" (Comissões de Estudo – CE). These CEs are a mirror of the WGs within the IEC TCs and SCs.

Following the YP Programme, I have worked in three CEs, including CE 03.002.01 – Rotating Electrical Machines, CE 03.031.005 – Equipment for Use in Explosive Atmospheres – Vocabulary and Type Protection "p", and CE 03.031.006 – Equipment for Use in Dust Combustible Atmospheres.

Due to my effective participation and my good work in these CEs, I was elected as the coordinator of the CE 03.031.006 in April.

I have been working in some CEs since 2007; however, it was only after my involvement in the IEC YP Programme that my participation in standards development grew. I have gained a deeper understanding of the standards development process and how my NC fits into the larger picture of reliable, globally recognized standards.

Carlos Rodriguez – Spain (YP2010)

I became a member of WG10 in the IEC TC 57: Power Systems Management and Associated Information Exchange, through my NC in March 2010, but my company had not decided how much my involvement in the WG would entail. In June 2010, I was chosen by my employer to attend a training course focused on the subject of "business success through standardization". This course was organized by the Spanish NC (AENOR). After the course, I was one of the people selected by AENOR to attend the YP Workshop in Seattle. After my participation in the YP Workshop in Seattle, my employer decided to increase my work in TC 57. I started to attend WG meetings throughout the world including Australia, Korea and others.

Since the Seattle YP Workshop, I have been working as a volunteer in a task force within the working group and I am now co-leader of another task force of the working group. I do not think this could have been possible without the YP Workshop and, of course, without my effort.

Juan Rosales – Mexico (YP2010)

Being part of the IEC YP Programme in 2010 was one of the most remarkable experiences in my professional life. Going back one year ago, I used to be part of a testing lab for laundry equipment in my company. After being selected as one of the three YP leaders for the 2010 YP Programme, different opportunities started to arise. I was invited, by my NC to share my experience and ideas for a local programme in my country. I also had the opportunity to speak about my perspective on the programme during an experts' forum hosted for the Council for Harmonization of Electrotechnical Standards of the Nations of the Americas (CANENA). Most importantly, at the beginning of 2011, I received an invitation from the Director of Government Affairs in my company to join as Leader of Regulatory Intelligence in Mabe – one of the leaders in household appliance manufacturing in the Americas.

Making some new friends during the workshop and keeping contact with them is something that I really appreciate. I am thankful to receive advice, comments, and ideas from experienced people in the IEC.

I would really like to share this experience with new generations, and perhaps, one day, I could be part of those groups of experts giving advice to a new line of young professionals.

Chetan Mistry – Canada (YP2010)

Before I attended the 2010 IEC YP Workshop I had already begun my involvement in standards development work by becoming a member of the Canadian mirror committee for IEC TC 45: Nuclear Instrumentation, and SC 45A: Instrumentation and Control of Nuclear Facilities. Some of my work assignments included the use of IEC International Standards to develop work processes to aid in design.

My experience with standards grew and my involvement with the Canadian mirror committee grew to include reviewing and commenting on draft standards, and tracking the status of the commenting process for the mirror committee. Relatively new standards (early in the development stage) provide the opportunity to mold the standard at a high level. This was the case for one particular draft that I had commented on concerning cyber security.

During the 2010 IEC Annual General Meeting TC 45 and SC 45A held their committee meetings and several WG meetings. Since I was attending the YP Workshop I also had the opportunity to attend a few WG meetings and committee meetings. Just being at the meetings provided exposure to what happens at technical meetings, interacting with others drafting up standards, getting our issues addressed in the development of the project, and participating in further work to aid in the development of the project. In particular, the project group working on the standard for cyber security needed help to address various topics covered in the standard, and I had volunteered. I have since developed an Appendix to the draft standard that has been incorporated into the document.

My experience at the YP Workshop provided me with a clear picture of how standards are developed, the amount of hard work and consensus that must go into them. In the end, standards are developed with a group effort from several experts from around the world.

3. Importance of standards

3.1 Why standards are important

Key benefits

From the perspective of the end user, standards have little visibility. People are often unaware that you can find standardization in everything you look at or in every service you receive. Standards are always there. Standardization is one of the most powerful tools governments have to take care of their citizens, to assert that the products are safe to use, to open up markets, to remove barriers to trade, to improve exportation and importation, etc.

Standards facilitate industry in creating new and innovative products and in providing a coherent structure that assists designers and producers in keeping associated risks and costs to a minimum, while at the same time ensuring that new products work with existing products.

Ultimately, from a societal perspective, standards make life easier, safer and healthier. Consumers need to have confidence that goods and products work in a safe manner, are free from danger and that no detrimental impact on the environment is incurred. Standards help consumers understand what they are buying – whether something is going to be fit for the purpose and whether such purchases are going to be of suitable quality. Thanks to standardization, products can be safely used, equipment can be safely connected and electrical devices can be purchased that are guaranteed to be safe to use, without needing any special knowledge about electricity.

End user benefits

The following are the main key benefits of IEC standards for the domestic end user:

- **Security**. Many IEC standards are about guaranteeing product security in electrotechnical terms. Products that comply with these standards are safe to use by end users. Ensuring product security thus maintains the security of humans. Governments play a vital role in product security by means of legislation.
- **Health**. The well-known IEC 61000 series is developed in IEC TC 77: Electromagnetic compatibility. EMC (electromagnetic compatibility) describes the ability of electronic and electrical systems or components to work correctly when they are close together. In practice this means that the electromagnetic disturbances from each item of equipment must be limited and also that each item must have an adequate level of immunity to the disturbances in its environment. Limiting the emissions of the equipment ensures that interference is kept to a minimum. This is beneficial for people's health and crucial when different

equipment related to people health are working together (for example, equipment used in hospitals or aircrafts need to comply with EMC standards to guarantee they function even in bad EMC conditions).

- **Energy efficiency**. Standardization of techniques that make the development of more energy efficient products possible give people the chance to save money in the long-term. It is expected that Smart Grids will lead to new services and provide end-users with a better knowledge and control of their real time consumption and energy use. All these elements working together should lead to an improvement of energy efficiency in the world and a decrease in the cost of energy.
- **Environment**. There are IEC International Standards that specifically cater for the environment by covering environmental aspects of electrotechnology. Recycling electrical equipment, limiting EMC emissions and using renewable sources are all part of the environment protection actions IEC leads. People then can live in a better and greener world than before.
- **More benefits**. The fact that products conforming to IEC International Standards can be sold nearly all over the world opens markets and reduces the price of electronic equipment. Thus, technology is more immediate and available to people at a reasonable cost.
- **Economy**. Governments and Regulators need to develop and maintain a healthy economy and defend national business interests while stimulating export. They need to pass and enforce legislation and regulations to protect populations from unsafe products and domestic, industrial, environmental and health hazards. Increasingly, they participate in international or regional organizations – as a member or observer – to tackle global issues related to safety, energy supply and the environment. As governments use standards in their legislation, IEC standards are crucial for the economy of countries and their citizens.
- **Combating climate change**. Through its activities in renewable energies, the IEC is contributing to global efforts, helping industry and government mitigate the effects of climate change. These efforts are directly visible on end-user's quality of life.

Company benefits

From the point of view of companies, standards are a must. The relationship between standards and companies needs to be bidirectional and reciprocal. Standards depend on companies and companies depend on standards.

The following are the main key benefits of IEC standards for

companies:

- **Cost reduction**. Thanks to standards, different manufacturers' products can work together, reducing not only the cost in terms of money, but also in terms of time and efficiency.
- **Open markets**. International Standards ensure that companies can produce services and products that can be sold throughout the world. As a result the market for a company is not confined to a country, community or village.
- **Improve the knowledge**. The standardization process of a product implies sharing information between companies. Although not all of the know-how is transferred and made public during the standardization process, a good and healthy technological environment is created and the knowledge is shared between companies.
- **Harmonize**. With the standards, services and products are harmonized so that they work together and behave as is expected in specific situations.

3.2 Global relevance

Why it's important

Standards and conformity assessment activities are recognized as elements that are used to ensure that services and products have certain characteristics of safety, quality, environmental care, and others; but they are also important tools for trade. They can be considered as elements that may procure the development of the economy of a country through an increase of production effectiveness, facilitating trade as well as promoting innovation and competiveness.

The WTO (World Trade Organization) indicates that International Standards should have the characteristic of being applicable for use or implementation as broadly as possible by relevant industries and other stakeholders around the world. This characteristic is better known as Global Relevance.

The definition of Global Relevance has been elaborated in a way to ensure it is applicable. For this reason, the IEC has established procedures that ensure that all opinions on the development of International Standards are considered and that promote consensus as the way by which all International Standards are established.

Encouraging worldwide participation

In order to produce globally relevant standards, the IEC has designed different levels in which countries may become involved:

- **Full members**. An NC has access to all technical and managerial activities and functions, at all levels of the IEC, including voting rights in Council.
- **Associate members**. An NC has full access to all working

documents but limited voting rights in technical work and no eligibility to managerial functions within the IEC.

- **Affiliate countries**. As it is in the interest of IEC that as many countries as possible contribute to and implement International Standards, in 2001, the IEC launched a special programme for developing countries. Known as the IEC Affiliate Country Programme, it offers such countries limited participation in the IEC without the financial burden of actual membership. More information can be found at: http://www.iec.ch/affiliates/

IEC Global Relevance Policy

In order to address the global relevance of standards development and their application, the IEC has established the following policy:

> *In order to ensure transparency, openness, impartiality and consensus, effectiveness and relevance, coherence, and to address the concerns of developing countries, essential differences in requirements, consistent with Annex 3 to the WTO Agreement on TBT, may, in well specified cases, be included on an equivalent basis as either normative or informative requirements or in an informative annex.* [1]

The IEC ensures the compliance of its policy through its processes and various mechanisms that encourage the participation, under the same conditions, of the involved parties. On this issue, it is important to highlight the following items:

- The IEC encourages its members to develop International Standards based on performance rather than on design or descriptive characteristics; this ensures that innovation and technical developments are not limited.
- Even though it is desirable that an International Standard represents a unique solution, a unique solution should not imply that it does not include the particular market characteristics and essential differences as this would limit the application of a standard on specific markets or in certain products. Therefore, International Standards may present different approaches.

More information about the IEC Global Relevance Policy and how to implement it in a specific IEC technical work or publication can be found at:
http://www.iec.ch/members_experts/refdocs/ac_cl/200722e.pdf

[1] AC/17/2008

IEC collaboration and enrolment activities

The IEC Young Professionals Programme is just one example of the IEC activities directed to promote the active participation and involvement, not just of all the countries, but of all involved segments. Other examples of how the IEC encourages participation from all sectors:

- **Academia.** A special "Academia area" is available on the IEC website, providing access to selected working documents. The IEC and certain academic institutions have also worked together to produce research papers. In this manner, the IEC promotes the value of standardization and its related activities within academic institutions and the decision makers of tomorrow so as to encourage them to participate through their relevant NCs. More information is available at: http://www.iec.ch/about/globalreach/academia/
- **Partners.** Cooperation among the different international and regional bodies as well as with certain organizations that are recognized for their expertise in the field of electrotechnology is important for achieving Global Relevance. More information is available at: http://www.iec.ch/about/globalreach/partners/
    - **International standardization bodies.** Every day the importance of collaboration between them increases as technologies become more intertwined. Examples of the cooperation between international standardization bodies are the joint working groups where technical experts from more than one international standardization body work together on a common task.
    - **Regional standardization bodies.** For the IEC, cooperation with regional bodies is an important way to promote the participation, adoption and implementation of its standards worldwide, while for regional bodies it represents a direct way for them to explain to the IEC their specific needs. In specific cases, regional bodies can enhance their standards development and adoption processes through their collaboration with the IEC.
    - **Organizations.** There are organizations that are involved or affected by the development of IEC International Standards that are not necessarily national or international standardization bodies but where it is recognized that their activities and participation in the IEC contribute to the implementation of IEC International Standards worldwide and reduce work overlaps. For this reason, the ISO/IEC Directives include ways to set up working liaisons and the different types of liaisons that exist with those organizations (See also Section 4.1 The Directives)

IEC and global trade

The IEC contribution to global trade extends to more than just issuing International Standards. Through the nature of the standards development work, the IEC helps facilitate global trade before a final standard is published.

Every day, awareness of the importance of design and of using IEC International Standards grows since they open the doors to trading for those who are interested in crossing borders with products and services. Countries that adopt IEC standards also have the possibility to validate test reports or even certificates from other countries that take part in the IEC International Conformity Assessment Systems.

The IEC's reach goes beyond its International Standards; the reach of the IEC is as broad as the people who are involved in its activities. Therefore, it is possible to list some of the contributions of IEC to global trade that derive from the IEC’s most valuable component, the people:

- **Networking.** In order to develop or modify an International Standard, people involved have the opportunity to work at the same table and network during coffee breaks with multiple manufacturers, users, standard developers and other people involved in trade or product development. Many times trade starts when it is possible to sell an idea. What people do in standardization activities is just that, they sell ideas to the other people involved in order to build the way to consensus. The IEC provides multiple opportunities to share ideas with the world.
- **Be the first to know.** Once again because the people involved in standards development share multiple interests they can share ideas. From this it is possible to enhance one's own ideas and get new ones coming from different approaches. This is a good way to be aware of new trends and, moreover, to be prepared for them. Of course, if one follows the publication of standards it is possible to have hints about new trends, but people involved in their development have a lot more advantage in terms of timing.
- **Lead - Do not follow.** People who develop standards build a big part of the world trade rules; other people become the followers of those rules in order to be part of trade. The IEC provides those who are interested with the opportunity to lead in building those rules.
- **Teach, learn.** When experts share their ideas with other experts, they enhance state-of-the-art of technology. Involvement in the IEC is a way to teach and learn about similar issues from people throughout the world.
- **Make your business more attractive.** People who are involved in standards development may use it as a marketing tool. As they promote their participation in standardization with

experts from all over the world they become experts and in doing so gain worldwide recognition.

More information is available at:
http://www.iec.ch/perspectives/industry/whats_in_it.htm

3.3 Case studies

Standards and innovation in industry

Industry needs International Standards to support innovation. They ensure that best practice is shared and in doing so, designers can focus on designing and developing better products. Benchmarking of performance with respect to quality assurance and safety is defined by standards. In developing appropriate and relevant standards, similar products (e.g. communications/IT) will work together resulting in minimised costs and alleviated risks when interoperability is required.

International Standards facilitate globalization of ideas and markets thereby raising the profile of companies and organizations, and create competitive advantage in a world that is getting more and more complex for customers. As Wolfhart Hauser, Chief Executive Officer, Intertek Group, affirms, it's not electrical safety; but many other aspects that need to be reflected in the production and design for a very demanding end-user[2].

Case study 1: Standards and industry – electrical safety

International Standards development strongly focuses on world trade and today the standards market is in the region of $15 trillion[3]. Underpinning such fiscal opportunities, however, are the requirements for safety. With respect to electrical systems within buildings, safety standards play a diverse and implicit role from design to final commissioning.

The nature of electricity offers danger by electric shock and fire through a diverse range of means.

Much literature to date has presented the inherent danger of electricity in the workplace, but literature from Australia[4] exploring electrical injury, places the home as the number one location to sustain electrical injuries. This statistic is further emphasised by a UK study which found that 46 % of all electrical incidents occur in the home[5]. This is where standards play a vital role in addressing this issue for society. IEC TC 64: Electrical installations and protection against electric shock, and its NC members explore the means and ways to ensure that among all types of low voltage electrical installations, every effort is made to preclude opportunistic occurrences of electrical

[2] http://www.iec.ch/globalvisions/intertek/
[3] J. Hill, "The Importance of International Standards for World trade," presented at the IEC General Meeting 2010 (Young Professionals Workshop), Seattle, USA, 2010.
[4] S. Pointer and J. Harrison, "Electrical Injury and death," Australian Institute of Health and Welfare, Canberra 2007.
[5] DTI, "24th and Final Report of the Home and Leisure Accident Surveillance System," 2003.

incidents and through the processes of compiling international wiring standards, the systems employed in electrical safety are continually enhanced.

In many countries, regulation defines the role of all stakeholders – from consulting engineers to the technical practitioners – to ensure that good, safe and best practice is embedded in the psyche of all involved within the built environment. Such regulation is therefore supported by the standards that are developed and that guide stakeholders towards the safe working practices required. Electrical standards therefore, are developed to synergize the design, construction, maintenance and application of electrical installations. One might argue that the extra formality of regulation – through relevant standards - adds additional costs and bureaucracy, but without this regulation, increased frequencies of electrical incidents via fire, injury and death would be inevitable.

Marketability: the effect of globalizing markets

Many nations create local standards to address safety issues or concerns covering public safety, environmental safety, worker safety, and others. In most cases, these standards utilize local preferences, practices, and technologies due to familiarity and historical trends. Local industries and enterprises are well suited and established to handle such cases. However, growth is dependent on the local economy.

As globalization progresses and companies extend to other jurisdictions, problems are encountered when new local requirements in other areas require changes to products. This may lead to additional costs, and further development time, additional resources, greater support, etc. By working within a broader standardization framework that is accepted in more locations, products developed in one location can be more easily marketed in other locations, thereby increasing market share.

The International Standards developed by the IEC promote increased marketability of companies and industries by establishing mutually agreed-upon standards and philosophies. Not only can marketability transcend national borders, but it can also transcend industrial borders, for example, digital instrumentation and control technology. IEC 61508 was developed to address digital instrumentation and control devices used in safety-critical applications in the process industry. It has since been adapted to address the same topic in a whole host of other industries including rail transportation, industrial applications, and the nuclear industry. With International Standards based on a common platform not only can similar products be used from one national location to another, but also from one industry to another.

Case study 2: Standards and industry – Conformity Assessment of circuit breakers

Conformity assessment of circuit breakers through the use of appropriate standards is an example where the design and manufacture processes are considered in association with operational security based on knowledge of defined safe limits of operation. Such security is realized through common evaluation methodologies for circuit breaker technologies with test and specifications towards acceptable levels of functional security.

For instance, in Mexico, the interested parties, based on this objective, develop technical standards by adopting International Standards as national standards (NMX-J-538/2-ANCE, derived from IEC 60898-1, and NMX-J-569-ANCE, derived from IEC 60898-1) and in parallel, these standards were harmonized with trade partners, for example Canada and US (NMX-J-266-ANCE) for application with an alternative (related) technology. The most recent edition of the national standard NMX-J-515-ANCE applicable to circuit breakers, takes into account these parallel standards so that both standards and their requirements for testing are considered in such a way that circuit breakers are not excluded because of the technology or design, but rather they are excluded (do not meet the standard) if they do not meet a safety performance.

The above approach is defined in Mexican standards by the normative annexes. And through these annexes the standard establishes specific tests for circuit breakers such as the short circuit test, which evaluates the performance of the equipment. The relevant test methods are therefore included on the NMX-515 as a generic standard for control and distribution equipment that is referred in a National Technical Regulation and this is recognized as a useful way for evaluating and demonstrating the safety performance of equipment as indicated in the next paragraph.

It is also important to point out that the act of testing as well as the standards underpinning the testing process also supports competition in the market through defined safe design criteria. This also serves to 'sort' the technologies in terms of those that do not meet the essential tests demanded by the worldwide market.

Standards and society

Standards protect the consumer's fundamental right for safety. Society demands safe principles and practices and this right is underpinned by disseminating appropriate and relevant information concerning the standards. Such information must also relate to the choice of products and services available. Therefore, the information portal serves as a fundamental principle in the application and adoption of product/service standards.

Standards strive towards the continuing improvement of products and services by promoting effective research and development which results in products that effectively get easier to use while at the same time providing safety at the core of application.

Standards also facilitate knowledge sharing. In order for standardisation to be effective all sections of society are involved. Standards therefore provide the means for interaction concerning the broader societal concerns such as the environment and health and safety. Standards act as the mechanism where these concerns are synergized towards common goals.

Case study 3: Standards and society – education

As a fundamental building block of society, educational communities have an important role in ensuring that standardisation is effective and practical. Ideally, standards development is fed through the professional education programmes, empowering students to be knowledgeable and competent in associated standards and systems. The loop is closed back into industry when graduates from these programmes engage in advancing such standards in their respective fields and industries and in some instances this is done synergistically with the colleges and universities from which they graduated.

The case study presented here explores such a synergy between electrical engineering education and the Electro-Technical Council of Ireland (ETCI), and more specifically, how TC 2 - the Technical Mirror Committee responsible for writing the Irish Standard for LV installations - works alongside the School of Electrical Engineering Systems at Dublin Institute of Technology (DIT), Ireland.

The School has approximately 1 200 full and part-time students engaged in programmes that range from electrical apprenticeships to Doctorates and post-Doctorate level. The range of disciplines taught at the school includes electrical engineering, control engineering, electrical building services and energy management.

The management within the School of Electrical Engineering Systems and ETCI maintain that for continued success and development in the Irish economy, graduates require an understanding of the significance of standards. Standards form a common language in which graduates can participate and from which all can benefit. The School asserts this belief by ensuring that the standards developed by ETCI are embedded within the electrical engineering syllabuses and in turn, the participation of lecturing staff in the ETCI technical committee further guarantees that the respective syllabuses are current and up-to-date with changes and developments.

Embedding standards at the heart of education delivers real benefits to the world in terms of practices in construction and environmental aspects and can assist in opening doors to employment and business internationally to students equipped to engage in the process.

One of the key roles of standards is to offer the framework for globally shared knowledge. Participation in lectures within the School in the ETCI technical community assists in the diffusion of research findings

into a globally understood context. Research outputs in such environments lead to innovation which links with business opportunities. Such initiatives directly benefit any participating tertiary educational institutions such as DIT.

The benefits for DIT in terms of the lecturers who participate in implementing standards, is obtained through the educational and research relevance the standards guarantee. Standards further maintain the quality, relevance, and effectiveness of education.

Case study 4: Standards and the environment – global concerted efforts towards a 'green' & energy-efficient economy

One area where research and standards will converge is in the development of a greener and more efficient economy. Greener approaches in a world with depleting energy resources are demanded, but to achieve this, efficient processes that are cognisant of the entirety of a life-cycle analysis of such systems are needed. The following case study details some initiatives of some of the world's most renowned multinational organizations.

For instance, as outlined by Dr Naoya Takashi, Executive Vice President and Executive Officer of Hitachi Ltd.[6], Hitachi is committed to *"contributing to the solution of fundamental global issues and a better global society through the development of superior original technology and products"*. For Hitachi, the goal is a sustainable society where preserving the environment is crucially important. As Dr Takashi asserts, such aspirations require *"a collective commitment that goes beyond a single company's efforts - society as whole has got to get involved".* From Hitachi's perspective, one important emphasis for energy efficient and green initiatives is the need to recycle rare and precious metals. Such an initiative is very important and relevant to the green economy internationally and will only be realised through participation in International Standards development.

Complementary to the initiatives sought by Hitachi is the work towards energy efficiency being undertaken by Schneider Electric. As explained by Jean-Pascal Tricoire, CEO, Schneider Electric[7], total energy consumption will double by 2050 and accompanied with the urgency of climate change, there is the need to reduce carbon dioxide emissions by a factor of 2. Therefore, if we want to preserve the climate and embrace the required reduction in carbon dioxide emissions, we need to improve energy intensity of everything we do by a factor of 4. This will be achieved by technological innovations in new buildings in the fields of efficiency in energy management. Schneider Electric believes in preparing the planet for tomorrow and this can be achieved through innovation in the fields of efficiency and

[6]Dr Naoya Takahashi, Executive Vice President and Executive Officer, Hitachi Ltd. (http://www.iec.ch/globalvisions/hitachi/)

[7] Jean-Pascal Tricoire, CEO, Schneider Electric (http://www.iec.ch/globalvisions/schneiderelectric/)

energy management. And Jean-Pascal believes that we need to *"develop renewable sources of energy but more so, we need to learn to do more while using less of our planet and this means energy efficiency in energy saving"*.

Another perspective on this topic is offered by Keith E. Williams, President & CEO, Underwriters Laboratories (UL). UL, through its work and in collaboration with IEC, is committed to green safety for the 21st century as well as ensuring energy efficiency in electrical products. Such products being energy efficient, environmentally safe and focused on being recyclable establish confidence in the adoption of green initiatives. Indeed standards and conformity assessment *"set a framework for competition where products can be traded internationally and at the same time reliable and reputable manufacturers can know that products won't have to face unfair competition from someone that doesn't care about quality and is willing to sacrifice public safety in order to make a cheaper product"*.

4. Standards development

4.1 The Directives

What they are and how to find them

While the basic introduction covered here provides an excellent overview of the process, you will eventually need to refer to the official "rulebook" of the IEC. These are often simply known as "The Directives". These are the primary source for most of the activities that occur within the TC (Technical Committee) level and beyond within the IEC. The official names of the three documents that make up The Directives are:

- ISO/IEC Directives, Part 1: Procedures for the technical work
- ISO/IEC Directives, Part 2: Rules for the structure and drafting of International Standards
- ISO/IEC Directives, IEC Supplement: Procedures specific to IEC

These can be found on the IEC website (www.iec.ch) by following: Members & Experts > Reference Material > Statutes / Directives / Agreements

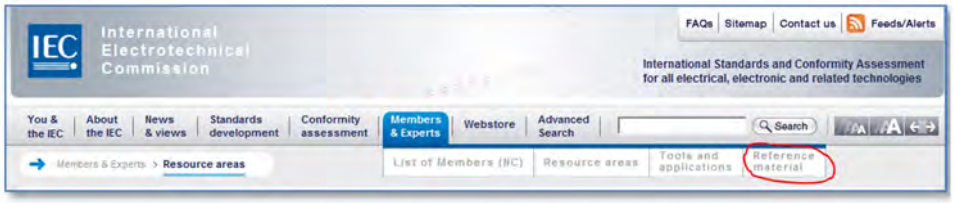


Figure 1 – Location of Reference material

For the remainder of this section, we will simply refer to these documents as Directives Part 1, Directives Part 2, and the Directives Supplement.

4.2 How standards are developed

Resources and principles

There are many resources with regard to how standards are developed in the IEC. The primary source is the Directives, Part 1 (see item 4.1 of this manual). In general, IEC follows the globally accepted principles of standardization, namely:

- Transparency
- Openness
- Impartiality
- Effectiveness and relevance
- Consensus
- Performance-based
- Coherence

- Due process
- Technical Assistance
- Flexible
- Timely
- Balanced

These principles are driven by the work done by IEC TCs and SCs (Subcommittees). The primary duty of an IEC TC or SC is to develop and maintain International Standards and other alternative deliverables. These groups initiate projects that are intended to lead to the issue of a new or revised IEC standard.

Projects must fall within the overall area of work of the committee.

- Projects must be defined and accepted in accordance with relevant procedures.
- Projects must be managed through a defined process in accordance with strict target dates.

Projects are often sub-assigned to WGs (Working Groups) for development.

Processes and procedures

There are many resources with regard to the standards development processes and procedures of the IEC. The primary source is the Directives, Part 2 (see item 4.1 of this manual). However, this document can be difficult for those new to IEC. The first resource, which is particularly useful if you are new to the world of IEC, is right on the IEC website (www.iec.ch). A high-level overview is provided under the Standards Development tab as described below.

Standards Development > How We Work

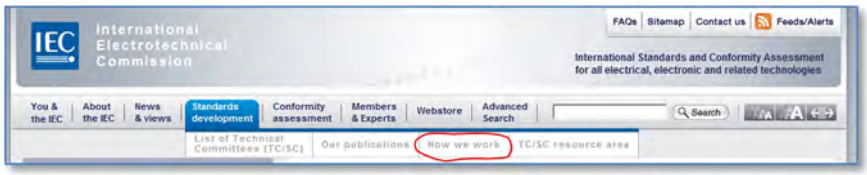


Figure 2 – Location of information on Standards development

In this section, follow the link to Processes & Procedures

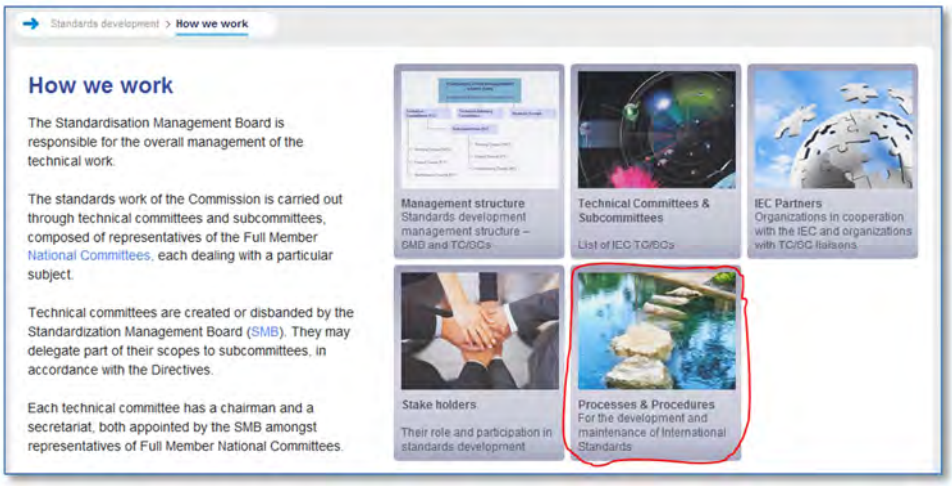


Figure 3 – Location of information on standards development processes and procedures

Where you will find the following structure:

Development process

This section starts with a brief overview of the development process. It then goes into the various stages of the document development process starting with the concept inception all the way through to publication. These include:

- Preliminary Stage
- Proposal Stage
- Preparatory Stage
- Committee Stage
- Enquiry Stage
- Approval Stage
- Publication Stage

Hint for YPs

Hint for YPs: Make a special note of the acronyms associated with the document used for each stage (for example, the "Committee Stage" has the acronym "CD" for Committee Draft). Why is this important? Because when you attend meetings, most experienced members do not refer to the document process by their stage names, they use the acronym for the document associated with that stage. For example, instead of hearing the proposal "Should we progress this document to the Committee Stage?", you will likely hear "Should we go to CD?".

Stage codes

Stage Codes are the language of the WG. When you first show up to a meeting, it can often be the most difficult part to understand. While you

may be an expert in the technical topic of the WG, you can get lost in the language of the IEC.

Hint for YPs

Hint for YPs: It has been found useful to have two copies of the Stage Code list with you at meetings.

- Alphabetical Order – For quick reference
- Stage Code order – This is the column with the numbers (for example, "30.2" for 1CD). This will put the Stage Codes in the order they will occur during the standards development process.

Work Programme

The Work Programme section covers 3 topics:

- Project Management – A brief overview of how it should be determined "who" should be doing the development within IEC and how that work is coordinated by that group.
- Target Dates – These are the IEC guidelines for how long the document associate with each stage should be available.
- Project Control – A very brief description of "who is in control".

Hint for YPs

Hint for YPs: There is always a desire to speed up the process. When you consider the overall development process stages, their associated target dates, the fact that a stage may contain multiple documents/versions/revisions, and you will start to get a feel for the expression, "moving at the speed of standards".

4.3 TC/SC/WG and Survival Guides

TC/SC resources

The main location for any information pertaining to TCs, SCs, and WGs can be found on the IEC TC/SC Resource Area.

This area gives all the essential information that TC/SC officers, WG and MT (Maintenance Team) convenors, PT (Project Team) leaders and experts will need to understand regarding their roles and responsibilities in the standards development process along with supporting material. The area includes resources covering roles and responsibilities of various members within a TC/SC structure, online tools and applications for members, document preparation guidelines, and other resources.



Figure 4 – Location of TC/SC Resource Area

Appointment / Nomination by NCs

The IEC website also maintains a listing of all NCs (National Committees) and the status of their membership. This resource (see Figure 5) also provides a listing of all the TCs and SCs in which each NC is involved. Individuals participate in the IEC's work through the NCs as an expert or delegate.

Experts are individuals with specialist knowledge in a particular technical field. Each NC participating in a TC's work can appoint experts to take part in specific technical work through WGs, PTs or MTs. Category A liaison organizations may also appoint experts to WGs and PTs. Experts participate in IEC technical work in a personal capacity and do not represent their company/organization or NC.

Delegates are representatives of their NC at a TC or SC meetings and should be fully briefed by their NC or Chief Delegate before attending a meeting. For TC/SC meetings, each NC participating in the committee assigns a head of delegation, who is responsible for speaking and voting on behalf of the NC during the meeting, but may invite other delegates from their NC delegation to speak if required.

Hint for YPs

Hint for YPs: To become involved in the IEC's standardization work, your NC is the first point of contact. The "list of members" resource page on the IEC website will provide information on who the NC member is for a particular country, which TCs and SCs they are currently participating in, and their membership and participating status.

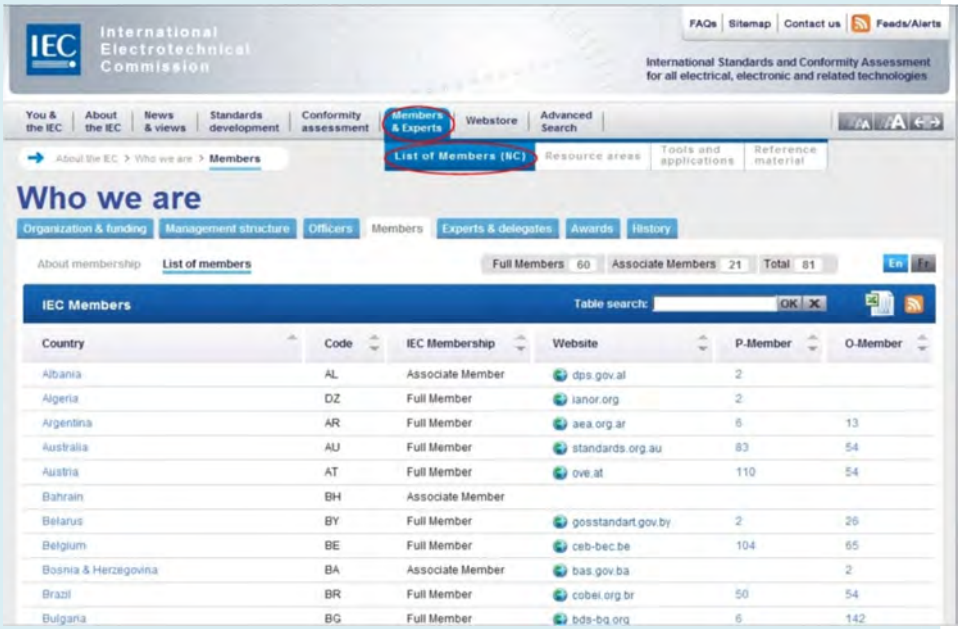


Figure 5 – List of NCs

NC involvement in TCs

Full NC membership includes access to all technical and managerial activities and functions, at all levels of the IEC, including voting rights in Council. Associate NC membership includes full access to all working documents but limited voting rights in the technical work and no eligibility to managerial functions within the IEC.

NC participation in TC or SC work is designated by the letters P or O. P-membership (or participating membership) refers to the TCs and SCs in which a particular NC is actively participating in on a technical level. This means they actively vote on draft documentation and proposals, providing comments and feedback, and nominating experts to work on specific TC/SC initiatives. O-membership (or observer membership) refers to the TCs and SCs in which a particular NC does not actively take part. O-members do, however, have access to the documentation produced by the TC or SC and can provide comments and feedback in TC/SC work programmes, but only have limited voting rights with the TC or SC.

Where to find IEC Resource materials

The IEC website also contains a multitude of resource materials for experts, delegates, NCs, and IEC staff.

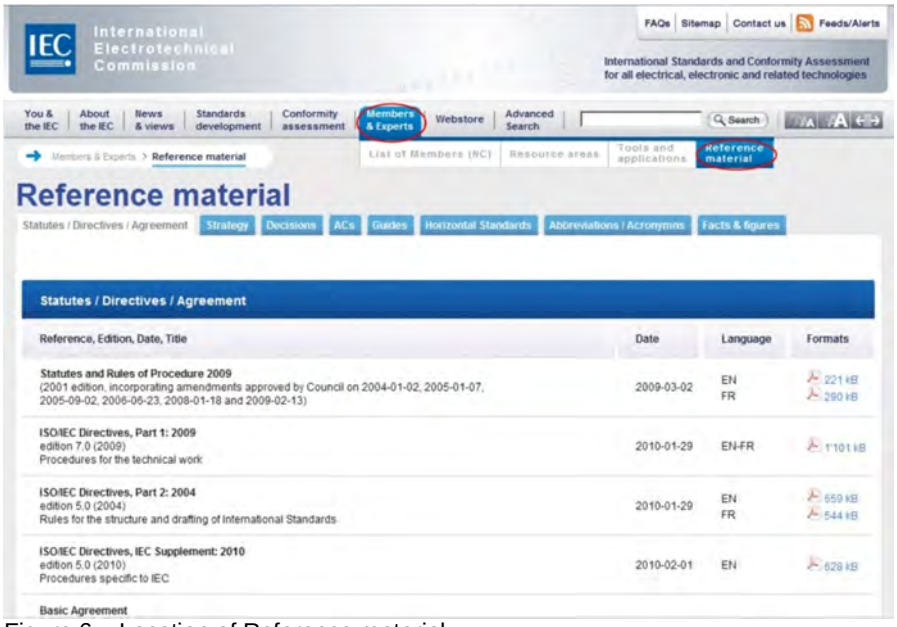


Figure 6 – Location of Reference material

This section includes directives and statutes for the operation of IEC managerial functions, overall strategy documentation, reports on the results of IEC managerial voting, and other high level documentation. Of particular importance to Young Professionals is a section on abbreviations/acronyms and guides. The “Guides” section provides a wealth of information covering such topics as general vocabulary and terminology, general principles, techniques, and guidance for a full range of topics covered by IEC subject areas.

Another valuable IEC resource is the "document preparation" area of the TC Resource site discussed in Section 4.3. This section includes information such as downloadable IEC Word templates for documentation, guidelines on the preparation of standards documentation, including specific examples of using Word for various situations (equations, styles, lists, figures, etc.) and guidance on the roles and responsibilities for document preparation.

How to find information about a Technical Committee

The IEC website maintains a current listing of the TCs and SCs that are part of the IEC framework. This listing can be found under the "Standards Development" tab of the website (see Figure 7).

A listing can also be found on the IEC website in the "Expert Management System" which can be found in the "Tools & Applications" area of the TC Resource area discussed in Section 4.3 or directly from the IEC main page drop down menu (same figure in Section 4.3 next to the "Resource Areas" link). However, the Expert Management System first requires login access that has to be granted

by your NC.



Figure 7 – List of TCs/SCs

This area of the IEC website provides a wealth of information for newcomers. Not only are current TCs and SCs listed, but also disbanded committees (under a separate folder link under the "IEC TC/SCs" heading). Each TC listing on this website provides links to associated information to the committee's dashboard, such as scope of the technical/subcommittee, their officers and participating countries, publications (standards or reports) produced by the committee, the current work programme of the committee (what publications the committee is currently working on), and a link to the committee's Strategic Business Plan (SBP) document.

The dashboard for each TC and SC is a central repository for any information associated with the committee. In addition to the information mentioned above, the dashboard also includes a listing of the structure of the committee (such as chairman and secretary), NC members that are involved with the committee (either participating or observing), and information about the last meeting of the group. Note that much of the information (links to documentation) available from each committee's dashboard is not publicly available and requires approval from the NC.

4.4 Conformity Assessment

What it is

CA (Conformity Assessment) is any activity which provides a determination of whether an object corresponds to the requirements contained in a specification.

A specification, typically but not exclusively a standard, is a technical description of the characteristics which are required to be fulfilled by the object. These objects may be physical products, services,

processes, bodies, people, or systems (management systems, for example).

Officially, CA is the "demonstration that specified requirements relating to a product, service, process, system, person, or body are fulfilled". Note that the phrase "conformity assessment" does not limit or classify the activity in any way – a consumer who buys an appliance and at home checks that it conforms to a technical description may be said to be carrying out "conformity assessment".

Benefits of Conformity Assessment

The most frequent reason for CA is the desire to demonstrate that a product or process is safe and that its use will not cause any harm or injury to humans or animals.

- Governments want to **protect** their populations from unnecessary risks.
- Insurers want to know that equipment will not cause loss of life or **damage**.
- Buyers want **proof** about a product or system's safety, performance, and reliability.
- Users of equipment and consumers want to be able to **trust** the product or service they are purchasing.

CA allows the ability to determine if a product or service is what it appears to be, and if a system performs as it should. It provides insights into safety, quality, efficiency, effectiveness, the economic use of materials and energy, if a product fits and operates correctly with other products, and its effect upon the environment (such as pollution and noise).

There are two main benefits of performing CA: reducing costs and barriers to trade, and providing reassurance to customers/consumers of object quality.

<u>Reducing cost and barriers to trade</u>
IEC International Standards and CA help reduce trade barriers caused by different certification criteria in different countries. By having an internationally accepted means of assessing whether objects meet specification requirements, vendors can provide certified objects to multiple jurisdictions. CA also helps to remove significant delays and expense for multiple testing and approval, as would be required if each jurisdiction had its own set of specifications to confirm the acceptability of objects. This allows industry to reduce costs and enter markets faster with its products.

<u>Customer/consumer assurance of quality</u>
Customers gain assurance of object quality based on the requirements described in the specifications that the assessment is conducted to. This allows the assurance that various requirements

placed on the object can be achieved. Consumers can be confident that electrical and electronic products are safe to use, energy efficient and environmentally friendly, and perform to expectations.

IEC's Conformity Assessment Systems

The three IEC CA systems include IECEE (covering electrical and electrotechnology products), IECEx (covering equipment used in explosive environments), and IECQ (covering electronic components). Their ultimate objective is to facilitate global product acceptance by means of **one test**, **one certification** and, when appropriate, **one mark** valid in all markets.

Each of the systems offers CA schemes based upon IEC International Standards and other specifications when approved by the CAB (Conformity Assessment Board). Independent third party organizations that perform CA activities based on IEC International Standards are listed on each specific IEC Conformity Assessment System's website.

IECEE

IECEE– IEC System of Conformity Assessment Schemes for Electrotechnical Equipment and Components.

IECEE covers safety and performance for a wide variety of equipment and components used in homes, offices, workshops, healthcare facilities, and more. IECEE Test Certificates are mutually recognized by all members. A product that has been tested in one member market will not have to be retested in another if the relevant national differences have been taken into account. As a result, approval and certification at the national level is greatly facilitated.

IECEx

IECEx – IEC System for Certification to Standards Relating to Equipment for Use in Explosive Atmospheres

IECEx covers the highly specialized field of explosion protection associated with the use of equipment in areas where flammable gases, liquids, and combustible dusts may be present. This System provides the assurance that equipment is manufactured to meet safety standards, and that services such as installation, repair, and overhaul also comply with IEC International Standards on safety. The System has recently been endorsed by the UN Economic Commission of Europe (UNECE) as the recommended CA system for hazardous environments.

IECQ

IECQ – IEC Quality Assessment System for Electronic Components

IECQ ensures the safety and reliability of electronic components used in the IT industry, avionics, and so on. It also monitors and tests the

use of hazardous substances in electrical and electronic equipment and provides assessment and certification for facilities that handle unprotected electostatic discharge (ESD) sensitive devices.

Objects that undergo Conformity Assessment

As discussed above, pretty much anything can undergo CA, from products and services to processes and people. How to carry out the CA properly, professionally and effectively is itself the subject of International Standards.

Objects that can undergo CA can be classified into three broad categories, products, processes or management systems, and people. The following sections will briefly describe these categories while a relevant international standard will describe how CA should be carried out for each type.

Product Conformity Assessment

CA of products typically involves the examination of physical characteristics and behaviour (using testing and inspection). The IEC Systems focus mainly on product CA activities since the majority of the subject areas of IECs standards cover electrical or electrotechnology products. Independent third party organizations that perform CA activities based on IEC International Standards include TÜV, Exida, and Underwriters Laboratories. When a country adopts an IEC International Standard as a national standard it may on certain occasions modify the standard to include additional specifications related to local conditions. As the technical CA in these countries are performed according to their national standards, then the technical assessment is in fact done according to IEC International Standards; however it is important to clarify that for each country there is the possibility to have specific requirements so as to comply with national legislation.

Conformity Assessment of processes or management systems

CA of processes or management systems looks at the behaviour of mechanisms or individuals and includes the examination of structures, rules, and documentation. These types of assessments typically include manufacturing processes, and quality and environmental management systems.

Conformity Assessment of a person

The IEC CA systems have set up specific certification for assessing the professional role of a person specific to the training, skills, and performance of the person against the criteria specified in a standard.

5. Involvement

5.1 The importance of being and staying involved

Active participation in standardization work keeps you up-to-date with what is going on in the industry. Effective participation in the International Standards arena has become a requirement for competitiveness in the global market place. Staying involved will bring you many advantages and opportunities to:

- Share and get knowledge

  You have a say in what goes into an IEC International Standard as the standardization development process is based on consensus. Sharing your knowledge with others will help strengthen the industry pool of resources and help improve the content of a standards publication. Standardization facilitates trade and new market development in which by staying involved in the process you gain information ahead of your competitors on product requirements. During the process, you get to know what other companies are doing in the field by being actively involved in the standardization work.

- Advocate and influence

  Through participation in IEC TCs (Technical Committees), you are given the opportunity to gain recognition for the vision of your company and the industry in which you are interested. You are given access to state-of-the-art platforms and a means to contribute to the future of electrotechnology in the world. The standardization work that you are doing today will be the basis for the product developers, engineers and managers of tomorrow. Your input and contributions have influence on the future innovation and technological development

- Expand your professional network

  Thousands of companies, regardless of their size and market share, participate in IEC standardization work. By staying actively involved in this platform, you will get the opportunity to expand your professional network and benefit from technical and professional interaction with others. Multinational companies like Hitachi are willing to send their experts to participate in international standardization because through this platform the company is able to disseminate technology that is currently in development throughout the world (further testimonials from industry players are available on the IEC website). Having a larger professional network and contributing to IEC standardization work in turn helps your company to become a key player within your industry and with greater impact on your business.

- Finding your area of interest or expertise

  IEC International Standards address safety, performance, reliability and provide built-in interoperability, metrics and test procedures, state-of-the-art guidelines about the use of hazardous materials and substances, environmental impact and recycling. The standards are the basis for and support all forms of CA (Conformity Assessment). By participating and staying involved in IEC standardization work, especially for young engineers and managers, you will certainly find your area of interest and expertise within the 170-plus TCs and SCs (Technical Committees and Sub Committees) listed with description in their core activities.

For more information, go to:
http://www.iec.ch/perspectives/industry/whats_in_it.htm
http://www.iec.ch/perspectives/industry/companies/

5.2 How to get involved?

With your National Committee

A detailed list of all the TCs and SCs with a description of their core activities can be found on the main website. If you are not sure whether your industry participates in IEC standardization work or you would like to get involved in TC and/or SC work, you should contact your own NC for further information. The list of participating countries and respective NCs are also listed in the main website.

As a Young Professional

The YP Programme is a newly introduced platform within the IEC community that brings together the world's upcoming expert engineers, technicians and managers. The programme provide then with the opportunity to get involved in shaping the future of international standardization and CA in the field of electrotechnology. The IEC YPs are selected by their IEC NC to represent their country as future leaders on the IEC global platform.

Criteria for eligible young professionals to participate in this programme are:

- Have some experience of standards development or using standards in the context of CA
- Be aged early 20s to mid-30s
- Work for a business, industry, association, education body or government institution that is using, benefiting from or contributing to the IEC's work

5.3 Online tools

The IEC has developed several online tools and applications designed to help everyone with their daily IEC activities. There are currently 13 online tools and applications available for use.

The following electronic online tools are those mostly used within the IEC community to carry out standardization work:

Your profile

Expert Management System

NCs use EMS (Expert Management System) to assign IEC Roles/Permission which indicates a user's degree of participation as an expert and the authorization to access the relevant documentation. NCs will provide WG/PT/MT (Working Group/Project Team/Maintenance Team) experts and TC/SC Officers an IEC username and password. Once entered in the application, the password may be changed accordingly. TC/SC Officers and experts may view the complete details for the experts in their committee and manage own personal details (email, address, etc.)

Connecting with other experts

Collaboration Tools

The CTS (Collaboration Tool Suite) enables officers and experts from IEC National Committees and regional partner organizations to connect with other experts around the world and share their standardization work through an easy online tool. Access to the application will need the IEC login (username and password). The Collaboration Tool functionalities include file upload and/or download, version control, setting meeting folders and discussion forums at TC/SC or WG/PT/MT level, sending group emails and task assignment etc.

Registering for meetings

Meeting Registration System

The MRS (Meeting Registration System) application allows experts to register to attend TC/SC meetings and/or the IEC General Meeting. IEC login is required. Meeting organization and accreditation take place online and are managed by the appropriate parties. Participation may be subject to accreditation rules. The NCs manage meetings and registration online. Consult the list of meetings and events to see locations and dates.

Voting and commenting

Electronic Voting

Individuals who have been assigned Voting and/or Commenting rights by their NC may add comments and/or cast votes online. The list of documents open for vote and/or comment can be found here.

Staying up to date

NewDocs

NewDocs is a weekly email alert listing all documents posted on the IEC document server during the past seven days. Subscriptions are open to everyone. If you are interested in following of more than 10 or 20 committees, NewDocs list can help you organize your lists better. Whilst you can generate a list of documents for all committees in which you have an interest, access to the document themselves will still require authorization of the committee in question. Request for access to documents of a particular committee should be directed to your NC.

Web conferencing

GoToMeeting Web Conference

This tool is especially useful for those who wish to share screens (audio and video), carry out web conferencing, host an online meeting and work with people located in different parts of the world. Request to hold online meetings for your IEC standardization work can be directed to the Technical Officer of your TC/SC with the following information:

The name(s) and email(s) of the participants you wish to invite to the online meeting.
The name of the Chair of the meeting, i.e. the person in charge of running the meeting.
The preferred date(s), time(s) and time zone, and duration of the meeting.

The Technical Officer will respond to your request and send out email invitations to all participants. You can then connect to the meeting using the link provided in the email invitation.

Online terminology

Electropedia

Electropedia (also known as IEV Online) is the world's most comprehensive online electrical and electronic terminology database containing more than 20 000 terms and definitions in English and French organized by subject area, with equivalent terms in various other languages: Arabic, Chinese, German, Italian, Japanese, Portuguese, Polish, Russian, Spanish and Swedish.

Patents

Patents

A list of all patent declarations received by the IEC is archived in this database. The Patent Information databases are not certified to be either accurate of complete, but are a reflection of the information that

has been communicated to the organizations. The Patent Information databases may be viewed as simply raising a flag to alert users that they may wish to contact the entities who have communicated Declaration Forms to the organizations in order to determine if patent licenses must be obtained for use or implementation of a particular recommendation and/or deliverable.

Mailing Lists

Mailing Lists

The mailing lists allow TC/SC Secretaries or Chairmen to exchange information between the members of the same group. The e-mail addresses of each individual are be added to the mailing list. Once the e-mail is sent to the list, it will be then distributed to all members. This avoids long e-mail address lists, incorrect addresses, etc. There are also several public IEC (via RSS Feeds/Email Alerts) available by subscriptions which are:

IEC *e-tech*– The principal online source of news, the IEC *e-tech* reports every month to the global IEC community and other interested readers. You can subscribe to receive it here.

Just Published – The IEC's free email service delivered twice a month details all new publications released over the previous two weeks and explains their relevance to the market, thus providing more focused and value-added information.

News releases – News releases regularly signal important events and provide news on key international standards.

TC News – The TC News is an online publication that appears at regular intervals and is primarily intended for experts in IEC TCs and SCs. Subscribe for free and receive an email alert that lets you know when each new edition is online.

The following online tools and applications have limited and restricted access for use:

- Library Server

  The Library Server is a restricted website for IEC NCs and authorized sales outlets. The server contains all IEC Publications in electronic PDF (portable document format). This facility can be used for distribution and sales of IEC Publications following the conclusion of the relevant bilateral agreement between the relevant NC and the Central Office.

- Management Server

  The IEC Management Server provides limited and secure access to the selected members of the IEC management committees.

- Technical Server

  The IEC Technical Server provides limited and secure access to the selected members of SMB (Standardization Management Board), CAB (Conformity Assessment Board) and other technical advisory committees.

- Subscription Database Management

  The IEC Subscription Database Management is a restricted facility which allows IEC NCs and NC-appointed Sales Outlets to register and give direct access to their customers to the IEC Online Database on a subscription basis.

6. FAQ

6.1 How do I get involved?

To start with, please contact the IEC NC (National Committee) in your country to find out how you can get involved. Each IEC NC represents the full range of your country's electrotechnical sector so it doesn't matter what background you come from. The IEC NC can help you identify the right TC (Technical Committee) for you to get involved in and explain in detail the process. You may want to interact with other experts who are already participating and you can do so through your country's IEC NC.

If your country doesn't have an IEC NC because it is not yet a member of the IEC, or is not involved in the TC or SC (Subcommittee) that is of the most interest to you, please contact IEC Central Office in Geneva to find out more.

The IEC has currently more than 170 TCs and SCs with over 1000 working groups.

6.2 How do I balance involvement in the IEC and the rest of my work?

Participating and sharing your expertise in the standardization efforts related to your industry or area of interest requires time and dedication. It is advisable for you to get involved in the IEC TCs, SCs and/or WGs (Working Groups) that relate directly to your work. This is the basis on which you will be able to carry on your normal work and contribute to IEC standardization work.

6.3 How do I convince my employer this is worth the time and expense?

Companies that allow their employees participate in IEC standardization work have many advantages as follows:

- Be among the leaders in related industry to establish a level playing field for all
- Help set standards that other competitors have to equal
- Facilitate trade and new market development
- Know about and influence product requirements
- Improve productivity and save money
- Get to know what other companies are doing in the field
- Benefit from the technical and professional interaction with others

Participation in IEC standardization work will help companies in building network among leaders in the industry, improve quality of products, simplify processes, and accelerate innovations.

More information on these benefits can be found here:
http://www.iec.ch/perspectives/industry/whats_in_it.htm

6.4 How do I ensure my company's interests are considered?

If your company develops devices or systems that contain electronics or use, produce or store electricity, then you are certain to find an IEC TC/SC that develops globally relevant standards you might want to use. The quickest way is to contact your country's IEC NC to find out which of your competitors already sit at the table where the global rules of trade are written and then join the identified IEC TC/SC.

Once you are a member of a TC/SC you should attend meetings regularly and whenever possible, and communicate with other experts participating in the area of interest. By sharing your expertise and experience with the IEC community, it will then show you and your company's dedication towards standardization work and help you be among the leaders in the related industry.

6.5 How do I know what standards are forthcoming and what the trends are?

To start with, you can get the summary of standards and trends on the IEC website. You can view standards currently in development and monitor their progress. You can browse areas of the IEC website known as "dashboards" which are dedicated to each TC (http://www.iec.ch/dyn/www/f?p=103:62:0::::FSP_LANG_ID:25). If you would like to get more involved, you may want to participate or observe the committee which you are interested in, which starts with your NC.

IEC Website

To find out further information on any particular standard, or to find out more about a particular area of work, the easiest thing to do is to obtain the information from the relevant TC responsible for the standards/area of work.

Each TC dashboard allows you to view the scope of a particular TC, along with the strategic business plan of the TC, the committee structure including membership lists, TC officers (e.g. the chair person, secretary, technical officer),the associated SCs (Subcommittees) and WG (Working Group) plus the TC's liaisons with other committees and third parties.

Although a login is required for full access (login can be granted by your NC), there is a lot of information that is accessible to everyone such as an overview of current work programmes that gives information on work stages with key dates, publications produced by the TC and details of previous and next meetings.

NC level

A vital feature of a truly International Standard is the fact that it can be submitted to public enquiry in any of the IEC member countries. To find out what standards are forthcoming, you are encouraged to search through your NC website to find out how your NC deals with public enquiry.

For example, in the UK there is a dedicated website called Standards Draft Review (http://drafts.bsigroup.com/) that provides an easy way for anyone to comment on draft International Standards. This enables the NC to give national feedback from the widest possible audience before publication. All comments received are sent to the responsible NC mirror committee for review and, where appropriate, incorporated into the NC national position submitted to IEC (i.e. they form part of the NC's 'Committee Draft for Vote' – see Standards Development – Processes & Procedures: http://www.iec.ch/standardsdev/how/processes/).

In summary, it is possible to obtain all draft International Standards that are out for public enquiry from your NC (providing your NC has the relevant participation in the relevant TC). Please note that charges for draft standards by your NC may be applicable.

TTA (Technology Trend Assessment)

Technology Trend Assessments highlight certain aspects of a technology that might conceivably become an area for standardization in the near-to-medium term. It responds to the need for global collaboration on standardization questions during the early stages of technical innovation. A TTA gives the state of the art or trend in emerging fields. It is typically the result of pre-standardization work or research. A list of TTAs is available in the IEC website (http://www.iec.ch/standardsdev/publications/tta_list.htm) along with a brief synopsis of each TTA. Full TTA publications have to be purchased from the IEC.

6.6 How do I participate more on the NC level?

NC committees and their members play a vital role in the development of standards. NCs actively seek to bring together all those with significant interest in particular projects.

Representations are usually sought from many spheres including: consumer organizations; professional institutions; certification, testing and inspection bodies; educational establishments; research organizations; notified bodies; enforcement bodies and government departments.

NCs also work with trade associations or equivalent organizations as a means of representing most standards users in business. This enables a wide measure of consultation and support in standards work.

All participation is on a voluntary basis, and there are a number of different ways that you can be involved in helping to develop standards. For example, you could comment on Drafts for Public Enquiry, or become a Committee member to fully participate.

Committee Members

All NCs are representative of the interests of users, manufacturers, government departments and other bodies concerned with their work.

All Committee Members give their time and expertise on a voluntary basis often with the support of their employer or trade association.

The commitment required varies between and within committees, depending on the current work programme and the level of participation. Most committees only meet a few times each year.

If you are interested in participating in the work of a NC you contact your NC Customer Services who can put you in touch with the relevant person to discuss how this can be achieved.

Hint for YPs

Hint for YPs: It is encouraged to proactively seek which TCs at national level are involved within your particular field of expertise or interests. You should find out what representation makes up that committee i.e. which trade associations, or regulatory bodies etc. Think about who you could represent on the committee, and get in touch with the relevant organizations about how to become involved. Communicating with key people specialized in what you are interested in is necessary to participate the committee on your NC. For that reason, for example, you may actively participate in seminars, scientific societies, etc. to network with such individuals. This is also important to enhance your skills as an expert in your NC.

It is important to have the full backing of your employer, as time to participate with the committee is essential, and depending on the rules of your NC, it is likely that NCs will not wholly pay for travel expenses (e.g. to committee meetings), and it is normal that your employer will be expected to cover these costs.

6.7 How do I convince my NC to start a Young Professionals Programme in my country?

If your NC does not already have a YP programme advertised, you could contact your NC to find out if there are any initiatives to introduce a YP programme. It may be that you contact your NC and encourage them to start a mirror YP programme on a national level, and even volunteer to help start it.

If they do not have any initiatives currently in place, you could describe how a YP programme could contribute to your NC. The contribution is to develop new leaders, expand the latest technologies and increase

opportunities to experience global technology. It may also be interesting to research the average age of NC participants, and the rate of new participants to retiring participants. However, opening a YP programme needs funding, and you or your NC have to get funds from participants and contributors. You may also have to negotiate with speakers who have good experience with International Standards.