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BILINGUALISM OF IEC STANDARDS

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Bilingualism of IEC Standards

I. Introduction

I. 1 General

International standardization is an undisputed necessity, and the International Electrotechnical Commission (IEC) is responsible for all sectors of electrical/electronics engineering.

Standardization in IEC has numerous technical, economic, political and managerial aspects.

Certain linguistic aspects relate to the role of Standards as communication tools. These aspects are not merely of academic interest, but they are interrelated with some important issues:

- Search for improvement of the standardization process
- Maintaining and improving the quality of IEC Standards
- Policy towards member bodies
- Marketing issues
- Coordination with other international organizations and with regional organizations

- Role of Standards as vehicles for technology transfer.

Technical standardization is, and always will be, undertaken by experts with a technical rather than a language background. Linguists have limited comprehension of technical questions, and they get little involved in the management of technical projects.

Technical experts, on the other hand, generally lack a specific background in linguistics.

It is therefore unsurprising that in the past neither engineers nor linguists paid much attention to the linguistic aspects of bilingual standardization.

I.2 Past and present language problems

- The shadow of the Tower of Babel

The disturbing myth of the Tower of Babel has always fascinated painters and writers. This strange construction still casts its shadow on our imagination. Perhaps because of the babel of tongues it is still with us; or because whenever man conceives a new, grand ambition, the memory of the first technological disaster assails him for a moment.

The Old Testament account tells us that a long time ago, when the whole earth was of one language, the people decided to build a city and a tower reaching to heaven, and to make themselves a name, lest they be scattered over the whole earth. But Jehovah was displeased, confounded their language so that they could not understand each other, and scattered them all over the earth. So they ceased to build the city and tower.

- Situation in the IEC

Its more than 50 member countries are indeed scattered all over the earth and still use many languages. Nevertheless, they work together efficiently – this time building not a tower but a Standards system, certainly no mean achievement.

IEC Standards differ from other texts. In fact, they

– are bilingual

– are prepared by technical experts who frequently work in a lingua franca

– have nevertheless to be clear and precise

– use linguistic codes other than natural language

– are prepared in line with special rules for their development, structure and drafting

– have to be fit for use by experts with mother tongue other than English (EN) or French (FR).

As similar conditions exist in other organizations, the present account may also be of interest to their experts (e.g. in ISO and ITU).

I.3 Structure of the account

IEC standards are bilingual texts prepared by groups of experts and most experts are to some degree bilingual. Therefore, bilingualism is a fundamental aspect of IEC work. See II. General aspects of bilingualism, and III. Functional bilingualism.

The equivalence of matching bilingual texts must be ensured. The general concept of equivalencies is considered, with the language combination French/English as an example. See IV. Equivalence of bilingual French/English texts.

IEC Standards are technical or scientific/technical texts. Many special requirements must be taken into account, both in the preparation and the translation of the relevant documents. See V. Translating scientific/technical texts, VI. Features of scientific/technical texts, and VII. Checking, revision and editing.

The preparation of IEC Standards has to follow the ISO/IEC Directives. See VIII. Development, structure and drafting of IEC Standards.

IEC Standards have several distinct textual features, e.g. their terminology, bilingualism, letter symbols and graphical symbols. See IX. Specific linguistic aspects of IEC Standards.

Many experts contribute to IEC Standards during and between the different project stages. These experts are frequently bilingual and work in a bilingual environment. Section X. Linguistic behaviour of participants in standardization, presents an eclectic assessment of their performance.

The bilingualism of IEC Standards aims at improving their quality. The relevant contribution of the French texts is addressed in XI. Bilingualism of IEC Standards and fitness for use.

II. General aspects of bilingualism

II.1 General

To be bilingual or multilingual is not the aberration supposed by many (particularly, perhaps, by people in Europe and North America who speak a “big” language); it is, rather, a normal and unremarkable necessity for the majority in the world today [1].

There are two approaches to bridging language gaps: lingua francas and translation.

Apart from an almost useless word-for-word exercise, every act of translation involves interpretation and judgment. Translation may have many disadvantages, but in a multilingual world it is needed.

Bilingualism has been defined in several ways:

- Bilingualism results from the addition of a perfectly learned foreign language to one’s own undiminished native tongue.
- Bilingualism is the alternate use of two languages.
- Bilingualism begins with the ability to produce complete and meaningful utterances in the second language.

Generally speaking, earlier definitions tended to restrict bilingualism to equal mastery of the two languages, while later ones have allowed much greater variation in competence. But since this relaxation proves in practice to be as unsatisfactory as an argument from perfection - at least for the purpose of defining bilingualism in any generally applicable fashion - most modern treatments acknowledge that any meaningful discussion must be attempted within a specific context, and for specific purposes.

Further complicating this question of where bilingualism starts is the fact that any line drawn must cross not just one general language

dimension, but many more specific threads of ability. See Section III. Functional bilingualism.

Bridging of language barriers can also be accomplished through a shared second language, through agreement on a lingua franca.

II.2 Lingua francas

There have often existed important lingua francas which serve as aids to cross-group understanding, and which usually represent the language of a powerful and prestigious society; thus, Greek, Latin, French, Arabic and, currently, English, have all held sway [1].

Serious questions have been raised recently about the greater language-killing potential of the present "world language" English.

The dominant languages serve as bridges between national groups and language communities. These varieties achieved widespread power and status because of the heightened fortunes of their users, and not because of any intrinsic qualities of the languages themselves. The most common elements here have to do with military, political and economic might, although there are also examples in which a more purely cultural status supports the lingua franca function. However, in this latter case, the cultural influence which lingers has generally grown from earlier associations with those more blatant features just mentioned. The strength of these languages derives from the fact that their original users control important commodities - wealth, dominance, learning - which others see as necessary for their own aspirations.

After Latin, several other languages have achieved lingua franca status. French, for example, was a powerful link throughout Europe and beyond by the eighteenth century. It had particular influence at the higher levels of society.

Today, there is no doubt that English is the most important global variety and thus has the greatest status as a world lingua franca. Across all levels of proficiency and "nativeness", English is probably spoken by more people than any other language.

More than half of the world's learned journals are in English, 80 per cent of all computer information is stored in English, the language of most multinational companies is English, English is formally studied

as a second language more than any other variety, English is the main medium of international popular music and entertainment.

II.3 Second-language learning

There are two types of second-language learners:

One type needs to know a language for purely utilitarian reasons, e.g. because it is necessary for the learner's career, and therefore this type has an instrumental orientation to learning it;

the second type wishes to be integrated, at least in part, into the other language group and not to be rejected by that group. These learners, who have an integrative orientation to language learning, usually attain a much higher level of fluency than the first type [2].

Education for the élite has always included a training in languages which evolved from a potent combination of necessity, snobbery and social boundary marking. Indeed, remnants of this are still visible, and "finishing" education still includes an important language component.

Within the English-speaking world, in particular, the predominance of English has meant a progressive dilution of effort and achievement here, a decline to be seen even at the highest postgraduate levels, where traditional language requirements are increasingly waived. Among other things, this had the interesting effect of even more positively marking those with foreign-language competence [1].

Especially within powerful linguistic groups, it is common to find references to the difficulties involved or to the particular lack of language talents supposedly possessed. Thus, in the modern world, English and American monolinguals, for example, often complain that they have no aptitude for foreign-language learning. This is usually accompanied by expressions of envy for those multilingual Europeans, and sometimes (more subtly) by a linguistic smugness reflecting a deeply-held conviction that, after all, those clever "others" who do not already know English will have to accommodate themselves to a world made increasingly safe for anglophones.

There is an extensive literature on the specifics of second-language acquisitions, both "natural" learning and that which occurs formally, at school. It should be stressed that, with sufficient motivation and opportunity, all normally intelligent people can learn another

variety; those who claim they are “no good” at foreign languages are usually lacking in one or both of these. This is not to deny that there may exist individuals who have a greater innate or acquired aptitude - a “good ear” may be helpful, as well as a good memory and a capacity for self-initiated application. Beyond these, adaptability and genuine interest in other cultures are no doubt important. It can be seen, though, that virtually all of these qualities are of general value and do not form a package specifically directed at language learning.

The formal methods used to teach language are many, and they range from well-researched techniques to schemes advertised by fly-by-night charlatans.

II.4 Bilingualism and intelligence

It must be stated that bilingualism per se does not have much value. Linguistic fluencies must be matched by wit. In other words, it is not sufficient to have many languages to express one’s thoughts if there are no thoughts worth expressing.

It is of course true that the time spent on language learning must necessarily reduce that available for other pursuits.

One can quote many expressions of the problems allegedly faced by bilinguals; these include split national loyalties and problems of “marginalization”, emotional difficulties, moral depravity (through receiving inadequate religious instructions in their mother tongue), stuttering, left-handedness, excessive materialism, laziness and detrimental consequences for intelligence. All these ideas seem dated, to say the least. Experimental evidence is always, of course, in shorter supply than the speculation behind most of these assertions.

The problems of bilinguals are much more likely to stem from social factors in bilingual households than from linguistically driven “mental conflict”. This is much more in line with modern thinking, although if it were true that bilingual families have a heightened level of social tension this could be taken as an indirect discouragement of bilingualism. But again, there is no reason to believe that such practices are anything more than aberrations of an unsystematic kind.

Of all connections made between bilingualism and other features of individual life, none is more central or contentious than the presumed

link between bilingualism and intelligence. Many prominent linguists in the past felt that there was a trade-off which can be formulated as follows: It is, of course, an advantage for a child to be familiar with two languages but without doubt the advantage may be, and generally is, purchased too dear. First of all the child in question hardly learns either of the two languages as perfectly as he would have done if he had limited himself to one. Secondly, the brain effort required to master the two languages instead of one certainly diminishes the child's power of learning other things [3].

Early studies tended to associate bilingualism with lowered intelligence, and it is unsurprising that many of them were conducted, in America, at a time of great concern with the flood of immigrants from Europe (roughly 1900-20). The story of the intelligence-testing itself, which flourished at that time, is an example of the misuse of "science" allied to ignorance and prejudice. One study concluded, for example, that "the use of a foreign language in the home is one of the chief factors in producing mental retardation" [1].

Assertions like this are understandable only in their context but even so, even allowing for general intolerance and nativism, even understanding the feelings of those concerned to protect the social status quo from a horde of barbarians (in the Greek sense of that word), it is still chastening to think that such comments could appear in respected academic journals. This is not just a new-world disease either; at about the same time, scientists in the old world were gearing up for a full-scale denunciation of "Jewish science".

A turning point came in the early 1960s, when findings showing a positive relationship between intelligence and bilingualism began to appear. The bilinguals were found to outperform their monolingual counterparts on both verbal and non-verbal intelligence tests and the authors concluded that the bilingual child had "mental flexibility, a superiority in concept formation and a more diversified set of mental abilities". However, they also noted that "it is not possible to state from the present study whether the more intelligent child became bilingual or whether bilingualism aided his intellectual development".

II.5 Interference

It is probably not possible to keep the patterns of two (or more), languages absolutely pure, so that a bilingual becomes in effect two monolinguals, each speaking one language perfectly but also perfectly understanding the other and able to produce in one the meaning of the other without at any point violating the usages of either language [3].

Interferences seldom affect communication; bilinguals usually develop enough skills in their weaker language to communicate satisfactorily with monolinguals, and the latter quickly grow accustomed to a foreign accent, a stilted syntax, and words with slightly different meanings. Language conservatives magnify the significance of interferences, which are usually of small import to the persons communicating.

Interferences can occur at all levels of language production in both speaking and writing. Four domains are concerned: pronunciation, words and idiomatic expressions, syntax, and spelling.

- Pronunciation

A "foreign accent" is often a direct reflection of the interference of another language at the level of pronunciation, that is at the level of phonology and prosody (melody curve). And unlike other aspects of a foreign language, it usually cannot be eradicated after the age of fifteen or sixteen.

- Words and idiomatic expressions

Interferences at the word level are very similar to the various types of lexical borrowing made by bilinguals when speaking to one another. However, word interferences are involuntary, and the monolingual listener may misunderstand what is being said.

Depending on the context, interference involving words and idioms will affect communication to a greater or lesser degree. Very often the monolingual interlocutor understands what is being said because of the context. When a breakdown does occur, the interlocutor will usually tell the bilingual, and the latter will make a correction or use a paraphrase.

- Syntax

Several types of interference can occur at the level of syntax. For instance, using the word order pattern of one language in the other can give ungrammatical, although quite often understandable, sentences.

- Spelling

Words that are spelt similarly in the two languages are often a source of interference for the bilingual writer, however proficient he may be.

II.6 Code-switching

It is a feature of much code-switching behaviour that the language changes are non-random, that a switch signifies something. Speakers may often switch for emphasis, because they feel that the mot juste is found more readily in one of their languages than in another, or because of their perception of the speech situation, changes in context, the linguistic skills of their interlocutors, degrees of intimacy and so on [1].

Attitudes towards code switching are often negative, particularly on the part of monolinguals who are sometimes inclined to dismiss it as gibberish. Terms like Franglais are used and often meant pejoratively. Bilinguals, too, are wont to see their behaviour here as embarrassing, impure, lazy, even dangerous, but the reasons they give for the practice - fitting the word to the topic, finding a word with a nuance unavailable in the other variety, helping out a listener, strengthening intimacy - make a great deal of sense.

II.7 Psycholinguistic aspects

Three psycholinguistic aspects will be mentioned in this context: language forgetting, performance under stress, and the difficulties in translating [3].

- Language forgetting

This phenomenon is probably as frequent as language learning. Some of its characteristics are: language production becomes hesitant as the person searches for the appropriate words or expressions; code-switching is extensive, and the person borrows whole expressions from the dominant language often without being aware of it; the pronunciation is affected at the level of intonation and stress, and also at

the level of individual consonants; and writing skills suffer considerably unless the person maintains them. It is interesting that language comprehension suffers much less; apart from the new terminology and new colloquialisms that the person may not know, he usually has no problems retaining a good understanding of the spoken language.

- Performance under stress

The fact that a person is not as fluent in one language as in the other may not be apparent at first if the pronunciation of the weaker language is good and production is correct. But if the bilingual is put under stress, the underlying dominance pattern may become very clear. Information overload, environmental, emotional or social stresses, fatigue, all these factors may unveil the hidden imbalance between the dominant and subordinate languages.

- Difficulties in translating

This is the third aspect to be reviewed. To the uninformed monolingual, the bilingual is a born translator, who should have no problem mapping one language onto the other quickly and efficiently. And yet, this is far from the truth. Many bilinguals report difficulties in translating, especially in writing.

The bilingual usually uses each language for specific purposes with certain people, and for certain topics. It is probably quite rare for a bilingual to use both languages in all domains of life.

In addition, translating is a complex skill that can be developed and trained. A given notion, evoked by a single word in one language, may require a cumbersome circumlocution in another and will therefore be less easily evocable in that language. This is why a bilingual person who speaks both languages like a native might nevertheless encounter great difficulties in translating from one language into the other. Generally speaking, contrary to popular opinion, translating has little to do with fluency, and bilinguals range from being very poor to being very competent translators.

II.8 Bilingualism and society

Some 5000 languages are spoken in about 200 countries, a fact which itself argues for the prevalence of multilingualism. But only a quarter of all states recognize more than one language. Also, even in

those countries in which two or more varieties have legal status, one language is usually predominant, or has regional limitations, or carries with it disproportionate amounts of social, economic and political power [1].

The occurrence of multilingualism at a personal level has a great deal to do with patterns of social interaction.

There is a certain correlation between simple mobility and bilingualism. Scholarly and diplomatic interaction and exchange, for example, have always necessitated multilingual facility among an élite. But daily physical mobility is also important, accounting for a more widespread, non-élite multilingualism.

Given the fact that bilingualism is a world phenomenon, but given also that official or prestige status is often restricted, it is apparent that attitudes towards bilingualism and language diversity in general are important.

At an élite level, of course, bilingualism has always been encouraged, has been itself a marker of high status. In the middle ages those European scholars, diplomats and aristocrats who spoke Latin as a lingua franca enjoyed a level of education and privilege far removed from the lives of the masses.

If the bilingual is college educated, a member of the middle or upper class, and speaks both languages without an accent, monolinguals are impressed by the ability to speak two languages and by the ease with which the person switches from one to the other. But if the bilingual is an immigrant worker who speaks the dominant language of his new country with a strong accent or is a child adapting slowly to a totally monolingual school, then monolinguals refer to "semilingualism" and the apparent dangers of bilingualism. The latter attitude is prevalent in the United States.

In general, the more monolingual a group is, the more difficult it is for its members to understand that bilinguals are just like everybody else.

II.9 Languages in contact

In this context, linguistic hierarchies and language conflicts are considered [1].

- Linguistic hierarchies

The most important attitudes, prejudices and preferences about language and language choice are those enshrined in law or sanctioned practice, for these are the codified wishes of the socially dominant. The whole area of language planning can be seen in this light. Many of the difficulties encountered by minority-language communities in particular emerge because local desires do not mesh with state policy.

Languages are best seen as different systems reflecting different varieties of human condition. Although they may be unequal at given points, this does not imply that some have, overall, greater expressive power. Rather, not all varieties have the same capabilities: different social, geographical and other conditions determine what elements will be needed and, therefore, developed. All varieties are, however, potentially functionally equivalent. Languages differ in many aspects of complexity - lexical, grammatical, phonological - and bilingual speakers will often prefer one language to another for specific purposes. But, the question of overall language “goodness” is spurious, unless we are willing to define, compare and judge the goodness of situations, contacts and social environments.

- Languages in conflict

It is not surprising that most linguistic preferences - based on historical pedigree, aesthetic judgment, “logic” or whatever - reveal a liking for one’s own variety.

As language communities come into contact in a multilingual world, the need arises for bilingualism, translation and the use of a lingua franca. Proximity, necessity and convenience also lead to borrowing and interpenetration of languages. However, it is also quite apparent that languages in contact can become languages in conflict. The force of circumstances can cause a group to abandon its original language for another; “big” languages can push smaller ones around and can contribute to their demise.

There is contact, competition and conflict among languages and language varieties, and there are reasons behind these phenomena.

Language attitudes are better understood as attitudes towards the members of language communities and are often allied with powerful protective sentiments for one's own group.

II.10 Language ecology

Ecology of language means the study of interactions between a language and its environment. In this context, seven "basic ecological variables" may be considered [1].

1. Ethnographic variables

Size and concentration of the language group, urban-rural distinctions, etc.

2. Ethnosociological variables

Sex, age, social stratification, etc.

3. Ethnopolitical variables

Group-state relations, institutional status of the language

4. Ethnocultural variables

Descent criteria, organizational promotion of group interests, etc.

5. Ethnopsychological variables

Attitudes, language-identity relationship, etc.

6. Interactional variables

Communicational mobility, language variety use by topic and situation, etc.

7. Ethnolinguistic variables

Linguistic distance between contact languages, etc.

All these variables have functions in language maintenance and language shifts. Most of them are to some extent relevant to the bilingualism of the IEC.

II.11 English versus immigrants' languages in the USA

Many people in the United States, and elsewhere, believe that English is the official language in that country. In fact, however, the framers of the American constitution did not enshrine it there; but over the past two centuries English has become de facto the main language of the country, notwithstanding the many other varieties which have co-existed with it. English assimilative pressures have prevailed among virtually all non-English-speaking immigrants over the course of a few generations. Acquisition of English competence is important for full social participation and the desired mobility which was often a major incentive for coming to America [1].

President Roosevelt said that "we have room for but one language here, and that is the English language, for we intend to see that the crucible turns our people out as Americans, of American nationality, and not as dwellers in a polyglot boarding house".

The vision is that of a linguistically efficient and socially united country where one language is seen to integrate, and where more than one is both largely unnecessary and potentially Balkanizing.

We know, from millions of cases, that the old-style "submersion" works; but the psychological cost may have been high and, more to the point, unnecessary. Perhaps a limited bilingual provision at school would have helped those early immigrants to America, both in their linguistic progress and their identity. But this, of course, is not the point.

The fact is that most "big" language speakers in most societies remain unconvinced of either the immediate need or the philosophical desirability of officially-supported cultural and linguistic programmes for their small-language neighbours. Equally common is the ignorance of the scope of bilingualism, past and present, and of the powerful relationship between languages and all aspects of social and psychological life.

II.12 Societal bilingualism

An important distinction is that between individual and societal bilingualism. In societal linguistics, the investigator is placing the accent primarily on understanding what linguistic forces are present in a

community, their inter-relationships, the degree of connection between political, economic, social, educative and cultural forces on the one hand and language on the other hand (item Ethnopolitical variables under II.10) [2].

The scope of such investigations can be very wide and can lead to implications for language policy makers and language planners, educational strategists, social engineers and media or communication specialists.

II.13 Language as core value

Whether or not in immigrant communities a second language leads to the loss of the primary language depends on the role that language plays in the immigrant community's life [2].

If the original language represents one of the core values which typify the immigrant community (fundamental component by which a group indicates its cohesion and identity) the immigrants tend to maintain their original language (item Ethnopsychological variables under II.10).

It is significant too, that whatever the motivation in becoming bilingual, speakers from communities where language represents a core value often maintain a marked foreign accent in the second language whereas this is less the case with others. It is a sort of defence mechanism against total assimilation into the dominant group.

II.14 Distance between language groups

The broad concept of distance includes social distance and psychological distance [2].

- Social distance

Social distance refers to several factors which affect the nature and amount of contact which speakers of one language group may have with those of another, thereby influencing the volume of interactions (items Ethnographic variables, Ethnosociological variables and Ethnopsychological variables under II.10).

The following aspects are relevant.

- Social dominance patterns where a politically, culturally, technically or economically superior group tends not to acquire the language of the inferior group.
- Levels of assimilation, preservation or adaptation which determine whether speakers of language A give up their specific life style and values (assimilation), maintain these (preservation), or adaptation to the life style and values of language B while maintaining language A for intergroup contact.
- Degree of enclosure which refers to the sharing or separate use of institutions.
- Cohesiveness and size of language groups which determine the amount of contact between speakers of different languages.
- Congruence or similarity of the two cultures concerned.
- Attitude towards the other community, positive attitudes increasing the likelihood of language acquisition, negative attitudes decreasing it.
- Intended length of residence.
- Psychological distance (item Ethnopsychological variables under II.10).
- Cultural shock relating to the ease or difficulty with which the cultural attributes borne by the second language and its speakers are assimilated.
- Ego-permeability which refers to the amount of inhibition felt in using a weaker language, the more permeable one is, the more likely one is to take risks in trying out the weaker language.
- Motivation, both integrative or instrumental.

These sub-components of social distance and psychological distance probably interact.

III. Functional bilingualism

III.1 General

The vast majority of people who by force of circumstances or by choice manipulate more than one language do reveal significant differences in the quality of speech produced sometimes in both languages involved but more often manifesting greater ease and ability in one than the other. Clear divergences from monoglot speech are detectable in at least one language used by the non-fluent bilingual [2].

The emphasis that has been placed upon what the speaker does with his languages in the society in which he lives leads to the idea of functional bilingualism. This term can be interpreted in two ways, a minimalist and a maximalist interpretation.

Under the minimalist interpretation a person can be called functionally bilingual if he is able to accomplish a restricted set of activities in a second language with perhaps only a small variety of grammatical rules at his disposal and a limited lexis appropriate to the task in hand.

The maximalist interpretation of functional bilingualism covers a wide range of activities and capacities in the two languages. In this case the speaker is able to conduct all of his activities in a dual linguistic environment satisfactorily. However, such a speaker may well use patterns that are alien to the monoglot reference group and show heavy signs of interference in phonology, morphology, lexis and syntax. But to the extent that they do not impede communication between speaker and listener they do not get in the way of functional bilingualism.

III.2 Receptive bilingualism

Receptive bilingualism can be considered as one form of functional bilingualism. This description fits a person who understands a second language, in either a spoken or written form, or both, but does not necessarily read or write it. An alternative term for this is passive bilingualism [2].

Receptive bilingualism is relatively easy to acquire, particularly for old learners, and does not involve the laborious acquisition of language patterns that must be at ready command for fruitful conversation or written communication with a speaker of another

language. Moreover, its long-term effects tend to be greater in that the ability to understand a foreign language can linger on for longer than the ability to speak or write it.

III.3 Productive bilingualism

The counterpart to receptive bilingualism is the situation where speakers not only understand but also speak and possibly write in two or more languages, i.e. productive bilingualism. Most foreign language teaching programmes are designed potentially to lead to productive bilingualism, though whether they do so or not depends to a large extent on the point at which one considers a person can handle the second language with enough facility to be classified as a bilingual. What is apparent from observation is that the development of receptive bilingualism outpaces that of productive bilingualism just as its long-term effects seem to be greater.

Productive bilingualism does not necessarily imply that the individual is capable of both writing and speaking both languages to the same level of proficiency. Such equivalent ability is largely determined by the learning circumstances [2].

Some people are able to speak and understand two languages with almost equal facility without necessarily being able to write either of them adequately. Others can write only one with any degree of accuracy though they may speak two. Certain productive bilinguals may be able to write relatively easily in two languages but not speak with equal fluency in two, though often the ability to use the written form productively implies relative ease in oral abilities. However, one has only to think of scholars of classical languages to realize that it is perfectly possible to write a language that one does not speak.

On the other hand, productive bilingualism need not imply biliteracy; indeed in many parts of the world where bilingualism is prevalent the speakers may not be able to read or write in the other language.

The classification of an individual as a productive bilingual makes no statement about his degree of competence in two of his languages since this is not a qualitative term.

III.4 Strategies of language learners

Speakers who are not proficient frequently use the following strategies to achieve communication [2].

- Reformulation: the speaker goes back and starts again (this occurs also in monoglot speech)
- Prime skipping: words are used which are semantically simpler than the complex words they replace (also used in monoglot speech)
- Analytic rebundling: redistribution of semantic information into smaller units (also occurs in monoglot speech)
- Synonym seeking (also applied in monoglot speech)
- Gap stopping: the speaker falls back on his known language(s) to fill what would otherwise be a gap in the message structure (not relevant to monoglot speech)
- Updating: the speaker uses a known language lexeme as a temporary gap-stopper while search is in progress (does not occur in monoglot speech)
- Appeal to authority: the speaker abandons the attempt to find a solution to his lexical difficulties and appeals to the authority of his interlocutor (also occurs in monoglot speech)
- Message abandonment (not relevant to monoglot speech).

III.5 Fossilized items in the weaker language

Many speakers of more than one language never go beyond a specific plateau which they have attained, thereby accounting for the inability to appreciate grammaticality or ambiguity when confronted with a speaker in their weaker language [2].

This type of bilingual, who may regularly use both of his languages, perhaps with manifest traces of interference in one or both, is not necessarily able to detect what to monoglot speakers appears as bilingually marked or even ambiguous in his output. Even when his attention is directed towards an anomaly that has been pointed out in his non-dominant language, he may be unable to see what is unclear,

ambiguous, or even incomprehensible about a particular structure in the eyes of a monoglot; he is incapable of realizing what it is that may disturb his interlocutor and is often incapable of disambiguating the particular feature or making it more acceptable.

The fossilized items, rules and sub-systems observable in the non-fluent bilingual's weaker language which can be attributed to the influence of his dominant language 1 represents the process of language transfer. These are cases of over-generalization of language 1 rules in language 2 and account for a large part of interference in bilingual performance. On the other hand, certain bilingual utterances tend to show over-generalization of rules specific to language 2 which leads to an inadequate awareness of restrictions to a particular rule.

III.6 Affective filter

The notion of the affective filter accounts for differences in ultimate attainment between early and late bilinguals. Three elements make up the affective filter: anxiety, motivation and self-confidence. They determine whether the speaker has a low affective filter and is permeable to input in the language 2 or whether he has a high affective filter, leading to sub-conscious resistance. Subjects who have low levels of anxiety about manipulating a weaker language are more willing to communicate and more likely to make better progress [2].

People with higher motivation are equally more likely to take chances in the weaker language and maximize opportunities for interaction. Also, integrative motivation leads to better aural-oral skills, possibly because of the desire to socialize with members of the target group.

Finally, people with more self-confidence and an outgoing personality and who are not shy about using unaccustomed speech patterns tend to have a lower affective filter, leading to higher achievement potential.

III.7 Conclusion

Bilingualism is a double means of efficient communication, imposed or freely chosen between two "worlds", using the two linguistic systems.

This statement imposes no restrictions about the nature, purity or equivalence in linguistic knowledge in either language, except the indication that communication must be efficient. It does not even imply that one has to speak a second language, since a person who speaks one but understands two can possibly communicate efficiently by means of two linguistic systems.

Functional bilingualism is not a phenomenon of language; it is a characteristic of its use. It is not a feature of the code but of the message. It does not belong to the domain of langue but to that of parole [2].

The usefulness of this definition is that it allows one to view bilingualism as a cline with no clear-cut limits other than those of the pure monoglot at one end and the perfect ambilingual at the other.

IV. Equivalence of bilingual French/English texts

IV.1 General

The concepts developed in this section are fundamental and independent of the chosen language combination French/English. They are also applicable, for instance, when the Japanese secretary of an IEC technical committee prepares a draft in English language.

Section IV is based on Vinay and Darbelnet's approach to translation [4]. Written language has three aspects:

- the lexicon
- the syntactic structure
- the message

The more two languages are alike in structure and civilization, the greater the risk of confusing the meanings of their respective lexicons.

The different translation methods and procedures seem to be countless, but they can be condensed to just seven. In practice, they may be used either on their own or combined with one or more of the others.

Direct and oblique translation

In some translations, it may be possible to transpose the message of the source language (SL) element by element into the target language (TL) because it is based on either parallel categories (structural parallelism) or on parallel concepts (metalinguistic parallelism). But translators may also notice gaps (or lacunae) in the TL which must be filled by the corresponding elements. These procedures are the direct procedures.

Direct procedures:

1. Borrowing

2. Calque

3. Literal translation

It may, however, also happen that because of structural and metalinguistic differences, certain stylistic effects cannot be transposed into the TL without upsetting the syntactic order, or even the lexis. In this case it is understood that more complex methods have to be used, the "oblique" translation methods.

A translation is considered unacceptable when the message

- gives another meaning
- has no meaning
- is structurally impossible
- does not have a corresponding expression within the metalinguistic experience of the TL
- has a corresponding expression, but not within the same register.

Oblique procedures:

4. Transposition

5. Modulation

6. Equivalence

7. Adaptation

These seven methods are applied to different degrees in the three planes of expression, i.e. lexis, syntactic structure, and message.

It is obvious that several of these methods can be used within the same sentence, and that some translations involve a whole complex of methods which may be difficult to distinguish.

IV.2 Methods of translation

1. Borrowing

To overcome a lacuna, usually a metalinguistic one (e.g. a new technical process, an unknown concept), borrowing is the simplest of all translation methods.

Translators occasionally use it in order to create a stylistic effect. For instance, in order to introduce the flavour of the SL culture into a translation, foreign terms may be used, e.g. such Russian words as rubles and datchas.

Some well-established, mainly older, borrowings are so widely used that they are no longer considered as such and have become a part of the respective TL lexicon. Examples of French borrowings from other languages are alcool, paquebot. In English, expressions like déjà vu and enfant terrible are no longer considered to be borrowings.

Many borrowings enter a language through translation, just like semantic borrowings or faux amis, whose pitfalls translators must carefully avoid.

2. Calque

A calque is a special kind of borrowing whereby a language borrows an expression form of another, but then translates literally each of its elements. The result is either a lexical calque or a structural calque.

Examples of French calques with English sources

science-fiction	:	science-fiction
l'homme dans la rue	:	the man in the street
thérapie occupationnelle	:	occupational therapy

Calques are frequently awkward. Many fixed calques become, after a period of time, an integral part of the language. They may have undergone a semantic change, turning them into faux amis.

3. Literal translation

Literal, or word for word, translation is the direct translation of an SL text into a grammatically and idiomatically appropriate TL text in which the translator's task is limited to observing the adherence to the linguistic servitudes of the TL.

Examples

Where are you? : Où êtes-vous?

This train arrives at Union Station at ten.: Le train arrive à la Gare Centrale à 10 heures.

In principle, a literal translation is a unique solution which is reversible and complete in itself. It is most common when translating between two languages of the same family (e.g. between French and Italian), and even more so when they share the same culture.

If literal translation arises between French and English, it is because common metalinguistic concepts also reveal physical coexistence (periods of bilingualism). They can also be justified by a certain convergence of thought and sometimes of structure (creation of the definite article, concepts of culture and civilization).

4. Transposition

This method involves replacing one word class with another without changing the meaning of the message.

Transposition can also be applied within a language.

Example

Il a annoncé qu'il reviendrait. : Il a annoncé son retour.

In translation there are two distinct types of transposition: obligatory and optional transposition.

Examples of obligatory transposition

Défense de fumer	:	No smoking
Dès son lever …	:	As soon as he gets/got up …
Expéditeur	:	From

From a stylistic point of view, the base and the transposed expression do not necessarily have the same value. Translators must, therefore, choose to carry out a transposition if the translation thus obtained fits better into the utterance, or allows a particular nuance of style to be retained.

5. Modulation

Modulation is a variation of the form of message obtained by a change in point of view. This change can be justified when, although a literal, or even transposed, translation results in a grammatically correct utterance, it is considered unsuitable, unidiomatic or awkward in the TL.

Examples

The time when …	:	Le moment où …
It is not difficult to show that …:		Il est facile à démontrer que …
No vacancies	:	Complet

As with transposition, we distinguish between optional modulations and those that are obligatory.

The difference between optional and obligatory modulation is one of degree. In the case of obligatory modulation, translators with a good knowledge of both languages freely use this method. In fact, they will be aware of the frequency of use, the overall acceptance and the confirmation provided by a dictionary or grammar of the preferred expression.

Cases of free modulation are single instances not yet fixed and sanctioned by usage, so that the procedure must be carried out anew each time. When carried out as it should be, the resulting translation should correspond perfectly to the situation indicated by the SL. Optional modulation tends towards a unique solution. It is therefore evident that between obligatory and optional modulation there is only a difference of degree; once an optional modulation is used often enough, it may become obligatory. However, an optional modulation does not actually become obligatory until it is referred to in dictionaries and grammar and is regularly taught.

6. Equivalence

One and the same situation can be rendered by two texts using completely different stylistic and structural methods. In such cases we are dealing with the method which produces equivalent texts.

Most equivalences are fixed, and belong to a phraseological repertoire of idioms, clichés, proverbs and nominal or adjectival phrases. In general, proverbs are perfect examples of equivalences.

Examples

Il pleut des cordes.	:	It is raining cats and dogs.
Like a bull in a China shop	:	Comme un chien dans un jeu de quilles.

7. Adaptation

This seventh method relates to the extreme limit of translation: it is used in those cases where the type of situation being referred to by the SL message is unknown in the TL culture. In such cases, translators have to create a new situation that can be considered as being equivalent. Adaptations are particularly frequent in the translation of book and film titles.

Example

Three men and a baby	:	Trois hommes et un couffin

The refusal to make an adaptation is invariably detected within a translation because it affects not only the syntactic structure, but also the development of ideas and how they are represented within the paragraph. Even though translators may produce a perfectly correct text without adaptation, its absence may still be noticeable by an indefinable tone, something that does not sound quite right.

IV.3 Translationese

In languages other than English, there is a trend toward a Mid-Atlantic jargon. This is unfortunately the impression often given by texts published by international organizations, whose members, either through ignorance or because of a mistaken insistence on literalness, seem to demand translations which are largely based on calques. The

result may then turn out to be pure gibberish which has no name in any language, but which has been referred to as sabir atlantique, Mid-Atlantic jargon or translationese.

Translationese has its roots in ill-digested translations of Anglo-American originals. A very serious problem is that of intellectual, cultural and linguistic changes, which over time can be affected by important documents, school text books, journals, film dialogues, etc., written by translators who are unable or do not dare to venture into the world of oblique translation.

Growing centralization, lack of respect for cultural differences and cultural submissiveness of certain countries are driving international organizations into adopting working languages which are then hastily translated by overworked and unappreciated translators. There is good reason to be concerned about the prospect that four fifths of the world will have to live on nothing but translations, their intellect being starved by a diet of linguistic pap.

It is, however, relatively easy to identify such texts which have been translated from English by their use of false comparative, artificial or prestigious allusion, certain uses of emphasis and an unusual verbosity.

Translators should be suspicious of the, normally unconscious, influence an original can exert. Even if the target language terminology is flawless, it is always possible that parts of metalinguistic attitudes have discoloured the TL text, especially in official international documents where the pressure on closeness of structures is great.

IV.4 The lexicon

- Concrete and abstract levels

Generally, it can be said that French words function at a higher degree of abstraction than the corresponding English words. They tend to be less cluttered with reality. Of course, abstraction has its degrees.

- Semantic values

Translation errors sometimes result when translators have not noted the distance between the meanings of words which at first seemed freely interchangeable.

There is no reason why an English word and its French counterpart should have the same extension, or in other words, why they should cover the same semantic region.

Each source language has its gaps, which are not necessarily the same as those of the target language. Translators must be aware of the fact that in the source language there are words which do not have a match in the target language. The signified may not exist or may not be acknowledged in one of the two languages.

Faux amis are those words which are identical in form and etymology in two languages but which, because of their separate development in two distinct cultures, have taken on different meanings (see V.11).

The correspondence of aspect between two languages is never absolute. Where there is no single word, the other language must use a periphrase to explain the difference.

IV.5 Structures

Transposition is probably the most common structural change by translators. There are different types.

Adverb - verb		
He will soon be back.	:	Il ne tardera pas à rentrer.
Verb - noun		
Before he comes back …	:	Avant son retour …
Noun - past participle		
With the help of …	:	Muni de …
Verb - preposition		
Reports reaching here	:	D'après des informations
indicated …	:	reçues ici …
Adverb - noun		
It is popularly supposed that …	:	Les gens se figurent que …

Past participle - noun

Easily blown away : Qu' un souffle pourrait emporter

Adjective - noun

In the early 19th century : Au début du XIXe siècle.

Prepositional expression - adjective

The evening was oppressively warm: La soirée était d'une chaleur accablante.

Prepositional expression - adverb

The full purchase price will be refunded: Le prix d'achat sera remboursé intégralement.

Supplementation of demonstratives

This text is intended for …: Le présent manuel s'adresse à …

Staff only : Réservé au personnel

We deliver : Livraison à domicile

No parking : Stationnement interdit

This may reach you before I arrive.: Il se peut que ce mot vous parvienne avant mon arrivée.

Other important items dealt with by Vinay and Darbelnet in the context of structures are the stylistic comparison of word classes and comparative stylistics of accidence.

IV.6 Message

The structural parallelism observed between two cognate languages like French and English is obviously an indicator of a historical commonality of thought and culture.

- Prosody

- In general it appears that English is shorter than French. This emerges when English texts are contrasted with their French translations. But we also have to take account of the fact that all

translations tend to be longer than the original. Translators lengthen their texts out of prudence but also out of ignorance. It can happen that translators have wrongly segmented a text and present as separate elements what belongs together. We call this overtranslation. It is, of course, true that there are many cases where the word for word translation is unclear and where clarity requires amplification. The translator must not be enslaved by either form or space.

- English prepositions, numerals, adjectives, definite and demonstrative pronouns are stronger than their French equivalents and do not require supplementation. In addition, French supplements out of a desire for clarity.

- Compensation can be defined as the technique which maintains the tonality of the whole text by introducing, as a stylistic variant in another place of the text, the element which could not be rendered at the same place by the same means.

- This technique permits the conservation of the integrity of the text while leaving the translator complete freedom in producing the translation.

- Prevalence of abstract expression in French in contrast to concrete expression in English: what is expressed in one mode in the SL is transposed to another in the TL, and this compensation is a subtle but efficient way of compensating the limitations of one language on one of these levels of expression.

- What we have called equivalence is also a manner of compensation; it is an attempt to convey a message, which the reader does not understand for cultural reasons, by a detour which makes it accessible.

- Translators enjoy a certain freedom of expression or work within a range of expressions which does not affect the meaning of the message. This range accounts for personal preferences and the inevitable variances that arise from differences in the cultural and geographical background. A French Canadian translation may differ slightly from a French or Belgian one in its choice of synonyms, variants or regionalisms which do not affect the global meaning of the message.

- Thematic structure

An image in one language does not necessarily have a correspondence in the other language.

French seems to have a larger repertoire of such words than English. While their use in French is a sign of thoughtful style, a direct translation into English would be stylistically inappropriate because this particular use is not common.

- Importance of link elements

Translating means transposing the source language message without forcing the means available in the target language. In translating from French into English a great many connectors will have to be left implicit; a number of them not even having an English equivalent. Conversely, translation into French obliges translators to insert connectors which are only implied in English. These will have to be identified during the analysis and segmentation stage of the process. This double position towards connectors in French and English faces translators with many problems. It has to be accepted that what is explicit in one language may have to be implicit in the other and vice versa, even in texts that are otherwise considered to require as literal a translation as possible.

Connectors bring together quite different word classes: conjunctions, adverbs, fixed expressions, relatives, copulas, etc. Translators must take a very broad view of what is included under connectors which range from separate words to particular meaning of words.

Connectors can be classified according to their deictic functions into:

recall connectors (of past elements)

view point connectors (to what is to follow)

linkage connectors, e.g. coordinate conjunctions

concluding connectors.

From the stylistic point of view, these formal distinctions are difficult to maintain because a single connector may have a double function, e.g. serve as recall and viewpoint indicator, and even as link element.

- Structuring into paragraphs

We can observe that in a tightly knit language like French, the structuring of texts into paragraphs is a connecting device of the message, which has to be given the same attention as the smaller units of translation.

It is also true that this necessary freedom to create a macrostructure is not always fully recognized by translators of official texts.

For example, in multilingual publications of the United Nations there seems to be an excessive concern with preserving identical paragraphs in all languages. This practice certainly facilitates cross-references among multilingual texts in a discussion, but it is dangerous to elevate it to an absolute rule. A simple count in bilingual Canadian and European documents shows that for the same text English uses fewer paragraphs than French and that paragraph borders do not always coincide.

- Modulation of the syntactic structure

At the level of the message, oblique translation methods do not readily suggest themselves. Inexperienced or incurious translators do not spontaneously feel the need for the change of the point of view in the message. The more familiar a syntactic structure is to translators, the less they think of oblique solutions. This tendency is also prevalent in bilingual populations where translation is often no more than a simple calque of structure from the source language. It is, of course, true to say that bilingual populations usually also share a fair amount of culture and therefore background knowledge which influences their verbalization. They are therefore less likely to use the methods of modulation, which is built on the recognition of extralinguistic differences.

IV.7 Conclusions

- Characteristic features of languages

The comparison of French and English makes it possible to isolate characteristic features of French, and by contrast, also features of English which would remain hidden to the linguist working with a single language.

Translation allows clarification of certain linguistic phenomena which otherwise would remain undiscovered.

- Skills of the translators

Literal translation and transposition presuppose solid knowledge of the linguistic structure of both languages; the successful application of the methods of modulation, equivalence and adaptation require translators to have additional experience. They must be able to locate a text in its social environment and be informed about the current state of literature, science, politics, etc. of both language communities which are reflected in the texts they are asked to translate.

Translators must know the SL well and master the TL (which in principle should be the mother tongue).

- Literal versus free translation

The literal-free opposition is wrongly posed. Comparative linguistics teach us to stray from literalness only to the extent of the requirements of the target language. In other words, oblique translation methods should only be used with good reason and within strictly defined limits.

The move from SL to TL requires the application of methods which are legitimated by the fact that they take account of the characteristics of both languages concerned.

- Translation methods in the context of IEC standards

  - The issue of borrowing is very important. Borrowing must be avoided where appropriate terms in the TL exist. This is closely related to the need for the IEV (International Electrotechnical Vocabulary).

  - Literal translation is usually not possible.

  - Transposition is very common.

  - Modulation is frequently required. But it is not always applied by those translators who are unable or who do not dare to venture into oblique translation.

  - Equivalence is not relevant to bilingual technical texts.

  - The method of adaptation is culture-related and therefore not applicable to technical texts.

V. Translating scientific/technical texts

V.1 General

In this context, “translating” does not include the translating of literary texts but is limited to scientific / technical subjects.

Specialized translating involves much more than the mechanical looking up of “equivalents” or special terms in dictionaries. In fact, most words have no true equivalent in another language. This is the reason for the systematic approach taken by IEC/TC 1, TC 3 and TC 25 (see IX.4, IX.5 and IX.6). Polysemy, “faux amis” and paronyms account for many translation errors (see V.10 and V.11).

Even if dictionaries were perfect and up to date, which is far from being the case, they could never be a substitute for familiarity with the subject matter on the part of the translator.

Good scientific/technical translators possess linguistic sensitivity. Provided the latter is inborn, education may foster its development. If, however, it is not inborn it cannot be instilled.

One component of the able translator’s make-up is humility, that is the ability to admit to himself (and to others) when he does not know.

V.2 Source text errors

If the original author’s expression of his ideas is obscure or otherwise defective it is the translator’s duty to disentangle the author’s intended meaning and express it in the best possible way in the target language [5].

However, the translator’s duty to be unhampered by the author’s wording does not license him to distort the author’s intended meaning or emphasis.

It would be senseless to repeat, in the translation, what obviously are printers’ or typists’ errors; but if an error or mis-statement on the part of the author is noted and corrected the translator should report that it is he who is doing so.

However, “throwing light on obscurity” in the original is a dangerous practice, for the translator who attempts it can scarcely fail to introduce some personal slant of his own. Writing what is not merely a translation but amounts to further development of the author’s thesis is not the translator’s job.

V.3 Presentation of translated texts

Where translations are made simply for information within an organization, much less importance is attached to finish of presentation than to speed and economy of effort [5].

There are circumstances in which the preparation of a translation in the proper sense would be a waste of time: all the reader wants is to be told what the meaning of the source text is and to be able to ask questions about it.

V.4 Collaborative translating

Collaborative writing means that arrangements are made for collaboration between translators who are primarily linguists, and engineers, who are primarily subject specialists [5].

Often the work of non-specialist translators is so defective that it takes a subject specialist as long to revise it as it would take to make a completely new translation.

This is not only because the general translator does not know the specialized terms, but mainly because the concepts of a field of technology with which he is unacquainted mean nothing to him.

The method of having translations prepared by non-scientific persons and revised by a scientifically-educated translator has proved unsuccessful. It may well be more difficult and time-consuming to revise such a translation than to translate directly from the foreign text.

V.5 Translating from mother tongue to foreign language and vice versa

A translator normally translates from a foreign language into his mother tongue, the reason being that native-tongue competence is more

powerfully internalized than foreign-language competence. Hence, a translator can analyze and adequately eliminate translation difficulties much better in the field of foreign language to native tongue translation.

Statistically, target language reproductive translation difficulties are far more frequent than source language receptive translation difficulties; however, one must not overlook the fact that receptive errors may have far more serious consequences than reproductive errors violating only target language norms.

Employers of translators stick, wherever possible, to the principle of foreign language to native tongue translation; however, for reasons of limited resources this principle cannot be strictly upheld.

V.6 Source text comprehension

Nobody can properly translate what he does not understand. Hence, satisfactory technical translating can only be done by someone with the requisite technical knowledge, and practice in technical reasoning, to follow technical arguments in the required speciality [5].

The kind of competence to do this depends not only on the nature and subject matter of the original text, but also on the purpose of the translation and on the kind of readership for whom it is intended.

A technical translator must therefore be versed in and able to reason about the subject matter of the translation.

V.7 Knowledge of source language

The source language, that is the language of the document to be translated, is normally one that the translator has learned deliberately [5].

A technical translator must be able to read the language he is translating from so well that he can go out to meet the author halfway and apprehend the author's intended meaning even if badly expressed. See also V.10 and V.11 below.

V.8 Knowledge of target language

The target language, that is the language into which the document is to be translated, is normally the one that the translator has first learned unconsciously as a child. There are exceptions; it may be the language of a country in which the translator has long been resident, having thus become his language of habitual use; it may be any other language if the material to be translated is brief and conventional.

A technical translator must be able to embody the meaning in lucid, terse and euphonious target language prose. A good translator does not allow the wording of the original to carry over into the target language. See also V.10 and V.11 below.

It is a fallacy to suppose that understanding of a foreign language is more important than the ability of expression in one's own. On the contrary, whoever really knows his own language is in a position to translate accurately a scientific or technical text, even though lacking mastery of the foreign language [5].

V.9 Translational competence

Translational competence is an imperative prerequisite for a translator to be able to translate semantically, syntactically and/or stylistically complex texts from various text domains with minimal communicative translation error. The textual character of transfer competence is the explanation for the fact that a person who is fluent in the oral and written use of two languages, is not necessarily an efficient translator.

There is a linguistic sensitivity which goes beyond mere knowledge of forms and constructions. A translator possessing this quality may, even though his linguistic training may be limited, far surpass in performance a more thoroughly drilled translator who lacks it.

The more technical the passage to be translated, the easier it becomes for a person who is professionally versed in the special subject to translate. Conversely, it becomes less and less possible for a linguist lacking technical knowledge even to attempt it.

V.10 Monosemy and polysemy

A term is monosemic if it is used for a single notion [6].

Polysemy means that a language uses a given term for several distinct notions [7].

- Translation from monosemy in the SL to monosemy in the TL is straightforward.
- Translation from monosemy in the SL to polysemy in the TL is also easy.

Examples

Heating (consideration of the qualitative aspect of the phenomenon)	:	Echauffement
Temperature rise (quantitative term in Celsius degrees)	:	Echauffement
Resistance (as a quantity)	:	Résistance
Resistor (applicable to a component)	:	Résistance

- Translation from polysemy in the SL to monosemy in the TL: for several distinct notions, the SL has one term and the TL has different terms. Therefore the context has to be taken into account.

Examples

Manufacturer	:	Fabricant (de câbles)
		Constructeur (de transformateurs)
Conductivity (electrical):		Conductibilité (propriété de conduire le courant électrique)
		Conductivité (grandeur qui mesure cette propriété)
Air gap	:	Entrefer (entre plaques magnétiques)
		Distance en l'air (entre isolants)

- Cases of translation from polysemy in the SL to polysemy in the TL also occur in technical translation. They are more complicated than the preceding cases.

V.11 Faux amis and paronyms

"Faux amis" are terms of different languages and of common origin which have different meanings but may be mistaken for equivalents [6].

A paronym is a word based upon the same root, i.e. having the same derivation as another word. The presence of paronyms in the TL creates problems similar to those mentioned in connection with polysemy (see V.10 above).

- Examples of "faux amis"

Conductor, dans un câble, n'est pas le conducteur isolé, mais l'âme conductrice.

Isolator n'est pas un isolateur, mais un synonyme de isolating switch.

Commutator n'est pas un commutateur, mais le collecteur d'une machine tournante.

- Example of English paronyms

"Resistance" and "resistor"

"Axle" and "axis"

"Base" and "basis"

"Reactance" and "reactor"

"Economic" and "economical"

"Electric" and "electrical"

- Examples of French paronyms

"Condensateur" and "condenseur"

"Déchiffrement" and "déchiffrage"

"Relevage" and "relèvement"

"Linéaire" and "linéique"

"Accouplement" and "couplage"

"Usager" and "utilisateur"

VI. Features of scientific/technical texts

VI.1 General

The sciences and technology have considerable influence upon language in general and scientific/ technical language in particular. The speed of development of new knowledge, which requires new words for new concepts and their relationships, makes demands upon language unprecedented in history [7].

Industry in the economically developed countries has become science-based rather than craft-based. The import and export of expertise is becoming as important as the import and export of goods.

A craft-based industry can rely on the transmission of its special language from master to apprentice. However, science-based industries, like petrochemicals or electronics, introduce completely new processes, developed in the laboratory or experimental plant. They are often introduced via a foreign language. So a new "special" language which is likely to be multi-disciplinary and transnational has to be formulated and taught.

Special languages are of course based on natural languages, but in order to serve their more limited functions they reduce polysemy and ambiguity. They thereby develop properties which are associated more strongly with artificial languages.

By reducing the emotive and social uses, special subject languages put greater emphasis on organizing knowledge and experience. In some artificial languages this is the predominant function, as in documentary languages or in classification schemes.

In the small circle of a specialist user group, special languages also tend to be less redundant and less ambiguous than general language as the context becomes more predictable. They do, however, retain their contact with the general language and their ability to vary according to the degree of specialization of the user.

Whereas one acquires a dialect and sociolect unconsciously, a standard language is learned normally similarly to a second language; a special language, however, is always learnt as a second language on the basis of general language.

In the applied sciences and in technology we have a heterogeneous group of language users with different levels of education, and this may lead to dialectal and sociolectal variations.

The same linguistic features of say a high degree of monosemy and absence of synonyms are to be found in such different languages as the language of glass-blowing in a single national centre or the language of astronomy which may involve a similarly small group scattered over the entire English speaking world.

VI.2 Pragmatics

If in a document explicit reference is made to the user of a language, then we assign it to the field of pragmatics [7].

The user-oriented or pragmatic approach requires consideration of both the circumstances under which individuals use language and the potential or function of the language they use. In both parts there are socially determined elements but also limited individual freedom of choice. In this choice of means of expression the individual is influenced by the subject he is talking about, his place in society and his geographical location.

To illustrate the interaction of the language varieties with which we are concerned, the concept of a pragmatic space is developed. This concept relates special languages to dialects and sociolects.

Individual manifestations of language occur on three axes and can be described as belonging to one area of space thus created.

Subject languages: medicine
agriculture
chemistry
electrotechnology
etc.

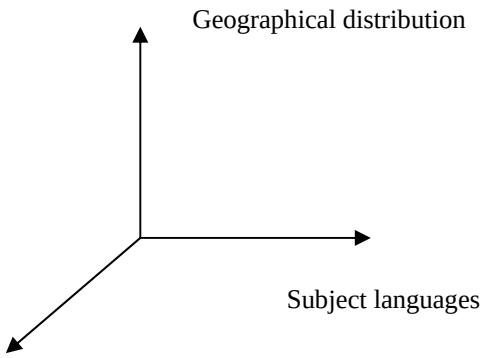


Figure 1: Pragmatic space of technical language varieties

Sociolects:	workshop
	design office
	lecture theatre
	standardizing
	etc.
Geographical distribution:	company
	regional
	interregional
	international

The **Subject languages** axis exemplifies the many areas of knowledge and activity which special languages can cover; in the case of IEC Standards, this is essentially electrotechnology.

The **Sociolects** axis exemplifies areas of use which can be established for subject languages. Some subject languages have a wide

range of social variation, e.g. electrotechnology (from workshop to legislation); others, e.g. astrophysics have a very narrow range (not applied in workshop and legislation).

The **Geographical distribution** axis exemplifies physical areas of distribution of usage to account for, e.g. a "house-style", the dialectal varieties of old established industries, or at the other end of the scale, internationally agreed usage (e.g. IEC Standards).

A language related to an applied subject is likely to have a wider range of users than a theoretical one. An applied subject also stipulates different forms of speech act: laboratory reports, parts-lists of machines and procedural prescriptions are forms of the language of experimental and applied sciences.

VI.3 Semantics

If we leave out considerations of the user of the language and analyze only the expressions and their designata, we are in the field of semantics [7].

Aim of the semantic approach: to clarify the linguistic means of signalling special subject language items.

It is at the semantic level that the greatest difference with general language is noted and this is because of the need to develop a system of references which organizes and structures such notions of the special subject as

- its object: materials, instruments, machines, products, parts and installations
- its properties, qualities and states
- its quantitative parameters
- the process and its methods

Since these notions are seen as separate and separable items, they are often conceived of as nouns or nominal groups in the first instance; appropriate adjectives and verbs are derived from the nominal form by regular processes.

VI.4 Syntax

If we abstract from the user of the language and from the designata and analyze only the relations between expressions, we are in the field of (logical) syntax [7].

The syntactic approach: the syntax of general language is fully explored but the existing observations are unrelated to a coherent pragmatic and semantic theory and can only be explained in terms of the linguistic system itself. They are unattributable to a particular motivation in language.

Special languages cannot be explained in linguistic terms only. Traditionally, syntax has concerned itself with units no larger than a sentence, a level at which it is difficult to single out special language features. However, special languages are functional categories and the syntactic approach must be guided by pragmatic and semantic criteria. The whole text affects its segments and those in turn affect their constituent parts. Many special language texts also consist of or contain units which are not conventional sentences and can therefore not be described adequately by traditional grammar.

VI.5 Informative intention

The speaker concentrates his efforts on conveying information to his interlocutor, i.e. adding to his knowledge, to the virtual exclusion of all other intentions. The informative intention is topic-oriented; speaker, listeners and situation all rank second in importance [7].

Informative intention is signalled through declarative sentences, i.e. simple assertion without evaluative words or words with evaluative connotations.

Artificial language manifestations are extreme examples of informative speech acts.

Information assumed to be known and on which the new information is based, usually precedes the new information. In IEC Standards, the informative intention is very important.

VI.6 Evaluative intention

The speaker relates himself to the topic either as an individual, a social role player or a subject specialist and expresses this relationship in a deliberate evaluation of the topic [7].

In special language the evaluative intention accounts for reviews, critical essays, leading articles, test evaluation, etc.

Linguistically, evaluative intention is openly expressed in comparative or contrastive statements.

The evaluative intention is absent in IEC Standards.

VI.7 Directive intention

Directive speech acts are designed to cause or modify behaviour, and in order to specify that behaviour they draw upon the referential nature of language. The directive intention is listener-oriented [7].

Any request, order, instruction, prohibition, exhortation or warning is directive and its distinct linguistic form is usually obvious.

Science is essentially concerned with the extension of knowledge, technology with the application of knowledge. Thus technology is always expository, educational, instructional, the speech act focusing on the recipient, there is in principle, inequality in knowledge.

Directive speech acts are therefore virtually absent in the language of science and frequent in the language of technology.

The fourth type of intention concerns phatic speech acts (not relevant to IEC Standards).

VI.8 Social norm

The norm determines and controls linguistic realisations, but is also more fundamentally concerned with the role of language as a psychological, physical, physiological and social phenomenon [7].

There are two tendencies at work which operate in the same linguistic community. The first explains the development of national languages, the second that of sub-languages.

- The unifying social pressure reveals itself on the linguistic level by a tendency to unify norms.
- The tendency for small groups, whether they be geographical, social or professional, to differentiate themselves.

These two tendencies are often complementary since they fulfil separate social needs. A language is a system which maintains its overall stability under the influence of internal and external pressures.

The linguistic norm establishes the equilibrium between the potential of the system and the physiological, psychological and intellectual capability of its users.

The social norm maintains the balance between divergent use and the unity of the system.

The IEC is in principle a bilingual organization (see IX.2), but there is pressure towards monolinguism.

VI.9 Dialects, sociolects and special languages

Dialects form a contrasting set of sub-languages used by geographically determined speech communities. They are frequently grouped together under the sociolinguistic concept of “national” language.

Sociolects form contrasting sets within dialects or a national language. They reflect the social structure of a speech community.

Special languages form mutually exclusive, though overlapping sets of sub-languages based on the division of knowledge of the speech community. They can have dialectal and sociolectal variants.

VI. 10 Schedules

- Major message forms [7].

There are five major message forms: Dialogue, memo, report, schedule and essay.

– Dialogue

The dialogue is characterized by its exclusive aural-oral technique and the fact that the linguistic roles of A and B are reversible, that is productive and receptive in alternation.

– Memo

The memo is the written message form most fully adjusted to the recipient's status, occupational role, knowledge and other situational factors.

Examples: minutes of meetings, memoranda, textbooks, manuals, contracts, guarantees.

– Report

A report is a record of an act or a number of acts, produced at the instigation of the recipient. The recipient has authority over the producer either as a superior in a hierarchy or as a consumer.

– Schedule

The schedule orders and classifies information, a topic, according to the logical order inherent in that topic or as it appears to the schedule writer.

Examples: inventories, catalogues, comprehensive dictionaries, sets of rules with graphs and tables (frequent in IEC Standards)

– Essay

An essay is a personal, individual interpretation of a topic and hence of the reality reflected in it. It is thus at the opposite end of the spectrum with respect to the dialogue.

- The schedule

The schedule is topic centred, the report dominated by the reader, the essay focusses on the writer's appreciation of reality.

The main linguistic characteristic of the schedule is the absence of linguistic connecting elements between whatever units are established. The relationships between these units are indicated by sequential, horizontal or vertical ordering. The orderings may be supplemented by various numbering or typographical devices.

Whereas the dialogue, the memo and even certain reports are addressed to individuals in their occupational role, schedules are addressed to a professional category as or to several professional categories at the same time.

The schedule is by its very nature evaluative as any form of listing implies a hierarchy.

It may also be directive in that it may indicate a series of decisions to be taken or actions to be carried out.

The segments of schedules are as consistent as possible, to ensure that the writer includes all the relevant information and to facilitate reference by scanning and consultation rather than by continuous reading.

VI.11 Non-linguistic codes

The non-linguistic dimension is important for special subject communication which frequently uses diagrams, tables, numerical and other notation to supplement linguistic communication. The use of one or the other is a significant factor in achieving effectiveness in communication, and indirectly for the description of the systemic and functional nature of special languages [7].

The potentials of modality and tense are little used whereas causality and sequential ordering are fully exploited. The systemic devices are also supplemented by other systems to express relationships which general syntax does not normally have to accommodate and which would therefore be ambiguous and cumbersome in form. The symbol codes of chemistry and physics, for instance, offer a more economical and precise means of ordering concepts. In extreme cases the natural language only survives as a metalanguage for instance in mathematics and logic where both references and relationship are expressible in artificial languages. Some special languages have alternative written codes or whole systems of communication parallel to linguistic expression codes which may be conceived as independent of any particular language and taken over in their entirety into another special language community. In their specificity of reference and sometimes even independent syntax they approach the nature of artificial languages. These codes are, however, never independent of a linguistic expression code but supplement it. In all subjects where

international agreement has been reached on units of measurement, as for instance in SI units, there is a special reference code.

- Language of mathematics

The language of mathematics has a written code which is language-independent. A lecturer, for instance, speaks a national language which is in theory transcribable into the written form of the same national language, but in practice he writes on the blackboard another set of symbols. These written symbols represent another language which happens to be largely supranational by common agreement. Insofar as we can speak these symbols, they are linguistic signs.

The written code of mathematical notation is a more economical, precise and appropriate mode of expression and is a complete self-contained and non-redundant language.

- Language of chemistry

The language of chemistry operates with two parallel representational systems referring to the same knowledge structure. When we speak or write benzene or pentatriacontane, we are using the linguistic system. When we speak or write C_6H_6 or $C_{35}H_{72}$, the system is linguistic only inasmuch as we can speak the symbolic notation. While both systems obviously have the same reference, they are built on the representation of different semantic features.

- Programming languages

The codes developed for man-machine communication have evolved from the mode of writing developed for mathematics and logic with their unique mixture of continuous sentences interrupted by equations and formulae. But whereas mathematics and logic are concerned with statements about truth functions, programming languages consist of a series of commands and are therefore comparable in function and even form, to knitting patterns. These commands must be absolutely unambiguous but their expression can be highly concentrated and therefore difficult to learn, or resemble natural language in appearance so that they can be learnt more quickly.

- Flow diagrams

Flow diagrams are a convenient alternative presentation of the sequence of orders.

- Visual codes

In general language the written code is consequent upon the spoken one. The written and therefore predominantly visual basis of many special codes is clearly evident in the frequent divergence between written and spoken forms: the spoken form often appears as a paraphrase of the written form, or inversely the written form appears to be an abbreviation of the spoken one.

When the code has no directional equivalent as, for example, in statistical tables or diagrams, different rules of layout exploit the horizontal, vertical and diagonal dimension of the page, and even the format of the paper may change to accommodate the message.

The structural code of chemical notation, for instance, abandons the linearity and sequentiality of writing, and presents a simultaneous picture which only the eye is capable of interpreting.

There are specific rules for schedules, refined for particular special text types and subjects, which provide models for the ordering and organization of elements in visual codes.

Manifestations of visual codes as message types, e.g. tables, figures, graphs and diagrams, resemble schedules in that prior knowledge of conventions is required for their full understanding.

Tables are generally preferred for the systematic presentation of extensive quantitative data. Bar-graphs or charts visualize quantities in horizontal or vertical bars, and the bars themselves can indicate different data by colour, shading or hatching.

Relative sizes of parts in a whole or group are conveniently represented by pie charts.

Trends in figures and dependent variables are frequently shown in natural or logarithmic line-graphs which are open-ended on the right-hand side, thus permitting free interpretation of the trends observed.

Flow-charts or block diagrams can be used to visualize complex processes or operations, with squares, circles, diamonds and other box forms representing different types of operation.

- Artificial languages

Special subject languages can be classified according to the degree to which they differ from the general language and move towards the borderline of artificial language. Such a position shifts with the development of a subject; linguistics and logic have developed into areas where non-linguistic representation is preferred.

Artificial languages have the following features:

a) Artificial languages serve one or at most two purposes: they describe, classify or prescribe but do not evaluate or express or incite emotions, they do not evoke aesthetic reactions or socialize except in the trivial sense that every communication establishes a contact.

b) Artificial languages can therefore aim at monofunctional denotation where one concept corresponds to one expression element and one lexeme corresponds to one semene. Homonymy and synonymy can be avoided in a carefully constructed artificial language.

c) Artificial languages are not polysemous and therefore can only be described or talked about in another artificial language or in natural language.

d) The rules of artificial languages are conciously contrived, thus eliminating the need for a norm.

e) An artificial language does not alter in time, which means that usage never deviates from the rules and therefore makes the concept of norm unnecessary.

f) Artificial languages are written languages. They can be spoken but only derivately, unlike natural languages where the spoken form is primary and the written form is generally derived from it.

VI.12 Modes of expression

The choice of the mode of expression depends heavily on the participants and the situation and to a lesser extent on the topic, intention and message form. The names of the five modes are frozen, formal, consultative, casual and intimate [1].

These are regions of a continuous scale which merge into one another, and they are characterized by macro- and microlinguistic features.

Frozen and formal texts are impersonal because they are produced by people who are not writing as individuals, but as holders of some officially established position. Frozen and formal texts are further distinguished by grammatical completeness and a high degree of repetition.

Formality is associated with hypercorrectness of syntax and morphology, an intolerance of mixed or loose constructions to the extent of supplementing linguistic means by compositional ones.

As the frozen mode discourages innovation and prefers the archaic, it is rare in the special languages of science and technology.

The consultative mode occupies the central area. It is the preferred mode for written and spoken messages in special language communities where the participants are acting only in their occupational roles. Its signs are complete, but not over-correct grammar, a planned utterance, a full range of lexis to reflect the full range of topics available but without archaisms, slang or private denotations.

Frozen, consultative, casual and intimate texts are not used in IEC Standards. They use the formal mode.

VI.13. Economy

In special communication, economy can be maximally achieved because of prior agreement in a relatively small group, the confined subject areas involved and the frequency of occurrence of certain messages and lexical items [7].

The use of acronyms, symbols and other abbreviations is the most obvious economy. Economy of expression is often a necessity in graphs, figures, tables or even pictorial presentation, but is achieved only at the cost of separate legends which explain the abbreviations or symbols used. Complex concepts can be expressed by simple terms only because the term is acknowledged to be a substitute label for the full definition.

- Economy in forms

The presentation of information by non-linguistic means in tables, charts and drawings is highly economical, but meaningful only to the specialist who knows the symbols and can interpret the intention that

accompanies the message. The omission of introductory and concluding statements in memos or their reduction to names, date and topic, the frequent use of pre-printed forms in which single words and phrases are entered and the organizational structure of reports all represent economy of communication.

A special case of economy occurs in information retrieval via thesauri. Thesauri do not list all the terms but group them into descriptors, allowing access to the information only via preferred terms.

- Syntactic economy

Because of their limited functions and clear specification of intention special languages can develop a high degree of syntactic economy. The various types of memos, reports and schedules which constitute the vast majority of all written communication permit simple listings in columns, the use of brackets to contain explanatory detail, the expression of clauses by simple apposition between dashes, the use of abbreviations such as cf., viz., i.e., etc. to express syntactic links, all of which increase syntactic economy. The density of expression of derived forms also exemplifies the economizing tendency of special languages. Abstracts and summaries contain a higher degree of complexity of nominal groups than the texts they relate to and usually also longer sentences.

- Lexical economy

Economy in the expression of lexical items is achieved by derivation and compounding, especially when the compound represents the concentration of a whole phrase or even clause. Further economy can be achieved by blending, compression and acronymy.

Nomenclatures are highly economical means of representing complex relationships among terms, fixing the meaning of word order and patterns of affixation and compounding. The binomial code of biology provides a means of identifying uniquely thousands of species, subspecies and even varieties.

VI.14 Precision

Precision, a measure of accuracy with which knowledge and intention are represented in a text, is a universal requirement of communication. Terms and standards do not have an intrinsic potential

for precision. Their precision can be no greater than the definition for which they stand, but when standards are used as parts of definitions, the precision of reference is maximized. Precision is not an absolute but a gradable concept, and the requirement of precision is not absolute but dependent on the purpose of each speech act [7].

Precision normally conflicts with economy in that a full definition is likely to be a lengthy one. One of the main functions of terms and standards is to allow users of special reference to replace long definitions with more economical but equally precise expressions; but a term can only be precise if its definition is both itself precise and universally understood and accepted by its potential users. Standardization, which imposes such general acceptance, is thus an important guarantee of precision of reference. See IX.4, IX.5 and IX.6.

- Precision in forms

Forms do not have an inherent proclivity for precision but, except for the precision required of and attached to spoken language in legal proceedings, oaths, etc., written forms are considered to be more precise than spoken forms. The syntax of the latter is frequently more ambiguous, especially when interpreted after the situation in which they have occurred.

An attempt to regulate precision can be seen in the various pre-printed forms which specify the type of answer required or provide model answers from which alternatives have to be chosen.

- Syntactic precision

The precise expression of syntactic relationships is highly developed in special languages. In legal language the requirements are so stringent that pronouns are avoided altogether or are only used when their reference is totally unambiguous.

The need for precision is increased by the density and complexity of the information which results from economy. Precision makes special English appear more formal than general English.

- Lexical precision

Standardized terms are more precise than terms, and terms are more precise than words. Precision in lexical items can take various forms: they can be precise in reference inasmuch as they designate unique aspects; they can be precise in expression form inasmuch as they

may not have developed their polysemic potential, in that they have no synonyms with overlapping meaning or to the extent that they have no homonyms.

VI.15 Summary in French

The above features of scientific/technical text are common to all languages. R. Kocourek provides a summary under the title "Caractéristiques sommaires de la langue technique et scientifique"[8].

La langue de spécialité, et en particulier la langue technoscientifique, constitue, d'une part, un des systèmes sémiotiques de spécialité, distinct des autres systèmes sémiotiques, tels que les langues symboliques.

D'autre part, elle est une des sous-langues de la langue tout entière; elle a certaines ressources en commun avec la langue usuelle, mais elle a aussi ses ressources propres.

Parmi les arguments en faveur de l'étude particulière de la langue de spécialité est le volume important des textes de spécialité.

La langue de spécialité est plus qu'un style, plus qu'un registre, et plus qu'un vocabulaire ou une terminologie de spécialité. C'est un ensemble complet de ressources, qui possède plusieurs styles, plusieurs registres, et plus que des caractéristiques lexicales.

La langue de spécialité est principalement la langue dite naturelle, avec des éléments brachygraphiques intégrés et avec l'accent plus prononcé sur l'écrit.

Elle se situe, de plusieurs points de vue, entre la langue usuelle et les langues symboliques; les caractéristiques des langages symboliques sont souvent considérées comme propriétés idéales de la langue de spécialité.

Par analogie du langage symbolique et contrairement à la langue usuelle, une langue de spécialité est usitée et comprise dans un groupe restreint de spécialistes.

La langue de spécialité partage avec la spécialité la diversification selon le domaine, selon l'intellectualisation et selon la particularisation.

Elle vise l'idéal de l'intellectualisation, c'est-à-dire la précision sémantique, la systématisation notionnelle, la neutralité émotive, l'économie formelle et sémantique; elle a tendance à définir ses concepts, à contrôler la polysémie et l'homonymie, à supprimer les synonymes, à simplifier et à mieux délimiter les moyens syntaxiques, à neutraliser l'affectivité, la subjectivité et les fonctions conative et esthétique au sens étroit, à assimiler un nombre important des éléments brachygraphiques (abréviatifs, idéographiques).

Par contraste à la fois avec la langue usuelle et avec le langage symbolique, la langue de spécialité a un lexique très étendu, ce qui lui permet de saisir le monde de la spécialité dans sa complexité et dans son intégralité ou, du moins, plus intégralement que les autres systèmes sémiotiques de spécialité.

La langue de spécialité peut, en conséquence, être l'instrument de sa propre formation, de son propre fonctionnement, de sa précision, de son évolution. Elle peut aussi servir à interpréter, même à construire d'autres systèmes sémiotiques; cette fonction métalinguistique et métalangagière lui attribue une place privilégiée parmi les systèmes sémiotiques.

Du point de vue des fonctions primaires, la langue de spécialité est un instrument qui sert principalement à signifier et à communiquer le contenu spécialisé (fonction cognitive et communicative).

Le contenu spécialisé est le contenu des textes de spécialité; il reflète toutes les composantes essentielles de la spécialité, telles que le monde de spécialité (les choses étudiés), les concepts correspondants, les connaissances accumulées, les buts visés, les méthodes employées, et les spécialistes en tant que spécialistes.

Le champ commun à l'aspect linguistique et à l'aspect non linguistique de la spécialité, c'est justement le contenu spécialisé; une étude de la langue de spécialité comprendra donc non seulement l'étude de son agencement sur tous les plans linguistiques, mais aussi l'examen de diverses correspondances entré les composants de la spécialité et la langue de la spécialité.

VII. Checking, revision and editing

Checking has to be done by the translator or by the expert who prepared a text in a language other than his mother tongue.

Revisions are mostly undertaken by Editing committees, see X.6.

Editing is carried out by Editing committees and by the Central Office of the IEC.

VII.1 Checking

In the first instance, every translation text should be checked by the translator. For difficult and complicated texts, the translator must check through the text for typing errors, misleading statements and ambiguities, and ensure that they are corrected before submitting his final text. Most scientific and technical texts require, in addition, comparison with the original to make sure that there are no omissions. Figures, proper names etc., should always be checked against the original [9].

The translator is not supposed to know better than the author. By the very nature of his calling, the translator has to analyze the text in depth. In doing so, he may very well stumble upon something which has evaded the author. All errors detected and changed after consultation with the author must be noted in the original text.

Discussion with a subject matter specialist is not without problems but will almost certainly provide confirmation and/or inspiration.

In instances in which the translation is made by someone to whom the target language is not his language of habitual use, it is obvious that a checker of appropriate mother tongue should be employed to pick up any loose ends in grammar, usage, spelling and vocabulary in the translated text. Changes of a stylistic variety in this context are more revision than checking.

VII.2 Revision

Revision implies performing remedial surgery on the submitted text, upgrading the terminology used, clarifying obscurities, reinforcing the impact, honing the emotive appeal to suit the target reader, etc. Also

included are consistency of terminology, spelling and grammar, and ensuring that the text is couched in the appropriate language register. The presentation may have to be revised by, e.g. shortening titles, subdividing long paragraphs, rearranging the layout or having the text reset using another type face [9].

Revision, in simple terms, is the attempt to achieve optimum orientation of the translated text to the requirements of the target reader.

VII.3 Editing

It can be said that editing is not part of the scope of translation. Nevertheless, most texts, whether source or target texts, can profit from being edited [9].

Pruning may be required to eliminate extraneous and superfluous matter or to extirpate irrelevancies. Space considerations may demand that the translation be restricted to a specific length.

Certain conventions have to be followed, e.g. in nomenclature and spelling. The layout or format is of great importance and, where present, illustrations and their captions have to be correct and of appropriate length.

All experienced translators have seen or heard of switched captions, figures upside down, page references wrong, numbering of figures mixed up, etc. There are also great problems involved in transferring the typed manuscript to the printed page, involving renumbering of pages and complete reediting of the contents page.

Far from being a second class product, the finished translation is often a great improvement on the original.

The checking, revising and editing functions are a safeguard of quality to the user of the translation and, at the same time, a safety net for the translator.

VIII. Development, structure and drafting of IEC Standards

VIII.1 General

The ISO/IEC Directives provide guidance for the technical work, as well as the development and the structure of International Standards.

These Directives are published as three parts.

- Part 1: Procedures for the technical work [10]

Third edition, 1995

With Amendment 1, 1997

Part 1 deals with the procedures to be followed within ISO and IEC in carrying out their technical work: primarily the development and maintenance of International Standards through the activities of technical committees and their subsidiary bodies.

- Part 2: Methodology for the development of International Standards [11]

Second edition, 1992

With Amendment 1, 1995

This part sets out methodological rules and guidelines to be followed by the TCs and their subsidiary bodies in developing International Standards. The latter are required to be comprehensible and unambiguous. They have to be drawn up in such a way that they can readily be adopted as national Standards and, where applicable, be referenced in governmental regulations, certification and rules or other documents.

- Part 3: Rules for the structure and drafting of International Standards [12]

Third edition, 1997

These rules are intended to ensure that International Standards (as well as Technical Reports and Guides) prepared by the committee secretariats of ISO and IEC, are drafted in as uniform a manner as practicable, irrespective of the technical content.

Part 3 also gives some indication with regard to presentation.

The three parts were approved by the ISO Technical Management Board and the IEC Committee of Action.

The fact that new editions were required for all parts and that two of them were already amended in 1997, reflects a continuous evolution which has probably not yet come to an end.

VIII.2 Development of IEC Standards

This section is essentially based on Part 1 of the ISO/IEC Directives. Part 1 should be consulted for more detailed information [10].

- Project stages

IEC Standards are developed on the basis of a project approach. This entails that the projects move through a sequence of project stages. These project stages and the associated documents, with their abbreviations, are as follows.

0 Preliminary stage

Preliminary work item, PWI

Languages: English or French/English

1 Proposal stage

Form 4: New work item proposal, NP

Languages: English or French/English

2 Preparatory stage

Working draft, WD

Languages: English or French/English

3 Committee stage

Form 7: Committee draft, CD

Language: every possible effort must be made to prepare both a French and an English version of the text in order to avoid delays in the later stages.

4 Enquiry stage

Form 7: Committee draft for vote, CDV

Language: an Editing committee must be set up with an expert of French mother tongue and one of English mother tongue. As soon as the English version of the CDV is available, the Secretary sends a copy to the French expert. The latter must return the French version within 60 days.

5 Approval stage

Form 9: Final Draft International Standard, FDIS

Languages: as soon as the English version of the FDIS is available, the Secretary sends a copy to the French expert of the Editing committee. This expert must return the French version within 60 days.

6 Publication stage

International Standard (IS)

The flow chart "Development of an IEC Standard" shows the sequence of these documents:

PWI - NP - WD - CD - CDV - FDIS – IS

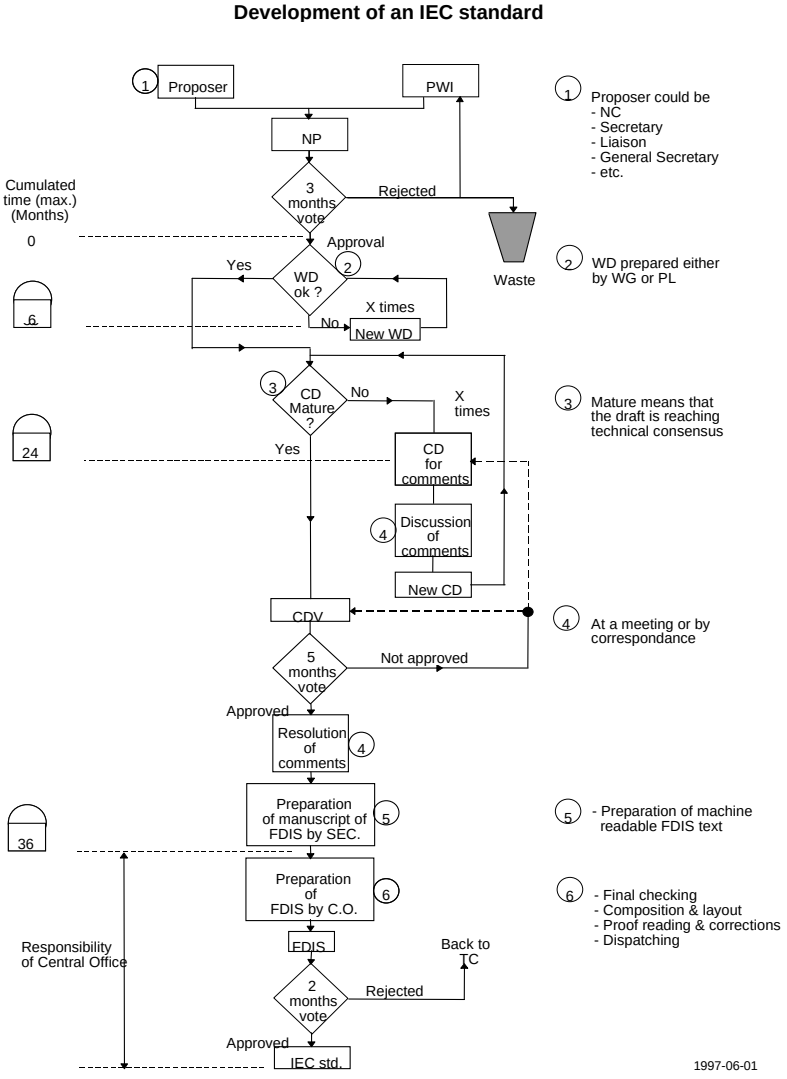
VIII.3 General principles

This section is essentially based on Part 3 of the ISO/IEC Directives. Part 3 should be consulted for more detailed information [12].

In order to provide clear and unambiguous provisions, International Standards must be homogeneous and consistent; they must also have equivalent official language versions and be fit for implementation as regional or national Standards.

- Homogeneity

Homogeneity includes uniformity of structure, of style and of terminology not only within each Standard, but also in a series of associated Standards. The structure of associated Standards and the numbering of their clauses should, as far as possible, be identical. Analogous wording should be used to express analogous provisions; identical wording should be used to express identical provisions.



Flowchart: Development of an IEC standard

The same term must be used throughout each Standard or series of Standards to designate a given concept. Synonyms must be avoided. As far as possible, only one meaning should be attributed to each term chosen.

- Consistency

Consistency requires that the text of every Standard is in accordance with the relevant provisions of existing basic International Standards. This relates particularly to

- standardized terminology

- quantities, units, and their letter symbols,

- abbreviated terms,

- bibliography references,

- technical drawings,

- graphical symbols.

A list of basic International Standards is given in annex A of

Part 3 of the ISO/IEC Directives.

VIII.4 Structure of IEC Standards

This section is essentially based on Part 3 of the ISO/IEC Directives. Part 3 should be consulted for more detailed information [12].

Standards are so diverse that no universally acceptable rules can be established for the subdivision of the subject matter. However, an individual Standard must be prepared for each subject to be standardized, and published as a complete entity.

The Standard may be split into separate parts under the same number for practical reasons, for example

- the Standard is likely to become too voluminous,

- subsequent portions of the content are interlinked,

- portions of the Standard could be referred to in regulations,

- portions of the Standard are intended to serve for certification purposes.

This has the advantages that each part can be changed separately when the need arises.

Standards have divisions and subdivisions with the following designations:

English term	French term	Example of numbering
part	partie	61000-4
clause	article	1
subclause	paragraphe	1.1
subclause	paragraphe	1.1.1
paragraph	alinéa	-
annex	annexe	A

- Subdivision within an individual Standard

The elements that together form a Standard may be classified in two ways:

- by their normative/informative nature and their position within the structure

- by their required or optional presence.

Table 2 shows a typical arrangement of the elements in a Standard.

Table 2 — Example of a typical arrangement of elements in a standard

Type of element	Arrangement of elements[a] in standard		Permitted content[a] of element(s) in standard
Informative preliminary	*Title page*		**Title**
	Table of contents		*(generated content)*
	Foreword		***Text*** *Note(s)* *Footnote(s)*
	Introduction		*Text* *Figure(s)* *Table(s)* *Note(s)* *Footnote(s)*
Normative general	**Title**		**Text**
	Scope		**Text** Figure(s) Table(s) *Note(s)* *Footnote(s)*
	Normative reference(s)		Reference(s) *Footnote(s)*
Normative technical	Term(s) and definition(s) Symbols and abbreviated terms Requirements ⋮ Normative annex		Text Figure(s) Table(s) *Note(s)* *Footnote(s)*
Informative supplementary	*Informative annex*[b]		*Text* *Figure(s)* *Table(s)* *Note(s)* *Footnote(s)*
Normative technical	Normative annex		Text Figure(s) Table(s) *Note(s)* *Footnote(s)*
Informative supplementary	*Bibliography*		*Reference(s)* *Footnote(s)*
	Index(es)		*(generated content)*

[a] Bold type = required element; upright type = normative element; italic type = informative element.

[b] Informative annexes may not contain normative elements unless these elements constitute optional provisions. For example, a test method that is optional may contain provisions.

Table 2 — Example of a typical arrangement of elements in a standard

A Standard need not contain all the normative elements shown and it may contain technical elements other than those shown.

VIII.5 Elements of IEC Standards

This section is essentially based on Part 3 of the ISO/IEC Directives. Part 3 should be consulted for more detailed information [12].

- Preliminary informative elements

These elements include the following items:

- title page

- table of contents (optional)

- foreword

- introduction

See subclause 6.1 of Part 3.

- General normative elements

This subclause covers

- scope

- normative references (optional)

See subclause 6.2 of Part 3.

- Technical normative elements

They include

- terms and definitions (optional)

- symbols and abbreviated forms (optional)

- requirements (optional)

- test methods (optional)

- classification and designation (optional)

- marking, labelling and packaging (optional)

- normative annexes (optional)

See subclause 6.3 of Part 3.

- Supplementary informative elements

This subclause covers

- informative annexes

- bibliography

- index(es)

See subclause 6.4 of Part 3.

VIII.6 Common rules and elements

- Verbal forms for the expression of provisions

A Standard does not in itself impose any obligation upon anyone to follow it. However, such an obligation may be imposed, for example, by legislation or by contract. In order to be able to claim compliance with a Standard, the user needs to be able to identify the requirements he is obliged to satisfy. He needs also to be able to distinguish these requirements from other provisions where he has a certain freedom of choice.

According to Annex E of Part 3, the following verbal forms are used:

- Requirement

shall, shall not

doit, ne doit pas

- Recommendation

should, should not

il convient de, il convient de ne pas

- Permission

may, need not

peut, peut ne pas être

- Possibility and capability

can, cannot

peut, ne peut pas

- Figures

Figures should be used wherever appropriate to present information in an easily comprehensible form. It must be possible to refer to each figure explicitly within the text.

- Diagrams

Diagrams, such as circuit diagrams and connection diagrams, must be prepared in accordance with IEC 61082. Graphical symbols used in schematic diagrams must be in accordance with IEC 60617. Reference designations must be in accordance with IEC 61346.

- Tables

Tables should be used wherever appropriate to present information in an easily comprehensible form. It must be possible to refer to each table explicitly within the text.

- References

As a general rule, references to particular pieces of text must be used instead of repetition of the original source material, since such repetition involves the risk of error or inconsistency and increases the length of the document. However, if it is considered necessary to repeat such material, its source must be identified precisely.

- Representation of numbers and numerical values

To express values of physical quantities, Arabic numerals followed by the international symbol for the unit (see IEC 60027) must be used.

- Mathematical formulae

Equations between quantities are preferred to equations between numerical values. Equations must be expressed in mathematically correct form; the variables are represented by letter symbols the meanings of which are explained in connection with the equations, unless they appear in a “Symbols and abbreviated terms” clause. Descriptive terms or names of quantities must not be arranged in the form of an equation.

IX. Specific linguistic aspects of IEC Standards

IX.1 General

IEC Standards are scientific/technical texts. Generally speaking, the following concepts apply.

- Pragmatics

The pragmatic space of IEC language (language of IEC Standards) is determined by the subject language electrotechnology, the sociolect standardizing and the geographical distribution international (see VI.2).

- Semantics

The greatest difference between IEC language and general language exists at the semantic level (see VI.3).

- Syntax

The whole text affects its segments and those in turn affect the constituant parts. Many IEC Standards also consist of or contain units which are not conventional sentences and can therefore not be described adequately by traditional grammar (see VI.4).

- Intention of texts (see VI.5, 6 and 7)

In IEC Standards, the topic-oriented information carrying intention is very important. It is signalled through declarative sentences, i.e. simple assertion without evaluative words or words with evaluative connotations. Artificial language manifestations are extreme examples of information carrying speech acts.

The directive intention is listener-oriented. Any request, order, instruction or warning is directive and its distinct linguistic form is usually obvious. Directive speech acts are frequent in the language of technology.

Evaluative and phatic speech acts are not relevant to IEC Standards.

- Social norm

The social norm is concerned with the role of language as a social phenomenon; it maintains the balance between divergent use and the unity of the system (see VI.8). The social norm of the IEC, a bilingual organization, includes two sub-norms.

- Schedules

The message forms dialogue, memo, report and essay do not concern IEC language. The schedule, on the other hand, orders and classifies information, a topic, according to the logical order inherent in that topic.

The main linguistic characteristic of the schedule is the absence of non-linguistic connecting elements between its units. The relationships between these units are indicated by sequential, horizontal or vertical ordering. The ordering may be supplemented by various numbering or typographical devices. See VI.10.

- Non-linguistic codes

The non-linguistic dimension is important for IEC Standards which frequently use diagrams, tables, numerical and other notation to supplement linguistic communication. The use of one or the other is a significant factor in achieving effectiveness in communication (see VI.11).

Some special languages have alternative written codes or whole systems of communication parallel to linguistic expression codes which may be conceived as independent of any particular language. Important non-linguistic codes:

– Language of mathematics

– Language of chemistry

– Programming codes

– Visual codes

– Artificial languages

- Modes of expression

IEC language uses the formal style rather than frozen, consultative, casual or intimate texts (see VI.12).

- Economy

Economy is practiced in IEC Standards on three levels (see VI.13)

– Economy in forms (e.g. use of tables, charts, drawings and prescribed forms)

– Syntactic economy (e.g. use of tables and abbreviations)

– Lexical economy (e.g. nomenclature)

- Precision

Precision is a universal requirement in communication. In IEC texts, lexical precision is more important than precision in forms and syntactic precision (see VI.14).

IX.2 IEC's Language Policy

The IEC's Statutes and rules of procedure deal with the use of languages. Article 20 reads: The languages of the Commission are English, French and Russian [13].

Part 1 of the Directives provides relevant information in Annex F, General policy on the use of languages.

Languages are in contact where two or more languages are used; a certain degree of competition and conflict may then occur. According to II.10 above, the ecology of language covers seven basic ecological variables. One of these is particularly relevant in the given context: Attitudes and language-identity relationship (ethnopsychological variables).

IX.2.1 Ethnopsychological considerations

An international organization necessarily transcends national, cultural and linguistic borders; it must promote and facilitate communication among its members, and between its members and other individuals and groups. Such communication has to be based on the use of languages. It is, however, impossible for any international organization to work in all the languages normally used by all its members. Moreover, any single language used in different geographical and cultural regions is likely to exhibit widely varying characteristics, expressions, styles, accents and rhythms. Languages are essential tools of international relations and international comprehension, and

therefore of the process in which international organizations are fundamentally engaged.

Seven issues are fundamental:

An international organization can only exist and carry out its function if all its members are linked together, ideally having the same access to information from the organization, shared with it or transmitted to the outside world. It needs the input of all its members. For an organization to deprive itself of the contribution of some of its members results not only in a waste but also in a distortion of its essential role.

For an international non-governmental organization having consultative status with the United Nations, it is particularly important that all members be able to communicate their problems and their wishes.

It is, however, clear that communicating in all languages spoken by members of an international organization is not possible. The more the organization grows, the more the number of languages in which its members best express themselves increases. Unfortunately, the cost of true multilingualism is prohibitive.

The cultural, social, psychological and political aspects of the issue should not be underestimated. Language is inseparable from culture; furthermore it is an integral part of the individual's personality and identity. Whilst learning a foreign language is indeed an enriching experience, its use can be a frustrating one because nuances are difficult to express and the approach to issues may vary with the language. If one goes beyond the level of words, it is in fact a question of concepts, sensitivity and way of thinking that are different. Therefore, an organization's main working language does influence its functioning.

The person who must use a foreign language to communicate can easily feel himself to be in an inferior position relative to those who have the opportunity to express themselves in their mother tongue. This feeling of inequality may develop into an impression of injustice. The privilege of some may be experienced as a form of discrimination or even as an indication of imperialism. Added to this is the fact that many international organizations were founded in an Anglo-Saxon country, and this has left its mark on their structure and their way of working.

This background explains some forms of opposition, examples of which are resistance to the generalized use of English and the struggle of some groups to have their language recognized as an official one. To French speakers, their language represents a core value (see II.13).

On a practical level, it is impossible for an organization to work in all the languages of its members. But it is difficult to claim to be international and to use only one language - in all practical cases English. A compromise solution must therefore be found that can be adapted to the particular circumstances within the organization.

The questions which an organization has to face are posed in terms of cost and benefit. However, they relate not only to finance, but - more importantly - also to the organization's purpose and philosophy.

Publications may be produced in several languages, but they are not really multilingual if most parts are written in one language and translated afterwards; for instance, drafting in English is different from drafting in French.

IX.2.2 Advantages of bilingualism

At the international level, it is common practice to use at least two languages. There are a number of reasons why this is advantageous, and several aspects are considered in the following.

Standards are not used exclusively by the technical experts that prepared them; they are also used by lawyers to settle disputes in commerce and industry. Standards are sometimes linked to legal texts for national or regional regulations; bilingual texts have to be translated into different national languages by technical experts who are of neither English nor French mother tongue.

It is therefore absolutely essential that Standards are clear, precise and free of any ambiguity. On the other hand the majority of secretaries and project leaders in IEC are not of English mother tongue.

Greater clarity and accuracy of meaning can be achieved by expressing a given concept in two languages which have different grammar and syntax.

If consensus is reached on the basis of a text drafted in only one language, difficulties may arise when it comes to putting that text into

another language. Subsequent drafting into a second language of a text already approved in the first language often brings to light difficulties of expression that could have been avoided if both versions had been prepared together. The preparation of the French version frequently allows substantial improvement of the English version.

To ensure that international meetings will be as productive as possible, it is important for the agreements reached to be utterly devoid of ambiguity.

IX.2.3 Languages of IEC Standards

International Standards are published by the IEC in EN and FR (and sometimes in multilingual editions also including Russian and other, non-official, languages, especially in cases of terminology). These versions of a given IS are equivalent, and each is regarded as being an original-language version.

It is advantageous for the technical content of a Standard to be expressed in both EN and FR from the outset of the drafting procedure, so that these two versions will be studied, amended and adopted at the same time and their linguistic equivalence will be ensured at all times.

IX.2.4 Practical aspects

When FR texts are based on existing EN texts, certain pitfalls must be avoided. The most important ones are the following:

- Secretaries whose mother tongue is not FR try to correct the FR text. This generally leads to poor results.
- When an FDIS is finalized by a secretary who is not a FR speaker, he must transmit the amended EN text to his FR experts for finalization of the FR text. Otherwise the texts are no longer equivalent.
- If a CDV was circulated in EN only, and if substantial amendments (e.g. of the structure) were required afterwards, the person in charge of the FR version must be fully informed.

- If several persons participate in the preparation of a given FR text, the result may not be homogenous and will usually suffer from terminology problems.
- If the Editing department of C.O. proposes amendments, they must be introduced in both versions (FR and EN) in a coordinated manner.

Generally speaking, it must be avoided that the quality of the FR texts is inferior to the quality of the corresponding EN texts.

IX.3 Standard American English, Standard British English and Standard French

IX.3.1 General

Regional variation of a language seems to be realized predominantly in phonology. That is, we generally recognize the different pronunciation of a speaker before we notice that his vocabulary (lexicon) is also distinctive [13].

Pronunciation distinguishes one national standard from another almost immediately, and links in a most obvious way the national standards to regional varieties.

Grammatical variation tends to be less extensive and certainly less obtrusive. But all types of linguistic organization can possibly be involved.

IX.3.2 Standard American English versus Standard British English [6, 7]

- General

Today, it is possibly American rather than British English which exerts the greater influence, worldwide and even in Europe, if only because of factors such as the “brain drain” and the impact of the mass media through films, TV and popular music.

The degree of acceptance of a single standard of EN throughout the world, across a multiplicity of political and social systems, is a truly remarkable phenomenon. The more so since the extent of the uniformity involved has, if anything, increased in the present century.

Uniformity is greatest in what is from most viewpoints the relatively unimportant matter of spelling.

In grammar and vocabulary, EN presents somewhat less of a monolithic character, but even so the world-wide agreement is extraordinary and seems actually to be increasing under the impact of closer world communication and the spread of identical culture, both material and non-material.

- Spelling

Although printing houses in all EN speaking countries retain a tiny area of individual decision (some preferring -ise and others -ize in words like realize; some preferring judgement and others judgment; etc.), there is basically a single system, with two minor subsystems: British and American. The subsystem with British orientation is used in all EN-speaking countries except the United States, with distinctive forms in only a small class of words. Examples:

GB	U.S.
colour	color
centre	center
levelled	leveled
armour	armor
aluminium	aluminum
metre	meter

In Canada, the British subsystem is used for the most part, but some publishers (especially of popular material) follow the American subsystem and some a mixture (color but centre).

- Vocabulary

Lexical examples are far more numerous than examples for grammatical differences, but many of them are familiar to users of both standards.

GB	U.S.
railway	railroad
tap	faucet

autumn	fall
earth	ground
isolator	disconnector
isolating switch	disconnecting switch

More recent lexical innovations in either area tend to spread rapidly to the other.

- Internal “faux amis”

Certain forms have different meanings in British and American usage.

	GB	U.S.
To table	Mettre en discussion	Ajourner
Corn	Blé	Maïs
First floor	Étage au-dessus du rez-de-chaussée	Rez-de-chaussée

- Grammar

Grammatical differences are few and the most conspicuous are widely known; the fact that American EN has two past participles for get (got, gotten) and British EN only one (got), for example. And that in British EN the indefinite pronoun one is repeated in co-reference when American English uses he.

Example: One cannot succeed at this unless one (he) tries hard.

IX.3.3 Standard French versus other varieties [6]

Outside France several varieties of FR exist - in Canada, Belgium, Switzerland, the Maghreb and Black Africa. These varieties differ only little from Standard FR. There are canadianismes, belgicismes and helveticismes, which are accepted as good usage. These are special expressions coined in the relevant countries where they became part of the standard language.

The rare differences regarding Belgium and Switzerland are usually explained by the contact of French with Dutch or German.

FR in Canada is in a different situation. For various reasons, the technical literature in FR did not develop as might be expected in a country which is officially bilingual. However, the economic development which has now taken place in Quebec for a number of years is changing the picture.

The future will show if the gap between Standard FR and Canadian FR will widen. In fact, the Office de la Langue Française is very active with the creation of neologisms.

IX.3.4 ISO/IEC Directives

In subclause 6.6.2 of Part 3 [12], Spelling and abbreviations of names of organizations, and style, the following reference works for EN are suggested:

- The Shorter Oxford English Dictionary
- The Concise Oxford Dictionary

In other words, the preferred variety is Standard British EN.

As far as French is concerned, the recommended reference works are:

- Dictionnaire Robert
- Dictionnaire Larousse (Lexis)
- Dictionnaire des difficultés de la langue française (V. Thomas, Larousse).

IX.4 The IEV (TC1)

IX.4.1 General

Information management and large-scale information distribution make terminology standardization and harmonization increasingly important. The most efficient use of information and communication technology at national and international level is closely linked to the dual function of terminology; it represents, on the one hand, specialized knowledge at the level of concepts and, on the other, it can be used to access any other kind of specialized information at its highest degree of detail. It is self-evident that this requires appropriate organization and

the establishment of rules. Terminology is vital to all information activities. It is applied for instance in

- documentation (indexing and abstracting)
- information retrieval
- information management
- scientific and technical writing
- technical documentation
- translation of scientific/technical texts
- subject-field related teaching and training
- foreign specialized language learning
- transfer of knowledge and technology.

In other words, terminology plays a crucial role wherever and whenever specialized knowledge or information is created, recorded, communicated, transformed or transferred.

In the field of standardization, the standardization of terminology is known to be a prerequisite of subject standardization. For the users, the consistent application of a unified terminology across all documents produced by a Standards organization is one of the criteria by which the overall quality of Standards may be judged. For the IEC, its terminology constitutes a tool for information management and quality assurance of the contents of its Standards.

Moreover, drafting of a standard is a special type of technical writing. The same applies to the translation of a Standard. Technical writing comprises more than just writing a document in a specialized language; it also covers the handling of reference documents or other sources and the consistent use of terminology, layout, etc., in a logical and harmonized way.

IX.4.2 IEC TC1: Terminology

It is an error in principle if one supposes when compiling a multilingual dictionary, that the notional systems of the relevant languages are identical. In fact, only a limited number of equivalent

words really do have the same meaning; in the majority of cases, these are defined scientific or technical terms. Providing such definitions is the task of IEC TC1.

TC1: Terminology, was set up in 1908. It is a "horizontal" committee which

- standardizes and coordinates terms and definitions used by other TCs of the IEC
- gives the equivalence of the terms in the different languages, and
- prepares the International Electrotechnical Vocabulary (IEV).

TC 1 has the overall responsibility for preparing the IEV. All other IEC TCs have to make sure that their terminology is not inconsistent with the IEV.

IX.4.3 Methodology of IEC TC1

The procedures for preparing IEV chapters are given in Part 2, Annex G of the ISO/IEC Directives [11].

The fundamental principle is that in TC1 a broad and truly international consensus has to be reached. In this context, the following aspects are particularly important:

- Out of more than 50 IEC member countries, 21 are participating in the work of TC1 (P-members).
- Requests for new terminology may be submitted by any TC/SC or NC.
- Committee drafts (CDs) are prepared either by a Working Group (WG) of the relevant product TC/SC or, alternatively,
- CDs may also be prepared by a WG of TC1. Two different cases exist:
- either no TC/SC is particularly concerned, e.g. Mathematics, or
- several TCs/SCs are concerned, e.g. Electromagnetic compatibility.

- NCs consult their experts of TC1 and of any other interested committee in parallel and submit their collated comments in a single document.
- The entries are selected by experts in the technical field rather than lexicographers.
- The resulting draft is circulated to all parties concerned (including other international organizations).

The definitions of the concepts are given in FR, EN and Russian, that is in the principal IEV languages.

The definitions are reviewed by experts from all P-member countries. This is the only way to guarantee not only the correctness of the definitions, but also their unambiguity and translatability into other languages.

The terms are given in the above three principal languages and also in the additional IEV languages: Arabic, German, Spanish, Italian, Polish, Swedish, Portuguese, Greek, and Japanese. They are provided (or coined, if necessary) by experts in the relevant fields in their mother tongue.

Each IEV chapter therefore represents the amalgamation of three monolingual dictionaries and a multilingual dictionary. Compared to conventional multilingual dictionaries, this layout considerably reduces the risk of errors.

More than sixty chapters have been published as parts of IEC publication 60050.

IX.4.4 Existing IEV chapters

There are eight classes of IEV chapters:

1. General concepts
2. Materials
3. Measurement, regulation and calculation
4. Electric equipment
5. Electronic equipment

6. Generation, transmission and distribution of energy

7. Telecommunications

8. Particular applications

List of existing IEV chapters [15]

IEC 60050-101	Mathematics
IEC 60050-111	Physics and chemistry
IEC 60050-121	Electromagnetism
IEC 60050-131	Electric and magnetic circuits
IEC 60050-151	Electrical and magnetic devices
IEC 60050-161	Electromagnetic compatibility
IEC 60050-191	Dependability and quality of service
IEC 60050-195	Earthing and protection against electric shock
IEC 60050-212	Insulating solids, liquids and gases
IEC 60050-221	Magnetic materials and components
IEC 60050-301	General terms on measurements in electricity
IEC 60050-321	Instrument transformers
IEC 60050-351	Automatic control
IEC 60050-371	Telecontrol
IEC 60050-393	Nuclear instrumentation: Physical phenomena and basic concepts
IEC 60050-394	Nuclear instrumentation: Instruments
IEC 60050-411	Rotating machines
IEC 60050-415	Wind turbine generator systems
IEC 60050-421	Power transformers and reactors
IEC 60050-426	Electrical apparatus for explosive atmospheres
IEC 60050-431	Transductors

IEC 60050-436	Power capacitors
IEC 60050-441	Switchgear, controlgear and fuses
IEC 60050-442	Electrical accessories
IEC 60050-446	Electrical relays
IEC 60050-448	Power system protection
IEC 60050-461	Electric cables
IEC 60050-466	Overhead lines
IEC 60050-471	Insulators
IEC 60050-481	Primary cells and batteries
IEC 60050-486	Secondary cells and batteries
IEC 60050-521	Semiconductor devices and integrated circuits
IEC 60050-531	Electronic tubes
IEC 60050-541	Printed circuits
IEC 60050-551	Power electronics
IEC 60050-561	Piezoelectric devices for frequency control and selection
IEC 60050-581	Electromechanical components for electronic equipment
IEC 60050-601	Generation, transmission and distribution of electricity - General
IEC 60050-602	Generation, transmission and distribution of electricity - Generation
IEC 60050-603	Generation, transmission and distribution of electricity - Power systems planning and management
IEC 60050-604	Generation, transmission and distribution of electricity - Operation
IEC 60050-605	Generation, transmission and distribution of electricity - Substations

IEC 60050-651	Live working
IEC 60050-691	Tariffs for electricity
IEC 60050-701	Telecommunications, channels and networks
IEC 60050-702	Oscillations, signals and related devices
IEC 60050-704	Transmission
IEC 60050-705	Radio wave propagation
IEC 60050-712	Antennas
IEC 60050-713	Radiocommunications: transmitters, receivers, networks and operation
IEC 60050-714	Switching and signalling in telecommunication
IEC 60050-715	Telecommunication networks, teletraffic and operation
IEC 60050-716	Integrated services digital network
IEC 60050-721	Telegraphy, facsimile and data communication
IEC 60050-722	Telephony
IEC 60050-723	Broadcasting: Sound, television, data
IEC 60050-725	Space radiocommunications
IEC 60050-726	Transmission lines and waveguides
IEC 60050-731	Optical fibre communication
IEC 60050-801	Acoustics and electroacoustics
IEC 60050-806	Recording and reproduction of audio and video
IEC 60050-807	Digital recording of audio and video signals
IEC 60050-811	Electric traction
IEC 60050-815	Supraconductivity
IEC 60050-821	Signalling and security apparatus for railways

IEC 60050-826	Electrical installations of buildings
IEC 60050-841	Industrial electroheating
IEC 60050-845	Lighting
IEC 60050-851	Electric welding
IEC 60050-881	Radiology and radiological physics
IEC 60050-891	Electrobiology

IX.5 Documentation and graphical symbols (TC3)

IX.5.1 General

Technical texts, especially in electrical technology, frequently contain graphical symbols. “Technical documentation” is also present in many Standards. In fact, electrotechnical documentation cannot be exchanged without a standardized collection of electrotechnical symbols.

A well-defined relationship exists between terminology and symbology; that is, a good symbol should give a fair impression of the functional behaviour of a device.

Constructional details are generally of less importance, although they may play a role in the recognition of the symbolized device, so that the meaning of a symbol will be clear at once.

There is a tendency to increase the role of alphanumeric information in symbology. This is due to the fact that letters and numbers are available on every printer and can be recognized easily. Letters and numbers, single or in combination, serve essentially as qualifying symbols for input functions, output functions and general functions.

Symbols on equipment form a special category and should, if possible, be associated with their meaning at once (not relevant in this context).

IX.5.2 Present developments

Although IEC TC3 is a very old committee, its activities are much influenced by ongoing technical developments.

Industry and other bodies are increasingly dependant on complex systems. The demand for installations or systems that are safe, easy to operate and easy to maintain is increasing. This is shown, for example, by quality Standards like ISO 9000 and rules for product liability. Documentation plays an important economic role in this context.

Complex systems often involve different technologies, and electrotechnology is just one of them. This calls for methods and rules which are coordinated across technological boundaries.

Documentation is fast moving away from the traditional "paper-based" documentation into the information technology area where other media and computer-based tools are used. That is, documentation and information technology are now closely linked together.

IX.5.3 IEC TC3: Documentation and graphical symbols

IEC TC3 has four subcommittees:

SC3A, Graphical symbols for diagrams

SC3B, Documentation

SC3C, Graphical symbols for use on equipment (not relevant in this context)

SC3D, Data sets for libraries of electric component data.

Its scope is to prepare standards for the electrotechnical and related fields.

1. Methods and rules associated with human interpretation of information. This refers to

- presentation of information in technical documentation
- graphical symbols for use in technical documentation
- graphical symbols for human interaction with equipment.

2. Methods and rules associated with the handling of information in computer sensible form. This refers to

- information models for the purpose of technical documentation and the exchange of technical information, and the identification of further needs for such models
- definition of data element types and data sets for use on information models and technical documentation, and for exchange of technical information.

The scope includes definition and coordination of the information required during the whole life cycle of a device, system or plant.

The work should be carried out in close coordination with associated technical committees and international organizations.

Membership: 22 P-members and 11 O-members.

IX.5.4 IEC SC3A: Graphical symbols for diagrams

IEC SC3A is responsible for the preparation of standards for methods and rules referring to graphical symbols for use in technical documentation (especially diagrams).

Included are symbol elements, rules for (basic or) general symbols, rules for qualifying (or additional) symbols, as well as rules for different forms and orientations of symbols.

Membership: 22 P-members and 11 O-members

IX.5.5 IEC SC3B: Documentation

IEC SC3B has the following terms of reference: To prepare standards regarding methods and rules referring to

- presentation of information in technical documentation
- information models for the purpose of technical documentation and the exchange of technical information, and the identification of further needs for such models.

Included are the following items:

- Rules for the application of graphical symbols in diagrams (the “outside” of the symbol), and rules for the manipulation

of complete symbol versions (but not the contents or "inside" of the different versions)

- Rules for the presentation of diagram information, that is, the integration of graphical symbols and supplementary data
- Rules for reference designation and the application of terminal designation
- Rules for document designations
- Rules for different kinds of document, including rigorous descriptions of document architecture which are the basis for computer-based interchange of documents
- Rules for the structuring of documentation
- Coordination within TC3 of activities in the field of computer-aided design.

Membership: 22 P-members and 12 O-members

IX.5.6 IEC SC3D: Data sets for libraries

IEC SC3D prepares standards for the electrotechnical and related fields regarding methods and rules associated with the handling of information in computer sensible form. The methods and rules refer to the definition of data element types and data sets for use in information models and technical documentation, and for exchange of technical information.

Membership: 19 P-members and 12 O-members

IX.5.7 Standards published by IEC SC3A, SC3B and SC3D [15]

- Standards published by IEC SC3A

IEC 60617 Graphical symbols for diagrams

IEC 60617-1 Part 1: General information, general index. Cross-reference tables

IEC 60617-2	Part 2: Symbol elements, qualifying symbols and other symbols having general application
IEC 60617-3	Part 3: Conductors and connecting devices
IEC 60617-4	Part 4: Passive components
IEC 60617-5	Part 5: Semiconductors and electron tubes
IEC 60617-6	Part 6: Production and conversion of electrical energy
IEC 60617-7	Part 7: Switchgear, controlgear and protective devices
IEC 60617-8	Part 8: Measuring instruments, lamps and signalling devices
IEC 60617-9	Part 9: Telecommunications - Switching and peripheral equipment
IEC 60617-10	Part 10: Telecommunications - Transmission
IEC 60617-11	Part 11: Architectural and topographical installation plans and diagrams
IEC 60617-12	Part 12: Binary logic elements
IEC 60617-13	Part 13: Analogue elements
IEC 61734	Application of IEC 60617-12 and IEC 60617-13 standards

- Standards published by IEC SC3B

IEC 60848	Preparation of function charts for control systems
IEC 61082	Preparation of documents used in electrotechnology
IEC 61082-1	Part 1: General requirements
IEC 61082-2	Part 2: Function-oriented diagrams
IEC 61082-3	Part 3: Connection diagrams, tables and lists
IEC 61082-4	Part 4: Location and installation diagrams
IEC 61082-6	Part 6: Index

IEC 61175	Designations for signals and connections
IEC 61286	Information technology - Coded graphic character set for use in the preparation of documents used in electrotechnology and for information interchange
IEC 61346	Industrial systems, installations and equipment and industrial products - Structuring principles and reference designations
IEC 61346-1	Part 1: Basic rules
IEC 61355	Classification and designation of documents for plants, systems and equipment
IEC 61666	Industrial systems, installations and equipment and industrial products - Identification of terminals within a system

- Standards published by IEC SC3D

IEC 61360	Standard data element types with associated classification scheme for electric components
IEC 61360-1	Part 1: Definitions - Principles and methods
IEC 61360-3	Part 3: Maintenance and validation procedures
IEC 61360-4	Part 4: IEC reference collection of standard data element types, component classes and terms

IX.6 Quantities and units, and their letter symbols (TC25)

IX.6.1 Quantities and units in technical texts

Technical texts, especially in electrical technology, always contain quantities and units regardless of their sociolectal and geographical characteristics.

Quantities and units are closely related. In fact, measuring units have been allocated to all physical quantities. Most systems of units are metric, e.g. CGS (centimetre, gram, second), the Technical system (metre, kilogram-force, second) and Giorgi's MKSA system (metre, kilogram, second, ampere) on which the International System of Units (SI) is based. The history of the latter system is closely linked to the history of the IEC.

The names of quantities are not identical in different languages, but the names for their units are in general international. All quantities and units can be presented by letter symbols as shown in the following examples:

Name of quantity	Symbol of quantity	Name of unit	Symbol of unit
Pressure	p	pascal	Pa
Active power	P	watt	W
Electric current	l	ampere	A

The letter symbols are used in equations, whereas the names of quantities and symbols are spelled out in texts.

IEC 60027: Letter symbols to be used in electrical technology, was prepared by IEC TC 25: Quantities and units, and their letter symbols.

Other important Standards on quantities and units in general are:

- ISO 50031 (all parts): Quantities and units
- ISO 51000: SI units and recommendations for the use of their multiples and of certain other units.

A checklist concerning quantities and units to be used in international standards is included as Annex F in Part 3 of the ISO/IEC Directives [12].

IX.6.2. IEC TC 25: Quantities and units, and their letter symbols

- Scope

The scope of TC 25 is to prepare international Standards on quantities and units to be used generally in electrical technology, and to

review the use of quantities and units in IEC Standards. These Standards should, whenever possible, be based on the SI (International System). Such Standards may be related to definitions, names, letter symbols and their use; to the relations in which these quantities and units appear; and to the signs and symbols used with them.

- Membership:

At present, there are 17 participating members and 12 observing members.

- Standards prepared:

IEC 60027, Letter symbols to be used in electrical technology

IEC 60375, Conventions concerning electric and magnetic circuits

- Present trends:

The expansion of applications of electrical, electromagnetic, and optical technology to telecommunications, data transfer, and information technology requires the development of additional standards for the associated quantities, units, and letter symbols. These areas of technology are critical to the industrial nations. The scientific nature of the present field and the need for close co-ordination with other organizations calls for a specially adapted methodology.

IX.6.3. Standardization of quantities and units, and their letter symbols

This procedure is described in clause G.2 of Part 2 of the ISO/IEC Directives [11].

It should be noted that this task can be undertaken only by engineers/scientists who are familiar with the subject matter.

All relevant proposals have to be voted upon by National Committees, and the above-mentioned liaison organizations have an opportunity to submit their comments.

IX.6.4. IEC 27: Letter symbols to be used in electrical technology [15]

This standard consists at present of four parts:

IEC 60027-1 (1992):	General
IEC 60027-2 (1972):	Telecommunications and electronics, with supplements 60027-2A (1975) and 60027-2B (1980)
IEC 60027-3 (1989):	Logarithmic quantities and units
IEC 60027-4 (1985):	Symbols for quantities to be used for rotating electrical machines
IEC 60027-1:	General

Part 1 provides information about general quantities, units and their letter symbols, and mathematical symbols that are to be used in electrical technology. It also gives rules for writing and printing these symbols and for the use of additional marks (subscripts, superscripts, etc.) with symbols for quantities.

The present sixth edition (1992) covers in particular the following technical fields:

Space and time

Periodic and related phenomena

Mechanics

Heat

Electricity and magnetism

Light and related electromagnetic radiation

X. Linguistic behaviour of participants in standardization

X.1. Selected participants

Several categories of experts participate directly in the technical part of standardization work:

- WG members
- WG convenors

- delegates at TC/SC meetings
- chairmen of TCs/SCs
- secretaries of TCs/SCs
- translators (who should preferably also participate in the technical work).

Other players contribute in a less direct manner to technical and publishing activities:

- experts in member countries who prepare comments
- editing committees
- Central Office staff

The WG members, WG convenors, delegates at TC/SC meetings, chairmen, secretaries, anonymous experts preparing comments and editing committee members all belong to one of three language groups. They can be

- of neither EN nor FR mother tongue (these experts represent the majority and include e.g. Japanese and Germans)
- of EN mother tongue (e.g. Americans or certain Canadians).
- of FR mother tongue (e.g. certain Belgians or certain Canadians).

It would be possible but is not practical to examine the linguistic behaviour of all categories of participants in all language groups. Five types were selected because of their obvious impact on the linguistic aspects of IEC Standards:

- TC/SC secretaries with mother tongue other than EN or FR, see X.2
- TC/SC secretaries with EN mother tongue, see X.3
- TC/SC secretaries with FR mother tongue, see X.4
- Translators, see X.5
- Editing committees, see X.6

X.2 Performance of TC/SC secretaries-mother tongue other than EN or FR

X.2.1 Aspects related to Section II: General aspects of bilingualism

- Lingua francas (see II.2)

The secretaries have to work in EN and, if possible, FR. These languages are necessarily weaker than their first language.

Today, there is no doubt that EN is the most important global variety and thus has the greatest status as a world lingua franca.

- Second-language learning (see II.3)

The secretaries are primarily technical experts who also studied at least one foreign language. In certain cases, they did not have the opportunity to attain a high level of fluency.

- Bilingualism and intelligence (see II.4)

In IEC, bilingualism has never been associated with lowered intelligence.

- Interference (see II.5)

Interference occurs at the levels of pronunciation, words, idiomatic expressions, syntax and spelling. A foreign accent, stilted syntax, and words with slightly different meanings are observed. However, communication between TC/SC secretaries and other experts on technical subjects must not be affected.

- Psycholinguistic aspects (see II.7)

The relevant aspects are:

- Language forgetting

  Its possible effects are hesitant language, code-switching, different pronunciation and reduced writing skills.

- Performance under stress

This may be a problem when the underlying dominance pattern becomes clear.

- Difficulties in translating

  Bilinguals are not necessarily born translators.

- Bilingualism and society (see II.8)

IEC experts are college educated and usually belong to the middle class. Their bilingualism (first language/EN) or trilingualism (first language/EN/FR) is always seen as a major asset, never as an inconvenience.

- Societal bilingualism (see II.12)

In the IEC, strong political, economic and cultural forces are present. EN, and to a lesser degree FR, are powerful links throughout the IEC community.

- Distance between language groups (see II.14)

A high level of functional bilingualism is enhanced by the following:

- amount of contact between the secretary's country and EN (FR) speaking countries
- similarity of the cultures involved
- attitude towards the EN (FR) community

X.2.2 Aspects related to Section III: Functional bilingualism

- General (see III.1)

The TC/SC secretaries have to be functionally bilingual.

- Receptive bilingualism (see III.2)

- The secretaries should understand EN, both spoken and written, even with heavy interference at the levels of pronunciation, lexicon, syntax and spelling.
- Receptive abilities in FR are an important asset.

- Productive bilingualism (see III.3)

- The secretaries should speak and write EN correctly.

- Productive abilities in FR are an important asset.

- Affective filter (see III.6)

A low affective filter is essential (no anxiety about manipulating the weaker language).

X.2.3 Aspects related to Section IV: Equivalence of FR/EN texts

- Methods of translation (see IV.2)

The secretaries have to be able to apply the translation methods borrowing, calque, literal translation, transposition and modulation.

- Translationese (see IV.3)

An effort must be made to avoid translationese in EN and FR texts.

X.2.4 Aspects related to Section V: Translating scientific/technical texts

- Translating from mother tongue to foreign language and vice versa (see V.5)

Employers of translators stick, wherever possible, to the principle of foreign language to native language translation.

- The TC/SC secretaries, however, have to prepare their documents in foreign languages.

- Many IEC documents handled by the secretaries were originally drafted by experts of mother tongue other than EN or FR.

- Knowledge of target language (see V.8)

A technical translator must be able to embody the meaning in lucid, terse and euphonious target language prose. The secretaries,

however, cannot avoid wording in their mother tongue sometimes carrying over into their EN/FR texts.

- Translational competence (see V.9)

Linguistic sensitivity is important for translators. This applies probably even more to secretaries who have to work in the foreign languages EN and FR.

- Polysemy, faux amis and paronyms (see V.10 and 11)

Familiarity with these concepts is an asset.

X.2.5 Aspects related to Section VI: Features of scientific/technical texts

- Non-linguistic codes (see VI.11)

If applicable, the secretaries must be familiar with the relevant codes (languages of mathematics and chemistry, flow diagrams, visual codes and artificial languages).

- Modes of expression (see VI.12)

IEC Standards apply the formal style.

- Economy and precision (see VI.13 and 14)

Economy and precision are necessary in scientific/technical texts. However, precision normally conflicts with economy.

X.2.6 Aspects related to Section VIII: Development, structure and drafting of IEC Standards

- General (see VIII.1)

The secretaries must be familiar with the ISO/IEC Directives. In the present context, three clauses of Part 3: Rules for the structure and drafting of International Standards, are particularly relevant:

– Clause 4: General principles (see VIII.3)

– Clause 5: Structure (see VIII.4)

– Clause 6: Drafting (see VIII.5)

X.2.7 Aspects related to Section IX: Specific linguistic aspects of IEC Standards

- Advantages of bilingualism (see IX.2.2)

The secretaries should understand that this bilingualism is an asset despite the additional investment in effort and time. See also Section XI.

- Standard American EN, Standard British EN and Standard FR versus other varieties (see IX.3)

In principle, the varieties used in IEC work are Standard British EN and Standard FR.

- The IEV (TC1), Documentation and graphical symbols (TC3), Quantities and units, and their letter symbols (TC25) (see IX.4, 5 and 6)

Where applicable, the secretaries must apply the Standards prepared by the above horizontal TCs.

X.2.8 Aspects related to other parts of Section X: Linguistic behaviour of participants in standardization

- Performance of translators (see X.5)

Close coordination between the TC/SC secretaries and the translators is essential.

- Performance of editing committees (see X.6)

It is desirable that the secretary is a member of the editing committee.

X.3 Performance of TC/SC secretaries-mother tongue EN

X.3.1 Aspects related to Section II: General aspects of bilingualism

- Lingua francas (see II.2)

The secretaries work in their native language EN and, if possible, in FR (which is necessarily weaker than their first language).

Today, there is no doubt that EN is the most important global variety and thus has the greatest status as a world lingua franca.

- Bilingualism and society (see II.8)

IEC experts are college educated and usually belong to the middle class. If they are bilingual EN/FR, this is always seen as a major asset, never as an inconvenience.

- Societal bilingualism (see II.12)

In the IEC, strong political, economic and cultural forces are present. EN and to a lesser degree FR are powerful links throughout the IEC community.

X.3.2 Aspects related to Section III: Functional bilingualism

- Receptive bilingualism (see III.2)

- The secretaries shall understand EN, both spoken and written, even with heavy interference at the levels of pronunciation, lexicon, syntax and spelling.
- Receptive abilities in FR are an important asset.

- Productive bilingualism (see III.3)

- The secretaries must speak and write EN correctly.
- Productive abilities in FR are an important asset.

X.3.3 Aspects related to Section IV: Equivalence of FR/EN texts

- Methods of translation (see IV.2)

The secretaries should understand the concept of translation methods.

- Translationese (see IV.3)

An effort must be made to avoid translationese in EN and FR texts.

X.3.4 Aspects related to Section V: Translating scientific/ technical texts

- Translating from mother tongue to foreign language and vice versa (see V.5)

Employers of translators stick, wherever possible, to the principle of foreign language to native language translation. However, many IEC documents have to be prepared by experts of mother tongue other than EN or FR.

- Polysemy, faux amis and paronyms (see V.10 and 11)

Familiarity with these concepts is an asset.

X.3.5 Aspects related to Section VI: Features of scientific/ technical texts

- Non-linguistic codes (see VI.11)

If applicable, the secretaries must be familiar with the relevant codes (languages of mathematics and chemistry, flow diagrams, visual codes and artificial languages).

- Modes of expression (see VI.12)

IEC Standards apply the formal style.

- Economy and precision (see VI.13 and 14)

Economy and precision are necessary in scientific/technical texts. However, precision normally conflicts with economy.

X.3.6 Aspects related to Section VIII: Development, structure and drafting of IEC Standards

- General (see VIII.1)

The secretaries must be familiar with the ISO/IEC Directives. In the present context, three clauses of Part 3: Rules for the structure and drafting of International Standards, are particularly relevant:

– Clause 4: General principles (see VIII.3)

– Clause 5: Structure (see VIII.4)

– Clause 6: Drafting (see VIII.5)

X.3.7 Aspects related to Section IX: Specific linguistic aspects of IEC Standards

- Advantages of bilingualism (see IX.2.2)

The secretaries should understand that this bilingualism is an asset despite the additional investment in effort and time. See also Section XI.

- Standard American EN, Standard British EN and Standard FR (see IX.3)

In principle, the varieties used in IEC work are Standard British EN and Standard FR.

- The IEV (TC1), Documentation and graphical symbols (TC3), Quantities and units, and their letter symbols (TC25) (see IX.4, 5 and 6)

Where applicable, the secretaries must apply the Standards prepared by the above horizontal TCs.

X.3.8 Aspects related to other parts of Section X: Linguistic behaviour of participants in standardization

- Performance of translators (see X.5)

Close coordination between the TC/SC secretaries and the translators is essential.

- Performance of editing committees (see X.6)

It is highly desirable that the secretary is a member of the editing committee. He may take direct responsibility for English.

X.4 Performance of TC/SC secretaries-mother tongue FR

X.4.1 Aspects related to Section II: General aspects of bilingualism

- Lingua francas (see II.2)

The secretaries have to work in EN (which is necessarily weaker than their first language); they also use their native language FR.

Today, there is no doubt that EN is the most important global variety and thus has the greatest status as a would lingua franca.

- Second-language learning (see II.3)

The secretaries are primarily technical experts who also studied at least one foreign language. In certain cases, they did not have the opportunity to attain a high level of fluency.

- Bilingualism and intelligence (see II.4)

In IEC, bilingualism has never been associated with lowered intelligence.

- Interference (see II.5)

Interference occurs at the levels of pronunciation, words, idiomatic expressions, syntax and spelling. A FR accent, stilted syntax, and words with slightly different meanings are observed. However, communication between TC/SC secretaries and other experts on technical subjects must not be affected.

- Psycholinguistic aspects (see II.7)

The relevant aspects are:

– Language forgetting

Its possible effects are hesitant language, code-switching, different pronunciation and reduced writing skills.

– Performance under stress

This may be a problem when the underlying dominance pattern of FR becomes clear.

– Difficulties in translating

Bilinguals are not necessarily born translators.

- Bilingualism and society (see II.8)

IEC experts are college educated and usually belong to the middle class. In the IEC member countries where FR is at least one of the official languages (France, Belgium, Canada, Luxemburg and Switzerland), the bilingualism FR/EN is always seen as a major asset, never as an inconvenience.

- Societal bilingualism (see II.12)

In IEC, strong political, economic and cultural forces are present. English, and to a lesser degree French, are powerful links throughout the IEC community.

- Language as a core value (see II.13)

The FR language clearly represents a core value to the secretaries of FR mother tongue.

- Distance between language groups (see II.14)

A high level of functional bilingualism is enhanced by the following:

- amount of contact between the secretary's country and EN speaking countries (this contact is particularly strong in Canada)

– similarity of the FR and EN culture

– attitude towards the EN community

X.4.2 Aspects related to Section III: Functional bilingualism

- General (see III.1)

The secretaries have to be functionally bilingual.

- Receptive bilingualism (see III.2)

– The secretaries should understand EN, both spoken and written, even with heavy interference at the levels of pronunciation, lexicon, syntax and spelling.

– The secretaries must have full receptive abilities in FR.

- Productive bilingualism (see III.3)

– The secretaries should speak and write EN correctly.

– The secretaries must have full productive abilities in FR.

- Affective filter (see III.6)

A low affective filter is essential (no anxiety about manipulating EN).

X.4.3 Aspects related to Section IV: Equivalence of FR/EN texts

- Methods of translation (see IV.2)

The secretaries have to be able to apply the translation methods borrowing, calque, literal translation, transposition and modulation.

- Translationese (see IV.3)

An effort must be made to avoid translationese in EN and FR texts.

X.4.4 Aspects related to Section V: Translating scientific/ technical texts

- Translating from mother tongue to foreign language and vice versa (see V.5)

Employers of translators stick, wherever possible, to the principle of foreign language to native language translation.

– The TC/SC secretaries of FR mother tongue, however, have to prepare most documents in EN.

– Many IEC documents handled by the secretaries were originally drafted by experts of mother tongue other than EN or FR.

- Knowledge of target language (see V.8)

A technical translator must be able to embody the meaning in lucid, terse and euphonious target language prose. The secretaries, however, cannot avoid wording in their mother tongue sometimes carrying over into their EN texts.

- Translational competence (see V.9)

Linguistic sensitivity is important for translators. This applies probably even more to the secretaries who have to work in the foreign language EN.

- Polysemy, faux amis and paronyms (see V.10 and 11)

Familiarity with these concepts is an asset.

X.4.5 Aspects related to Section VI: Features of scientific/ technical texts

- Non-linguistic codes (see VI.11)

If applicable, the secretaries must be familiar with the relevant codes (languages of mathematics and chemistry, flow diagrams, visual codes and artificial languages).

- Modes of expression (see VI.12)

IEC Standards apply the formal style.

- Economy and precision (see VI.13 and 14)

Economy and precision are necessary in scientific/technical texts. However, precision normally conflicts with economy.

X.4.6 Aspects related to Section VIII: Development, structure and drafting of IEC Standards

- General (see VIII.1)

The secretaries must be familiar with the ISO/IEC Directives. In the present context, three clauses of Part 3: Rules for the structures and drafting of International Standards, are particularly relevant:

– Clause 4: General principles (see VIII.3)

– Clause 5: Structure (see VIII.4)

– Clause 6: Drafting (see VIII.5)

X.4.7 Aspects related to Section IX: Specific linguistic aspects of IEC Standards

- Advantages of bilingualism (see IX.2.2)

The secretaries of FR mother tongue understand that this bilingualism is an asset despite the additional investment in effort and time. See also Section XI.

- Standard American EN, Standard British EN and Standard FR (see (IX.3)

In principle, the varieties used in IEC work are Standard British EN and Standard FR.

- The IEV (TC1), Documentation and graphical symbols (TC3), Quantities and units, and their letter symbols (TC25) (see IX.4, 5, 6)

Where applicable, the secretaries must apply the Standards prepared by the above horizontal TCs.

X.4.8 Aspects related to other parts of Section X: Linguistic behaviour of participants in standardization

- Performance of translators (see X.5)

Close coordination between the TC/SC secretaries and the translators is essential.

- Performance of editing committees (see X.6)

It is highly desirable that the secretary is a member of the editing committee. He may take direct responsibility for FR.

X.5 Performance of translators

X.5.1 Types of translation

The translations prepared in connection with IEC work and the application of the Standards can be classified according to the source language (SL) and target language (TL). The following classification consists of seven translation types.

- SL: national language which is not an IEC working language

TL: EN

Ex.: translation of a PWI from Japanese into EN

Little effect of the translation quality on the EN text of the project.

This translation type is common.

- SL: a national language which is not an IEC working language

TL: FR

Ex.: translation of a PWI from Portuguese into FR

Little effect of the translation quality on the FR text of the project.

This translation type is not common.

- SL: FR

TL: EN

Ex.: translation of a CD or CDV from FR into EN

Major effect of the translation quality on the EN text of the project.

This translation type is common. See X.3.2.

- SL: EN

TL: FR

Ex.: translation of a CD or CDV from EN into FR

Major effect of the translation quality on the FR text of the project.

This translation type is very common. See X.4.2.

- SL: FR

TL: a national language which is not an IEC working language

No effect of the translation quality on the IEC project.

- SL: EN

TL: a national language which is not an IEC working language

No effect of the translation quality on the IEC project.

- SL: FR/EN

TL: a national language which is not an IEC working language

No effect of the translation quality on the IEC project.

X.5.2 Aspects related to Section II: General aspects of bilingualism

- Interference (see II.5)

– Translation from FR into EN

The translators are sometimes engineers without linguistic training who translate from their mother tongue FR into the foreign language EN. A high level of interference is then common.

If engineers translate from the foreign language FR into their mother tongue EN, the level of interference tends to be moderate.

Less interference arises if translations are prepared by trained translators.

– Translation from EN into FR

The translators are frequently engineers without linguistic training who translate from the foreign language EN into their mother tongue FR. The level of interference tends to be moderate.

Less interference is observed if translations are prepared by professional translators.

- Psycholinguistic aspects (see II.7)

To the uninformed monolingual, any bilingual is a born translator who should have no problem mapping one language onto the other quickly and efficiently. This is far from the truth. Many bilinguals report difficulties in translating, especially in writing.

X.5.3 Aspects related to Section IV: Equivalence of bilingual French/English texts

- General (see IV.1)

Translations (in connection with IEC work) are unsatisfactory unless the translator masters the following translation methods:

– Borrowing

– Calque

– Literal translation

– Transposition

– Modulation

- Translationese (see IV.3)

If translations are largely based on calques (i.e. the translators are unable or do not dare to venture into oblique translation) the result may turn out to be pure gibberish. Even if the terminology is flawless, parts of the metalinguistic attitudes may discolour the TL text. This danger is real for IEC documents where the pressure on closeness of structure is great.

- Structures (see IV.5)

Transposition is probably the most common structural change required in translation. Structural changes are necessary to avoid translationese.

- Message (see IV.6)

In order to carry over the original message into the translation, the following aspects are important:

– Avoiding overtranslation

– Maintaining the tonality of the whole text

– Transposition of SL expressions into the appropriate mode in the TL

– Using correct link elements in the TL

– Modulation of the syntactic structure.

X.5.4 Aspects related to Section V: Translating scientific/ technical texts

- General (see V.1)

Contrary to popular belief, specialized translating involves much more than mechanical looking up of "equivalents" or special terms in dictionaries. In fact, it is only rarely that a word has a true equivalent in another language. This is the reason for the systematic approach taken by IEC TC1, TC3 and TC25.

- Source text errors (see V.2)

If the original author's expression of his ideas is obscure or otherwise defective, the translator has to disentangle the author's intended meaning and express it in the best possible TL prose.

- Collaborative translating (see V.4)

Often work of a non-specialist translator is so defective that it takes a subject specialist as long to revise it as it would take to make a completely new translation. This is not only because the general translator does not know the specialized terms, but mainly because the concepts of a field of technology with which he is unacquainted mean nothing to him.

- Translating from mother tongue to foreign language and vice versa (see V.5)

A translator normally translates from a foreign language into his mother tongue, the reason being that native-tongue competence is more powerfully internalized than foreign-language competence.

Statistically, target language reproductive translation difficulties are far more frequent than source language receptive difficulties. However, receptive errors may have far more serious consequences than reproductive errors violating only target language norms.

- Source text comprehension (see V.6)

Nobody can properly translate what he does not understand. Hence, satisfactory technical translating can only be done by someone with the requisite technical knowledge, and practice in technical reasoning, to follow technical arguments in the required specialty.

- Knowledge of source language (see V.7)

The translator must be able to read the language he is translating from so well that he can apprehend the author's intended meaning even if badly expressed.

- Knowledge of target language (see V.8)

The technical translator should be able to express the meaning in lucid, terse and euphonious target language prose. A good translator does not allow the wording of the original to carry forward into the target language.

However, it is clear that IEC technical experts who have to use a foreign language are frequently unable to meet these requirements.

- Translational competence (see V.9)

There is a linguistic sensitivity which goes beyond mere knowledge of forms and constructions. The textual character of transfer competence is the explanation for the fact that a person who is fluent in the oral and written use of two languages is not necessarily an efficient translator.

- Polysemy, faux amis and paronyms (see V.10 and 11)

Trained translators and technical experts are frequently unable to avoid these pitfalls.

X.5.5 Aspects related to Section VI: Features of scientific/ technical texts

- Non-linguistic codes (see VI.11)

If applicable, the translators must be familiar with the relevant codes (languages of mathematics and chemistry, flow diagrams, visual codes and artificial languages).

- Modes of expression (see VI.12)

IEC Standards apply the formal style.

- Precision (see VI.14)

Precision in forms, syntactic precision and lexical precision are essential.

X.5.6 Aspects related to Section VII: Checking, revision and editing

- Checking, Revision and Editing (see VII.1, 2 and 3)

These steps are particularly important if the translator did not translate into his language of habitual use.

X.5.7 Aspects related to Section VIII: Development, structure and drafting of IEC Standards

- General (see VIII.1)

The translators have to follow the ISO/IEC Directives [12]. In the present context, three clauses of Part 3: Rules for the structure and drafting of International Standards, are particularly relevant:

– Clause 4: General principles (see VIII.3)

– Clause 5: Structure (see VIII.4)

– Clause 6: Drafting (see VIII.5)

X.5.8 Aspects related to Section IX: Specific linguistic aspects of IEC Standards

- Standard American EN, Standard British EN and Standard FR (see IX.3)

In principle, the varieties used in IEC work are Standard British EN and Standard FR.

- The IEV (TC 1), Documentation and graphical symbols (TC 3), Quantities and units, and their letter symbols (TC 25) (see IX.4, 5 and 6)

Where applicable, the translators must apply the Standards prepared by the above horizontal TCs.

X.5.9 Aspects related to other parts of Section X: Linguistic behaviour of participants in standardization

- Performance of TC/SC secretaries (see X.2, 3 and 4)

Close coordination between translators and TC/SC secretaries is essential.

X.5.10 Aspects related to Section XI: Bilingualism of IEC Standards and fitness for use

- The translations prepared in connection with IEC work contribute considerably to the fitness for use of the IEC Standards.

X.6 Performance of editing committees

X.6.1 General

- Practical aspects

In Part 1 of the ISO/IEC Directives, the following is stated: "When the chairman of the TC or SC has taken the decision to proceed to the Approval stage, the secretariat shall prepare with the assistance of its editing committee a final draft and send it to C.O. for preparation and circulation of the FDIS.

It is strongly recommended that editing committees be established or confirmed in connection with committee meetings for the purpose of updating and editing CDs, CDVs and FDISs considered at the meeting and for ensuring their conformity with Part 3 of the ISO/IEC Directives."

- Membership

Editing committees shall comprise at least

– one technical expert of English mother tongue and having an adequate knowledge of French;

– one technical expert of French mother tongue and having an adequate knowledge of English;

– the project leader.

The project leader and/or secretary, if of appropriate mother tongue, may take direct responsibility for one of the languages concerned.

If required, a C.O. representative will attend the editing committees meetings [10].

X.6.2 Aspects related to Section II: General aspects of bilingualism

- Interference (see II.5)

Editing committees have to eliminate all interferences in both languages (especially if the documents had been prepared by experts working in a foreign language).

X.6.3 Aspects related to Section IV: Equivalence of bilingual FR/EN texts

- Methods of translation (see IV.2)

The editing committees must be able to apply the translation methods borrowing, calque, literal translation, transposition and modulation.

- Translationese (see IV.3)

Translationese is relatively easy to identify by the use of false comparative, artificial or prestigious allusion, certain uses of emphasis and unusual verbosity.

Even if the target language terminology is flawless, it is always possible that parts of metalinguistic attitudes have discolored the TL text since the pressure on closeness of structures is great.

- The lexicon (see IV.4)

There is no reason why an English word and its French counterpart should cover the same semantic region. Exceptions are the terms and symbols developed by IEC TC1, TC3 and TC 25 (see IX.4, IX.5 and IX.6).

Each SL has its gaps, which are not necessarily the same as those of the TL. One must be aware of the fact that in the SL there are words which do not have a match in the TL. The signified may not exist or not be acknowledged in one of the two languages.

In editing committees, such cases of "untranslatability" are solved by changing the source text accordingly. The "untranslatable" phrase is replaced by an equivalent but translatable phrase, and the apparent gap disappears.

X.6.4 Aspects related to Section V: Translating scientific/ technical texts

- Source text errors (see V.2)

If the original author's expression of his ideas is obscure or otherwise defective, the editing committees shall disentangle the author's intended meaning and express it in the best possible SL and TL prose.

- Polysemy, faux amis and paronyms (see V.10 and 11)

Editing committees are responsible for correcting all relevant shortcomings.

X.6.5 Aspects related to Section VI: Features of scientific/ technical texts

- Non-linguistic codes (see VI.11)

If applicable, the editing committees must be familiar with the relevant codes (language of mathematics and chemistry, flow diagrams, visual codes and artificial languages).

- Modes of expression (see VI.12)

IEC Standards apply the formal style.

- Economy and precision (see VI.13 and 14)

Economy and precision are necessary in scientific/technical texts. However, precision normally conflicts with economy.

X.6.6 Aspects related to Section VII: Checking, revision and editing

- Checking (see VII.1)

The texts are checked for typing errors, misleading statements, ambiguities and omissions, correct legends and numbering of figures and tables.

It is obvious that in instances in which a text was prepared by an expert to whom the relevant language is not the language of habitual use, another expert of appropriate mother tongue shall pick up any loose ends in grammar, usage, spelling and vocabulary.

- Revision (see VII.2)

Revision implies performing remedial surgery on the text, upgrading the terminology used, clarifying obscurities and reinforcing the impact. Also included are the consistency of terminology, spelling, grammar and ensuring that the texts are couched in the appropriate language register.

- Editing (see VII.3)

Pruning may be required to eliminate extraneous and superfluous matter and to extirpate irrelevancies. There are also problems involved in transferring the typed texts to the printed page.

X.6.7 Aspects related to Section VIII: Development, structure and drafting of IEC Standards

- General (see VIII.1.)

Editing committees must be familiar with the ISO/IEC Directives. In the present context, three clauses of Part 3: Rules for the structure and drafting of International Standards, are particularly relevant.

– Clause 4: General principles (see VIII.3)

– Clause 5: Structure (see VIII.4)

– Clause 6: Drafting (see VIII.5)

- Common rules and elements (see VIII.6)

The editing committees must check the following items:

– Verbal forms for the expression of provisions

– Figures

– Diagrams

– Tables

– References

– Representation of numerical values

– Mathematical formulae

X.6.8 Aspects related to Section IX: Specific linguistic aspects of IEC Standards

- Standard American EN, Standard British EN and Standard FR (see IX.3)

In principle, the varieties used in IEC work are Standard British EN and Standard FR.

- The IEV (TC 1), Documentation and graphical symbols (TC 3), Quantities and units, and their letter symbols (TC 25) (see IX.4, 5 and 6)

Where applicable, the editing committees must apply the Standards prepared by the above horizontal TCs.

X.6.9 Aspects related to other parts of Section X: Linguistic behaviour of participants in standardization

- Performance of TC/SC secretaries (see X.2, 3 and 4)

– It is desirable that the TC/SC secretary is a member of the editing committee.

– Secretaries of EN mother tongue may then take direct responsibility for EN.

– Secretaries of FR mother tongue may then take direct responsibility for FR.

X.6.10 Aspects related to Section XI: Bilingualism of IEC Standards and fitness for use

- The editing committees contribute considerably to the fitness for use of the IEC Standards.

XI. Bilingualism of IEC Standards and fitness for use

XI.1 Fitness for use

Quality has been defined as "fitness for use". In this sense, a missing comma in an EN text or a superfluous accent in a FR text has little or no effect on the quality of a Standard.

If, on the other hand, a Standard is delayed and therefore not yet available, its fitness for use is zero. That is, timeliness is an important quality criterion.

Another example of Standards which are unfit for use are those which are not required in the market place.

Standards are not fit for use to a person lacking adequate receptive abilities in the relevant language(s).

By now it should have become clear that fitness for use consists of many components. Some of them are related to features of the texts themselves.

If texts are obscure, vague, ambiguous, contain conflicting stipulations in different language versions, or contain even technical errors, then their fitness for use is reduced or the texts may even be dangerous.

Standards are also used by lawyers to settle disputes in commerce and industry. Standards are sometimes linked to legal texts for national and regional regulations.

IEC Standards have to be translated into different national languages by technical experts who are of neither EN nor FR mother tongue.

The effect of IEC's bilingualism on the quality of the Standards is therefore an important issue. After all, not only sales figures but also the IEC's mission are at stake!

XI.2 Aspects related to section II: General aspects of bilingualism

- Languages in contact (see II.9)

Languages differ in many aspects of complexity – lexical, grammatical, phonological – and bilingual speakers will often prefer one language to another for specific purposes, but their overall expressive power is the same.

It is not surprising that most linguistic preferences – based on historical pedigree, aesthetic judgment, "logic" or whatever – reveal a liking for one's own variety.

As language communities come into contact, languages in contact can become languages in conflict. "Big" languages can push smaller ones around and can contribute to their demise.

Language attitudes are often allied with powerful protective sentiments for one's own group.

- Language ecology (see II.10)

The ecology of language refers to the interactions of a language and its environment. The following "Basic ecological variables" affect the functioning of the IEC.

– Ethnographic variables

  Size and concentration of the language groups

– Ethnopolitical variables

  Relations between language groups and the IEC; institutional status of the languages

– Ethnopsychological variables

  Attitudes toward other groups, language – identity relationship within groups

– Interactional variables

  Communicational mobility (most speakers of "large" languages have little foreign language competence, and vice versa)

– Ethnolinguistic variables

  Linguistic distance between contact languages (e.g., the distance is small between Dutch and EN, but wide between Japanese and FR)

- Language as core value (see II.13)

Core values are fundamental components by which a community indicates its cohesion and identity.

Examples: FR represents a core value to most FR speakers; most German speakers, however, show less concern for their language.

XI.3 Aspects related to Section III: Functional bilingualism

- Receptive bilingualism (see III.2)

Bilingual EN/FR Standards are fit for use by experts who have at least reading abilities in EN or FR. Experts who read FR only are numerous in countries where a Romance language is the official language (e.g. in Romania and on the African continent).

- Productive bilingualism (see III.3)

The fact that FR is an IEC language enhances the active participation of FR speakers in IEC work.

XI.4 Aspects related to Section IV: Equivalence of FR/EN texts

- The lexicon, structure and message (see IV.4, 5 and 6)

Languages differ at the following three levels: lexicon, structure and message.

The concepts of the lexicon are different. For example, there is no reason why an EN word and its FR counterpart should cover the same semantic region.

The differences of the structures are the main reason why transposition is frequently required in translations.

The formulation of the messages is dependent on the relationship between thought and the language concerned.

It is obvious that experts of EN (FR) mother tongue normally use the EN (FR) language version of IEC Standards.

Many experts are of neither EN nor FR mother tongue. If difficulties arise, they can have resort to the EN and the FR version which are both considered to be original-language versions (see IX.2.3). Because the lexicon, structures and formulation of messages are different in the texts, problems of linguistic nature usually disappear.

Therefore, the presence of two original-language versions in IEC Standards increases their fitness for use.

- Conclusions (see IV.7)

The comparison of bilingual FR/EN texts makes it possible to isolate characteristic features of both languages which would remain hidden to experts working with a single language. This fact makes improvements possible.

Again, the bilingualism of the IEC Standards represents an asset.

XI.5 Aspects related to Section V: Translating scientific/ technical texts

- Source text errors (see V.2)

If the original author's expression of his ideas is obscure or otherwise defective it is the translator's duty to disentangle the author's intended meaning and to express it in the best possible way in the target language. However, the translator must not distort the author's intended meaning or emphasis.

It would be senseless to repeat, in another IEC language, what obviously are typing errors or mis-statements. If an error or mis-statement in the source text is noted, the translators must inform the TC/SC secretary accordingly.

Experience shows that the preparation of the second original-language version, or the comparison of both versions, frequently leads to improvements in the source text. That is, to an increased fitness for use.

XI.6 Aspects related to Section VI: Features of scientific/ technical texts

- Pragmatics (see VI.2)

One of the three axes on which individual manifestations of language occur is the geographical distribution. This axis exemplifies the physical areas of distribution of language usage.

The presence of two (rather than one) original-language versions in IEC Standards increases the physical area of usage. By the same token, the fitness for use of the Standards is increased.

XI.7 Aspects related to Section VIII: Development, structure and drafting of IEC Standards

- Development of IEC Standards (see VIII.2)

At the "Committee stage", every possible effort must be made to prepare both a FR and an EN version of the "Committee draft" (CD) in order to avoid delays at later stages.

If consensus is reached at the basis of a text drafted in EN only, difficulties may arise when it comes to putting that text into FR. Subsequent drafting of a text already approved in EN often brings to light difficulties of expression that could have been avoided if both versions had been prepared together.

At the "Enquiry stage", an Editing committee must be set up for the preparation of the "Committee draft for vote" (CDV). This committee shall include an expert of FR mother tongue and one of EN mother tongue.

Again, the bilingualism of the IEC tends to improve the quality of the Standards.

On the other hand, it is obvious that the preparation of the FR texts represents a very heavy work load. Also, in many cases the circulation of a text in EN only would be possible before the bilingual text is available.

These facts must be included in an objective assessment of the net advantage offered by the IEC's bilingualism.

XI.8 Aspects related to Section IX: Specific linguistic aspects of IEC Standards

- Ethnopsychological considerations (see IX.2.1)

The IEC necessarily transcends national cultural and linguistic borders. Languages are essential tools of international relations and international comprehension, and therefore of the process in which the IEC is fundamentally engaged. The following issues should be considered.

– The IEC can only exist and carry out its function if all its members are linked together, ideally having the same access to information from the organization. Also, the IEC needs input of all its members. To deprive itself of the contribution of some of its members would result not only in a waste but also in a distortion of its essential role.

– It is, however, clear that communicating in all languages spoken by the IEC members is not possible. The more the organization grows, the more the number of languages in

which its members best express themselves increases. Unfortunately, the cost of true multilingualism is prohibitive.

– Whilst learning a foreign language is indeed an enriching experience, its use can be a frustrating one because nuances are difficult to express and the approach to issues may vary with the language. If one goes beyond the level of words, it is in fact a question of concepts, sensitivity and way of thinking that are different. Therefore, the IEC's main working language probably influences its functioning.

– The person who must use a foreign language to communicate can easily feel himself to be in an inferior position relative to those who have the opportunity to express themselves in their mother tongue. The privilege of some may be experienced as a form of discrimination.

– This background explains a certain resistance to the generalized use of EN.

– On the practical level, it is not possible for the IEC to work in all the languages of all its members. But it would be difficult to claim to be international and to use only EN. A compromise solution is therefore required. The questions which the IEC has to face are posed in terms of cost and benefit. However, they relate not only to finance but – more importantly – also to the IEC's purpose and philosophy.

In this sense, the bilingualism of the IEC is a necessity.

- The IEV (TC1) (see IX.4)

The standardization of terminology is a prerequisite of subject standardization. For the users, the consistent application of a unified terminology across all documents produced is one of the criteria by which the overall quality of Standards may be judged. For the IEC, its terminology constitutes a tool for information management and quality assurance of the contents of its Standards. In the IEV, the definitions of the concepts are given in FR, EN and Russian (the principal IEV languages).

The terms and definitions are prepared in both FR and EN already at the "Committee stage". This simultaneous preparation of two versions guarantees not only the correctness of the definitions, but also

their unambiguity and translatability into the "additional IEV languages".

The CDs and FDISs are reviewed by experts from all P-member countries and liaison organizations.

The terms are given in the above three principal IEV languages and also in the additional IEV languages: Arabic, German, Spanish, Italian, Polish, Swedish, Portuguese, Greek and Japanese. They are provided (or coined, if necessary) by experts in the relevant fields in their mother tongue.

The bilingualism of the IEC is an asset for TC1, and TC1 is important for the fitness for use of all IEC Standards.

- Documentation and graphical symbols (TC3) (see IX.5)

The standardization of documentation and graphical symbols is a prerequisite of standardization by many product committees of the IEC.

For the users (product committees of the IEC, users of product Standards outside the IEC) the application of unified documentation and graphical symbols is essential.

The concepts must be clear, precise and free of any ambiguity. This aim is better achieved by expressing the concepts in two languages with different lexicons, structures and formulations of messages.

- Quantities and units, and their letter symbols (TC25) (see IX.6)

Virtually all IEC Standards contain quantities and units, and TC25 is a typical horizontal committee.

The standardization of quantities and units, and their letter symbols is a prerequisite for all subject standardization.

The Standards prepared by TC25 are used

– inside IEC by all other horizontal committees and all product committees

– outside IEC by the users of IEC Standards and by other international/regional organizations.

The consistent application of a unified system across all IEC documents is absolutely necessary. The concepts must be clear, precise

and free of any ambiguity. This aim is better achieved by expressing the concepts in two languages with different lexicons, structures and formulations of the messages.

XI.9 Conclusion

It would be possible for the IEC to work in one language only. This method would indeed accelerate the standardization process but, by the same token, reduce the fitness for use of the Standards. It would be a step in the direction of technical “fast-food”.

Annex: Matrix presentation of important relationships

In this account, a large number of features relating to the IEC, its experts, the Directives, as well as the Standards and their users were introduced. The following features play particularly important roles:

1. Bilingualism of the IEC
2. Presence of two original-language versions in the Standards
3. Functional bilingualism
4. TCs of the IEC
5. TC secretaries
6. Standards preparation process
7. Standards quality
8. Standards users

Essential relationships between these features are presented in the matrix below which is read as follows:

- The items in a row affect the items in the columns.

  Example: Item 2 affects items 4 through 8

- The items in a column are affected by the items in the rows.

  Example: Item 8 is affected by items 2, 3 and 7

Matrix

	Bilingualism of the IEC	Two versions	Functional bilingualism	TCs of the IEC	TC secretaries	Standards preparation	Standards quality	Standards users
Bilingualism of the IEC		X			X	X	X	
Two versions				X	X	X	X	X
Functional bilingualism				X	X			X
TCs of the IEC						X	X	
TC secretaries	X					X	X	
Standards preparation		X		X	X		X	
Standards quality						X		X
Standards users	X	X						

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Bibliography

[1] Edwards, J. 1994. Multilingualism. London: Penguin

[2] Baetens Beardsmore, H. 1986. Bilingualism: Basic principles. Clevedon: Multilingual matters

[3] Grosjean, F. 1982. Life with Two Languages. Cambridge: Harvard

[4] Vinay, J.-P., Darbelnet, J. 1995. Comparative Stylistics of French and English. Amsterdam/Philadelphia: Benjamins

[5] UNESCO, 1958. Scientific and technical translation. Paris: UNESCO

[6] Maillot, J. 1981. La traduction scientifique et technique. Paris: Technique & documentation

[7] Sager, J.C., Dungworth, D., McDonald, P.F. 1980. English special languages: Principles and practice in science and technology. Wiesbaden: Brandstetter

[8] Kocourek, R. 1982. La langue française de la technique et de la science. Wiesbaden: Brandstetter

[9] Aslib 1983. The Translator's Handbook. Dorchester: Dorset

[10] ISO/IEC Directives. Part 1 1995: Procedures for the technical work. Geneva: ISO/IEC

[11] ISO/IEC Directives. Part 2 1992: Methodology for the development of International Standards. Geneva: ISO/IEC

[12] ISO/IEC Directives. Part 3 1997: Rules for the structure and drafting of International Standards. Geneva: ISO/IEC

[13] IEC 1993. Statutes and rules of procedure. Geneva: IEC

[14] Quirk, R., Greenbaum, S. 1973. A university grammar of English. London: Longman

[15] IEC, 1999: Catalogue of IEC Publications. Geneva: IEC

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