



INTRODUCTION

The present issue of the *TC Newsletter* deals with two subjects.

- You may recall that the last issue covered the implications of IEC Guide 107 regarding electromagnetic compatibility. The Chairman of TC 66, Mr. Cecil Chapman, suggested providing similar information about our Advisory Committee on Safety, ACOS.

Therefore, *TC Newsletter No. 6* presents his article *Third edition of IEC Guide 104 – The preparation of safety publications and the use of basic safety publications and group safety publications*.

Incidentally, an article on ACEA will follow in the next issue.

- Everybody uses units with prefixes. But what are tebibits of Tibytes (TiB)? Were these terms invented by some misguided Working Group? The Chairman of TC 25, Assist. Prof. Anders J. Thor, explains the mystery.

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TC Newsletter

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Third edition of IEC Guide 104 – The preparation of safety publications and the use of basic safety publications and group safety publications

Cecil Chapman, Chairman IEC TC 66

The third edition of IEC Guide 104 was published in August 1997 (also available for download from IEC's webstore). Like the second, it explains how to prepare safety standards, but new material has been added to clarify the importance of basic and group safety standards.

It also stresses the importance of liaison between TCs preparing safety standards and any TCs with horizontal or group safety functions that are relevant to their work.

This article summarizes the main points of the guide, but is not a substitute for reading the guide itself.

Guide 104 uses the term 'publication', and explains that this includes standards, technical reports, and guides. Since most of the publications concerned are standards, this article uses the term 'standard' except where quoting from the guide, but statements about standards also apply to the other types of publication.

IEC Guide 104 and ISO/IEC Guide 51

Guide 104 is intended to supplement ISO/IEC Guide 51: Safety aspects - Guidelines for their inclusion in standards. Ideally this article should cover both guides, but Guide 51 is at present under revision, and a detailed description of the new edition is not possible until the text is finalized.

Guide 104 includes many of the most important points of Guide 51, but it does not deal with risk assessment, which is covered in some detail in Guide 51. It is therefore important that everyone involved in preparing safety standards should read Guide 51 too.

The authority of Guide 104

Because the provisions of Guide 104 are written with the verb 'should', it might be thought that the guide is merely advisory. However the introduction makes it clear that compliance with the guide is not just optional, by stating:

" TCs dealing with subjects relating to safety for the whole, or for a specific part, of their activities, are expected to follow the provisions of this guide.... "

Types of safety standard

Basic safety standards

Basic safety standards are prepared by TCs with a horizontal safety function. They deal with specific safety-related matters that are applicable to many electrotechnical products.

Basic safety standards are primarily intended for use by TCs in preparing safety standards. They are not intended for use by manufacturers or certification bodies.

The introduction or scope of a basic safety standard should include the following statement:

"One of the responsibilities of a technical committee is, wherever applicable, to make use of basic safety standards in the preparation of its standards."

(In this context a recent IEC Administrative Circular said: 'it must be understood that the use of a basic publication is a must!')

Group safety standards

Group safety standards are prepared by TCs with a group safety function. They deal with all safety aspects of a specific group of products within the scope of two or more product TCs.

A TC preparing a safety standard for a product within the scope of a group safety function should make use of the relevant group safety standard. If the product TC wishes to modify requirements or test methods, it may do so after consultation with the TC with the group safety function.

Product safety standards

Product safety standards cover all safety aspects of one or more products within the scope of a single TC.

Product standards including safety

Guide 104 includes the following statement about product standards, which include safety as well as other aspects:

"Safety aspects and performance aspects should not be covered in the same publication, as this makes it difficult to assess conformity with the safety aspects alone. If, exceptionally, there are reasons to cover them in the same publication, safety aspects and performance aspects should be clearly differentiated from each other."



Preparation of product safety standards

Hazards to be considered

A product safety standard should cover all safety aspects of the products within its scope, and not be confined just to electrical safety. It should include all the requirements necessary to reduce risks, both in normal condition and single fault condition. (A note explains that other fault criteria as well as single fault condition have to be considered in the field of 'functional safety' which is that part of overall safety which depends on the correct functioning of safety-related control systems)

Annex A gives the basis for a check list, including sections on marking, electric shock, mechanical hazards, fire, and various other hazards.

Principles

In specifying requirements the following principles should be applied:

- equipment should be inherently safe by design and construction;
- where the above cannot be applied, additional protective measures in relation to hazards should be specified;
- if there are any risks not reduced to a tolerable level by the above means, it should be specified that users need to be informed of such risks.

Safety during the life of the equipment

The guide states that consideration should be given to:

- installation and putting into service;
- normal use of the equipment;
- reasonably foreseeable misuse;
- maintenance by the user;
- servicing by service personnel.

Safety measures to be considered include:

- appropriate design and construction;
- procedures and warnings in the manufacturer's documentation accompanying the equipment.

Conformity

For every requirement, a standard should specify a method for checking conformity.

Liaison between committees

Product committees

Their responsibility is defined as follows:

Product TCs should determine which existing basic safety publications and group safety publications are relevant to their work, and establish and maintain liaison with the TCs responsible for preparing those publications.

Product TCs should make use of any relevant basic safety standards. They should not modify requirements or test methods in basic safety publications. In some cases they may need requirements or test methods which fall within a horizontal safety function, but which are not adequately covered in existing standards. In such cases the product TC can submit proposals to the TC with the horizontal safety function to develop a new basic safety standard or make amendments to an existing one.

Similarly, product TCs should make use of relevant group safety standards. Unlike basic safety standards, requirements or test methods of group safety standards can be modified by a product TC itself, but only after consultation with the TC with the group safety function.

If a TC with a horizontal safety function or a group safety function does not accept a proposal from a product TC, or cannot offer completion by a date acceptable to the product TC, the matter should be referred to the IEC Advisory Committee for Safety (ACOS) for resolution.

Committees with safety functions

These committees should inform IEC Central Office of any new work item proposal (NP) relating to a basic safety standard or group safety standard, and say which TCs may be affected. Central Office will list these TCs when circulating the NP, so that National Committees can consult experts from those TCs.

Committees with a safety function should respond

to liaison requests from product TCs, and keep them informed about the progress of relevant work.

Liaison with ACOS

Although not stated in the guide, ACOS tries to maintain liaison with all TCs undertaking work connected with safety, and a member of ACOS is appointed to liaise with each such TC. In some cases ACOS has not known that a particular TC was preparing safety requirements, and this has led to more than one set of safety requirements being prepared for the same group of products. To avoid this, any committee involved in safety work should ask ACOS for a liaison if it does not already have one.

Conclusion

The new edition of Guide 104 is a valuable tool for all TCs with responsibilities for safety aspects. Among the benefits to be obtained from its use are:

- ensuring that product standards consider all safety aspects for the products within their scope;
- promoting consistency of safety requirements common to a number of TCs, by the proper use of basic and group safety standards;
- reducing the risk that a single product will have to conform with more than one standard, perhaps with contradictory requirements;
- stressing the importance of keeping safety requirements separate from other aspects.

IEC standardizes prefixes for binary multiples - Amendment 2 to IEC 60027-2

Anders J. Thor, Chairman IEC TC 25

Because of the near equivalence of 10^3 and 2^{10} the SI (International System) prefixes kilo (k), mega (M), giga (G) etc. are often used in information and computer technology to denote powers of two, for example kilo: $2^{10} = 1\ 024$ and mega: $2^{20} = 1\ 048\ 576$. However, the SI prefixes are defined to denote *exact* powers of *ten*, i.e. kilo: $10^3 = 1\ 000$ and mega: $10^6 = 1\ 000\ 000$, etc. and the popular use of k, M and G introduces an appreciable inaccuracy. The relative error increases for prefixes denoting higher powers. Often these errors do not matter, but in scientific texts it is necessary to be more accurate. Therefore IEC TC 25, *Quantities, units, and their letter symbols* has prepared an International Standard for prefixes for binary multiples to be distinguished from the SI prefixes for decimal multiples. These new prefixes are:

Factor	Name	Symbol
$(2^{10})^1$	kibi	Ki
$(2^{10})^2$	mebi	Mi
$(2^{10})^3$	gibi	Gi
$(2^{10})^4$	tebi	Ti
$(2^{10})^5$	pebi	Pi
$(2^{10})^6$	exbi	Ei

The prefix kibi (origin: kilobinary): $(2^{10})^1$ is derived from kilo: $(10^3)^1$; mebi (origin: megabinary): $(2^{10})^2$ is derived from mega: $(10^3)^2$ etc.

Thus the names and the symbols of the new prefixes are related to the old prefixes in a simple way and should therefore be easy to remember and to use. Of course, the new prefixes may also be useful outside the field of information technology.