



STRATEGIC BUSINESS PLAN – ISO/TC 21

Executive summary

ISO/TC 21, *Equipment for fire protection and fire fighting* develops equipment, system and installation standards for fire safety systems installed and used in and around buildings, together with fire fighting equipment that may be transported to a fire. Wherever there is oxygen, there is a risk of fire. Through the development, adoption and use of ISO/TC 21 standards, the ability to detect, restrict and extinguish fires are increased.

ISO/TC 21 has developed an extensive range of standards which are suitable for adoption by both developing and developed countries.

Developed countries often have domestic or regional standards already in use within the country however, globalization and the need for greater efficiency in the standards process can make the adoption of international standards an effective solution for these countries.

Developing countries are often restricted in participating in the development of international standards. Restrictions may be caused by limited economic resources, lack of information about the availability of international standards developed by ISO/TC 21, or a less well developed regulatory, compliance and enforcement regime requiring fire safety equipment and systems to be available.

Both groups are needed, as a source of expertise and experience, and as a beneficiary of the international standards developed by ISO/TC 21.

Whilst the initial development program of ISO/TC 21 focused on equipment standards, in recent years this has been broadened to develop international standards for systems, their installation and maintenance. The more recent publication of ISO/TC 21 subcommittees provide a suite of standards that have global acceptance, are the state of the art, and that will enable manufacturers, system integrators, installers and users to benefit from economies of scale not available with local or regional standards.

ISO/TC 21 has also sought to lead the way with the recognition of new technologies, and this was illustrated by the publication of a Technical Specification (ISO/TS) on Video fire detectors followed by an additional ISO/TS covering their installation and commissioning requirements.

1 Introduction

1.1 ISO technical committees and business planning

The extension of formal business planning to ISO Technical Committees (ISO/TCs) is an important measure which forms part of a major review of business. The aim is to align the ISO work programme with expressed business environment needs and trends and to allow ISO/TCs to prioritize among different projects, to identify the benefits expected from the availability of International Standards, and to ensure adequate resources for projects throughout their development.

1.2 International standardization and the role of ISO

The foremost aim of international standardization is to facilitate the exchange of goods and services through the elimination of technical barriers to trade.

Three bodies are responsible for the planning, development and adoption of International Standards: [ISO](#) (International Organization for Standardization) is responsible for all sectors excluding Electrotechnical, which is the responsibility of [IEC](#) (International Electrotechnical Committee), and most of the Telecommunications Technologies, which are largely the responsibility of [ITU](#) (International Telecommunication Union).

ISO is a legal association, the members of which are the National Standards Bodies (NSBs) of some 164 countries (organizations representing social and economic interests at the international level), supported by a Central Secretariat based in Geneva, Switzerland.

The principal deliverable of ISO is the [International Standard](#).

An International Standard embodies the essential principles of global openness and transparency, consensus and technical coherence. These are safeguarded through its development in an ISO Technical Committee (ISO/TC), representative of all interested parties, supported by a public comment phase (the ISO Technical Enquiry). ISO and its [Technical Committees](#) are also able to offer the ISO Technical Specification (ISO/TS), the ISO Public Available Specification (ISO/PAS) and the ISO Technical Report (ISO/TR) as solutions to market needs. These ISO products represent lower levels of consensus and have therefore not the same status as an International Standard.

ISO offers also the International Workshop Agreement (IWA) as a deliverable which aims to bridge the gap between the activities of consortia and the formal process of standardization represented by ISO and its national members. An important distinction is that the IWA is developed by ISO workshops and fora, comprising only participants with direct interest, and so it is not accorded the status of an International Standard.

2 Business Environment of the ISO/TC 21

2.1 Description of the Business Environment

The following political, economic, technical, regulatory, legal and social dynamics describe the business environment of the industry sector, products, materials, disciplines or practices related to the scope of this ISO/TC, and they may significantly influence how the relevant standards development processes are conducted and the content of the resulting standards:

Fire is an ever-present threat to every field of human endeavor and the standards developed by ISO/TC 21, *Equipment for fire protection and fire fighting*, are equally broad. Its standards are used for early detection of fire, containment of fire and smoke, and the suppression of fire with portable, fixed and mobile fire fighting equipment and systems. The principal objective is for the protection of life, property and the environment in and around buildings and similar structures (including mobile structures such as shipping and other transportation).

All countries have legislative requirements for the protection of life, property and the environment from the threat of fire. Whilst the absolute level of legislated fire safety requirements is ultimately a political decision for sovereign states, the standards produced by ISO/TC 21 establish the minimum requirements for performance of equipment and systems through the consensus of Participating Members of ISO/TC 21 and its subcommittees.

Loss of life due to fire is socially unacceptable and generates a direct or indirect financial burden on society. Injury due to fire is also costly in terms of lost production, medical costs incurred during recovery and the support costs related to the injured persons and their dependents. Legislators are sensitive to community tolerance to the risk of death and injury caused by fire, and seek to balance the cost of fire safety with a minimum acceptable safety level. The equilibrium point varies between countries. Countries with the lowest level of fire safety suffer the highest rates of injury and death.

Property protection is important in terms of maximizing production and minimizing the cost to society of insurance and the impact of uninsured losses. Even more important in many respects is the effect on commerce and industry of fire damage as statistics indicate that the long term viability of companies suffering a serious fire is greatly reduced.

Fire is a significant environmental risk on several levels. Collateral damage from a fire in a building may affect the ability of people to go about their day-to-day lives, including the normal functioning of adjacent businesses. Smoke and gas pollutants released into the atmosphere as a fire burns may be harmful to both the local environment and to the global environment through the release of additional carbon monoxide into the atmosphere. Using suppressants to extinguish a fire places further stress on the environment with possible ground contamination of chemicals used in suppressants, and water usage that may have been otherwise used for productive purposes.

The provision of means to detect and fight fires quickly and efficiently has been an essential factor in all civilizations. The cost in lives and injury is greatly increased if a fire service is inefficient, ill-equipped or non-existent. Whilst travelling fire fighters are necessary to reduce lives lost and property damaged by fire, increasing emphasis on early detection and on-site suppression yields additional levels of fire safety. These measures increasingly shift the responsibility to building owners and occupiers to provide a safe work environment. Public services are then able to place more emphasis on regulating and enforcing fire safety measures, with less emphasis being needed to react to fires after the event. To facilitate such a change, modern, efficient and reliable equipment and systems are needed for early detection, the limitation of the spread of fire and

smoke, and the efficient suppression of the fire. These equipment and systems standards are developed by ISO/TC 21.

Even with the standards available, there is often reluctance by business owners to adopt fire safety measures. The general perception is that lower fire safety costs will improve the financial outcome of the business. This narrow view fails to recognize the costs of the externalities. It generally requires governments to regulate minimum fire safety measures and enforce their implementation before business owners implement them. Whilst this is an area outside the scope of ISO/TC 21, the technical committee can make the implementation of regulatory requirements easier through the use and adoption of the standards developed by ISO/TC 21.

Fire detection and fire alarm

Fire detection and fire alarm systems provide early detection of a fire and the critical warning to building occupants to take action in accordance with the building evacuation plan. It is this early warning and rapid initiation of an appropriate response (most commonly the evacuation of the building) that saves lives in a fire.

Technologies for the early detection of the phenomena of fire, such as heat, smoke, gas and flame, continues to be refined to improve detection performance and simultaneously reduce unwanted fire alarm events. Newer detection technologies, such as video fire detection, coupled with technology for the transmission of the fire alarm signals, such as the Internet of Things, require standards to establish minimum performance requirements and assist designers with useful information for comparison and selection of appropriate equipment to deliver the required system performance.

Developing countries have increasingly focused on life safety which has seen an emphasis on early detection of smoke and fire together with occupant warning systems to facilitate evacuation of the building.

The change in building materials over the years has reduced the tenability of modern buildings and made the early detection of fire and the controlled evacuation of occupants critical factors. Like other equipment and systems complying with standards developed by ISO/TC 21, the fire detection and alarm system may be installed in a building for years and even decades without ever doing the task for which it was designed – that is, to detect a fire. However, one of the challenges of manufacturers is to design equipment that will do nothing for all this time but will operate correctly when finally required to do so. People's lives may depend on the correct operation of the system. The standards developed by ISO/TC 21 establish the minimum requirements for the equipment and systems and may be referenced by regulators to deliver the public safety levels required by the community.

Control of smoke and fire

The flames of a fire are commonly thought to kill people in a fire, however the inhalation effects of heat, smoke and toxic gas is usually the most common cause of death. Controlling the spread of smoke and heat in a building can provide critical additional time for people to escape a building. Often working together the fire detection and alarm system, the smoke and heat control equipment operates to contain the spread of smoke and heat, thus maintaining the viability of non-fire affected areas and allowing additional time for building occupants to evacuate the building.

The change in building materials over the years has reduced the tenability of modern buildings and made the control of smoke a critical consideration.

Even if no lives are lost, limiting the spread of heat and smoke can have a direct economic effect by minimizing the amount of work required to recover a building or other space following a fire.

Fire suppression

All fires are eventually extinguished. The nature of the fire, including the likely combustion material and the imperative for early extinguishment may drive the selection of the appropriate suppression system. Suppression systems specified in standards developed by ISO/TC 21 may use water, foam, powder or gas media. The overall objective is the same – to extinguish the fire in the minimum amount of time with the minimum damage to the structure and the environment. The selection of the optimal solution is also an economic decision, as speed of effectiveness may also be correlated to the cost of the equipment used in the system.

Fixed water suppression systems are commonly seen installed in and around buildings. Although the technology may appear stable, continuing research is being undertaken to develop new types of delivery systems that will provide quicker activation to enable the water to more quickly suppress the fire. Benefits also accrue to the environment, with less water being used which also reduces the level of damage to the building. The new technology can be assessed for performance against the requirements in existing standards developed by ISO/TC 21 and new or revised standards are developed to take into account the state of the art.

For more specialist applications, suppression systems using foam, powder or gas media provide solutions for different types of risks (such as oil refineries) or where the economic cost is very high (such as computer data centers). Suppression times are important, but the safety of the occupants of an area where the media is to be released is critical. Continuous research is being undertaken to develop suppressants that have a lower impact on the environment, the people in the vicinity to the suppressant release, and at the same time, with no loss of performance. Experts in the field bring to ISO/TC 21 specialist knowledge that is used to prepare a large body of Standards covering a wide range of media.

Fire suppression systems are not only installed in buildings but are also used portable and transportable fire extinguishers that are commonly known by the general public. Portable fire extinguisher standards need to consider the use of the equipment by the general public, who may or may not be trained, and also by fire fighting professionals. The range of standards and requirements must satisfy the complete continuum of user and media types. For the trained fire fighters, Standards are also developed by ISO/TC 21 that specify equipment and systems used as part of fire fighting vehicles.

2.2 Quantitative Indicators of the Business Environment

The following list of quantitative indicators describes the business environment in order to provide adequate information to support actions of the ISO/TC 21:

Fires harm and kill people, and damages and destroys property all over the world, in both developed and developing countries. Statistics for losses by fire are not readily available in the developing world, but a number of developed countries publish the direct and indirect costs of fire losses. Data published by The Geneva Association shows that the direct losses by fire in developed countries are up to 0,2% of annual GDP, with indirect losses adding another one tenth to the economic cost.

Economic loss is only one aspect of the negative effects of fire. More damaging is the impact on human life. In developed countries, loss of life is typically one death per 100.000 population per year. Fire injuries add significantly to the negative effects of fire. In developing countries, where fire safety systems and practices are less mature, the losses are expected to be higher.

Additional costs of fire safety are included in the costs of operating a fire service, insurance administration and the costs of fire protection in buildings. Given that most injuries, deaths and economic loss occur in and around buildings, the ability to construct safe buildings is an important part of reducing the costs of fire. A building becomes safer when effective fire detection, alarm, and suppression equipment and systems are installed. It is in the area of the development on international standards for these equipment and systems that ISO/TC 21 is a major global contributor.

Developed countries typically have mature building fire safety standards. Although the standards developed by ISO/TC 21 may be most easily adopted in developing countries, where existing standards may not be available, the adoption of international standards by developed countries provides regulators with a globally accepted norm. International standards provide manufacturers with greater economies of scale, leading to lower equipment manufacturing costs. As equipment costs are lowered, the opportunity for developing countries to install fire safety systems in buildings is enhanced. The installation of more fire safety in buildings will lead to lower loss of life and injuries, lower building losses caused by fire, and lower indirect costs, such as fire services and insurance administration.

3 Benefits expected from the work of the ISO/TC 21

The development and use of fire safety standards will lead to the reduction in the level of fire losses in both human and material terms. The introduction of fire safety engineering principles in the application of the ISO/TC 21 Standards should enhance their position in the market. The application of the Standards will result in substantial improvements in active fire safety and the inter-communication of fire protection measures.

The standards developed by ISO/TC 21 and its subcommittees are gaining increasing acceptance around the world in both developed and developing countries. Countries that have adopted these standards, particularly the equipment standards, are benefiting from lower costs of building fire safety systems due to the use of equipment that can be supplied into the global market. Manufacturers are increasingly recognizing that the higher costs of producing smaller production runs of equipment to satisfy local standards lead to higher costs to consumers.

Adoption of a single global equipment standard for a specific product reduces development costs and removes the local nuances that are typically used as a technical barrier to trade. The wider community benefits from the lower costs of delivering a fire safety solution, and efficient manufacturers are benefiting from better economies of scale.

Growth in free trade agreements around the world has brought the advantages of international standards into focus because they can remove an important barrier to trade.

4 Representation and participation in the ISO/TC 21

4.1 Membership

Participating membership is strongest in developed regions of the world. Observing members are commonly from developing countries, and yet large areas in need of fire safety systems, such as Africa and parts of Asia, remain under-represented.

The following link shows which countries are Participating members and which countries are Observing members of ISO/TC 21.

[Members of ISO TC 21 on ISO Online](#)

4.2 Analysis of the participation

Countries from all regions of the developed world participate in the work of ISO/TC 21. The major fire protection equipment manufacturers, peak industry bodies, government departments (including military), designers, engineers, researchers, testing laboratories and consumer groups, actively support ISO/TC 21. More participation is required by developing countries, where international standards can most benefit the local society. Participation costs have reduced in recent years with the increasing use of electronic means of communication, such as email and web conferences, however where most meetings are held in English and most developing countries are not native English speakers, participation remains a problem.

Direct member participation is enhanced by the important liaisons with organizations that represent industry peak bodies and regional standards organizations. Liaisons are a powerful way of receiving feedback from outside organizations and to provide those organizations with a meaningful insight into the development program of ISO/TC 21's subcommittees.

One of the challenges for ISO /TC21 is how to effectively promote the advantages of our fire standards more widely in the international community. One of our key objectives must be to encourage observing members to become participating members to strengthen the sub committees and foster the acceptance of ISO fire standards

5 Objectives of the ISO/TC 21 and strategies for their achievement

5.1 Defined objectives of the ISO/TC 21

The objectives of ISO/TC 21 are to develop Standards and other documents to meet market demand in a timely and cost effective manner. The objectives are to:

- Protect people, property and the environment against the risk of fire.
- Specify the minimum performance and operational requirements of products and systems under fire conditions.
- Develop standard guides for installation and servicing of equipment and systems.
- Co-ordinate and integrate Standards with related systems.

These objectives are pursued in close co-operation with other development organizations of major fires standards (e.g. CEN).

5.2 Identified strategies to achieve the ISO/TC 21's defined objectives

To achieve the defined objectives, ISO/TC 21 will maintain its existing standards and develop new standards within the existing ISO Directives time scales. Concurrently, standards that are no longer relevant to the market will be systematically reviewed and withdrawn. Active management of the publications of ISO/TC 21 will ensure that the standards available to users are those that are required to deliver the objectives of ISO/TC 21.

ISO/TC 21 will look to develop new standards for products to meet the changing requirements of its market.

ISO/TC 21 will continue to meet on an annual basis, with its sub-committees and working groups meeting when the work demands. Notwithstanding, ISO/TC 21 will endeavor to make the best use of the electronic tools available to it

The link below is to the Liaison committees of TC 21 page on ISO's website:

[Liaison committees of ISO TC 21 on ISO Online](#)

6 Factors affecting completion and implementation of the ISO/TC 21 work programme

Factors affecting completion and implementation of the ISO/TC 21 work program include the following:

Limited resources.

In such a competitive and rapidly developing market, there are only a small number of fire experts willing or able to devote time to standardization activities.

Lack of participation from developing countries.

ISO/TC 21 and its subcommittees need to promote the development of its standards in developing countries through the increased use of electronic communication and the twinning of working group conveners. Converting observing members to participating status is one avenue to increasing acceptance of ISO standards.

Covid 19 Pandemic.

This has had a significant effect on the work of ISO/TC21 providing both negative and positive impacts. On one hand it has stifled travel and made it harder to conduct traditional face to face meetings. On the other hand, it has improved the acceptance of virtual meetings which has been used to great affect by several WGs. Virtual and Hybrid meetings allow wider participation by significantly reducing the cost of that participation.

Vienna agreement.

In the field of fire detection and alarm systems, ISO/TC 21 has had limited success with the European Union with Europe moving to Directive driven markets and the importance of CEN standards has increased. Unfortunately CEN has focused their efforts on achieving acceptance of EN54 standards by the European Commission. This has inevitably led to a loss of markets for ISO standards, which may not meet the requirements of the Directives. . We continue close liaison with CEN however the relevant CEN technical committees need to be prepared to allow the development of joint standards under the framework contained within the Vienna agreement. Brexit does offers an opportunity with the UK seeking to broaden trade outside its traditional European market.

National implementation.

ISO/TC 21 can spend a great deal of time and resource in developing standards only to find that some of the major participants in the work do not use the standards. ISO/TC 21 needs to find ways to achieve greater national adoption and this is a major problem for all ISO work. There has been good progress with countries such as India and Brazil adopting a number of ISO fire standards as country standards which are referenced within their national regulations. This demonstrates the opportunity as these two countries alone house more than 20% of the world's population.

Strengths

- Institutional links to EC/EFTA via CEN.
- Openness and transparency of its process, involving the strength offered by the national infrastructures of the NSBs and their close links to national culture, enterprises and government (including local languages).
- Consensus as the basis for the development of Standards.
- Experienced pool of willing experts.
- Proven achievements in the reduction of technical barriers to trade (ISO 14520 series).

Weaknesses

- Non-uniform national implementation of international standards within the NSBs.
- Perceived discrepancies between national and international interests.
- Insecurity resulting from potential reduction of available experts in the longer term.
- Insecurity resulting from the perception of a loss of national sovereignty in the development of standards.

Opportunities

- Although it is a challenge to the current system, globalization through the widespread adoption of the WTO Technical Barriers to Trade Agreement presents opportunities for working in co-operation with CEN.
- Growing and new areas of interest for standardization (for example, services).
- Further deregulation initiatives.
- Better and more efficient involvement of all stakeholders including small and medium-sized enterprises, through their NSB.
- Increased use of information technology leading to shorter development times, cost reduction and wider involvement of interested parties e.g. TC Website.
- The ability of ISO /TC21 to embrace new technologies and develop standards to promote the acceptance of new technologies

Threats

- Specifications coming from other consortia and organizations such as CEN and UL.
- European Union Directives have adversely affected the output of CEN and reduced interest in the work of ISO/TC 21 and its subcommittees.
- Overall resources and financing of the system.
- Preference for mutual recognition principle compared to harmonization through standards.
- Reluctance of conformance assessment bodies to accept the test results and conformance assessment reports from laboratories other than their domestic laboratories.

7 Structure, current projects and publications of the ISO/TC 21

Information on ISO online

The link below is to the TC 21's page on ISO's website:

[ISO TC 21 on ISO Online](#)

Click on the tabs and links on this page to find the following information:

- About (Secretariat, Committee Manager, Chair, Date of creation, Scope, etc.)
- Contact details
- Structure (Subcommittees and working groups)
- Liaisons
- Meetings
- Tools
- Work programme (published standards and standards under development)

Reference information

[Glossary of terms and abbreviations used in ISO/TC Business Plans](#)

[General information on the principles of ISO's technical work](#)