EXECUTIVE SUMMARY

ISO/TC 193 develops international standards for natural gas and natural gas substitutes (gaseous fuels) in all its facets from production to delivery to all possible end users across national boundaries. These standards include terminology, quality specifications, methods of measurement, sampling, analysis and calculation and tests.

These standards are supporting tools for delivery contracts between exploration companies, transportation companies, trading companies, distribution companies and industrial and individual end users. Instead of negotiating natural gas quality and measurement methods for each contract, easy reference to international standards can be made. Also they serve as supporting tools for regulations in the field of natural gas.

The importance of International Standards for the natural gas industry is growing with the increasing availability and consumption of natural gas and the increasing international trade in natural gas. International standards are being used to support the liberalization of the gas markets, the energy efficiency, environment protection and safety.

Assuming that the yearly production of 2200 G m$^3$ changes ownership from owner at least once, an inaccuracy in measurement of 1% represents a value of 1 G USD. This illustrates the importance of clear agreements about the measurements of volume and quality (e.g. calorific value) of the gas. Harmonization of quality requirements by standardization enables cost effective realization of processing installations.

A new activity by ISO/TC 193 is the development of international standards for the upstream industry. The presence of solids and liquids in the gas presents special requirements for the measurement methods used. The first goal to publish a Technical Report on allocation procedures has been achieved.
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:
ISO/TC 193 develops international standards for natural gas and natural gas substitutes (gaseous fuels) in all its facets from production to delivery to all possible end users across national boundaries. These standards include terminology, quality specifications, methods of measurement, sampling, analysis and calculation and tests. These standards are supporting tools for delivery contracts between exploration companies, transportation companies, trading companies, distribution companies and industrial and individual end users. Also they serve as supporting tool for regulations in the field of natural gas.

As opposed to other energy sources, natural gas is used in the condition which is as close as possible to that in which it is found. It is not formulated, refined or blended to a defined specification. Natural gas is treated to satisfy requirements of safety or engineering constraints, but in most cases this is limited to removal of water and condensable hydrocarbons. Natural gases from different sources have different properties, such as heating value, and are not all compatible in terms of safe and efficient use on particular appliances or applications. Since the properties differ, their accurate measurement is critical for considerations of billing, transmission choices and use and this accuracy must apply throughout the ranges over which properties vary.

Natural gas is widely used for domestic private, commercial and industrial purposes, both as an energy carrier and as a feedstock. It accounts for more than 20% of the world's primary energy consumption. There has been a sharp increase of proven gas reserves. In 2000 the proven gas reserves amounts to $145,000 \text{ Gm}^3$, which is sufficient for 65 years at present consumption level.

Main players in the natural gas market are:
- exploration and production companies
- trading companies
- transportation companies
- distribution companies
- regulatory bodies
- industrial customers
- consultancy and certification bodies.

Via the national delegations these interested parties are all represented in ISO/TC 193.

As the transportation of natural gas is a relatively important factor in the costs of the product, only 20% of the total production is traded across national boundaries. Together North America and Europe + Russian Federation account for 75% of the total consumption and 73% of the total production of natural gas. Only Western Europe (netto import 5% of world production) and Asia – Pacific region (netto import 1% of world production) import more natural gas than they export, whereas Eastern Europe + Russian Federation (+ 3%) and Africa (+ 3%) are netto exporters.

In general the transport of natural gas over long distances is growing by building large pipelines and LNG terminals. The LNG share in the long distance transport of natural gas is growing.

The major factors which may have an impact on the developments of the markets are:
- liberalization of natural gas transport and delivery: more players involved, increase of trading companies, increasing need for clear standards for natural gas quality and measurement
- increasing need for reducing costs, merging of exploration companies
- increasing use of natural gas because of environmental effects and new applications
- increasing production facilities by applying new technologies.
Liberalization of gas market/Increasing exchange of gases

As a result of the opening-up of energy markets, competition increases, including more parties involved, differentiation between transporting and trading companies and common carrier systems. This will increase the need for international standards in many areas, particularly quality and interchangeability.

Efficient use of energy

Efficient use of energy is necessary in order to optimize the life time of gas reserves. Both the environment and the economy would benefit from this. Great strides have been made in the past decade toward increased efficiency, particularly in the appliance area.

Increasing attention to environmental effects

In general, energy consumption has a negative impact on the environment, especially in industrial and urban areas. Increased and efficient use of natural gas would reduce this impact. Environmental effects draw ever greater attention and are expected to be a driving force in the increased utilization of natural gas.

Increasing attention for safety aspects

Although the public attention for safety aspects is still increasing, regulations and responsibilities are in process of change.

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:

Natural gas is widely used for domestic private, commercial and industrial purposes, both as an energy carrier and as a feedstock. It accounts for more than 20% of the world’s primary energy consumption. There has been a sharp increase of proven gas reserves. In 2000 the proven gas reserves amounts to 145.000 Gm$^3$, which is sufficient for 65 years at present consumption level.

Increasing availability

Exploration techniques continue to improve so that natural gas reserves are expected to increase significantly. Liquified natural gas (LNG) is becoming a major factor in gas sales internationally. Technology is driving down the costs of pipelined gas and LNG to become competitive with oil.

Development of marginally small fields is increasing, demanding additional cost effective production technology and the ancillary standardization. Gas is so widely available that its market
share is very likely to increase and may even double during the 21st century (the expected natural gas share of world primary energy for 2010 is 24 %).

Increasing consumption

Natural gas is now a major energy carrier worldwide. Its consumption will grow as a result of overall energy usage growth, the advent of new applications (such as natural gas vehicles), and also because of gas superseding other energy carriers. Oil firing will be increasingly replaced by gas firing, particularly for generation of electricity. Compared with other fossil energy carriers the use of natural gas is growing sharply (from 1987 till 1997: 25 % growth compared with oil 15 % and coal 4,5 %).

Increasing international trade

Cross border transport and carriage distances will increase. While there are over a hundred countries which have natural gas reserves sufficient for commercial development, the major reserves are found in just a few countries (Russian Federation 33 %, Iran 15 %). Moreover, these large reserves are in many cases located at great distances from the major gas consuming areas.

Growth in LNG trade is expected to partly overcome the geographic difficulties of distances between remote locations and major consuming areas. Only until the year 2010 a growth in LNG trade of 200% is expected.

About 20 % of the total yearly gas production (2200 Gm$^3$) is traded across national boundaries which represents a value of 20 G USD.

3 BENEFITS EXPECTED FROM THE WORK OF THE ISO/TC

The standards developed by ISO/TC 193 are a main supporting tool for delivery contracts of natural gas. Instead of negotiating natural gas quality and measurement methods for each contract, easy reference to international standards can be made.

Assuming that the yearly production of 2200 G m$^3$ changes ownership from owner at least once, an inaccuracy in measurement of 1 % represents a value of 1 G USD. This illustrates the importance of clear agreements about the measurements of volume and quality (e.g. calorific value) of the gas. Harmonization of quality requirements by standardization enables cost effective realization of processing installations.

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 use of natural gas is made possible by the activities of producers, carriers, distributors of natural gas and manufacturers of gas appliances, all of whom recognize the significance of the end users’ demands. Proper functioning of the natural gas market requires effective interaction between all parties.

The gas industry, recognizing the need for standardization, has already developed numerous national and international standards. Moreover, it is willing to give both technical and organizational support to international standardization efforts. Existing co-operative bodies may be expected to give sufficient support.

For the elaboration of a work programme for the new subcommittee ISO/TC 193/SC 3 “Upstream area” representatives and experts from major natural gas exploration companies shall be attracted to participate in the work.

At present main representations are from natural gas transportation and distribution companies from Western and Eastern Europe, Russian Federation, USA and Asia. A reinforcement of the representation from exploration companies is needed as well as new representations from Australia, New Zealand and South American and African regions.

In order to improve the participation by new countries plenary meetings will be envisaged to take place in these countries.

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

5.1 Defined objectives of the ISO/TC

Since its creation in 1988 ISO/TC 193 developed 48 international standards for the quality and measurement of natural gas. An additional 18 standards are in development or under revision. It is the objective of ISO/TC 193 to keep these standards up to date and to develop new standards where necessary.

These standards mainly apply for treated gas (from treatment plant to end user).

Until now these standards do not apply to untreated gas in the upstream area (from well to treatment plant). As in this part of the production chain many parties are involved too, there is a growing need for standards for this upstream area. For this a new subcommittee, ISO/TC 193/SC 3 “Upstream area”, has been created which has published ISO/TR 26762 on allocation procedures. The following new work items are being explored: LNG vaporization, Wet Gas measurement, Hydrate management and Online Gas Chromatography (OGC) applications.

Based on the considerations above, the ISO/TC has the following objectives for its future work:

Objectives of the ISO/TC

- to provide standards for guidelines, methods of tests and evaluation procedures which will assist in the smooth operation of international gas trade
- to provide standards for gas specification formats which will enhance safety standards and promote the development of valuable new products and uses for natural gas, like the use as vehicle fuel
• to provide standards for guidelines, methods of test and various evaluation procedures to enhance uniformity and safety in gas operations around the world
• to provide standards for gas specification formats pertinent to the liquefaction, storage and re-evaporation of LNG
• to provide standards for a smooth transaction of upstream gases
• to accommodate liberalization aspects in standards
  • to maintain a network with (access to) experts in the field of natural gas (up- and downstream) in the industry as well as in governmental organizations.

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

These objectives will be achieved by:
• streamlining of all standardization activities for the natural gas industry
• co-ordination of the work of all parties involved
• full exchange of information
• liaison with all relevant international organizations and other ISO technical committees
• a structure with two subcommittees:
  - SC 1 “Analysis of natural gas”
  - SC 3 “Upstream area”
  and working groups directly under the TC for items not falling in the scope of these subcommittees
• agreement with CEN that all published ISO/TC 193 standards will be taken over as European standards.

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

The following factors could place constraints on the completion of the objectives:
• less availability of expertise due to re-engineering of organizations in the natural gas sector
• not enough representation from exploration companies yet. As the original work programme was mainly oriented to the downstream sector the majority of experts involved still originates from this sector

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