BUSINESS PLAN

ISO/TC 11
Boilers and pressure vessels

EXECUTIVE SUMMARY

Boilers and pressure vessels addressed by ISO/TC 11 are essential elements in the systems that heat and cool homes, offices, hospitals, schools, factories and places of worship. The equipment is also used in industrial systems for electric power generation, chemicals, petrochemicals, pharmaceuticals, food processing, paper and other types of manufacturing. Equipment is manufactured mainly from steel plate, pipe, tubes and fittings although other metals and non-metals are also used. Most (80%) manufacturers are small companies employing fewer than 100 individuals. Specialty manufacturers may produce fewer than 10 vessels per year while a large manufacturer of simple pressure vessels (air receivers, propane tanks) may produce more than 100,000 annually.

There are significant differences among countries in regulating the supply and operation of pressure equipment. These differences include compliance with a specific national standard(s), limiting source or specification of materials, use of specific inspection bodies, and discriminatory certification systems or import licenses. Development of a performance based International Standard is the best realistic approach to facilitating world trade by enhancing recognition of national and regional standards. These standards have a proven history of supporting public safety and good commercial operating experience. An international performance based standard will enable these standards to co-exist providing an approach that can accommodate technical innovations, existing regulatory frameworks and market needs.

The main objective is to produce and ecougage the use of an ISO performace standard that can be used by the member bodies of ISO to accommodate the needs of their markets – both users and regulatory bodies. Subsequent priorities include:

1. Build on the information learned from the contents of national and regional standards during the development of the performance based standard to begin development of a common market-based international standard.
2. Provide a forum for international cooperation and collaboration in developing common rules and approaches in national and regional standards.
3. Formulate a common market-based international standard.

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:

2.1.1 Market Environment and Objectives of ISO/TC

This section establishes a sequential development of thoughts regarding the market for which the ISO/TC aims to fulfill the needs. Details in relation to the market analysis are given in the Guidance document on ISO Business Planning. The sequence of thoughts starts from a description of the current market situation relevant to the product or product grouping under consideration by the ISO/TC, continues on to an analysis of the different factors motivating/influencing the activities of the ISO/TC, to come to clear description of objectives and expected benefits resulting from the work of the ISO/TC, together with an accompanying strategy how to reach those objectives. Finally, a general risk analysis is included highlighting issues that may delay or stop the ISO/TC achieving its set objectives.

2.1.2 Market Environment

Political, economical, social, technical, legal and international factors that either directly require some or all of the standardization activities proposed by the ISO/TC, or significantly influence the way these activities are carried out are the following:

2.1.3 General description of the market

Boilers and pressure vessels addressed by ISO/TC 11 are essential elements in the systems that heat and cool homes, offices, hospitals, schools, factories and places of worship. The equipment is also used in industrial systems for electric power generation, chemicals, petrochemicals, pharmaceuticals, food processing, paper and other types of manufacturing.

The scope of TC 11 is:

Standardization of construction of boilers and pressure vessels.

Excluded:

- railway and marine boilers covered by ISO/TC 8
- gas cylinders covered by ISO/TC 58
- aircraft and vehicle components covered by ISO/TC 20
- equipment used for fire-fighting covered by ISO/TC 21
- personal safety equipment covered by ISO/TC 94
- components of rotating or reciprocating devices
- nuclear pressure equipment covered by ISO/TC 85
- piping systems
- cryogenic vessels covered by ISO/TC 220

Note: Construction is an all-inclusive term that includes design, material, fabrication, examination, inspection, testing and conformity assessment.

Boilers and pressure vessels are generally nationally regulated products. Regulations have been adopted not only to ensure the safety of employees and the general public but to limit damage to property and local economies.

2.1.4 Description of the total market

The United States of America and the European Union are major markets for and producers of boilers and pressure vessels, followed by Japan, China, Korea, India, Indonesia, Malaysia, Australia and New Zealand. In developing countries, boilers and pressure vessels are essential for establishing industry and supporting infrastructure (e.g., electric power generation). Further, the variety of equipment classified as boilers and pressure vessels is extremely large (boilers can

range from a few liters in volume at 1 bar up to a utility boiler containing thousands of liters at 100 bar, pressure vessels can range from simple air receivers containing a few liters at a few bars to a cracking tower in an oil refinery).

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:

2.2.1 Structure of the market: Suppliers/Manufacturers

Boilers and pressure vessels are manufactured mainly from steel plate, pipe, tubes and fittings although other metals and non-metals are also used. Most (80%) manufacturers are small companies employing fewer than 100 individuals.

Boilers are classified as low pressure (heating) boilers or high pressure (power) boilers. Boilers are used to produce steam or hot water for space heating, power generation or process purposes. Some countries classify pressure vessels by size, contained fluid and/or pressure.

Specialty manufacturers may produce fewer than 10 vessels per year while a large manufacturer of simple pressure vessels (air receivers, propane tanks) may produce more than 100,000 annually.

2.2.2 Structure of the market: customers

The structure of the market is as diverse as the equipment itself. The largest owners of pressure vessels are chemical manufacturers and oil refiners owning 10-20% of pressure vessels. However, most boilers and pressure vessels are owned by small concerns such as dry cleaners, schools, apartment buildings, etc.

2.2.3 Major factors which may have an impact on the development of markets.

<u>Suppliers and customers</u>

Boilers and pressure vessels are used in a wide variety of industries and applications. Trade in pressure equipment is a highly internationalized market. In many countries, boilers and pressure vessels are regulated by government bodies either through technical statutes or application of standards and conformity assessment requirements. Companies are seeking to control costs and optimize equipment designs and sources as part of their local or globalization plans.

<u>Technological changes/product innovation</u>

Standardization in this field must strike a balance between safety, function and technical innovation. New materials, processes, e.g., welding, non-destructive examination and service experience should be incorporated into standards on a regular basis.

<u>Social changes</u>

Standards must accommodate public and occupational safety. In general, society increasingly demands improvements in safety and reliability of equipment and services as well as reductions in environmentally harmful emissions. Standards also provide an important means of technology transfer to emerging economies.

Political

Sound standards contribute to solutions to political issues such as public health and safety and help assure reliable essential public services such as power and fuel supplies. Standards can be a major contributor to promoting economic trade.

Technical barriers to trade (TBT)

Currently, different prescriptive requirements in national and local regulations introduce technical barriers to trade. Providing realistic means to reduce these barriers within the context of mature industries and widespread familiarity with and use of longstanding or well proven design standards is the key challenge.

Regulator and legal measures

There are significant differences among countries in regulating the supply and operation of pressure equipment. These may include compliance with a specific national standard(s), limiting source or specification of materials, use of specific inspection bodies, and discriminatory certification systems or import licenses.

3 BENEFITS EXPECTED FROM THE WORK OF THE ISO/TC

Until now codes, standards, certification systems and regulations have formed a set of interlocking requirements to assure that the equipment is safe to operate. With the globalization of economies and implementation of trade agreements, customers and regulatory authorities will need international standards to provide the structure to facilitate free trade while assuring expected levels of equipment safety.

The development of a single comprehensive boiler and pressure vessel standard will be a lengthy process. Achieving compromise among the member countries is time consuming due to the historical differing approaches taken by regulatory authorities and differences in the underlying design and construction philosophies of the various national and regional product standards. It is also recognized that experts in the various countries are under increasing pressure to limit participation in all aspects of standards development.

Given these real constraints, development of a performance based International Standard is the best realistic approach to facilitating world trade by enhancing recognition of national and regional standards. These standards have a proven history of supporting public safety and good commercial operating experience. An international performance based standard will enable these standards to co-exist providing an approach that can accommodate technical innovations, existing regulatory frameworks and market needs.

4 REPRESENTATION AND PARTICIPATION IN THE ISO/TC

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

Major players in the TC are summarized from the aspect of member bodies in Table 1. Active members include France, Germany, Hungary, Italy, UK, Sweden from Europe, USA and Canada from North America, Australia, China, Korea and Japan from Asia/Oceania.

Manufacturers, users, inspection bodies and governments are represented on the TC.

4.2 Analysis of the participation

Table 1 Regional Distribution of Membership of ISO/TC 11

Region	P-Member Countries	O-Member Countries
Europe	Austria, Belgium, Denmark, France, Germany, Hungary, Italy, Romania, Spain, Sweden, Switzerland, United Kingdom	Croatia, Czech Republic, Estonia, Finland, Greece, Ireland, Moldova, Netherlands, Norway, Poland, Portugal, Slovakia, Slovenia, Ukraine, Yugoslavia
North America	Canada, United States of America	Mexico
Atlantic		Barbados, Cuba, Jamaica
South America	Brazil, Colombia	Argentina, Venezuela
Asia/Oceania	Australia, China, India, Indonesia, Japan, Korea (Republic of), Malaysia, New Zealand, Philippines, Russian Federation	Hong Kong (China), Pakistan, Korea (Dem. P. Rep. of), Mauritius, Mongolia, Singapore, Thailand, Vietnam
Middle East	Iran (Islamic Rep. of), Israel	Saudi Arabia, Tunisia, Turkey
Africa		Kenya, South Africa

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

5.1 Defined objectives of the ISO/TC

Based on the above considerations, ISO/TC 11 proposes the following objectives and strategic directions for its future work.

1. Promote the use of TS 16528
2. Use TS 16528 as the basis for developing a performance based standard.
3. Build on the information provided in the registration process to begin more detailed study of the contents of national and regional standards.
4. Provide a forum for international cooperation and collaboration in developing common rules and approaches in national and regional standards.
5. Formulate a common market-based international standard(s).

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

5.2.1 Adopt a performance based standard

- Identify obstacles that in the past have impeded the development of such a standard and provide recommendations to overcome those obstacles.
- Finalize the performance based standard.

- Make sure decision makers, particularly in emerging nations, are aware of the benefits of the performance based standard and emphasize that alternatives, i.e., a single ISO standard, while in the abstract appearing preferable, are not workable in the short term, given the market and regulatory impediments.
- Provide public access to submitted registration forms.

5.2.2 Build on the information provided in the registration process to begin more detailed study of the contents of national and regional standards

- Confirm the benefit/cost of the study (if positive proceed).
- Establish working group.
- Develop hierarchy of key criteria of registered codes.
- Provide a comparative matrix of key criteria.

5.2.3 Provide a forum for international cooperation and collaboration in developing common rules and approaches in national and regional standards

- Share current major work projects of national and regional standards.
- Seek to establish common terminology and definitions among national and regional standards.

5.2.4 Formulate common market-based international standards

- Establish and define scope of working group.
- Engage all stakeholders, i.e., equipment users and manufacturers, regulators and standards developers to define standards needs.
- Based on needs assessment, set work programs for standards development, review of candidate standards or other viable alternatives.

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

1. The principles of the performance based standard are not understood and adopted.
2. Promoting the use of the performance based standard by member countries may be time consuming due to differing approaches taken by regulatory authorities.
3. Experts may be under pressure to limit participation in TC 11 work due to decrease of support from the experts' organizations.
4. When the need for a common standard is confirmed, achieving compromise among member countries will be time consuming due to differing approaches taken to design and construction in the various national and regional 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

This section gives an overview of the existing and planned standardization structure for this ISO/TC and its resources, which are required to be able to elaborate the above listed projects. Only structures directly responsible for standardization projects (WIs) are listed. Therefore, no

coordination or advisory groups are included. Again, the aim of this listing is to demonstrate the adequacy of available resources with regard to the anticipated workload.

Resources Required to Complete Items Listed in Clause 8:

Work Item (WG 10)	Secretariat	Chairman	Experts
1. WG 10 to draft Part One of a standard to include performance based requirements, mindful of current regulatory and commercial realities.	0.10 FTE	0.10 FTE	0.10 FTE/ country Note [1]
[1] Work item would require the commitment of significant amounts of time from the participating experts.			

Work Item (WG 11)	Secretariat	Chairman	Experts
1. WG 11 to draft Part Two of a standard to address processes to inditify standards conforming to Part One	0.10 FTE	0.10 FTE	0.10 FTE/ country Note [1]
[1] Work item would require the commitment of significant amounts of time from the participating experts.			

Work Item (TC 11)	Secretariat	Chairman	Experts
1. Adopt and promote the use of 16528	0.01 FTE	0.01 FTE	0.05 FTE/ country
2. Build on the information provided on the contents of national and regional standards during the development of the performance based standard to begin development of a common market-based international standard.	0.20 FTE	0.10 FTE	75 man days
3. Provide a forum for international cooperation and collaboration in developing rules and approaches in national and regional standards	0.1 FTE	0.1 FTE	40 man days
4. Formulate a common market-based international standard	0.3 FTE	0.1 FTE	Note [1]
[1] Work item would require the commitment of significant amounts of time from the participating experts.			

7.2 Current projects of the ISO technical committee and its subcommittees

This section gives an overview of existing and planned standardization projects, called Work Items (WI). The aim of this listing is to demonstrate the adequacy of the proposed programme of work with the actual market or stakeholders needs. You will find that the projects are listed according to the Working Group that is responsible for the drafting of the documents. More comprehensive information regarding the ISO/TC structure can be found under the next section ″ISO/TC Structure and Resources”

7.2.1 Work Item (WG 10)	Start	Complete
1. WG 10 to draft a standard including performance based requirements, mindful of current regulatory and commercial realities.	05/02	08/04
2. WG 10 shall use the approved Technical Specification as the basis for this work	05/02	ongoing

7.2.2 Work Item (WG 11)	Start	Complete
1. WG 11 to draft a standard including performance based requirements, mindful of current regulatory and commercial realities.	07/04	08/04
2. WG 11 shall use the approved Technical Specification as the basis for this work	07/04	ongoing

7.2.3 Work Item (TC 11)	Start	Complete
1. Adopt and promote the use of 16528	06/00	08/05
2. Build on the information provided on the contents of national and regional standards during the development of the performance based standard to begin development of a common market-based international standard.	03/03	ongoing
3. Provide a forum for international co-operation and collaboration in developing common rules and approaches in national and regional standards.	09/01	ongoing
4. Formulate a common market-based international standard.	08/04	to be determined

Chairperson: Mr. K. Ennis
Secretary: Mr. C. Withers
ISO Member responsible: ANSI
Chairperson & Secretary Time Allocation Per Year = 20% FTE

7.2.3 Additional human resources that ISO/TC 11 would need to participate in the work of the TC:

1. Establish a WG to:

   - confirm the benefit/cost of detailed study of the contents of national and regional standards.
   - develop a hierarchy of key criteria of registered codes.
   - provide a matrix of key criteria.

   Need - convenor and experts appointed by P-members.

   Convenor Time Allocation Per Year = 10% FTE.
   Secretary Time Allocation Per Year = 20% FTE.
   75 man days from expert members of the WG.

2. Establish a WG to:

Formulate common market-based international standards.

Need - convenor and experts appointed by P-members.

Convenor Time Allocation Per Year = 10% FTE.
Secretary Time Allocation Per Year = 20% FTE.
Significant amount of time to be committed by experts.

Note: Items 1 and 3 of the list of work items should be handled by the TC. There may be a requirement to establish a further working group if benefits of specific items under common rules are identified e.g. standards definitions, nomenclature and units.

Designation	ISO/CD 16528
Title	Boilers and pressure vessels – Registration of Codes and Standards to promote international recognition
Target Dates	ISO Stage 60 (Publication): 2005
Comments	None
Relationship of this project to the business environment	Provides a basis for registering national and regional standards. Registration may support the potential development of an ISO product standard.
Actions for alignment with the business environment	None

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