



BUSINESS PLAN
ISO/TC 127
Earth-moving machinery

EXECUTIVE SUMMARY

By the 1960's the earthmoving machinery industry was already a global industry, with machines from the United States, Europe and Asia being sold into earth-moving applications around the world. Several countries were beginning to develop standards and regulations for earthmoving machines, which created a challenge for the industry to be able to meet the different requirements in different countries.

To address the challenge of having to comply with the different requirements around the world, ISO/TC 127 was formed in 1968 to develop international standards for earth-moving machinery. The objective was to develop a complete set of ISO standards that could be used as the basis for any national standards and regulations.

Since 1968, over 100 ISO/TC 127 standards have been published to address the commercial needs and the safety and ergonomics areas for earth-moving machines. Twenty new standard projects are underway and approximately one half of the published ISO/TC 127 standards are being updated to address smaller, larger and new types of machines and the application of new technologies.

One common objective of both the earthmoving machinery industry and the users of earthmoving machines is to provide a safe and comfortable work place for the workers who operate the machines. This common objective has enabled health and safety experts from industry and experts from health and safety organizations and independent test labs to efficiently work together in ISO/TC 127 to develop over 40 standards that address the safety and human factors areas of earth-moving machines. The combined input from all participants has been compiled into standards that cover the safety for all risk areas of earthmoving machines.

Most of the ISO/TC 127/SC 2 safety and ergonomics standards have been adopted as national safety and ergonomics standards by the USA and Japan and have been referenced for the technical requirements in the European earth-moving machine standards. With the adoption of the ISO standards as national standards, the cost and complexity of developing and proving compliance with the safety standards has been reduced and the overall level of safety and comfort for the earth-moving machinery industry has been improved.

An international project has been started to develop model legislation based upon the ISO/TC 127 standards. This model legislation will be promoted as the basis for all national and regional standards for earthmoving machines.

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 140 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

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:

The earth-moving machinery industry has achieved a certain level of maturity in that the changes in machinery design are more evolutionary, rather than revolutionary. Even so there is continual progression of new technologies into the machinery. Currently the new technology that is the focus of several new standards projects involves the addition of electronic devices and software to the machinery.

In the initial years of ISO TC 127, the major emphasis was to harmonise the various national standards that dealt with test methods for machines. Very quickly, the participants in ISO TC 127 recognised the need for nomenclature and specification standards to ensure common terminology between the manufacturers and the customers of the machinery. In due course the interest in the safety of the machinery expanded with various countries establishing national safety requirements. TC 127 participants responded with many work items to address the safety issues. As the availability of earth-moving machinery is critical to its success, standards dealing with operation, maintenance and serviceability were also developed.

In more recent years with the growth of society's interest in the environment and safety, projects for TC 127 have been undertaken to harmonise the safety requirements. Specific efforts were undertaken in the mid 1980s to evaluate the portfolio of TC 127 standards to ensure that its standards would be suitable for use in government regulatory requirements. As the portfolio wasn't as complete as it needed to be, a substantial number of new work items were undertaken. These standards were developed in time to meet the needed regulatory requirements.

The dynamics within the earth-moving machinery industry are such that the number of manufacturers continues to decline through mergers and acquisitions. Whereas at the formation of TC 127 there were multiple manufacturers in many countries, the consolidation of these as subsidiaries or affiliates of larger global or international manufacturers has occurred. This trend will only continue and the participation in TC 127 will continue to change.

The result of the many changes in the industry since the formation of TC 127 is that only global standards are of value to the industry, and to governments and society. As a result national standards development has essentially stopped. National and regional adoption of TC 127 standards is the major effort supported by TC 127.

Significant support for TC 127 comes from the manufacturers. In addition there are a number of research laboratories, test organisations and notified bodies, as well as some government health and safety agencies participating in the standards development projects. Because earth-moving machinery is capital goods as distinguished from consumer goods, consumers have not found participation a rewarding use of their resources.

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:

As the market for earth-moving machinery depends significantly on the growth of the world economy, the growth of the earth-moving machinery market closely follows economic growth. Housing starts are one of the important factors affecting the market for earth-moving machinery. Industrial growth is likewise a significant factor. Public works projects such as new infrastructure for roads, airports, power stations, dams, etc. provide significant stimulation to the market. Many of the larger machines are used in natural resource mining applications, such as in mining and in petroleum.

As the earth-moving machinery market is global, a major interest in the need for ISO TC 127 standards is to obtain global standards. The work of earth-moving machinery does not respect

national boundaries. Earth is earth, and rock is rock and requires the same type of machinery regardless of the location on the earth.

People who operate machines have the same needs for operational performance and for safety regardless of location on the globe. Thus, global standards are what are needed to affect an efficient market and provide for the needs of the operators and support people for earth-moving machinery.

With the current desires of society to reduce the amount of new expansion of businesses, a considerable amount of the market deals with the demolition of existing infrastructure and replacing it with new facilities. Thus, roads are being rebuilt rather than new ones being created. Inner cities are being revitalised with new buildings in place of old, rather than expansion to suburbs.

The manufacturing industry is essentially divided between a limited number of large enterprises and then a substantial number of small enterprises. The small enterprises occupy niche markets for specialised machines for quite specific applications, or serve only a limited geographical area. Many of these smaller enterprises are merged into the larger enterprises as such opportunities develop.

The size of the earth-moving industry globally is in the \$ 60 billion (US) range. The businesses are principally located in Europe, Japan and the USA. Many of the enterprises have expanded to some of the developing countries. Major global enterprises build products in a number of countries and then export globally. Global enterprises use the technology wherever it is located to develop the machines and then search for the best locations to manufacture product. Many of the products are only produced in low volume and thus global exporting is the only way to keep production volumes efficient.

Most of the major global enterprises extensively use ISO standards for marketing and regulatory purposes. In some instances, national standards that are technically equivalent to ISO standards are used. As some of the regulatory schemes in place go back to the early 1970s, prior to the point in time when the TC 127 had gained stature, these still use the national technically equivalent standards in their legal texts.

Most of the developed countries that have safety requirements for earth-moving machinery accept conformity to ISO standards as meeting their regulatory requirements. As the European safety requirements are relatively new, 1992 era, they have made the most use of TC 127 standards. Because of the fact that ISO standards are not mandatory, Europe has invoked the European Standards Committee, (CEN) as a means to provide harmonised standards across Europe. The basic European Norms (EN) for earth-moving machinery references some 50 TC 127 standards. Other countries are now on a fast track to dual-designate the TC 127 as national standards. In South America, projects are underway in Mercosul to achieve regional adoption of TC 127 standards. Other countries such as Brazil, Russia, China, Australia and the USA are actively engaged in national adoption.

3 BENEFITS EXPECTED FROM THE WORK OF THE ISO/TC

The work of TC 127 is important because to achieve full global trade with limited volumes of machines it is absolutely imperative to have global standards. Therefore, continuing to adapt the TC 127 portfolio of standards for new technology must be an ongoing objective of the TC. The infusion of electronics into earth-moving machinery is developing at a fast pace. Electronics are used to operate vital systems on machines. Electronic devices and software will eventually provide substantial benefit to the performance of the machines, increase the safety for the operators and those in contact with the machine and provide more efficient use of the machine

assets in construction and mining projects.

The major thrust of the TC 127 standards has been to enable global trade with the harmonisation of the different national standards and where national or regional standards have not yet been developed to develop global standards. For the last 20 years a substantial percentage of the work projects have dealt with the aspects of safety for the operator and personnel who service the machinery.

Global standards provide substantial opportunities for cost effective development of earth-moving machinery. Development and design costs are significant and as such developing product to different national or regional standards increases cost of the machinery to all citizens of the globe.

4 REPRESENTATION AND PARTICIPATION IN THE ISO/TC

4.1 Countries/ISO members bodies that are P and O members of the ISO committee

4.2 Analysis of the participation

The manufacturing industry is principally located in Europe, Japan and the USA. Some manufacturing is done in China, Russia, Brazil, Asia-Pacific countries and some Central European countries. The balance of participation between the main countries is quite good. Most significant participating countries are USA, Japan, Germany, Sweden, UK, Italy, and France. Brazil recently became a participating country. Poland and Russia participate as well. China is a country where the TC 127 desires to obtain active participation. In recent years, ISO/TC 127 has worked with developing countries to help them host the international meeting. This was done in Russia in 1999, in Brazil in 2000, and in Poland 2002. Having meetings in developing countries enables more participants from the developing host country to participate and learn the ISO process and the ISO/TC 127 standards projects. The next ISO/TC 127 meeting will be in China.

5 OBJECTIVES OF THE ISO/TC AND STRATEGIES FOR THEIR ACHIEVEMENT

5.1 Defined objectives of the ISO/TC

The basic objectives of TC 127 are to provide the portfolio of standards for earth-moving machinery to support the manufacturers need for global trade. A further objective is to recognise the responsibility of manufacturers to provide machinery that meets the need of society with respect to health, safety and the environment, and the needs of regulators for their accountability for health, safety and environmental concerns for machinery.

Within the global trade objective is the need to provide common terminology and performance criteria for manufacturers in the specification of the performance of machines. Only when adequate standards that can quantify the performance of machines exist, are purchasers able to make informed decisions as to the value of the desired machine. Because earth-moving machines are work machines used by customers to earn an income, purchasing decisions must be made on machine performance and the ability of the machinery to satisfy the needs of the customer.

The earth-moving machinery industry believes that it can adequately determine the appropriate health, safety and environmental requirements for its machines through the ISO/TC 127 standards development process. Thus, government regulations can be based on ISO/TC 127 standards to meet the needs of society.

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

Because TC 127 is a mature TC with a plus 30-year portfolio of standards, the periodic review of standards is the most time consuming project within the TC. The second driver of the TC workload is the adaptation of new technology into the machinery. The increased use of electronics in machinery requires a number of additional standards.

Because the industry is spread around the globe, developing global standards through ISO is the basic strategy. Then regions or nations can then adopt those global standards to fit their specific local customs or legal systems.

The development of a full set of ISO standards provides the best solution for TC 127. Other ISO deliverables are not as desirable because there is a need to have as much consensus as is reasonable and practicable for the standards. While speed to produce the necessary standards is desired, it is not the principal factor for the standards portfolio.

The TC 127 is organised with four subcommittees. All of the standards development work is conducted within the subcommittees. They may do the work directly through project leaders or through the use of working groups. Where projects may cross over the scopes of two or more subcommittees, the working group is assigned to the TC for management purposes.

The main role of the TC is management of the subcommittees and the approval of new work items. This ensures appropriate coordination of projects and coherence with the TC 127 scope.

6 FACTORS AFFECTING COMPLETION AND IMPLEMENTATION OF THE ISO/TC WORK PROGRAMME

The only issue that presents a challenge is that the participants who have the necessary expertise are also very busy people in their normal work positions. Thus, the time available to work on the development of ISO standards is sometimes limited, delaying the production of drafts and the review and commenting on new proposals. This will not get any better unless the world economy significantly recovers to a point that reasonable profit is generated from the earth-moving machinery businesses. Government social, fiscal, monetary and taxation policies are major factors in the vitality of the earth-moving machinery industry.

As the technology becomes more advanced, the need for pre-standard research, development and verification will also become more challenging. A significant challenge will be for participants to gain approval for the industry, or government to fund such work in order to produce sound technical standards.

7 STRUCTURE, CURRENT PROJECTS AND PUBLICATIONS OF THE ISO/TC

This section gives an overview of the ISO/TC's structure, scopes of the ISO/TCs and any existing subcommittees and information on existing and planned standardization projects, publication of the ISO/TC and its subcommittees.

7.1 Structure of the ISO committee

7.2 Current projects of the ISO technical committee and its subcommittees

7.3 Publications of the ISO technical committee and its subcommittees

Reference information

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

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