BUSINESS PLAN

CEN/TC 286

LIQUEFIED PETROLEUM GAS EQUIPMENT AND ACCESSORIES

EXECUTIVE SUMMARY

Scope

Standardisation in the field of equipment and accessories used for the transportation, transfer, storage of LPG fuel tanks and cylinders and automotive LPG fuel. Drafting of product standards specific to LPG equipment and accessories harmonised to the essential requirements of relevant EU Directives and referenced in the RID/ADR

Business Environment

LPG equipment represents approximately 80 % of all the transportable pressure equipment within Europe for gases of Class 2, as defined in the RID/ADR. The amount of LPG that is transported throughout Europe simply dwarfs all other Class 2 gases and as such harmonization of the equipment for its transport is essential.

LPG is also widely used in the automotive sector as well as being a common domestic fuel in cylinders or bulk.

Benefits

Since the publication of the previous business plan the TC has published 19 European Standards and 3 Amendments covering all sectors the TC is addressing. This makes a total of 34 current European Standards to date. The publication of these standards has enabled the industry to more easily conform to the various legislative regimes covering the industry. It also encourages more uniform designs of equipment throughout Europe. Also since the publication of the previous business plan 16 CEN/TC 286 standards have been referenced in the ADR/RID regulation for the Transport of Dangerous Goods within the EC. With the changes that have occurred in the ADR/RID the use of these standards is now mandatory.

Priorities

The relationship the standards have with the legislation covering the industry activities is important. Maintaining this relationship is the greatest priority facing the TC presently. As most of the original work program is complete a program of revisions will be started over the coming year and working group experts will have to dedicate time to the process. It is also a priority of the TC to ensure that all relevant standards are fully referenced in the ADR/RID. The TC has committed to adding an Environmental Annex to all relevant standards as and when they are revised.

1 BUSINESS ENVIRONMENT OF THE CEN/TC

1.1 Description of the Business Environment

1.1.1 General

The following political, economic, technical, regulatory, legal, societal and/or international dynamics describe the business environment of the industry sector, products, materials, disciplines or practices related to the scope of CEN/TC 286, and they may significantly influence how the relevant standards development processes are conducted and the content of the resulting standards:

1.1.2 LPG market in Europe

1.1.2.1 The market for LPG pressure equipment and accessories is a function of the market for LPG. Petroleum Gas is a hydrocarbon product in the C3-C4 range, which is generally designated as Propane or Butane or mixtures thereof. It is found as a constituent of oil fields and some natural gas fields and is produced in the refining process. It is used as a feedstock for the petrochemical industry and as a constituent of petrol, as a propellant and for refrigeration. However, its main uses in the context of the Work Programme of CEN/TC 286 is as a fuel for heating and cooking and as a fuel for road vehicles and industrial vehicles e.g. fork lift trucks.

1.1.2.2 Annual volume of sales of LPG in European countries are approximately as follows:

- 21,2 million metric tonnes in total (approximately).
- 5,4 million metric tonnes of cylinder gas
- 8,3 million metric tonnes of bulk gas
- 7,4 million metric tonnes of automotive gas (approximately)

1.1.3 Structure of the market

1.1.3.1 The market in Europe has been in existence for more than seventy years. LPG is traded internationally between the producers and marketers and hitherto has been marketed on a national basis. The markets have tended to evolve differently in different countries. In some countries the producers i.e. the major oil companies are also the marketers. However, national dedicated LPG marketers, who purchase from the major oil refiners have also developed as major competitors to them. In the above situations, three to six marketers would tend to supply the market. However, in some countries, a larger number (several hundred in a few cases) of regional and local marketers have evolved. All of these parties have an interest in manufacturing and operational standards relating to cylinders, customer tanks, transport tanks, valves and other accessories.

1.1.3.2 National markets vary significantly but tend to be classified in the final distribution mode as ‘The Cylinder Market’ or ‘The Bulk Market’. In general, the butane cylinder market is in decline as piped natural gas networks have been expanded in Europe. However, many LPG customers are changing to LPG tank supply. The market can be broadly classified on a sectoral basis as domestic, commercial, industrial, agricultural and automotive. Domestic consumers out number commercial and industrial consumers significantly. In some countries, over 50 % of domestic premises use LPG cylinders.

1.1.3.3 Outside piped gas areas, most commercial, industrial and many agricultural undertakings use LPG for cooking, water heating, space heating and many specialised applications.

1.1.4 Interface between the LPG fuel market and LPG pressure vessel and accessories market

1.1.4.1 LPG has valuable characteristics as a fuel, being clean burning, non-toxic and non-corrosive. It must be pressurised for storage and distribution. However, it has the advantage of being liquefiable at relatively low pressures. These factors influence the need for the development of standards for dedicated LPG equipment, appliances and associated accessories.

1.1.4.2 The pressure of LPG is a function of ambient temperature, this implies that in an area as large as Europe, standards that are developed for this sector must also take account of the temperature factor. It is also critical to appreciate that because of the non-corrosive nature of the product, the pressure vessel population has a very long life expectancy if external maintenance is carried out.

1.1.4.3 The varying ambient temperature throughout Europe has a major influence on the developed pressure of LPG being stored. In the colder northern countries such as Finland, this pressure is significantly lower that the pressure developed in more southerly countries such as Italy. The difference in pressure a vessel will experience in operation can seriously affect, for instance, the required road tanker shell wall thickness. If the shell wall thickness is lower it is proportionally lighter. With the reduction in weight of the shell, the road tanker can safely transport greater loads. An increase in the capacity of each load means a reduction in the number of trips any given tanker has to make to transport a given amount of LPG. Equally reference-filling temperatures can also be lower in Northern Europe thereby allowing more LPG to be carried in a tanker at any one time. This will further decrease the number of trips required. A similar argument can be made to cover the filling and transport of cylinders. From a public safety point of view it must be far more desirable to have fewer road tankers and cylinders on the road at any one time and thus it is important to maintain the capacity for each member state to define the temperature to which the road tanker and cylinder must be designed and filled.

1.1.4.4 The LPG distribution industry, therefore, requires the development of operational standards that take account of these factors.

1.1.4.5 The marketing of LPG as a fuel requires the development and maintenance of an integrated storage and distribution system, which is, pressurised i.e. ship tanks, road tank vehicles, rail tankers, customer storage tanks and customer cylinders. The location of refineries, geographical factors and market segments, which have evolved nationally, all play their part in determining which elements of the storage and distribution system are employed and in what ratio. However, customer cylinders under 150 Litres, customer tanks between one and thirteen cubic metres, road tankers and cylinder vehicles are universally used in the final part of the distribution system. Hitherto, the market has been nationally based. National rules for certifying cylinders acted to restrict cross- border trading in addition to other factors e.g. the market value of the product relative to the cost of distribution.

1.1.4.6 The LPG market is distinguished from the compressed gases market and other sectors of the liquefied gases market by the nature of the hazard, the large number of domestic customers and small commercial undertakings it serves, the very large number of LPG dedicated cylinders and tanks in service and the methods of distribution and storage.

- Approximately 200 million LPG dedicated cylinders are in service in Europe, of which approximately 90 % are in the 11 to 13 kg (net weight) range.

- Approximately 3,7 million customer tanks are installed at customer premises.

- Approximately 9 000 road tanker vehicles.

- Approximately 3 000 rail cars.

- Approximately 8 million motorcars equipped for LPG use.

- Fire is the main hazard. Safety in the distribution and storage of cylinders and bulk tanks can be more readily controlled as long as it is under the responsibility of the marketer or industrial customer, but less so when it is in the hands of domestic customers. The cylinder distribution chain requires the storage of full and empty cylinders in small retail outlets. Cylinders kept as a backup/reserve may remain for many months, sometimes years, at the customer's premises and cannot be inspected by the marketer. These features create the need for specific provisions in relevant standards.

1.1.4.7 The cylinder and customer tank population have been, and still are, manufactured from welded steel, while the valves are brass. However, brazed steel, stainless steel and aluminium cylinders are also manufactured on a small scale and recently the sale of composite cylinders is being developed. They are all manufactured specifically for LPG use.

1.1.4.8 The automotive market has specially designed cylinders/tanks, components and systems for vehicles. It also requires the use of special storage and dispensing systems.

1.1.5 Interested parties in the standardization process

1.1.5.1 Marketers (Distributors)

In many countries, the whole pressure vessel population, or a considerable part of it, is owned by the marketers and is a significant part of their asset base as commercial organisations. However, in some Northern European countries, it is common for the cylinder to be owned by the consumer. Because of the 'non-corrosive' advantage of LPG these assets have a very long life expectancy if properly maintained externally. However, because of the significant costs involved they have to ensure that national and international regulations and standards in the context of prequalification, testing and maintenance of pressure vessels take account of the particular nature of the LPG market. In a mature market, the annual procurement of new cylinders may be quite small, e.g. in the order of 2 % of the existing cylinder population. Consequently they have an interest in ensuring that new vessels, particularly cylinders, conform to a corporate pattern that can be integrated into their existing population where filling, distribution and maintenance systems and procedures have been optimised.

1.1.5.2 National and European LPG Associations

Since the development of the LPG market in Europe there has been a need for the development of national standards, or, in their absence, national 'Codes of Practice' or equivalent, to supplement any national regulations to ensure safety in the market. In most countries national LPG Associations have been developed and technical staff employed to pursue these objectives. Generally, well established structures are in place to deal with the

relevant national regulatory bodies and the national standards bodies. Because the CEN system is broadly based on the principles of consensus of the national standards bodies, the national LPG associations play an important role at all stages in the process, i.e. evaluation of drafts, prENs at the 'Enquiry' and the 'Final Vote' stages. The AEGPL has a complementary role in representing the industry at appropriate EU, ECE and CEN consultation structures.

1.1.5.3 Cylinder manufacturers

They tend to be large undertakings with production lines dedicated to manufacturing welded steel, aluminium and composite LPG cylinders.

1.1.5.4 Tank manufacturers

While a small number have significant production lines, there are also smaller producers who service smaller national markets.

1.1.5.5 Road tanker manufacturers

They tend to be smaller units operating nationally in support of the larger marketing companies. It should be appreciated that when bulk tank vehicles are replaced it is normal to re-use the tank and only replace the chassis.

1.1.5.6 Valve manufacturers

Manufacturers are producing dedicated LPG valves and associated accessories for LPG cylinders and tanks. Even though the cylinder market is mature, the market for new valves is not dependent on new cylinders or tanks because the life of a valve is almost always shorter than the life of vessels that can be refurbished and requalified many times.

1.1.5.7 Automotive Tanks, components and accessories manufacturers

In addition to the marketers who have to invest heavily on a national scale in infrastructure to develop an automotive market, there are a number of manufacturers of automotive LPG equipment who have an interest in standards for that segment.

1.1.5.8 Specialist pressure vessel refurbishment undertakings

In some countries these undertakings have evolved to carry out refurbishing and requalification of pressure vessels on behalf of the owners of these vessels and who do not have the expertise nor the volume of work to sustain such work. In other cases the major marketers have contracted this work, or part of the work, to such organisations for their own commercial reasons. It is obvious that they have an interest in relevant standards for commercial as well as technical reasons.

1.1.5.9 Authorities/Regulators

LPG installations, cylinders, tanks, road and rail tankers and automotive installations are subject to stringent national regulatory control, but the nature of the control regulations can vary significantly. Regulators have sought to get agreement in the case of international trade through agreements such as RID and ADR. The regulators have an interest in the development of CEN European Standards. Some country representatives participate directly in the working groups. However, most tend to exercise influence at national level during the CEN Enquiry and Final Vote process.

The problem now exists for a CEN standard having gone through the process of:

— Development in working groups;

— CEN enquiry;

— Resolution of enquiry comments;

— Formal Vote;

Then having to be reassessed by a further working group of regulators (who have access to the process at all of the above stages) before being referenced in the ADR/RID.

1.1.5.10 'Approved bodies', 'notified bodies', 'competent authorities' etc.

There are a number of such organisations who have roles which arise from legislative provisions for independent testing and approval and also for commercial insurance reasons. They also have a major interest in all standards arising from the scope of CEN/TC 286.

The LPG is a mature industry and CEN/TC 286 is in the process of harmonizing practices throughout Europe.

The main technical changes in recent years have been in materials for cylinder production.

The CEN/TC 286 stakeholders are LPG supply companies, national authorities, equipment manufacturers and trade associations.

Safety issues are the prime concern of the committee and are mainly associated with pressure and flammability. These issues are dealt with by all the committee standards where relevant.

The other concerns of the stakeholders are:

— The essential requirements of Directives for harmonized standards are met

— The requirements of the ADR/RID for standards are met

— The requirements of the UN ECE R 67 for standards are met

— If the adoption of UN text into the ADR and RID is expanded then the need for equivalent ISO standards can be necessary.

1.2 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 CEN/TC:

— The LPG market can be distinguished from the compressed gases market and other sectors of the liquefied gases market by the nature of the hazard, the large number of domestic customers and small commercial undertakings it serves, the very large number of LPG dedicated cylinders and tanks in service and the methods of distribution and storage.

— Approximately 200 million LPG dedicated cylinders are in service and maintained in Europe, of which approximately 90 % are in the 11 to 13 kg (net weight) range.

— Approximately 3,5 million customer tanks are installed and maintained.

— Approximately 6 000 road tanker vehicles.

— Approximately 10 million fills are made to customer tanks per year

— Approximately 200 million cylinders are filled per year

— Approximately 2,3 million motor cars equipped for LPG use.

A number of the standards of the committee have been referenced in the ADR/RID and thus they are legally binding where the ADR/RID is in force.

The harmonized standards give presumption of conformity to the PED and the ATEX Directives.

There is extensive cross-referencing between standards within CEN/TC 286 committee European Standards. Other CEN committees that reference CEN/TC 286 standards are CEN/TC 23, CEN/TC 181 and CEN/TC 234.

2 BENEFITS EXPECTED FROM THE WORK OF THE CEN/TC

The TC responded to a need to produce standards appropriate to the LPG industry for the design, manufacture, safe filling and periodic inspection of cylinders made from composite materials and also stainless steel.

The automotive filling connector can be equated to the electric plug when viewed from a standardization point of view. Harmonisation of this connector throughout Europe is a long-term goal of the European LPG automotive industry. The TC has developed a European Standard for both halves of the connector, see EN 13760 and EN 12806.

Major cost savings have been achieved as a direct result of CEN/TC 286 European Standards covering periodic inspection of cylinders and reference temperatures for filling.

All harmonized standards under the PED and the ATEX directives are intended to remove technical barriers to trade.

3 PARTICIPATION IN THE CEN/TC

All the CEN national members are entitled to nominate delegates to CEN Technical Committees and experts to Working Groups, ensuring a balance of all interested parties. Participation as observers of recognized European or international organizations is also possible under certain conditions. The participation in the activities of this CEN/TC, is the responsibility of the national standards organization in each country.

4 OBJECTIVES OF THE CEN/TC AND STRATEGIES FOR THEIR ACHIEVEMENT

4.1 The defined objectives of CEN/TC 286 are:

4.1.1 To develop standards in the following areas:

— design and manufacture of LPG pressure vessels (tanks and cylinders),

— design and manufacture of accessories (valves, gauges, fittings) for LPG pressure vessels (tanks and cylinders),

— operational requirements for LPG tanks used for road and rail transport (including equipping, re-qualification, filling and discharge procedures),

— automotive LPG tanks, equipment, installations and filling systems,

— operational requirements for transportable cylinders (including filling procedures, periodic inspection),

— operational requirements for static tanks (including equipping, periodic inspection and requalification).

4.1.2 To ensure that relevant standards that lie within the scope of this TC provide the manufacturer with a means to demonstrate a presumption of conformity for his products in relation to the relevant essential requirements of applicable EU directives.

4.1.3 To ensure that users of relevant standards will be in compliance with EU legislation through the referencing of relevant standards in the RID/ADR and ECE regulations.

4.1.4 To include in all relevant standards an Environmental Annex in line with the recommendations of CEN SABE and the Environmental Helpdesk

4.1.5 To ensure that standards are delivered in line with agreed target dates and consistent with the optimum use of resources.

4.1.6 To work in co-operation with ISO in order to ensure the efficiency of the international standardising objectives in this field with the optimum use of resources.

4.2 Identified strategies to achieve the CEN/TC.s defined objectives

4.2.1 The management of the work of this TC is centred on achieving the most efficient use of resources, which are principally the availability of relevant experts from as many national interested parties as possible, the financial funding of their time and travel and the provision of the expert administrative support to ensure that the technical input is structured to conform to the CEN requirements.

4.2.2 The strategy adopted to deal with the work items deemed to be within the ‘Scope’ of the TC has been to group the work items into related areas under the control of a working group, to seek relevant experts in those areas and formulate a work program for the resultant work group.

4.2.3 Presently there are over 139 work items in the work programme, 23 of which are active, and these are allocated to 7 working groups.

4.2.4 Up to now, there has been generous support by national LPG marketing companies, national LPG associations, cylinder, tank, valve and automotive equipment manufacturers in providing experts for all working groups.

4.2.5 Working Group 1 has responsibility for the design and manufacture of LPG pressure vessels. The convenor and secretariat support are provided through co-operation with UK LPG and BSI.

4.2.6 Working Group 2 has responsibility for the design and manufacture of accessories for vessels designed by Working Group 1. The convenor and secretariat support are provided by the ILPGA and NSAI.

4.2.7 Working Group 5 has responsibility for the operational requirements of the transport of LPG in tanks by road or rail. The convenor and secretariat support are provided through co-operation with DVFG and DIN.

4.2.8 Working Group 6 has responsibility for automotive LPG systems. The convenor and secretariat are provided through co-operation Federchimica with UNI..

4.2.9 Working Group 7 (previously separate working groups 3 and 4) has responsibility for operational requirements for both transportable LPG cylinders and static customer tanks. The convenor and secretariat support are provided through co-operation with CFBP and AFNOR

4.2.10 Working Group 8 has responsibility for producing a standard for the requirements for the design, installation and subsequent maintenance of LPG pipework systems and supports for the conveyance of LPG in the liquid phase and of LPG in the vapour phase when at vapour pressure. The convenor and secretariat support are provided through co-operation with BP Polska and NSAI. It is the intention of the TC to disband this working group on completion of the standard.

4.2.11 Working Group 9 has responsibility for producing a standard for the Installation requirements for LPG propulsion systems for boats, yachts and other craft. . The convenor and secretariat support are provided through co-operation with British Marine Federation and NSAI. It is the intention of the TC to disband this working group on completion of the standard.

4.2.12 An Editing Committee comprises representatives from industry with support from AFNOR, BSI and DIN, under the chairmanship of the TC Secretary.

4.2.13 TC Plenary meetings take place at approximately twelve-month intervals, with the working groups meeting at intervals appropriate to the relevant work item target dates. The use of electronic means of communications is now the norm.

5 FACTORS AFFECTING COMPLETION AND IMPLEMENTATION OF THE CEN/TC WORK PROGRAMME

There are two specific areas where the work programme could be compromised in the future and they relate to expert availability and funding.

1. It is a growing concern that economic considerations in the marketplace are forcing companies to closely examine the level of support that can be justified from the work programme and in particular the time scale to achieve the completed standards. The main problem is the resources required for working group/secretariats and the Editing Committee in the context of the increased workload for these functions resulting form the CEN optimisation changes.

2. Funding is inextricably linked to the above issue in that continued financial support from Standards Bodies and/or Stakeholders will be required in order to complete the work programme to schedule.

6 Glossary of acronyms

Acronym	Description
ADR	European Agreement concerning the international carriage of Dangerous goods by Road.
RID	Regulations concerning the International Carriage of Dangerous Goods by Rail.
ECE	United Nations Economic Commission for Europe
UN ECE R 67	UN/ECE Regulation 67, Uniform provisions concerning the approval of specific equipment of motor vehicles using Liquefied Petroleum Gases in their propulsion system
EU	European Union
PED	Directive 97/23/EC of the European Parliament and of the Council of 29 May 1997 on the approximation of the laws of the Member States concerning pressure equipment.
ATEX	Directive 94/9/EC of the European Parliament and the Council of 23 March 1994 on the approximation of the laws of the Member States concerning equipment and protective systems intended for use in potentially explosive atmospheres.
CEN	European Committee for Standardisation
ISO	International Standards Organisation
AEGPL	Association Europeenne des Gaz de petroles liquefies
UK LPG	UK LPG association
ILPGA	Irish LP Gas Association
DVFG	Deutscher Verband Flüssiggas
CFBP	Comité Français du Butane et du Propane
DIN	Deutsches Institut für Normung e.V. (German Standards Body)
NEN	Nederlands Normalisatie-instituut (Dutch Standards Body)
NSAI	National Standards Authority of Ireland (Irish Standards Body)