WORLD STANDARDS DAY MESSAGE

14 October 1999

Building on Standards

This year, the World Standards Day theme highlights the importance of International Standards in the construction industry, which has been one of the basic human activities throughout the thousands of years of human progress.

There will never be a standard for beautiful design, but to lay the foundations for an intelligent museum or a sophisticated city infrastructure, standards need to be shared and applied on a practical daily basis by the many professionals. These range from designers, architects, civil engineers to manufacturers, regulators and contractors all the way to the companies who spend billions on construction goods and related services each year. The relevant standards range from the more obvious building standards to those covering telecommunications, electrical installations, electronics, networking and the associated safety standards.

Mathias Fünfschilling, President of IEC

Giacomo Elias, President of ISO

Yoshio Utsumi, Secretary-General of ITU

When a Japanese construction company following Canadian plans builds a factory in Chile, everybody understands the need for totally transparent, universally comprehensible technical standards. Each professional organization involved in the supply of material and components from mechanical equipment to electrical systems relies on these "tools" that International Standards represent.

If, today, 100 building professionals were to come together from all over the world to build a tunnel, they would virtually take for granted the effectiveness of standardization that provides the building blocks for the work, without hampering individual design or imposing unwanted features on the finished product.

As in electronic commerce or any other technology sphere, standardization is at its best when it is international. The technical agreements developed by the International Electrotechnical Commission (IEC), the International Organization for Standardization (ISO), and the International Telecommunication Union (ITU) supply the foundations needed for different products and services, no matter where they are produced.

IEC, ISO and ITU – as the three apex organizations in international standardization – are in the position to provide the necessary overall, all-encompassing view that takes in all spheres of intellectual, scientific, technological and economic activity. The very nature of the international, open and consensus-based standards process ensures that the final standards, be they for products or services, represent the collective knowledge and experience of all sides involved – industries, governments, research institutes, testing laboratories and consumer organizations.

Small and big companies all over the world acknowledge the benefits of International Standards. Many customers and suppliers promote actively the need to join the international standardization network of IEC, ISO and ITU.

The return on investment by participating in the international standards development process can be seen at various levels within each sector. The first level is usually that of the creation of a common language. This enables a manufacturer to communicate clearly, without fear of ambiguities or misunderstandings, with a customer's product engineers, designers, and purchasing agents anywhere in the world. And it allows the same clarity with suppliers. Everyone gains. At another level, today a commercial, as well as a social – and more and more a legal – requirement is to address concerns of public health and safety as well as the impact a product or service may have on the environment.

Quoting one user and developer of standards : "If your exports have to be modified to conform to the national standards of a customer then you clearly have had no part in the development of those standards. Any redesign of your product or service to meet the technical specifications of that country represents a bit out of your profit margin. You're winning some, but you're also spending some. And if you have customers in several countries each with its own unique national standard, then you're spending even more. If on the other hand, the client country is using International Standards, that makes things clearer and more cost-effective for everyone."

Today, quantitative and qualitative requirements arising from the population explosion and natural aspirations for higher living standards makes building one of the key areas for the satisfaction of human needs ever more important. A recent study of the construction process in the 21st century made by Sweden's Lund University, says that from many parts of the world there are demands for increased productivity in the construction process, higher quality of construction products, increased consideration of property management and a more holistic view of the entire process. To ensure these improve, International Standards are key tools for staying abreast of technology-driven business development.

As many of those who are part of the construction and associated industries already know, to build well, for the long term, to build internationally, rationally, and cost-effectively, International Standards hold a key to the solution.

Information technology: ISO/IEC JTC 1 On-line balloting system

by Matthew Deane, ISO/IEC JTC 1 Secretariat Staff

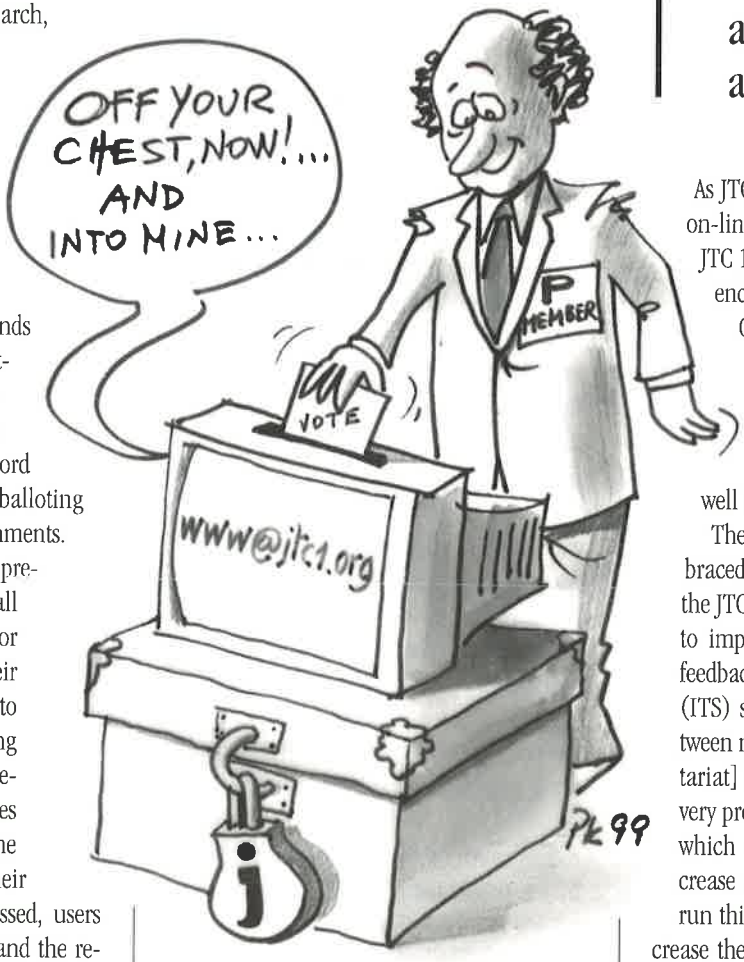
ISO/IEC JTC 1 on Information technology has conducted its administrative work electronically for many years. It began in 1995 with the introduction of document distribution via diskette. In its efforts to continually seek ways to improve the efficiency of its administrative functions, a website (**http://www.jtc1.org**) was created in September 1997 for document distribution and dissemination of information to national body members. With the success of this method of operation, an on-line balloting system was added to the JTC 1 website on 1 March, 1999.

The JTC 1 on-line balloting system is for use by national bodies which are P-members (participating members) of the committee. The system allows the JTC 1 Secretariat to post a document for ballot and then the system automatically sends an e-mail notification of this posting to specified national body contacts. Each national body has a unique user name and password which is necessary to enter the balloting system and submit votes and comments.

Once members log in, they are presented with a screen containing all documents that are currently out for ballot. National bodies input their votes and comments directly into the system rather than sending them to the JTC 1 Secretariat via e-mail or facsimile. National bodies have until midnight (EST) on the day the ballot closes to enter their votes. Once the due date has passed, users can no longer input or edit data and the results are automatically tallied under the "Closed Ballots" section of the system. Each closed ballot indicates how the national bodies voted and includes any comment files that were uploaded to the balloting system.

The first JTC 1 ballots circulated via the on-line balloting system closed in early June and thus far the system has been a success. The on-line balloting system saves administrative time for the JTC 1 Secretariat as summaries of voting are now automatically generated. It allows for remote access to the system for national body contacts, meaning votes can be submitted even when an individual is out of the office. The system also eliminates the possibility that national body votes and comments may be recorded incorrectly by the JTC 1 Secretariat as national bodies enter this information into the system directly.

One feature of the on-line balloting system that has been appreciated by national bodies is the automatic e-mail reminder sent by the system two weeks and also two days prior to the ballot closing. "When the due date is coming close and Japan has not voted yet, the JTC 1 on-line balloting system sends us warning information. It's useful to prevent us from not voting," commented the Japanese national body (IPSJ/ITSCJ). Adds the national body of the Netherlands (NNI), "The JTC 1 balloting system makes it almost impossible not to vote or to deliver a late vote on a document. It makes 'administrative life' for a national body much easier."



> "The JTC 1 balloting system makes it almost impossible not to vote or to deliver a late vote on a document."

As JTC 1 subcommittees begin to develop on-line balloting systems themselves, the JTC 1 system has served as a useful reference point for their work. JTC 1/SC 31 Chairman Alan Haberman stated, "As the JTC 1/SC 31 Secretariat designed SC 31's balloting system, she had a wonderful touchstone to compare to as well as to emulate."

The JTC 1 community has thus far embraced this new method of operation and the JTC 1 Secretariat will continually work to improve this system based upon user feedback. As the national body of Sweden (ITS) summarizes, "The interaction [between national bodies and the JTC 1 secretariat] during the development has been very productive. We have now got a system which shows how the Internet can increase efficiency and quality. In the long run this type of centralized system will increase the visibility of the work and will decrease delays and the costs of the administration around the standardization processes."

Questions on the JTC 1 balloting system can be directed to Matthew Deane (mdeane@ansi.org) at the American National Standards Institute. □

BUILDING ON STANDARDS

IT'S hard today to talk about "the construction industry" in the singular. There are many parts to it, but, in addition, there are many related and interconnected industries and other "satellite" industries. And more and more, there are aspects governing the building industry that go beyond the pure design or products for the industry, and that touch on urbanism, safety systems, environmental concerns, quality demands and performance levels.

ISO is an influential player in the construction industry through its standard-development in a number of separate committees, and in this issue of the ISO Bulletin *for World Standards Day, we look at some important aspects of its contribution. Building up for this year's theme, it has already talked this year of work underway in ISO/TC 98 and TC 195.*

Danny Halel, Secretary of TC 205, Building Environment design, *first makes an appeal for standards to be more integrated into the building processes to promote global practices and products. In this way, those countries with lesser resources benefit from those that have more.*

ISO/TC 59 works on standards for many fundamental aspects of building. The Chairman of the committee, Prof. Kristoffer Apeland gives an overview of the work done and that is now underway and highlights the "standards imperative". He shows how the strands of the standardization work are interwoven within regions, how the various subcommittees and other ISO/TCs interrelate within or with TC 59, and how the developments within the industry are reflected in standards work.

One aspect that is becoming almost an automatic reflex within the industry is integrating environmental considerations into construction work. Dr. Georg Soronis takes a look at how sound environmental management is simply sound business management.

Standards stipulating performance requirements are one measure for ensuring quality in building, and Denis Dawkins, secretary of TC 59/SC 15, demonstrates what can be – and is being – done with standardization in the field.

Building on Standards

From product standards to global management standards

by Professor Kristoffer Apeland, Chairman, ISO/TC 59, *Building construction*

The starting point for standardization was the need for a limitation in variants, primarily in products for the mechanical and electrical industries. As a consequence, the need for standards for testing of materials and products also arose. Product standards are as important today as they were right at the start, just as standards for testing are.

However, the field of standardization has grown considerably in the course of the last decades.

The field of national legal regulations and requirements, e.g. building regulations, has shifted from specific requirements in the national legal documents into a system of "reference to standards". This means that if a standard is developed on the basis of minimum requirements, the law will thereby be respected, providing the products comply with the requirements of the standards.

This principle has been – and is – of great significance, in particular in connection with building regulations. It has also become very important, in order to minimize trade obstacles, to develop global standards for the field of regulations and for performance requirements.

The development of ISO standards

In general, in the past, the procedure for the development of an ISO standard has been to develop an international consensus standard on the basis of an already existing national document or documents. Owing to the tremendous development in information communication technology over the last decades, however, it has proved more efficient now to develop international solutions for the problems in question right from the outset.

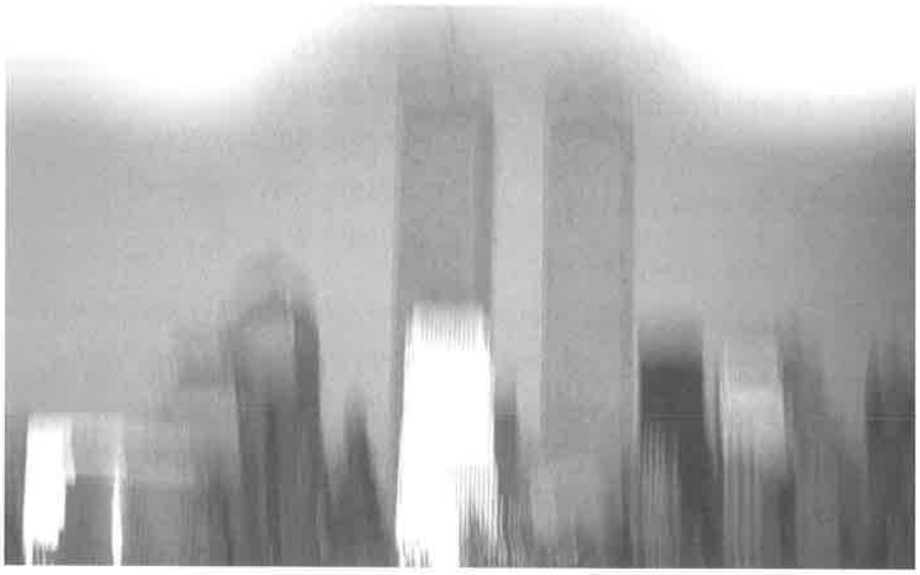
"The field of national legal regulations and requirements, e.g. building regulations, has shifted from specific requirements in the national legal documents into a system of "reference to standards".

As a consequence, ISO has taken a leading role, in particular in global management systems, for which the ISO committees and working groups are instrumental in pre-normative research and development for the fields in question. The ISO 9000 series on quality management, and the ISO 14000 series on environmental management are the most distinguished examples of this new major field of standardization. For the building and construction sector, both of these series of generic standards are important.

Self-contained markets and global standardization

International standardization has as one of its main objectives to minimize trade obstacles. Additionally, the practical importance of limitation of variants is indisputable. In particular, this is the case for product standards. There is general international consensus about these major objectives.

On the other hand, for large markets that may be said to be self-contained, the need for international standardization may not be as strong as in smaller markets. The United States used to be one such self-contained market which, in the building standards field, had been reluctant to invest great effort in international standardization. However, this attitude has been changing over the last decade. In the work of TC 59, *Building construction*, it has been a pleasure to observe that the United Stated has become an active participant in our work. For the whole Pacific area, global activity has also increased. Japan has been involved in ISO work for a long time. It should also be mentioned that countries like Australia and New Zealand are very active in the field of building construction.



In Europe, the development has to a great extent gone in the opposite direction over the last decade. With the establishment of the European Common Market, a new and almost self-contained market came into existence, which has resulted in a considerable slowing down of global standardization in Europe.

In particular, this has been the case in the building and construction field. A joint effort, with the aim of developing a uniform code for Europe, the "Eurocode", was transferred to CEN in order to develop European Standards. All of the members of CEN, i.e., primarily EEC/EFTA countries, have taken part in this development during the last decade.

The European Commission has established a framework of harmonizing directives. The directives present requirements which, to a great extent, are based on performance of all kinds of products and also address the requirements to the various agents of the building sector. In particular, this is the case in connection with the building product directive. Requirements regarding health, environment and safety are becoming an important part of legal building regulations.

The ambitious aim of developing a complete set of CEN standards has been given top priority by the CEN member countries, so that during these years ISO work took on lower importance.

The aim of making the CEN standards into a complete set of documents has in a number of cases led to the establishment of new CEN work items, which were already under development in ISO committees. This problem went right up to the highest ISO/CEN directional level, and resulted in the Vienna Agreement, which stipulates that all duplication of work is to be avoided. Problems of this nature still arise, however, between CEN and ISO.

At the start of this intense CEN development, the hope was that these efforts would be of short duration. Although ISO was set up in Europe, and has benefited from a large European input and financing, there is a tendency nowadays for CEN to develop into a self-contained standardization organization. The author, therefore, feels that endeavours need to be made to concretize a Vienna Agreement Part 2, stating that after the first generation of CEN documents is finished, ISO should re-become priority number one, and that CEN should take part in activities in transforming the CEN documents into ISO standards.

Building construction – state of the art

In the field of building and construction work, standardization is of great importance at all levels, from the tiniest nut and bolt level up to the global level of sustainable development. This becomes manifestly clear by looking at a representative list of levels within the field:

Global level:
- Sustainable development
- Societal requirements
- Cultural heritage requirements

End user level:
- Performance requirements
- Reliability requirements
- Facility management requirements
- Sustainable building requirements

General building industry level:
- Information and communication systems
- Reliability systems
- Quality management systems

Building construction level:
- Standards for building design
- Standards for structural building materials
- Standards for construction
- Standards for maintenance
- Standards for design life prediction
- Standards for life cycle cost estimation

Product level:
- Standards for building components
- Standards for building systems
- Standards for testing methods

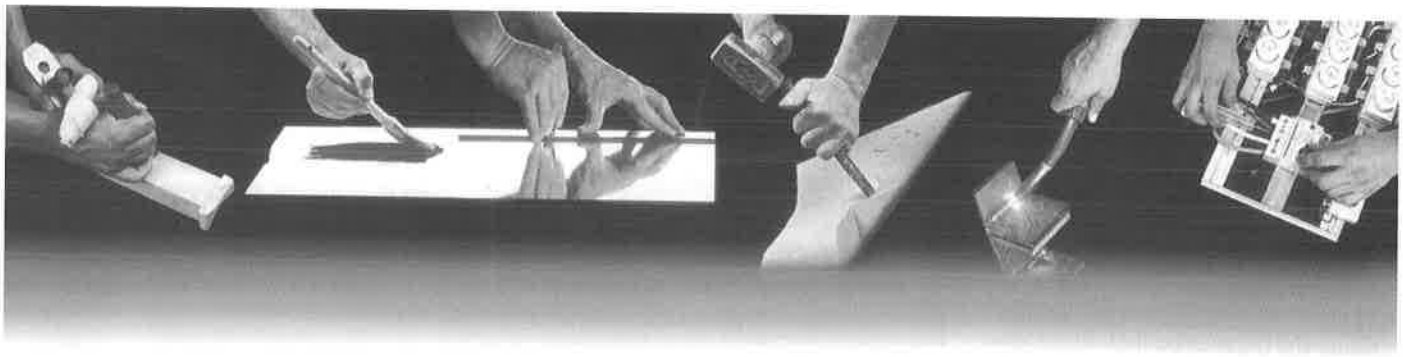
Standardization is going on in all the fields listed above. At some of the levels, work is well advanced whereas development work has only just started in some other fields.

At the product level, a large number of standards have been produced. Development of product standards was a main activity of TC 59, *Building construction*, in its early days. This has altered in recent years, and at present the focus is centered on the performance and management fields. A number of product working items have been transferred to other technical committees, or new technical committees.

In the area of building systems, many tasks remain to be worked on: to develop standards for these systems, the process is at times slow, since fairly different systems often exist in the countries that are taking part in the work.

At the building construction level, ISO work has been held back because of the intense CEN activity in the field. This is not the case, however, for the design life prediction and life-cycle cost estimation, which are primarily ISO work items that are being developed in liaison with other organizations working in these fields.

Standardization work on design life was started in a working group under TC 59/SC 3. At the ISO/TC 59 meeting in London in



1997, the working group was changed into a new subcommittee TC 59/SC 14, *Design life*, which now even has a number of working groups within it.

At the TC 59 meeting in London, the committee appointed two ad hoc working groups, one for Sustainable Building and the other for Quality Assurance and Management for the building sector. These ad hoc groups submitted reports to TC 59, and at the meeting of TC 59 and several subcommittees in Vancouver in 1999, it was decided to establish the following two new working groups under TC 59/SC 3:

- TC 59/SC 3/WG 12, *Sustainable building construction*, with Norwegian convenorship and US secretariat.
- TC 59/SC 3/WG 13, *Management of construction and facilities*, with Swedish convenorship.

At the TC 59 meeting in London a new subcommittee was established:

- TC 59/SC 15, *Performance criteria for single family attached and detached dwellings*, with Australian secretariat.

TC 59/SC 15 has, among other basic principles, decided that "The Standards shall focus on the performance of a house as a whole".

All of these fields and work items illustrate that global standardization for the building construction sector is more and more centering on principal and complete systems, which provide a means for reducing trade obstacles. Moreover, end-user requirements – as well as those of society as a whole – can be better served by complete systems, rather than subfield solutions.

The life-cycle concept has widened the field of the building construction sector. Facility management, which earlier was left to the end user, has now become part of the total building process, and must be incorporated into standards within the life-cycle field.

The field of information and communication systems for building and construction is under rapid development. At Vancouver in June 1999, TC 59/SC 13 initiated a coordinating meeting with representatives of IAI (International Alliance for Interoperability), ICIS (International Construction Information Society), ISO/TC 10, *Technical drawings, product definition and related documentation*, SC 8, *Technical product documentation*, ISO/TC 184, *Industrial automation systems and integration*, SC 4/WG 3, *Product modeling*, T22, CIB W078.

The collaboration between these parties is expected to result in new advanced standardized rules for information and communication systems.

Perspectives

In view of the description above giving the state of the art, it is fair to say that the future has already begun. This is particularly so for ISO/TC 59, *Building construction*, which has adopted a number of work items at the forefront of general development in technology, management, as well as political and societal fields.

Sustainable Development with its subfield, Sustainable Building, and the Life Cycle concept have all widened the field of the building construction sector, e.g. the subfield of Facility Management. It follows that TC 59, which has the most general terms of reference within the Building Construction field, will concentrate more of its activity on these more general global standardization fields. As a consequence, ISO will to a greater extent than earlier be leading in the development of pre-normative as well as normative work.

It is our view that ISO should put even more emphasis on extension of the collaboration between ISO and the more self-contained markets: we feel that everybody would benefit from even more active cooperation. This will improve the **quality** of international standardization, as well as making it more efficient. □

About the author

Professor Kristoffer Apeland has been active in ISO standardization since 1971 when he was convenor for the working group ISO/TC 98/SC 3/WG 1, that prepared the first ISO standard for snow loads, ISO 4355. He was also convenor for the revision of that standard. He has been chairman of ISO/TC 59 since Norway took over the secretariat of the TC in 1989.

"The life-cycle concept has widened the field of the building construction sector. Facility management, which earlier was left to the end user, has now become part of the total building process, and must be incorporated into standards within the life-cycle field."

Building on the environment

The standards imperative

by Dr. Georg Soronis and Anne-Marie Nyström

The philosophical values of environmental sustainability in all human activities are now accepted as a part of our political and business ethics. Green buildings are no longer a fashionable or glamorous part of building technology but a new fact of business life.
In other words, the building industry is as of present alive to the fact that sound environmental management is simply sound business management. Environmental management systems in building (EMS) are now a vital part of existing quality management systems, and provide an excellent interface with worldwide trade communication.

Just as the debate during the 1980s established quality as a cornerstone of effective building practice, so the environmental issues of the 1990s are here to stay. Organizations concerned with building strive to meet the increasing environmental government regulations on the one hand and the private expectations on the other. Many clients are already expecting their designers and builders to adopt a more environmentally responsible attitude. This new business ethic has led in many cases to a requirement for them to have a certified EMS in order to start business negotiations.

Stakeholders in environmental management

The environment has a much broader range of stakeholders than those traditionally associated with quality management. Nowadays, stakeholders may be subjected to [1]:

- International environmental agreements, e.g. The Kyoto Protocol on Global Climate Change or the Montreal Protocol on Ozone-Depleting Substances.
- Regulators and regulations:
  - European Directives and Regulations.
  - National Environmental legislation and best practice guidance.
  - Regional environmental legislation and guidance.
  - Local bylaws and customs relating to the environment.
- Finance (all banks carry out some form of risk assessment on loan funding).
- Insurance companies increasingly require the proactive management of environmental risks and liabilities from their policy-holders.
- Clients expect companies to behave in an environmentally responsible way.
- Suppliers may expect environmental criteria to fulfil contracts.
- Local communities expect responsible neighbours.
- Staff and employees require a healthy working environment.

General view of Hammarby Sjöstad, an important urban development close to the centre of Stockholm.

All contractors participating in the project have to develop in a continuous way environmental improvements and measures with a view to registration either to EMAS, or certification according to the ISO 14000 series, or to another equivalent system. To tackle this hurdle, designers and contractors develop their own EMS systems (see the two examples below). There is an urgent need to develop methods for harmonizing these systems according to internationally accepted guidelines, such as those currently being prepared within ISO/TC 59, as described above.

1] ISO Development Manual 10, *Environmental Management and ISO 14000*, ISBN 92-67-10280-X, 1998.

International EMS standards bring together all groups of actors

International Standards are powerful tools helping organizations and stakeholders to document environmental performance of buildings [2]. Some of these standards relate to the fields of quality assurance and quality management according to the ISO 9000 series of standards. Others focus on the products themselves, and give guidelines to determine the environmental impacts arising from the manufacture, use and disposal of specific products according to the ISO 14000 series. These standards offer business benefits to those using an environmentally-responsible approach, or satisfy their needs to meet the requirements of their clients. Eco-labelling standards, for example, figure among these.

Environmental management systems functioning according to the ISO 14000 series provide a ready-built framework for all building designs to use. They offer many benefits including [1]:

- The use of EMS standards as a company's environmental policy;
- Marketplace recognition of commitment to the environment;
- An excellent foundation for adequate environmental reporting;
- Stakeholder security;
- Recognition by regulators;
- The basis for demonstrating continual improvement in environmental performance.

The natural expansion of the technical work

Building technology is traditionally complex and demands communication between many different disciplines, such as architecture, building engineering, ergonomics plus economics, finance, law, etc. [2]. Hypothetical and explanatory models, adapted to modern computer techniques, are used to monitor and transfer knowledge, facilitating visualization of different parts of the building process. This results in the interaction between "traditional" building standards and the new EMS standards, such as those in the ISO 14000 series, often becoming difficult. In the building process where things must be done "now", different organizations have developed their own codes of practice in this area. To overcome the particular problem, ISO/TC 59, *Building construction*, set up two working groups that aimed to develop internationally accepted rules and guidelines and harmonize the use of EMS standards in the building process, namely:

- ISO/TC 59/SC 14/WG 6, *Building and Constructed Assets – Service Life Planning* – Part 6: *Guidelines for Life Cycle Assessment*. The scope for the first work item underway in WG 6 is:

An ISO technical report intended to provide guidance when the environmental impacts and other sustainability issues are taken into account in the service life planning process of buildings and other constructed assets; this report provides the links of sustainability issues covered by other ISO standards when they are applied to the service life planning process.

WG 6 was started up in June 1998 with Swedish convenorship and secretariat.

- ISO/TC 59/SC 3/WG 12, *Functional/user requirements and performance in building construction – Sustainability in building construction*. The scope for its work is: *To develop guidelines and standards to promote a sustainable development in the building and construction sector, including existing real estate, that are based on the principles of the ISO 14000 series.* WG 12 was established in June 99, and has a Norwegian convenership with a US secretariat.

International Standards are powerful tools helping organizations and stakeholders to document environmental performance of buildings.

The school in Sickla

The first school in Hammarby Sjöstad was designed and planned in the area called Sickla. The designer of the building is the Swedish architect Torbjörn Almqvist. The client concerned with the design is SISAB (School buildings in Stockholm). SISAB has developed its own EMS on three levels: requirements, recommendations, and long-term *goals. These EMS systems are partly based on an inventory within SISAB's building stock, and partly on the City of Stockholm's environmental requirements. The building designers have to provide documentation on all the environmental issues according to SISAB's own EMS. These issues are to be implemented within the working documents and drawings of the project.*

2] Soronis, G., *International Standardisation for Sustainable Building*, Proceedings of the second International Conference "Building and the Environment", June 1997, Paris.

Implementing EMS in a new city district in Sweden

Close to the city centre of Stockholm, the new district of Hammarby Sjöstad is now designed as an ecological spearhead in the sustainable building technology [3]. The district includes parks, office buildings, small-scale industries and dwelling houses for 15 000 residents. Intelligent technology is implemented to minimize use of natural resources and to follow nature's cycle. All involved in the project have to adopt an environmentally-friendly and sustainable attitude. Creative relationships have been developed between industry, research institutions, the state and the local authorities.

3] Hammarby Sjöstad, Miljöprogram, Stockholm 1998.

The Sikla commercial centre

Sikla's commercial centre is located on the banks of the Hammarby Channel. The centre is planned to lie on both sides of the tram station, and the design includes shops and offices on street level with dwelling areas on them. The designer and planner of the area is Torbjörn Almqvist, and the client assigned the design and planning, the Swedish contracting company, PEAB. PEAB, in cooperation with the Swedish consulting company J&W, has developed its own EMS to implement the environmental targets of the design and planning in this project. The EMS systems as included in the Miljömanual give environmental guidelines on the different stages of building, such as design, construction, use, demolition and re-use of materials.

"Environmental management systems functioning according to the ISO 14000 series provide a ready-built framework for all building designs to use."

The need for a comprehensive programme for all actors

- Environmental optimization of every product, project and enterprise in the building industry and real estate management becomes more and more natural and as indispensable as optimization from the viewpoint of business economics.
- In this article, the urgent need for the development of internationally accepted guidelines for EMS for buildings on the basis of existing the ISO 14000 series of standards is highlighted.
- Sustainable building requires a vast amount of knowledge, and thus the use of computer-based standardization becomes a necessity. For this reason, standards for EMS in building have to be connected to computer-aided standardization techniques. □

About the authors

Dr. Georg Soronis *has long experience as a building designer and standards developer. He is currently working within SIS-Forum in Stockholm, Sweden. Dr. Soronis is also Ass. Professor at the Royal Institute of Technology /School of Architecture in Stockholm within the field Service Life Planning of Buildings.*

Mrs. Anne-Marie Nyström *is an architect SAR. She has a long experience in building design and planning. She is currently employed by the Swedish architects, AIX AB. She is responsible for the development of systems for implementation of ISO 14000 in building design within AIX.*

Preparing International Standards for single family attached and detached dwellings

By Denis Dawkins, Secretary ISO/TC 59/SC 15

Performance standards present a real advantage in that they do not lay down the law on how to get to a result, but they do specify the result and performance required. For SC 15, understanding of the "performance" concept and the desirability, or in fact viability, of specifying actual levels of performance for houses, systems and components, was the first step; then had to be hammered out how to standardize descriptions of performance. With this now done, the outlook for an excellent suite of standards is promising.

The proposal for ISO Standards for housing was first raised at the Pacific Area Standards Congress (PASC) meeting in 1995. The concept was supported by Japan, South Africa, New Zealand and Australia.

At the time, both Australia and the US were working on separate projects in the Performance housing concept, and both countries made proposal for New Work Items to ISO/TC 59/SC 3, *Functional/user Requirements in Building Construction* meeting in Stockholm on 24 May 1996. At the meeting, it was decided that the project should proceed as a Working Group of SC 3 under the convenership of Dr. George Walker, Australia. However, as the two proposals from Australia and the US differed conceptually, Australia and the US were asked to discuss the issues with other interested member bodies, and report back to the next SC 3 meeting in June 1997 with a consolidated plan of action. At the same time, members were asked to nominate experts to the WG.

> "The "performance" concept is widely used in standardization and building regulations, but there is little international agreement on specific details."

In order to adequately canvas opinion on the scope of such a suite of standards, particularly on the understanding of the "Performance" concept and the desirability, or in fact viability of specifying actual levels of performance for houses, systems and components, a public forum was held in Japan, followed by a preliminary meeting of the WG.

The outcome of these meetings was a Strategy which foreshadowed an extensive suite of standards, based on the performance of houses, systems and components when subjected to a wide range of attributes, such as fire safety, structural, safety and serviceability, functionality, durability, accident strategy, etc.

The Strategy envisioned the international trading of manufactured houses, systems and components and the capacity to evacuate innovative design and construction.

Describing the performance of houses in simple, standardized terms

The Committee believes the suite of International Standards that it is developing will have a major impact on the internationalization of manufactured houses and systems.

Manufacturers will be able to describe the performance of their houses in simple, standardized terms, for a nominated range of attributes.

The purpose of the SC 15 suite of standards is to provide a standardized system for those who need to prescribe required levels of performance and those who need to rate a product which forms a house or part of a house.

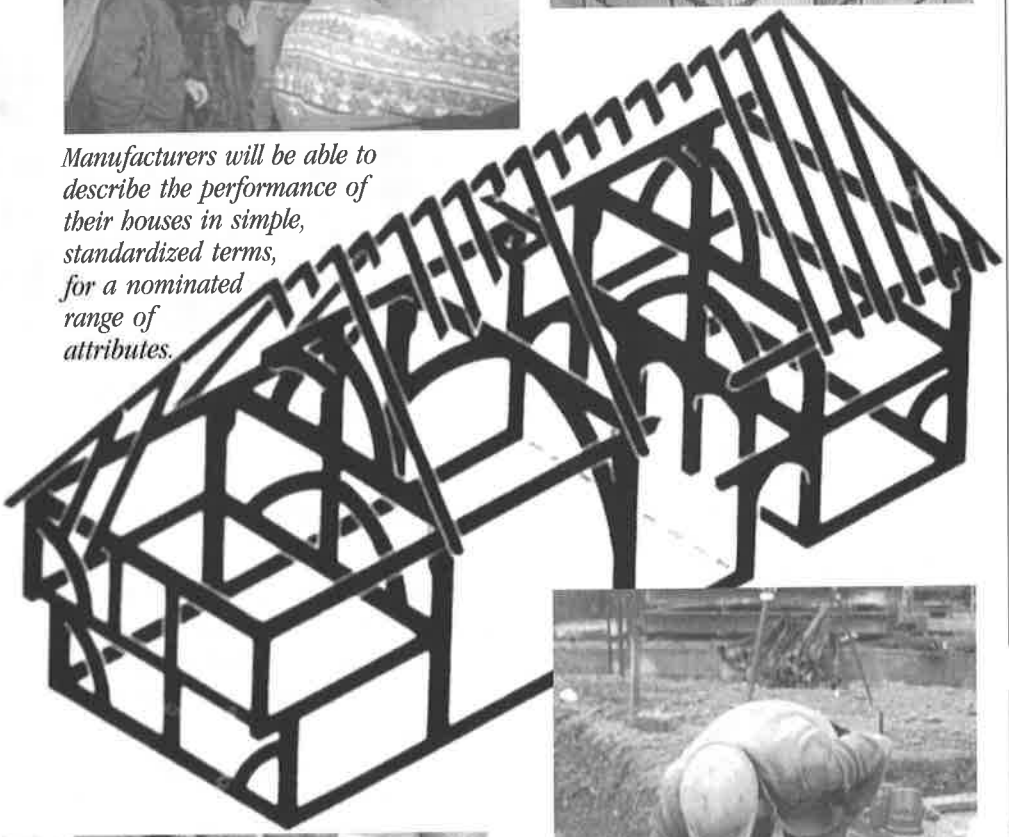
Purchasers or specifiers will be able to match their requirements against the manufacturers' specified performance, for as many attributes as are necessary. For example, very basic housing may only need to have structural adequacy, when assessed against wind and earthquake loads. The manufacturer would specify the rated performance against these criteria, in the standardized manner, and the purchaser would match requirements against this performance specification.

The need to facilitate the standardization of manufactured houses and systems is now of paramount importance if maximum benefit is to be derived from the rapidly expanding world of electronic commerce on the Internet. If products are not acceptable and usable in a number of countries, particularly those with high computer penetration, maximum potential cannot be gained from this exciting new way of doing business.

The standards would also help national, regional and local building regulatory bodies to describe their minimum performance levels in a standardized fashion, allowing free movement of manufactured houses and systems between different jurisdictions.

Furthermore, writers of detached national "deemed to comply" product specifications or verification methods would be able to nominate the particular performance levels their standards or specifications would achieve – and to broaden their potential markets to all countries adopting the standards[1)].

Manufacturers will be able to describe the performance of their houses in simple, standardized terms, for a nominated range of attributes.



From a vague perceived need to the creation of a forward-looking SC

Because of the wide range of expertise needed to develop standards on the various attributes that were envisioned, the WG decided that the optimum way of progressing the project would be as a subcommittee of TC 59, with expert WGs developing single attribute standards.

The proposal to elevate WG 10 to an SC of TC 59 was considered at the TC 59 meeting in London in June 1997 and agreed in principle.

The purpose and justification were as follows:

> The current SC 3/WG 10 was constituted to develop international performance standards as a basis for the design, construction and evaluation of single family attached and detached dwellings and their associated systems and components, worldwide, in order to facilitate international trade, innovative design and construction, and insurance of these systems and components.
>
> As the house comprises a large number of specific attributes, ranging from structural performance to functionality, it will be necessary to develop standards for each attribute separately through individual working groups, under the direction of a parent committee.
>
> This coordination role could only be carried out if WG 10 was re-established as an SC.

1) Members wishing to participate in this extremely important project should contact the secretary of TC 59/SC 15, Denis Dawkins, at Standards Australia or e-mail denis.dawkins@standards.com.au

The Strategy and Work Programme was amended at the second WG meeting, also in June 1997 in London, to strengthen the concept of facilitation of international trade and to prioritize tasks. First priority was given to development of standards on Structural, Fire Safety, Durability and Functionality.

> "When the concept is applied to a project in which the required level of performance for a house or system can vary significantly from country to country (and even within countries), it quickly became evident that the proposed standards could not *define* levels of performance. The most that could be expected, would be to define how the required performance could be *expressed* or *described*, and how it could be measured."

In addition, the WG strongly advocated the preparation of a "*Guide document for the Preparation of Performance Standards*" – an essential tool to ensure consistency of understanding of the fundamental underpinning the "performance" concept.

The proposal to establish the SC was agreed and the first meeting was held in Dallas, US, in January 1998.

As foreshadowed in the last WG meeting in London, the cornerstone of the project is the development of a "Guidelines" document.

The standards under development would not prescribe levels of performance, but would primarily standardize descriptions of performance.

The "performance" concept is widely used in standardization and building regulations, but there is little international agreement on specific details. When the concept is applied to a project in which the required level of performance for a house or system can vary significantly from country to country (and even within countries), it quickly became evident that the proposed standards could not *define* levels of performance. The most that could be expected, would be to define how the required performance could be *expressed* or *described*, and how it could be measured.

Getting down to brass tacks

The first SC meeting in Dallas concentrated on establishing a set of working guidelines, or "Basic Principles", which would guide WGs in the initial stages of development of the standards, until the *Guide Document for the Preparation of Performance Standards* becomes available.

At this stage, it is essential to emphasize that the standards would not *prescribe* levels of performance, but would primarily standardize *descriptions* of performance. i.e. the purpose of the standards is to provide a standardized system for those who need to prescribe required levels of performance and those who need to rate a product which forms a house or part of a house.

The Basic Principles are as follows:

Basic Principles

Preparation

- The standards shall focus on the performance of a house as a whole.
- The standards shall be prepared, beginning with the whole house and addressing lower levels as deemed necessary.
- The standards shall be prepared as a suite of international standards on performance requirements for single family attached and detached dwellings, comprising separate stand-alone parts for each attribute, together with a general principles document to aid in the understanding of the standards.
- To facilitate future coordination with performance requirements in building standards and performance-based specifications, compatibility should be sought with the relevant ISO standards, ISO 6240, 6241 6242 and 7162 and the Nordic model as the basis for the content and format of the proposed International Standards.

Format

The individual attribute standards will be developed in a framework of user needs, based on ISO 6240, where appropriate, leading to:

- performance descriptions in terms of qualitative statements of performance;
- followed by a statement of the parameters to be used in quantifying the performance; and
- how the parameters are to be evaluated.

Working groups have been established to progress drafts on *Structural* convened by Dr. Lam Pham of Australia and *Durability* convened by Mr. Walter Rossiter of the US, with committee drafts anticipated in 2000. □